



 **SIGMATEK**

Product Catalog



S-DIAS Control and I/O System



S-DIAS Safety



P-DIAS I/O System (IP67)



Industrial PCs

HMI



Motion Control System



MSR-System



Accessories

VARAN Accessories



Engineering Tool LASAL

CONTENT

SIGMATEK

We MaxUp your Automation

| | |
|----------------------------------|----|
| Complete Automation Systems..... | 27 |
| Standard Topologies | 32 |
| SIGMATEK International..... | 40 |

S-DIAS Control and I/O System

CPU & Bus Coupling

| | |
|--|----|
| CP 101 | 50 |
| CPU Module 1 Ethernet, 1 CAN 1 USB Device | |
| CP 102 | 52 |
| CPU Module 1 Ethernet, 1 CAN 1 USB-OTG | |
| CP 111 | 54 |
| CPU Module 2 VARAN Out, 1 Ethernet 1 USB Device, 1 microSD | |
| CP 112 | 56 |
| CPU Module 2 Ethernet, 1 VARAN Out 1 USB Device, 1 microSD | |
| CP 311 | 58 |
| CPU Module 1 Ethernet, 2 VARAN Out, 1 CAN 1 USB Device, 1 USB Host, 1 microSD | |
| CP 312 | 60 |
| CPU Module 2 Ethernet, 1 VARAN Out, 1 CAN 1 USB Device, 1 USB Host, 1 microSD | |
| CP 313 | 62 |
| CPU Module 1 Ethernet, 1 EtherCAT Drive Controller, 1 VARAN Out, 1 CAN 1 USB Device, 1 USB Host, 1 microSD | |
| CP 731 | 64 |
| CPU Unit 2 Ethernet, 2 VARAN Out, 1 CAN 1 USB Device, 1 USB 3.0, 1 microSD | |
| CP 733 | 66 |
| CPU Unit 1 Ethernet, 1 EtherCAT Master, 2 VARAN Out, 1 CAN 1 USB Device, 1 USB 3.0, 1 microSD | |
| EC 121 | 68 |
| Control Module 1 EtherCAT IN, 1 EtherCAT OUT, 1 S-DIAS Bus OUT | |
| VI 021 | 70 |
| VARAN Connection | |

Interfaces & Splitters

| | |
|---|----|
| ICA 011 | 72 |
| Interface Module CAN | |
| ICA 012 | 74 |
| Interface Module CAN galvanically separated | |

21

23

50

50

52

54

56

58

60

62

64

66

68

70

72

72

74

| | |
|--|----|
| IIO 041 | 76 |
| SDCI Master Module 4 SDCI ports, 4 digital inputs input delay 0.5 ms | |
| IPN 021 | 80 |
| Profinet I/O Slave Modul CAN | |
| ISE 021 | 82 |
| Interface Module RS232/RS485 | |
| ISE 031 | 84 |
| Interface Module RS232/RS485/TTY | |
| SE 051 | 86 |
| Interface Module 5 ethernet interfaces (RJ45) | |
| SE 052 | 88 |
| Interface Module 5 ethernet interfaces (Tyco Mini I/O) | |
| SV 141 | 90 |
| Interface Module 1 VARAN In (RJ45), 4 VARAN Out (RJ45) | |
| SV 142 | 92 |
| Interface Module 1 VARAN In (Tyco Mini I/O), 4 VARAN Out (Tyco Mini I/O) | |

Digital Input

| | |
|---|-----|
| DI 080 | 94 |
| Input Module 8 digital inputs input delay 5 ms | |
| DI 160 | 96 |
| Input Module 16 digital inputs input delay 5 ms | |
| DI 169 | 98 |
| Input Module 16 digital inputs input delay 5 ms | |
| DI 200 | 100 |
| Input Module 20 digital inputs input delay 5 ms | |
| DI 202 | 102 |
| Input Module with counter function 16 digital inputs, 4 digital inputs with counter function input delay input 1-4: 10 µs, input delay input 5-20: 0.5 ms | |
| DI 203 | 104 |
| Input Module 20 digital inputs input delay 0.5 ms | |
| DI 205 | 106 |
| Input Module 20 ground-switching inputs with a pull-up resistor to a +24 V signal | |

Digital Output

| | |
|--|-----|
| TO 081 | 108 |
| Output Module 8 short-circuit proof digital outputs | |
| TO 127 | 110 |
| Output Module 12 short-circuit proof digital outputs | |
| TO 161 | 112 |
| Output Module 16 short-circuit proof digital outputs | |

94

94

96

98

100

102

104

106

108

108

110

112

| | |
|---|------------|
| PW 022 | 114 |
| Pulse Width Module 2 PWM outputs | |
| PW 161 | 116 |
| Pulse Width Module 16 valve outputs | |
| RO 041 | 118 |
| Relay Output Module 4 relay outputs | |
| RO 051 | 120 |
| Relay Output Module 5 relay outputs | |
| Digital Mix | 122 |
| DM 046 | 122 |
| Digital Mixed Module 4 back-readable digital outputs input delay 0.5 ms | |
| DM 081 | 124 |
| Digital Mixed Module 4 digital inputs, 4 short-circuit proof digital outputs input delay 5 ms | |
| DM 108 | 126 |
| Mixed Module 4 digital inputs, 4 digital outputs, 2 digital outputs back-readable, 4 supply connections input delay 5 ms | |
| DM 161 | 130 |
| Digital Mixed Module 8 digital inputs, 8 short-circuit proof digital outputs input delay 5 ms | |
| DM 162 | 132 |
| Digital Mixed Module 4 digital inputs, 4 digital inputs with counter function and time measurement, 8 short-circuit proof digital outputs input delay 5 ms | |
| DM 167 | 134 |
| Digital Mixed Module 8 digital inputs, 8 short-circuit proof digital outputs input delay 5 ms | |
| Digital Analog Mix | 136 |
| IO 011 | 136 |
| Multi I/O Module 6 digital inputs (input delay 0.5 ms), 8 short-circuit proof digital outputs (turn-off delay 0.5 ms), 1 analog voltage input, 1 analog current input | |
| IO 011S | 140 |
| Multi I/O Module 6 digital inputs (input delay 1 μ s), 8 short-circuit proof digital outputs (turn-off delay 150 μ s), 1 analog voltage input, 1 analog current input | |
| Analog Input | 144 |
| AI 022 | 144 |
| Strain Gauge Input Module 2 analog inputs: measurement range ± 1.875 mV until ± 120 mV | |
| AI 022-1 | 146 |
| Strain Gauge Input Module 2 analog inputs: measurement range ± 1.25 mV until ± 80 mV | |
| AI 023 | 148 |
| Input Module 4 resistor or temperature inputs | |
| AI 043 | 152 |
| Input Module 4 resistor or temperature inputs | |

| | |
|--|------------|
| AI 046 | 156 |
| Analog Input Module 4 inputs ± 11 V or ± 1.1 V | |
| AI 047 | 160 |
| Analog Input Module 4 inputs 0-22 mA or 4-22 mA | |
| AI 075 | 164 |
| Input Module 6 analog inputs, 1 temperature input, 1 reference output | |
| AI 084 | 168 |
| Input Module 8 current inputs (0-20 mA/4-20 mA) | |
| AI 0812 | 170 |
| Input Module 8 analog inputs (PT1000/KTY -50 ... +150 °C) | |
| AI 088 | 172 |
| Input Module 8 thermal element inputs, 2 KTY temperature sensors | |
| AI 088-1 | 176 |
| Input Module 8 thermal element inputs, 2 KTY temperature sensors; Difference to AI 088: Measurement ranges | |
| Analog Output | 180 |
| A0 026 | 180 |
| Output Module 2 analog outputs (voltage/current switchable) | |
| A0 046 | 184 |
| Output Module 4 analog outputs (voltage/current switchable) | |
| A0 081 | 188 |
| Output Module 8 analog outputs | |
| Analog Mix | 190 |
| AM 221 | 190 |
| Mixed Module 2 analog inputs or potentiometer inputs, 2 analog outputs, 1 reference output | |
| AM 222 | 194 |
| Mixed Module 2 current inputs, 2 current outputs | |
| AM 441 | 198 |
| Mixed Module 4 analog inputs or potentiometer inputs, 4 analog outputs, 1 reference output | |
| AM 442 | 202 |
| Mixed Module 4 current inputs, 4 current outputs | |
| Counters & Position Recording | 206 |
| DI 204 | 206 |
| Input Module 14 digital inputs, 2 incremental encoder inputs | |
| FC 021 | 208 |
| Counter Input Module 2 digital RS422 inputs, 2 digital TTL inputs, 2 digital HTL inputs | |
| NC 100 | 212 |
| Positioning Module 4 digital inputs, 4 digital outputs, 1 incremental encoder input | |

| | |
|---|------------|
| SI 021 | 216 |
| SSI Interface Module 2 SSI absolute value encoders | |
| TS 041/TS 051 | 218 |
| Transsonar Module 4 or 5 transsonar encoders | |
| Measurement Technology | 220 |
| AI 031 | 220 |
| AC Current Measuring Module 3 current inputs 0-5 A AC | |
| AI 040 | 222 |
| Analog Input Module 4 inputs for vibration sensors with IEPE interface | |
| DM 811 | 224 |
| Absolute Pressure Input Module 1 absolute pressure input (0-1600 mbar), 1 PT100 temperature input, 8 digital inputs input delay 0.5 ms | |
| DM 822 | 228 |
| Differential Pressure Input Module 2 differential pressure inputs (-2068 ... +2068 mbar, 8 digital inputs input delay 0.5 ms | |
| EE 121 | 230 |
| Energy Measuring Module 3 voltage inputs (0-600 V), 12 current inputs (0-2 A AC) | |
| Motion | 234 |
| DC 061-1 | 234 |
| Axis Module 1 motor output stage 6 A, 1 resolver input, 1 holding brake | |
| DC 062(-X) | 238 |
| Axis Module 1 motor output stage 6 A, 1 incremental encoder input, 1 holding brake | |
| DC 101 | 242 |
| Drive Module 1 motor output stage 10 A, 1 resolver input, 1 holding brake | |
| DC 102 | 246 |
| Drive Module 1 motor output stage 10 A, 1 incremental encoder input, 1 holding brake | |
| SR 011 | 250 |
| DC Motor Module 1 DC motor output stage 50 V/5 A, 1 brake chopper, 1 incremental encoder input, 2 enable inputs, 1 digital output | |
| SR 020 | 254 |
| Current Controller Module: 1 DC motor output stage 3,5 A, 1 power LED driver 350 mA, 1 LED driver 20 mA | |
| SR 022 | 256 |
| Current Controller Module: 1 DC motor output stage 3,5 A, 1 incremental encoder input, 1 digital input +5 V, 2 digital inputs +24 V | |
| ST 011 | 260 |
| Stepper module 1 incremental encoder input, 1 output channel for the motor control, 2 digital optic coupler outputs, 2 digital inputs | |
| ST 151 | 264 |
| Stepper Motor Output Stage Module 1 stepper motor output stage 50 V/5 A, 1 brake chopper, 1 incremental encoder input, 2 enable inputs with STO functions, 2 latch/digital inputs | |

| | |
|--|------------|
| Special Functions | 268 |
| CO 041 | 268 |
| Current output module 4 current controlled outputs / Pulse signal outputs, 4 digital inputs +5 V | |
| DM 821 | 270 |
| Differential Pressure Input Module 2 differential pressure inputs (-1034 ... +1034 mbar), 8 digital inputs input delay 0.5 ms | |
| EZ 101 | 272 |
| Digital Input Module 10 digital inputs, Euromap interface | |
| EZ 102 | 274 |
| Digital Output Module 10 digital short-circuit proof outputs, Euromap interface | |
| EZ 122 | 276 |
| Digital Output Module 12 digital short-circuit proof outputs, Euromap interface | |
| KL 090 | 278 |
| Power Supply Module 9 terminals +24 V, 9 terminals 0 V | |
| KL 091 | 280 |
| Power Supply Module 9 terminals +24 V, 9 terminals 0 V | |
| KL 180 | 282 |
| 0 V Potential Distributor Module 18, 0 V terminals | |
| KL 181 | 284 |
| +24 V Potential Distributor Module 18, +24 V terminals | |
| PL 221 | 286 |
| Pixel LED Module 2x RGB Pixel LED stripes and 2x 24 V PWM LED stripes | |
| PSB 001 | 288 |
| Power Boost Module power the voltage supply for the S-DIAS bus | |
| RC 001 | 290 |
| RealTimeClock Module | |
| VA 011 | 292 |
| VARAN Analyzer Module 1 VARAN In 1 VARAN Out 1 Ethernet | |
| BL 011 | 294 |
| Dummy Module | |
| DEE 021 | 296 |
| Energy Measuring Module 3 voltage inputs, 12 current inputs | |
| S-DIAS SAFETY | 299 |
| SCP 011 | 302 |
| Safety CPU Module 1 Safety Interface, 1 USB Device, microSD Slot | |
| SCP 111 | 304 |
| Safety CPU Module Data memory: 24 kbytes, Program memory: 224 kbytes 1 Safety Interface, 1 USB Device, microSD Slot, with FSoE security report | |

| | |
|--|------------|
| SCP 211 | 306 |
| Safety CPU Module 1 Safety Interface, 1 USB Device, microSD Slot, with FSoE security report | |
| SDI 101 | 308 |
| Safety Digital Input Module 10 secure inputs, 1 redundant output signal (short-circuit proof) | |
| SDM 081 | 310 |
| Safety Digital Mixed Module 6 safe inputs +24 V DC/0.5 ms , 2 safe outputs +24 V/2 A per output, 1 redundant output signal (short-circuit proof) | |
| SNC 021 | 314 |
| Safety SNC Incremental encoder module 2 Incremental encoder inputs | |
| SRO 021 | 316 |
| Safety Relay Output Module 2 safe outputs 2 actuator signals | |
| SRO 022 | 318 |
| Safety Relay Output Module 2 safe outputs Closing (NO) | |
| SSI 021 | 320 |
| Safety SSI Absolute Value Encoder 2 absolute value encoder | |
| STO 081 | 322 |
| Safety Digital Output Module 8 secure outputs | |
| SIB 061 | 324 |
| Safety Input Box 6 safe inputs, 1 redundant output signal (short-circuit proof) | |

P-DIAS I/O System (IP67) 327

Digital I/O 334

| | |
|---|------------|
| PVDM 086 | 334 |
| VARAN Mixed Module 8 digital outputs (back-readable) M12 | |
| PVDM 087 | 336 |
| VARAN Mixed Module 4 digital outputs (back-readable), 4 digital inputs M12/M8 | |

Analog I/O 338

| | |
|--|------------|
| PVAI 011 | 338 |
| Protected VARAN DMS Module for a resistance bridge | |

Industrial PCs 341

| | |
|--|------------|
| IPC 221 | 346 |
| Industrial PC Intel Celeron 1020E 2-Gbyte DDR3 RAM | |
| PC 444-W | 350 |
| Control Cabinet PC Intel Celeron G3900 4-Gbyte DDR4 RAM 128 GByte SSD WIN 10 MUI HMI-Link G2 | |
| PC 521 | 352 |
| Data Recording PC Intel Celeron J1900 4-Gbyte DDR3 RAM 128-Gbyte SSD Windows 10 IoT HDMI | |
| ETV 1591 | 354 |
| 15" resistive touch 1024 x 768 Intel Celeron Ethernet, VARAN IP54 | |

Accessories IPC 358

| | |
|---|------------|
| USV 011 | 358 |
| Uninterruptable Current Supply | |
| PC 301-E8 | 362 |
| HMI-Link G2 Device 1 HMI-Link, 1 USB 2.0, 1 Displayport | |
| PC 301-E12 | 364 |
| HMI-Link G2 Device 1 HMI-Link, 1 USB 2.0, 1 Displayport | |
| PCV 521 | 366 |
| PCI Insert Module 2 VARAN Out (Manager) | |
| PCV 522 | 368 |
| PCI Insert Module 2 VARAN Out (Manager) 1024-kbyte SRAM | |
| PCV 531 | 370 |
| PCI Insert Module 2 VARAN Out (Manager) 16-MBit Flash internal memory | |
| PCD 101 | 372 |
| Interface Card 1 electrical DIAS bus | |
| PCD 111 | 374 |
| Interface Card 1 electrical DIAS bus, 1 DIAS bus HP fiber optics | |
| PCD 403 | 376 |
| Interface Card 3 electrical DIAS bus | |
| PCD 412 | 378 |
| Interface Card 2 electrical DIAS bus, 1 DIAS bus HP fiber optics | |

HMI's 381

3.5" - 12.1" Panels Multitouch 386

| | |
|---|------------|
| ETT 732 | 386 |
| 7" capacitive touch 800 x 480 EDGE2 Technology processor Ethernet, CAN, ... IP54 | |
| ETT 7321 | 390 |
| 7" capacitive touch 800 x 480 EDGE2 Technology processor Ethernet IP54 | |
| ETT 764 | 394 |
| 7" capacitive touch 1024 x 600 EDGE3 Technology processor Ethernet, ... IP65 | |
| ETT 0833 | 398 |
| 8.4" capacitive touch 800 x 600 EDGE2 Technology processor Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETT 1033 | 402 |
| 10.4" capacitive touch 1024 x 768 EDGE2 Technology processor Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETT 1034 | 406 |
| 10.1" capacitive touch 1280 x 800 EDGE2 Technology processor Ethernet, USB IP65 | |
| ETT 1044 | 410 |
| 10.1" capacitive touch 1280 x 800 Intel® Celeron® J4005 DisplayPort, Ethernet, USB IP65 | |
| ETT 1054-W | 414 |
| 10.1" capacitive touch 1280 x 800 Intel® Celeron® J5005 DisplayPort, Ethernet, USB IP65 Windows | |

| | |
|---|------------|
| TAE 1044 | 418 |
| 10.1" capacitive touch 1280 x 800 HMI-Link G2.1 USB IP65 | |
| ETT 1233 | 422 |
| 12.1" capacitive touch 1024 x 768 EDGE2 Technology processor Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETT 1234 | 426 |
| 12.1" capacitive touch 1280 x 800 EDGE2 Technology processor Ethernet, USB IP65 | |
| ETT 1244 | 430 |
| 12.1" capacitive touch 1280 x 800 Intel® Celeron® J4005 DisplayPort, Ethernet, USB IP65 | |
| TAE 1244 | 434 |
| 12.1" capacitive touch 1280 x 800 HMI-Link G2.1 USB IP65 | |
| 3.5" - 12.1" Panels Singletouch | 438 |
| ETT 312 | 438 |
| 3.5" resistive touch 320 x 240 CAN IP65 | |
| ETT 352 | 440 |
| 3.5" resistive touch 320 x 240 CAN IP30 | |
| ETT 353 | 442 |
| 3.5" resistive touch 320 x 240 CAN IP54 | |
| ETT 412 | 444 |
| 4.3" capacitive touch 480 x 272 CAN IP65 | |
| ETT 731 | 446 |
| 7" resistive touch 800 x 480 EDGE2 Technology processor Ethernet, CAN, ... IP54 | |
| ETT 771 | 450 |
| 7" resistive touch 800 x 480 EDGE2 Technology processor Ethernet, CAN, ... IP54 | |
| ETT 775 | 454 |
| 7" resistive touch 800 x 480 EDGE2 Technology processor Ethernet, CAN, TTY, ... IP54 | |
| ETV 0551 | 458 |
| 5.7" resistive touch 640 x 480 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP54 | |
| ETV 0552 | 462 |
| 5.7" resistive touch 640 x 480 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETV 0555 | 466 |
| 5.7" resistive touch 640 x 480 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP54 | |
| ETV 0851 | 470 |
| 8.4" resistive touch 800 x 600 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP54 | |
| ETV 0851-I | 474 |
| 8.4" resistive touch 800 x 600 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETV 0853-3 | 478 |
| 8.4" capacitive touch 800 x 600 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETV 0855 | 480 |
| 8.4" resistive touch 800 x 600 EDGE Technology processor VARAN, Ethernet, CAN, ... IP54 | |
| ETV 1251 | 482 |
| 12.1" resistive touch 800 x 600 EDGE Technology processor VARAN, Ethernet, CAN, ... 8 DI, 8 DO IP54 | |

| | |
|---|------------|
| 15" - 23.8" Panels Multitouch | 486 |
| ETT 1533 | 486 |
| 15" capacitive touch 1024 x 768 EDGE2 Technology processor Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETT 1534 | 490 |
| 15.6" capacitive touch 1366 x 768 EDGE2 Technology processor Ethernet, USB IP65 | |
| ETT 1544 | 494 |
| 15.6" capacitive touch 1366 x 768 Intel® Celeron® J4005 DisplayPort, Ethernet, USB IP65 | |
| TAE 1544 | 498 |
| 15.6" capacitive touch 1366 x 768 HMI-Link G2.1 USB IP65 | |
| ETT 1834 | 502 |
| 18.5" capacitive touch 1366 x 768 EDGE2 Technology processor Ethernet, USB IP65 | |
| ETT 1844 | 506 |
| 18.5" capacitive touch 1366 x 768 Intel® Celeron® J4005 DisplayPort, Ethernet, USB IP65 | |
| TAE 1844 | 510 |
| 18.5" capacitive touch 1366 x 768 HMI-Link G2.1 USB IP65 | |
| ETT 1933 | 514 |
| 19" capacitive touch 1280 x 1024 EDGE2 Technology processor Ethernet, CAN, ... 8 DI, 8 DO IP65 | |
| ETT 2134 | 518 |
| 21.5" capacitive touch 1920 x 1080 EDGE2 Technology processor Ethernet, USB IP65 | |
| ETT 2144 | 522 |
| 21.5" capacitive touch 1920 x 1080 Intel® Celeron® J4005 DisplayPort, Ethernet, USB IP65 | |
| ETT 2154-W | 526 |
| 21.5" capacitive touch 1920 x 1080 Intel® Celeron® J5005 DisplayPort, Ethernet, USB IP65 Windows | |
| TAE 2144 | 530 |
| 21.5" capacitive touch 1920 x 1080 HMI-Link G2.1 USB IP65 | |
| TT 1533 | 534 |
| 15" projective capacitive glass touch 1024 x 768 EDGE2 Technology processor Ethernet, CAN, ... IP54 | |
| TT 1933-S | 538 |
| 18.5" projective capacitive glass touch 1366 x 768 EDGE2 Technology processor USB, Ethernet, ... IP54 | |
| TAE 2343 | 542 |
| 23.8" projective capacitive touch 1920 x 1080 HMI-Link G2, ... IP54 | |
| 15" - 23.8" Panels Singletouch | 546 |
| TAE 151 | 546 |
| 15" resistive touch 1024 x 768 S-DVI, CAN, ... IP54 | |
| ETT 1561 | 548 |
| 15" resistive touch 1024 x 768 EDGE2 Technology processor Ethernet, CAN, ... IP54 | |
| ETT 1962 | 552 |
| 19" resistive touch 1280 x 1024 EDGE2 Technology processor Ethernet, ... IP54 | |
| TAE 1921 | 556 |
| 19" resistive touch 1280 x 1024 HMI-Link, ... IP54 | |

| | |
|--|------------|
| TAE 1931 | 558 |
| 19" resistive touch 1280 x 1024 Display port, ... IP54 | |
| TAE 1941 | 560 |
| 19" resistive touch 1280 x 1024 HMI-Link G2, ... IP54 | |
| Mobile Panels | 562 |
| HBG 0811 | 562 |
| 8.4" resistive touch 800 x 600 HMI-Link, Safety Interface, ... IP54 | |
| HGT 835 | 564 |
| 8.4" resistive touch 800 x 600 EDGE2 Technology processor VARAN, Ethernet, Safety Interface, ... IP54 | |
| HBG 1011 | 568 |
| 10.4" resistive touch 1024 x 768 HMI-Link, Safety Interface, ... IP54 | |
| HGT 1035 | 570 |
| 10.4" resistive touch 1024 x 768 EDGE2 Technology processor VARAN, Ethernet, Safety Interface, ... IP54 | |
| HGT 1051 | 574 |
| 10.1" capacitive touch 800 x 1280 EDGE2 Technology processor Ethernet, Safety Interface, ... IP54 | |
| HGT 1053 | 578 |
| 10.1" capacitive touch 800 x 1280 EDGE3 Technology processor Ethernet, Safety Interface, ... IP54 | |
| HGW 1033 | 582 |
| 10.1" projective capacitive touch 800 x 1280 portrait mode EDGE2 Technology processor WLAN Dualband IP54 without Safety functions | |
| HGW 1033-01 | 586 |
| 10.1" projective capacitive touch 800 x 1280 landscape mode EDGE2 Technology processor WLAN Dualband IP54 without Safety functions | |
| HGW 1033-3 | 590 |
| 10.1" projective capacitive touch 800 x 1280 portrait mode EDGE2 Technology processor WLAN Dualband IP54 with Safety functions | |
| HGW 1033-32 | 594 |
| 10.1" projective capacitive touch 800 x 1280 portrait mode EDGE2 Technology processor WLAN Dualband IP54 with Safety functions rotary encoders | |
| BWH 001 | 598 |
| WLAN HGW Base station EDGE2 Technology Processor WLAN Dualband | |
| BWH 011 | 602 |
| WLAN HGW Base Station without suspension EDGE2 Technology Processor WLAN Dualband | |
| Keypads | 606 |
| TE 891 | 606 |
| Keypad | |
| TE 401 | 608 |
| Keypad 40 keys | |
| TE 501 | 610 |
| Keypad 50 keys | |
| Accessories HMI | 612 |

| | |
|---|------------|
| Motion Control System | 615 |
| DIAS Drives | 626 |
| MDD 2000 | 626 |
| 3 Achsen 3 Baugrößen Wirknenleistung von 1,3-18 kW Dauerstrom 5-30 A/Achse | |
| SDD 310 | 632 |
| 3 axes 3x 10 A continuous current, 20 A peak current | |
| SDD 315 | 636 |
| 3 axes 1x 15 A/2x 10 A continuous current, 1x 30 A/2x 20 A peak current | |
| SDD 335 | 640 |
| 3 axes 1x 15 A/2x 10 A continuous current, 1x 35 A/1x 30 A/1x 20 A peak current | |
| SDD 210 | 644 |
| 2 axes 2x 10 A continuous current, 20 A peak current | |
| SDD 215 | 648 |
| 2 axes 1x 10 A/1x 15 A continuous current , 1x 20 A/1x 30 A peak current | |
| SDD 120 | 652 |
| 1 axis, 1x 20 A continuous current 1x 40 A peak current | |
| MDP 101-1 | 656 |
| Power Module 400 V/480 V | |
| MDP 102-1 | 660 |
| Power Module 230 V | |
| MDD 111-1 | 664 |
| Axis Module for 1 axis 230 V-400 V/480 V | |
| MDD 121-1 | 666 |
| Axis Module for 2 axes 230 V-400 V/480 V | |
| MDM 011, 021, 031 and 041 | 668 |
| Module Carrier | |
| MDM 011-Z1 | 670 |
| Regen Resistor accessory for the module carrier MDM 0x1-0 | |
| VST 012 | 672 |
| Stepper Module 1 VARAN In, 1 VARAN Out, 1 incremental encoder input, 1 enable input, 4 digital inputs, 4 digital outputs, 2 stepper motor outputs | |
| Servo Motors | 676 |
| Series AKM | 676 |
| Series AKM Low Voltage | 682 |
| Mechanical Dimensions AKM | 684 |
| Order Code AKM | 686 |
| Series SM | 688 |
| Mechanical Dimensions SM | 690 |

| | |
|-----------------------------|-----|
| Order Code SM | 691 |
| Series DSM5 | 692 |
| Mechanical Dimensions | 698 |
| Order Code | 705 |

Planetary Gears 706

| | |
|-----------------------------|-----|
| Series PEII | 706 |
| Mechanical Dimensions | 710 |

Cable 712

| | |
|--|-----|
| Sensor Cables | 712 |
| Motor Cable MDD 2000 | 716 |
| Motor Cable SDD 310/315/335/215/120 | 720 |
| Motor Cable MDD 100 and DC 061-1/062 | 722 |

Interface Cards 724

| | |
|--|-----|
| VBI 021 | 724 |
| Interface Card 1 VARAN bus, 1 „BACI“-Bus | |
| VKI 021 | 726 |
| VARAN-KEB-F5 Interface | |
| VKI 022 | 728 |
| VARAN-KEB-F5 Interface | |

MSR System 731

| | |
|---|-----|
| MSR 111 | 736 |
| Measuring System module carrier | |
| MSR 121 | 738 |
| Measuring System interface module | |
| MSR 131 | 740 |
| Measuring System fan module | |
| MSR 211 | 742 |
| Measuring System base module | |
| MSR 221 | 744 |
| Measuring System AI insert module | |
| MSR 222 | 748 |
| Measuring System AI insert module (0 ... 20 mA) | |
| MSR 223 | 752 |
| Measuring System AI insert module (PT100) | |
| MSR 231 | 754 |
| Measuring System 8B insert module | |

| | |
|-------------------------------------|-----|
| MSR 241 | 756 |
| Measuring System AO-insert module | |

| | |
|-------------------------------------|-----|
| MSR 251 | 758 |
| Measuring System FC-insert module | |

| | |
|-------------------------------------|-----|
| MSR 261 | 760 |
| Measuring System NC insert module | |

| | |
|--------------------------------------|-----|
| MSR 281 | 762 |
| Measuring System DMS insert module | |

| | |
|--------------------------------------|-----|
| MSR 282 | 766 |
| Measuring System DMS insert module | |

| | |
|-------------------------------|-----|
| MSR 311 | 770 |
| Measuring System I/O module | |

Accessories 773

| | |
|-----------------|-----|
| Batteries | 776 |
|-----------------|-----|

| | |
|---------------|-----|
| CAN Bus | 778 |
|---------------|-----|

| | |
|-----------------------------|-----|
| S-DVI Interface Cable | 780 |
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| Cable | 781 |
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| CFF 011 | 784 |
| Replacement for 3.5" floppy drive | |

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|---------------------------|-----|
| DC 06X-Z1 | 786 |
| Regen resistor for DC 06X | |

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| DC 061-Z3 | 788 |
| Regen resistor for DC 061 with Molex plug | |

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| RFID 131 | 790 |
| RFID Reader USB and CAN connection | |

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| RAR 24XX | 792 |
| Remote Access Router Standard hardware for the SIGMATEK Remote Access Platform (RAP) | |

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|--|-----|
| WIFI 011 | 796 |
| WiFi Adapter USB Stick Client & Access Point | |

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|--------------------------------------|-----|
| Memory Cards and Miscellaneous | 798 |
|--------------------------------------|-----|

VARAN Connector Cable 800

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| Prefabricated Connector Cable | 801 |
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| Connector Cable CAT5 | 807 |
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| RJ45 Connector Set CAT5 | 808 |
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| Mini I/O Connector Set CAT5 | 809 |
|-----------------------------------|-----|

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|----------------------|-----|
| Stripping Tool | 810 |
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VARAN Boards/Analyzer **813**

| | |
|--|------------|
| VEB 031 | 814 |
| VARAN Manager Board 2 VARAN | |
| VEB 011 | 816 |
| VARAN Client Board 1 VARAN, 1 periphery interface | |
| VEB 011C | 818 |
| VARAN Client Board data exchange CANOpen or DPRAM 1 VARAN, 1 periphery interface | |
| VEB 011-SPI | 820 |
| VARAN Client Board 1 VARAN, 1 periphery interface, SPI | |
| VEB 012 | 822 |
| VARAN Client Board 1 VARAN, 1 periphery interface | |
| VEB 013 | 824 |
| VARAN Client Board splitter function 2 VARAN (Client In/Out), 1 periphery interface | |
| VEB 013-SPI | 826 |
| VARAN Client Board splitter function, SPI 1 VARAN In, 1 VARAN Out, 1 Periphery interface | |
| VEB 021 | 828 |
| VARAN Demo Board | |
| VEB 022 | 832 |
| VARAN Demo Board minimally populated | |
| WVO 323 | 834 |
| VARAN Valve Interface with 32 digital outputs | |
| ETVA 0501 | 836 |
| VARAN Analyzer | |

Engineering Tool LASAL **841**

| | |
|-------------------------------------|------------|
| Engineering Tool LASAL | 844 |
| LASAL CLASS | 848 |
| LASAL SCREEN | 852 |
| LASAL MOTION | 854 |
| LASAL SAFETYDesigner | 856 |
| LASAL SERVICE | 858 |

Findex **862**



SIGMATEK

Founded in 1988, today SIGMATEK is internationally one of the leading manufacturers of complete and fully integrated automation systems. A spirit of innovation, competence and absolute customer orientation has brought us to the forefront of automation technology.

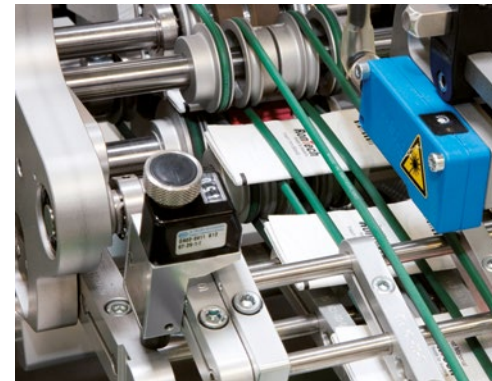
Trend-Setting Automation Solutions

Integrated automation systems increase the flexibility and productivity of your machine. Here lies SIGMATEK's core expertise. All hard and software components for our automation systems are designed and produced in the main factory in Lamprechtshausen. Thanks to their compatibility and scalability, the components can be flexibly combined; a tailor-made automation solution with long-term availability is therefore provided.



We MaxUp your Automation

... with complete automation systems, engineering know-how and industry experience. You therefore receive flexible solutions with added value.



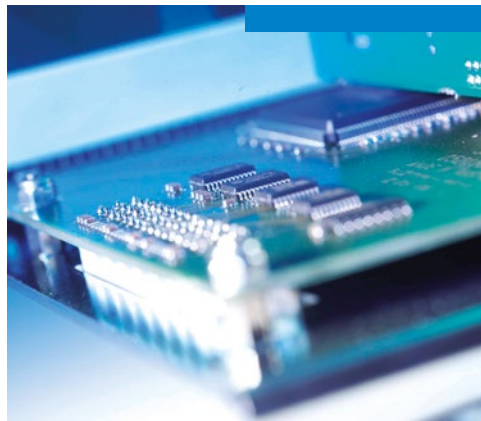
Solution Expertise

SIGMATEK has combined expertise and a high degree of experience in the most varying application areas and industries. We understand your specific needs, have a feeling for trends and quickly convert them into serial products. Whereby, we never lose sight of the big picture. The customer therefore receives a tailor-made industry solution.



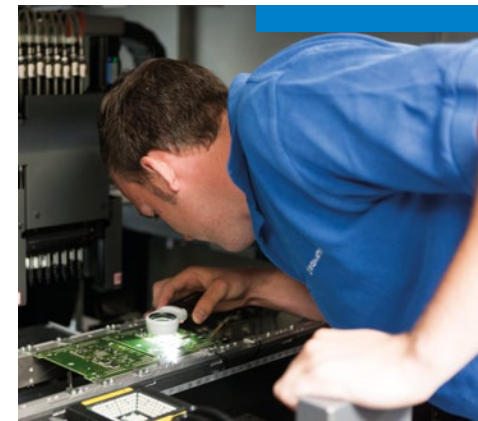
Always Close to the Customer

We are experts in integrated complete solutions. This gives the customer the advantage of having just one contact partner for all their automation questions. With a complete view of the machine process, we support you over for the entire product life cycle: from finding a solution, project development through the application engineering and initial start-up to service and remote maintenance.



Head Start Through Innovation

Innovation is the result of our passion for the continuous improvement of products and solutions. With innovative new and improved designs, we are setting future trends. This allows us to maintain our role as a technology leader and continually build on our position in the automation industry.



Uncompromising Quality

All components are produced in the main facility in Austria. Here, trend-setting technology at an economic price with high reliability and long-term availability is produced. This is an added value that our customers know to appreciate. The most modern production technologies and an ISO 9001: 2008-certified quality management system guarantee the continuous high quality of our products.

Complete Automation Systems



At SIGMATEK, hard and software come from one source. Our fully integrated system solutions are modularly constructed like a toolbox system. This modularity offers you an important competitive advantage: the most varying customer requirements can be implemented flexibly and efficiently. The compatibility and scalability of the components are just as guaranteed as the long-term availability.



PLC



The right CPU is available for any application: compact controls component series, control panels with integrated visualization or classic industrial PCs. Different processors are thereby used, from low-loss EDGE technology to Intel® Atom™. The scalability and compatibility of the user software goes without saying.

I/O



The I/O modules of the DIAS system family cover IP20 (S-DIAS) as well as IP67 (P-DIAS) requirements. For Safety applications, S-DIAS Safety modules are available. The numerous standard modules can be combined individually and therefore perfectly customized for any application.



Motion Control



At SIGMATEK, motion control is fully integrated into the control system. Motors, DIAS Drives and software interact perfectly and enable highly dynamic and exact movement sequences. The engineering is simple. In the different component series of the DIAS Drives, important safety functions are already integrated.



HMI



A broad spectrum of HMI panels are available to choose from: from simple non-intelligent operating terminals to control panels with integrated CPUs. A diversity of sizes is also available: from 5.7" to 24".



Safety



The fully integrated and TÜV-certified Safety system allows the simple implementation of Safety requirements in accordance with EN 62061/SIL3/PL e. The Safety systems can be combined with the S-DIAS series as desired. The uncomplicated installation and comfortable programming contribute to the efficiency of your machine.

Communication



Integrated, hard real-time communication is the backbone of modern communication systems. The Ethernet technology-based VARAN bus system provides a great deal of freedom for plant design through different network topologies. Data is exchanged in hard real-time with guaranteed determination at cycle times up to 100 μ s and jitter under 100 ns.



Engineering

SIGMATEK automation systems are completed with the comfortable "all-in-one" engineering tool LASAL, which scores with object oriented programming and graphic representation. LASAL enables the fast and efficient realization of machine concepts: PLC programming, HMI, motion control, Safety, diagnostics and service.

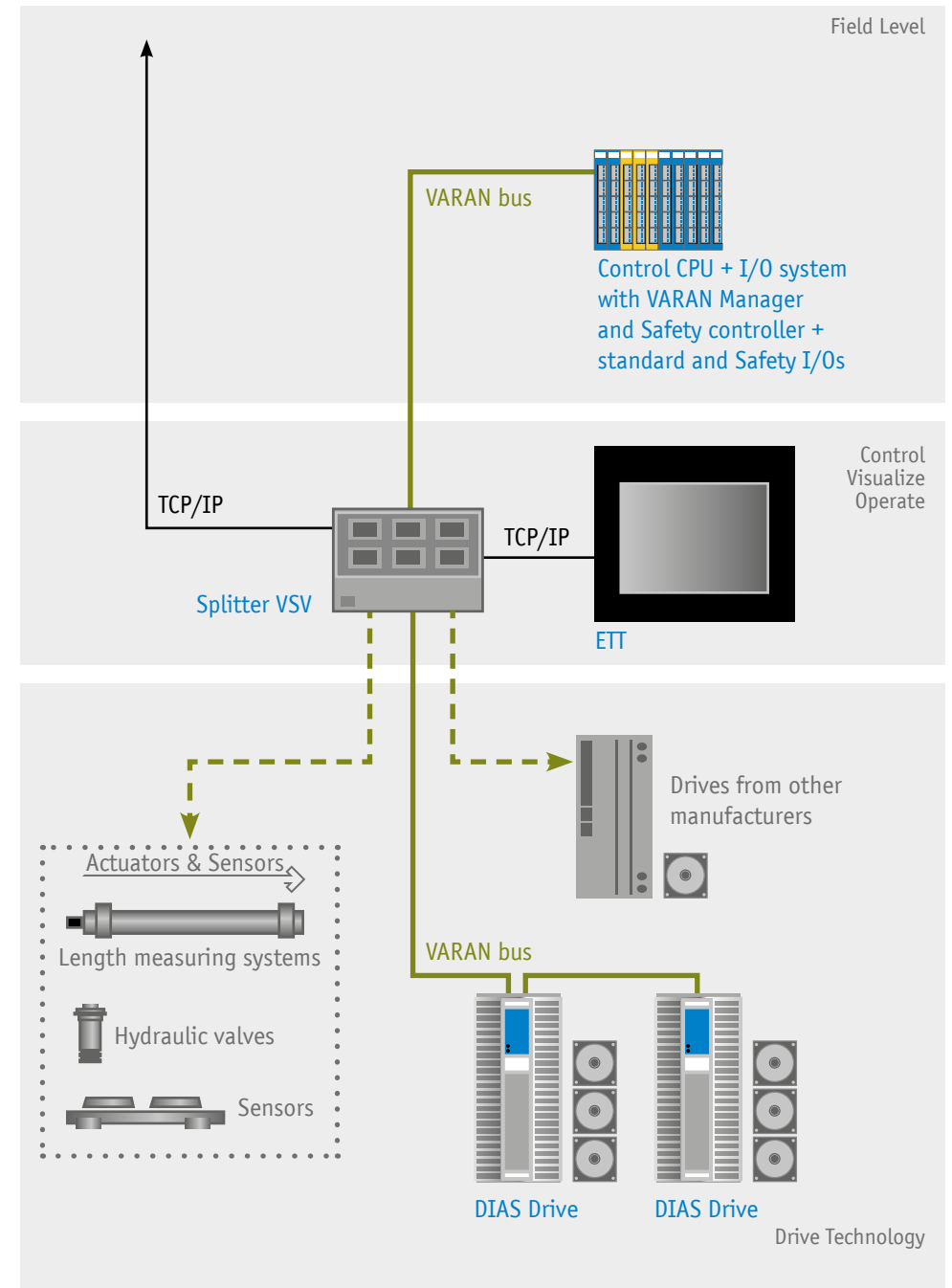


Standard Topologies

With our multiple standard components, we can customize the solution for your automation tasks to fit your individual requirements; your needs are met with the best solution at an economic price.

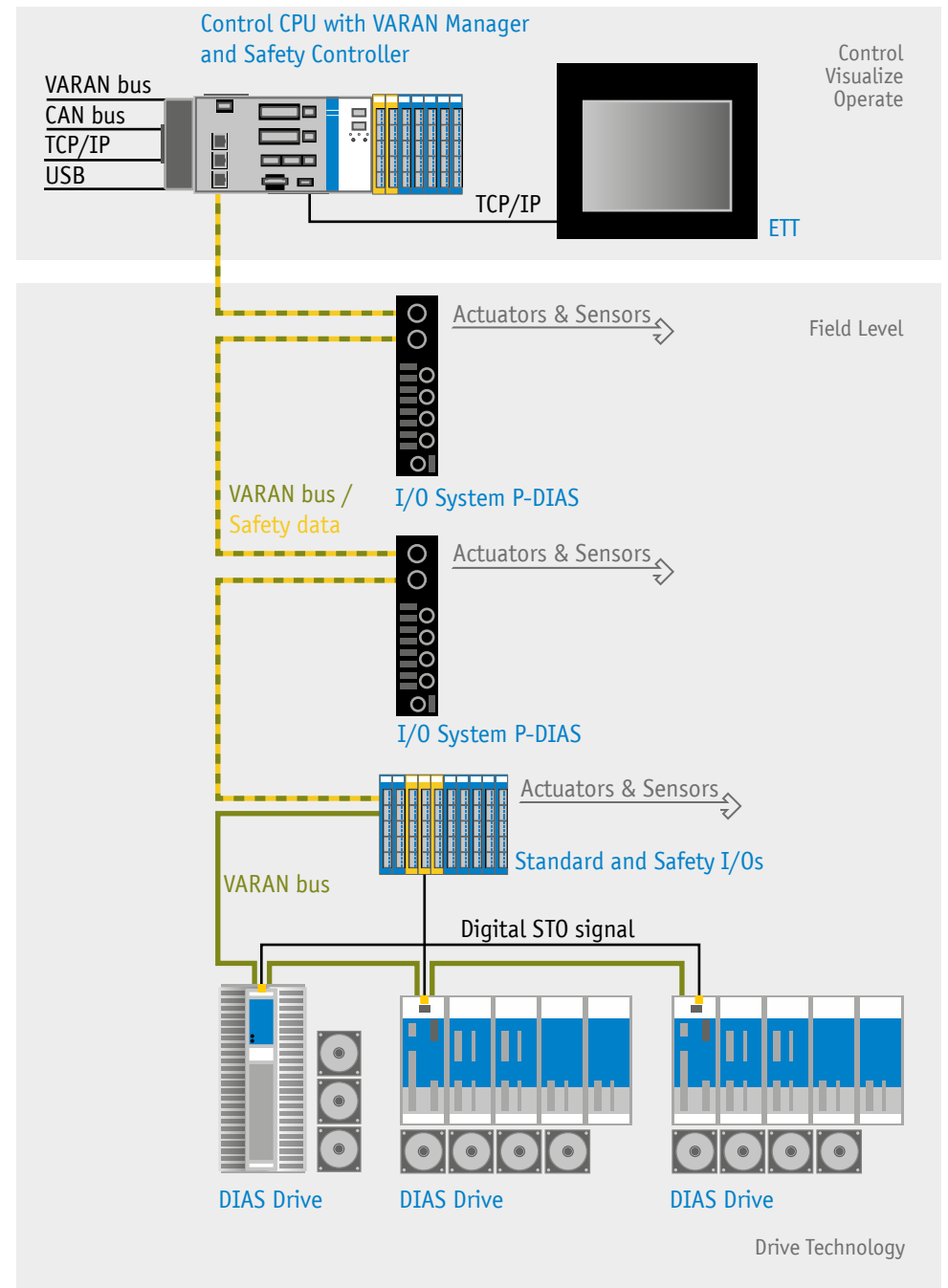
Distributed Sensors + Centralized Automation

For modular machine concepts with several function units that are similar, a central control is used to reduce costs. and all components are networked over the extremely fast, high performance real-time Ethernet bus VARAN. With a Laptop, for example, the designer can establish an online connection over each available splitter.



Control Unit with Remote Visualization

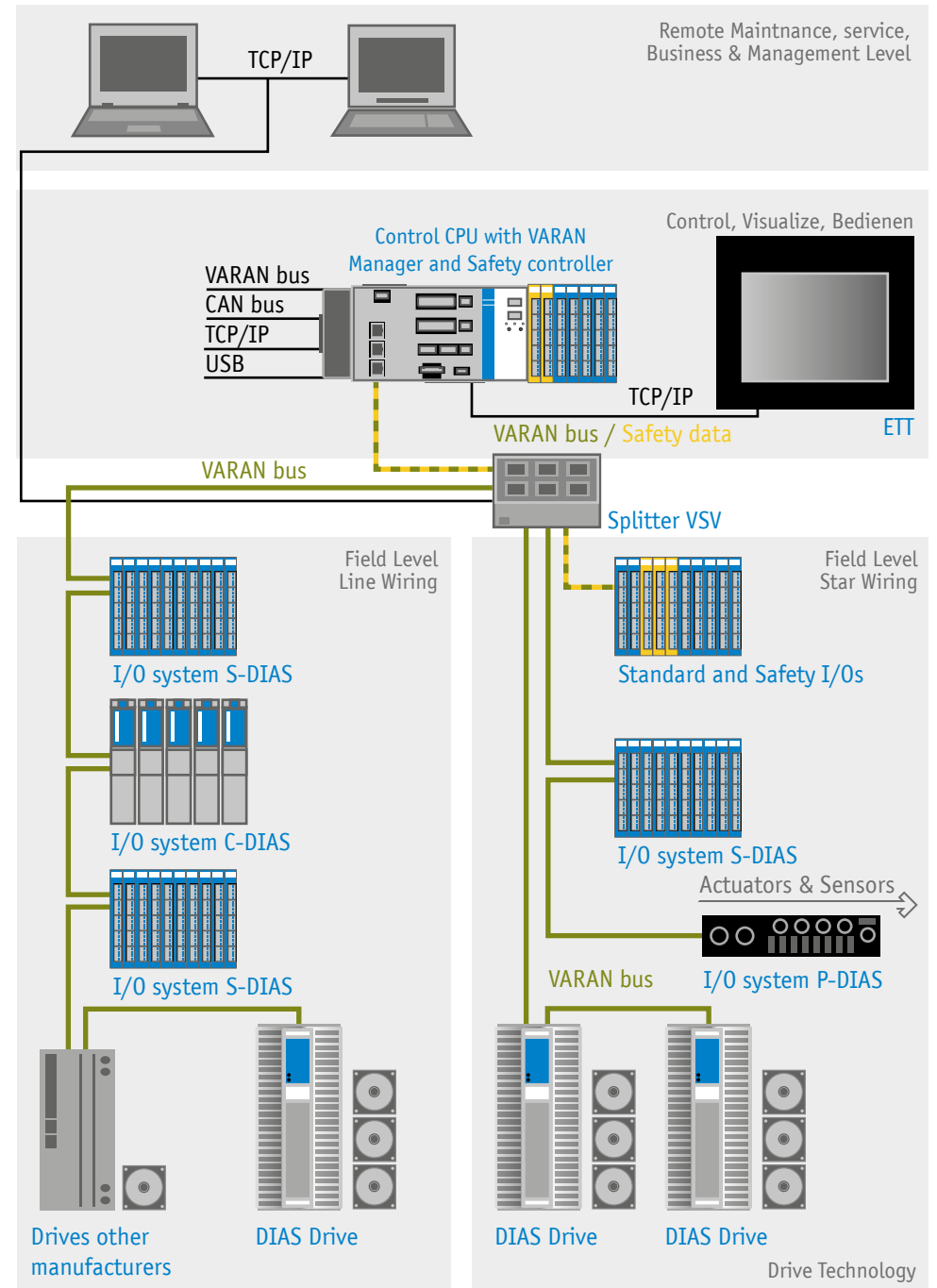
The terminal can be located up to 15 meters away from the control unit in the switching closet. The screen content, touch input and the USB are integrated into the S-DVI; the display unit itself does not have any intelligence. The various I/O components and drives are networked over the extremely fast, high performance real-time Ethernet bus VARAN.



Continuous Network with the Real-Time Ethernet VARAN Bus

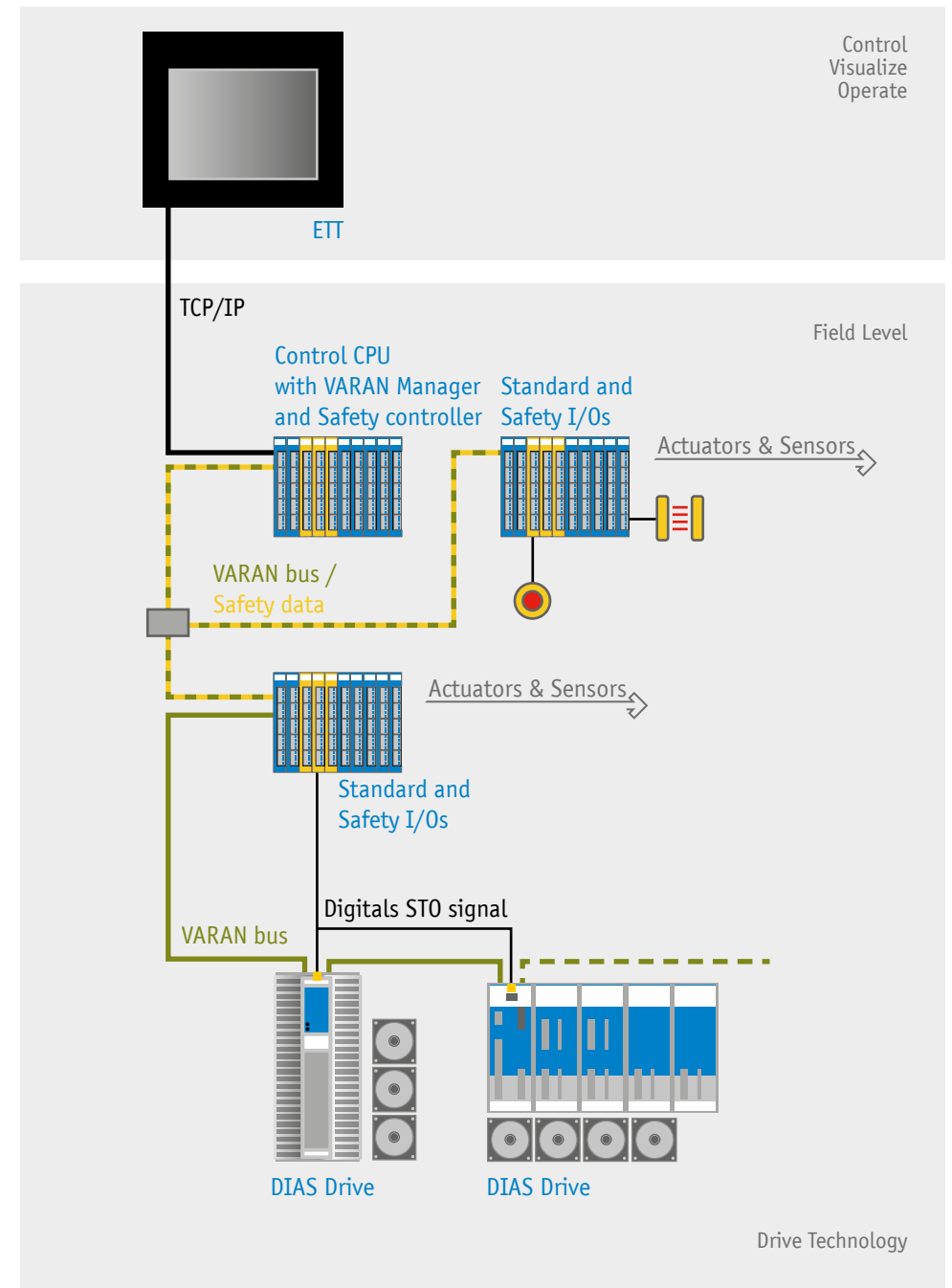
Continuous vertical communication is becoming increasingly important; connectivity from the control level to the field bus level.

The hard real-time capable VARAN bus is used to connect or network the automation components. The VMC 052 Varan Manager client makes it possible to network several autonomous VARAN systems. This client has a DPRAM over which a defined exchange of data occurs between VARAN networks in real time, ensuring highly dynamic and synchronous applications.



Safety Fully Integrated into the Control System

Through a decentralized configuration and component modularity, the Safety components can be flexibly integrated into the control architecture. Safe and non-safe components can be combined as desired. The different series of the DIAS Drives already contain important safety functions such as Safe Stop 1 (SS1) and Safe Torque Off (STO).



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S-DIAS Control and I/O System

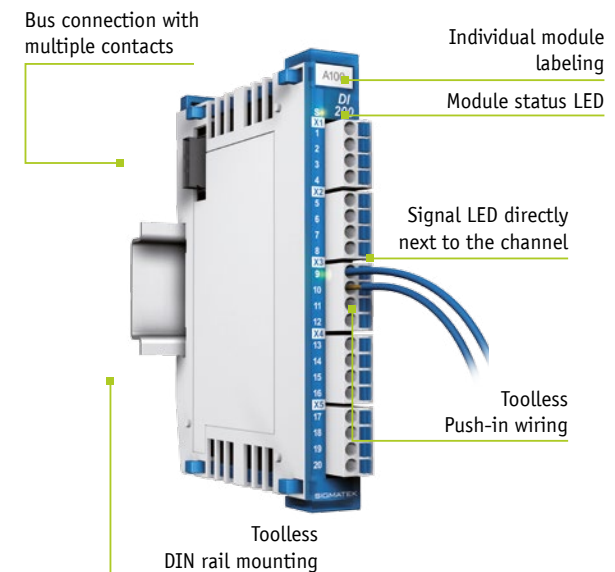


System S-DIAS

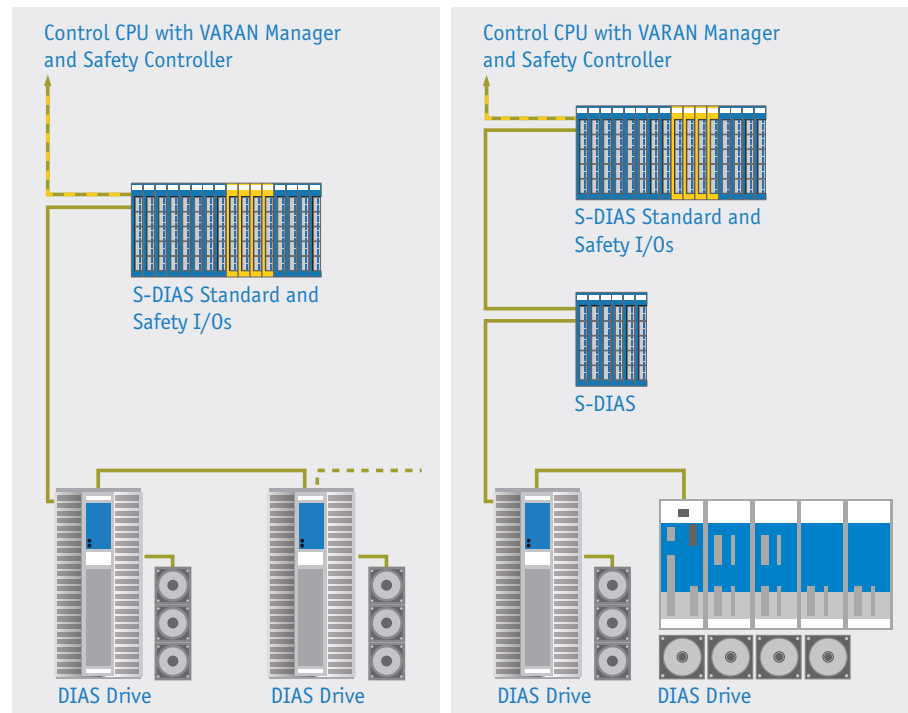
With up to 20 I/Os per module, the new, super compact I/O series has the highest package density to date - and that with dimensions of only 12.5 x 103.5 x 72 mm (W x H x D).

The modules communicate quickly (100 MBit/s) and safely over the realtime ethernet bus VARAN. The update time for 64 modules with up to 1,280 I/Os is under 60 μ s.

In addition to the space-saving design, special attention was given to high usability and easy handling: operational complete modules, toolless DIN rail mount, standard connectors with Push-in wiring, signal LEDs directly next to the individual channels and mechanical interlocking, which provides high reliability and vibration tolerance. This reduces the work of assembly, wiring, servicing as well as ordering and storing to a minimum. Safety is fully integrated and already TÜV certified.



Possible Configurations

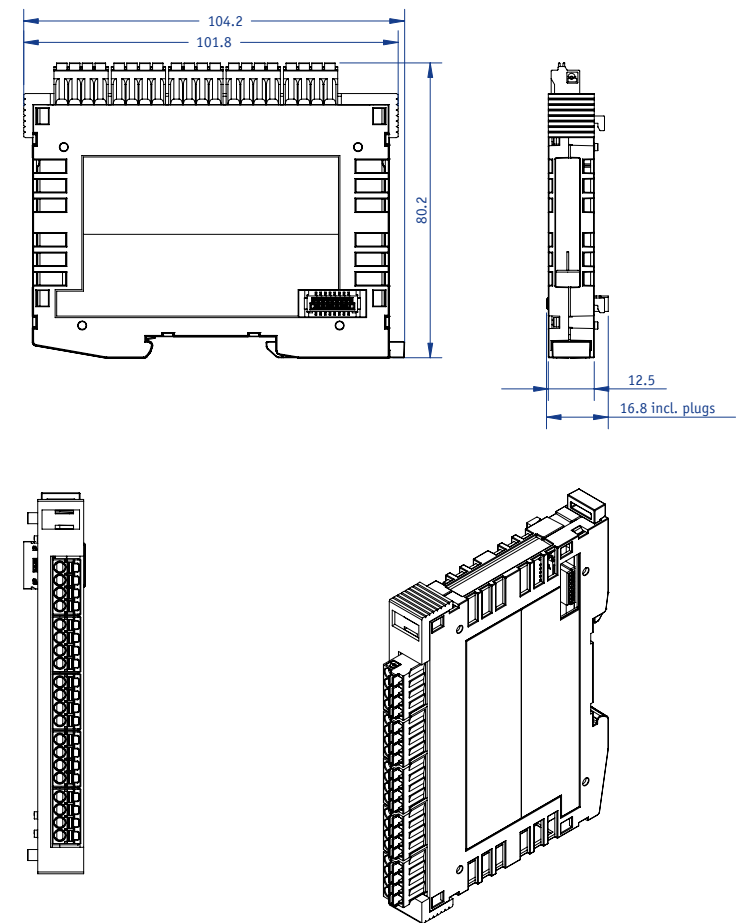


local

decentralized

The configuration can be local, decentralized or a combination of both. Whether the modules are mechanically placed next to one another or perform their tasks in a physically separated location does not matter.

Mechanical Dimensions



S-DIAS Modules

CPU & Bus Coupling

Interfaces & Splitters

Digital Input

Digital Output

Digital Mix

Digital Analog Mix

Analog Input

Analog Output

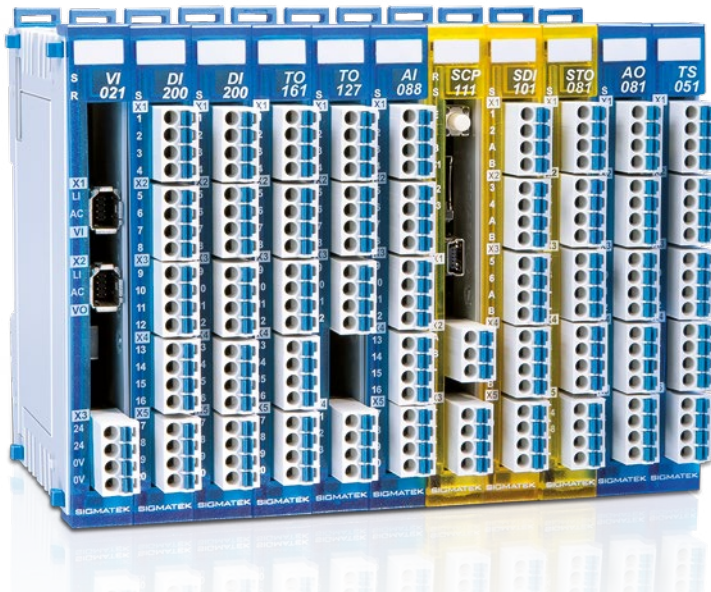
Analog Mix

Counters & Position Recording

Measurement Technology

Motion

Special Functions



S-DIAS CPU Module CP 101



with 1 Ethernet
1 USB Device
1 CAN

The S-DIAS CP 101 CPU module is a high-performance processor unit for the S-DIAS I/O modules. With the Ethernet and CAN bus interfaces, the module can be used for various applications. A zero-voltage protected RAM area is available, which is implemented by copying a data block from the DDR RAM to the NAND Flash.

The voltage supply is already available in the module. With this variant, a maximum of 12 I/O modules can be powered. S-DIAS has no intelligent master (manager).

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Addressable I/O/P modules | CAN participants: > 100 S-DIAS bus: 64 (of which a maximum of 12 modules can be powered) |
| Internal I/O | no |
| Internal cache | 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 2-kbytes (one Flash block) |
| Internal storage device | NAND Flash 256-Mbyte |
| Interfaces | 1x Ethernet 1x CAN 1x USB device 1.1 1x S-DIAS (without manager) |
| Data buffer | yes |
| Status display | no |
| Status LEDs | yes |
| Real-time clock | no |

Electrical Requirements

| Module Supply (Input) | | |
|--|--|----------------|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of voltage supply (+24 V) | typically 80 mA | maximum 850 mA |
| S-DIAS Bus Supply (Output) | | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | maximum 0.6 A | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | maximum 0.6 A | |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Article number | 20-004-101 |
| Operating system | Salamander |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU-Module CP 102



with 1 Ethernet
1 USB-OTG (On-the-Go)
1 CAN

The CPU in slice format with USB OTG is the right choice for slim automation systems. Individual I/O modules can be accessed within 1.12 μ s.

A zero-voltage protected RAM area is available, which is implemented by copying a data block from the DDR RAM to the NAND Flash.

The voltage supply is already available in the module and with this variant, a maximum of 12 I/O modules can be powered. S-DIAS has no intelligent master (manager).

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Addressable I/O/P modules | CAN participants: > 100 S-DIAS bus: 64 (of which a maximum of 12 modules can be powered) |
| Internal I/O | no |
| Internal cache | 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 2-kbyte (one Flash block) |
| Internal storage device | NAND Flash 256-Mbyte |
| Interfaces | 1x Ethernet 1x CAN 1x USB-OTG (Host/Device) (for service purposes only) 1x S-DIAS (without manager) |
| Data buffer | yes |
| Status display | no |
| Status LEDs | yes |
| Real-time clock | no |

Electrical Requirements

| Module Supply (Input) | | |
|--|--|-------------|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of voltage supply (+24 V) | typically 100 mA | maximum 1 A |
| S-DIAS Bus Supply (Output) | | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | maximum 0.6 A | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | maximum 0.6 A | |
| USB Host (OTG) (can only be used with a USB stick for service purposes) | +5 V DC maximum 200 mA (current limited) | |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Article number | 20-004-102 |
| Operating system | Salamander |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5 Hz – 8.4 Hz 1 g from 8.4 Hz – 150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Module CP 111



with 2 VARAN Out
1 Ethernet
1 USB Device
1 microSD

The S-DIAS CP 111 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. To operate the CPU, a voltage supply module is required that also has the USB host and CAN interface.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Addressable I/O/P modules | VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal I/O | no |
| Internal cache | 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnantdata memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 1x Ethernet 2x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN (via PS 101) 1x USB host 2.0 (high speed 480 Mbit/s) (via PS 101) 1x USB device 1.1 1x S-DIAS (with manager) |
| Status display | no |
| Status LEDs | yes |
| Real-time clock | yes (battery buffered) |

Electrical Requirements

| | | |
|---|------------------|----------------|
| Supply voltage | +5 V from PS 101 | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on S-DIAS bus (+5 V power supply) | typically 400 mA | maximum 450 mA |

Electrical Requirements

| | | |
|---|------------------|----------------|
| Module Supply (Input) | | |
| Supply voltage | +5 V from PS 101 | |
| S-DIAS Bus Supply (Output) | | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 400 mA | maximum 450 mA |

Article Number and Miscellaneous

| | | |
|------------------------------------|----------------------------------|--|
| Article number | 20-004-111 | |
| Article number power supply module | 20-003-101 | |
| Operating system | Salamander | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Project backup | internally on the microSD card | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Module CP 112



- with 2 Ethernet
- 1 VARAN Out
- 1 USB Device
- 1 microSD

The S-DIAS CP 112 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through various interfaces, such as 2x Ethernet, VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. To operate the CPU, a voltage supply module is required that also has the USB host and CAN interface.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Addressable I/O/P modules | VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal I/O | no |
| Internal cache | 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnantdata memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 2x Ethernet 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN (via PS 101) 1x USB host 2.0 (high speed 480 Mbit/s) (via PS 101) 1x USB device 1.1 1x S-DIAS (with manager) |
| Status display | no |
| Status LEDs | yes |
| Real-time clock | yes (battery buffered) |

Electrical Requirements

| Module Supply (Input) | | |
|---|------------------|----------------|
| Supply voltage | +5 V from PS 101 | |
| S-DIAS Bus Supply (Output) | | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 400 mA | maximum 450 mA |

Article Number and Miscellaneous

| | | |
|------------------------------------|----------------------------------|--|
| Article number | 20-004-112 | |
| Article number power supply module | 20-003-101 | |
| Operating system | Salamander | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Project backup | internally on the microSD card | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Module CP 311



- with 1 Ethernet
- 2 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 311 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.

The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology Dual Core |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache |
| Addressable I/O/P modules | VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal I/O | no |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnantdata memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 1x Ethernet 2x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager) |
| Status display | no |

| | |
|-----------------|------------------------|
| Status LEDs | yes |
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

Module Supply (Input)

| | |
|---|--|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC |
| Current consumption of +24 V supply voltage | maximum 2.75 A |

S-DIAS Bus Supply (Output)

| | |
|--|---------------|
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | maximum 1.1 A |
| Voltage supply from S-DIAS bus | +24 V |
| Current consumption on the S-DIAS bus (+24 V supply) | maximum 1.6 A |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Article number | 20-004-311 |
| Operating system | Salamander |
| Dimensions | 37.5 x 104.2 x 72 mm (W x H x D) |
| Project backup | internally on the microSD card |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Module CP 312



- with 2 Ethernet
- 1 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 312 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, 2x VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided.

The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology Dual Core |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache |
| Addressable I/O/P modules | VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal I/O | no |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnantdata memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 2x Ethernet 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager) |
| Status display | no |

| | |
|-----------------|------------------------|
| Status LEDs | yes |
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

Module Supply (Input)

| | |
|---|--|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC |
| Current consumption of +24 V supply voltage | maximum 2.75 A |

S-DIAS Bus Supply (Output)

| | |
|--|---------------|
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | maximum 1.1 A |
| Voltage supply from S-DIAS bus | +24 V |
| Current consumption on the S-DIAS bus (+24 V supply) | maximum 1.6 A |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Article number | 20-004-312 |
| Operating system | Salamander |
| Dimensions | 37.5 x 104.2 x 72 mm (W x H x D) |
| Project backup | internally on the microSD card |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Module CP 313



- with 1 Ethernet
- 1 EtherCAT Drive Controller
- 1 VARAN Out
- 1 CAN
- 1 USB Device, 1 USB Host
- 1 microSD

The S-DIAS CP 313 CPU module is a high-performance processor unit for the S-DIAS I/O modules. Through the various interfaces, such as Ethernet, EtherCAT, VARAN, CAN bus, USB and an exchangeable microSD card, this module can be used for a variety of applications. Additionally, a RealTimeClock and zero voltage proof RAM space with buffer battery are provided. The CPU and I/O modules are supplied by the integrated voltage supply module.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology Dual Core |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 256-kbyte L2 Cache |
| Addressable I/O/P modules | VARAN bus: 65,280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal I/O | no |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnantdata memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 1x Ethernet 1x EtherCAT Drive Controller 1x VARAN Out (Manager) (maximum cable length: 100 m) 1x CAN 1x USB host 2.0 (high speed 480 Mbit/s) 1x USB-OTG (Host/Device), Type Mini B 1x S-DIAS (with manager) |
| Status display | no |

| | |
|-----------------|------------------------|
| Status LEDs | yes |
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

Module Supply (Input)

| | |
|---|--|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC |
| Current consumption of +24 V supply voltage | maximum 2.75 A |

S-DIAS Bus Supply (Output)

| | |
|--|---------------|
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | maximum 1.1 A |
| Voltage supply from S-DIAS bus | +24 V |
| Current consumption on the S-DIAS bus (+24 V supply) | maximum 1.6 A |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Article number | 20-004-313 |
| Operating system | Salamander |
| Dimensions | 37.5 x 104.2 x 72 mm (W x H x D) |
| Project backup | internally on the microSD card |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Unit CP 731



with 2 Ethernet
2 VARAN
1 CAN
1 USB Device, 1 USB 3.0
1 microSD

The CP 731 is an industrial PC with an Intel Atom E3827 processor. The CPU unit is used to control S-DIAS modules and has various interface connections such as: CAN, Gigabit Ethernet and two VARAN Out interfaces. 14 status LEDs provide information CPU status directly on the CPU unit. A microSD card can be used to store program memory. The CP 731 can be operated with 2 independent VARAN Managers.

Performance Data

| | |
|-----------------------------------|--|
| Processor | Intel Atom E3827 DualCore |
| Processor cores | 2 |
| Addressable I/O/P modules | VARAN bus: 65.280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal program memory (microSD) | 1 Gbyte (12-630-105, included with delivery) |
| Internal data memory (SRAM) | 512-kbyte (battery buffered) |
| Internal memory (DDR3 RAM) | 2-GByte DDR3L 1333 MHz |
| Internal I/O | no |
| Internal cache | 1-Mbyte L2 Cache |
| Interfaces | 1x Ethernet1 10/100/1000 1x Ethernet2 10/100 2x VARAN Out (manager) 1x CAN 1x USB 3.0 1x USB Device 2.0 (Micro USB Type B) 1x S-DIAS |
| Status display | no |

| | |
|---------------------------|-------------------|
| Status LEDs | yes |
| Real-time clock | yes |
| Input voltage measurement | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|------------------|
| Supply voltage | typically +24 V DC (SELV/PELV) | |
| | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | +18-30 V DC (NEC Class 2 or LVLC) | |
| Supply voltage current consumption (maximum total current) | maximum 3.0 A at +24 V | |
| Current consumption without external devices | 0.5 A at +24 V | |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.2 A (for 25 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 30 A (for 22.5 µs, load-dependent) | |
| Available current for S-DIAS (+5 V) | maximum 1.6 A | |
| Available current for S-DIAS (+24 V) | maximum 1.6 A | |
| Available current for USB 3.0 (+5 V) | maximum 0.9 A | |

Article Number and Miscellaneous

| | |
|------------------|-------------------------------------|
| Article number | 20-004-731 |
| Operating system | Salamander |
| Dimensions | 40.2 x 147.7 x 193.6 mm (W x H x D) |
| Project backup | internally on the microSD card |
| Approvals | CE |

Environmental Conditions

| | | |
|-------------------------------|---|--|
| Storage temperature | -20 ... +85 °C | |
| Ambient temperature | 0 ... +55 °C | |
| Maximum processor temperature | +110 °C (automatic cut-off) | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 2-9 Hz 1 g (10 m/s ²) from 9-200 Hz |
| | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 | IP20 |

S-DIAS CPU Unit CP 733



- with 1 Ethernet
- 1 EtherCAT Master
- 2 VARAN
- 1 CAN
- 1 USB Device, 1 USB 3.0
- 1 microSD

The CP 733 is an industrial PC with an Intel Atom E3827 processor. The CPU unit is used to control S-DIAS modules and has various interface connections such as: CAN, Gigabit Ethernet, EtherCAT and two VARAN Out interfaces. 14 status LEDs provide information CPU status directly on the CPU unit. A microSD card can be used to store program memory. The CP 733 can be operated with 2 independent VARAN Managers.

Performance Data

| | |
|-----------------------------------|--|
| Processor | Intel Atom E3827 DualCore |
| Processor cores | 2 |
| Addressable I/O/P modules | VARAN bus: 65.280 CAN participants: > 100 S-DIAS bus: 64 |
| Internal program memory (microSD) | 1 Gbyte (12-630-105, included with delivery) |
| Internal data memory (SRAM) | 512-kbyte (battery buffered) |
| Internal memory (DDR3 RAM) | 2-GByte DDR3L 1333 MHz |
| Internal I/O | no |
| Internal cache | 1-Mbyte L2 Cache |
| Interfaces | 1x Ethernet1 10/100/1000 1x Ethernet2 10/100 2x VARAN Out (manager) 1x CAN 1x USB 3.0 1x USB Device 2.0 (Micro USB Type B) 1x S-DIAS |
| EtherCAT Master | Class A EtherCAT Master mit Distributed Clock |
| Status display | no |
| Status LEDs | yes |

| | |
|---------------------------|-------------------|
| Real-time clock | yes |
| Temperature sensor | yes |
| Input voltage measurement | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|------------------|
| Supply voltage | typically +24 V DC (SELV/PELV) | |
| | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | +18-30 V DC (NEC Class 2 or LVLC) | |
| Supply voltage current consumption (maximum total current) | maximum 3.0 A at +24 V | |
| Current consumption without external devices | 0.5 A at +24 V | |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.2 A (for 25 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 30 A (for 22.5 µs, load-dependent) | |
| Available current for S-DIAS (+5 V) | maximum 1.6 A | |
| Available current for S-DIAS (+24 V) | maximum 1.6 A | |
| Available current for USB 3.0 (+5 V) | maximum 0.9 A | |

Article Number and Miscellaneous

| | |
|------------------|-------------------------------------|
| Article number | 20-004-733 |
| Operating system | Salamander |
| Dimensions | 40.2 x 147.7 x 193.6 mm (W x H x D) |
| Approvals | CE |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -20 ... +85 °C | |
| Ambient temperature | 0 ... +55 °C | |
| Maximum processor temperature | +110 °C (automatic cut-off) | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 2-9 Hz 1 g (10 m/s ²) from 9-200 Hz |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 | IP20 |



S-DIAS Control Module EtherCAT

EC 121



with 1 EtherCAT IN
1 EtherCAT OUT
1 S-DIAS Bus OUT

The S-DIAS EtherCAT control module EC 121 is an interface module between an S-DIAS control system and EtherCAT bus. The module provides the voltage supply for up to 32 S-DIAS modules. With an additional power boost module (PSB 001), up to 64 modules can be connected via the EtherCAT control module. The EC 121 detects the connected S-DIAS modules automatically. It provides the EtherCAT slave configuration for the EtherCAT master and exchanges data between the EtherCAT and S-DIAS bus during operation.

Performance Data

| | |
|------------|--|
| Interfaces | 1x EtherCAT In (RJ45) 1x EtherCAT Out (RJ45) 1x S-DIAS bus |
|------------|--|

Spezifikation EtherCAT

| | |
|----------------------|--------------------------------|
| Configuration | 2x shielded RJ45 port |
| Cable length | maximum 100 m between stations |
| Propagation delay | approximately 1 µs |
| Potential separation | 500 V (EtherCAT - S-DIAS bus) |
| FMMU | 3 |
| Sync Manager | 4 |
| Process data RAM | 8-kbyte |
| Synchronization | 64-bit distributed clock |
| Process image | modular device profile |

| Asynchronous data exchange | Protocol | Supported functions | Description |
|-------------------------------|----------|---|--|
| | CoE | Complete Access Support SDO-Info Support PDO Assign | CANopen over EtherCAT is required for transmitting parameters |
| | FoE | X | File over EtherCAT for transferring files (only in BOOTSTRAP mode) |
| | FSoE | X | UL in preparation |
| Max. number of S-DIAS modules | | up to 32 (64 with PSB 001) S-DIAS modules | |

Electrical Requirements

| | | |
|--|--|---------------|
| Power supply +24 V | +18-30 V DC UL: Class 2 or LVLC | |
| Current consumption of +24 V power supply | the current consumption depends on the connected loads (max. 2.75 A) | |
| Power supply on the S-DIAS bus | via the EC 121 | |
| Current capacity on the S-DIAS bus (power supply for the modules). | +5 V | +24 V |
| | maximum 1.6 A | maximum 1.6 A |

Article Number and Miscellaneous

| | |
|----------------|--------------------------------|
| Article number | 20-003-121 |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) |
| Approvals | CE, UL 508 (E247993) |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -40 ... +85 °C | |
| Environmental temperature | -25 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147,15 m/s ²) |
| Protection type | EN 60529 | IP20 |

S-DIAS Control Module VARAN

VI 021



with 1 VARAN In
1 VARAN Out (optional Ethernet (VtE))

The S-DIAS VI 021 module serves as the power supply and connection for decentralized S-DIAS module groups with a CPU over the VARAN bus.

A module group consists of a control module and up to 32 connected S-DIAS modules.

The VARAN Out port allows the construction of the VARAN bus in a line structure.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|---|
| Interfaces | 1x VARAN In (Industrial Mini I/O) 1x VARAN Out (optional Ethernet (VtE)) (Industrial Mini I/O) |
|------------|---|

Electrical Requirements

| | | |
|--|--|---------------|
| Supply voltage | 18-30 V DC | |
| Supply voltage (UL) | 18-30 V DC (Class 2) | |
| Current consumption of voltage supply | the current consumption is dependent on the connected loads (max. 2.75 A) | |
| Power supply on the S-DIAS bus | via the VI 021 | |
| Current capacity on S-DIAS bus (power supply for I/O/P modules) | +5 V | +24 V |
| | maximum 1.6 A | maximum 1.6 A |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-003-021 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

S-DIAS Interface Module ICA 011



with 1 CAN bus
1 termination circuit switchable

The S-DIAS ICA 011 interface module has a CAN interface.

The internal CAN termination resistor can be deactivated at the connector via software or wire jumper.

Performance Data

| | | | |
|--------------------------------------|-------------------------------------|--|---------------|
| Interfaces | 1x CAN 1x Termination connection | | |
| Adjustable data transfer rates | CAN | 20,000 Baud, 50,000 Baud, 100,000 Baud, 125,000 Baud, 250,000 Baud, 500,000 Baud, 615,000 Baud, 1,000.000 Baud | |
| Over voltage protection | CAN | Pin CAN H | ±30 V |
| | | Pin CAN L | ±30 V |
| | Termination | Pin TERM+ | +30 V -0 V |
| | | Pin TERM- | 0 |
| Maximum connectible CAN participants | 100 | | |
| Short-circuit proof | yes | | |
| Status LEDs | yes | | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Power supply +24 V | 18-30 V DC | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 50 mA | maximum 60 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 20 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-102-011 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Interface Module ICA 012



with 1 CAN bus galvanically separated
1 termination circuit switchable

The S-DIAS ICA 012 interface module has a galvanically separated CAN interface.

The internal CAN termination resistor can be deactivated at the connector via software or wire jumper.

Performance Data

| Interfaces | 1x CAN 1x Termination connection | |
|--------------------------------------|-------------------------------------|--|
| Adjustable data transfer rates | CAN | 20,000 Baud, 50,000 Baud, 100,000 Baud, 125,000 Baud, 250,000 Baud, 500,000 Baud, 615,000 Baud, 1,000.000 Baud |
| Over voltage protection | CAN | Pin CAN H ±30 V |
| | | Pin CAN L ±30 V |
| | Termination | Pin TERM+ +30 V -0 V |
| | | Pin TERM- 0 |
| Maximum connectible CAN participants | 100 | |
| Short-circuit proof | yes | |
| Galvanic isolation | yes (isolation voltage 500 V) | |
| Status LEDs | yes | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Power supply +24 V | 18-30 V DC | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 60 mA | maximum 70 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 25 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-102-012 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL in preparation | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Interface SDCI Master Module

IIO 041



with 4 SDCI ports
4 digital inputs

The S-DIAS Single-Drop Digital Communication Interface (SDCI) master module enables the connection of up to 4 intelligent SDCI sensors or SDCI actuators in compliance with the SDCI specification V1.1 according to IEC61131-9. All SDCI ports can also be configured as +24 V digital inputs or +24 V digital outputs. The module has a 24 V supply connection for powering the SDCI ports and connected SDCI devices. Additionally, the module has 4 standard +24 V/3.7 mA/0.5 ms digital inputs.

SDCI Interface Specifications

| | |
|------------------------|--|
| Number of interfaces | 4 |
| Specification version | SDCI V1.1 |
| Data transfer rate | 4.8 kbit/s, 38.4 kbit/s, 230.4 kbit/s |
| SDCI supply | 24 V (via power switch, short-circuit proof) |
| SDCI supply current | maximum 500 mA per connection |
| SDCI switching signal | +24 V and GND switching |
| SDCI switching current | maximum 500 mA |
| Connection technology | 3-wire (unshielded) |
| Cable length | maximum 20 m |
| wire resistance | maximum 6 Ω |
| wire capacity | maximum 3 nF |
| Status LEDs | yes |

SDCI Interface as a Digital Output

| | |
|---|------------------------|
| Output signal | +24 V-switching |
| Short-circuit proof | yes |
| Maximum continuous current load/ channel allowed | 0.25 A |
| Maximum total current (all channels) | 1 A (100 % of on-time) |
| Maximum braking energy of outputs (inductive load) | 1 Joule/channel |
| Residual current output (off) | ≤ 10 μA |
| Turn-on delay | < 10 μs |
| Turn-off delay | < 10 μs |

SDCI Interface as a Digital Input

| | | |
|---------------------|------------------|---------------|
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 6.8 mA at +24 V | |
| Input delay | typically 0.5 μs | |

Digital Input Specifications

| | | |
|---------------------|------------------|---------------|
| Number | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|--|---|--|
| External +24 V supply | +18-30 V DC | |
| Current consumption external +24 V supply without actuators or sensors | typically 20 mA at +18 V typically 23 mA at +24 V typically 26 mA at +30 V | maximum 25 mA (at +18 V) maximum 29 mA (at +24 V) maximum 33 mA (at +30 V) |
| Current consumption external +24 V supply with actuators or sensors | Intrinsic current consumption of the external +24 V supply + current consumption of the connected SDCI actuators or sensors + switching current of the SDCI actuators or sensors (max. 3.0 A) | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 33 mA at +18 V typically 27 mA at +24 V typically 23 mA at +30 V | maximum 41 mA at +18 V maximum 34 mA at +24 V maximum 29 mA at +30 V |

Voltage Monitor

| | |
|------------------------------|--|
| Supply voltage +24 V SDCI | supply voltage > 18 V (corresponding DC OK-LED lights green) |
|------------------------------|--|

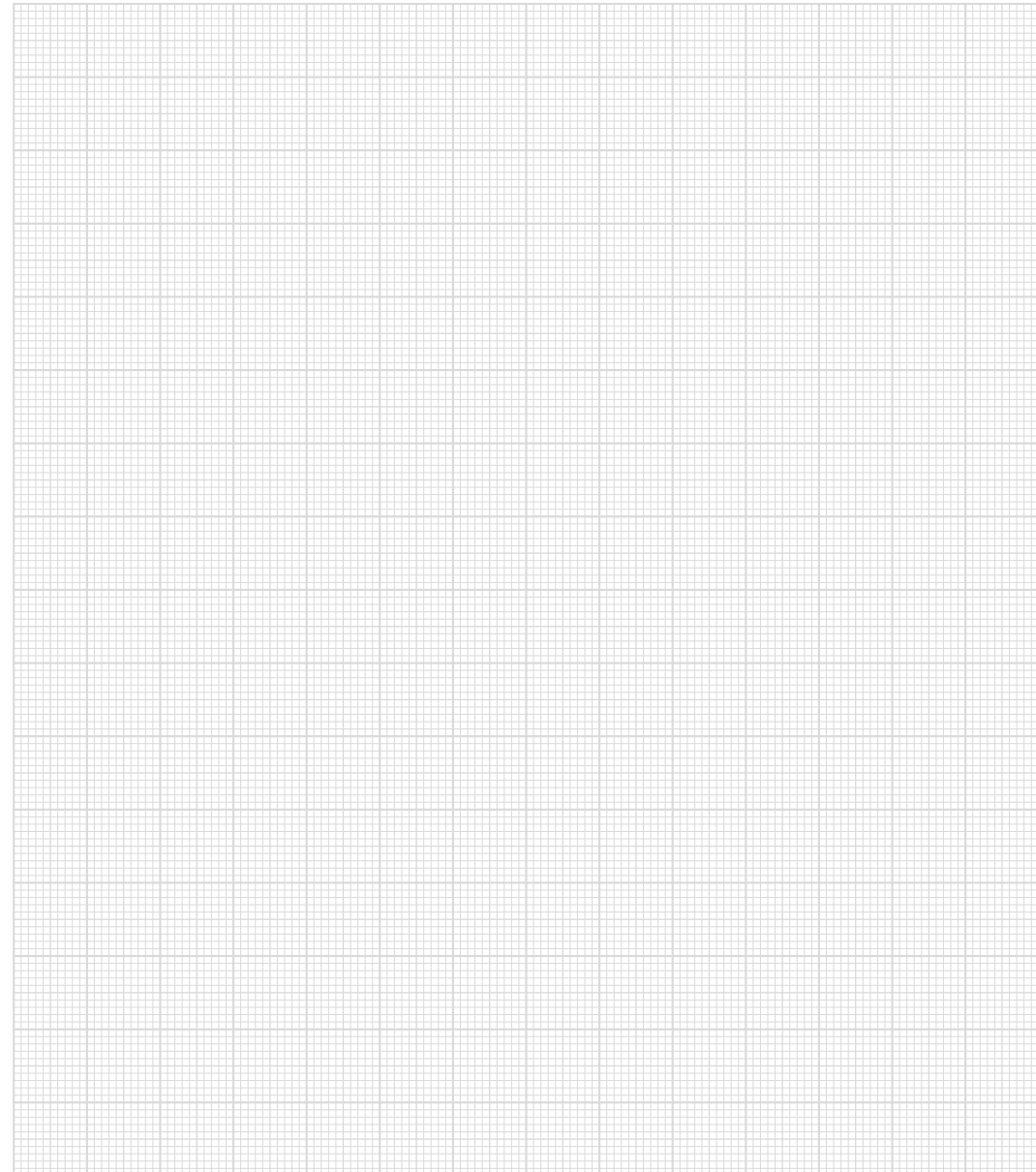
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-104-041 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL in preparation |
| Approvals | UL, cUL, CE in preparation |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS PROFINET I/O Slave IPN 021



with 1 Profinet I/O IN
1 Profinet I/O OUT

The S-DIAS Profinet I/O slave module IPN 021 slave module is an interface module between the S-DIAS control system and PROFINET bus.

Performance Data

| | | |
|-------------------------------|---|------------------------------|
| Bus Controller | Profinet I/O (lt. Profinet I/O Specification V2.3) | |
| Configuration | 2x shielded Tyco Mini I/O port | |
| Cable length | maximum of 100 m between two stations (segment length) | |
| Minimum cyclic time | 1 ms | |
| Maximum input data per cycle | 1440 | |
| Maximum output data per cycle | 1440 | |
| Data transfer rate | 100 Mbits/s Full duplex auto negotiation auto crossover | |
| Diagnosis | module status | per status LED and SW status |
| | bus function | per status LED and SW status |
| Supported conformity classes | Class A Class B | |
| Media redundancy support | yes, the module can be used as a client in a Profinet MRP ring, but there must be at least one other client with redundancy manager (RM, MRM) functionality in the ring | |
| Status LEDs | yes | |

Electrical Requirements

| | | |
|---|-----------------|-----------------|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically | maximum |
| | 125 mA at +18 V | 140 mA at +18 V |
| | 95 mA at +24 V | 110 mA at +24 V |
| | 75 mA at +30 V | 95 mA at +30 V |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-103-021 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| | | |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Interface Module ISE 021



with 1 RS232 interface with handshake lines
or 2 RS232 interfaces without handshake lines
1 RS485 interface with switchable termination
and spread resistors

The S-DIAS ISE 021 interface module has an RS232 interface with the handshake signals RTS and CTS. Alternatively to the handshake signals, these signals can be configured as a second RS232 interface. The ISE 021 also has an RS485 interface with switchable 120 Ω termination and spread resistors (switchable via software).

The module requires no external +24 V supply.

Performance Data

| | | | |
|--------------------------------|--|---|----------------|
| Interfaces | 1x RS232 (2x RS232, switchable via software) 1x RS485 | | |
| Adjustable data transfer rates | RS232 | 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud | |
| | RS485 | 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud, 230400 Baud, 460800 Baud, 921600 Baud | |
| Over voltage protection | RS232 | pin RxD | ±30 V |
| | | pin TxD | ±15 V |
| | RS485 | pin A/B | -9 V ... +14 V |
| Spread resistor | RS485 | 1 kΩ => 5 V 1 kΩ => GND internally settable | |
| Terminating resistor | | 120 Ω internally settable | |
| Short-circuit proof | | yes | |
| Status LEDs | | yes | |
| Send buffer | | 240 Byte | |
| Receive buffer | | 784 Byte | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 8 mA | maximum 15 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-101-021 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Interface Module ISE 031



with 1 RS232 interface with handshake lines
or 2 RS232 interfaces without handshake lines
1 RS485 interface with switchable termination
and spread resistors
1 TTY

The S-DIAS ISE 031 interface module has an RS232 interface with the handshake signals RTS and CTS, an RS485 and active TTY interface. Alternatively to the handshake signals, these signals can be configured as a second RS232 interface. The ISE 031 also has an RS485 interface with switchable 120 Ω termination and spread resistors (switchable via software).

Performance Data

| | | | |
|--------------------------------------|---|---|----------------|
| Interfaces | 1x RS232 (2x RS232, switchable via software) 1x RS485 1x TTY (20 mA) | | |
| Adjustable data transfer rates | RS232/RS485 | 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud | |
| | RS485 | 2400 Baud, 4800 Baud, 9600 Baud, 19200 Baud, 38400 Baud, 57600 Baud, 62500 Baud, 115200 Baud, 230400 Baud, 460800 Baud, 921600 Baud | |
| | TTY | 2400 Baud, 4800 Baud, 9600 Baud | |
| Over voltage protection | RS232 | pin RxD | ±30 V |
| | | pin TxD | ±15 V |
| | RS485 | pin A/B | -9 V ... +14 V |
| Spread resistor | RS485 | 1 kΩ => 5 V 1 kΩ => GND internally settable | |
| | | 120 Ω internally settable | |
| Terminating resistor | 120 Ω internally settable | | |
| Maximum connectable TTY participants | depends on the voltage drop on the participants, cables and connectors (up to a maximum of 6) | | |

| | |
|---------------------|----------|
| Short-circuit proof | yes |
| Status LEDs | yes |
| Send buffer | 240 Byte |
| Receive buffer | 784 Byte |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | maximum 100 mA | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 50 mA | maximum 60 mA |

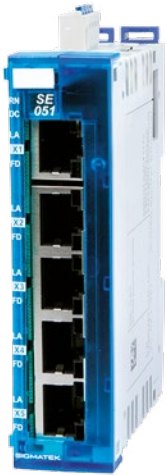
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-101-031 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Splitter Ethernet SE 051



with 5 ethernet interfaces (RJ45)

The S-DIAS SE 051 Ethernet splitter connects several network segments via 5 ports. In-coming data packets at one Ethernet port are distributed over the other ports. The splitter module is located in a double-wide S-DIAS housing. Power is applied from above through a 4-pin Phoenix plug.

Performance Data

| | |
|---------------------------|---|
| Interfaces | 5x Ethernet 10/100 Mbits (RJ45) |
| Network coupling type | Layer 2 Switch |
| Supported functionalities | Auto MDI/MDIX, Autonegotiation with 100Base-TX, full-duplex, 100Base-TX, half-duplex, 10Base-T, full-duplex, 10Base-T, half-duplex |

Standard Configuration

| | |
|------------|----|
| Ethernet 1 | X1 |
| Ethernet 2 | X2 |
| Ethernet 3 | X3 |
| Ethernet 4 | X4 |
| Ethernet 5 | X5 |

Electrical Requirements

| | | | |
|-----------------------|---|---|--|
| Supply voltage | 18-30 V DC UL: Class 2 or LVLC | | |
| Supply voltage via X6 | typically 45 mA at 18 V typically 35 mA at 24 V typically 30 mA at 30 V | maximum 50 mA at 18 V maximum 40 mA at 24 V maximum 35 mA at 30 V | |

Article Number and Miscellaneous

| | | | |
|----------------|--------------------------------|--|--|
| Article number | 20-023-051 | | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | | |
| Standard | UL 508 (E247993) | | |
| Approvals | UL, cUL, CE | | |

Environmental Conditions

| | | | |
|---------------------------------------|--|---|--|
| Storage temperature | -20 ... +85 °C | | |
| Environmental temperature | 0 ... +55 °C | | |
| Humidity | 0-95 %, non-condensing | | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | | |
| Operating conditions | pollution degree 2 | | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz | |
| Shock resistance | EN 60068-2-27 | 15 g | |
| Protection type | EN 60529 | IP20 | |

S-DIAS Splitter Ethernet SE 052



with 5 ethernet interfaces (Tyco Mini I/O)

The S-DIAS SE 052 Ethernet splitter connects several network segments via 5 ports. In-coming data packets at one Ethernet port are distributed over the other ports. The splitter module is located in a double-wide S-DIAS housing. Power is applied from above through a 4-pin Phoenix plug.

Performance Data

| | |
|---------------------------|---|
| Interfaces | 5x Ethernet 10/100 Mbps (Tyco Mini I/O) |
| Network coupling type | Layer 2 Switch |
| Supported functionalities | Auto MDI/MDIX, Autonegotiation with 100Base-TX, full-duplex, 100Base-TX, half-duplex, 10Base-T, full-duplex, 10Base-T, half-duplex |

Standard Configuration

| | |
|------------|----|
| Ethernet 1 | X1 |
| Ethernet 2 | X2 |
| Ethernet 3 | X3 |
| Ethernet 4 | X4 |
| Ethernet 5 | X5 |

Electrical Requirements

| | | | |
|-----------------------|---|---|--|
| Supply voltage | 18-30 V DC UL: Class 2 or LVLC | | |
| Supply voltage via X6 | typically 45 mA at 18 V typically 35 mA at 24 V typically 30 mA at 30 V | maximum 50 mA at 18 V maximum 40 mA at 24 V maximum 35 mA at 30 V | |

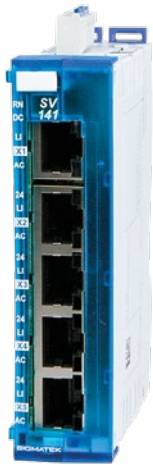
Article Number and Miscellaneous

| | | | |
|----------------|--------------------------------|--|--|
| Article number | 20-023-052 | | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | | |
| Standard | UL 508 (E247993) | | |
| Approvals | CE | | |

Environmental Conditions

| | | | |
|---------------------------------------|--|---|--|
| Storage temperature | -20 ... +85 °C | | |
| Environmental temperature | 0 ... +55 °C | | |
| Humidity | 0-95 %, non-condensing | | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | | |
| Operating conditions | pollution degree 2 | | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz | |
| Shock resistance | EN 60068-2-27 | 15 g | |
| Protection type | EN 60529 | IP20 | |

S-DIAS Splitter VARAN SV 141



with 1 VARAN In (RJ45)
4 VARAN Out (RJ45)

With its four VARAN Out ports, the VARAN SV 141 S-DIAS splitter module allows a VARAN bus system to be configured in a tree structure.

The VARAN Out ports have a +24 V supply for the VARAN bus, which can be switched via the software. With this supply, special VARAN peripheral devices can be connected to the SV 141 and supplied with +24 V without an additional power cable.

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|--|
| Interfaces | 1x VARAN In (RJ45) 4x VARAN Out (RJ45), +24 V switchable over VARAN, 500 mA per port (of which 1x Ethernet (Vte) or real-time Ethernet optional) |
|------------|--|

Electrical Requirements

| | |
|---|---|
| Supply voltage | 18-30 V DC |
| Current consumption of +24 V power supply | typically 0.25 A internal electronics supply VARAN Out port load (maximum 2 A) |

Article Number and Miscellaneous

| | |
|----------------|--------------------------------|
| Article number | 20-023-141 |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

S-DIAS Splitter VARAN SV 142



with 1 VARAN In (Tyco Mini I/O)
4 VARAN Out (Tyco Mini I/O)

With its four VARAN Out ports, the VARAN SV 142 S-DIAS splitter module allows a VARAN bus system to be configured in a tree structure.

The VARAN Out ports have a +24 V supply for the VARAN bus, which can be switched via the software. With this supply, special VARAN peripheral devices can be connected to the SV 142 and supplied with +24 V without an additional power cable.

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|---|
| Interfaces | 1x VARAN In (Tyco Mini I/O) 4x VARAN Out (Tyco Mini I/O), +24 V switchable over VARAN, 500 mA per port (of which 1x Ethernet (Vte) or real-time Ethernet optional) |
|------------|---|

Electrical Requirements

| | |
|---|---|
| Supply voltage | 18-30 V DC |
| Current consumption of +24 V power supply | typically 0.25 A internal electronics supply VARAN Out port load (maximum 2 A) |

Article Number and Miscellaneous

| | |
|----------------|--------------------------------|
| Article number | 20-023-142 |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | CE |

S-DIAS Digital Input Module DI 080



with 8 inputs, input delay 5 ms

The S-DIAS DI 080 digital input module is equipped with eight inputs and a +24 V signal for reading the signal states "0" and "1". Input filters are available to suppress noise signals occurring in the signal lines.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 35 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-006-080 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

S-DIAS Digital Input Module

DI 160



with 16 digital inputs, input delay 5 ms

The S-DIAS DI 160 digital input module is equipped with 16 inputs and a +24 V signal for reading the signal states "0" and "1". Input filters are available to suppress noise signals occurring in the signal lines.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 16 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

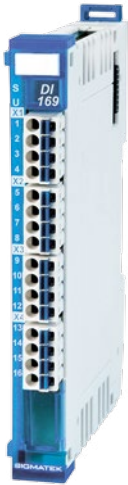
Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 51 mA | maximum 56 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-006-160 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

S-DIAS Digital Input Module DI 169



with 16 digital inputs

The S-DIAS digital input module DI 169 is equipped with 16 counter inputs for Open-Collector outputs. The actual input signal can be read (use as digital input - earthing switching).

To suppress noise in the signal lines, input filters are provided.

Digital Input Specifications

| | | |
|--------------------|--|----------------|
| Number | 16 | |
| Input signal | GND switching | |
| Pull-up voltage | typically +24 V | maximum +30 V |
| Collector current | typically 2.5 mA | maximum 3.5 mA |
| Saturation voltage | maximum 1 V at 3 mA | |
| Residual current | maximum 200 µA | |
| Input delay | 50 µs low pass 1. order | |
| Input frequency | maximum 1 kHz | |
| Counter frequency | 1 kHz in normal counter mode resp. 4 kHz in incremental counter mode with 4-edge analysis | |
| Status display | LED (green) lights when the input signal < 1 V | |

Counter Functionality

| | | |
|-----------------|--------------|--------------------|
| Channel | 16 | 8 |
| Operating modes | counter mode | 1-/4-edge analysis |
| Resolution | 8-bit | |

Electrical Requirements

| | | | | |
|---------------------------------------|-----------------|---------------|----------------------------|--------------------------|
| Voltage supply from S-DIAS bus | +5 V | | +24 V | |
| Current consumption on the S-DIAS bus | typically 38 mA | maximum 43 mA | typically 40 mA (at +24 V) | maximum 56 mA (at +30 V) |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-006-169 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Input Module DI 200



with 20 digital inputs, input delay 5 ms

The S-DIAS DI 200 digital input module has 20 inputs with a +24 V signal for reading the signal statuses „0“ and „1“. To suppress noise in the signal lines, input filters are provided.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 20 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 51 mA | maximum 56 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-006-200 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

S-DIAS Digital Input Module DI 202



with 16 digital inputs
4 digital inputs with counter function

The S-DIAS DI 202 digital input module is equipped with 20 inputs and a +24 V signal for reading the signal states "0" and "1". To suppress noise in the signal lines, input filters are provided. In addition, digital inputs 1-4 have a counter function.

Digital Input Specifications

| | | |
|-----------------------------|---|---------------|
| Number | 20 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | input 1-4: 10 µs input 5-20: 0.5 ms | |
| Input frequency, inputs 1-4 | 25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis | |
| Counter frequency input 1-4 | 25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 40 mA | maximum 45 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-006-202 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Input Module DI 203



with 20 digital inputs, input delay 0.5 ms

The S-DIAS DI 203 digital input module has 20 inputs with a +24 V signal for reading the signal status „0“ and „1“. To suppress noise in the signal lines, input filters are provided.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 20 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 36 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-006-203 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

S-DIAS Digital Input Module DI 205



with 20 ground-switching digital inputs

The S-DIAS digital input module DI 205 is equipped with 20 ground-switching inputs with a pull-up resistor to a +24 V signal. Each input can be connected to ground with a transistor or switch. An open switch corresponds to the signal condition „0“, switches connected to ground correspond to the signal condition „1“. Input filters are available to suppress noise signals occurring in the signal lines.

Digital Input Specifications

| | | | |
|--------------------|--|---------------|--|
| Number | 20 | | |
| Input signal | GND switching | | |
| Pull-up voltage | typically +24 V | maximum +30 V | |
| Collector current | typically 3 mA | maximum 4 mA | |
| Saturation voltage | maximum 1 V at 3 mA | | |
| Residual current | maximum 200 µA | | |
| Input delay | typically 5 ms | | |
| Status display | LED (green) lights when the input signal < 1 V | | |

Electrical Requirements

| | | | | |
|---------------------------------------|-----------------|---------------|-----------------------------|-----------------------------|
| Voltage supply from S-DIAS bus | +5 V | | +24 V | |
| Current consumption on the S-DIAS bus | typically 35 mA | maximum 50 mA | maximum 60 mA (at +24 V) | maximum 80 mA (at +30 V) |

Article Number and Miscellaneous

| | | | |
|----------------|----------------------------------|--|--|
| Article number | 20-006-205 | | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | | |
| Standard | UL 508 (E247993) | | |
| Approvals | UL, cUL, CE | | |

Environmental Conditions

| | | | |
|---------------------------|---|--|--|
| Storage temperature | -20 ... +85 °C | | |
| Environmental temperature | 0 ... +60 °C | | |
| Humidity | 0-95 %, non-condensing | | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz | |
| Shock resistance | EN 60068-2-27 | 15 g | |
| Protection type | EN 60529 | IP20 | |

S-DIAS Digital Output Module TO 081



with 8 short-circuit proof digital outputs

The S-DIAS TO 081 digital output module has eight short-circuit protected outputs in a group (+24 V/0.5 A/short-circuit protected). The power supply for the group is monitored for under voltage.

Digital Output Specifications

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 0.5 A |
| Maximum total current (entire module) | 4 A (100% of on-time) |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel |
| Residual current (off) | ≤ 10 µA |
| Turn-on delay | < 100 µs |
| Turn-off delay | < 100 µs |

Electrical Requirements

| | |
|---|--|
| +24 V supply voltage | 18-30 V DC |
| Current consumption of voltage supply +24 V1 | corresponds to the load on the digital outputs |
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 40 mA maximum 45 mA |

Voltage Monitor

| | |
|----------------------|--|
| +24 V supply voltage | supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

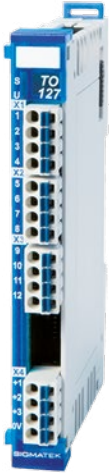
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-007-081 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Output Module TO 127



with 12 short-circuit proof digital outputs

The S-DIAS TO 127 digital output module has 12 short-circuit proof digital outputs in three groups (+24 V /1.7 A). The supply voltage for each group is monitored for low voltage.

In compliance with the safety-relevant requirements of the BG Institute for Occupational Safety (BIA), the outputs on the primary (+5 V) and the secondary (+24 V) sides are isolated using optic couplers (according to application class 3, pollution degree 2). In the monitoring circuits of the voltage supply for each channel group, the primary and secondary sides are also isolated with optic couplers.

Digital Output Specifications

| | |
|---|--|
| Number | 12 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 1.7 A |
| Maximum total current (group) | 5,1 A at 40 °C ambient temperature 3,4 A at 55 °C ambient temperature |
| Maximum total current (complete module) | 15,3 A at 40 °C ambient temperature 10,2 A at 55 °C ambient temperature |
| Maximum braking energy of outputs (inductive load) | maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels |
| Leakage current (output inactive) | ≤ 12 µA |
| Turn-on delay | < 200 µs |
| Turn-off delay | < 200 µs |

Electrical Requirements

| | | |
|---|--|---------------|
| Supply voltage +24 V /1-3 | 18-30 V DC | |
| Current consumption of voltage supply +24 V /1-3 | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | |
|---------------------------|--|
| Supply voltage +24 V /1-3 | supply voltage > 18 V (corresponding DC OK-LED lights green) |
|---------------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-007-127 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Output Module TO 161



with 16 short-circuit proof digital outputs

The S-DIAS TO 161 digital output module has 16 short-circuit proof digital outputs in two groups (+24 V/0.5 A, short-circuit proof). The supply voltage for each group is monitored for low voltage.

Digital Output Specifications

| | |
|---|-------------------------|
| Number | 16 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 0.5 A |
| Maximum total current (per 8-channel group) | 4 A (100 % of on-time) |
| Maximum total current (entire module) | 8 A (100 % of on time) |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel |
| Residual current (off) | ≤ 10 µA |
| Turn-on delay | < 100 µs |
| Turn-off delay | < 100 µs |

Electrical Requirements

| | | |
|---|--|---------------|
| Supply voltage +24 V /1-2 | 18-30 V DC | |
| Current consumption of voltage supply +24 V /1-2 | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 62 mA | maximum 67 mA |

Voltage Monitor

| | |
|---------------------------|--|
| Supply voltage +24 V /1-2 | supply voltage > 18 V (corresponding DC OK-LED lights green) |
|---------------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-007-161 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Pulse Width Module PW 022



with 2 PWM outputs

The S-DIAS PW 022 pulse width module has two +24 V switching PWM outputs with an adjustable frequency for controlling inductive loads (magnetic valve, proportional valve, ...). The 2 PWM outputs are powered through a supply connection. The supply voltage is monitored for under voltage.

PWM Output Specifications

| | |
|--------------------------------|--|
| Number | 2 |
| Configuration | +24 V-switching |
| Short-circuit proof | yes |
| Maximum output current/channel | 1.5 A to 45 °C 1 A to 55 °C |
| PWM frequency | adjustable as period in 0.5 µs increments between 30.5 Hz and 20 kHz |
| PWM pulse width | adjustable via software in 0.5 µs increments |

Electrical Requirements

| | | |
|---|--|---------------|
| PWM output supply voltage | +18-30 V DC | |
| Current consumption of PWM output supply | corresponds to the load on PWM outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 65 mA |

Voltage Monitor

| | |
|--------------------|--|
| PWM supply voltage | supply voltage > 18 V (corresponding DC OK LED lights) |
|--------------------|--|

Article Number and Miscellaneous

| | |
|------------------|-----------------------------------|
| Article number | 20-030-022 |
| Hardware version | 12,5 x 104,2 x 72 mm (B x H x T) |
| Standard | UL 508 (E247993) |
| Approvals | CE, _c UL _{US} |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating Conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Pulse Width Module PW 161



with 16 valve outputs

The S-DIAS PW 161 pulse width module has 16 valve outputs for valves with a starting current of up to 1 A and a 0.5 A stopping current. The 16 valve outputs are divided into two supply groups of 8 outputs each. Each supply group provides a current measurement for the switch point detection of the valve.

The supply voltages are monitored for under voltage.

Valve Outputs Specifications

| | |
|--|---|
| Number | 16 |
| Execution | GND switching |
| Short-circuit proof | yes |
| Maximum starting current/channel | 1 A |
| Maximum stopping current/channel | 0.5 A |
| Maximum total current/group | 4 A |
| Brake voltage during shutdown | 39 V |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/for all channels maximum 0.25 Joules/channel |
| Turn-on delay | 100 µs can be set through the software in 0-255 increments |
| Excitation time | 100 µs can be set through the software in 0-255 increments |
| PWM frequency | 20 kHz |
| Current measurement/group | 0-2 A 10-bit ADC 100 µs conversion time |

| | |
|-------------------|---|
| Derating variants | 50 % starting ratio of all channels, 100 % simultaneity of all channels, 100 % of the maximum stopping current per channel. 100 % starting ratio of all channels, 50 % simultaneity of all channels, 100 % of the maximum stopping current per channel. 100 % starting ratio of all channels, 100 % simultaneity of all channels, 50 % of the maximum stopping current per channel. |
|-------------------|---|

Electrical Requirements

| | | |
|--|--|---------------|
| Supply voltage of valve +UV /1-2 +UV /1-2 | 18-52 V DC | |
| Current consumption of voltage supply +UV /1-2 | corresponds to the load on the valve outputs | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | |
|-------------------------|--|
| Supply voltage +UV /1-2 | Supply voltage > 18 V (corresponding DC OK-LED lights green) |
|-------------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-030-161 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Relay Output Module

RO 041



with 4 relay outputs

The S-DIAS RO 041 relay output module has four relay outputs, each with normally open contacts for 230 V/6 A AC or 24 V/6 A DC.

Relay Outputs Specifications

| | | |
|---|-------------------|------------------|
| Number | 4 | |
| Contact | normally open | |
| Relay type | V23061-A1007-A302 | |
| Nominal voltage | 24 V DC | 230 V AC |
| Switching voltage | maximum 30 V | maximum 250 V AC |
| Maximum continuous current /channel | maximum 6 A DC | maximum 6 A AC |
| Simultaneity of all outputs | 100 % | |
| Maximum continuous current per connector plug contact allowed | 10 A DC | 10 A AC |
| Turn-on delay | ≤ 10 ms | |
| Turn-off delay | ≤ 10 ms | |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 35 mA | maximum 40 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 37 mA at +18 V typically 50 mA at +24 V typically 62 mA at +30 V | maximum 44 mA at +18 V maximum 58 mA at +24 V maximum 73 mA at +30 V |
| (all relays active) | | |

Article Number and Miscellaneous

| | | |
|----------------|--------------------------------|--|
| Article number | 20-064-041 | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -40 ... +85 °C | |
| Environmental temperature | -25 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Relay Output Module

RO 051



with 5 relay outputs

The S-DIAS RO 051 relay output module has five relay outputs, each with change over contacts for 115 V/6 A AC or 24 V/6 A DC.

Relay Outputs Specifications

| | | |
|---|-------------------|------------------|
| Number | 5 | |
| Contact | change over | |
| Relay type | V23061-B1007-A301 | |
| Nominal voltage | 24 V DC | 115 V AC |
| Switching voltage | maximum 30 V | maximum 125 V AC |
| Maximum continuous current /channel | maximum 6 A DC | maximum 6 A AC |
| Simultaneity of all outputs | 100 % | |
| Maximum continuous current per connector plug contact allowed | 6 A DC | 6 A AC |
| Turn-on delay | ≤ 10 ms | |
| Turn-off delay | ≤ 10 ms | |

Electrical Requirements

| | | |
|---|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 35 mA | maximum 40 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) (all relays active) | typically 46 mA at +18 V typically 62 mA at +24 V typically 77 mA at +30 V | maximum 54 mA at +18 V maximum 72 mA at +24 V maximum 91 mA at +30 V |

Article Number and Miscellaneous

| | | |
|----------------|--------------------------------|--|
| Article number | 20-064-051 | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -40 ... +85 °C | |
| Environmental temperature | -25 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm von 5 Hz-8,4 Hz 1 g von 8,4 Hz-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Mixed Module

DM 046



with 4 back-readable digital outputs

The S-DIAS Digital Mixed Module DM 046 has four back-readable digital outputs (+24 V/1.7 A). These can also be used as digital inputs (24 V/3.7 mA/0.5 ms) The supply voltage is monitored for under voltage. The back-readable outputs are galvanically separated.

Digital Input Specifications

| | | |
|---------------------|-------------------------------|---------------|
| Number | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |
| Galvanic isolation | yes (isolation voltage 500 V) | |

Digital Output Specifications

| | | |
|--|---|--|
| Number | 4 | |
| Short-circuit proof | yes | |
| Maximum continuous current load/channel allowed | 1.7 A | |
| Maximum total current (entire module) | 6.8 A | |
| Maximum braking energy of outputs (inductive load) | maximum 0.65 Joule/channel maximum 1.95 Joule/4 channels | |

| | | |
|-------------------------------|-------------------------------|--|
| Residual current output (off) | ≤ 12 µA | |
| Turn-on delay | < 200 µs | |
| Turn-off delay | < 200 µs | |
| Galvanic isolation | yes (isolation voltage 500 V) | |

Electrical Requirements

| | | |
|--|---|---------------|
| External power supply +24 V | 18-30 V DC | |
| External current consumption Power supply +24 V | corresponds to the load on the digital outputs + outgoing 24 V supply maximum 6.8 A | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 39 mA | maximum 50 mA |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-008-046 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL in preparation | |
| Approvals | UL in preparation | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Mixed Module

DM 081



with 4 digital inputs
4 short-circuit proof digital outputs

The S-DIAS DM 081 digital mixed module has four digital inputs (+24 V/3.7 mA/5 ms) and four short-circuit proof digital outputs (+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Digital Output Specifications

| | | |
|---|-------------------------|--|
| Number | 4 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 0.5 A | |
| Maximum total current (all 4 outputs) | 2 A (100 % of on time) | |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel | |
| Residual current (off) | ≤ 10 µA | |
| Turn-on delay | < 100 µs | |
| Turn-off delay | < 150 µs | |

Electrical Requirements

| | | |
|---|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-008-081 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Mixed Module DM 108



with 4 digital inputs +24 V/5 ms/3.7 mA
 4 digital outputs +24 V/0.5 A
 2 digital outputs +24 V/0.5 A/back-readable
 4 supply connections +24 V/0.25 A

The S-DIAS DM 108 digital mixed module has four digital inputs (+24 V/3.7 mA/5 ms), four short-circuit proof digital outputs (+24 V/0.5 A) and two short-circuit proof back-readable outputs (+24 V/0.5 A). These can be used as digital inputs (+24 V/3.7 mA/0.5 ms).

Four +24 V/0.25 A supply connections for sensors or actuators. The supply voltage is monitored for under voltage.

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Digital Output Specifications

| | | |
|---|---------------------------|--|
| Number | 4 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 0.5 A | |
| Maximum total current (all 4 outputs) | 2 A (100 % of on time) | |
| Maximum braking energy of outputs (inductive load) | maximum 0,1 Joule/channel | |
| Residual current (off) | ≤ 10 µA | |
| Turn-on delay | < 100 µs | |
| Turn-off delay | < 150 µs | |

Digital Back-readable Output Specifications

| | | |
|---|---------------------------|---------------|
| Number | 2 | |
| Short-circuit proof | yes | |
| Maximum continuous current load/channel allowed | 0.5 A | |
| Maximum total current (all 2 outputs) | 1 A (100 % of on-time) | |
| Maximum braking energy of the output (inductive load) | maximum 0.1 Joule/channel | |
| Residual current output (off) | ≤ 10 µA | |
| Turn-on delay | < 100 µs | |
| Turn-off delay | < 150 µs | |
| Back-reading input voltage | typically +24 V | maximum +30 V |
| Back-reading signal level | low: < +8 V | high: > +14 V |
| Back-reading switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Back-reading input delay | typically 5 ms | |

Sensor/Actuator Supply Specifications

| | | |
|---|---|--|
| Sensor/actuator supply | corresponds to the +24 V supply applied at X5 | |
| Short-circuit proof | yes | |
| Maximum permissible continuous current/supply connection | 0.25 A | |
| Maximum total current (all 4 outgoing supply connections) | 1.0 A | |

Electrical Requirements

| | | |
|---|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs and sensor/actuator supply (max. 4 A) | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 40 mA | maximum 50 mA |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Artikel number | 20-008-108 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | CE |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes

S-DIAS Digital Mixed Module

DM 161



with 8 digital inputs
8 short-circuit proof digital outputs

The S-DIAS DM 161 digital mixed module has eight digital inputs +24 V/3.7 mA/5 ms) and eight short-circuit proof digital outputs(+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Digital Output Specifications

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 0.5 A | |
| Maximum total current (all 8 outputs) | 4 A (100% of on-time) | |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel | |
| Residual current (off) | ≤ 10 µA | |
| Turn-on delay | < 100 µs | |
| Turn-off delay | < 150 µs | |

Electrical Requirements

| | | |
|---|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 62 mA | maximum 67 mA |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-008-161 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Mixed Module DM 162



with 4 digital inputs
 4 digital inputs with counter function and time measurement
 8 short-circuit proof digital outputs

The S-DIAS DM 162 digital mixed module has four digital inputs (+24 V/3.7 mA/5 ms), four digital inputs with counter function and time measurement and eight short-circuit proof digital outputs (+24 V/0.5 A). The supply voltage is monitored for under voltage.

Digital Input Specifications

| | | |
|----------------------------------|---|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | Input 1-4: 1 µs (counter, time measurement) Input 5-8: 5 ms | |
| Input frequency of counter input | 25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis | |
| Counter frequency | 25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis | |
| Time measurement | measurement of the time between Sync and edge change in µs for input 1-4 | |

Digital Output Specifications

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 0.5 A | |
| Maximum total current (all 8 outputs) | 4 A (100% of on-time) | |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel | |
| Residual current (off) | ≤ 10 µA | |
| Turn-on delay | < 100 µs | |
| Turn-off delay | < 150 µs | |

Electrical Requirements

| | | |
|---|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 50 mA | maximum 55 mA |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-008-162 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Mixed Module DM 167



with 8 digital inputs
8 short-circuit proof digital outputs

The S-DIAS Digital Mixed Module DM 167 has eight digital inputs (+24 V/3.7 mA/5 ms) and eight short circuit proof outputs (+24 V/1.7 A) in two groups. The power supply for each channel group is monitored for under voltage.

In compliance with the safety-relevant requirements of the BIA, the outputs on the primary (+5 V) and the secondary (+24 V) sides are isolated using optic couplers (according to application class 3, pollution degree 2). For the inputs, the primary (+24 V) and the secondary sides (+5 V) are separated using optic couplers.

Digital Input Specifications

| | | |
|---------------------|---|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |
| Galvanic isolation | Optic coupler, GND/EXTGND not galvanically isolated | |

Digital Output Specifications

| | | |
|---|---|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 1.7 A | |
| Maximum total current (group) | 5.1 A to 50 °C ambient temperature 3.4 A to 55 °C ambient temperature | |
| Maximum total current (entire module) | 10.2 A to 50 °C ambient temperature 6.8 A to 55 °C ambient temperature | |

| | | |
|--|--|--|
| Maximum braking energy of outputs (inductive load) | maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels | |
| Residual current output (off) | ≤ 12 µA | |
| Turn-on delay | < 200 µs | |
| Turn-off delay | < 200 µs | |
| Galvanic isolation | Optic coupler, GND/EXTGND not galvanically isolated | |

Electrical Requirements

| | | |
|---|--|---------------|
| Supply voltage +24 V /1-2 | 18-30 V DC, typically +24 V DC | |
| Current consumption of voltage supply +24 V /1-2 | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | | |
|----------------------------|---|--|
| Supply voltage +24 V 1/2/3 | Supply voltage > 18 V (corresponding DC OK-LED lights green) | |
| Galvanic isolation | Optic coupler, GND/EXTGND not galvanically isolated | |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-008-167 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Multi I/O Module IO 011



with 6 digital inputs
8 short-circuit proof digital outputs
1 analog voltage input
1 analog current input

The module has 6 digital inputs (+24 V/3.5 mA/0.5 ms) and 8 short circuit proof digital outputs (+24 V/0.5 A), these support read-back (0.5 ms). The voltage supply for the digital outputs are monitored for under voltage.

Additionally, the module has an analog ± 10 V input and an analog current input (0-20 mA or 4-20 mA). The resolution of the two analog inputs is 16 bits.

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 6 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Digital Output Specifications

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum permitted continuous load current / channel | 0.5 A | |
| Maximum total current (all 8 outputs) | 4 A (100 % of on-time) | |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel | |

| | | |
|---|---|---------------|
| Residual current output (off) | $\leq 10 \mu\text{A}$ | |
| Turn-on delay | < 100 μs | |
| Turn-off delay | < 150 μs | |
| Read-back signal level | low: < +8 V | high: > +14 V |
| Input delay | typically 0.5 ms | |
| Maximum allowed voltage on the digital output when switched off | A voltage supplied to the digital output pin from external must not exceed the voltage on the supply pin (24 V) by more than 0.7 V. | |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Analog ± 10 V Input Specifications

| | | |
|---|--|---|
| Number of channels | 1 | |
| Measurement range | -10 ... +10 V | 0 ... +10 V |
| Measurement value | -10,000 ... +10,000 or -30,000 ... +30,000 (at full range) | 0 ... +10,000 or 0 ... +30,000 (at full range) |
| Input type | difference input | |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | |
| Conversion time for all channels | depending on the selected timing Speed mode: 15.26 μs Time offset mode: corresponds to the S-DIAS cyclic time | |
| Common mode range | ± 12 V | |
| Input resistance | typically 660 k Ω | |
| Cable break monitor | yes | |
| Input filter hardware | typically 1 kHz, low pass 3rd order system | |
| Input filter software | configurable, low pass 1st order system | |
| Basic accuracy | ± 0.20 % of maximum measurement value | |
| Total accuracy (0-60 $^{\circ}\text{C}$) | ± 0.30 % of maximum measurement value | |

Analog Current Input Specifications

| | | |
|----------------------------------|--|--|
| Number of channels | 1 | |
| Measurement range | 0-20 mA | 4-20 mA |
| Measurement value | 0-20,000 or 0-60,000 (at Full-Range) | 4,000-20,000 or 12,000-60,000 (at Full-Range) |
| Input type | difference input | |
| Resolution current | 16-bit (ca. 0.3 μ A/LSB) | |
| Conversion time for all channels | depending on the selected timing Speed mode: 15.26 μ s Time offset mode: corresponds to the S-DIAS cyclic time | |
| Common mode range | \pm 10 V | |
| Input resistance | typically 50 Ω | |
| Cable break monitor | no | yes, settable via software between 0-4 mA (default: 3 mA) |
| Short-circuit monitor | no | yes, settable via software between 0-4 mA (default: 3 mA) |
| Input filter hardware | typically 1 kHz, low pass 3rd order | |
| Input filter software | configurable low pass 1st order system | |
| Basic accuracy | \pm 0.30 % of maximum measurement value | |
| Total accuracy (0-60 °C) | \pm 0.50 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 60 mA | maximum 65 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 20 mA | maximum 25 mA |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy | |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-013-011 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Multi I/O Module Smart IO 011S



- with 6 digital inputs
- 8 short-circuit proof digital outputs
- 1 analog voltage input
- 1 analog current input

The module has 6 digital inputs (+24 V/3.5 mA/1 μ s) and 8 short circuit proof digital outputs (+24 V/0.5 A), these support read-back (150 μ s). The voltage supply for the digital outputs are monitored for under voltage.

Additionally, the module has an analog ± 10 V input and an analog current input (0-20 mA). The resolution of the two analog inputs is 16 bits.

Digital Input Specifications

| | | |
|---------------------|---------------------|---------------|
| Number | 6 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 1 μ s | |

Digital Output Specifications

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum permitted continuous load current / channel | 0.5 A |
| Maximum total current (all 8 outputs) | 4 A (100 % of on-time) |
| Maximum braking energy of outputs (inductive load) | maximum 1 Joule/channel |

| | | |
|---|---|---------------|
| Residual current output (off) | $\leq 10 \mu$ A | |
| Turn-on delay | < 100 μ s | |
| Turn-off delay | < 150 μ s | |
| Read-back signal level | low: < +8 V | high: > +14 V |
| Input delay | typically 1 μ s | |
| Maximum allowed voltage on the digital output when switched off | An external voltage supplied to the digital output pin must not exceed the voltage on the supply pin (24 V) by more than 0.7 V. | |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

Analog ± 10 V Input Specifications

| | | |
|------------------------------------|--|---------------|
| Number of channels | 1 | |
| Measurement range | -10 ... +10 V | 0 ... +10 V |
| Measurement value | -30.000 ... +30.000 | 0 ... +30.000 |
| Input type | differential input | |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | |
| Conversion time for all channels | default mode: 10 μ s (current input disabled) default mode: 20 μ s (current input enabled) time-trigger mode: 15 μ s (current input disabled/enabled) latch mode: 10 μ s (current input disabled, 1-4 latch registers enabled) latch mode: 20 μ s (current input disabled, 5-8 latch registers enabled) latch mode: 20 μ s (current input enabled, 1-8 latch registers enabled) | |
| Common mode range | ± 12 V | |
| Input resistance | typically 660 k Ω | |
| Cable break monitor | yes | |
| Input filter hardware | typically 100 kHz, low pass 3rd order system | |
| Input filter software | configurable low pass 1st order system (in standard mode only) | |
| Basic accuracy | ± 0.20 % of maximum measurement value | |
| Total accuracy (0-60 $^{\circ}$ C) | ± 0.30 % of maximum measurement value | |

Analog Current Input Specifications

| | | |
|------------------------------------|---|---|
| Number of channels | 1 | |
| Measurement range | 0-20 mA | 4-20 mA |
| Measurement value | 0-60,000 | 12,000-60,000 |
| Input type | difference input | |
| Resolution current | 16-bit (ca. 0.3 μ A/LSB) | |
| Conversion time for all channels | default mode: 10 μ s (voltage input disabled) default mode: 20 μ s (voltage input enabled) time-trigger mode: 15 μ s (voltage input disabled/enabled) latch mode: 10 μ s (voltage input disabled, 1-4 latch register enabled) latch mode: 20 μ s (voltage input disabled, 5-8 latch register enabled) latch mode: 20 μ s (voltage input enabled, 1-8 latch register enabled) | |
| Common mode range | ± 10 V | |
| Input resistance | typically 50 Ω | |
| Cable break monitor | no | yes, settable via software between 0-4 mA (default: 3 mA) |
| Short-circuit monitor | no | yes, settable via software between 0-4 mA (default: 3 mA) |
| Input filter hardware | typically 1 kHz, low pass 3rd order | |
| Input filter software | configurable low pass 1st order system (in standard mode only) | |
| Basic accuracy | ± 0.30 % of maximum measurement value | |
| Total accuracy (0-60 $^{\circ}$ C) | ± 0.50 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|--|---------------|
| Power supply +24 V | 18-30 V DC | |
| Current consumption of the +24 V supply | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 70 mA | maximum 75 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 20 mA | maximum 25 mA |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy | |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-013-011S | |
| Dimensions | 12,5 x 104,2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) in preparation | |
| Approvals | cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 $^{\circ}$ C | |
| Environmental temperature | 0 ... +60 $^{\circ}$ C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Strain Gauge Input Module

AI 022



with 2 analog inputs
measurement range ± 1.875 mV until ± 120 mV

The S-DIAS AI 022 strain gauge input module is used to analyze measuring bridges (i.e. DMS load cells). With a 24-bit resolution, measurement values with an accuracy of 0.035 % are provided.

Analog Channel Specifications

| | | | | | |
|---|---|---------------|--------------|-------------|--------------|
| Number of channels | 2 | | | | |
| Bridge supply voltage | +5 V | | | | |
| Load cell rated values | 0.25 mV/V | 0.5 mV/V | 1 mV/V | 2 mV/V | 16 mV/V |
| Measurement range | ± 1.875 mV | ± 3.75 mV | ± 7.5 mV | ± 15 mV | ± 120 mV |
| Measurement value | ± 8388608 d | | | | |
| Resolution | 24-bit | | | | |
| Hardware filter | 180 Hz, 1 st order | | | | |
| Filter setting, conversion time and noise-free resolution | filter word | 2 | 5 | 1023 | |
| | filter type | Sinc4 | Sinc4 | Sinc4 | |
| | cutoff frequency (-3 dB) | 144 Hz | 57.7 Hz | 0.282 Hz | |
| | conversion time | 4 ms | 9 ms | 1702 ms | |
| | noise-free resolution | 15.5 bits | 16 bits | 20 bits | |
| Sensor break detection | yes | | | | |
| Load per channel | 75-5000 Ω (when using one channel) 150-5000 Ω (when using both channels) | | | | |

| | | |
|---|--|--|
| Noise | ± 0.0031 % referred to the full scale value for filter Word 2 | |
| Temperature drift | ± 0.001 % / °C referred to the full scale value of the measuring range | |
| Overall accuracy | ± 0.035 % referred to the full scale value of the measuring range | |
| Calibration data Null-voltage protected | yes | |
| Calibratable | no | |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) without load on the measuring bridge supply voltage | typically 17 mA at +18 V typically 15 mA at +24 V typically 14 mA at +30 V | maximum 20 mA at +18 V maximum 18 mA at +24 V maximum 17 mA at +30 V |
| Current consumption on the S-DIAS bus (+24 V power supply) with maximum load on the both measuring bridge supply voltage | typically 41 mA at +18 V typically 34 mA at +24 V typically 29 mA at +30 V | maximum 48 mA at +18 V maximum 40 mA at +24 V maximum 34 mA at +30 V |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-022 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Strain Gauge Input Module

AI 022-1



with 2 analog inputs
measurement range ± 1.25 mV until ± 80 mV

The S-DIAS AI 022-1 strain gauge input module is used to analyze measuring bridges (i.e. DMS load cells). With a 24-bit resolution, measurement values with an accuracy of 0.035 % are provided.

Analog Channel Specifications

| | | | | | |
|---|---|--------------|------------|-------------|-------------|
| Number of channels | 2 | | | | |
| Bridge supply voltage | +5 V | | | | |
| Load cell rated values | 0.25 mV/V | 0.5 mV/V | 1 mV/V | 2 mV/V | 16 mV/V |
| Measurement range | ± 1.25 mV | ± 2.5 mV | ± 5 mV | ± 10 mV | ± 80 mV |
| Measurement value | ± 8388608 d | | | | |
| Resolution | 24-bit | | | | |
| Hardware filter | 8 Hz, 1 st order | | | | |
| Filter setting, conversion time and noise-free resolution | filter word | 2 | 5 | 1023 | |
| | filter type | Sinc4 | Sinc4 | Sinc4 | |
| | cutoff frequency (-3 dB) | 144 Hz | 57.7 Hz | 0.282 Hz | |
| | conversion time | 4 ms | 9 ms | 1702 ms | |
| | noise-free resolution | 15.5 bits | 16 bits | 20 bits | |
| Sensor break detection | yes | | | | |
| Load per channel | 60-5000 Ω (when using one channel) | | | | |

| | | |
|---|--|--|
| Noise | ± 0.0031 % referred to the full scale value for filter Word 2 | |
| Temperature drift | ± 0.001 % / $^{\circ}\text{C}$ referred to the full scale value of the measuring range | |
| Overall accuracy | ± 0.035 % referred to the full scale value of the measuring range | |
| Calibration data Null-voltage protected | yes | |
| Calibratable | no | |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) without load on the measuring bridge supply voltage | typically 17 mA at +18 V typically 15 mA at +24 V typically 14 mA at +30 V | maximum 20 mA at +18 V maximum 18 mA at +24 V maximum 17 mA at +30 V |
| Current consumption on the S-DIAS bus (+24 V power supply) with maximum load on the both measuring bridge supply voltage | typically 41 mA at +18 V typically 34 mA at +24 V typically 29 mA at +30 V | maximum 48 mA at +18 V maximum 40 mA at +24 V maximum 34 mA at +30 V |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-022-1 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|--|---|
| Storage temperature | -20 ... +85 $^{\circ}\text{C}$ | |
| Environmental temperature | 0 ... +60 $^{\circ}\text{C}$ | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Analog Input Module

AI 023



with 2 resistance or temperature inputs

The AI 023 S-DIAS analog input module has two resistance inputs with five settable measurement ranges from 0-250 Ω, 0-500 Ω, 0-1000 Ω, 0-2500 Ω and 0-5000 Ω. Supported temperature sensors include PT100, PT1000, NI100, NI1000 and various KTY sensors. The module allows a connection with 2 or 4-wire measuring technology. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Resistor/Temperature Specifications

| | |
|--|--|
| Number of channels | 2 |
| Measurement range | see the following measurement range table. |
| AD converter resolution | 16-bit |
| Typical current measurement | < 0.3 ms |
| Conversion time for all channels | 4 ms |
| Input resistance | > 10 MΩ |
| Input filter hardware | 10 kHz, low pass 2nd order system |
| Input filter | configurable |
| Measurement precision | ±0.3 % of maximum measurement value |
| Resistor sensor connection cable | < 100 Ω |
| Galvanic separation of analog inputs to S-DIAS bus | yes (560 V) |
| Status display | green LEDs |

Measurement Range of Resistor Inputs

| Type | Resistance range | Measurement value |
|------|------------------|-------------------|
| 1 | 0 ... 250 Ω | 0-2500 |
| 2 | 0 ... 500 Ω | 0-5000 |
| 3 | 0 ... 1000 Ω | 0-10000 |
| 4 | 0 ... 2500 Ω | 0-25000 |
| 5 | 0 ... 5000 Ω | 0-50000 |

Measurement Range of Temperature Inputs

| Type | Temperature range | Resistance range | Measurement value |
|-------------------------------------|-------------------|---------------------|-------------------|
| Pt100 | -200 ... +150 °C | 18.5 ... 157.3 Ω | -2000 ... +1500 |
| Pt100 | -200 ... +850 °C | 18.5 ... 390.5 Ω | -2000 ... +8500 |
| Pt200 | -200 ... +150 °C | 37.0 ... 314.6 Ω | -2000 ... +1500 |
| Pt200 | -200 ... +850 °C | 37.0 ... 781.0 Ω | -2000 ... +8500 |
| Pt500 | -200 ... +150 °C | 92.6 ... 786.6 Ω | -2000 ... +1500 |
| Pt500 | -200 ... +850 °C | 92.6 ... 1952.4 Ω | -2000 ... +8500 |
| Pt1000 | -200 ... +150 °C | 185.2 ... 1573.3 Ω | -2000 ... +1500 |
| Pt1000 | -200 ... +850 °C | 185.2 ... 3904.8 Ω | -2000 ... +8500 |
| NI100 | -60 ... +150 °C | 69.5 ... 198.6 Ω | -600 ... +1500 |
| NI100 | -60 ... +250 °C | 69.5 ... 289.2 Ω | -600 ... +2500 |
| NI1000 | -60 ... +150 °C | 695.2 ... 1986.3 Ω | -600 ... +1500 |
| NI1000 | -60 ... +250 °C | 695.2 ... 2891.6 Ω | -600 ... +2500 |
| KTY10-62 KTY11-62 | -50 ... +150 °C | 1035.9 ... 4575.3 Ω | -500 ... +1500 |
| KTY81-110 KTY81-120 KTY81-150 | -55 ... +150 °C | 490.0 ... 2211.0 Ω | -550 ... +1500 |
| KTY81-121 | -55 ... +150 °C | 485.1-2189.1 Ω | -550 ... +1500 |
| KTY81-122 | -55 ... +150 °C | 494.9-2233.0 Ω | -550 ... +1500 |
| KTY84-130 KTY84-150 | -40 ... +300 °C | 358.8 ... 2623.0 Ω | -400 ... +3000 |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 46 mA at +18 V typically 37 mA at +24 V typically 32 mA at +30 V | maximum 50 mA at +18 V maximum 41 mA at +24 V maximum 36 mA at +30 V |

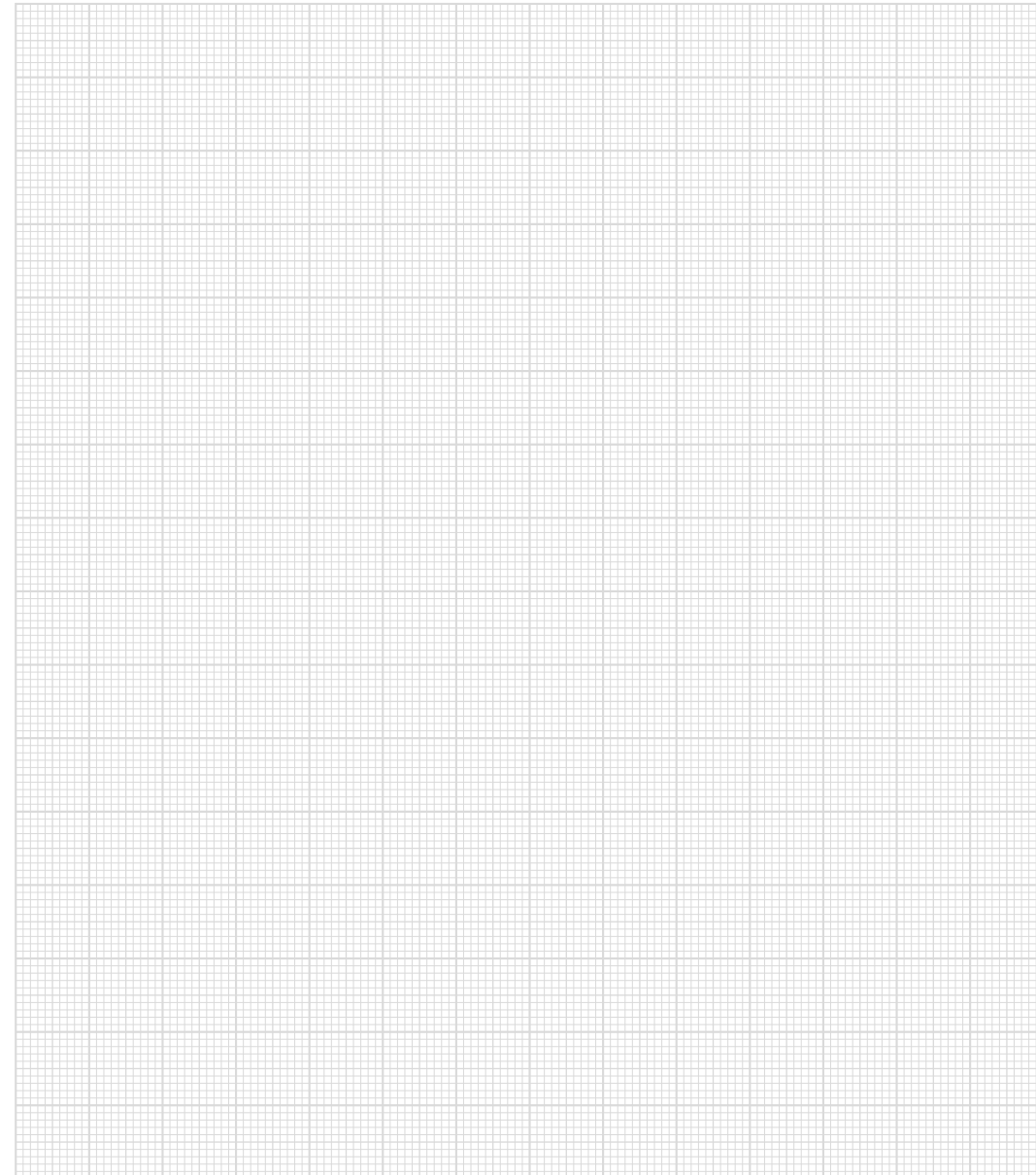
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-023 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL in preparation |
| Approvals | CE |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without Derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module AI 043



with 4 resistor or temperature inputs

The S-DIAS AI 043 analog input module has four resistor inputs with five adjustable measurement ranges from 0-250 Ω, 0-500 Ω, 0-1000 Ω, 0-2500 Ω and 0-5000 Ω. PT100, PT1000, NI100, NI1000 are used as temperature sensors and various KTY sensors are supported. The module allows the connection of the sensors using 2 or 3-wire measuring technology. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Resistor/Temperature Specifications

| | |
|--|--|
| Number of channels | 4 |
| Measurement range | see the following measurement range table. |
| AD converter resolution | 16-bit |
| Typical current measurement | < 0.3 ms |
| Conversion time for all channels | 4 ms |
| Input resistance | > 10 MΩ |
| Input filter hardware | 10 kHz, low pass 2nd order system |
| Input filter | configurable |
| Measurement precision | ±0.3 % of maximum measurement value |
| Resistor sensor connection cable | < 100 Ω |
| Galvanic separation of analog inputs to S-DIAS bus | yes (560 V) |
| Status display | green LEDs |

Measurement Range of Resistor Inputs

| Type | Resistance range | Measurement value |
|------|------------------|-------------------|
| 1 | 0 ... 250 Ω | 0-2500 |
| 2 | 0 ... 500 Ω | 0-5000 |
| 3 | 0 ... 1000 Ω | 0-10000 |
| 4 | 0 ... 2500 Ω | 0-25000 |
| 5 | 0 ... 5000 Ω | 0-50000 |

Measurement Range of Temperature Inputs

| Type | Temperature range | Resistance range | Measurement value |
|-------------------------------------|-------------------|---------------------|-------------------|
| Pt100 | -200 ... +150 °C | 18.5 ... 157.3 Ω | -2000 ... +1500 |
| Pt100 | -200 ... +850 °C | 18.5 ... 390.5 Ω | -2000 ... +8500 |
| Pt200 | -200 ... +150 °C | 37.0 ... 314.6 Ω | -2000 ... +1500 |
| Pt200 | -200 ... +850 °C | 37.0 ... 781.0 Ω | -2000 ... +8500 |
| Pt500 | -200 ... +150 °C | 92.6 ... 786.6 Ω | -2000 ... +1500 |
| Pt500 | -200 ... +850 °C | 92.6 ... 1952.4 Ω | -2000 ... +8500 |
| Pt1000 | -200 ... +150 °C | 185.2 ... 1573.3 Ω | -2000 ... +1500 |
| Pt1000 | -200 ... +850 °C | 185.2 ... 3904.8 Ω | -2000 ... +8500 |
| NI100 | -60 ... +150 °C | 69.5 ... 198.6 Ω | -600 ... +1500 |
| NI100 | -60 ... +250 °C | 69.5 ... 289.2 Ω | -600 ... +2500 |
| NI1000 | -60 ... +150 °C | 695.2 ... 1986.3 Ω | -600 ... +1500 |
| NI1000 | -60 ... +250 °C | 695.2 ... 2891.6 Ω | -600 ... +2500 |
| KTY10-62 KTY11-62 | -50 ... +150 °C | 1035.9 ... 4575.3 Ω | -500 ... +1500 |
| KTY81-110 KTY81-120 KTY81-150 | -55 ... +150 °C | 490.0 ... 2211.0 Ω | -550 ... +1500 |
| KTY81-121 | -55 ... +150 °C | 485.1-2189.1 Ω | -550 ... +1500 |
| KTY81-122 | -55 ... +150 °C | 494.9-2233.0 Ω | -550 ... +1500 |
| KTY84-130 KTY84-150 | -40 ... +300 °C | 358.8 ... 2623.0 Ω | -400 ... +3000 |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 46 mA at +18 V typically 37 mA at +24 V typically 32 mA at +30 V | maximum 50 mA at +18 V maximum 41 mA at +24 V maximum 36 mA at +30 V |

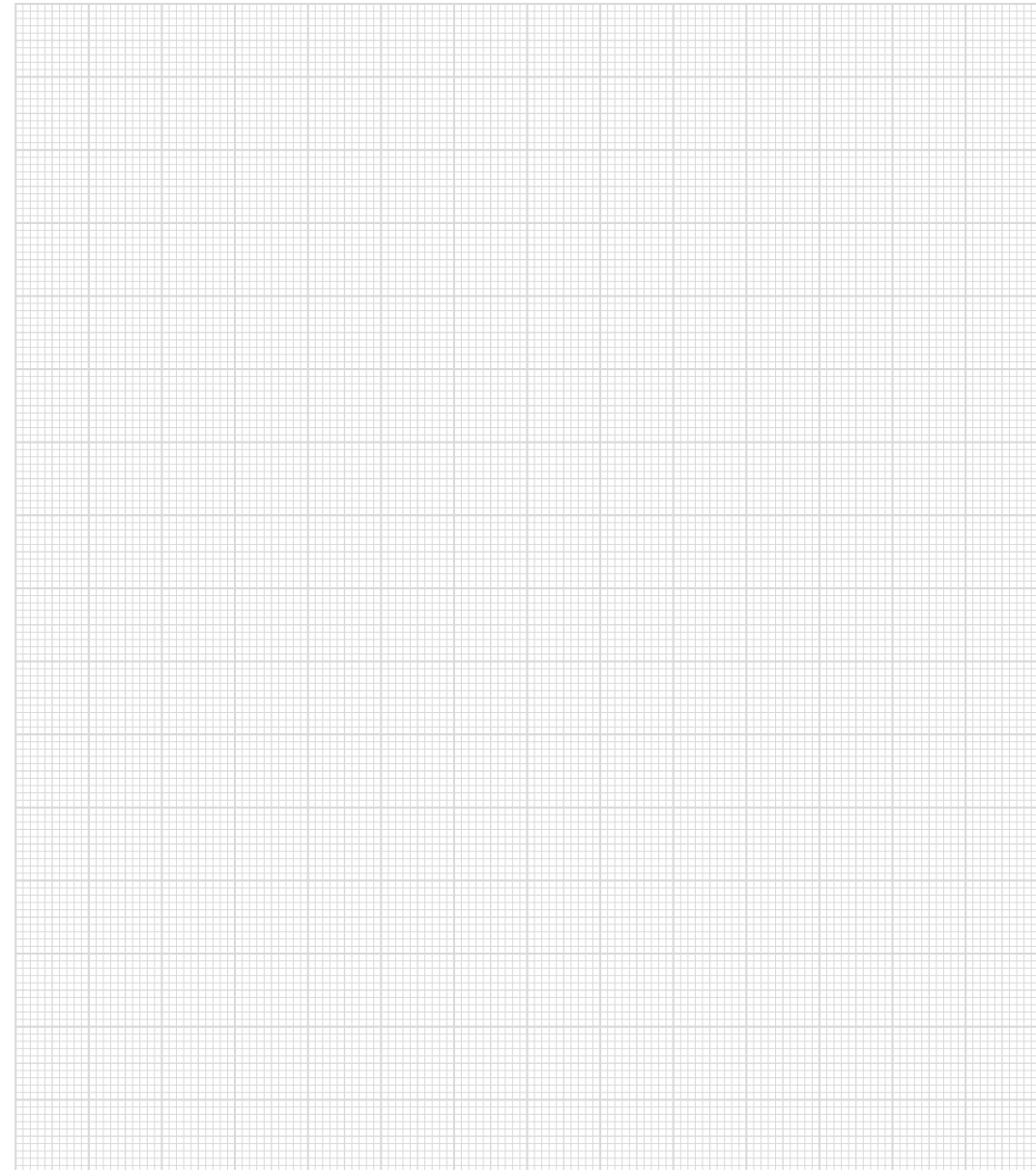
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-043 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module AI 046



with 4 analog inputs ± 11 V or ± 1.1 V

The S-DIAS analog input module AI 046 has four analog inputs with two adjustable measurement ranges with ± 11 V or ± 1.1 V with an 18-bit resolution. The voltage supply for the analog inputs are monitored for under voltage. The analog inputs are gal-vanically separated from the S-DIAS bus.

Analog Input Specifications

| | | |
|--|--|---------------------|
| Number of channels | 4 | |
| Measurement range | -11 ... +11 V | -1.1 ... +1.1 V |
| Amplification | 1 | 10 |
| Measurement value | -110,000 ... +110,000 (Mode: 18-bit signed value range) -27,500 ... +27,500 (Mode: 16-bit signed value range) | |
| Galvanic isolation | 500 V (maximum isolation voltage) | |
| Input type | difference input | |
| A/D converter | 18-bit SAR with simultaneous scanning | |
| Measurement range resolution | 18-bit | |
| | ca. 84 μ V/LSB | ca. 8.4 μ V/LSB |
| Scan rate per channel | ≥ 10 μ s (minimum S-DIAS cycle time: 100 μ s) | |
| Data memory depth per channel | 512 Dwords (32 bits) 1024 words (16 bits) | |
| Calculation basis for number of values per channel (n) | n = S-DIAS cycle time / scan rate | |
| Common mode range | ± 12 V | ± 6 V |

| | | |
|--|---|---------------------------------------|
| Input resistance | typically 5 M Ω | |
| Cable break monitor | yes (10 M Ω between AI+ and +12 V, 10 M Ω between AI- and -12 V) | |
| Input filter hardware | 10 kHz, low pass 3 rd order (differential mode) 100 kHz, low pass 1 st order (common mode) | |
| Input filter software | configurable | |
| Maximum allowable input voltage | ± 30 V | |
| Total measurement precision | ± 0.030 % (20-40 $^{\circ}$ C) | ± 0.045 % (20-40 $^{\circ}$ C) |
| Measurement method: Mode 2, sampling rate 50 μ s | ± 0.045 % (0-55 $^{\circ}$ C) | ± 0.060 % (0-55 $^{\circ}$ C) |
| Status display | green LED | |

Measuring Modes

| Scan rate (μ s) | Mode 1 | Mode 2 |
|----------------------|---------------------------------|---------------------------------|
| | hardware frequency limit in kHz | hardware frequency limit in kHz |
| 10 | 10 | 10 |
| 20 | 10 | 10 |
| 25 | 10 | 10 |
| 50 | 10 | 8 |
| 100 | 10 | 5 |
| 200 | 10 | 3 |
| 250 | 10 | 3 |
| 500 | 10 | 1.5 |
| 1000 | 10 | 1.5 |

Measurement Precision

| | | |
|---|--|--|
| Measurement range | -11 ... +11 V | -1.1 ... +1.1 V |
| Accuracy incl. calibration error and noise Mode 2, sampling rate 50 μ s 25 $^{\circ}$ C | 0.010 % | 0.017 % |
| Temperature drift 20-40 $^{\circ}$ C 0-55 $^{\circ}$ C | 0.006 % 0.020 % | 0.008 % 0.025 % |
| Linearity | 0.003 % | 0.005 % |
| Crosstalk | 0.003 % | 0.003 % |
| Symmetry | 0.009 % | 0.010 % |
| Total error 20-40 $^{\circ}$ C 0-55 $^{\circ}$ C | ± 0.030 % (± 3.3 mV) ± 0.045 % (± 5.0 mV) | ± 0.045 % (± 0.50 mV) ± 0.060 % (± 0.66 mV) |

Electrical Requirements

| | | |
|--|--|---------------|
| External voltage supply X5 | 18-30 V DC | |
| Current consumption X5 | maximum 650 mA (maximum 500 mA for all sensor supplies) typically 60 mA (electronics) | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | 0 | 0 |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 30 mA | maximum 35 mA |

Voltage Monitor External +24 V Supply

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

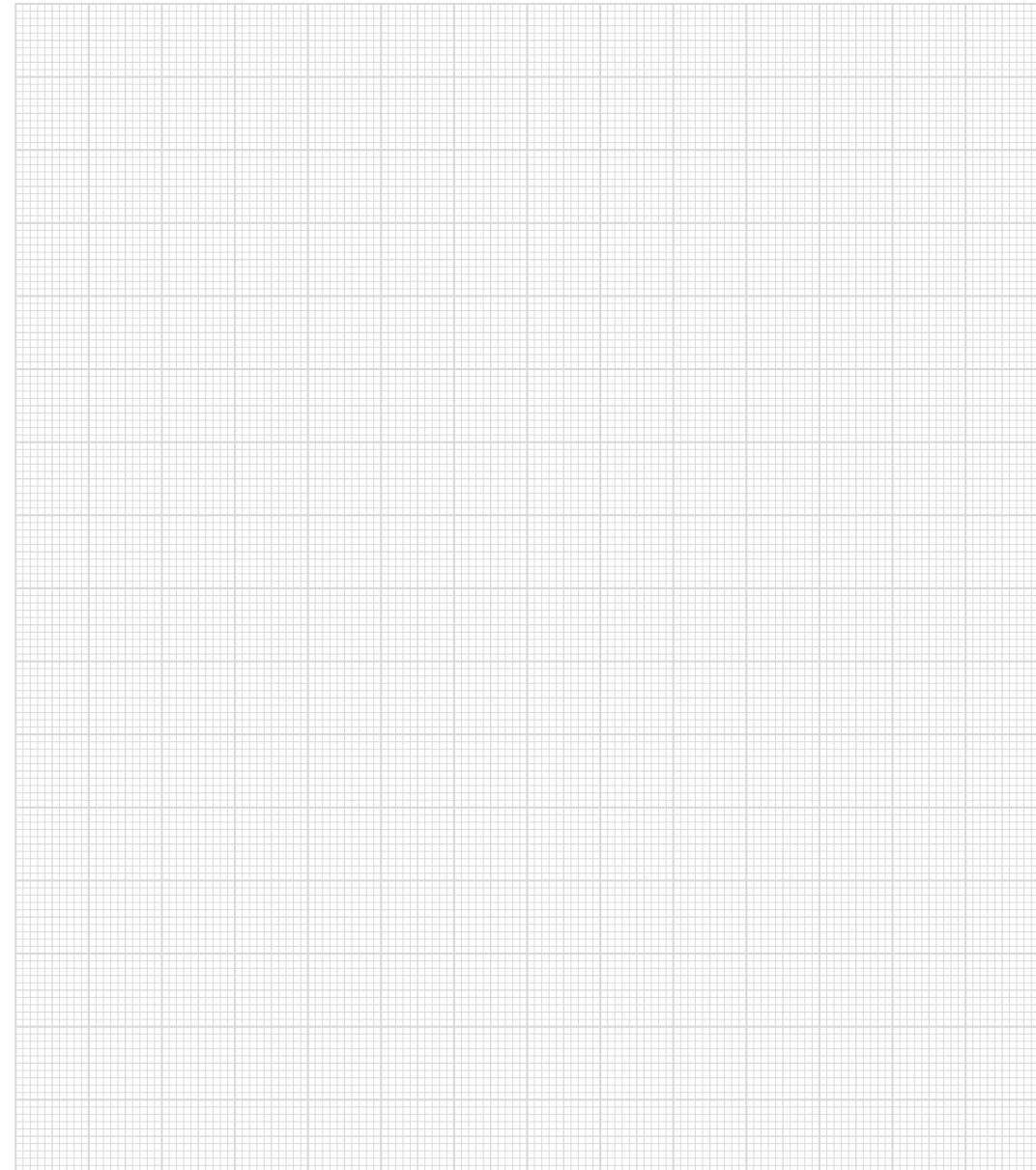
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-009-046 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL in preparation | |
| Approvals | UL, cUL, CE in preparation | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module AI 047



with 4 analog inputs 0-22 mA or 4-22 mA

The S-DIAS analog input module AI 047 has four analog inputs 0-22 mA or 4-22 mA with an 18-bit resolution. The voltage supply for the analog inputs are monitored for under voltage. The analog inputs are galvanically separated from the S-DIAS bus.

Analog Input Specifications

| | | |
|--|---|--|
| Number of channels | 4 | |
| Measurement range | 0-22 mA | 4-22 mA |
| Amplification | 10 | |
| Measurement value | 0-220,000 (Mode: 19-bit signed value range) 0-27,500 (Mode: 16-bit signed value range) | 40,000-220,000 (Mode: 19-bit signed value range) 5,000-27,500 (Mode: 16-bit signed value range) |
| Galvanic isolation | 500 V (maximum isolation voltage) | |
| Input type | difference input | |
| A/D converter | 18-bit SAR with simultaneous scanning | |
| Measurement range resolution | 17-bit ca. 0.17 μ A/LSB | |
| Scan rate per channel | 10 μ s minimum | |
| Data memory depth per channel | 512 Dwords (32 bits) 1024 words (16 bits) | |
| Calculation basis for number of values per channel (n) | n = S-DIAS cycle time / scan rate | |
| S-DIAS cyclic time | 100 μ s minimum | |

| | | |
|--|---|--|
| Common mode range | ± 8 V | |
| Load | typically 45 Ω | |
| Cable break monitor | no | yes, can be set from 0-4 mA via software (default: 3 mA) |
| Input filter hardware | 10 kHz, low pass 3 rd order (differential mode) 100 kHz, low pass 1 st order (common mode) | |
| Input filter software | configurable | |
| Maximum input current allowed | continuous 50 mA single pulse 0.12 A/1 s single pulse 0.25 A/40 ms single pulse 0.75 A/200 μ s | |
| Total measurement precision | ± 0.060 % (20-40 $^{\circ}$ C) | |
| Measurement method: Mode 2, sampling rate 50 μ s | ± 0.070 % (0-55 $^{\circ}$ C) | |
| Status display | green LED | |

Measuring Modes

| Scan rate (μ s) | Mode 1 | Mode 2 |
|----------------------|---------------------------------|---------------------------------|
| | hardware frequency limit in kHz | hardware frequency limit in kHz |
| 10 | 10 | 10 |
| 20 | 10 | 10 |
| 25 | 10 | 10 |
| 50 | 10 | 8 |
| 100 | 10 | 5 |
| 200 | 10 | 3 |
| 250 | 10 | 3 |
| 500 | 10 | 1,5 |
| 1000 | 10 | 1,5 |

Measurement Precision

| | |
|---|---|
| Accuracy incl. calibration error and noise Mode 2, sampling rate 50 μ s 25 $^{\circ}$ C | 0.028 % |
| Temperature drift 20-40 $^{\circ}$ C 0-55 $^{\circ}$ C | 0.007 % 0.032 % |
| Linearity | 0.005 % |
| Crosstalk | 0.003 % |
| Total error 20-40 $^{\circ}$ C 0-55 $^{\circ}$ C | ± 0.045 % (± 9.9 μ A) ± 0.070 % (± 15.4 μ A) |

Electrical Requirements

| | | |
|--|--|---------------|
| External voltage supply X5 | 18-30 V DC | |
| Current consumption X5 1) | maximum 650 mA (maximum 500 mA for all sensor supplies) typically 60 mA (electronics) | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | 0 | 0 |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 30 mA | maximum 35 mA |

Voltage Monitor External +24 V Supply

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|--------------------|--|

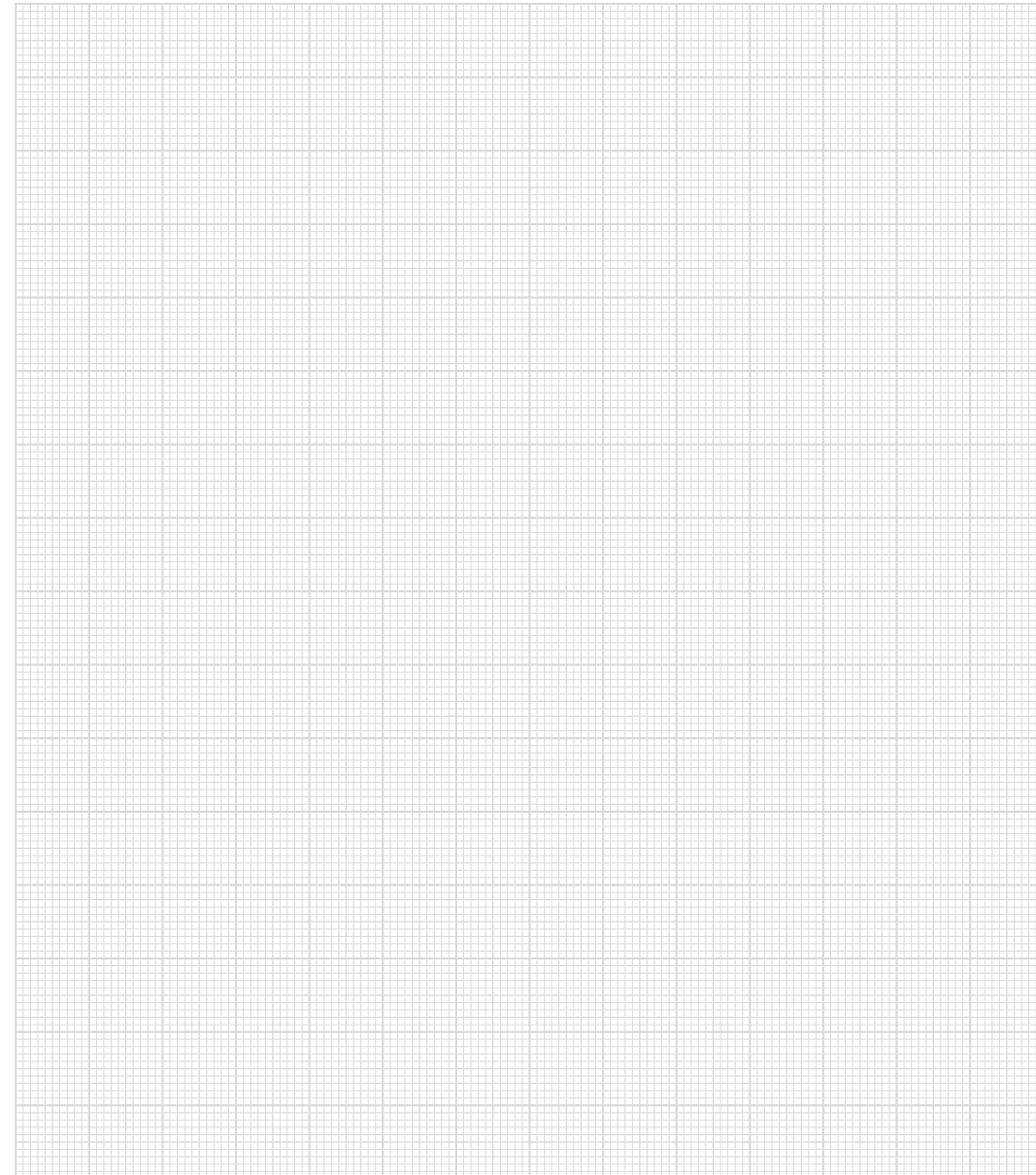
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-009-047 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL in preparation | |
| Approvals | UL, cUL, CE in preparation | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module AI 075



with 6 analog inputs or potentiometer inputs
1 temperature input
1 reference output (10 V)

The S-DIAS AI 075 analog input module has six ± 10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution, whereby the first input can be used as a temperature input (KTY, PT1000). For the potentiometer inputs a separate temperature input (KTY, PT1000) and a 10 V reference output, which can be loaded with a maximum of 25 mA, are available.

Periphery Controller

| | |
|----------------------|---|
| Periphery Controller | yes |
| Functionality | The periphery controller executes the analog conversion, the standardization of the analog inputs and the software filtering of the analog inputs and provides the data on the S-DIAS bus via DPRAM with variable settings for the measuring time points. |

Analog Inputs Specifications ± 10 V or Potentiometer Inputs 0-100 %

| | | |
|-----------------------------|--|-----------------|
| Number of channels | 6 | |
| Measurement range | -10 ... +10 V | 0-100 % |
| Measurement value | -10.000 ... 10.000 | 0 ... 10.000 |
| Inputs | differential input | potential input |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | |
| Conversion time per channel | standard mode: 250 μ s variable sample points: S-DIAS cycle time (min. 250 μ s) | |
| Common mode range | ± 12 V | |
| Input resistance | > 10 M Ω | |

| | | |
|-----------------------|--|---|
| Cable break monitor | yes | |
| Hardware input filter | typically 1 kHz, low pass 3rd order | |
| Input filter software | configurable resp. to deactivate | |
| Measurement precision | ± 0.3 % of maximum measurement value | ± 0.35 % of maximum measurement value |

Reference Output Specifications

| | | |
|--|--|--|
| Number of channels | 1 | |
| Reference voltage | +10 V | |
| Allowed output current | maximum 15 mA (< HW-Version 1.5, $T_{a_{MAX}} = 60$ °C) maximum 25 mA (\geq HW-Version 1.5, $T_{a_{MAX}} = 55$ °C) | |
| Allowable load per potentiometer input | ≤ 2.50 mA (< HW-Version 1.5, $T_{a_{MAX}} = 60$ °C) ≤ 4.17 mA (\geq HW-Version 1.5, $T_{a_{MAX}} = 55$ °C) ≥ 4.0 k Ω (< HW-Version 1.5, $T_{a_{MAX}} = 60$ °C) ≥ 2.4 k Ω (\geq HW-Version 1.5, $T_{a_{MAX}} = 55$ °C) | |
| Allowed capacitive load | maximum 100 nF | |
| Short-circuit protection | yes | |
| Precision | ± 0.5 % | |

Temperature Input Specification

| | | |
|-----------------------------|--|----------------------------|
| Number of channels | 1 | |
| Measurement range | 500.6 ... 3904.8 Ω | 1035.9 ... 4575.3 Ω |
| | PT1000 | KTY10 |
| | -125 ... +850 °C | -50 ... +150 °C |
| Resolution | 0,1 °C | |
| Conversion time per channel | standard mode: 250 μ s variable sample points: S-DIAS cycle time (min. 250 μ s) | |
| Input resistance | 33 k Ω | |
| Short circuit monitor | yes | |
| Cable break monitor | yes | |
| Hardware input filter | typically 1 kHz | low pass 3rd order |
| Input filter software | 10 Hz | |
| Measurement precision | ± 0.5 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|---|--|
| Power supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 55 mA |
| Power supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 40 mA (without load on reference output) | typically 50 mA (without load on reference output) |
| | typically 68 mA (reference output loaded with 6x 4 kΩ) | maximum 80 mA (reference output loaded with 6x 4 kΩ) |
| | typically 85 mA (reference output loaded with 6x 2k4 kΩ) | maximum 100 mA (reference output loaded with 6x 2k4 kΩ) |

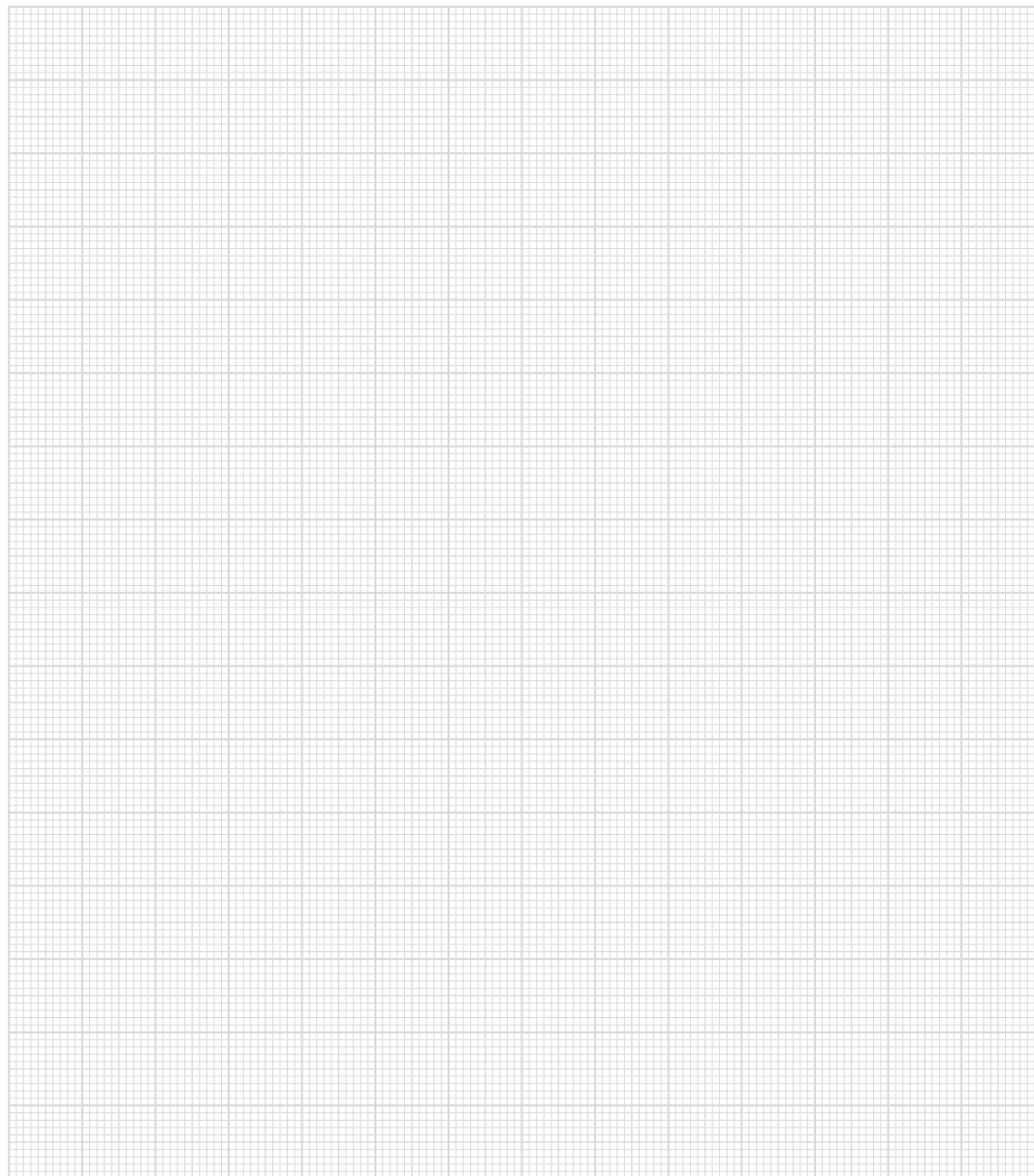
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-009-075 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module

AI 084



with 8 current inputs

The S-DIAS AI 084 analog input module has eight current inputs with a 16-bit resolution.

The module supports the measurement ranges 0-20 mA and 4-20 mA.

Analog Current Input Specifications

| | | |
|---|---|---|
| Number of channels | 8 | |
| Measurement range | 0-20 mA | 4-20 mA |
| Measurement value | 0-20000 | 4000-20000 |
| Input type | differential input | |
| Current resolution | 16-bit (circa 0.3 μ A/LSB) | |
| Conversion time for all channels | 1 ms | |
| Common mode range | ± 10 V | |
| Input resistance | typically 50 Ω | |
| Hardware input filter | typically 1 kHz low pass 3rd order system | |
| Input filter | configurable | |
| Cable break monitor | no | yes, adjustable via software between 0-4 mA (Default: 3 mA) |
| Short circuit monitor | 20.25 mA | 20.25 mA |
| Basic precision incl. calibration error, linearity and noise at 25 °C | ± 0.30 % of maximum measurement value | |
| Temperature drift 0-60 °C | ± 0.20 % of maximum measurement value | |
| Total measurement precision (0-60 °C) | $\pm 0,50$ % of maximum measurement value | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 30 mA | maximum 35 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-009-084 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Normung | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Analog Input Module AI 0812



with 8 analog inputs

The S-DIAS analog input module AI 0812 has eight PT1000/KTY inputs with 16-bit resolution.

As temperature sensors PT1000, KTY10-62, KTY11-62, KTY81-110, KTY81-120, KTY81-150, KTY81-121, and KTY81-122 are supported.

Analog Input Specifications Resistance/Temperature

| | | |
|--|--|--------------------|
| Number of inputs | 8 | |
| Measurement range | see the following measurement range table | |
| Resolution | 0.1°C or 0.1 Ω | |
| Conversion time for all channels | 1 ms | |
| Input resistance | > 30 KΩ | |
| Typical input current | < 0.33 ms | |
| Input filter hardware | typically 1 kHz | Low pass 3rd order |
| Input filter software | configurable (10, 25, 50, 100 Hz, or switched off) | |
| Measurement precision | 0.75 % of maximum measurement value | |
| Potential isolation S-DIAS bus to inputs | no | |

Measurement Range of Temperature Inputs

| Type | Temperature range | Resistance range | Measurement value |
|-------------------------------------|-------------------|------------------|-------------------|
| Pt1000 | -150 ... +850 °C | 397.2-3904.8 Ω | -1500 ... +8500 |
| KTY10-62 KTY11-62 | -50 ... +150 °C | 1035.9-4575.3 Ω | -500 ... +1500 |
| KTY81-110 KTY81-120 KTY81-150 | -55 ... +150 °C | 490.0-2211.0 Ω | -550 ... +1500 |
| KTY81-121 | -55 ... +150 °C | 485.1-2189.1 Ω | -550 ... +1500 |
| KTY81-122 | -55 ... +150 °C | 494.9-2233.0 Ω | -550 ... +1500 |

Electrical Requirements

| | | | |
|--|--|--|--|
| Voltage supply from S-DIAS bus | +24 V | | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 24 mA at +18 V typically 22 mA at +24 V typically 20 mA at +30 V | maximum 27 mA at +18 V maximum 24 mA at +24 V maximum 23 mA at +30 V | |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-0812 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Normung | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Analog Input Module

AI 088



with 8 thermal element inputs
2 KTY temperature sensors

The S-DIAS AI 088 analog input module has eight thermal element inputs for all conventional thermal element types. Two inputs for KTY temperature sensors for coupling compensation are also provided and additional temperature sensor for thermocouple compensation are integrated into the module.

Thermal Element Input Specifications

| | | |
|---|---|--------------------------------|
| Number of channels | 8 | |
| Measurement range | see the following table, Measurement Ranges Thermo Elements | |
| Converter resolution | 16-bit | |
| Conversion time per channel | 1 ms | |
| Common mode range | ±10 V | |
| Input resistance | 2 MΩ | |
| Cable break monitor | yes | |
| Measurement current for cable brake monitor | typically 3 μA | |
| Over voltage protection | 265 V AC | |
| Input filter Hardware | typically 2 Hz | low pass 3 rd order |
| Input filter Software | 50 Hz/60 Hz | |
| Measurement precision | ±0.7 % of maximum measurement value | |

Measurement Ranges Thermo Elements

| Type | Thermocouple | Measurement range | Measurement value | Measurement error |
|------|--------------|------------------------------------|-------------------|-------------------|
| J | Fe-CuNi | -10 ... +690 °C (-0.501-38.512 mV) | -100-6900 | 0.0078 %/Ω |
| K | NiCr-Ni | -40 ... +940 °C (-1.527-38.918 mV) | -400-9400 | 0.0077 %/Ω |
| T | Cu-CuNi | -40 ... +400 °C (-1.475-20.872 mV) | -400-4000 | 0.0144 %/Ω |
| E | NiCr-CuNi | 0 ... +520 °C (0-38.624 mV) | 0-5200 | 0.0078 %/Ω |
| N | NiCrSi-NiSi | -80 ... 1080 °C (-1.972-39.326 mV) | -800-10800 | 0.0076 %/Ω |
| S | Pt10Rh-Pt | -50 ... 1760 °C (-0.236-18.609 mV) | -500-17600 | 0.0161 %/Ω |
| R | Pt13Rh-Pt | -50 ... 1760 °C (-0.226-21.003 mV) | -500-17600 | 0.0142 %/Ω |
| B | Pt30Rh-Pt6Rh | 0 ... +1820 °C (0-13.820 mV) | 0-18200 | 0.0217 %/Ω |
| L | Fe-CuNi | 0 ... +680 °C (0-38.487 mV) | 0-6800 | 0.0078 %/Ω |
| U | Cu-CuNi | 0 ... +590 °C (0-33.606 mV) | 0-5900 | 0.0089 %/Ω |

Voltage Measurement Range

| Type | Voltage range | Measurement value |
|------|---------------|-------------------|
| 1 | 0-40 mV | 0-40000 |

Temperature Sensor Input Spec. for Thermo Coupling Compensation

| | | |
|-----------------------------|-------------------------------------|--------------------------------|
| Number of channels | 2 | |
| Sensor type | KTY 10-62 or KTY 11-62 | |
| Measurement range | -20 ... +80 °C | |
| Measurement value | -200 ... 800 | |
| Converter resolution | 16-bit | |
| Conversion time per channel | 1 ms | |
| Sensor current | typically 0.3 mA at 25 °C | |
| Cable break monitor | yes | |
| Short circuit monitor | yes | |
| Input filter | typically 2 Hz | low pass 3 rd order |
| Measurement precision | ±0,7 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|-----------------|----------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 62 mA | maximum 68 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 80 mA | maximum 102 mA |

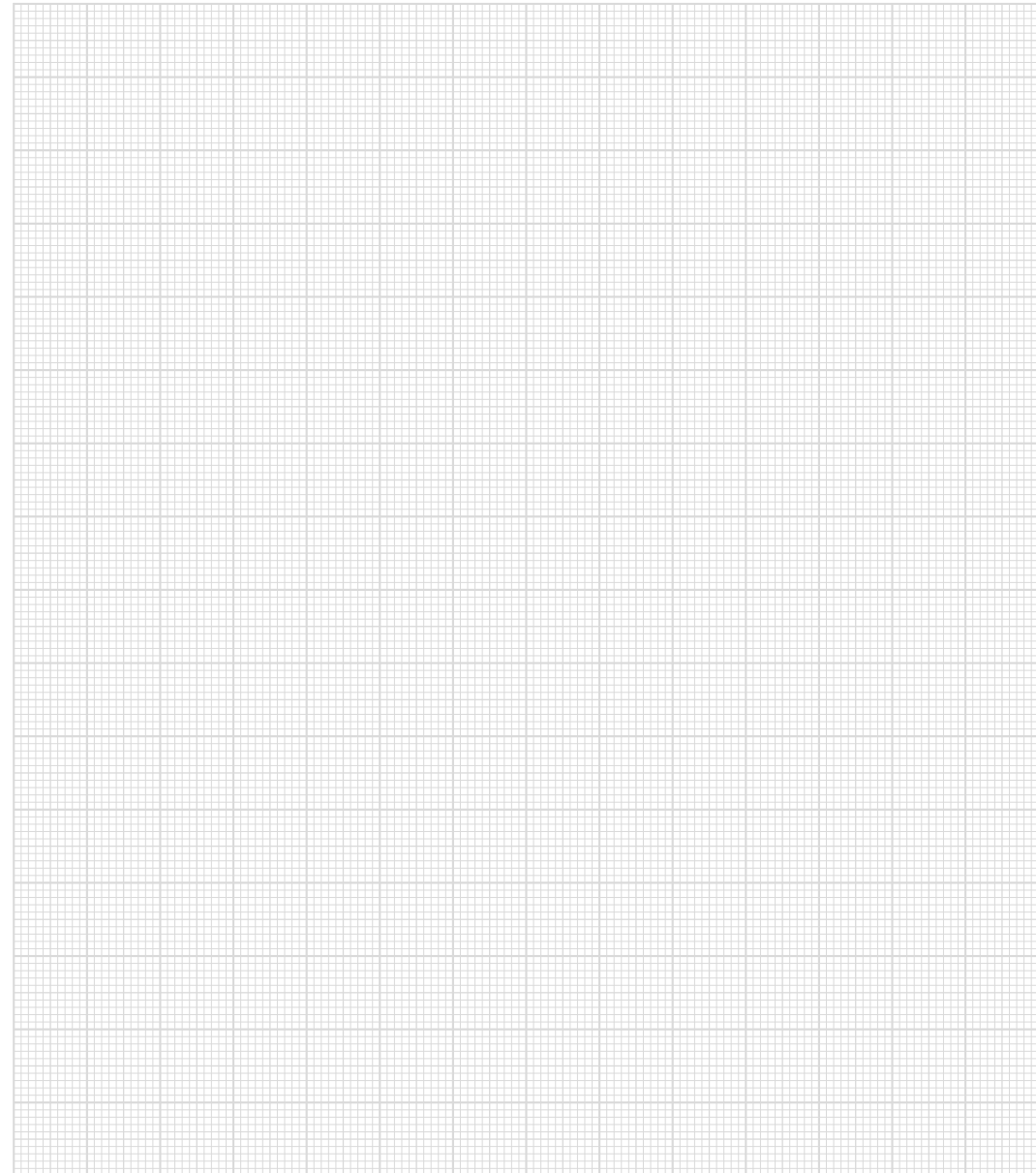
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-088 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Input Module AI 088-1



with 8 thermal element inputs
2 KTY temperature sensors

The S-DIAS AI 088-1 analog input module has eight thermal element inputs for all conventional thermal element types. Two inputs for KTY temperature sensors for coupling compensation are also provided and additional temperature sensor for thermocouple compensation are integrated into the module.

Extended measurement range compared to AI 088.

Thermal Element Input Specifications

| | | |
|---|---|--------------------------------|
| Number of channels | 8 | |
| Measurement range | see the following table, Measurement Ranges Thermo Elements | |
| Converter resolution | 16-bit | |
| Conversion time per channel | 1 ms | |
| Common mode range | ±10 V | |
| Input resistance | 2 MΩ | |
| Cable break monitor | yes | |
| Measurement current for cable brake monitor | typically 3 μA | |
| Over voltage protection | 265 V AC | |
| Input filter Hardware | typically 2 Hz | low pass 3 rd order |
| Input filter Software | 50 Hz/60 Hz | |
| Measurement precision | ±0.7 % of maximum measurement value | |

Measurement Ranges Thermo Elements

| Type | Thermocouple | Measurement range | Measurement value | Measurement error |
|------|--------------|-------------------------------------|-------------------|-------------------|
| J | Fe-CuNi | -10 ... +850 °C (-0.501-48.715 mV) | -100-8500 | 0.0062 %/Ω |
| K | NiCr-Ni | -40 ... +1200 °C (-1.527-48.838 mV) | -400-12000 | 0.0061 %/Ω |
| T | Cu-CuNi | -40 ... +400 °C (-1.475-20.872 mV) | -400-4000 | 0.0144 %/Ω |
| E | NiCr-CuNi | 0 ... +640 °C (0-48.313 mV) | 0-6400 | 0.0062 %/Ω |
| N | NiCrSi-NiSi | -80 ... +1300 °C (-1.972-47.513 mV) | -800-13000 | 0.0063 %/Ω |
| S | Pt10Rh-Pt | -50 ... +1768 °C (-0.236-18.693 mV) | -500-17680 | 0.0160 %/Ω |
| R | Pt13Rh-Pt | -50 ... +1768 °C (-0.226-21.101 mV) | -500-17680 | 0.0142 %/Ω |
| B | Pt30Rh-Pt6Rh | 0 ... +1820 °C (0-13.820 mV) | 0-18200 | 0.0217 %/Ω |
| L | Fe-CuNi | 0 ... +840 °C (0-48.943 mV) | 0-8400 | 0.0061 %/Ω |
| U | Cu-CuNi | 0 ... +600 °C (0-34.309 mV) | 0-6000 | 0.0087 %/Ω |

Voltage Measurement Range

| Type | Voltage range | Measurement value |
|------|---------------|-------------------|
| 1 | 0-50 mV | 0-50000 |

Temperature Sensor Input Spec. for Thermo Coupling Compensation

| | | |
|-----------------------------|-------------------------------------|--------------------------------|
| Number of channels | 2 | |
| Sensor type | KTY 10-62 or KTY 11-62 | |
| Measurement range | -20 ... +80 °C | |
| Measurement value | -200 ... 800 | |
| Converter resolution | 16-bit | |
| Conversion time per channel | 1 ms | |
| Sensor current | typically 0.3 mA at 25 °C | |
| Cable break monitor | yes | |
| Short circuit monitor | yes | |
| Input filter | typically 2 Hz | low pass 3 rd order |
| Measurement precision | ±0,7 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 62 mA | maximum 68 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 75 mA | maximum 90 mA |

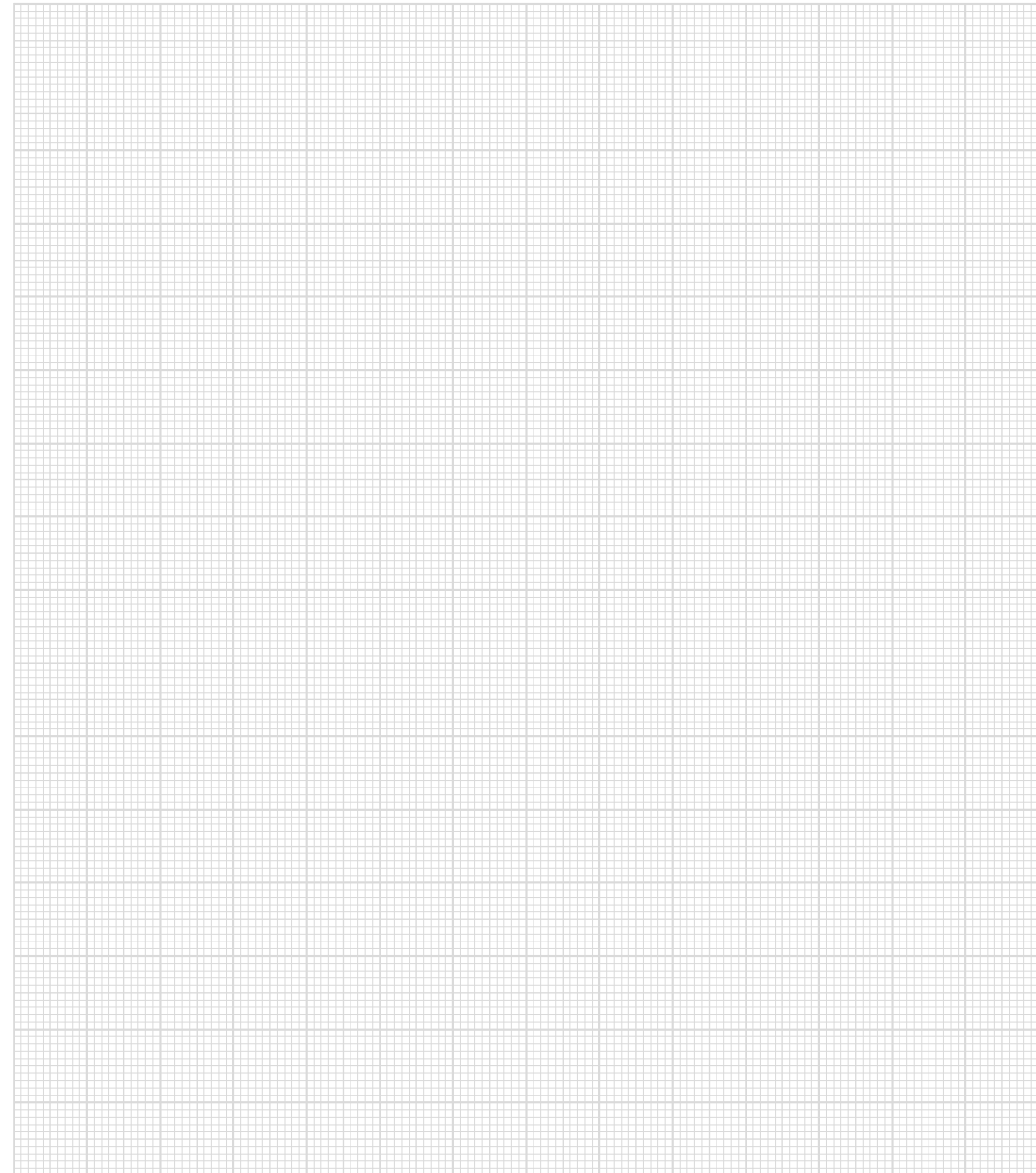
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-009-088-1 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Output Module

AO 026



with 2 outputs (voltage/current switchable)

The S-DIAS AO 026 analog output module has two galvanically isolated outputs with a resolution of 16 bits, which can be switched between voltage and current outputs. The supply of the analog outputs is realized with an external +24 V supply.

Analog Output Voltage Specifications

| | | |
|------------------------------|--|--------------------------|
| Number of channels | 2 | |
| Output range | -10 ... +10 V | 0 ... +10 V |
| Output value | -30,000 ... +30,000 | 0 ... +60,000 |
| Output range over range | -10.8 ... +10.8 V | 0 ... +10.8 V |
| Output value over range | -32,400 ... +32,400 | 0 ... +64,800 |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | 16-bit (ca. 0.15 mV/LSB) |
| Refresh time of all channels | ≥ 250 μs (depending on the cyclic time) | |
| Output voltage capacity | maximum 2 mA | |
| Allowable capacitive load | maximum 100 nF | |
| Short circuit protection | yes | |
| Settling time | 200 μs typical for C < 100 nF (99.9 % of the end value) | |
| Galvanic isolation | yes (500 V) | |
| Output precision | ±0.04 % of maximum output value | |

Analog Output Current Specifications

| | | |
|------------------------------|---|---------------|
| Number of channels | 2 | |
| Output range | 0-20 mA | 4-20 mA |
| Output value | 0-60,000 | 12,000-60,000 |
| Output range over range | 0-20.2 mA | 3.8-20.2 mA |
| Output value over range | 0-60,600 | 11,400-60,600 |
| Resolution current | 16-bit (ca. 0.3 μA/LSB) | |
| Refresh time of all channels | ≥ 250 μs (depending on the cyclic time) | |
| Settling time | 200 μs typical for L < 0.5 mH at 50 Ω 200 μs typical for L < 5 mH at 500 Ω | |
| Load | maximum 500 Ω | |
| Allowed output inductivity | maximum 0.5 mH at 50 Ω maximum 5 mH at 500 Ω | |
| Cable break monitor | yes | |
| Galvanic isolation | yes (500 V) | |
| Output precision | ±0.17 % of maximum output value | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| External +24 V supply | +18-30 V DC | |
| Current consumption external (+24 V supply) without load of the analog outputs | typically 45 mA | maximum 55 mA |
| Current consumption external (+24 V supply) with load of the analog outputs | typically 82 mA | maximum 95 mA |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 60 mA | maximum 65 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | - | - |

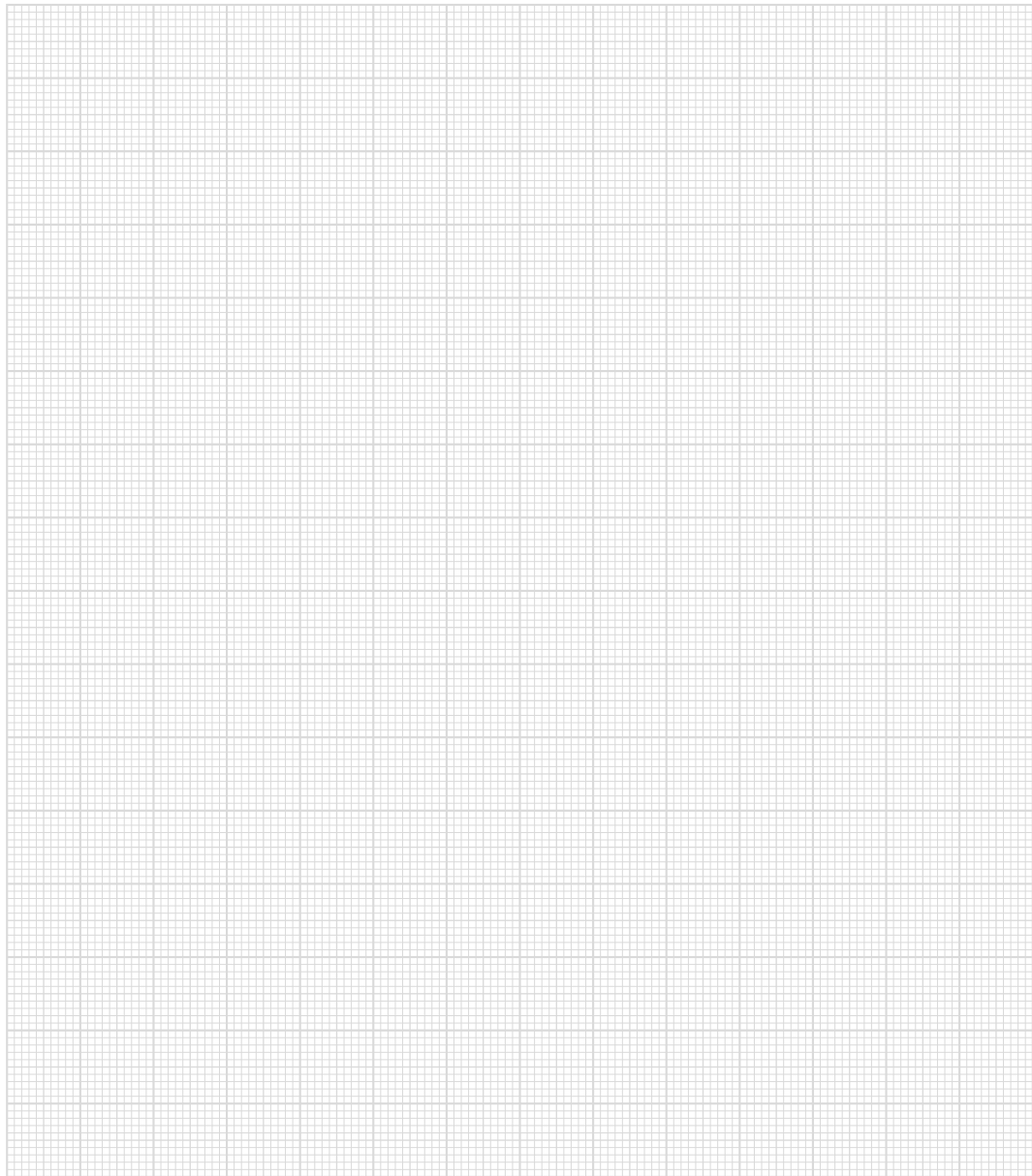
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-010-026 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL (in preparation) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Output Module AO 046



with 4 outputs (voltage/current switchable)

The S-DIAS AO 046 analog output module has four ± 10.8 V or 0-21.6 mA analog outputs with a resolution of 16 bits. The analog outputs are powered by an external +24 V supply. The analog output system is galvanically separated from the potential of the S-DIAS bus.

Analog Output Voltage Specifications

| | | |
|------------------------------|---|--------------------------|
| Number of channels | 4 | |
| Output range | -10 ... +10 V | 0 ... +10 V |
| Output value | -30,000 ... +30,000 | 0 ... +60,000 |
| Output range over range | -10.8 ... +10.8 V | 0 ... +10.8 V |
| Output value over range | -32,400 ... +32,400 | 0 ... +64,800 |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | 16-bit (ca. 0.15 mV/LSB) |
| Refresh time of all channels | minimum 100 μ s (corresponds to the S-DIAS cycle time) | |
| Output voltage capacity | maximum 2 mA | |
| Allowable capacitive load | maximum 100 nF | |
| Short circuit protection | yes | |
| Settling time | 200 μ s typical for C < 100 nF (99.9 % of the end value) | |
| Galvanic isolation | yes (500 V) | |
| Output precision | ± 0.04 % of maximum output value | |

Output Accuracy Analog Outputs Voltage

| | |
|--|--|
| Basic accuracy incl. calibration error and noise 25 °C | 0.015 % |
| Temperature drift 20-40 °C 0-55 °C | 0.008 % 0.015 % |
| Linearity | 0.010 % |
| Crosstalk | < 0.001 % |
| Total error 20-40 °C 0-55 °C | ± 0.035 % (± 3.5 mV) ± 0.045 % (± 4.5 mV) |

Analog Output Current Specifications

| | | |
|------------------------------|---|---------------|
| Number of channels | 4 | |
| Output range | 0-20 mA | 4-20 mA |
| Output value | 0-60,000 | 12,000-60,000 |
| Output range over range | 0-21.6 mA | 3.8-21.6 mA |
| Output value over range | 0-64,800 | 11,400-64,800 |
| Resolution current | 16-bit (ca. 0.3 μ A/LSB) | |
| Refresh time of all channels | minimum 100 μ s (corresponds to the S-DIAS cycle time) | |
| Settling time | 200 μ s typical for L < 0.5 mH at 50 Ω 200 μ s typical for L < 5 mH at 500 Ω | |
| Load | maximum 500 Ω | |
| Allowed output inductivity | maximum 0.5 mH at 50 Ω maximum 5 mH at 500 Ω | |
| Cable break monitor | yes | |
| Galvanic isolation | yes (500 V) | |
| Output precision | ± 0.17 % of maximum output value | |

Output Accuracy Analog Outputs Current

| | |
|--|--|
| Basic accuracy incl. calibration error and noise 25 °C | 0.045 % |
| Temperature drift 20-40 °C 0-55 °C | 0.028 % 0.055 % |
| Linearity | 0.035 % |
| Crosstalk | < 0.001 % |
| Total error 20-40 °C 0-55 °C | ± 0.140 % (± 28 μ A) ± 0.170 % (± 34 μ A) |

Electrical Requirements

| | | |
|---|-----------------|----------------|
| External +24 V supply | +18-30 V DC | |
| Current consumption of the +24 V supply without load on the analog outputs | typically 34 mA | maximum 44 mA |
| Current consumption of the +24 V supply with a load on the analog outputs per 20 mA | typically 92 mA | maximum 122 mA |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | 0 | 0 |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 22 mA | maximum 26 mA |

Voltage Monitoring External +24 V Supply

| | |
|----------------------|---|
| Supply voltage +24 V | query of the supply voltage with hysteresis: voltage > 18,0 V => LED on, ExternVoltageOk=1 voltage < 16,0 V => LED off, ExternVoltageOk=0 (DC OK-LED shines green) |
|----------------------|---|

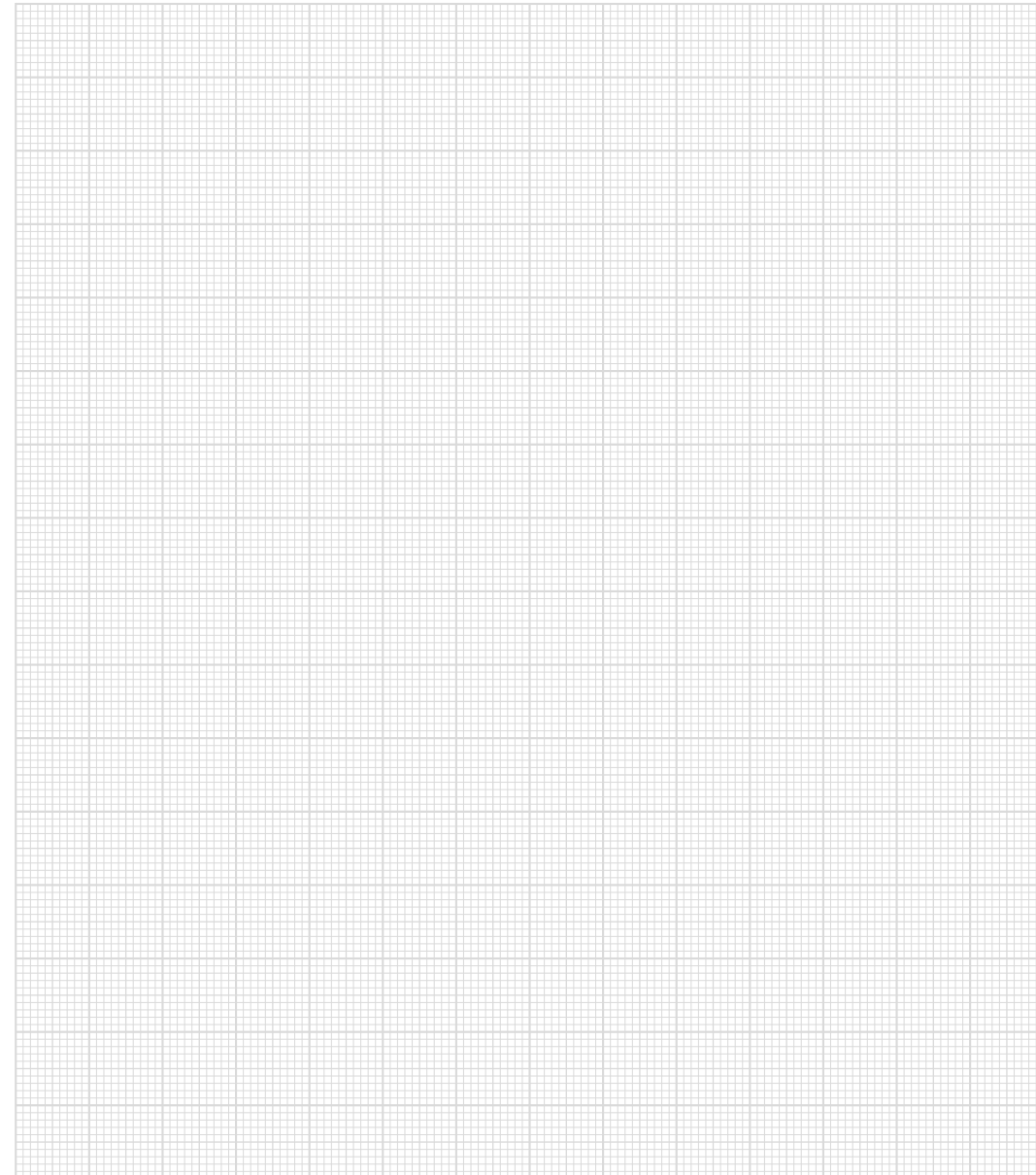
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-010-046 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL (in preparation) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Output Module

AO 081



with 8 analog outputs

The S-DIAS AO 081 analog output module has eight ± 10 V analog outputs with a resolution of 12 bits.

Analog Outputs Specification

| | |
|-------------------------------|---|
| Number of channels | 8 |
| Output range | -10 ... +10 V |
| Output value | -10.000 ... +10.000 |
| Resolution | 12-bit (ca. 5 mV/LSB) |
| Refresh time for all channels | 1 ms |
| Output voltage capacity | > 5 kOhm |
| Allowable capacitive load | maximum 100 nF |
| Short-circuit protection | yes (1 min.) |
| Settling time | 50 μ s (63 % of the end value) 100 μ s (86 % of the end value) 250 μ s (99 % the end value) |
| Analog precision | $\pm 0,5$ % of maximum output value |

Electrical Requirements

| | | |
|---|--|--|
| External +24 V supply | +18-30 V DC | |
| Current consumption of the +24 V supply without load on the analog outputs | typically 36 mA at +18 V typically 31 mA at +24 V typically 28 mA at +30 V | maximum 40 mA at +18 V maximum 35 mA at +24 V maximum 32 mA at +30 V |
| Current consumption of the +24 V supply with maximum load on the analog outputs | typically 54 mA at +18 V typically 44 mA at +24 V typically 39 mA at +30 V | maximum 60 mA at +18 V maximum 49 mA at +24 V maximum 44 mA at +30 V |
| Current consumption of +24 V during short-circuit | typically an additional 25 mA per analog output | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 55 mA | maximum 60 mA |

Voltage Monitor External +24 V Supply

| | |
|----------------------|--|
| +24 V supply voltage | Supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-010-081 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Analog Mixed Module AM 221



with 2 analog outputs
2 analog inputs/potentiometer inputs
1 reference output

The S-DIAS AM 221 analog mixed module has two ± 10 V analog outputs with a resolution of 12 bits and four ± 10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution. For the potentiometer inputs a 10 V reference is provided that can be loaded with a maximum of 8.3 mA.

Analog Input Specifications ± 10 V or Potentiometer Inputs 0-100 %

| | | |
|----------------------------------|--|---|
| Number of channels | 2 | |
| Measurement range | -10 ... +10 V | 0-100 % |
| Measurement value | -10,000 ... +10,000 or -30,000 ... +30,000 (at full range) | 0 ... 10,000 or 0 ... 30,000 (at full range) |
| Input type | differential input | potential input |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | |
| Conversion time for all channels | depending on the selected timing Speed mode: 200 μ s Time offset mode: corresponds to the S-DIAS cyclic time | |
| Common mode range | ± 12 V | |
| Input resistance | > 10 M Ω | |
| Cable break monitor | yes | |
| Input filter hardware | typically 1 kHz, low pass 3rd order system | |
| Input filter software | configurable, low pass 1st order system | |
| Analog measurement precision | ± 0.3 % of maximum measurement value | ± 0.35 % of maximum measurement value |

Reference Output Specifications

| | |
|--|--|
| Number of channels | 1 |
| Reference voltage | +10 V |
| Allowable output current | maximum 5 mA (< HW-Version 2.5) maximum 8.3 mA (\geq HW-Version 2.5) |
| Allowable load per potentiometer input | ≤ 2.50 mA (< HW-Version 2.5) ≤ 4.17 mA (\geq HW-Version 2.5) ≥ 4.0 k Ω (< HW-Version 2.5) ≥ 2.4 k Ω (\geq HW-Version 2.5) |
| Short-circuit protection | yes (1 min.) |
| Accuracy | ± 0.5 % |

Analog Output Specifications ± 10 V

| | |
|-------------------------------|--|
| Number of channels | 2 |
| Output range | -10 ... +10 V |
| Output value | -10,000 ... +10,000 |
| Resolution | 12-bit (ca. 5 mV/LSB) |
| Refresh time for all channels | ≥ 500 μ s (corresponds to the S-DIAS cyclic time) |
| Output voltage capacity | > 5 k Ω m |
| Allowable capacitive load | maximum 100 nF |
| Short-circuit protection | yes |
| Settling time | 50 μ s (63 % of the end value) 100 μ s (86 % of the end value) 250 μ s (99 % of the end value) |
| Output precision | ± 0.5 % of maximum output value |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 32 mA (without load on reference output and analog outputs) | typically 40 mA (without load on reference output and analog outputs) |
| | typically 40 mA (reference output loaded with 4x 4 k Ω and maximum load on the analog outputs) | maximum 55 mA (reference output loaded with 4x 4 k Ω and maximum load on the analog outputs) |
| | typically 45 mA (reference output loaded with 4x 2k4 k Ω and maximum load on the analog outputs) | maximum 60 mA (reference output loaded with 4x 2k4 k Ω and maximum load on the analog outputs) |
| Short-circuit condition | typically an additional 30 mA per channel on a +24 V supply | |

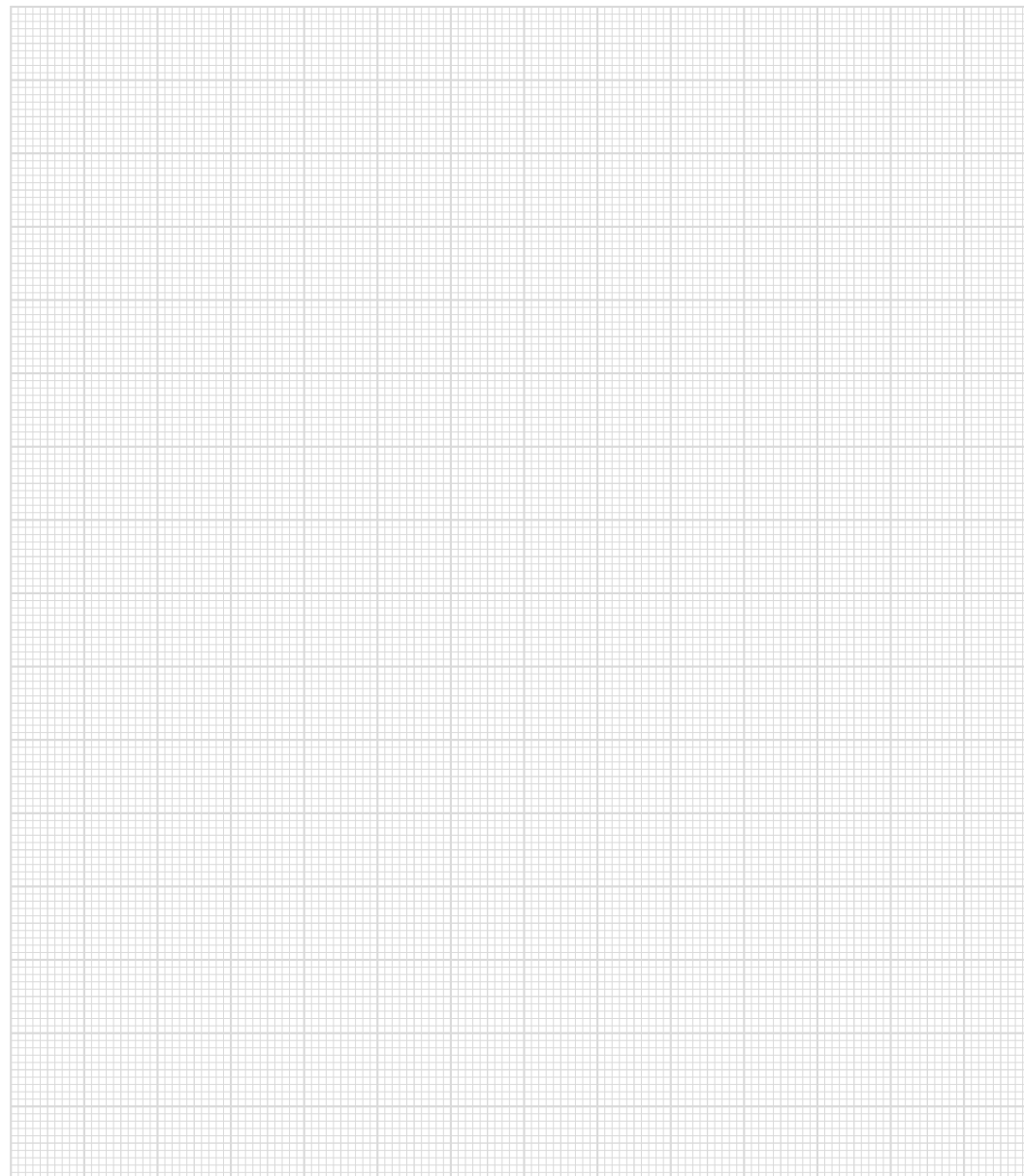
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-017-221 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Mixed Module AM 222



with 2 current inputs
2 current outputs

The S-DIAS AM 222 analog mixed module has two current inputs, 0-20 mA and 4-20 mA respectively, each with a 16-bit resolution as well as two current outputs, 0-20 mA and 4-20 mA respectively, with a 12-bit resolution. The voltage supply for the current inputs and outputs are monitored for under voltage.

Analog Input Specifications

| | | |
|---|--|--------------|
| Number of channels | 2 | |
| Measurement range | 0-20 mA | 4-20 mA |
| Measurement value | 0-20,000 | 4,000-20,000 |
| Input type | differential input | |
| Current resolution | 16-bit (ca. 0.3 μ A/LSB) | |
| Conversion time for all channels | 1 ms | |
| Common mode range | ± 10 V | |
| Load | typically 50 Ω | |
| Input filter hardware | typically 1 kHz, low pass 3rd order system | |
| Input filter | configurable | |
| Cable break monitor | no | yes |
| Short circuit monitor | no | yes |
| Basic precision incl. calibration error, linearity and noise at 25 °C | ± 0.30 % of maximum measurement value | |
| Temperature drift 0-60 °C | ± 0.20 % of maximum measurement value | |
| Total measurement precision (0-60 °C) | $\pm 0,50$ % of maximum measurement value | |

Analog Output Specifications

| | | |
|---|---|--------------|
| Number of channels | 2 | |
| Output range | 0-20 mA | 4-20 mA |
| Output value | 0-20,000 | 4,000-20,000 |
| Current resolution | 12-bit (ca. 5 μ A/LSB) | |
| Refresh time for all channels | 1 ms | |
| Settling time | 50 μ s + load * capacitive load (63 % of the end value) 100 μ s + 2*load * capacitive load (86 % of the end value) 250 μ s + 5*load * capacitive load (99 % of the end value) | |
| Load | maximum 500 Ω | |
| Allowable output capacity | 1 μ F at 50 Ω load | |
| Cable break monitor | no | |
| Basic precision incl. calibration error, linearity and noise at 25 °C | ± 0.30 % of maximum output value | |
| Temperature drift 0-60 °C | ± 0.20 % of maximum output value | |
| Total output precision (0-60 °C) | $\pm 0,50$ % of maximum output value | |

Analog In and Output Voltage Supply Specifications

| | |
|---------------------|---------------|
| External supply | +18-30 V |
| Current consumption | maximum 70 mA |

Voltage Monitor External +24 V Supply

| | |
|----------------------|--|
| +24 V supply voltage | Supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

Electrical Requirements

| | | |
|---|--|--|
| External +24 V supply | +18-30 V DC | |
| Current consumption of the +24 V supply without load on the analog outputs | typically 27 mA at +18 V typically 24 mA at +24 V typically 23 mA at +30 V | maximum 31 mA at +18 V maximum 28 mA at +24 V maximum 27 mA at +30 V |
| Current consumption of the +24 V supply with maximum load on the analog outputs | typically 63 mA at +18 V typically 51 mA at +24 V typically 45 mA at +30 V | maximum 70 mA at +18 V maximum 57 mA at +24 V maximum 50 mA at +30 V |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 55 mA | maximum 62 mA |

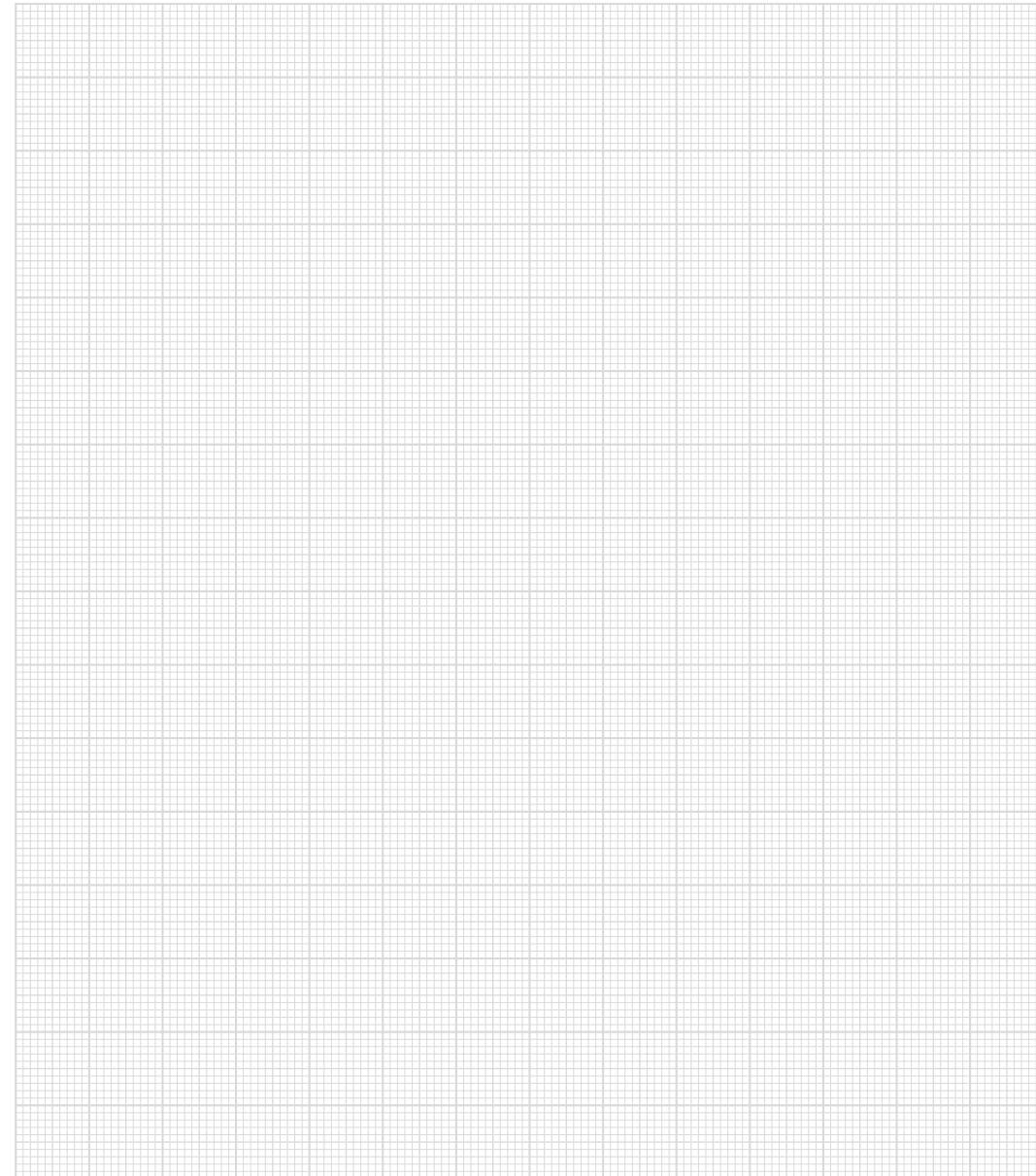
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-017-222 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Analog Mixed Module

AM 441



with 4 analog outputs
4 analog inputs or potentiometer inputs
1 reference output

The S-DIAS AM 441 analog mixed module has four ± 10 V analog outputs with a resolution of 12 bits and four ± 10 V analog inputs or 0-100 % potentiometer inputs with a 16-bit resolution. For the potentiometer inputs a 10 V reference is provided that can be loaded with a maximum of 16.7 mA.

Analog Input Specifications ± 10 V or Potentiometer Inputs 0-100 %

| | | |
|----------------------------------|--|---|
| Number of channels | 4 | |
| Measurement range | -10 ... +10 V | 0-100 % |
| Measurement value | -10,000 ... +10,000 or -30,000 ... +30,000 (at full range) | 0 ... 10,000 or 0 ... 30,000 (at full range) |
| Input type | differential input | potential input |
| Resolution | 16-bit (ca. 0.3 mV/LSB) | |
| Conversion time for all channels | depending on the selected timing Speed mode: 200 μ s Time offset mode: corresponds to the S-DIAS cyclic time | |
| Common mode range | ± 12 V | |
| Input resistance | > 10 M Ω | |
| Cable break monitor | yes | |
| Input filter hardware | typically 1 kHz, low pass 3rd order system | |
| Input filter software | configurable, low pass 1st order system | |
| Measurement precision | ± 0.3 % of maximum measurement value | ± 0.35 % of maximum measurement value |

Reference Output Specifications

| | |
|--|--|
| Number of channels | 1 |
| Reference voltage | +10 V |
| Allowable output current | maximum 10.0 mA (< HW-Version 3.5) maximum 16.7 mA (\geq HW-Version 3.5) |
| Allowable load per potentiometer input | ≤ 2.50 mA (< HW-Version 3.5) ≤ 4.17 mA (\geq HW-Version 3.5) ≥ 4.0 k Ω (< HW-Version 3.5) ≥ 2.4 k Ω (\geq HW-Version 3.5) |
| Allowable capacitive load | maximum 100 nF |
| Short-circuit protection | yes |
| Accuracy | ± 0.5 % |

Analog Output Specifications

| | |
|-------------------------------|--|
| Number of channels | 4 |
| Output range | -10 V ... +10 V |
| Output value | -10,000 ... +10,000 |
| Resolution | 12-bit (ca. 5 mV/LSB) |
| Refresh time for all channels | ≥ 500 μ s (corresponds to the S-DIAS cyclic time) |
| Output voltage capacity | > 5 k Ω m |
| Allowable capacitive load | maximum 100 nF |
| Short-circuit protection | yes |
| Settling time | 50 μ s (63 % of the end value) 100 μ s (86 % of the end value) 250 μ s (99 % of the end value) |
| Output precision | 0.5 % of maximum output value |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 40 mA (without load on reference output and analog outputs) | typically 50 mA (without load on reference output and analog outputs) |
| | typically 60 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) | maximum 80 mA (reference output loaded with 4x 4 kΩ and maximum load on the analog outputs) |
| | typically 70 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs) | maximum 95 mA (reference output loaded with 4x 2k4 kΩ and maximum load on the analog outputs) |
| Short-circuit condition | typically an additional 30 mA per channel on a +24 V supply | |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-017-441 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes

S-DIAS Analog Mixed Module

AM 442



with 4 current inputs
4 current outputs

The S-DIAS AM 442 analog mixed module has four current inputs, 0-20 mA and 4-20 mA respectively, each with a 16-bit resolution as well as two current outputs, 0-20 mA and 4-20 mA respectively, with a 12-bit resolution. The voltage supply for the current inputs and outputs are monitored for under voltage.

Analog Input Specifications

| | | |
|---|--|--------------|
| Number of channels | 4 | |
| Measurement range | 0-20 mA | 4-20 mA |
| Measurement value | 0-20,000 | 4,000-20,000 |
| Input type | differential input | |
| Current resolution | 16-bit (ca. 0.3 μ A/LSB) | |
| Conversion time for all channels | 1 ms | |
| Common mode range | ± 10 V | |
| Load | typically 50 Ω | |
| Input filter hardware | typically 1 kHz, low pass 3rd order system | |
| Input filter | configurable | |
| Cable break monitor | no | yes |
| Short circuit monitor | no | yes |
| Basic precision incl. calibration error, linearity and noise at 25 °C | ± 0.30 % of maximum measurement value | |
| Temperature drift 0-60 °C | ± 0.20 % of maximum measurement value | |
| Total measurement precision (0-60 °C) | $\pm 0,50$ % of maximum measurement value | |

Analog Output Specifications

| | | |
|---|---|--------------|
| Number of channels | 4 | |
| Output range | 0-20 mA | 4-20 mA |
| Output value | 0-20,000 | 4,000-20,000 |
| Current resolution | 12-bit (ca. 5 μ A/LSB) | |
| Refresh time for all channels | 1 ms | |
| Settling time | 50 μ s + load * capacitive load (63 % of the end value) 100 μ s + 2*load * capacitive load (86 % of the end value) 250 μ s + 5*load * capacitive load (99 % of the end value) | |
| Load | maximum 500 Ω | |
| Allowable output capacity | 1 μ F at 50 Ω load | |
| Cable break monitor | no | |
| Basic precision incl. calibration error, linearity and noise at 25 °C | ± 0.30 % of maximum output value | |
| Temperature drift 0-60 °C | ± 0.20 % of maximum output value | |
| Total output precision (0-60 °C) | $\pm 0,50$ % of maximum output value | |

Analog In and Output Voltage Supply Specifications

| | |
|---------------------|---------------|
| External supply | +18-30 V |
| Current consumption | maximum 70 mA |

Voltage Monitor External +24 V Supply

| | |
|----------------------|--|
| +24 V supply voltage | supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

Electrical Requirements

| | | |
|---|--|---|
| External +24 V supply | +18-30 V DC | |
| Current consumption of the +24 V supply without load on the analog outputs | typically 27 mA at +18 V typically 24 mA at +24 V typically 23 mA at +30 V | maximum 31 mA at +18 V maximum 28 mA at +24 V maximum 27 mA at +30 V |
| Current consumption of the +24 V supply with maximum load on the analog outputs | typically 99 mA at +18 V typically 78 mA at +24 V typically 66 mA at +30 V | maximum 110 mA at +18 V maximum 87 mA at +24 V maximum 73 mA at +30 V |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 55 mA | maximum 62 mA |

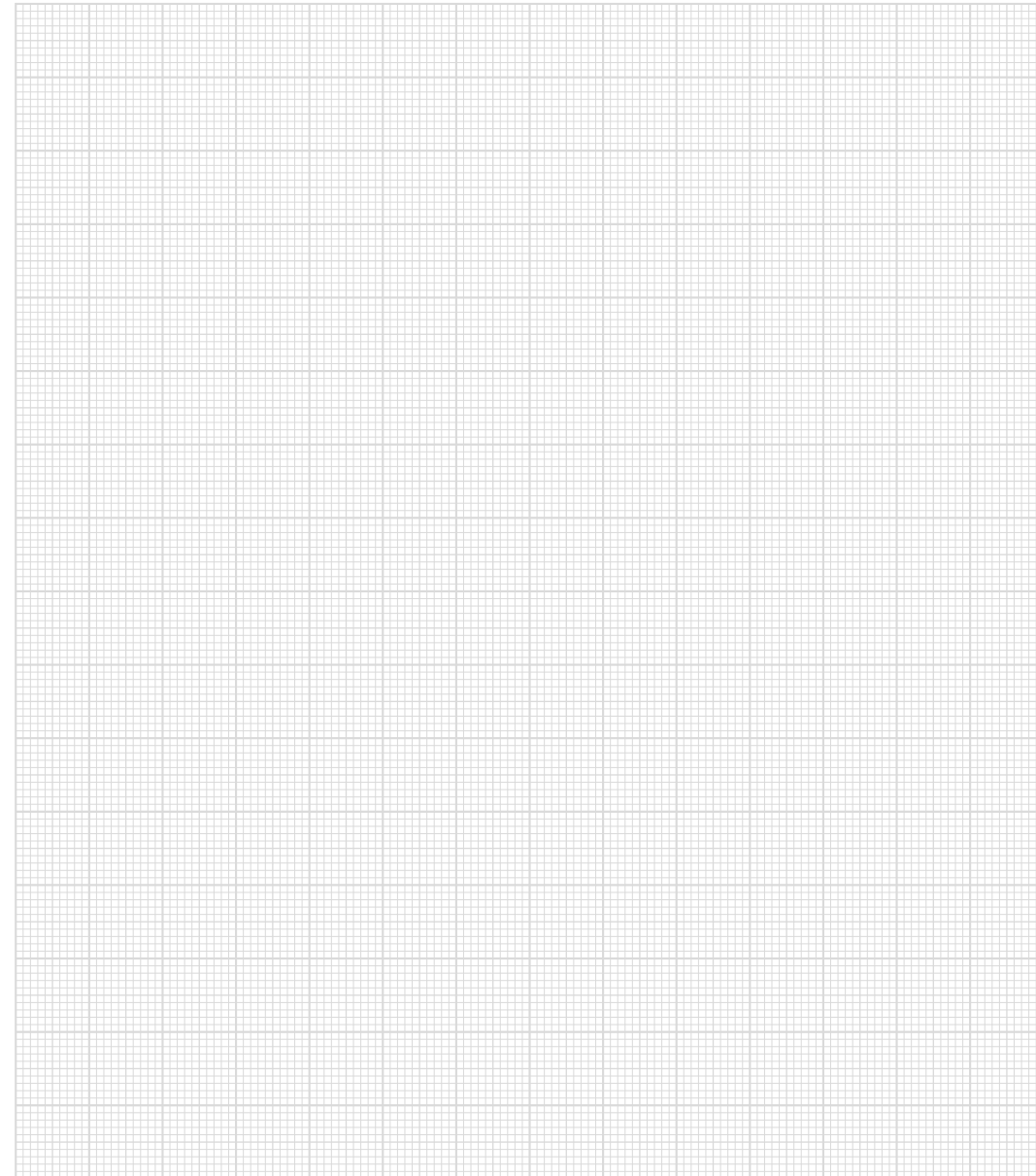
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-017-442 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Digital Input Module with 2 Incremental Encoder Inputs

DI 204



with 2 incremental encoder inputs
14 digital inputs

The S-DIAS digital input module DI 204 is equipped with two incremental inputs with a TTL signal and 14 inputs with a +24 V signal for reading the signal states "0" and "1". To suppress noise in the signal lines, input filters are provided. The incremental encoder values can be latched.

Incremental Encoder Input Specifications

| | | |
|---------------------|--|---------------|
| Number | 2 | |
| Input voltage | typically 0.5 V | maximum 5.5 V |
| Signal level | low 0.8 V | high 2.0 V |
| Switching threshold | typically 1.4 V | |
| Input current | 1.5 mA at +5 V | |
| Input delay | typically 10 µs | |
| Input frequency | maximum 25 kHz | |
| Counter frequency | maximum 100 kHz in incremental counter mode with 4-edge analysis | |

Digital Input Specifications

| | | |
|---------------------|------------------|---------------|
| Number | 14 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 38 mA | maximum 43 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-006-204 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Counter Input Module FC 021



- with 2 digital RS422 inputs with counter function
- 2 digital TTL inputs with counter function
- 2 digital HTL inputs with counter function

The S-DIAS counter input module FC 021 provides the option to configure 2 counter inputs or one incremental encoder input. Thereby, the RS422, TTL or HTL inputs can be optionally used for the counter function. Parallel to the inputs, the module also provides the actual status of all digital inputs. The TTL and HTL inputs are galvanically separated on the S-DIAS bus. The sensor supply connected to X3 is also galvanically separated on the S-DIAS bus.

RS422 Digital Input Specifications

| | |
|--------------------|---|
| Number of channels | 2 |
| Input signals | RS422 signal (inputs: 330 Ω bus termination, 1.2 kΩ spread each against 5 volts and ground) |
| Input delay | 0.025 μs |
| Input frequency | maximum of 5 MHz in normal counter mode or in incremental counter mode with 4-edge analysis |
| Counter frequency | 5 MHz in normal counter mode 20 MHz in incremental counter mode with 4-edge analysis |
| Galvanic Isolation | no |
| Common mode range | -5 V ... +10 V |
| Status LEDs | yes |

HTL Digital Input Specifications

| | | |
|---------------------|---|---------------|
| Number | 2 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | 10 μs | |
| Input frequency | maximum of 25 kHz in normal counter mode or in incremental counter mode with 4-edge analysis | |
| Counter frequency | 25 kHz in normal counter mode 100 kHz in incremental counter mode with 4-edge analysis | |
| Galvanic isolation | yes (isolation voltage 125 V) | |

TTL Digital Input Specifications

| | | |
|---------------------|--|---------------|
| Number | 2 | |
| Input voltage | typically 5.0 V | maximum 5.5 V |
| Signal level | low: 0.8 V | high: 2.0 V |
| Switching threshold | typically 1.4 V | |
| Input current | 1.5 mA at +5 V | |
| Input delay | typically 1 μs | |
| Input frequency | maximum of 125 kHz in normal counter mode or in incremental counter mode with 4-edge analysis | |
| Counter frequency | 125 kHz in normal counter mode 500 kHz in incremental counter mode with 4-edge analysis | |
| Galvanic isolation | yes (isolation voltage 125 V) | |
| Status LEDs | yes | |

Counter Mode Specifications

| | | |
|----------------------------|---|--|
| Signal analysis | 1-/2x edge analysis for counter input 1-/2-/4x edge analysis for incremental encoder input Period measurement falling/falling edges, Period measurement rising/rising edges, Time measurement falling -> rising edge Time measurement rising -> falling edge | |
| Counter resolution | 32-bit | |
| Internal counter frequency | 100 MHz | |
| Frequency precision | Frequency stability ± 25 ppm, aging: ± 3 ppm p.a. | |
| Prescaler | Configurable via software, 16-bit | |
| Input filter | Can be configured or deactivated via software, 12-bit (0-32.76 ms in 8- μ s stages) | |
| Configuration | Up/Down Enable Load Edge Counter source | via software via software via software via software via software |
| Reference counter | Internal counter with programmable prescaler. If the counter of the respective channel is raised, the reference counter is saved. | |

Electrical Requirements

| | | |
|--|--|---------------|
| External supply voltage | 4.75-30 V DC | |
| External current consumption supply voltage | corresponds to the load on the digital output + outgoing 24 V supply Maximum: 6 A | |
| Galvanic separation of external supply voltage | yes (isolation voltage 125 V) | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 15 mA | maximum 20 mA |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 55 mA | maximum 65 mA |
| Current consumption of sensor supply | dependent on connected loads however, maximum is 6 A | |

Voltage Monitor

| | |
|--------------------|---|
| Power supply +24 V | Supply voltage > 18 V (+24 V DC OK-LED lights green) |
| Power supply | Supply voltage > 4.75 V (+5 V DC OK-LED lights green) |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-016-021 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | in preparation |
| Approvals | in preparation |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm von 5-8.4 Hz 1 g von 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Positioning Module NC 100



- with 4 digital inputs
- 4 digital outputs
- 1 Incremental encoder input

The S-DIAS NC 100 positioning module has four digital outputs, four digital inputs, as well as an incremental encoder (optional TTL or RS422 signal).

With the digital inputs, the signal statuses („0” and „1”) can be read with a +24 V reference. The incremental encoder value can be latched.

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 10 µs | |

Digital Output Specifications

| | | |
|---|--|--|
| Number | 4 | |
| Short-circuit proof | yes | |
| Output voltage | typically +24 V | |
| Maximum continuous current load allowed per channel | 2 A | |
| Max. total current (complete module) | 6 A | |
| Maximum braking energy of outputs (inductive load) | maximum 0.65 Joules/channel maximum 1.95 Joules/ 4 channels | |
| Residual current (off) | ≤ 12 µA | |
| Turn-on delay | < 200 µs | |
| Turn-off delay | < 200 µs | |

Incremental Encoder Input Specification

| | | |
|--------------------|---|--|
| Number of channels | 1 | |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module) Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module) | |
| Input frequency | maximum 125 kHz | |
| Counter frequency | maximum 500 kHz | |
| Signal evaluation | 4X | |
| Counter resolution | 16-bit | |
| Power supply | +5 V/0.2 A short-circuit protected | |

Electrical Requirements

| | | |
|---|---------------------|---------------|
| Power supply +24 V | 18-30 V | |
| Current consumption of +24 V power supply | maximum 250 mA/24 V | |
| Supply voltage digital outputs | 18-30 V | |
| Current consumption of digital output supply | load-dependent | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 40 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-011-100 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes

S-DIAS SSI Interface Module

SI 021



with 2 SSI absolute value encoders

The S-DIAS SI 021 SSI interface module can evaluate two absolute value encoders via the S-DIAS interface.

The SSI interface is designed for SSI encoders (e.g. absolute angle encoded length measurement rods...). Non-coded and Gray coded (Gray code is internally converted to binary) sensors are supported.

SSI Absolute Value Encoder Specifications

| | | |
|---------------------|--|--|
| Number | 2 | |
| Encoder | Absolute value encoder with RS422 interface | |
| SSI signal level | RS422 Inputs: 330 Ω bus termination, per 1.2 kΩ resistor spread against to 5 volts and mass Outputs: 330 Ω bus termination, without spread | |
| Data transfer speed | 125 kHz, 250 kHz, 500 kHz, 1 MHz (configurable) | |
| Encoder resolution | maximum 32 bits | |
| Coding | binary/gray | |
| Status LED | yes | |

Electrical Requirements

| | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) without SSI encoders | typically 28 mA at +18 V typically 24 mA at +24 V typically 21 mA at +30 V | maximum 33 mA at +18 V maximum 28 mA at +24 V maximum 25 mA at +30 V |
| Current consumption on the S-DIAS bus (+24 V power supply) with two SSI encoders | typically 33 mA at +18 V typically 27 mA at +24 V typically 23 mA at +30 V | maximum 39 mA at +18 V maximum 32 mA at +24 V maximum 27 mA at +30 V |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-022-021 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Transsonar Module TS 041/TS 051



with 4 (TS 041) or 5 (TS 051) Transsonar encoders

The S-DIAS TS 041 or TS 051 transsonar module can be used to analyze ultrasound distance recordings. The advantage lies in the contact and wear-free collection of measurement values with ultrasound.

Transsonar Specifications

| | | |
|--|---|--|
| Number of channels | 5 (TS 051) 4 (TS 041) | |
| Number of position encoders/channel | maximum 4 | |
| Transonic encoder | ultrasonic encoder with start/stop function and RS422 interface (MTS EPS, Balluff BTL5, Balluff BTL6, Balluff BTL7) | |
| Position encoder speed | manufacturer-dependent (vus*: ca. 2845 m/s for Balluff encoder). This value must be set for each position encoder!! | |
| Automatic sensor parameter recognition | for sensors with integrated protocols (= "expanded P-interface" with Balluff BTL 6 AT types with DPI/IP (BTL6-P111-.....) MTS EP start/stop sensor EPSxxxMDxxxR3) | |
| Measurement value (corresponds to the runtime) | 0-1048575 (0-3.50 ms) | |
| Resolution | 20 bits (corresponds to 9.48 µm at vus* = 2845 m/s) | |
| Gate time | 3.33 ns | |
| Counter frequency | 500 MHz | |
| Distance measuring (Example) | minimum: depends on the type of position sensor | maximum: runtime x vus (3.50 ms x 2845 m/s = 9.96 m) |
| Status LEDs | 5 | |

Electrical Requirements

| TS 041 | | |
|--|--|--|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 85 mA at 18 V 65 mA at 24 V 55 mA at 30 V | maximum 90 mA at 18 V 70 mA at 24 V 60 mA at 30 V |
| TS 051 | | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 90 mA at 18 V 70 mA at 24 V 60 mA at 30 V | maximum 95 mA at 18 V 75 mA at 24 V 65 mA at 30 V |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-053-041 20-053-051 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

S-DIAS AC Current Measuring Module

AI 031



with 3 analog current inputs 0-5 A AC

The S-DIAS AI 031 AC current measuring module is used to measure current in low voltage networks. To decouple from the supply, an external transformer must be used, which converts the measured current to a maximum of 5 A AC.

Analog Current Input Specifications

| | | |
|-----------------------------|-----------------------------------|---------------------------|
| Number of channels | 3 | |
| Measurement range | 0-5 A AC | |
| Measurement value | 0-5000 digits | |
| Measuring process | average value | |
| Signal form | sine | |
| Frequency | 47-63 Hz | |
| Resolution | 12-bit (ca. 1.53 mA AC/digit) | |
| Conversion time per channel | 1 ms | |
| Common mode range | ±10 V | |
| Input filter hardware | typically 2 Hz | low pass 3rd order system |
| Resistive sensor | 12 mΩ | |
| Measurement precision | ±1 % of maximum measurement value | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 50 mA | maximum 55 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 40 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|------------------|----------------------------------|--|
| Article number | 20-009-031 | |
| Hardware version | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | CE, \ulcorner UL _{US} | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Analog Input Module AI 040



with 4 inputs for vibration sensors with IEPE interface

The S-DIAS AI 040 analog input module has four constant current sources, which can be set independently of one another. The sensor signals converted to a broad frequency range with a 16-bit resolution.

IEPE Interface Specifications

| | | | | | | |
|--|---|----------------|----------------|--|----------------|----------------|
| Number of channels | 4 | | | | | |
| Measurement range | ±5,500 V AC | ±2,750 V AC | ±1,375 V AC | ±0,688 V AC | ±0,344 V AC | ±0,172 V AC |
| Adjustable amplification | 1 | 2 | 4 | 8 | 16 | 32 |
| Measurement value | ±30000 | | | | | |
| AD converter resolution | 16-bit | | | | | |
| Conversion rate per channel | ≥ 5 µs (adjustable, default setting 5 µs) | | | | | |
| Data recording per channel | maximum 64 Word | | | | | |
| Short circuit monitoring | yes | | | | | |
| Cable break monitor | yes | | | | | |
| Hardware input filter | typically 31 mHz | | | high pass 1 st order system | | |
| | typically 20 kHz | | | low pass 3 rd order system | | |
| Measurement precision (amplification 1 to 8) | ±0,5 % | | | | | |
| Measurement precision (amplification 16 to 32) | ±2 % | | | | | |

Software Band Pass Filter Specifications

| | | |
|--|---|--|
| Lower frequency limit | adjustable (min 0.1 Hz) | |
| Upper frequency limit | adjustable (max. 10 kHz) | |
| Measurement values processed per cycle | configurable | |
| Output parameters | average value minimum value maximum value time stamp minimum value time stamp maximal value | |

Supply Voltage Specifications

| | | |
|--|--|------------------|
| Adjustable current | 0, 4, 8, 12 mA separately adjustable for each channel | |
| Setting tolerance | maximum ±5 % | |
| Supply voltage | +18-30 V DC | |
| Current consumption | typically 20 mA plus constant current setting | |
| Sensor voltage at 12 mA supply current | minimal 18.5 V | typically 19.1 V |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 30 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-009-040 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Absolute Pressure Input Module

DM 811



with 1 absolute pressure inputs
1 PT100 temperature input
8 digital inputs

The S-DIAS DM 811 absolute pressure input module has one absolute pressure input with a measurement range of 0-1600 mbar, one PT100 temperature input 0-300 °C and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Absolute Pressure Input Specifications

| | |
|----------------------------------|--|
| Number | 1 |
| Pressure sensor type | absolute pressure sensor |
| Measurement range | 0-1600 mbar |
| Measurement value | 0-1600 |
| Resolution | 12-bit (ca. 0.4 mbar/LSB) |
| Conversion time for all channels | 1 ms |
| Input filter hardware | typically 1 kHz, low pass 3rd order system |
| Input filter software | configurable |
| Measurement precision | ±0.25 % of scale end value, i.e. ±4.0 mbar for 25 °C ambient temperature with offset and gain comparison ±1.00 % of scale end value, i.e. ±16.0 mbar for 0-50 °C ambient temperature without offset and gain comparison |
| Calibratable | yes (2-point comparison) |
| Maximum overpressure | 4 bar |

Temperature Input Specifications PT100

| | | |
|---|-------------------------------------|---------------------------|
| Number | 1 | |
| Measurement range | 100.0-212.1 Ω | |
| | PT100 | |
| | 0-300 °C | |
| Resolution | 0.1 °C | |
| Conversion time per channel | 1 ms | |
| Cable break monitor | yes | |
| Input filter hardware | typically 1 kHz | low pass 3rd order system |
| Input filter software | configurable | |
| Precision of analog channel measurement | ±0.5 % of maximum measurement value | |

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 60 mA | maximum 65 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 20 mA | maximum 25 mA |

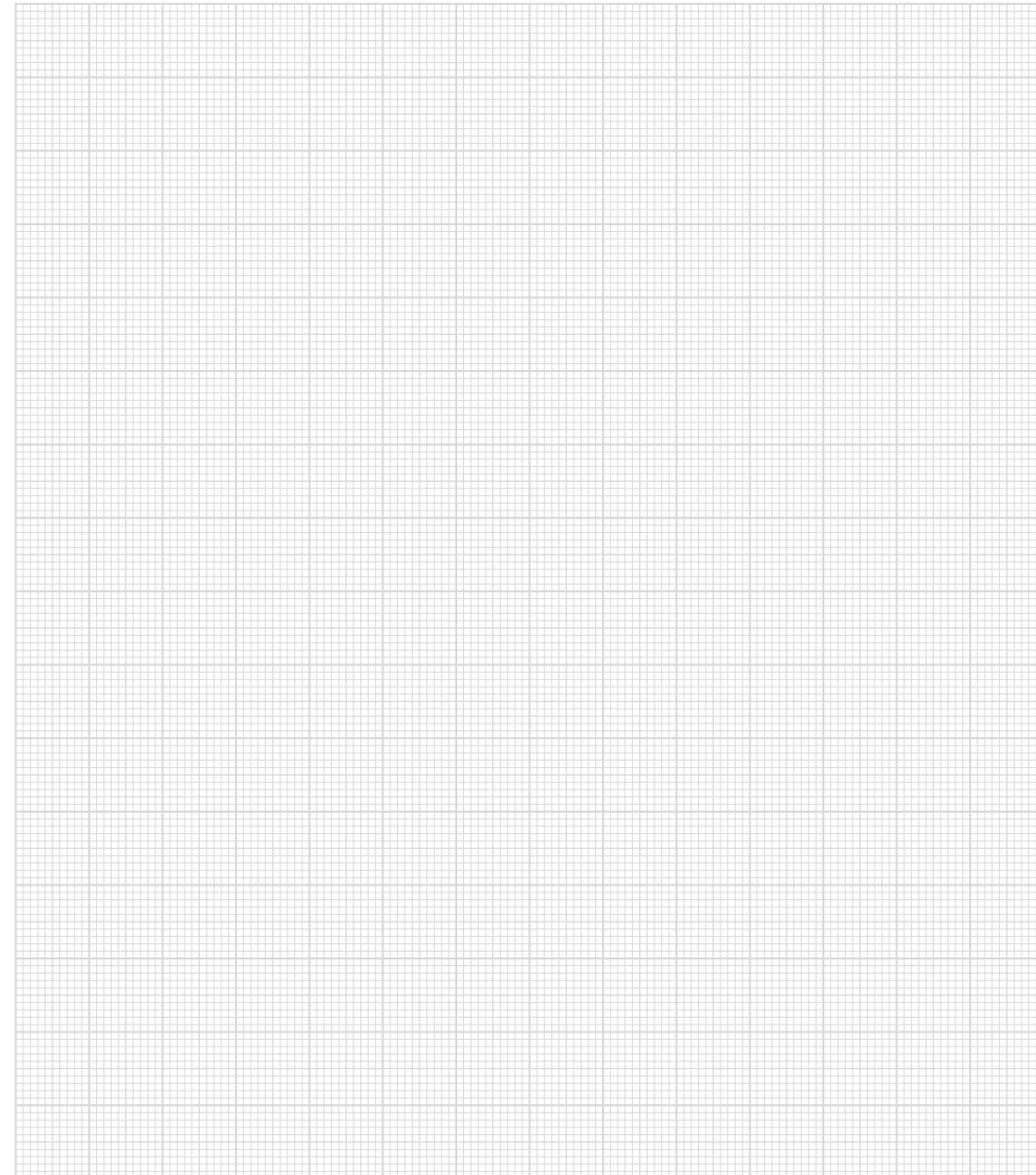
Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-008-811 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Differential Pressure Input Module

DM 822



with 2 differential pressure inputs
8 digital inputs

The S-DIAS DM 822 differential pressure input module has two differential pressure inputs with a measurement range of -2068 mbar to +2068 mbar and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Differential Pressure Inputs Specifications

| | |
|----------------------------------|--|
| Number | 2 |
| Pressure sensor type | difference pressure sensor |
| Measurement range | -2068 ... +2068 mbar |
| Measurement value | -2068 ... +2068 |
| Resolution | 12-bit (ca. 1.0 mbar/LSB) |
| Conversion time for all channels | 1 ms |
| Input filter hardware | typically 1 kHz, low pass 3rd order system |
| Input filter software | configurable |
| Measurement precision | Based on the entire measurement range: $\pm 2\%$ (at +10 ... +50 °C ambient temperature) Based on the entire measurement range: $\pm 3\%$ (at 0 ... +60 °C ambient temperature) |
| Maximum differential pressure | 8 bar |
| Maximum ambient pressure | 10 bar |

| Applicable tube types | Manu- facturer | Article number | Inner tube diameter | Shore hardness | Max. pressu- re at 25 °C |
|-----------------------|----------------------|----------------|------------------------|-------------------|-----------------------------|
| | Frelin-Wade | 95a-157 | 1.68 mm | 95 | 6.89 bar |
| | NewAge Industries | 2110535 | 1.68 mm | 85 | 9.31 bar |
| | SMC | TU0212BU-20 | 1.2 mm | - | 7.50 bar |

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 55 mA | maximum 60 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 10 mA | maximum 15 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-008-822 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Energy Measuring Module

EE 121



with 3 voltage inputs (0-600 V)
12 current inputs (0-2 A AC)

The S-DIAS energy measuring module is used to record power and energy, as well as mains synchronization. The voltages from the three input phases (L1, L2 and L3) are measured, as well as the mains frequency and timestamp of the zero-voltage crossings. Additionally, up to 12 currents are also recorded. The currents can be arbitrarily assigned to the phases. The voltages are connected directly, the currents however, must be connected through the output of a current transformer with 1 A rms output.

Voltage Input Specifications

| | |
|--|---|
| Number of channels | 3 |
| Supported nominal system voltage | 0-480 V AC (phase conductor voltage Lx - Ly) 0-277 V AC ((star voltage Lx - N) |
| Measurement range | 0-600 V AC (phase conductor voltage Lx - Ly) 0-346 V AC (star voltage Lx - N) |
| Measurement value | 0-60.000 (10 mV/d) 0-34.600 (10 mV/d) |
| Frequency range | 15-120 Hz |
| ADC resolution | 16-bit (ca. 25 mV/LSB) |
| Scan rate | 15 µs |
| Voltage inputs frequency measurement range | 15-120 Hz with a 0.01 Hz resolution |
| Frequency measurement accuracy | typically 10 MHz at 400 V AC/50 Hz and sine-formed mains voltage |
| Zero-voltage crossing timestamp | 0 to (32767 - bus cycle time) in 1 µs increments |
| Input filter hardware | 1.5 kHz |

| | |
|--|---|
| Galvanic separation (voltage inputs to S-DIAS bus) | 4000 V AC (1 min) |
| Base accuracy incl. calibration errors, linearity and noise at 25 °C | ±0.25 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N) within the nominal system voltage range at a mains frequency of 45 to 65 Hz |
| Temperature drift 0-60 °C | ±0.35 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N) within the nominal system voltage range at a mains frequency of 45 to 65 Hz |
| Total accuracy 0-60 °C | ±0.60 % based on the nominal system voltage of 480 V AC (Lx - Ly)/277 V AC (Lx - N) within the nominal system voltage range at a mains frequency of 45 to 65 Hz |

Current Input Specifications

| | |
|--|--|
| Number of channels | 12 |
| Supported current converters, secondary nominal current | 1 A AC |
| Measurement range | 0-2 A AC |
| Measurement value | 0-20.000 x I _{PRIMARY} /I _{SECONDARY} (0.1 mA/d) |
| Permissible overcurrent | 2 A continuous 5 A for 20 s 10 A for 1 s |
| Frequency range | 15-120 Hz |
| ADC resolution | 16-bit (ca. 50 µA/LSB) |
| Scan rate | 30 µs |
| Current shunt | 60 mΩ |
| Input filter hardware | 1.5 kHz |
| Galvanic separation (current inputs to S-DIAS bus) | none |
| Base accuracy incl. calibration errors, linearity and noise at 25 °C | ±0.25 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz |
| Temperature drift 0-60 °C | ±0.40 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz |
| Total accuracy 0-60 °C | ±0.65 % based on the nominal current of 1 A within the nominal current range of 1 A AC at a mains frequency of 45 to 65 Hz |

Electrical Requirements

| | |
|--|------------------------------------|
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | 0 |
| Power supply on the S-Dias bus | +24 V |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 45 mA maximum 60 mA |

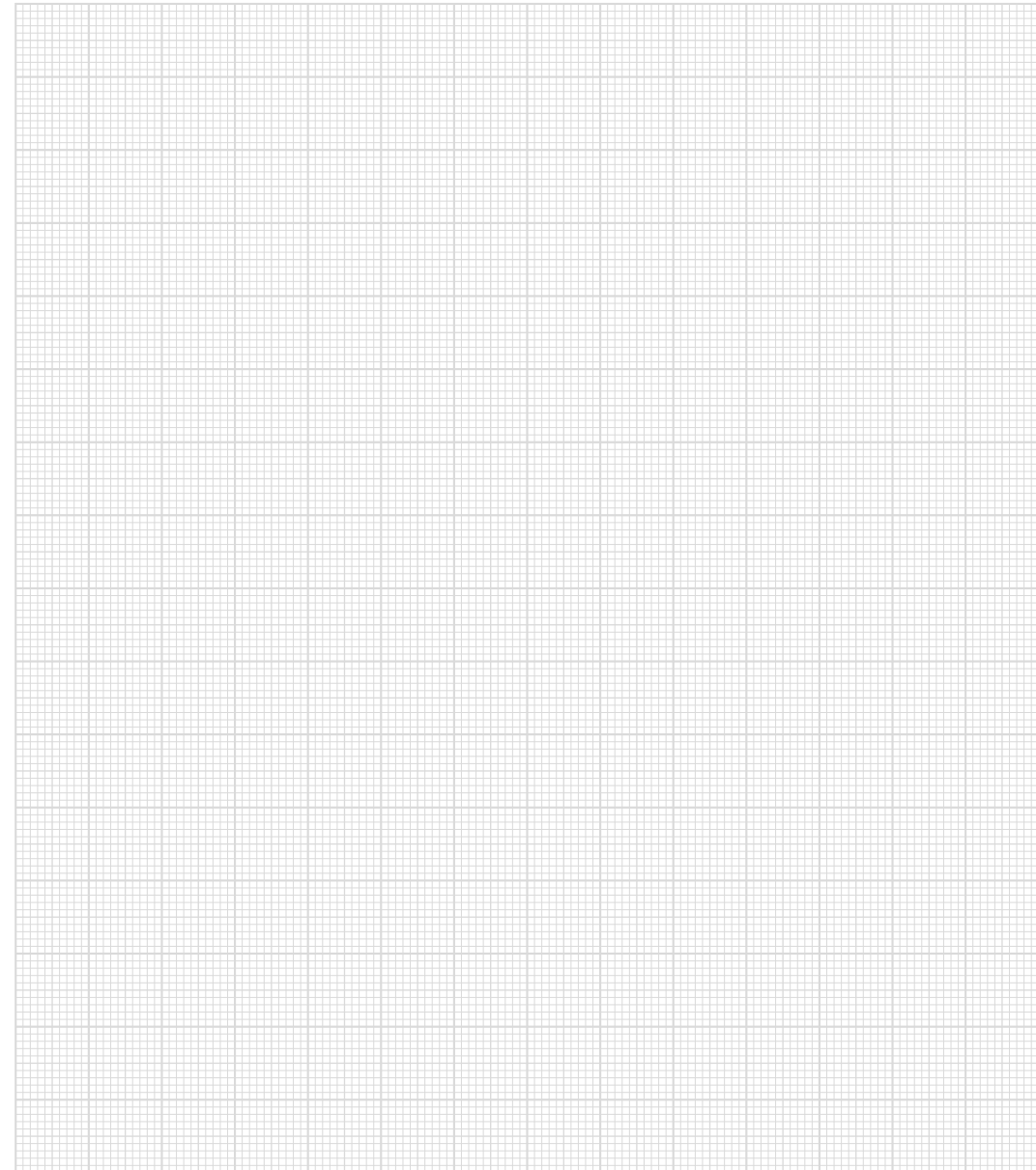
Article Number and Miscellaneous

| | |
|----------------|--------------------------------|
| Article number | 20-068-121 |
| Mechanical | 25 x 104.2 x 72 mm (W x H x D) |
| Standard | UL in preparation |
| Approvals | CE |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | over voltage category III pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Axis Module DC 061-1



with 1 motor output stage 6 A
 1 resolver input
 1 holding brake
 2-channel enable input for STO
 (Safe Torque Off)

The S-DIAS DC 061-1 axis module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 6 A. A Resolver input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

| | |
|-------------------------------|---|
| Type | brushless DC |
| Operating voltage | +18-55 V |
| Maximum continuous current | 6 A |
| Maximum peak current (10 sec) | 15 A |
| Controller frequency | 16 kHz |
| PWM frequency | 16 kHz |
| Overload protection | Short circuit cutoff Temperature monitor I ² T monitor Over and under voltage monitor |

Resolver Specifications

| | |
|------------------------------|--------------------|
| Type | Resolver |
| Resolution | 12-bit |
| Output voltage (EXC) | typically 7 Vrms |
| Maximum output current (EXC) | 200 mA |
| Output frequency | 8 kHz |
| Input voltage | typically 3.5 Vrms |
| Resolver transfer ratio | 0.5 |

Enable Inputs Specifications

| | | |
|---------------------|------------------|--------------|
| Number | 2 | |
| Input voltage | +24 V | |
| Input voltage range | +18-24 V | |
| Signal level | low: < 5 V | high: > 15 V |
| Switching threshold | typically 11 V | |
| Input current | 3 mA at 24 V | |
| Input delay | typically 0.5 ms | |

Holding Brake Specifications

| | |
|--|--------|
| Output voltage | 24 V |
| Maximum continuous current | 500 mA |
| Short-circuit protection | yes |
| Maximum switch-off energy (inductive load) | 50 mJ |

Regen Brake Specifications

| | |
|--------------------------------|-------------------------|
| Type | external power resistor |
| Output | GND switching |
| Maximum current | 10 A |
| Lowest possible resistance | 6 Ω |
| Short-circuit protection | yes |
| Threshold regen braking on/off | 60 V/55 V |

Electrical Requirements

| | | |
|--|--------------------------------|---------------|
| Power supply +24 V | +18-30 V, Class 2 | |
| Current consumption of the +24 V supply | load-dependent (holding brake) | |
| Supply voltage motor | +18-55 V | |
| Switching threshold for motor voltage monitor | minimum 18 V | maximum 65 V |
| Current consumption of motor supply | load-dependent (motor) | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 70 mA | maximum 80 mA |

S-DIAS Axis Module DC 062(-X)



- with 1 motor output stage 6 A
- 1 incremental encoder input
- 1 holding brake

The S-DIAS DC 062(-X) axis module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 6 A. An incremental encoder input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

| | |
|-------------------------------|---|
| Type | brushless, 4-quadrant regulator with position setting |
| Operating voltage | +24-55 V |
| Maximum continuous current | 6 A |
| Maximum peak current (10 sec) | 15 A |
| Controller frequency | 16 kHz |
| PWM frequency | 16 kHz |
| Overload protection | Short circuit cutoff Temperature monitor I ² T monitor Over and under voltage monitor |

Incremental Encoder Specifications

| | |
|----------------------|--|
| Number of channels | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module) Incremental encoder signals TTL (A, B, R) TTL-level (1200 Ω Pull-Up, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal evaluation | 4x |
| Counter resolution | 32 bits |
| Encoder power supply | +5 V/0.2 A short circuit protected |

Enable Inputs Specifications

| | |
|---------------------|------------------------------|
| Number | 2 |
| Input voltage | +24 V DC |
| Input voltage range | +18-30 V DC |
| Signal level | low: < 5 V high: > 15 V |
| Switching threshold | typically +11 V |
| Input current | 3 mA at +24 V DC |
| Input delay | typically 0.5 ms |

Holding Brake Specifications

| | |
|--|----------|
| Output voltage | +24 V DC |
| Maximum continuous current | 500 mA |
| Short-circuit protection | yes |
| Maximum switch-off energy (inductive load) | 50 mJ |

Regen Brake Specifications

| | |
|--------------------------------|-------------------------|
| Type | external power resistor |
| Output | GND switching |
| Maximum current | 10 A |
| Lowest possible resistance | 6 Ω |
| Short-circuit protection | yes |
| Threshold regen braking on/off | 60 V/55 V |

S-DIAS Drive Module DC 101



- with 1 motor output stage 10 A
- 1 resolver input
- 1 holding brake
- 2-channel enable input for STO
(Safe Torque Off)

The S-DIAS DC 101 drive module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 10 A. A resolver input is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

| | |
|---|--|
| Type | Synchronous servo motor |
| Operating voltage | +18-55 V |
| Maximum continuous current | 10 A |
| Maximum peak current (10 s) | 20 A |
| Output current over the environmental temperature | maximum 10 A continuous current at 45 °C maximum 7.5 A continuous current at 50 °C maximum 5 A continuous current at 55 °C |
| Controller frequency | 16 kHz |
| PWM frequency | 16 kHz |
| Overload protection | Short circuit cutoff Temperature monitor I ² T monitor Over and under voltage monitor |

Resolver Specifications

| | |
|------------------------------|--------------------|
| Type | Resolver |
| Resolution | 12-bit |
| Output voltage (EXC) | typically 7 Vrms |
| Maximum output current (EXC) | 200 mA |
| Output frequency | 8 kHz |
| Input voltage | typically 3.5 Vrms |
| Resolver transfer ratio | 0.5 |

Enable Inputs Specifications

| | |
|---------------------|------------------------------|
| Number | 2 |
| Input voltage | +24 V |
| Input voltage range | +18-30 V |
| Signal level | low: < 5 V high: > 15 V |
| Switching threshold | typically 11 V |
| Input current | 3 mA at 24 V |
| Input delay | typically 0.5 ms |

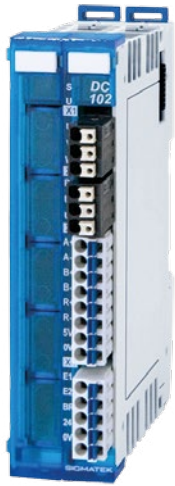
Holding Brake Specifications

| | |
|--|--------|
| Output voltage | 24 V |
| Maximum continuous current | 500 mA |
| Short-circuit protection | yes |
| Maximum switch-off energy (inductive load) | 50 mJ |

Regen Brake Specifications

| | |
|--------------------------------|-------------------------|
| Type | external power resistor |
| Output | GND switching |
| Maximum current | 10 A |
| Lowest possible resistance | 6 Ω |
| Short-circuit protection | yes |
| Threshold regen braking on/off | 60 V/55 V |

S-DIAS Drive Module DC 102



- with 1 motor output stage 10 A
- 1 incremental encoder input
- 1 holding brake
- 2-channel enable input for STO (Safe Torque Off)

The S-DIAS DC 102 drive module is used to control a synchronous servo motor with a 48-Volt supply voltage and phase current of up to 10 A. An incremental encoder is available for position feedback. A 24 V output for connecting a holding brake is provided. External Regen brake can also be connected.

Motor Driver Specifications

| | |
|---|--|
| Type | Synchronous servo motor |
| Operating voltage | +18-55 V |
| Maximum continuous current | 10 A |
| Maximum peak current (10 s) | 20 A |
| Output current over the environmental temperature | maximum 10 A continuous current at 45 °C maximum 7.5 A continuous current at 50 °C maximum 5 A continuous current at 55 °C |
| Controller frequency | 16 kHz |
| PWM frequency | 16 kHz |
| Overload protection | Short circuit cutoff Temperature monitor I ² T monitor Over and under voltage monitor |

Incremental Encoder Specifications

| | |
|----------------------|---|
| Number of channels | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal evaluation | 4x |
| Counter resolution | 32 bits |
| Encoder power supply | +5 V/0.2 A short circuit protected |

Enable Inputs Specifications

| | |
|---------------------|------------------------------|
| Number | 2 |
| Input voltage | +24 V |
| Input voltage range | +18-30 V |
| Signal level | low: < 5 V high: > 15 V |
| Switching threshold | typically 11 V |
| Input current | 3 mA at 24 V |
| Input delay | typically 0.5 ms |

Holding Brake Specifications

| | |
|--|--------|
| Output voltage | 24 V |
| Maximum continuous current | 500 mA |
| Short-circuit protection | yes |
| Maximum switch-off energy (inductive load) | 50 mJ |

Regen Brake Specifications

| | |
|--------------------------------|-------------------------|
| Type | external power resistor |
| Output | GND switching |
| Maximum current | 10 A |
| Lowest possible resistance | 6 Ω |
| Short-circuit protection | yes |
| Threshold regen braking on/off | 60 V/55 V |

S-DIAS DC Motor Output Stage SR 011



- with 1 DC motor output stage +50 V/5 A
- 1 brake chopper
- 1 incremental encoder input RS422/TTL
- 2 enable inputs +24 V/3 mA/0.5 ms with STO function (not EG type tested)
- 1 digital output +24 V/0.5 A/short-circuit prot.

The S-DIAS motor output stage module SR 011 allows the connection of DC brush motors with a phase current up to 5 A. The operating modes PWM control, current and speed regulation via IxR compensation, as well as speed and position regulation via incremental encoder are supported.

DC Motor Output Specifications

| | |
|---|---|
| Number | 1 |
| Supported motor type | DC brush motor |
| Operating modes | PWM control Current regulation Speed regulation via IxR compensation Speed regulation via incremental encoder Position regulation via incremental encoder |
| Supply voltage | +18-55 V |
| PWM frequency | 32 kHz |
| Current controller frequency | 16 kHz |
| Maximum PWM switching ratio | 95 % (limited by hardware) |
| Maximum continuous current | 5 A |
| Output current over the environmental temperature | maximum 5 A continuous current at 45 °C maximum 3.5 A continuous current at 50 °C maximum 2 A continuous current at 55 °C |
| Maximum peak current (1 s) | 15 A |
| DC-link capacitance | 2,8 µF |
| Motor current measurement | 0-15 A |

| | |
|-------------------------|---|
| Voltage measurement | 0-65 V |
| Temperature measurement | 0-125 °C with temperature warning at 103 °C with temperature warning at 108 °C |
| Safety functions | Short circuit cutoff Temperature cut-off I ² t monitor Over and under voltage monitor |

Brake Chopper Specifications

| | |
|---|-------------------------|
| Number | 1 |
| Output | GND switching |
| Maximum current | 6 A |
| Short-circuit protection | yes |
| Regen resistor | External power resistor |
| Article number | 20-014-061-Z1 |
| Regen resistor switching threshold on/off | 60 V/55 V |

Incremental Encoder Input Specifications

| | |
|----------------------|---|
| Number | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module) Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal analysis | 4x |
| Counter resolution | 16 bits |
| Encoder power supply | +5 V/0.2 A short-circuit proof |

STO Enable Input Specifications

| | | |
|---------------------|---|--------------------|
| Number | 2 | |
| Input voltage | +24 V DC | |
| Input voltage range | minimum +18 V | maximum +30 V |
| Signal level | low: $\leq +5$ V | high: $\geq +15$ V |
| Switch hysteresis | typically +11 V | |
| Input current | 3 mA at +24 V | |
| Input delay | typically 0.5 ms | |
| Safety Level | Complies with the requirements of Category 4, Performance Level „e“ according to EN ISO 13849-1 and SIL CL 3 according to 62061 Not EG type tested! | |
| Safety function | STO according to EN 61800-5-2, section 4.2.2.2 The motor is not supplied with energy, which can cause a turn. The DC motor output stage does not supply energy to the motor, which can generate torque. Not EG type tested! | |

Digital Output Specifications

| | | |
|---|--------------------|--|
| Number | 1 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed | 0.5 A | |
| Maximum braking energy of the output (inductive load) | maximum 0.5 Joules | |
| Residual current output (off) | ≤ 10 μ A | |
| Turn-on delay | < 200 μ s | |
| Turn-off delay | < 200 μ s | |

Electrical Requirements

| | | |
|--|--|---------------|
| Supply voltage +24 V | 18-30 V | |
| Current consumption of the +24 V supply | load-dependent (digital output + digital output supply) maximum 0.6 A | |
| Motor supply voltage | +18-55 V | |
| Current consumption of motor supply | maximum 5 A (load-dependent) | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 60 mA | maximum 85 mA |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | - | - |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-029-011 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | CE | |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards – immunity requirements for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Current Controller Module

SR 020



with 1 DC motor output stage 3,5 A
 1 Power LED driver 350 mA
 1 LED driver 20 mA

The S-DIAS SR 020 current controller module is used to operate a DC motor with a 12-30 V supply voltage and a maximum motor current of 3.5 A. Higher starting currents are possible for a short period.

The module also contains a current-controlled LED driver with a maximum current of 20 mA, as well as a current-controlled power LED with a maximum of 350 mA.

Motor Output Specifications

| | |
|-------------------------------|--|
| Number | 1 |
| Supply voltage | 12-30 V DC |
| Controller frequency | 30 kHz |
| Current | 0-3.5 A |
| Motor peak start current | maximum I^2t -value = 16 A ² s |
| Operation mode | S3/50 % duty cycle with a maximum on-time of 1.5 min |
| Intermediate circuit capacity | 140 µF |
| Voltage monitoring | Overvoltage and under voltage monitoring |
| Motor current measurement | 0-3.5 A |
| Protective function | Short circuit switch-off I^2t switch-off Over temperature switch-off |

Current Output Specifications

| | |
|-------------------|---|
| Number | 2 |
| LED 1 | 0-20 mA at max. 10 V LED forward voltage |
| Resolution | 8-bit |
| LED 2 (power LED) | 0-350 mA at max. 10 V LED forward voltage |
| Resolution | 8-bit |

Electrical Requirements

| | |
|--|------------------------------------|
| Power supply +24 V | 18-30 V |
| Current consumption of +24 V power supply | maximum 210 mA/24 V |
| Motor supply | 12-30 V |
| Current consumption of motor supply | depends on the motor |
| Voltage supply from S-DIAS bus | +5 V |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 68 mA maximum 80 mA |
| Voltage supply from S-DIAS bus | +24 V |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 15 mA maximum 20 mA |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-029-020 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 61800-5-1 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | |
|---------------------------|---|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0 ... +55 °C |
| Humidity | 0-95 %, non-condensing |
| Operating conditions | pollution degree 2 altitude up to 2000 m |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) |
| Vibration resistance | EN 60068-2-6 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 15 g |
| Protection type | EN 60529 IP20 |

S-DIAS Current Controller Module SR 022



- with 1 DC motor output stage
- 1 incremental encoder input
- 1 digital input +5 V
- 2 digital inputs +24 V

The S-DIAS SR 022 current controller module is used to operate a DC motor with a 12-30 V supply voltage and a maximum motor current of 3.5 A. Higher starting currents are possible for a short period.

Additionally, the motor contains an incremental encoder input (optional TTL or RS422 signal), as well as three digital inputs (1x +5 V, 2x +24 V).

Motor Output Specifications

| | |
|---|--|
| Number | 1 |
| Supply voltage | 12-30 V DC |
| Controller frequency | 30 kHz |
| Current | 0-2.0 A in S1 mode 0-3.5 A in S3 mode |
| Output current over the environmental temperature | 2.0 A (S1)/3.5 A (S3) up to 45 °C 1.0 A (S1)/1.4 A (S3) up to 55 °C |
| Operating modes | S1/100 % duty cycle S3/50 % duty cycle with a maximum on-time of 1.5 min |
| Intermediate circuit capacity | 140 µF |
| Voltage monitoring | Overvoltage and under voltage monitoring |
| Motor current measurement | 0-3.5 A |
| Protective function | Short circuit switch-off I ² t switch-off Over temperature switch-off |

Incremental Encoder Input Specifications

| | |
|----------------------|---|
| Number | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (120 Ω termination, integrated in the module) |
| | Incremental encoder signals TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal analysis | 4x |
| Counter resolution | 16-bit |
| Encoder power supply | +5 V/0.2 A short-circuit proof |

+5 V Digital Input Specifications

| | | |
|---------------------|------------------|----------------|
| Number | 1 | |
| Input voltage | typically +5 V | maximum +5.5 V |
| Signal level | low: < +0.8 V | high: > +2.0 V |
| Switching threshold | typically +1.4 V | |
| Input current | 1.5 mA at +5 V | |
| Input delay | typically 5 ms | |

+24 V Digital Input Specifications

| | | |
|---------------------|-----------------|---------------|
| Number | 2 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +8 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 5 ms | |

Electrical Requirements

| | | |
|--|--------------------------|---------------|
| Power supply +24 V | 18-30 V | |
| Current consumption of the +24 V external supply | maximum 70 mA (at +24 V) | |
| Motor supply | 12-30 V | |
| Current consumption of motor supply | depends on the motor | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 85 mA | maximum 95 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 20 mA | maximum 25 mA |

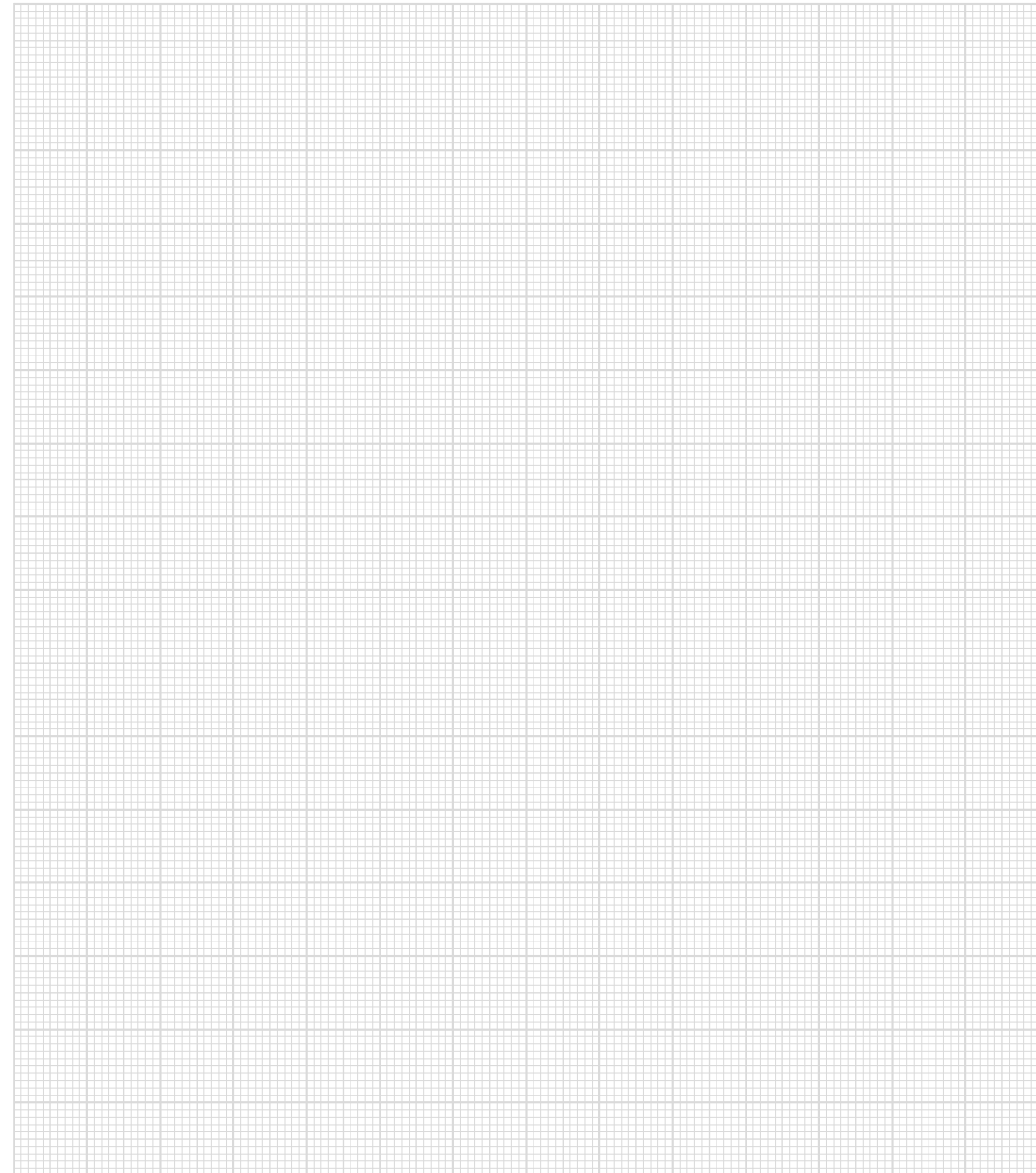
Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-029-022 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL in preparation |
| Approvals | UL, cUL, CE in preparation |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Stepper Module ST 011



- with 1 incremental encoder input
- 1 output channel for the motor control
- 2 digital optic coupler outputs
- 2 digital inputs

The S-DIAS ST 011 stepper module can be used to control stepper motors and servo motor power components. The digital inputs are provided for the reference motion and monitoring the end positions. The ST 011 also has two digital optic coupler outputs. An incremental encoder connection with A/B/R analysis is available as well as the corresponding +5 V incremental encoder supply.

Incremental Encoder Specifications

| | |
|----------------------|--|
| Number | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (150 Ω connection, 330 Ω spread, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal analysis | 4X |
| Counter resolution | 32-bit |
| Encoder power supply | +5 V/0.2 A short circuit protected |

Power Component Control Output Specifications

| | |
|------------------------------------|--|
| Number | 1 |
| Output signals | Activation signals RS422 (C, /C, D, /D, E, /E) RS422 signal |
| Output frequency | maximum 500 kHz |
| Maximum continuous current allowed | 40 mA |

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 2 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3 mA at +24 V | |
| Input delay | typically 0.1 ms | |

Digital Optic Coupler Specifications

| | | |
|-------------------|---|--|
| Number | 2 | |
| Configuration | potential-free (output 1 is either back readable or can be used as an input) | |
| Switching voltage | maximum +30 V DC | |
| Current load | maximum 100 mA | |
| Residual voltage | < 2 V at 100 mA | |

Electrical Requirements

| | | |
|---|---|---|
| Power supply +24 V from S-DIAS bus | +18-30 V DC | |
| Current consumption of the +24 V supply on the S-DIAS bus | typically 80 mA (incl. incremental encoder supply) | maximum 90 mA (incl. incremental encoder supply) |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 180 mA | maximum 200 mA |

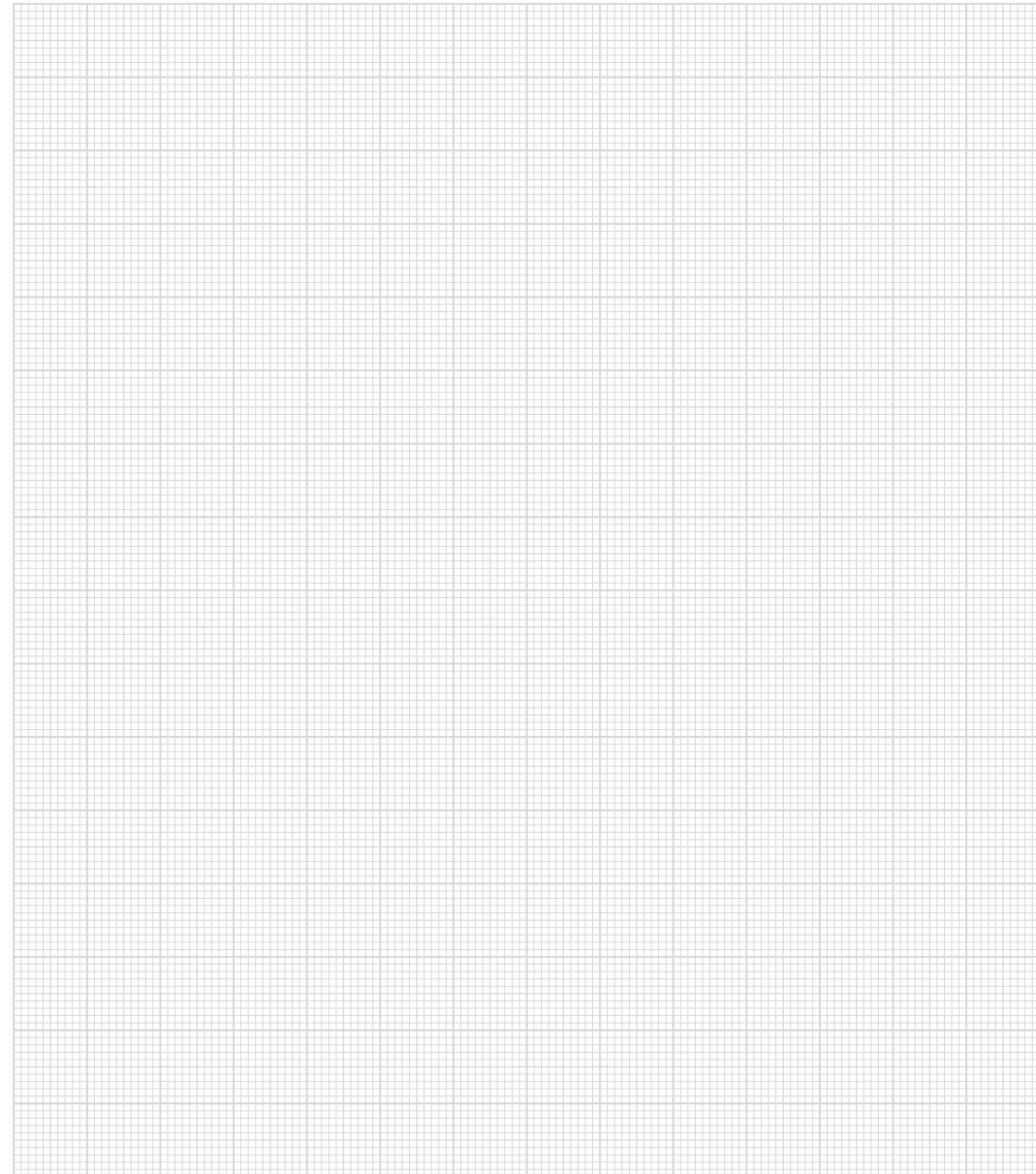
Article Number and Miscellaneous

| | | |
|----------------|--|--|
| Article number | 20-014-011 20-014-011-X (Printed circuit board with protective lacquer) | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Notes



S-DIAS Stepper Motor Output Stage

ST 151



- with 1 stepper motor output stage 50 V/5 A
- 1 brake chopper
- 1 incremental encoder input RS485/TTL
- 2 enable inputs with STO function
- 2 latch/digital inputs

The S-DIAS stepper motor output stage allows the connection of 2-phase stepper motors with a phase current up to 5 A. The incremental encoder input, which supports RS422 as well as TTL encoders, is provided for position feedback. With both enable inputs, the safety function STO is implemented. The 2 latch/digital inputs are provided for the reference motion and monitoring the end positions.

Stepper Motor Output Specifications

| | |
|---|---|
| Number of phases | 2 |
| Output voltage | dependent on the supply (18-55 V) |
| Current controller frequency | maximum 32 kHz |
| Output current | maximum 5 A RMS |
| Output current over the environmental temperature | maximum 5 A continuous current at 45 °C maximum 3 A continuous current at 55 °C |
| DC-link capacitance | 10 µF |
| Operating modes | step frequency mode |
| Step resolution | full step, half step 4-/8-/16-/32-/64x micro step |
| Voltage measurement | 15-70 V with an under voltage < 15 V or over voltage > 70 V, the motor output is shut down through the hardware. |
| Temperature measurement | 0-125 °C with temperature warning at 103 °C with temperature warning at 108 °C |

Brake Chopper Specifications

| | |
|---|-------------------------|
| Number | 1 |
| Output | GND switching |
| Maximum current | 6 A |
| Short-circuit protection | yes |
| Regen resistor | External power resistor |
| Regen resistor switching threshold on/off | 60 V/55 V |

Incremental Encoder Input Specifications

| | |
|----------------------|---|
| Number | 1 |
| Input signals | Incremental encoder signals RS422 (A, /A, B, /B, R, /R) RS422 signal (150 Ω termination, integrated in the module) Incremental encoder signal TTL (A, B, R) TTL level (1200 Ω Pull-Up, integrated in the module) |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal analysis | 4x |
| Counter resolution | 16-bit |
| Encoder power supply | +5 V/0.2 A short-circuit proof |

STO Enable Input Specifications

| | |
|---------------------|--|
| Number | 2 |
| Input voltage | +24 V DC |
| Input voltage range | minimum +18 V maximum +30 V |
| Signal level | low: ≤ +5 V high: ≥ +15 V |
| Switch hysteresis | typically +11 V |
| Input current | 3 mA at +24 V |
| Input delay | typically 0.5 ms |
| Safety Level | complies with the requirements of Category 4, Performance Level "e" according to EN ISO 13849-1 and SIL3 according to 62061 |
| Safety function | STO according to EN61800-5-2, section 4.2.2.2 The motor is not supplied with energy, which can cause a turn. The stepper motor output stage does not supply energy to the motor, which can generate torque. |

S-DIAS Current Output Module

CO 041



with 4 current controlled/pulse signal outputs
4 digital inputs +5 V

The S-DIAS CO 041 current output module is used for the simultaneous operation of four valves on supply voltages from 18-55 volts, a maximum holding current of 1 A and maximum output current of 3.5 A. To ensure the good, dynamic performance of the valve, the inrush current and secondary current (continuous) can be set. The four output stages are short-circuit protected. The module can also operate without a CPU (stand-alone). The module provides the option to reconfigure the current-controlled outputs as pulse signal outputs for operating micro-dosing valve control devices.

Current Controlled PWM Output Specifications

| | |
|--|--|
| Number | 4 |
| Configuration | plus-switching (current controlled) |
| Short-circuit proof | yes |
| Maximum inrush current/channel | 3.5 A (corresponds to reset inrush current 100 %) |
| Maximum inrush current/channel | 0.30 A (corresponds to reset inrush current 8.5 %) |
| Maximum holding current/channel (peak value) | 1.35 A (corresponds to reset inrush current 100 %) |
| Minimum holding current/channel (peak value) | 0.115 A (corresponds to reset inrush current 8.5 %) |
| Maximum holding current/channel (average value) | 1.0 A |
| Maximum total current per supply group (+UV1/+UV2) | 7.0 A peak current (peak value) 2.0 A holding current (average value) |
| Default resolution value inrush current | 8 Bit (0-255, 255 corresponds to 100 %) |
| Max. inrush current duration | 100 ms |
| Holding current preset resolution value | 8 Bit (0-255, 255 corresponds to 100 %) |
| Min. period in holding current phase | 50 µs (corresponds to a maximum PWM frequency of 20.0 kHz) |

| | |
|--------------------------------------|--|
| Max. period in holding current phase | 32.77 ms (corresponds to a minimum PWM frequency of 30.5 Hz) |
| Turn-on delay | adjustable via software in 1 µs increments from 0-32767 |
| Turn-off delay | adjustable via software in 1 µs increments from 0-32767 |
| Status display | 4x LED (yellow) |
| Safety functions | short-circuit/over temperature cut-off |

Digital Input Specifications

| | | |
|---------------------|------------------|----------------|
| Number | 4 | |
| Input voltage | typically +5 V | maximum +7 V |
| Signal level | low: < +0.8 V | high: > +2.0 V |
| Switching threshold | typically +1.4 V | |
| Input current | 1.5 mA at +5 V | |
| Input delay | typically 100 µs | |
| Status display | 4x LED (green) | |

Electrical Requirements

| | | |
|---|--|---------------|
| Valve supply voltages +UV/1-2 | 18-55 V | |
| Current consumption of the valve supply +UV/1-2 | corresponds to the load on valve outputs | |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) operating all valves | typically 35 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|-----------------------------------|--|
| Article number | 20-018-221 | |
| Dimensions | 217.4 x 187.7 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | CE | |

Environmental Conditions

| | | |
|----------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| ambient temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |



S-DIAS Differential Pressure Input Module

DM 821



with 2 differential pressure inputs
8 digital inputs

The S-DIAS DM 821 differential pressure input module has two differential pressure inputs with a measurement range from -1034 mbar to +1034 mbar and eight digital inputs (+24 V/3.7 mA/0.5 ms).

Differential Pressure Inputs Specifications

| | |
|----------------------------------|--|
| Number | 2 |
| Pressure sensor type | difference pressure sensor |
| Measurement range | -1034 ... +1034 mbar |
| Measurement value | -1034 ... +1034 |
| Resolution | 12-bit (ca. 0.5 mbar/LSB) |
| Conversion time for all channels | 1 ms |
| Input filter hardware | typically 1 kHz, low pass 3rd order system |
| Input filter software | configurable |
| Measurement precision | Based on the entire measurement range: $\pm 2\%$ (at +10 ... +50 °C ambient temperature) Based on the entire measurement range: $\pm 3\%$ (at 0 ... +60 °C ambient temperature) |
| Maximum differential pressure | 4 bar |
| Maximum ambient pressure | 10 bar |

| Applicable tube types | Manu- facturer | Article number | Inner tube diameter | Shore hardness | Max. pressu- re at 25 °C |
|-----------------------|----------------------|----------------|------------------------|-------------------|-----------------------------|
| | Frelin-Wade | 95a-157 | 1.68 mm | 95 | 6.89 bar |
| | NewAge Industries | 2110535 | 1.68 mm | 85 | 9.31 bar |
| | SMC | TU0212BU-20 | 1.2 mm | - | 7.50 bar |

Digital Input Specifications

| | | |
|---------------|------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 3.7 mA at +24 V | |
| Input delay | typically 0.5 ms | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V power supply) | typically 55 mA | maximum 60 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V power supply) | typically 10 mA | maximum 15 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-008-821 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Input Module EZ 101



with 10 digital inputs

The S-DIAS EZ 101 digital input module is equipped with 10 inputs and a +24 V signal for reading the signal states "0" and "1". To suppress noise in the signal lines, according input filters are provided.

The EZ 101 is used for the implementation of the Euromap interface.

The fed in supply voltage is protected with a self-resettable PTC-fuse (200 mA at 23 °C) available again at the power plug.

Digital Input Specifications

| | | |
|---------------|-----------------|---------------|
| Number | 10 | |
| Input voltage | typically +24 V | maximum +36 V |
| Signal level | low: < +5 V | high: > +15 V |
| Input current | 6.9 mA at +24 V | |
| Input delay | typically 5 ms | |

Electrical Requirements

| | | |
|---|--|---------------|
| Supply voltage +24 V IN | +18-36 V DC | |
| +24 V IN current consumption | according to the current consumption of the external circuit of the +24 V output (maximum 200 mA with 23 °C) | |
| Supply voltage +24 V OUT | +18-36 V DC | |
| Current drain at +24 V OUT | maximum 200 mA | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Artikel number | 20-051-101 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Output Module EZ 102



with 10 digital outputs

The S-DIAS EZ 102 digital output module has 10 short-circuit proof, galvanically isolated, digital outputs in 2 groups (+24 V/100 mA). The power supply for each group is monitored for under voltage.

The EZ 102 is used for the implementation of the Euromap interface.

Digital Output Specifications

| | |
|---|-------------------------------|
| Number | 10 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 0,1 A |
| Maximum total current (entire module) | 1 A |
| Maximum braking energy of outputs (inductive load) | maximum 0,1 Joule/channel |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 200 µs |
| Turn-off delay | < 200 µs |
| Galvanic separation | yes (isolation voltage 300 V) |

Electrical Requirements

| | | |
|---|--|---------------|
| +24 V supply voltage/1-2 | +18-36 V DC | |
| Current consumption of voltage supply +24 V/1-2 | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | |
|---------------------------|--|
| + 24 V/1-2 supply voltage | supply voltage > 18 V (DC OK-LED lights green) |
|---------------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-051-102 |
| Dimensions | 12,5 x 104,2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Digital Output Module EZ 122



with 12 digital outputs

The S-DIAS EZ 122 digital output module has 12 short-circuit proof, galvanically isolated, digital outputs in 2 groups (+24 V/100 mA). The power supply for each group is monitored for under voltage.

The EZ 122 is used for the implementation of the Euromap interface.

Digital Output Specifications

| | |
|---|-------------------------------|
| Number | 12 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 0,1 A |
| Maximum total current (entire module) | 1,2 A |
| Maximum braking energy of outputs (inductive load) | maximum 0,1 Joule/channel |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 200 µs |
| Turn-off delay | < 200 µs |
| Galvanic separation | yes (isolation voltage 300 V) |

Electrical Requirements

| | | |
|---|--|---------------|
| +24 V supply voltage/1-2 | +18-36 V DC | |
| Current consumption of voltage supply +24 V/1-2 | corresponds to the load on the digital outputs | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 45 mA | maximum 50 mA |

Voltage Monitor

| | |
|---------------------------|--|
| + 24 V/1-2 supply voltage | supply voltage > 18 V (according DC OK-LED lights green) |
|---------------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-051-122 |
| Dimensions | 12,5 x 104,2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Power Supply KL 090



with 9, +24 V terminals
9, 0 V terminals

The S-DIAS KL 090 power supply module has a connection for a +24 V supply with GND and distributes power over nine outgoing +24 V supplies with GND, separated into four supply groups.

+24 V Power Supplies

| | |
|---|---|
| Number of +24 V supplies | 9 (distributed over 4 supply groups) |
| Short-circuit proof | yes |
| Maximum allowable continuous load current/supply connection | 2 A |
| Maximum allowable continuous load current/supply group | 2 A |
| Maximum total current /module | 6 A |
| Safety functions | short circuit current limit per supply group typically 12 A over temperature cut-off cut-off with supply under voltage |

Electrical Requirements

| | |
|----------------------|------------|
| Supply voltage +24 V | 18-30 V DC |
|----------------------|------------|

Voltage Monitor

| | |
|----------------------|--|
| Supply voltage +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-024-090 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Power Supply KL 091



with 9, +24 V terminals
9, 0 V terminals

The S-DIAS KL 091 power supply module has a connection for a +24 V supply with GND and distributes power over nine +24 V, power outputs split over four connector supply groups.

+24 V Power Supplies

| | |
|---|---|
| Number of +24 V supplies | 9 (distributed over 4 supply groups) |
| Short-circuit proof | yes |
| Maximum allowable continuous load current/supply connection | 2 A |
| Maximum allowable continuous load current/supply group | 2 A |
| Maximum total current /module | 6 A |
| Safety functions | short circuit current limit per supply group typically 12 A over temperature cut-off cut-off with supply under voltage |

Electrical Requirements

| | |
|----------------------|------------|
| Supply voltage +24 V | 18-30 V DC |
|----------------------|------------|

Voltage Monitor

| | |
|----------------------|--|
| Supply voltage +24 V | supply voltage > 18 V (DC OK-LED lights green) |
|----------------------|--|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-024-091 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS 0 V Potential Distributor Module

KL 180



with 18, 0 V terminals

The KL 180 S-DIAS 0 V potential distributor module has 18 terminals. The voltage tap is possible without an additional series terminal.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

0 V Supplies

| | |
|--|---|
| Number of 0 V supplies | 2 |
| Short-circuit proof | no |
| Internal fuse | no |
| Maximum continuous current load allowed/connection | 8 A |
| Maximum total current | 16 A (The incoming and outgoing supplies cannot exceed the maximum current of 8 A per connection!) |

Electrical Requirements

| | |
|--------------------|--------|
| 0 V supply voltage | 0 V DC |
|--------------------|--------|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-024-180 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

S-DIAS +24 V Potential Distributor Module

KL 181



with 18, +24 V terminals

The S-DIAS KL 181 +24 V potential distributor module has 18 terminals. The voltage tap is possible without an additional series terminal.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

+24 V Power Supplies

| | |
|--|---|
| Number of +24 V supplies | 2 |
| Short-circuit proof | no |
| Internal fuse | no |
| Maximum continuous current load allowed/connection | 8 A |
| Maximum total current | 16 A (The incoming and outgoing supplies cannot exceed the maximum current of 8 A per connection!) |

Electrical Requirements

| | |
|--------------------|------------|
| Power supply +24 V | 18-30 V DC |
|--------------------|------------|

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-024-181 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

S-DIAS Pixel LED Module PL 221



with control for 2x RGB pixel LED stripes and 2x 24 V PWM LED stripes

With the S-DIAS Pixel LED module PL 221, two pixel LED stripes with a maximum of 512 pixel RGB LEDs each and two +24 V PWM dimmable white LED stripes can be controlled.

Pixel LED Outputs Specifications

| | |
|---------------------------------------|--|
| Number of channels | 2 |
| Short-circuit and overload protection | yes (short-circuit or overload can be read from software through a latched status bit) |
| Supported pixel LEDs | WS2812B, WS2813 |
| Maximum number of pixel LEDs | 512 pixel LEDs |
| Data rate Pixel LED control | 800 kB/s |
| Update frequency | circa 115 Hz @ 288 pixel LEDs, 800 kB/s |
| Data width per LED | 24 bit (8 bit red/green/blue) |
| Maximum load capacity +5 V | max. 4.5 A at 50 °C environmental temperature max. 4.0 A at 55 °C environmental temperature |

24 V PWM LED Outputs Specifications

| | |
|---|--|
| Number | 2 |
| Short-circuit and overload protection | yes (short-circuit or overload can be read from software through a latched status bit) |
| Maximum permissible continuous load current/channel | 2.0 A |
| Maximum total current | 4 A (100% of on-time) |
| PWM pulse width | 0-100 % adjustable in 1 % increments |
| PWM frequency | adjustable 100 Hz - 2 kHz |
| Residual current output (off) | ≤ 10 µA |

Electrical Requirements

| | | |
|--|--|----------------|
| External +24 V supply | +18-30 V DC | |
| External current consumption +24 V | max. total current 5.4 A (2x pixel LED total current max. 1.4 A, 2x PWM output total current max. 4 A) | |
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 90 mA | maximum 100 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 6 mA | maximum 8 mA |

Article and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-018-221 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Approvals | CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Power Boost Module PSB 001



with 1 +24 V/1.6 A voltage supply for S-DIAS bus
 1 +5 V/1.6 A voltage supply for S-DIAS bus
 1 voltage monitor +24 V supply

The S-DIAS power boost module PSB 001 is used to power the voltage supply for the S-DIAS bus. The module can be integrated into an S-DIAS system and provides the following S-DIAS modules with voltage supply of +24 V/1.6 A and +5 V/1.6 A on the S-DIAS bus. The module therewith allows a configuration of the S-DIAS system with up to 64 participants.

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | Supply voltage > 18 V (corresponding DC OK-LED lights green) |
|--------------------|--|

Electrical Requirements

| | | | | |
|---|---|---------------|----------------|---------------|
| Supply voltage | +18-30 V DC UL: Class 2 or LVLC | | | |
| Current consumption of the voltage supply | the current consumption is dependent on the connected loads (max. 2,2 A) | | | |
| Current consumption on the S-DIAS bus (IN) with +24 V supply missing. | +5 V | | +24 V | |
| | typically 40 mA | maximum 50 mA | typically 5 mA | maximum 10 mA |
| Current output on the S-DIAS bus (OUT) to power the I/O/P modules | +5 V | | +24 V | |
| | maximum 1.6 A | | maximum 1.6 A | |

Article and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-002-001 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS RealTimeClock Module

RC 001



with 1 RealTimeClock battery buffered

The S-DIAS RealTimeClock module provides battery buffered date and time information for processor modules on the bus, which have no integrated real-time clock. Buffering of the RealTimeClock without supply is realized with a Lithium battery.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Performance Data

| | | |
|-----------------|--|--|
| Real-time clock | yes (battery buffered) | |
| Precision | -50 ppm to +25 ppm (typ. -5 ppm) @ 0 °C ambient temperature -50 ppm to +25 ppm (typ. -20 ppm) @ 25 °C ambient temperature -95 ppm to +15 ppm (typ. -70 ppm) @ 45 °C ambient temperature -150 ppm to -20 ppm (typ. -120 ppm) @ 60 °C ambient temperature | |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 40 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-012-001 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (in preparation) | |

S-DIAS VARAN Analyzer VA 011



with 1 VARAN In
1 VARAN Out
1 Ethernet

The VA 011 S-DIAS VARAN Analyzer module allows the analysis of communication in a real-time Ethernet VARAN bus network. The connection is made over a free VARAN port. If no port is available, an existing VARAN bus connection can simply be removed and the VARAN Analyzer inserted. The data to analyze are output through a Gigabit Ethernet port and can be evaluated with the VARAN Service Tool. The option is also available to analyze the data via Wireshark and protocol plug-in from SIGMATEK.

Performance Data

| | |
|------------------|---|
| Interfaces | 1x Gigabit Ethernet 10/100/1000 1x VARAN In (RJ45) 1x VARAN Out (RJ45) |
| Control Elements | 1x mode button (front) |
| Status LEDs | 1x RUN 1x Link/Speed Gigabit Ethernet 1x Active Gigabit Ethernet 3x Modus (shows the current operating mode) 2x VARAN Link (1x VARAN In and Out each) 2x VARAN Active (1x VARAN In and Out each) 1x DC OK |

Elektrische Anforderungen

| | |
|---|------------------------------------|
| Supply voltage | +18-30 V DC UL: Class 2 or LVLC |
| Current consumption of +24 V power supply | typically 130 mA |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Article Number and Miscellaneous

| | | |
|----------------|--------------------------------|--|
| Article number | 20-027-011 | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | |
| Standard | CE | |

S-DIAS Dummy Module BL 011



The S-DIAS BL 011 dummy module can be used as a placeholder for a later system expansion. The dummy module is an active module on the S-DIAS bus.

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8,4 Hz 1 g from 8,4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Electrical Requirements

| | | |
|---|-----------------|---------------|
| Voltage supply from S-DIAS bus | +5 V | |
| Current consumption on the S-DIAS bus (+5 V supply) | typically 35 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-015-011 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Energy Measuring Module DEE 021



The DEE 021 energy measuring module is used to measure the energy directly on the machine. The voltages from the three input phases (L1, L2 and L3) are measured and up to 12 currents are recorded. The DEE 021 has a real-time Ethernet VARAN as well as a CAN bus interface and can therefore communicate with the automation world perfectly.

With the DEE 021, input voltages, phase sequences, phase positions and the frequency are monitored. It can also detect short power disruptions and registers the 0-crossing point. The module has 12 independent channels for measuring current.

Performance Data

| | |
|------------|---|
| Interfaces | 1x VARAN In (RJ45) 1x VARAN Out (optional Ethernet (VtE)) (RJ45) 1x CAN 2x DIAS 3x voltage 12x current |
|------------|---|

Electrical Requirements

| | | |
|--|------------------|----------------|
| Supply voltage | 18-30 V DC | |
| Current consumption of power supply at +24 V DC | typically 110 mA | maximum 130 mA |
| Current consumption of power supply at +24 V DC (UL) | maximum 120 mA | |

Voltage Inputs

| | |
|------------------------------|-------------------------------------|
| Number of channels | 3 |
| Measurement range | up to 500 V AC |
| Measurement value | -8000 ... +8000 |
| Resolution | 14-bit |
| Scan rate | 50 µs |
| Analog measurement precision | 0,65 % of maximum measurement value |

Current Inputs

| | |
|------------------------------|------------------------------------|
| Number of channels | 12 |
| Measurement range | up to 1 A rms |
| Measurement value | -8000 ... +8000 |
| Resolution | 14-bit |
| Scan rate | 50 µs |
| Analog measurement precision | 0,6 % of maximum measurement value |

Connection Requirements

| | |
|--------------------------|-------------------------------------|
| Required terminal module | DKL 361, article number: 05-024-361 |
| Mechanical coding | 1 2 3 4 5 7 |

Article Number and Miscellaneous

| | |
|----------------|------------------|
| Article number | 05-068-021 |
| Standard | UL 508 (E247993) |

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |
| Protection Type (UL) | open type device | |
| pollution degree | 2 | |

S-DIAS SAFETY



S-DIAS SAFETY

With S-DIAS Safety, a slim and economic safety system is provided that can be flexibly adapted to specific application needs. The Safety systems can be combined with standard modules as desired. In addition, S-DIAS Safety can be used as a stand-alone solution.

The Safety system is TÜV-certified and complies with SIL 3 in accordance with EN / IEC 62061 and EN ISO 13849-1/-2, Category 4, PL e.

S-DIAS Safety CPU Module SCP 011



with 1 Safety Interface
1 USB Device
1 microSD Slot

The S-DIAS 011 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 011 can operate handheld devices with Emergency Stop and/ or confirmation buttons. The Safety CPU component has the safety integrity level SIL3 or SIL CL 3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

The safety-related SCP 011 is ideal for use in systems with optional modules and interface variables. The SCP 011 module alone is already a minimal system of a safety control.

Performance Data

| | |
|-------------------------|---------------------|
| Interfaces | 1x Safety Interface |
| Program interfaces | 1x USB device |
| Bus connection possible | yes |
| Miscellaneous | microSD slot |
| Supply voltage | +24 V |

Electrical Requirements

| Module Supply (Input) | | | | | | |
|---|--|------------------|----------------|-----|-------|--|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC | | | | | |
| Current, internal consumption | typically 90 mA internal consumption | | | | | |
| Current consumption | maximum 1.4 A | | | | | |
| Current consumption from the S-DIAS bus | | | +5 V | | +24 V | |
| | with missing +24 V connection (X3) | typically 170 mA | maximum 200 mA | 0 A | 0 A | |
| | with existing +24 V connection (X3) | 0 A | 0 A | 0 A | 0 A | |

S-DIAS Bus/Safety Supply (Output)

| | | | |
|----------------|--|------------|------------|
| Voltage supply | in the S-DIAS bus | +5 V | +24 V |
| | | 0 A | 0 A |
| | in the S-DIAS Safety bus (supply of the I/O modules) | +12 V | +24 V |
| | | max. 0.8 A | max. 0.8 A |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-890-011 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) | |
| | 0 ... +60 °C starting with HW version 1.70 (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating | |
| | > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety CPU Module SCP 111



- with 1 Safety Interface
- 1 USB Device
- 1 microSD Slot
- 800 mA for supply of E/A modules

The S-DIAS 011 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 111 can operate handheld devices with Emergency Stop and/or confirmation buttons. The Safety CPU component has the safety integrity level SIL3 or SIL CL 3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

With the SCP 111, the safe process data is transmitted with its own safety protocol (FSoE).

Performance Data

| | | |
|------------------------------------|--|------------|
| CPU | ARM Cortex M μ Controller | |
| Addressable safety I/O modules | S-DIAS Safety Bus: 16 | |
| Data memory | Type | SRAM |
| | Memory | 24 kbytes |
| Program memory | Type | Flash |
| | Memory | 224 kbytes |
| Remnant memory for parameter lists | - | |
| Remnant memory for variables | - | |
| Interfaces | 1x microSD card holder 1x Safety interface 1x S-DIAS IN/OUT 1x Safety bus OUT | |
| Programming interfaces | 1x USB device | |
| Bus connection possible | yes | |
| Status LEDs | yes | |

Electrical Requirements

| Module Supply (Input) | | | | | |
|---|--|------------------|----------------|------------|-------|
| Supply voltage | +18-30 V DC, typically +24 V DC UL: Class 2 or LVLC | | | | |
| Current, internal consumption | typically 90 mA internal consumption | | | | |
| Current consumption | maximum 1.4 A | | | | |
| Current consumption from the S-DIAS bus | | | +5 V | | +24 V |
| | with missing +24 V connection (X3) | typically 170 mA | maximum 200 mA | 0 A | 0 A |
| | with existing +24 V connection (X3) | 0 A | 0 A | 0 A | 0 A |
| S-DIAS Bus/Safety Supply (Output) | | | | | |
| Voltage supply | in the S-DIAS bus | +5 V | | +24 V | |
| | | 0 A | | 0 A | |
| | in the S-DIAS Safety bus (supply of the I/O modules) | +12 V | | +24 V | |
| | | max. 0.8 A | | max. 0.8 A | |

Article Number and Miscellaneous

| | |
|----------------|----------------------------------|
| Article number | 20-890-111 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) | |
| | 0 ... +60 °C starting with HW version 1.10 (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating | |
| | > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| | | |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety CPU Module SCP 211



with 1 Safety Interface
1 USB Device
1 microSD Slot
1600 mA for supply of I/O modules

The S-DIAS SCP 211 Safety CPU module supports up to 16 Safe I/O modules. In addition, the SCP 211 can operate handheld devices with Emergency stop switch, consent button and key switch. The Safety CPU component has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e), Category 4 (EN ISO 13849-1).

With the SCP 211, the safe process data is transmitted with its own safety protocol (FSOE).

Performance Data

| | | |
|------------------------------------|--|---------------------------|
| CPU | ARM Cortex M μ Controller | |
| Addressable safety I/O modules | S-DIAS Safety Bus: 16 | |
| Data memory | Type | SRAM |
| | Memory | 500 kbytes |
| Program memory | Type | Flash |
| | Memory | 1 Mbyte |
| Remnant memory for parameter lists | Type | SPI-Flash |
| | Memory | 64 kbytes |
| | Life span | min. 100.000 write access |
| Remnant memory for variables | Type | EERAM |
| | Memory | 1000 byte |
| Interfaces | 1x microSD card holder 1x Safety interface 1x S-DIAS IN/OUT 1x Safety bus OUT | |
| Programming interfaces | 1x USB device | |
| Bus connection possible | yes | |
| Status LEDs | yes | |

Electrical Requirements

| Module Supply (Input) | | | | | |
|---|--|------------------|----------------|------------|-------|
| Supply voltage | +19.2-28.8 V DC, typically +24 V DC SELV/PELV | | | | |
| Current, internal consumption | typically 90 mA internal consumption | | | | |
| Current consumption | maximum 2.4 A | | | | |
| Current consumption from the S-DIAS bus | | | +5 V | | +24 V |
| | with missing +24 V connection (X3) | typically 250 mA | maximum 300 mA | 0 A | 0 A |
| | with existing +24 V connection (X3) | 0 A | 0 A | 0 A | 0 A |
| S-DIAS Bus/Safety Supply (Output) | | | | | |
| Voltage supply | in the S-DIAS bus | +5 V | | +24 V | |
| | | 0 A | | 0 A | |
| | in the S-DIAS Safety bus (supply of the I/O modules) | +12 V | | +24 V | |
| | | max. 0.8 A | | max. 1.6 A | |

Article Number and Miscellaneous

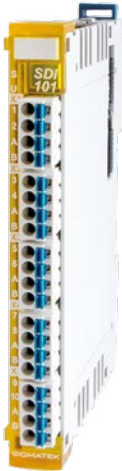
| | |
|----------------|--------------------------------|
| Article number | 20-890-211 |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) |
| Approvals | CE, TÜV EC type approved |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating | |
| | > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| | | |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety Digital Input Module

SDI 101



with 10 secure inputs
1 redundant output signal (short-circuit proof)

The S-DIAS SDI 101 Safety digital input module has the safety integrity level SIL3 (EN / IEC 62061) or Performance level e (PL e) (EN ISO 13849-1/-2).

To test inputs and detect cross circuits (e.g. Emergency Stop), the SDI 101 has two non-safe signal outputs, TA and TB.

Input Specifications

| | | |
|---------------------|------------------|--------------------|
| Number | 10 | |
| Input voltage | +24 V DC | |
| Input voltage range | minimum +18 V | maximum +30 V |
| Signal level | low: $\leq +5$ V | high: $\geq +15$ V |
| Switching threshold | typically +11 V | |
| Input current | 3 mA at +24 V | |
| Input delay | 0.5 ms | |

Signal Output Cross-Circuit Detection Specifications

| | | |
|----------------------|---------------------|---------------|
| Number | 5x signal A | 5x signal B |
| Rated output voltage | +24 V DC | |
| Output voltage range | minimum +18 V | maximum +30 V |
| Output current | 100 mA at +24 V | |
| Miscellaneous | short-circuit proof | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V power supply) | typically 12 mA | maximum 15 mA |
| Voltage supply from Safety bus | +24 V | |
| Current consumption on the Safety bus (+24 V power supply) | typically 44 mA | maximum 50 mA |

Article Number and Miscellaneous

| | | |
|----------------|----------------------------------|--|
| Article number | 20-891-101 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) 0 ... +60 °C (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety Digital Mixed Module SDM 081



- with 6 safe inputs
- 2 safe outputs
- 1 redundant output signal (short-circuit proof)

The S-DIAS Safety SDM 081 digital mixed module has the safety integrity level SIL3 in accordance with EN / IEC 62061 or Performancelevel e (PL e) in accordance with EN ISO 13849-1/-2. The safe outputs are used for the safety-oriented output of two actuator signals to, for example, control relays, valves, etc. The safety inputs are used for reading six actuator signals. To test inputs and detect cross circuits the SDM 081 has two non-safe signal outputs, A and B.

Input Specifications

| | | |
|---------------------|------------------|--------------------|
| Number | 6 | |
| Input voltage | +24 V DC | |
| Input voltage range | minimum +18 V | maximum +30 V |
| Signal level | low: $\leq +5$ V | high: $\geq +15$ V |
| Switching threshold | typically +11 V | |
| Input current | 3 mA at +24 V | |
| Input delay | 0.5 ms | |

Signal Output Cross-Circuit Detection Specifications

| | | |
|----------------------|---------------------|---------------|
| Number | 3x signal A | 3x signal B |
| Rated output voltage | +24 V DC | |
| Output voltage range | minimum +18 V | maximum +30 V |
| Output current | 100 mA at +24 V | |
| Miscellaneous | short-circuit proof | |

Output Specifications

| | | |
|---|--|-----------------|
| Number | 2 | |
| Rated output voltage | +24 V DC | |
| Output voltage range | minimum +18 V | maximum +30 V |
| Maximum output current | 2 A | |
| Maximum total current (2 outputs) | 4 A up to a max. environmental temperature of 55 °C | |
| Brake voltage with switching-off inductive loads | typically 0.85 V | |
| Maximum switch-off energy of the outputs (inductive load) | maximum 0.4 Joule per channel | |
| Turn-on delay | < 200 μ s | |
| Turn-off delay | < 1 ms | |
| Miscellaneous | short-circuit proof | |
| Cut-off test signal | < 1.5 ms | |
| Cutoff test pulse width (t_1) | minimum 0.1 ms | maximum 1.5 ms |
| Cutoff test pulse interval bet. FET Test and HSS Test (t_2) | minimum 112 ms | maximum 6450 ms |
| Cutoff test pulse interval (t_3) | 60 s | |

Electrical Requirements

| | |
|--|---------------|
| Voltage supply from Safety bus | +12 V |
| Current consumption on the Safety bus (+12 V power supply) | maximum 34 mA |
| Voltage supply from Safety bus | +24 V |
| Current consumption on the Safety bus (+24 V power supply) | maximum 21 mA |

Article Number and Miscellaneous

| | |
|----------------|---------------------------------------|
| Article number | 20-895-081 |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) |
| Standard | UL 508 (E247993) |
| Approvals | cULUS, CE, TÜV Austria EG type-tested |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) 0 ... +60 °C (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz 5 g from 8 Hz-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Notes

S-DIAS Safety SNC Incremental Encoder Module

SNC 021



with 2 Incremental encoder inputs

The S-DIAS Safety SNC incremental encoder module SNC 021 provides the values of two incremental encoders, the Safety CPU as well as the non-Safe CPU (standard PLC).

The two-channel safety function “monitors” the increments in the incremental encoder interfaces and processes the so-called Safety core in two micro controllers with cross-communication.

I-encoder Specifications

| | |
|-------------------------------|---|
| Number of channels | 2 |
| Encoder | Incremental encoder with RS422 Interface with null position trace. |
| Input frequency | 0.75 MHz |
| Counter frequency | 3 MHz |
| Signal analysis | 4x |
| Encoder resolution | maximum 12 bits |
| Encoder power supply | +5 V supply, short-circuit proof with monitoring function and current measurement (+ 5 V is generated from +24 V at X3) |
| Status LED | yes |
| I-encoder current consumption | maximum 300 mA per encoder |

Electrical Requirements

| | | |
|--|-----------------------|---------------------|
| Supply voltage for the encoder supply | +18-30 V | |
| Current consumption of supply voltage for the encoder supply | typically 162 mA/24 V | maximum 200 mA/30 V |
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V supply) | typically 75 mA | maximum 90 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 33 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|--|--|
| Article number | 20-896-021 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | Two-channel application: | EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4 |
| | One-channel application: | EN 62061 SIL 3 EN ISO 13849-1 PL d/Cat. 2 |
| | UL 508 (E247993) | |
| Approvals | CE, $c_{UL_{us}}$, TÜV Austria EG type-tested | |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C (UL) 0 ... +60 °C (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz 5 g from 8 Hz-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety Relay Output Module

SRO 021



with 2 safe outputs

The S-DIAS Safety SRO 021 relay output module has the safety integrity level SIL3 (EN/IEC 62061) or Performance level e (PL e) (EN ISO 13849-1/-2).

The safe outputs are used for the safety related output of two actuator signals, for example to control relays, valves, etc.

Relay Output Specifications

| | | |
|-----------------|--|--|
| Number | 2 | |
| Configuration | two-channel | |
| Voltage range | maximum +30 V | |
| Contact current | maximum 6 A by 55 °C maximum 4 A by 60 °C | |
| Miscellaneous | no protective circuit | |

Electrical Requirements

| | | |
|--|-----------------|----------------|
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V power supply) | typically 30 mA | maximum 40 mA |
| Voltage supply from Safety bus | +24 V | |
| Current consumption on the Safety bus (+24 V power supply) | typically 90 mA | maximum 100 mA |

Article Number and Miscellaneous

| | | |
|----------------|--|--|
| Article number | 20-893-021 | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | |
| Standard | EN 62061 SIL 3 EN ISO 13849-1 PL e/Kat. 4 UL 508 (E247993) | |
| Approvals | CE, TÜV EG-Baumustergeprüft, cUL _{US} | |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) +55 ... +60 °C with derating since HW version 3.10 (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety Relay Output Module

SRO 022



with 2 safe outputs

The S-DIAS Safety SRO 022 relay output module has the safety integrity level SIL3 (EN / IEC 62061) or Performancelevel e (PL e) (EN ISO 13849-1/-2).

Both outputs are used for the Safety-oriented closing (NO) of an electric circuit with a permissible rated voltage of 24 V DC / 230 V AC and a maximum continuous current of 6 A.

Relay Output Specifications

| | | |
|---------------------------------------|--|--|
| Number | 2 | |
| Configuration | two-channel | |
| Contact | normally open | |
| Relay type | SIS212 21VDC SEN | |
| Nominal voltage | +24 V DC | 230 V AC |
| Switching voltage | maximum +30 V DC | maximum 250 V AC |
| Maximum continuous current /channel | maximum 6 A at 55 °C maximum 4 A at 60 °C | maximum 6 A at 55 °C maximum 4 A at 60 °C |
| Short-circuit and overload protection | external fuse category gG, maximum 6 A | |
| Concurrence of all outputs | 100 % | |
| Response time | typically 10 ms | |
| fall time | typically 3 ms | |
| Miscellaneous | no protective circuit | |
| Voltage range | maximum +30 V | |
| Contact current | maximum 6 A | |
| Miscellaneous | no protective circuit | |

Electrical Requirements

| | | |
|--|-----------------|----------------|
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V power supply) | typically 30 mA | maximum 40 mA |
| Voltage supply from Safety bus | +24 V | |
| Current consumption on the Safety bus (+24 V power supply) | typically 90 mA | maximum 110 mA |

Article Number and Miscellaneous

| | | |
|----------------|---|--|
| Article number | 20-893-022 | |
| Dimensions | 25 x 104.2 x 72 mm (W x H x D) | |
| Standard | EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4 | |
| Approvals | CE, UL in preparation, TÜV-Austria EG type tested | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) +55 ... +60 °C with derating (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m Over voltage category II (up to 5000 hm) Over voltage category III (only up to 2000 hm) | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards – immunity requirements for equipment designed to perform functions in safety-based systems (functional safety) at industrial facilities) according to EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety SSI Absolute Value Encoder SSI 021



with 2 SSI encoder

The S-DIAS Safety SSI absolute value encoder module SSI 021 provides the values of two absolute value encoders, the Safety CPU as well as the non-Safe CPU (standard PLC). Since hardware version 2.0 rotary encoders are supported.

The 2-channel Safety function is implemented by processing the position values in the so-called Safety core (two micro controllers with cross communication). The safety-related component of the module meets the requirements for SIL3 in accordance with EN / IEC 62061 and PL e, cat. 4 in accordance with EN ISO 13849-1/-2 (with two-channel use).

SSI Encoder Specifications

| | | |
|----------------------|--|--|
| Number | 2 | |
| Encoder | absolute encoder with RS422 interface | |
| Data transfer speed | 125 kHz, 250 kHz, 500 kHz, 1 MHz (configurable) | |
| Encoder resolution | maximum 32 bits | |
| Coding | binary/gray | |
| Encoder power supply | +24 V supply, maximum 300 mA internal voltage monitor +24 V (+20 %/-15 %) | |
| Status LED | yes | |

Electrical Requirements

| | | |
|--|-----------------|----------------|
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V supply) | typically 70 mA | maximum 100 mA |
| Voltage supply from S-DIAS bus | +24 V | |
| Current consumption on the S-DIAS bus (+24 V supply) | typically 30 mA | maximum 50 mA |

Article Number and Miscellaneous

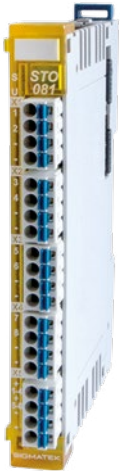
| | | |
|----------------|--|---|
| Article number | 20-894-021 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | 2-channel application: | EN 62061 SIL 3 EN ISO 13849-1 PL e/Cat. 4 |
| | 1-channel application: | EN 62061 SIL 2 EN ISO 13849-1 PL c /Cat. 2 |
| | UL 508 (E247993) | |
| Approvals | CE, $c_{UL_{US}}$, TÜV Austria EG type-tested | |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) 0 ... +60 °C starting with HW version 3.10 (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | Pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

S-DIAS Safety Digital Output Module

STO 081



with 8 secure outputs

The S-DIAS Safety 081 digital output module has the safety integrity level SIL3 (EN / IEC 62061) or Performance level e (PL e) (EN ISO 13849-1/-2).

The safe outputs are used for the safety-oriented output of eight actuator signals to, for example, control relays, valves, etc.

Output Specifications

| | | | |
|---|--|---|---|
| Number | 8 | | |
| Rated output voltage | +24 V DC | | |
| Output voltage range | minimum +18 V | maximum +30 V | |
| Maximum output current | 2 A | | |
| Maximum total current Per output group (2 outputs) | 5 A | | |
| Maximum total current (complete module) | 10 A up to a max. of 45 °C Ambient temperature | 8 A up to a max. of 55 °C Ambient temperature | 6 A up to a max. of 60 °C Ambient temperature |
| Brake voltage with switching-off inductive loads | typically 0.85 V | | |
| Maximum switch-off energy of the outputs (inductive load) | maximum 0.4 Joule per channel maximum 1.2 Joule (entire module) | | |
| Turn-on delay | < 200 µs | | |
| Turn-off delay | < 1 ms | | |
| Miscellaneous | short-circuit proof | | |
| Cut-off test signal | < 1.5 ms | | |

| | | |
|---|----------------|-----------------|
| Cutoff test pulse width (t_1) | minimum 0.1 ms | maximum 1.5 ms |
| Cutoff test pulse interval bet. FET Test and HSS Test (t_2) | minimum 112 ms | maximum 6450 ms |
| Cutoff test pulse interval (t_3) | 60 s | |

Electrical Requirements

| | | |
|--|-----------------|---------------|
| Voltage supply from Safety bus | +12 V | |
| Current consumption on the Safety bus (+12 V power supply) | typically 42 mA | maximum 50 mA |
| Voltage supply from Safety bus | +24 V | |
| Current consumption on the Safety bus (+24 V power supply) | typically 36 mA | maximum 40 mA |

Article Number and Miscellaneous

| | | |
|----------------|---------------------------------------|--|
| Article number | 20-892-081 | |
| Dimensions | 12.5 x 104.2 x 72 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |
| Approvals | cULUS, CE, TÜV Austria EG type-tested | |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C (UL) 0 ... +60 °C (CE) | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | Pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

Safety Input Box SIB 061



with 6 safe inputs
1 double clock output signal (short circuit proof)

The Safety Input Box SIB 061 has the Safety integrity level SIL3 (EN / IEC 62061) or Performance-level e (PL e) (EN ISO 13849-1/-2). The Safety inputs are used for reading 6 actuator signals (Emergency Stop, confirmation button etc.).

To test inputs and detect crossed circuits (e.g. Emergency Stop), the SIB 061 has 2 non-safe signal outputs, TA and TB.

Input Specifications

| | | |
|---------------------|-----------------|---------------|
| Number | 6 | |
| Input voltage | +24 V DC | |
| Input voltage range | minimum +18 V | maximum +30 V |
| Signal level | low: ≤ +5 V | high: ≥ +15 V |
| Switching threshold | typically +13 V | |
| Input current | 3 mA at +24 V | |
| Input delay | 0.5 ms | |

Signal Output Cross-Circuit Detection Specifications

| | | |
|----------------------|---------------------|---------------|
| Number | 3x signal A | 3x signal B |
| Rated output voltage | +24 V DC | |
| Output voltage range | minimum +18 V | maximum +30 V |
| Output current | 100 mA at +24 V | |
| Miscellaneous | short-circuit proof | |

Electrical Requirements

| | |
|---|-----------------------|
| Supply voltage | +24 V DC |
| Supply voltage (UL) | +24-30 V DC (Class 2) |
| Supply voltage range | +18-30 V DC |
| Current consumption (+24 V power supply, own consumption) | typically 35 mA |

CAN Bus

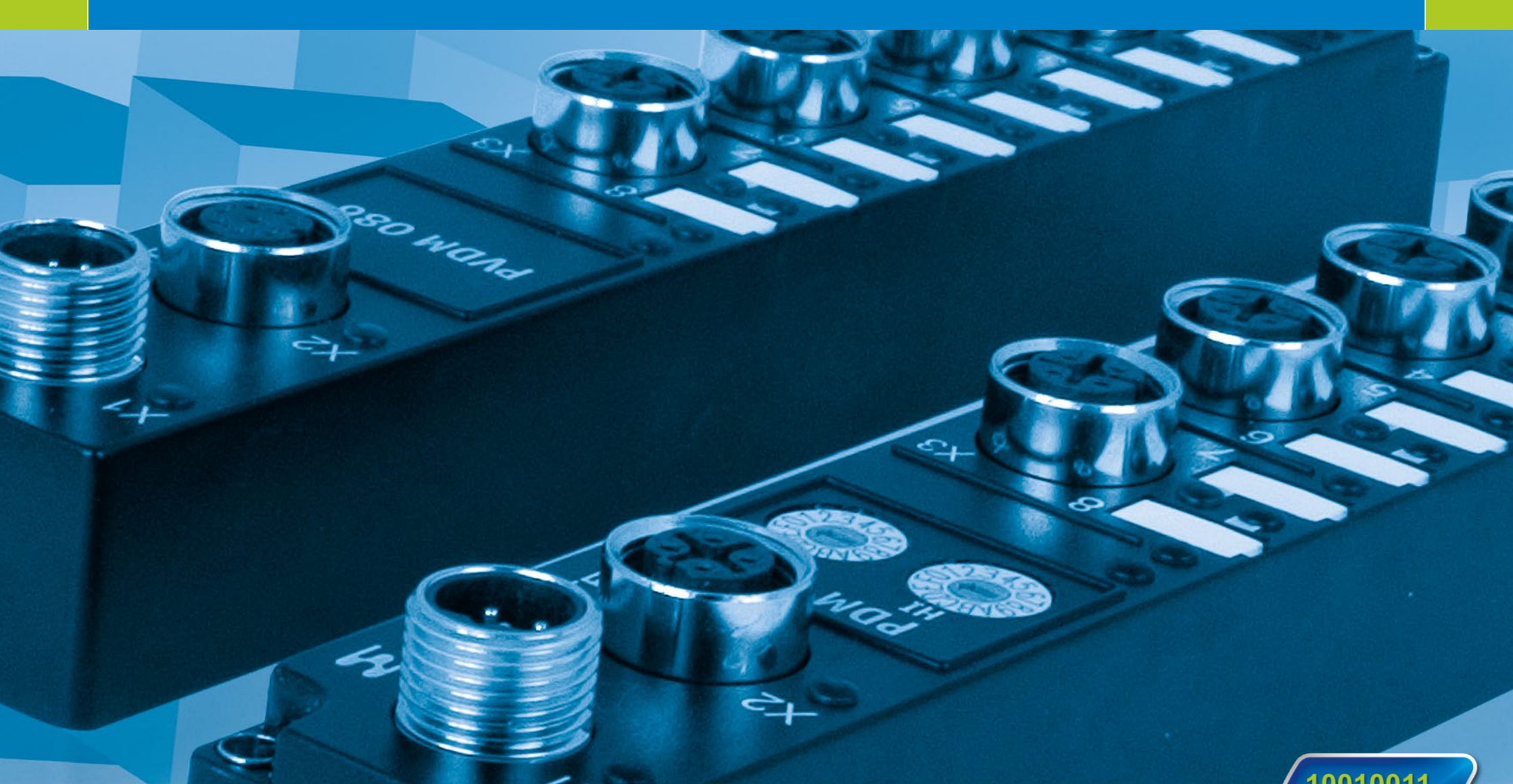
| | |
|----------------------|----------------|
| Baud rate | 500 kBit/s |
| Max. cable length | 80 m |
| Terminating resistor | 120 Ω internal |

Article Number and Miscellaneous

| | |
|----------------|---------------------------------|
| Article number | 20-895-081 |
| Dimensions | 95.5 x 73.5 x 16 mm (W x H x D) |
| Standard | UL in preparation |
| Approvals | CE, TÜV Austria E6 type-tested |

Environmental Conditions

| | | |
|---------------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | -10 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with 61000-6-7:2015 (Generic standards - Immunity requirements for equipment intended to perform functions in safety-related systems (functional safety) at industrial locations) in accordance with EN 61000-6-2:2007 (industrial area) (increased requirements in accordance with IEC 62061) | |
| EMC noise generation | in accordance with EN 61000-6-4:2007 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |



P-DIAS I/O System (IP67)

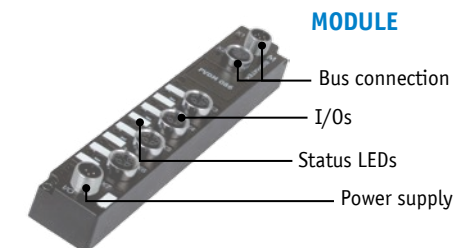


System P-DIAS

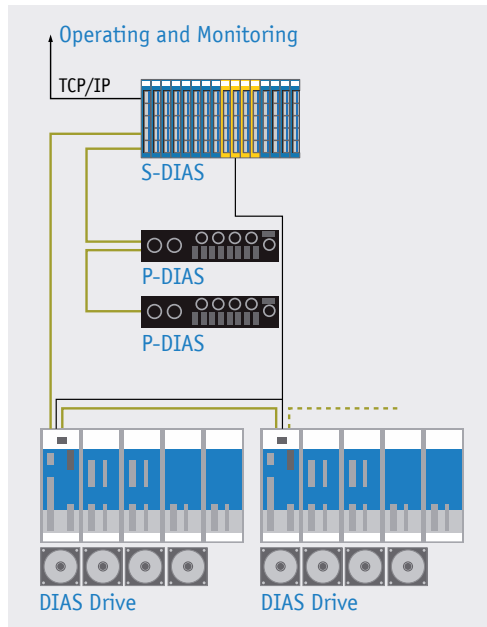
The P-DIAS family completes the DIAS control system in the IP67 protected area. It is ideal for modular, decentralized control system configurations and can be combined with other SIGMATEK component series as desired. In the field, data can be collected or distributed.

Application flexibility is an important feature of the P-DIAS series. The digital modules are equipped with 8 channels that can be used as in- or outputs.

The peripheral components are connected with M12 connector plugs, which are optimized for use under harsh operating conditions.

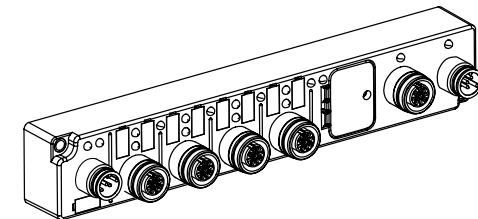
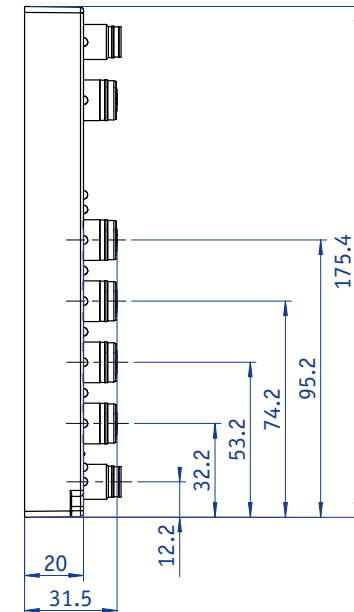
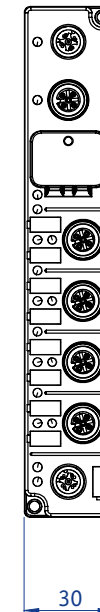


Possible Configuration



For decentralized control system configurations, the P-DIAS components are used in areas where IP67 protection is needed.

Mechanical Dimensions



P-DIAS Modules

Digital I/Os

Analog I/Os



Protected VARAN Digital Mixed Module

PVDM 086



The PVDM 086 Protected VARAN Digital Mixed Module has eight +24 V/2 A digital outputs (positive switching) that are back-readable and therefore can be used as inputs. In addition, the outputs are short-circuit protected. There are also diverse diagnostic functions available in this module:

- The status of the outputs is back readable.
- Each I/O socket is monitored for current surges in the sensor supply.

The status is shown with red LEDs and can be read back. Input filters are available to suppress noise signals occurring in the signal lines.

Interfaces

| | |
|------------|---|
| Interfaces | 1x VARAN In (M12) 1x VARAN Out (M12) |
|------------|---|

Digital Outputs

| | |
|---|------------------------|
| Number of outputs | 8 |
| Short-circuit proof | yes |
| Back readable | yes |
| Maximum continuous current load allowed per channel | 2 A |
| Maximum total current per group of 4 (I/O 1-4 or 5-8) | 2 A |
| Maximum total current (all 8-channels) | 4 A (100 % of on-time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (output inactive) | ≤ 1 mA |
| Turn-on delay | < 200 μs |
| Turn-off delay | < 200 μs |
| Status display | yellow LEDs |

Digital Inputs (back readable output)

| | | |
|-----------------------------|-------------------------------|---------------|
| Number of inputs | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Sensor supply current limit | maximum 100 mA per I/O socket | |
| Signal level | low: < 4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |
| Status display | yellow LEDs | |

Electrical Requirements

| | | |
|---------------------------------------|---|----------------|
| Bus supply voltage | 18-30 V DC | |
| I/O supply | 18-30 V DC | |
| Current consumption of the bus supply | typically 85 mA | maximum 100 mA |
| Current consumption of I/O supply | depends on the load of the digital outputs and the current capacity on the sensor supply: maximum 4 A | |

Article Number and Miscellaneous

| | |
|----------------|--------------------------------|
| Article number | 14-108-086 |
| Dimensions | 30 x 175 x 32.8 mm (W x H x D) |

Environmental Conditions

| | | |
|---------------------------|-------------------------------|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| EMC stability | in accordance with EN 61131-2 | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP67 |

Protected VARAN Digital Mixed Module

PVDM 087



The protected VARAN Digital Mixed Module PVDM 087 has four digital outputs +24 V/2 A (positive switching) and four digital inputs. In- and outputs are galvanically separated from the VARAN bus. Inputs and outputs have a separate supply. The outputs are also back-readable. There are also diverse diagnostic functions available in this module. Input filters are available to suppress noise signals occurring in the signal lines.

Next to the I/O connectors, LEDs show the signal status as well as the error status. The VARAN Out port allows the construction of the VARAN bus in a line structure. The component has IP67 protections.

Interfaces

| | |
|------------|---|
| Interfaces | 1x VARAN In (M12) (maximum length: 100 m) 1x VARAN Out (M12) (maximum length: 100 m) |
|------------|---|

Digital Outputs

| | |
|--|---|
| Number of outputs | 4 |
| Short-circuit proof | yes |
| Galvanic isolation | yes (60 V) |
| Maximum continuous current load/ channel | 4 A (50 % of on time) |
| Maximum total current | 4 A (50 % of on time) 2 A (100 % of on time) |
| Voltage drop over power supply (output current 4 A) | ≤ 1 V |
| Residual current (inactive) | ≤ 0.1 mA |
| Turn-on delay | < 300 μs |
| Turn-off delay | < 300 μs |
| Status display | yellow LEDs |

Digital Inputs

| | | |
|------------------------------------|-------------------------|---------------|
| Number of inputs | 4 | |
| Galvanic isolation | yes (60 V) | |
| Input voltage | typically +24 V | maximum +30 V |
| Maximum sensor supply current | 80 mA per input | |
| Signal level | low: < +5 V | high: > +15 V |
| Switching threshold | typically +11 V | |
| Input current | typically 6 mA at +24 V | |
| Maximum allowable residual current | 0.1 mA | |
| Input delay | typically 6 ms | |
| Status display | yellow LEDs | |

Electrical Requirements

| | | |
|---------------------------------------|---|----------------|
| Bus supply voltage | 18-30 V DC | |
| I/O supply | 18-30 V DC | |
| Current consumption of the bus supply | typically 85 mA | maximum 100 mA |
| Current consumption of I/O supply | depends on the load of the digital outputs and the current capacity on the sensor supply: maximum 4 A | |

Article Number and Miscellaneous

| | | |
|----------------|--------------------------------|--|
| Article number | 14-108-087 | |
| Software macro | PVDM0850_IM | |
| Dimensions | 30 x 175 x 32.8 mm (W x H x D) | |
| Standard | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|-------------------------------|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Mounting position | any | |
| EMC stability | in accordance with EN 61131-2 | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP67 |

Protected VARAN DMS Module PVAI 011



A bridge circuit with a resolution of 1.1 mV/V can be connected using 4-wire technology. The supply voltage for the bridge is 10 V. The minimum bridge resistance is 100 Ω.

Interfaces

| | |
|------------|-------------------|
| Interfaces | 1x VARAN In (M12) |
|------------|-------------------|

Input Specifications

| | | |
|---|--------------------------------------|-------------------------|
| Number of channels | 1 (4-wire connection) | |
| Measurement range | 1.1 mV/V | |
| Measurement value | 0-4000 | |
| Resolution | 12-bit | |
| Conversion time per channel | ≤ 1 ms | |
| Input filter | cutoff frequency 1 kHz (1 ms) | low pass class 3 system |
| Excitation voltage | 10 V/±2.5 % | |
| Maximum voltage supply capacity | 100 mA maximum, short-circuit proof | |
| Min. Bridge resistance | 100 Ω | |
| Precision of analog channel measurement | ±0.35 % of maximum measurement value | |
| Repeating accuracy | 1.1 mV/V ±0.3 % | |
| Linearity error | 1.1 mV/V ±0.35 % | |

Electrical Requirements

| | | |
|---------------------------------------|-----------------------|---------------------|
| Bus supply voltage | 18-30 V | |
| Current consumption of the bus supply | typically 75 mA/+24 V | maximum 130 mA/24 V |

Article Number and Miscellaneous

| | | |
|------------------|----------------------------------|--|
| Article number | 14-109-011 | |
| Hardware version | 1.x | |
| Standard | UL in preparation | |
| Dimensions | 148.4 x 79.4 x 55 mm (W x H x D) | |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP65 |



Industrial PCs



Industrial PCs

The SIGMATEK industrial PCs combine control and visualization tasks. The optimal processor is available for any application.

Numerous interface connections, ranging from USB and Ethernet over VARAN to CAN are available for communication with the control. An S-DVI connection provides a cost effective connection for terminals.

Low maintenance, extremely high reliability and long-term availability are strong arguments for choosing IPCs from SIGMATEK.

Industrial PCs

IPC

IPC Accessories



Industrial PC

IPC 221



The IPC 221 is an industrial PC with a Celeron1020E processor. It is used to control S-DIAS modules and has various interface connections such as: a VARAN Manager with 2 VARAN Out interfaces. A 7-segment display and 3 status LEDs provide information on the actual status of the CPU directly on the IPC.

A CompactFlash card can be used as program memory.

PC compatible.

The IPC works with a standard PC BIOS, where SIGMATEK specific settings can be made.

Performance Data

| | |
|--|--|
| Processor | Intel Celeron 1020E |
| Addressable I/O/P module | VARAN bus: 65,280 CAN bus: > 100 S-DIAS bus: 64 |
| Internal program memory (CompactFlash) | 512-Mbyte CompactFlash card (12-610-051, included in delivery) |
| Internal data memory (SRAM) | 256 kbytes (battery powered) |
| Internal memory (DDR3 RAM) | 2-Gbyte (SO-DIMM DDR3 1600 MHz) expandable up to 8 Gbytes |
| Internal cache | 2-Mbyte L3 Cache |
| Interfaces | 1x Ethernet1 10/100 (front) 1x Ethernet2 10/100 (front) 2x VARAN Out - Out 1 (front) - Out 2 (side, above the fan housing) 2x CAN 1x USB 2.0 (front) 1x DVI (front) 1x S-DVI (front) 2x UART - RS232 (front) 3x KTY temperature measuring (front) 1x machine EEPROM (for article 12-250-031) (front) 1x S-DIAS |

Performance Data

| | |
|-----------------|-----------------------------|
| Data buffer | yes (SRAM battery buffered) |
| Status display | yes |
| Status LEDs | yes |
| Real-time clock | yes |

KTY Temperature Sensor Specifications

| | |
|---|--|
| Number of channels | 3 |
| Measurement range | 1367-2980 Ω KTY10 -20 ... +80 °C |
| Converter resolution | 16-bit |
| Conversion time per channel | 1 ms |
| Sensor current | typically 0.3 mA at 25 °C |
| Cable break monitor | yes |
| Input filter | typically 2 Hz low pass 3 rd order |
| Precision of analog channel measurement | ±1 % of maximum measurement value |
| Voltage protection | up to +30 V |

Electrical Requirements

| | |
|--|--|
| Supply voltage | +18 ... +30 V DC |
| Supply voltage Current consumption (maximum total current) | maximum 5.5 A |
| Inrush current | maximum 6 A (10-500 ms, load-dependent) |
| Supply voltage Current consumption without external devices (+24 V) | 0.8 A |
| Current available for S-DIAS (+5 V) | maximum 1.6 A |
| Current available for S-DIAS (+24 V) | maximum 1.6 A |
| Available current for S-DVI (+24 V) | maximum 2 A |
| Available current for PCI (+5 V) | maximum 0.5 A (per USB connection) |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy |

Mechanical Dimensions

| | |
|---------|-------------------------------------|
| IPC 221 | 218.5 x 110.3 x 77.2 mm (W x H x D) |
|---------|-------------------------------------|

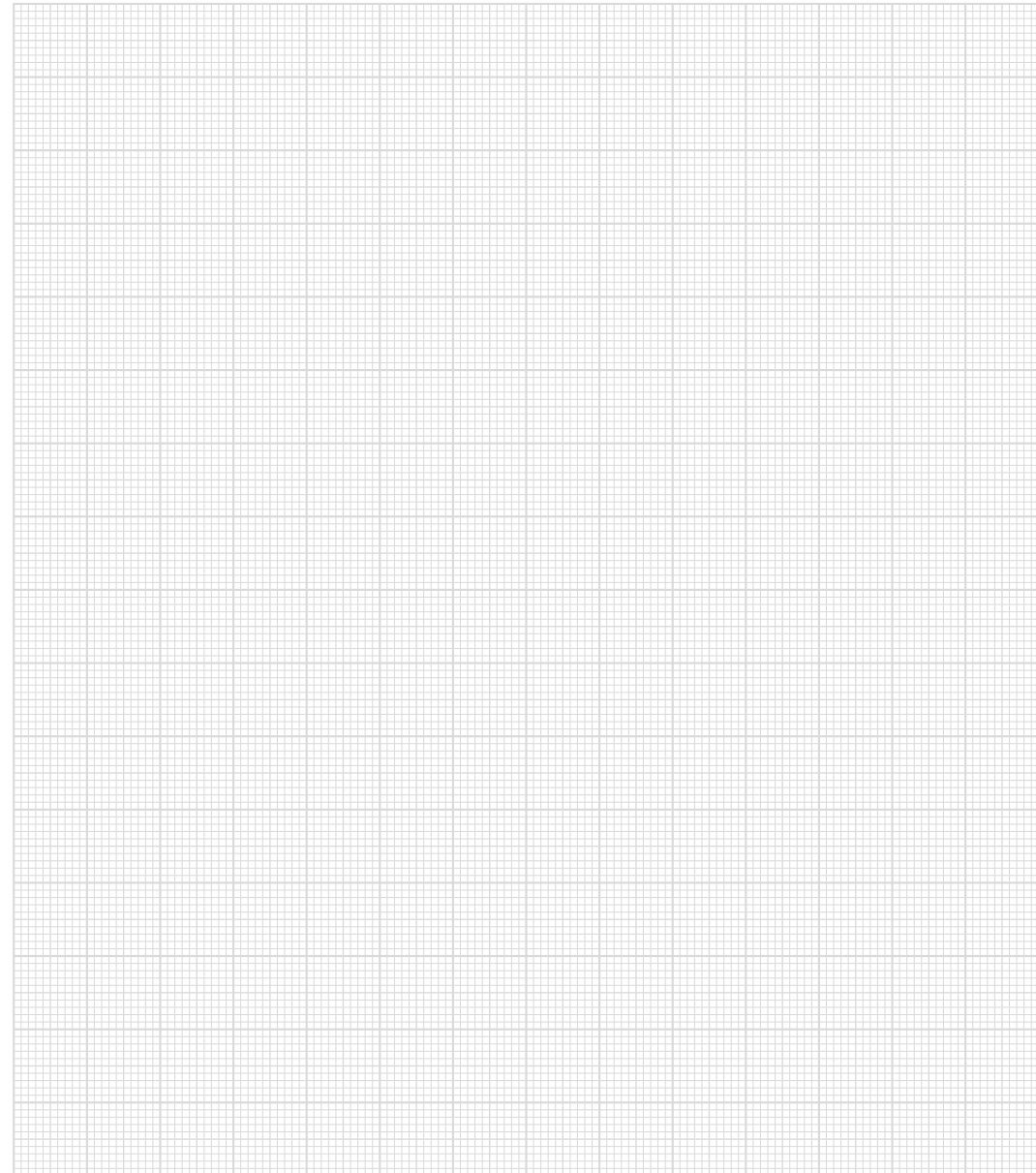
Article Number and Miscellaneous

| | |
|----------------|--------------------------------------|
| Article number | 20-450-221 |
| Standard | UL 61010-1, UL 61010-2-201 (E247993) |
| Project backup | internally on CompactFlash card |

Environmental Conditions

| | | |
|-------------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Environmental temperature | +120 °C (automatic cut-off) | |
| Maximum processor temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | Indoor use pollution degree 2 altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3,5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 (no UL-rating) |

Notes



Control Cabinet PC PC 444-W



The PC 444-W is a control cabinet PC with an Intel Celeron G3900 Skylake processor that is completely PC-compatible and operates with a standard PC BIOS.

Using the HMI-Link G2 Expansion, HMI-Link (G2) terminals can be connected to the PC 444-W. This allows USB and display signals to be transmitted up to 100 m.

Inclusive WIN 10 MUI.

Performance Data

| | |
|-----------------------|---|
| Processor | Intel Celeron G3900 |
| Hard drive | 128-Gbyte Solid State Disk |
| Main memory (DDR-RAM) | 4-Gbyte DDR4 RAM (SODIMM) |
| Graphics | Intel HD Graphics |
| Interfaces | 2x Ethernet 10/100/1000 Mbit 3x USB 2.0 2x USB 3.0 1x RS232 1x Audio (Line In, Line Out) 1x PS/2 Mouse 1x PS/2 Keyboard 1x DVI interface 1x Displayport 1x Local OUT (HMI-Link G2) |
| Real-time clock | yes |

Electrical Requirements

| | |
|-----------------------------------|--|
| Supply voltage | +18-30 V DC (Class 2 or SELV and Limited Energy) (connection: 4-pin Phoenix) |
| IDLE consumption without HMI-Link | 24 W |
| IDLE consumption with HMI-Link | 26 W |
| Max. consumption with HMI-Link | 43 W |
| Start current | 2.5 A peak – 15 ms |

Mechanical Dimensions

| | |
|----------|---------------------------------|
| PC 444-W | 80 x 223.7 x 193 mm (W x H x D) |
|----------|---------------------------------|

Article Number and Miscellaneous

| | |
|----------------|-------------------|
| Article number | 01-310-444-W |
| Standard | UL in preparation |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 Shocks |
| Protection Type | EN 60529: protected through the housing | IP20 |

Data Recording PC PC 521



The PC 521 is a data recording PC with an Intel Celeron J1900 processor that is PC-compatible and operates with a standard PC BIOS.

For better heat dissipation, a ventilator can be mounted onto the PC 521.

Performance Data

| | |
|-----------------------|--|
| Processor | INTEL Celeron J1900 |
| Hard drive | 128-Gbyte Solid State Disk |
| Main memory (DDR-RAM) | 4-Gbyte DDR3 RAM (SODIMM) |
| Graphics | Intel Graphics DX 11 |
| Interfaces | 4x Ethernet 10/100/1000 Mbit 2x USB 2.0 2x USB 3.0 1x VGA 1x Audio (Line Out) 1x HDMI |
| Real-time clock | yes (battery buffered) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | typically +24 V DC (SELV/PELV) | |
| | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | +18-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24 V | typically 1 A (without externally connected devices) | maximum 1.6 A (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 12.5 A (for 108 µs, load-dependent) | |
| Inrush current without current-limiting supply | maximum 30 A (for 23.5 µs, load-dependent) | |
| USB current load | maximum 0.5 A | |

Mechanical Dimensions

| | |
|--------------------|-------------------------------------|
| PC 521 incl. mount | 72.2 x 195.0 x 112.6 mm (W x H x D) |
|--------------------|-------------------------------------|

Article Number and Miscellaneous

| | |
|------------------|-----------------------|
| Article number | 20-018-221 |
| Operating system | Windows 10 IoT |
| Standard | UL (247993) |
| Approvals | CE, cUL _{US} |

Environmental Conditions

| | | |
|--|---|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature (without fan) | 0 ... +50 °C | |
| Environmental temperature (with fan) | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) |
| Protection type | EN 60529: protected through the housing | IP20 |

Control Panel VARAN ETV 1591



mit 15" XGA TFT-Farbdisplay

The control panel is an intelligent terminal for programming and visualization of automated processes. A touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display.

To safely back up the data before the panel is shut down, an integrated UPS is used to buffer the +24 V power supply.

With the integrated VARAN manager, the ETV 1591 offers the possibility to construct a high-performance VARAN system to operate for example, decentralized I/O modules, drive systems or communication modules. Operating system Windows 7 embedded.

Performance Data

| | |
|--|---|
| Processor | 1.4 GHz Intel® Celeron B827E |
| Intel® Smart Cache | 1.5 Mbytes |
| BIOS | AMI |
| SDRAM 50-DIMM 20-pin | 2-Gbyte DDR3 |
| SRAM | 512-Kbyte |
| Internal storage device | 100-Gbyte SATA HDD |
| Interfaces | 5x USB 2.0, Type A (High Speed 480 Mbit/s) 2x Gbit Ethernet 1x VARAN Out |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch 1x CF card socket 1x interface for connectable UPS |
| Display Resolution | 15" TFT color display 1024 x 768 pixels |
| Control panel | 5-wire touch screen (analog resistive) |

| | |
|------------------|------------------------|
| Data buffer | yes |
| Signal generator | yes |
| Status LEDs | no |
| Real-time clock | yes (battery buffered) |
| Cooling | active (fan) |

Electrical Requirements

| | | | |
|--|---|------------------|------------------|
| Supply voltage | typically +24 V DC | minimum +20 V DC | maximum +30 V DC |
| Supply voltage (UL) | 20-30 V DC (Class 2) | | |
| Current consumption Power supply +24 V | 1.25 A (without externally connected devices/100 % CPU load) (WIN7 embedded)/75 % brightness display) | | |
| Inrush current | maximum 28 A for 170 µs | | |

Terminal

| | |
|----------------------------|--------------------------------|
| Dimensions with battery | 358 x 313 x 109 mm (W x H x D) |
| Dimensions without battery | 358 x 313 x 81 mm (W x H x D) |
| Material | plastic housing: ASA |
| Weight | 5.3 kg |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-27 | 150 m/s ² |
| Shock resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP54 rear panel: IP20 |

Display

| | |
|--------------------|---|
| Type | 15" TFT color display |
| Resolution | 1024 x 768 pixels |
| Color depth | 18-bit (262 144 colors) |
| Pixel grid | 0.297 mm x 0.297 mm |
| Active surface | 304.128 mm x 228.096 mm |
| Backlighting | LED |
| Contrast | typically 700: 1 |
| Brightness | typically 400 cd/m ² |
| Angle CR > 10 from | left and right 80°, above and below 70° |

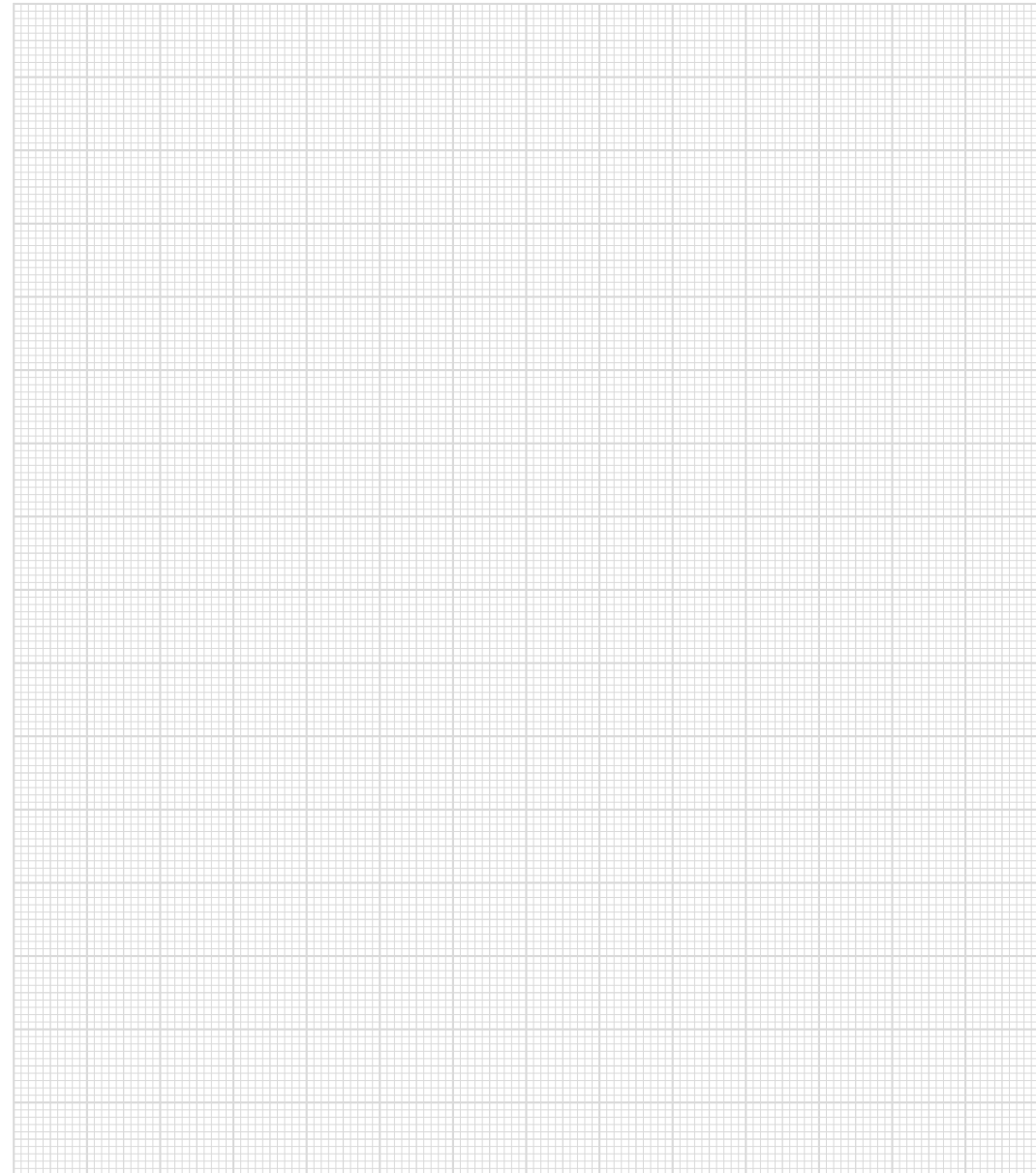
Control Unit

| | |
|-----------------------|---|
| Touch panel | analog resistive film-glass touch panel |
| Resolution | 12-bit Controller (USB) |
| Connection technology | 5-wire |

Article Number and Miscellaneous

| | |
|------------------|-----------------------------|
| Article number | 12-230-1591 |
| Operating system | Windows Embedded Standard 7 |
| Project backup | 100-Gbyte SATA HDD |
| Hardware version | 2.x |
| Standard | UL 508 (E247993) |

Notes



Uninterruptible Current Supply USV 011



The USV 011 uninterruptible current supply is used to buffer the +24 V supply voltage of an industrial PC.

Normally, the +24 V supply is switched to the +24 V output and loads the internal battery. In the event of a power failure, the internal battery assumes the current from the +24 V output.

A settable USV-time enables a flexible buffer time that is used as a controlled shutdown of the IPC.

Performance Data

| | |
|----------------------------------|---|
| Internal power storage (battery) | 2x +12 V/1.2 Ah maintenance-free lead gel battery |
| USV-time | configurable through software and DIP switches 4 to 692 seconds |
| Charging circuit | constant current/voltage current: 270 to 350 mA voltage: temperature controlled |
| Interfaces | 1x RS232 (2x connections) 2x +24 V (input & output) |
| Status LEDs | 3x battery status 3x USV status |

Electrical Requirements

| | |
|-----------------------------------|---|
| Supply voltage (+24 V input) | typically +24 V DC +18 ... +30 V DC |
| Current consumption (+24 V input) | corresponds to the load on the +24 V output internal current consumption: maximal 500 mA |
| Supply voltage (+24 V output) | typically +24 V DC +18 ... +30 V DC |
| Current load (+24 V output) | maximum 3.0 A |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | with SIGMATEK foil: 01-470-011 without foil 01-470-011-0 |
| Hardware version | 1.x |
| Weight | typically 2.2 kg (with 2 batteries) |

Environmental Conditions

| | |
|---------------------------|---|
| Storage temperature | -20 ... +60 °C |
| Environmental temperature | 0 ... +40 °C At low temperatures, the available capacity of the battery sinks and the charging process takes significantly longer. At high temperatures, the self-discharge increases and the battery can be damaged through fluid loss. self discharge at 50 °C: 0.5 % (capacity per day) self discharge at 60 °C: 1.0 % (capacity per day) |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Protection type | EN 60529 IP20 |

HMI-Link Expansion



Using the HMI-Link Expansion, HMI-Link terminals can be connected to the PC32X. This allows USB and display signals to be transmitted up to 100 m.

With the quick installation of the PC insert card, the PC32x can be easily equipped with an HMI-Link interface.

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 01-311-012 |
| Hardware version | 1.x |

Performance Data

| | |
|------------|---|
| Interfaces | 1x HMI-Link (maximum length: 100 m) 1x USB 2.0 (Type B) 1x Display Port |
|------------|---|

Electrical Requirements

| | |
|---------------------|----------------------|
| Supply voltage | +5 V DC (from PC32x) |
| Current consumption | maximum 1.25 A |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0-45 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission(only when installed) | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 shocks |

HMI-Link G2 Device PC 301-E8

Using the HMI-Link G2 Device, HMI-Link (G2) terminals can be connected to the PC 3XX. USB and display signals can therewith be transmitted up to 100 m.



Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: noise emission | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 shocks |

Performance Data

| | |
|------------|--|
| Interfaces | 1x HMI Local OUT (HMI-Link G2) 1x USB 2.0 (Type B) 1x display port 1x +24 V |
|------------|--|

Electrical Requirements

| | |
|-----------------------------|----------------|
| Supply voltage | 18-30 V DC |
| Current consumption at 24 V | maximum 170 mA |

Article Number and Miscellaneous

| | |
|-----------------------|----------------------------------|
| Article number | 01-310-301-E8 |
| Mechanical dimensions | 25.1 x 210.1 x 83 mm (W x H x D) |

HMI-Link G2 Device PC 301-E12

Using HMI-Link G2 Device allows HMI-Link G2 display units to be connected with a SIGMATEK IPC. This allows the transmission of USB and display signals up to 100 m.



Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -20 ... +60°C | |
| Environmental temperature | 0 ... +50°C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz amplitude 3.5 mm 9-200 Hz 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|---|
| Interfaces | 1x HMI Local OUT (HMI-Link G2) 1x USB 2.0 (Type B) IN 1x DisplayPort IN |
|------------|---|

Electrical Requirements

| | |
|--------------------------------|--------------------------------------|
| Supply voltage | typically +24 V DC ±20 % (SELV/PELV) |
| Supply voltage (UL) | +24 V DC ±20 % (NEC Class 2 or LVLC) |
| Current consumption at 24 V DC | maximum 170 mA |

Article Number and Miscellaneous

| | |
|-----------------------|---------------------------------------|
| Article number | 01-310-301-E12 |
| Approvals | CE, UL in preparation |
| Mechanical dimensions | 25 x 204.5 x 83 mm (W x H x D) |
| Material | housing: Aluminum anodized Natural CO |
| Weight | 0.20 kg |

PCI Insert Module PCV 521



The PCV 521 PCI insert module can be used in any standard PC and serves as an interface between the PC and the VARAN bus. With the PVC 521, VARAN modules can be controlled by the PC directly.

Performance Data

| | | |
|----------------|--|--|
| PCI-Bus | 32-bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 0C00 | |
| VARAN bus | 2x VARAN Out (Manager) | |
| Status display | green: link yellow: active | |

Electrical Requirements

| | | |
|---|--------------------------|----------------|
| Supply voltage | +5 V DC (from PCI bus) | |
| Current consumption on the PCI bus (+5 V) | typically 1 mA | maximum 5 mA |
| Supply voltage | +3.3 V DC (from PCI bus) | |
| Current consumption on the PCI bus (+3.3 V) | typically 400 mA | maximum 450 mA |

Article Number and Miscellaneous

| | | |
|------------------|------------|--|
| Article number | 01-320-521 | |
| Hardware version | 1.x | |

Environmental Conditions

| | | |
|---------------------------|------------------------|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | EN 61000-6-1 | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

PCI Insert Module PCV 522



The insertable PVC 522 PCI module can be used in any standard PC. The module provides a VARAN Manager and is used as an interface between the PC and VARAN bus. With the PCV 522, VARAN modules can be controlled directly from the PC.

In addition, the PCV 522 has a battery-buffered SRAM as well as a status LED.

Performance Data

| | | |
|------------------------------|--|--|
| PCI bus | 32-Bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 2200 | |
| VARAN bus | 2x VARAN Out (Manager) | |
| Status display | green: Run | |
| Internal remnant data memory | 1024-kbyte SRAM (battery buffered) | |

Electrical Requirements

| | | |
|--|--------------------------|----------------|
| Supply voltage | +5 V DC (from PCI bus) | |
| Current consumption on the PCI bus (+5 V power supply) | typically 25 mA | maximum 30 mA |
| Supply voltage | +3.3 V DC (from PCI bus) | |
| Current consumption on the PCI bus (+3.3 V supply) | typically 250 mA | maximum 300 mA |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 01-320-522 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP20 |

PCI Insert Module PCV 531



The PCI insert module, PVC 531 with integrated VEB 031, can be used in any standard PC. A VARAN Manager is available on the PC and serves as an interface between the PC and VARAN bus.

With the PVC 531, VARAN modules can be controlled by the PC directly.

Performance Data

| | | |
|----------------|--|--|
| PCI bus | 32-Bit PCI bus card/33 MHz Vendor ID: 5112 Device ID: 0C00 | |
| VARAN bus | 2x VARAN Out (Manager) | |
| Status display | green: Link yellow: Active | |

Electrical Requirements

| | | |
|--|--------------------------|----------------|
| Supply voltage | +3.3 V DC (from PCI bus) | |
| Current consumption on the PCI bus (+3.3 V supply) | typically 400 mA | maximum 450 mA |

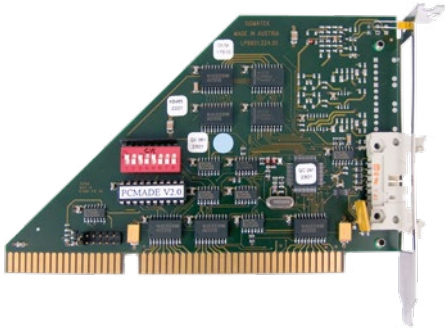
Article Number and Miscellaneous

| | | |
|------------------|------------|--|
| Article number | 01-320-531 | |
| Hardware version | 1.x | |

Environmental Conditions

| | | |
|---------------------------|---------------------------------|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC noise generation | in accordance with EN 61000-6-1 | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

Interface Card PCD 101



with 1 electrical DIAS bus (14-pins)

The PCD 101 interface card can be used in every standard PC.

It electrically connects an interface to the DIAS bus.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.

Performance Data

| | | |
|-------------|--------------------------------|--|
| AT bus | 16-bit AT bus card | |
| Interfaces | 1x DIAS bus (14-pins) | |
| I/O range | 16 bytes (16#200-16#3F0) | |
| Interrupt | 1 IRQ (5, 7, 10, 11, 12 or 15) | |
| Status LEDs | yes | |

Electrical Requirements

| | | |
|---|-----------------------|---|
| Supply voltage | +5 V DC (from AT bus) | |
| Current consumption of voltage supply | typically 100 mA | maximum 2.5 A (load on the DIAS bus) |
| Output voltage (DIAS bus supply) | minimum +4.95 V *) | maximum +5.35 V *) |
| Total current of connected DIAS modules | maximum 2 A *) | |

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

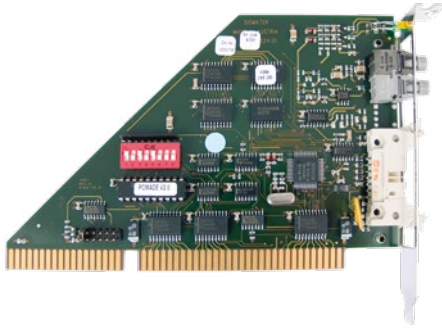
Article Number and Miscellaneous

| | |
|------------------|--------------|
| Article number | 01-320-101 |
| Software macro | SIGMATEK DLL |
| Hardware version | 2.x |

Environmental Conditions

| | |
|---------------------------|---|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0 ... +60 °C |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm! |

Interface Card PCD 111



with 1 electrical DIAS bus (14-pin)
1 HP fiber optic DIAS bus

The PCD 111 interface card can be used in every standard PC.

It connects an interface to the electrical DIAS bus, as well as a HP fiber optic connection.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.

Article Number and Miscellaneous

| | |
|------------------|--------------|
| Article number | 01-320-111 |
| Software macro | SIGMATEK DLL |
| Hardware version | 2.x |

Environmental Conditions

| | |
|---------------------------|---|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0 ... +60 °C |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm! |

Performance Data

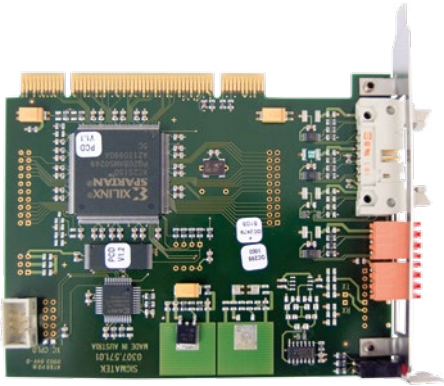
| | | |
|-------------|--|--|
| AT bus | 16-bit AT bus card | |
| Interfaces | 1x DIAS bus (14-pins) 1x HP fiber optic | |
| I/O range | 16 bytes (16#200-16#3F0) | |
| Interrupt | 1 IRQ (5, 7, 10, 11, 12 or 15) | |
| Status LEDs | yes | |

Electrical Requirements

| | | |
|---|-----------------------|---|
| Supply voltage | +5 V DC (from AT bus) | |
| Current consumption of voltage supply | typically 100 mA | maximum 2.5 A (load on the DIAS bus) |
| Output voltage (DIAS bus supply) | minimum +4.95 V *) | maximum +5.35 V *) |
| Total current of connected DIAS modules | maximum 2 A *) | |

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

Interface Card PCD 403



with 3 electrical DIAS bus
(2x 6-pins and 1x 14-pins)

The PCD 403 interface card can be used with every standard PC.

It electrically connects an interface to the DIAS bus.

DIAS modules can therefore be selected directly from the PC and a DIAS processor module is not required.

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 01-320-403 |
| Hardware version | 2.x |

Environmental Conditions

| | |
|---------------------------|---|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0 ... +60 °C |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) can only be guaranteed when the PC used also fulfills this norm! |

Performance Data

| | |
|-------------|--|
| PCI bus | 32-bit PCI insert module Vendor ID: 5112 Device ID: 0100 |
| DIAS bus | electrical: 2x socket 6-pin (Weidmüller S2L 3.5/6/90G) 1x blade terminal 14-pin (DIN 41651) |
| Status LEDs | yes |

Electrical Requirements

| | | |
|---|--------------------------|--|
| Supply voltage | +3.3 V DC (from PCI bus) | |
| Current consumption of voltage supply | typically 100 mA | maximum 150 mA |
| Supply voltage | +5 V DC (from PCI bus) | |
| Current consumption of voltage supply | typically 200 mA | maximum 800 mA (with 500 mA load on the DIAS bus) |
| Output voltage (DIAS bus supply) | minimum +4.95 V *) | maximum +5.35 V *) |
| Total current of connected DIAS modules | maximum 500 mA *) | |

*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

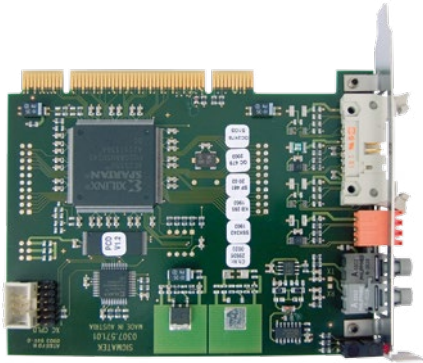
Interface Card PCD 412

with 1 optical DIAS bus (HP fiber optic)
2 electrical DIAS bus (6-pin and 14-pin)

The PCD 412 interface card can be used in every standard PC.

It connects an interface to the electrical DIAS bus as well as an HP fiber optic connection.

DIAS modules can therefore be controlled directly from the PC and a DIAS processor module is unnecessary.



*) depending on the internal power supply of the PC used. For the supply voltage on the DIAS bus, it is important to ensure that the supply voltage is in the specified range. Additionally, the maximum current capacity of the internal PC supply must be observed!

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 01-320-412 |
| Hardware version | 2.x |

Environmental Conditions

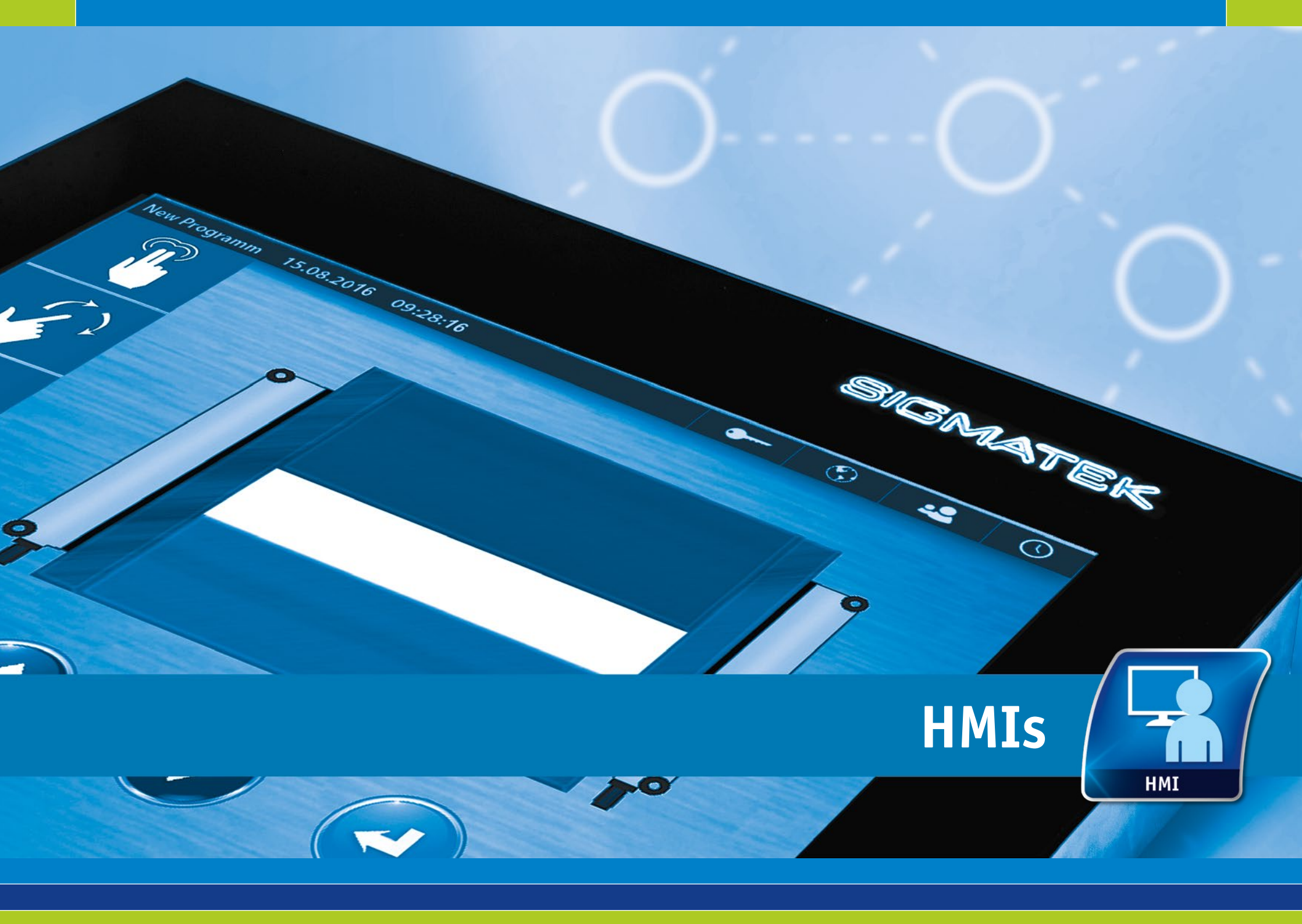
| | |
|---------------------------|---|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0 ... +60 °C |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) Can only be guaranteed when the PC used also fulfills this norm! |

Performance Data

| | |
|-------------|---|
| PCI bus | 32-bit PCI insert module Vendor ID: 5112 Device ID: 0100 |
| DIAS bus | optisch: 1x HP fiber optic electrical: 1x socket 6-pin (Weidmüller S2L 3.5/6/90G) 1x multipoint connector 14-pins (DIN 41651) |
| Status LEDs | yes |

Electrical Requirements

| | | |
|---|--------------------------|--|
| Supply voltage | +3.3 V DC (from PCI bus) | |
| Current consumption of voltage supply | typically 100 mA | maximum 150 mA |
| Supply voltage | +5 V DC (from PCI bus) | |
| Current consumption of voltage supply | typically 200 mA | maximum 800 mA (with 500 mA load on the DIAS bus) |
| Output voltage (DIAS bus supply) | minimum +4.95 V *) | maximum +5.35 V *) |
| Total current of connected DIAS modules | maximum 500 mA *) | |



HMI



HMI's

With the HMI's from SIGMATEK, our machines cut a good figure in any situation. Our human-machine interfaces are compactly designed and fanless. You have the choice between panels with a processor and remote operating units without a processor (HMI-Link up to 100 M).

Regardless of whether single, dual or multi-touch screens – we put the main focus on all our human-machine interfaces to ensure that you can work intuitively, quickly and safely.

Our selection of HMI's include built-in units, panels for the carrier arm and mobile Panels for use directly on-site. All HMI's equipped with a processor are fit for the Smart Factory (OPC-UA communication).

From the HMI's with resistive touch screens, ranging in sizes from 3.5 - 12.1 inches, you can choose between classic operating panels and all-in-one control panels of the ETV series; which with simple applications can also assume control tasks.

HMI

3.5" - 12.1" Panels Multitouch

3.5" - 12.1" Panels Singletouch

15" - 23.8" Panels Multitouch

15" - 23.8" Panels Singletouch

Mobile Panels

Keypads

Accessories HMI



Touch Operating Panel ETT 732



with 7" WVGA TFT color display

The ETT 732 is an intelligent terminal for programming and visualization of automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display with an LED backlight. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the build-in terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte NAND Flash |
| Internal I/O | no |
| Interfaces | 1x USB 2.0 (Type A) 1x Ethernet 10/100 (RJ45) 2x CAN bus (6-pin Weidmüller) 1x RS232 (9-pin D-Sub) |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |
| Display Resolution | 7" TFT color display 800 x 480 pixels |

| | |
|------------------|--------------------------------------|
| Control panel | touch screen (projective capacitive) |
| Signal generator | no |
| Status LEDs | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption of power supply at +24 V | typically 200 mA (without externally connected devices) | maximum 340 mA (with externally connected devices) |
| Current consumption of stand-by voltage at +24 V | typically 110 mA (without externally connected devices) | maximum 180 mA (with externally connected devices) |
| Inrush current | 600 mA (1 ms) | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|-------------------------------------|
| Dimensions | 183.6 x 138.8 x 41.9 mm (W x H x D) |
| Material | front plate: 4 mm aluminum |
| Weight | circa 600 g |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | in accordance with product standard EN 60730-1 | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 Shocks |
| Protection type | EN 60529 protection through housing | front: IP54 (no UL-rating) cover: IP20 (no UL-rating) |

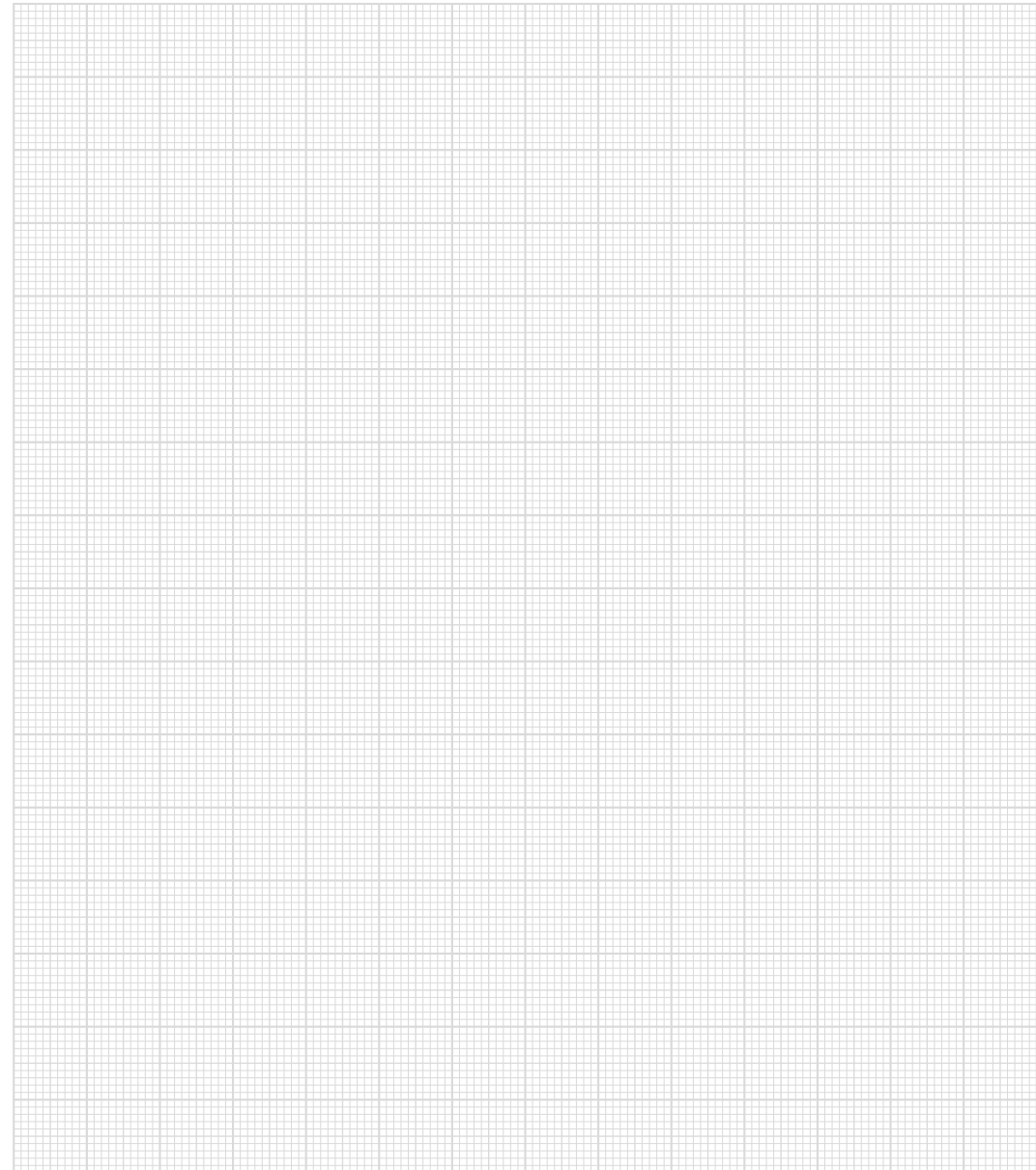
7" VGA Display incl. Touch

| | |
|------------------|--|
| Type | 7" TFT LCD color display |
| Resolution | WVGA 800 x 480 pixels |
| Color depth | 16-bit RGB (65K colors) |
| LCD mode | normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.1926 mm x 0.1790 mm |
| Number of pixels | 800*3 (RGB) x 480 |
| Active surface | 154.08 mm x 85.92 mm |
| Backlighting | LED |
| Contrast | 500:1 |
| Brightness | typically 280 cd/m² |
| Visible field | left and right 70°, below 70°, above 50° |
| Touch panel | projective capacitive touch |
| Sensor type | glass-glass |
| Surface | 1.0 mm hardened glass front with black frame |
| Surface hardness | 7H pencil hardness according to JIS K5400 |
| Transparency | ≥ 85 % |

Article Number and Miscellaneous

| | |
|----------------|----------------|
| Article number | 01-230-732 |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Notes



Carrier Arm Touch Terminal ETT 7321



The ETT 7321 is used to visualize automated process. Process diagnosis, operating and monitoring automated functions are simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display. With the LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256 Mbytes |
| Internal remnant data memory | 256-kByte SRAM (battery buffered) |
| Internal storage device | 512 Mbyte NAND-Flash |
| Internal I/O | no |
| Interfaces | 1x USB 2.0 (Type A) 1x M12 connector supply and Ethernet |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch screen |
| Display Resolution | 7" TFT LCD color display 800 x 480 Pixels |

| | | |
|------------------|--------------------------------------|--|
| Control panel | touch screen (projective capacitive) | |
| Signal generator | no | |
| Status LEDs | no | |
| Real-time clock | yes | |
| Cooling | passive (fanless) | |

Electrical Requirements

| | | |
|---|---------------------------------|----------------|
| Supply voltage | +24 V DC $\pm 20\%$ (SELV/PELV) | |
| Protection class | III | |
| Current consumption of (+24 V) power supply | typically 270 mA | maximum 400 mA |
| Inrush current | 700 mA (2 ms) | |

Control Unit

| | |
|-------------|-----------------------------------|
| Touch panel | projective capacitive touch panel |
|-------------|-----------------------------------|

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-150 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²), |
| Protection type | EN 60529 | front: IP65 cover: IP54 (only with all protective caps fitted) |

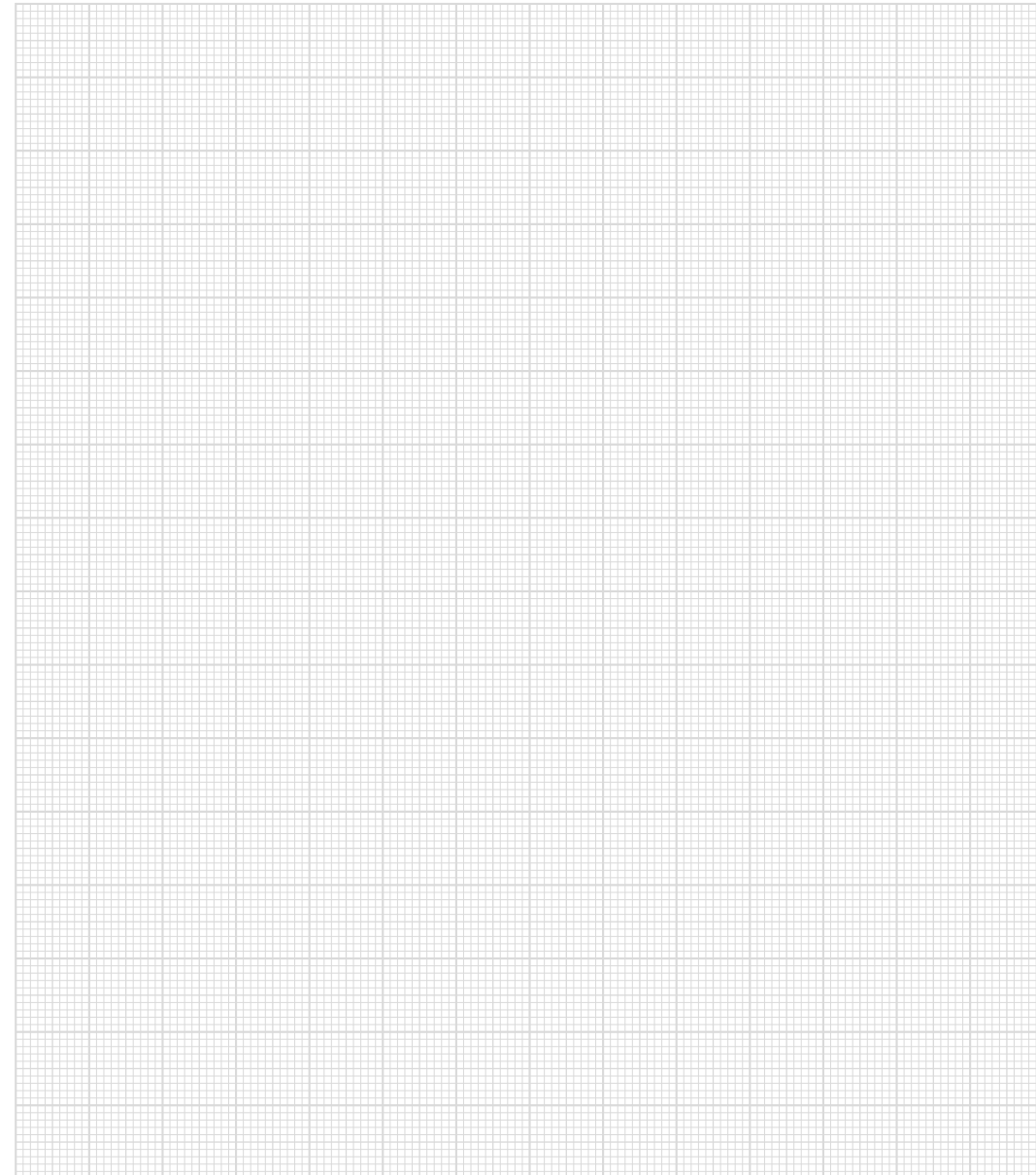
7" VGA Display incl. Touch

| | |
|----------------|--|
| Type | 7" TFT LCD color display |
| Resolution | 800 x 480 Pixels |
| Color depth | 16-bit RGB |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.1926 x 0.1790 mm |
| Active range | 154.08 x 85.92 mm |
| Backlighting | LED |
| Contrast ratio | 500:1 |
| Brightness | typically 280 cd/m ² |
| Angle CR ≥ 10 | left, right, below 70°, above 50° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|-------------|
| Article number | 01-230-7321 |
| Operating system | Salamander |
| Approvals | CE |

Notes



Touch Operating Panel ETT 764



with 7" TFT color display

The ETT 764 is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified.

A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" TFT color display.

The available interfaces can be used to exchange process data or configure the multitouch terminal.

Performance Data

| | |
|--|---|
| Processor | EDGE3 Technology |
| Processor cores | 4 |
| Internal program and data memory (RAM) | 2-GByte (DDR4) |
| Internal remnant data memory | 128-kByte FRAM |
| Internal storage device | 8-GByte eMMC |
| Optional memory expansion | microSD |
| Graphic | integrated in EDGE processor |
| Interfaces | 2x Ethernet (10/100/1000) 2x USB 2.0 Type A 1x USB 2.0 Type Mini-B OTG 1x microSD card holder (SD 3.0) |
| Internal interface connections and devices | no |
| Operating components | no |

| | |
|--------------------|---|
| Signal generator | no |
| Display Resolution | 7" TFT color display WSVGA 1024 x 600 pixels |
| Operating field | Touch screen (multi-touch, projective capacitive) |
| Status LEDs | yes (1x red/1x green) |
| Real-time clock | yes (battery buffered) |
| Cooling | passive |

Electrical Requirements

| | | |
|--|--|---|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC | |
| Protection class | III | |
| Current consumption of power supply at +24 V | typically 320 mA (with no external devices connected) | maximum 530 mA (with external devices connected) |
| Inrush current without currentlimiting supply | 30 A for max. 20 µs | |
| Inrush current with 24 V/10 A fixed voltage supply | 1 A for max. 30 ms | |

Terminal

| | |
|------------|---|
| Dimensions | 191 x 128 x 33 mm (W x H x D) |
| Material | Housing: aluminium/steel chromated Color: black Front: glass 1.1 mm |
| Weight | 0.60 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | according to EN 61000-6-3 (Household area) according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | Front: IP65 Cover: IP20 |

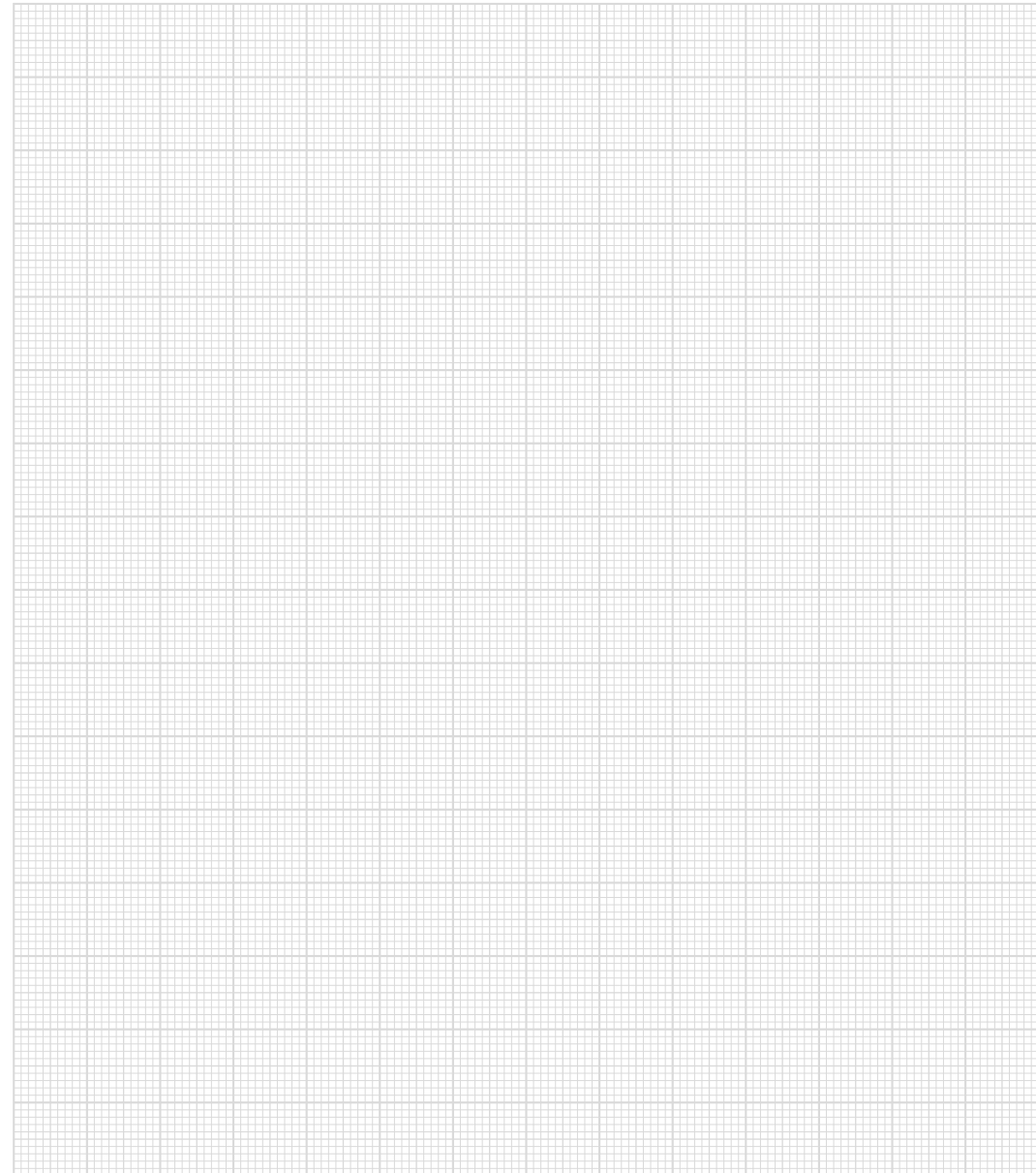
Display

| | |
|---------------|---|
| Type | 7" TFT color display |
| Resolution | WSVGA 1024 x 600 pixels |
| Color depth | 24-Bit RGB |
| LCD mode | normally black |
| LCD polarizer | transmissive |
| Pixel size | 0.1506 x 0.1432 mm |
| Active range | 154.08 mm x 85.92 mm |
| Backlighting | LED |
| Contrast | typically 800:1 |
| Brightness | typically 400 cd/m ² |
| Visible field | left, right, top, bottom typically 80° |
| Touch panel | projective capacitive touch panel |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 20,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 01-230-764 |
| Operating system | Gecko |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Multi-touch Operating Panel ETT 0833

with 8.4" SVGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4" SVGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.



backlighted customer logo
optionally available

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | yes |
| Interfaces | 2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated) |
| Internal interface connections and devices | 1x TFT-color display 1x USB (touch connection) |
| Display Resolution | 8.4" TFT color display 800 x 600 pixels |
| Control panel | Touch screen (projective capacitive) |
| Logo backlighting | optional (RGB) |

| | |
|-----------------|------------------------|
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption Power supply +24 V | typically 350 mA (without ext. connected devices) | maximum 560 mA (with externally connected devices) |
| Inrush current | maximum 2 A for 10 µs | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 230.4 x 200.3 x 45.9 mm (W x H x D) |
| Material | front plate: 4 mm glass on 1 mm aluminium frame |
| Weight | typically 1.8 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +75 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

Display

| | | |
|----------------|--|--|
| Type | 8.4" TFT color display | |
| Resolution | SVGA 800 x 600 pixels | |
| Color depth | 24 Bit RGB | |
| LCD mode | normally white | |
| LCD polarizer | transmissive | |
| Pixel size | 0.213 x 0.213 mm | |
| Active surface | 170.40 x 127.80 mm | |
| Backlighting | LED | |
| Contrast | typically 450 | |
| Brightness | typically 330 cd/m ² | |
| Angle CR ≥ 10 | left and right 65°, above 60°, below 55° | |
| Lifespan | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness | |

Control Unit

| | | |
|-------------|---|--|
| Touch panel | projective capacitive touch panel | |
| Surface | 4 mm front glass with black frame + SIGMATEK logo | |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum permitted continuous load current/channel | 0.5 A | |
| Maximum total current (all 8-channels) | 2 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (off) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|--------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at + 24 V | |
| Input delay | typically 5 ms | |

Article Number and Miscellaneous

| | | |
|------------------|----------------|--|
| Article number | 01-230-0833 | |
| Operating system | Salamander | |
| Standard | UL 61010-2-201 | |
| Approvals | UL, cUL, CE | |

Multi-touch Operating Panel ETT 1033

with 10.4" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 10.4" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.



Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | yes |
| Interfaces | 2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated) |
| Internal interface connections and devices | 1x TFT-color display 1x USB (touch connection) |
| Display Resolution | 10.4" TFT color display 1024 x 768 pixels |
| Control panel | Touch screen (projective capacitive) |
| Logo backlighting | optional (RGB) |

| | |
|-----------------|------------------------|
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption Power supply +24 V | typically 760 mA (without ext. connected devices) | maximum 920 mA (with ext. connected devices) |
| Inrush current | maximum 2 A for 10 µs | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 279.2 x 233.4 x 48.9 mm (W x H x D) |
| Material | front plate: 4 mm glass on 1.5 mm aluminium frame |
| Weight | typically 2.7 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +75 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | |
|----------------|--|
| Type | 10.4" TFT color display |
| Resolution | XGA 1024 x 768 pixels |
| Color depth | 24 Bit RGB |
| LCD mode | normally black |
| LCD polarizer | transmissive |
| Pixel size | 0.0685 x 0.2055 mm |
| Active surface | 210.40 x 157.80 mm |
| Backlighting | LED |
| Contrast | typically 1000 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | left, right 65°, above, below 88° |
| Lifespan | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Control Unit

| | |
|-------------|---|
| Touch panel | projective capacitive touch panel |
| Surface | 4 mm front glass with black frame + SIGMATEK logo |

Digital Outputs

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum permitted continuous load current/channel | 0.5 A |
| Maximum total current (all 8-channels) | 2 A (100 % of on time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 400 µs |
| Turn-off delay | < 400 µs |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] |

Digital Inputs

| | |
|---------------------|------------------------------------|
| Number | 8 |
| Input voltage | typically +24 V maximum +30 V |
| Signal level | low: < +4.5 V high: > +14 V |
| Switching threshold | typically +11 V |
| Input current | typically 5 mA at + 24 V |
| Input delay | typically 5 ms |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 01-230-1033 |
| Operating system | Salamander |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Build-in Touch Terminal ETT 1034



The ETT 1034 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (RAM) | 1-Gbyte DDR3 |
| Internal remnant data memory | 512 kByte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet |
| Internal interfaces | 1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector |

| | |
|--------------------|---|
| Display Resolution | 10.1" TFT color display WXGA 1280 x 800 pixels |
| Operating panel | Touch screen (projective capacitive) |
| Signal generator | no |
| Status LEDs | 2 (red & green) |
| Real-time clock | yes |
| Cooling | passiv (fanless) |

Electrical Requirements

| | | |
|--|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of (+24 V) power supply | typically 600 mA (without external devices connected) | maximum 750 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.5 A (für 15 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 65 A (für 25 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 264 x 183 x 48 mm (W x H x D) |
| Material | front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing; sheet steel |
| Weight | ca. 1.5 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

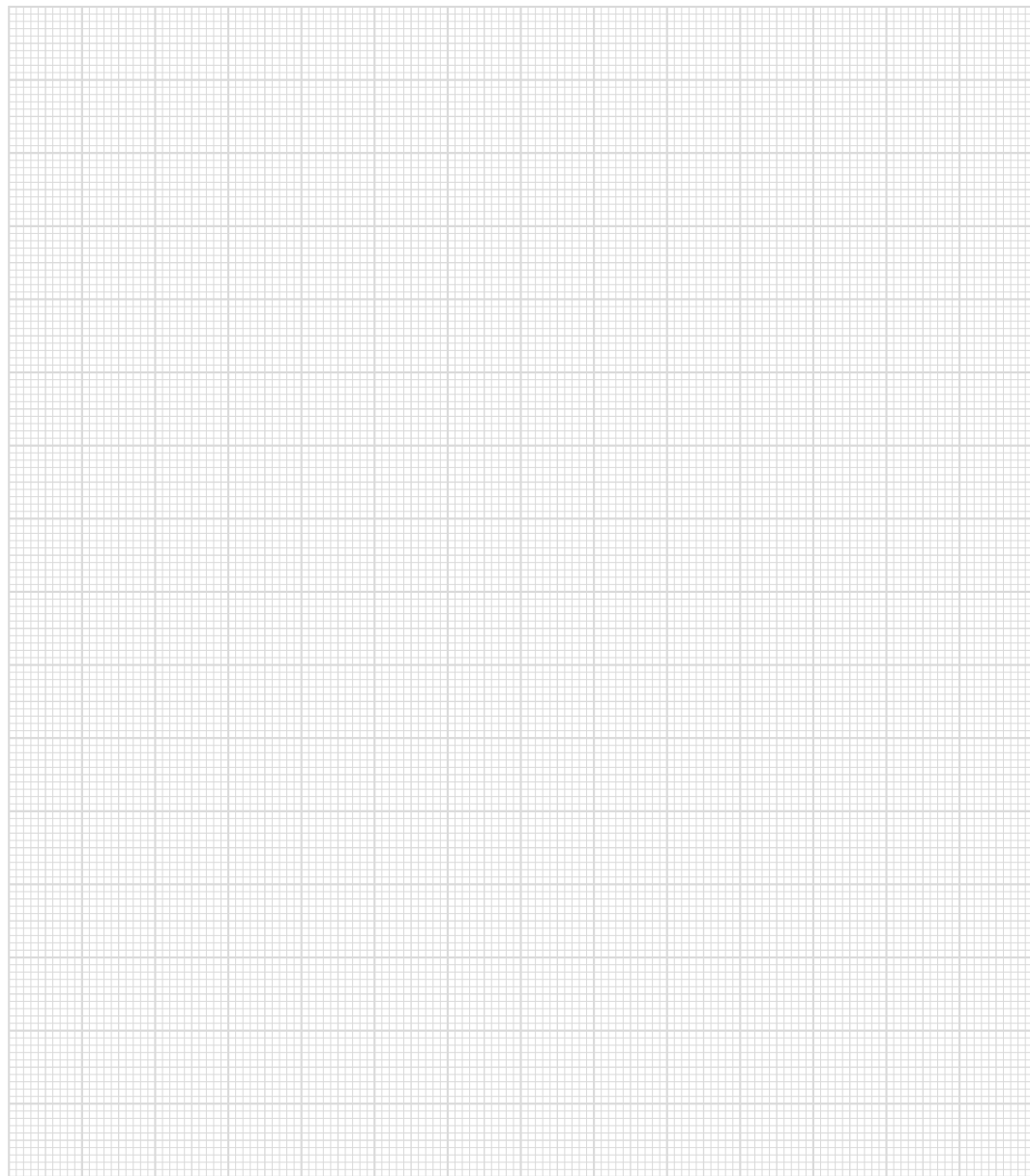
10.1" WXGA Display

| | |
|----------------|--|
| Type | 10.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixles |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Active surface | 216.96 x 135.60 mm |
| Backlighting | LED |
| Contrast | typically 1000 |
| Brightness | typically 500 cd/m ² |
| Blickwinkel | left, right, top, bottom typically 85° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1034 |
| Operating system | Salamander |
| Approvals | CE ETT 1034 consists of TP 1061 und PIM 031, both UL certified „UL _{us} (E247993) |

Notes



Build-in Touch Terminal ETT 1044



The ETT 1044 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J4005 |
| Processor cores | 2 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 2-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 600 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 10.1" TFT color display WXGA 1280 x 800 pixels |

| | |
|-----------------|--------------------------------------|
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 800 mA (without externally connected devices) | maximum 1300 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 3.5 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 264 x 183 x 83 mm (W x H x D) |
| Material | front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel Heat sink anodized aluminum |
| Weight | 2.3 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover IP20 |

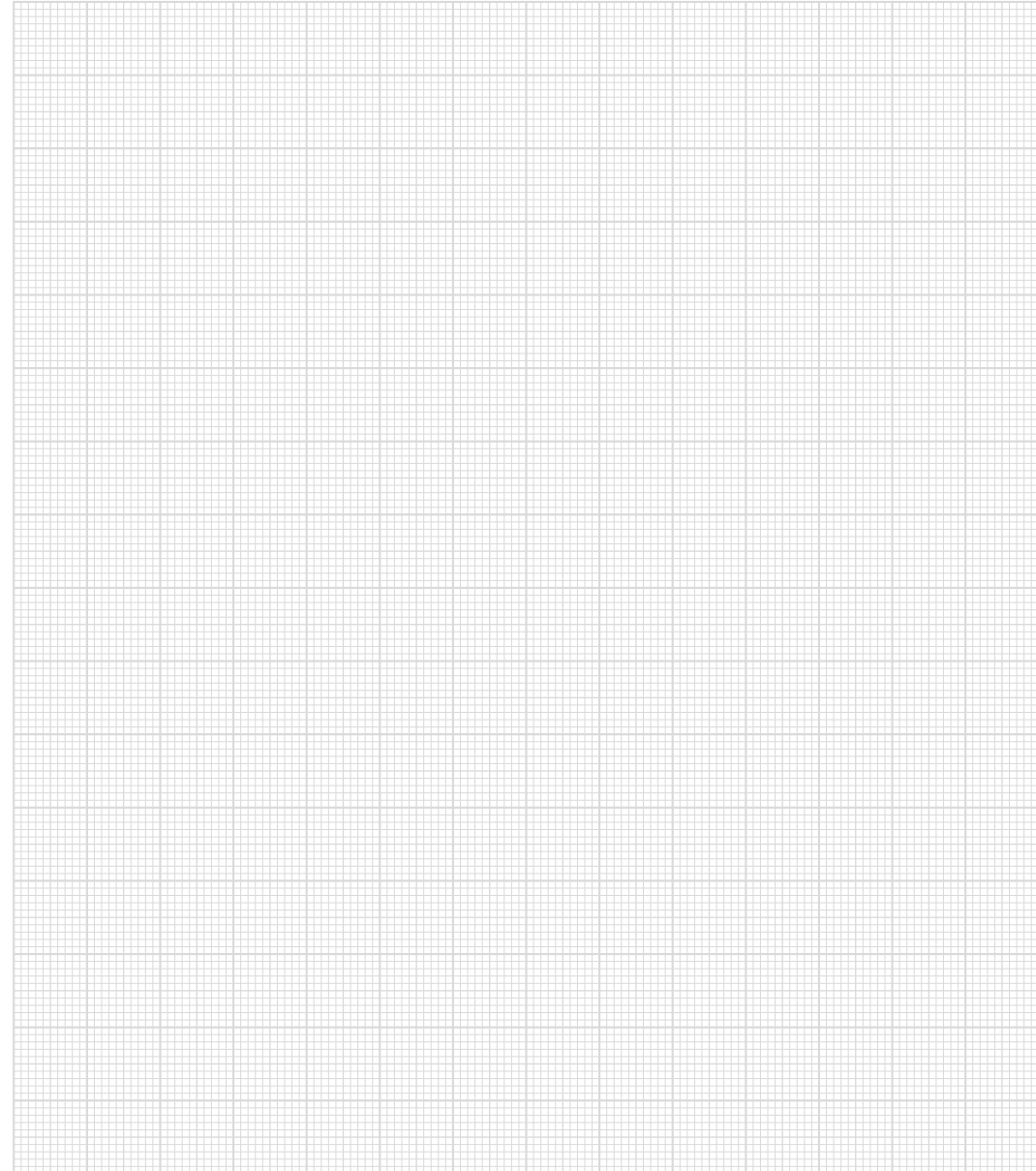
Display

| | |
|----------------|--|
| Type | 10.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Active surface | 216.96 x 135.60 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | left, right, top, bottom typically 85° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|--|
| Article number | 01-230-1044 |
| Operating system | Gecko |
| Approvals | CE the ETT 1044 consists of a TP 1061 (cULus (E247993)) and a PIM 041 (UL in preparation) |

Notes



Build-in Touch Terminal ETT 1054-W



The ETT 1054-W is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J5005 |
| Processor cores | 4 |
| Processor clock | 1.5-2.8 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 4-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 605 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 10.1" TFT color display WXGA 1280 x 800 pixels |

| | |
|-----------------|--------------------------------------|
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 950 mA (without externally connected devices) | maximum 1450 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 3.5 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 264 x 183 x 83 mm (W x H x D) |
| Material | front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel Heat sink anodized aluminum |
| Weight | 2.3 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover IP20 |

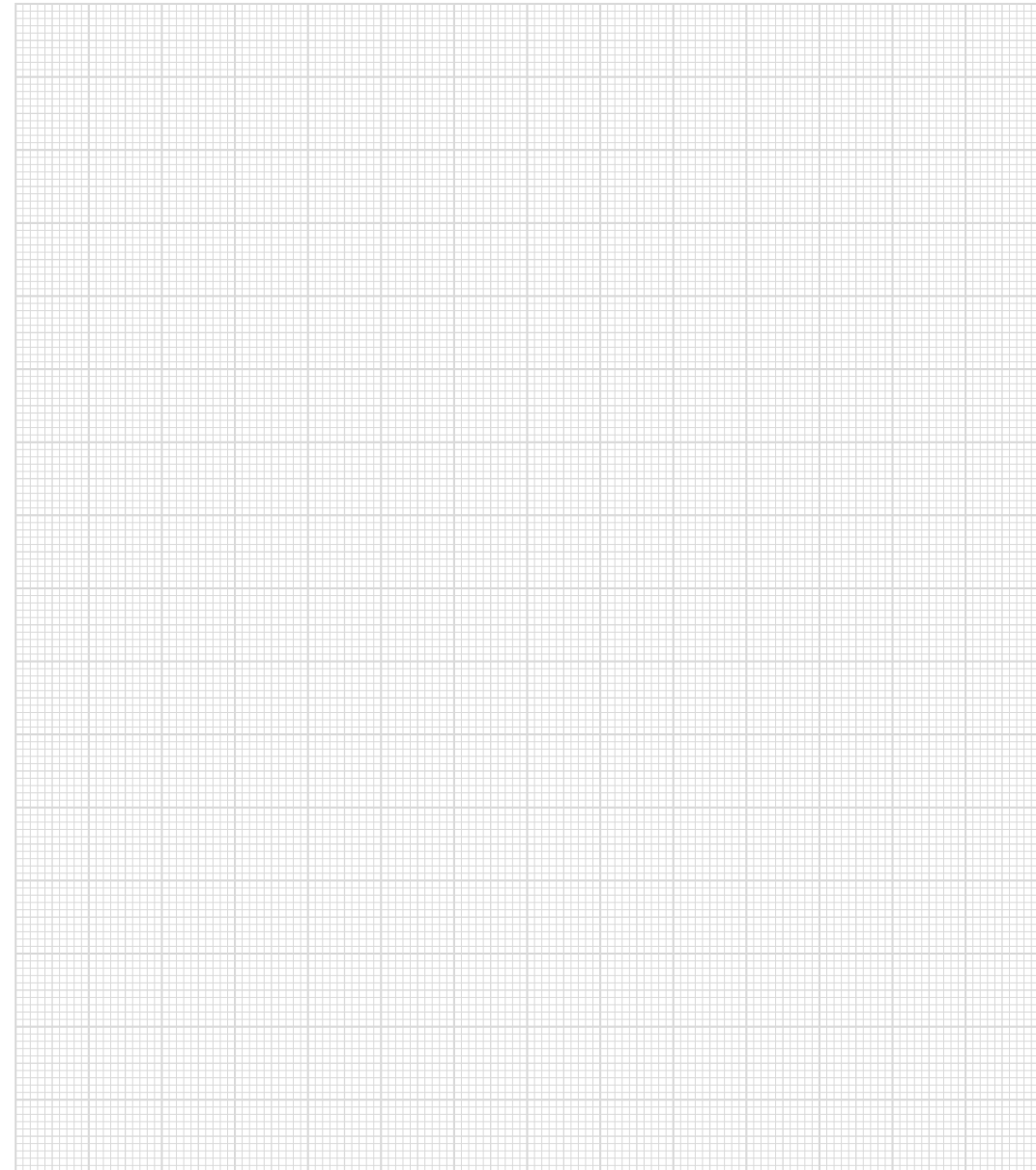
Display

| | |
|----------------|--|
| Type | 10.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Active surface | 216.96 x 135.60 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | left, right, top, bottom typically 85° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1054-W |
| Operating system | Windows IoT |
| Approvals | CE the ETT 1054-W consists of a TP 1061 (cULus (E247993)) and a PIM 051-W (UL in preparation) |

Notes



Build-in Touch Terminal TAE 1044



The multi-touch operating panel TAE 1044 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 10.1" TFT color display with LED backlighting. This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP) |
| Internal interfaces (via Panel Interface Connector) | USB 2.0 (for touch and front USB, if available on the TP) |
| Status LEDs | 1x green 1x red (depends on OS) |
| Display Resolution | 10.1" TFT color display WXGA 1280 x 800 pixels |
| Operating field | touch screen (projective capacitive) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|---|
| Supply voltage | +24 V DC $\pm 20\%$ (SELV/PELV) UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 700 mA (with no external devices connected) | maximum 900 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 3 A (for 14 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 71 A (for 1.5 ms, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 264 x 183 x 48 mm (W x H x D) |
| Material | front plate: 1.1 mm glass (touch screen) in black anodized aluminum frame |
| Weight | 1.5 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area) | |
| EMC noise emission | in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP65 cover: IP20 (not UL-listed) |

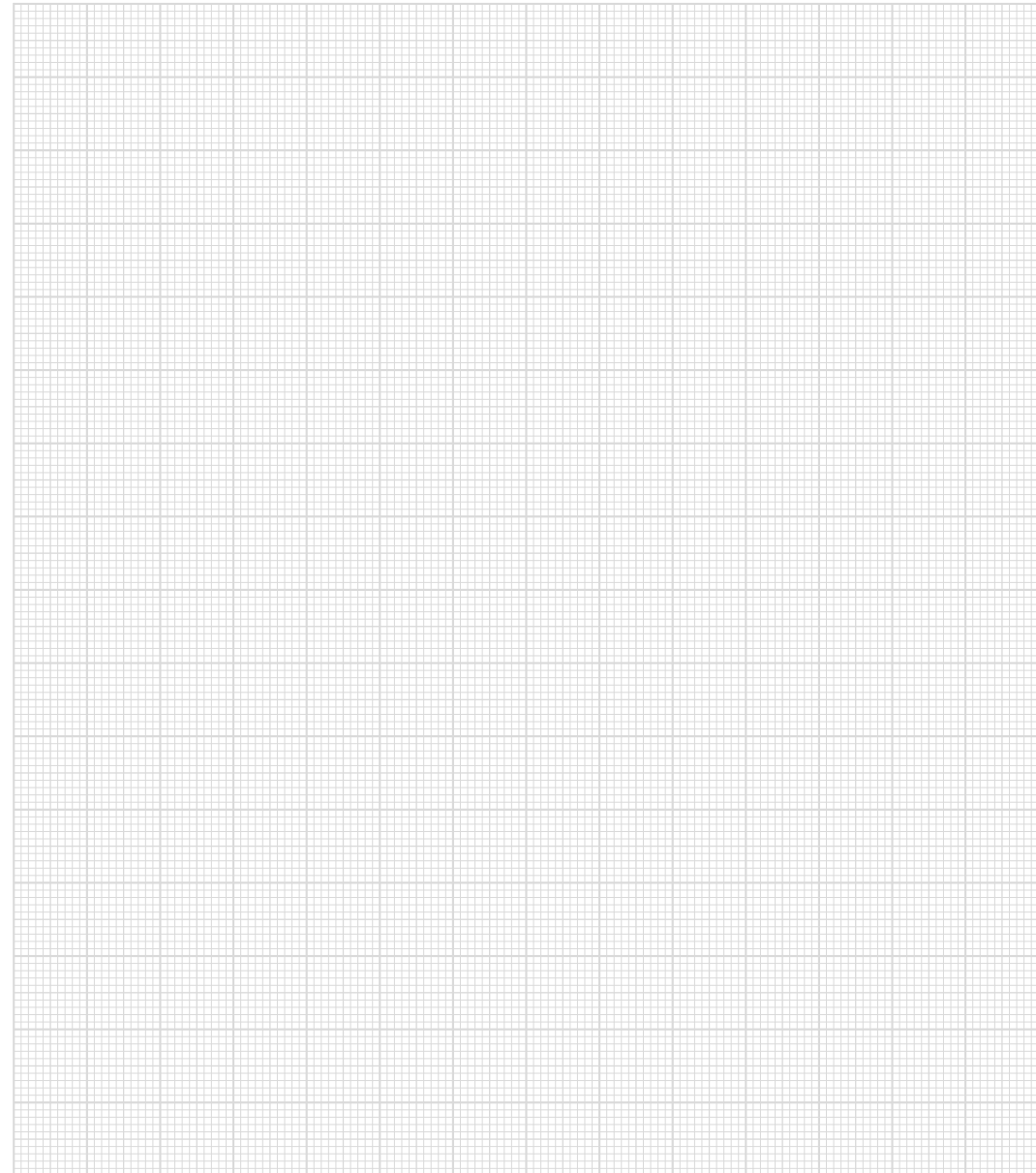
Display

| | |
|----------------|---|
| Type | 10.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Active range | 216.96 x 135.60 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | all directions typically 85° |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 12-200-1044 |
| Operating system | - |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Multi-touch Operating Panel ETT 1233

with 12.1" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 12.1" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.



Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | yes |
| Interfaces | 2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated) |
| Internal interface connections and devices | 1x TFT-color display 1x USB (touch connection) |
| Display Resolution | 12.1" TFT color display 1024 x 768 pixels |
| Control panel | Touch screen (projective capacitive) |
| Logo backlighting | optional (RGB) |

| | |
|-----------------|------------------------|
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption Power supply +24 V | typically 840 mA (without ext. connected devices) | maximum 870 mA (with ext. connected devices) |
| Inrush current | maximum 2 A for 10 µs | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 317 x 265.5 x 47.9 mm (W x H x D) |
| Material | front plate: 4 mm glass on 1.5 mm aluminium frame |
| Weight | typically 3.4 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +75 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | |
|----------------|--|
| Type | 12.1" TFT color display |
| Resolution | XGA, 1024 x 768 pixels |
| Color depth | 24 Bit RGB |
| LCD mode | normally white |
| LCD polarizer | transmissive |
| Pixel size | 0.24 x 0.24 mm |
| Active surface | 245.76 x 184.32 mm |
| Backlighting | LED |
| Contrast | typically 700 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | left, right 80°, above, below 70° |
| Lifespan | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Control Unit

| | |
|-------------|---|
| Touch panel | projective capacitive touch panel |
| Surface | 4 mm front glass with black frame + SIGMATEK logo |

Digital Outputs

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum permitted continuous load current/channel | 0.5 A |
| Maximum total current (all 8-channels) | 2 A (100 % of on time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 400 µs |
| Turn-off delay | < 400 µs |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] |

Digital Inputs

| | | |
|---------------------|--------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at + 24 V | |
| Input delay | typically 5 ms | |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 01-230-1233 |
| Operating system | Salamander |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Build-in Touch Terminal ETT 1234



The ETT 1234 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 12.1" TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (RAM) | 1-Gbyte DDR3 |
| Internal remnant data memory | 512 kByte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet |
| Internal interfaces | 1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector |

| | | |
|--------------------|---|--|
| Display Resolution | 12.1" TFT color display WXGA 1280 x 800 pixels | |
| Operating panel | Touch screen (projective capacitive) | |
| Signal generator | no | |
| Status LEDs | 2 (red & green) | |
| Real-time clock | yes | |
| Cooling | passiv (fanless) | |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of (+24 V) power supply | typically 700 mA (without external devices connected) | maximum 850 mA (without external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.5 A (für 15 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 65 A (für 25 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 313 x 215 x 50 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing; sheet steel |
| Weight | ca. 2.1 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

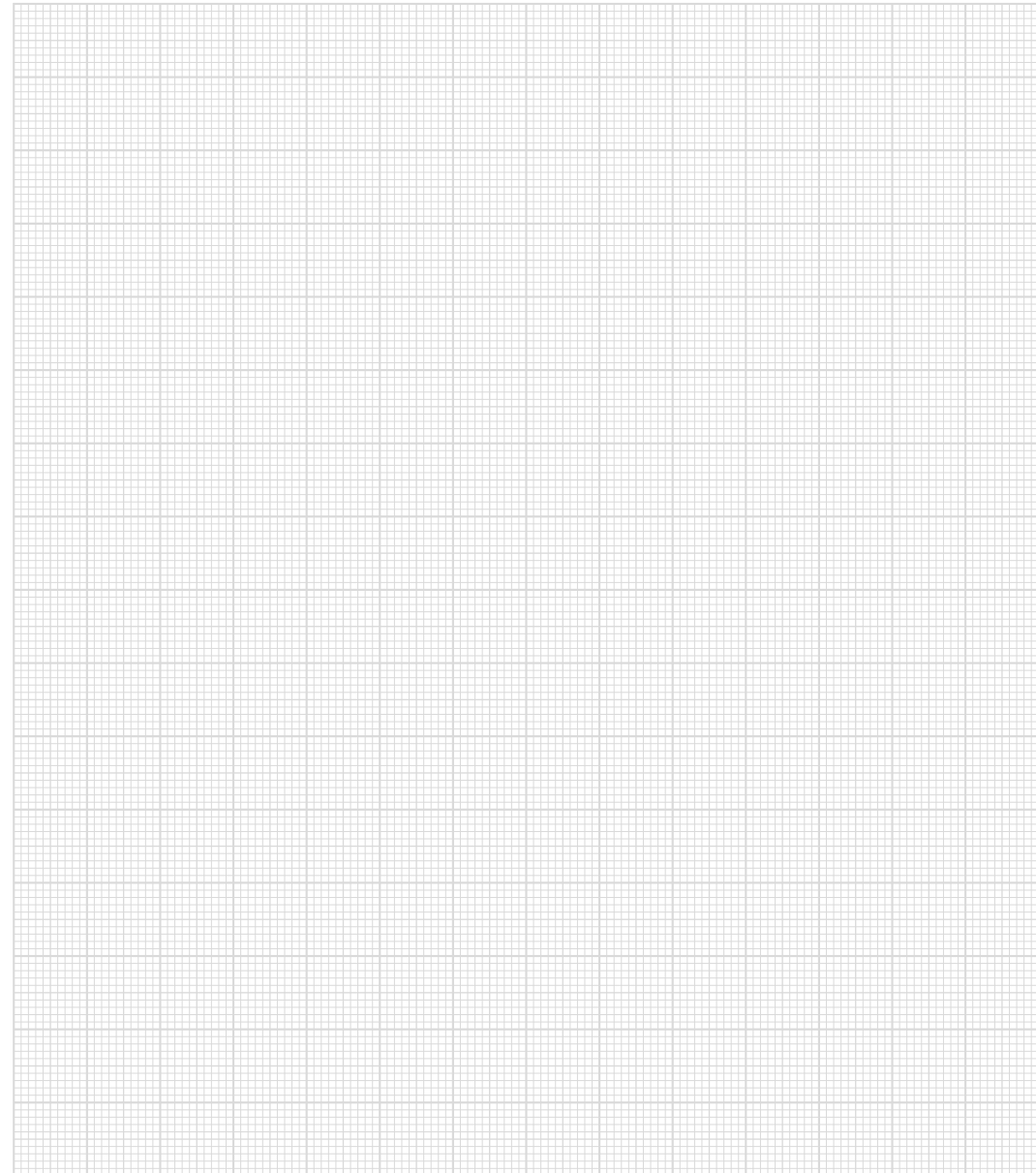
12.1" WXGA Display

| | |
|----------------|--|
| Type | 12.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixles |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.204 x 0.204 mm |
| Active surface | 261.12 x 163.2 mm |
| Backlighting | LED |
| Contrast | typically 1000 |
| Brightness | typically 400 cd/m ² |
| Blickwinkel | left, right, top, bottom typically 89° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1234 |
| Operating system | Salamander |
| Approvals | CE ETT 1234 consists of TP 1261 und PIM 031, both UL certified „UL _{us} (E247993) |

Notes



Build-in Touch Terminal ETT 1244



The ETT 1244 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 12.1" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J4005 |
| Processor cores | 2 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 2-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 600 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 12.1" TFT color display WXGA 1280 x 800 pixels |
| Operating panel | touch screen (projective capacitive) |

| | |
|-----------------|-------------------|
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 900 mA (without externally connected devices) | maximum 1400 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 4 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 313 x 215 x 85 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum |
| Weight | 2.9 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

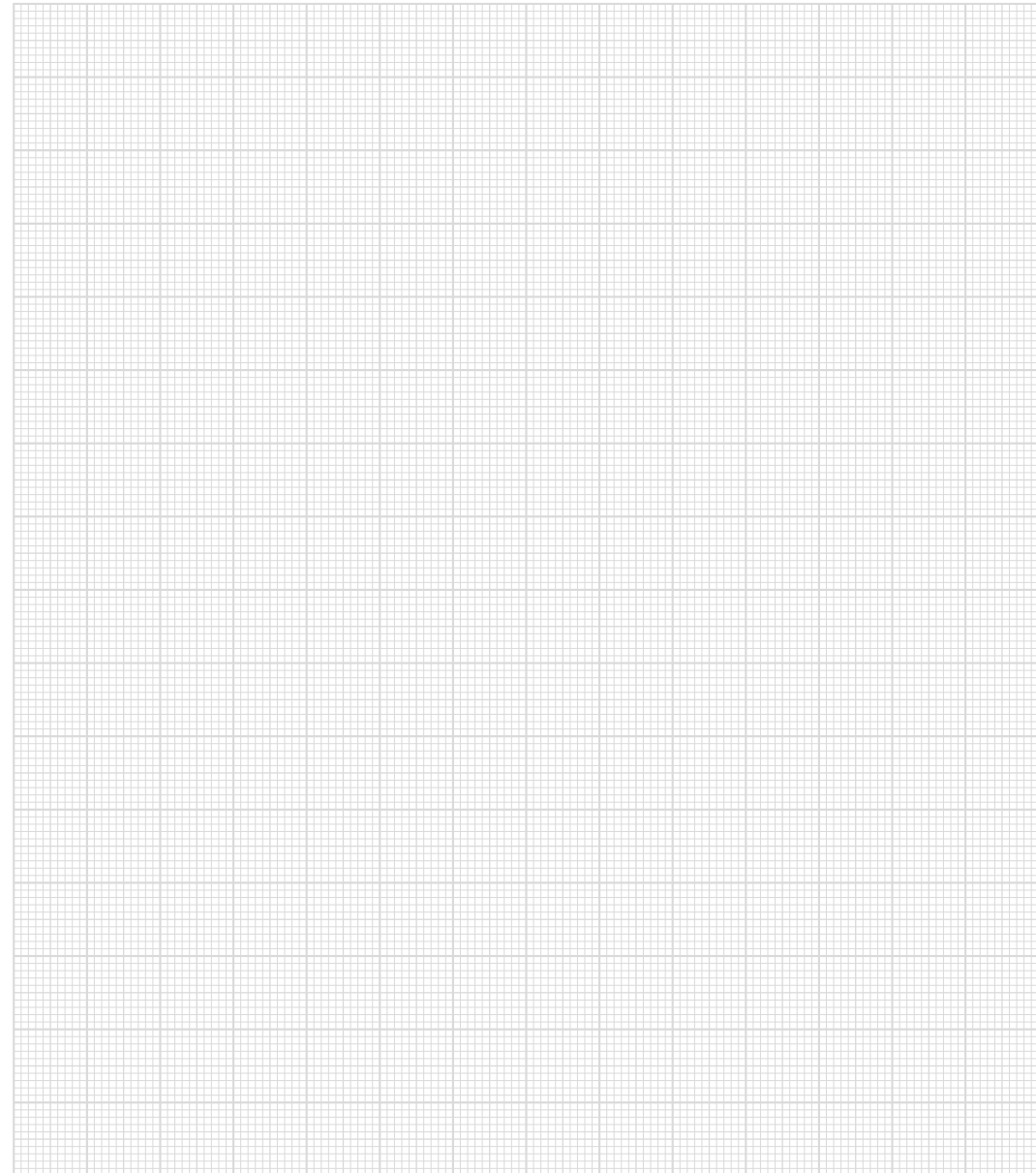
Display

| | |
|----------------|--|
| Type | 12.1" TN color display |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.204 x 0.204 mm |
| Active surface | 261.12 x 163.2 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 500 cd/m ² |
| Angle CR ≥ 10 | left, right, top, bottom typically 89° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1244 |
| Operating system | Gecko |
| Approvals | CE; the ETT 1244 consists of a TP 1261 (ULus (E247993)) and a PIM 041 (UL in preparation) |

Notes



Build-in Touch Terminal TAE 1244



The multi-touch operating panel TAE 1244 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 12.1" TFT color display with LED backlighting. This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP) |
| Internal interfaces (via Panel Interface Connector) | USB 2.0 (for touch and front USB, if available on the TP) |
| Status LEDs | 1x green 1x red (depends on OS) |
| Display Resolution | 12.1" TFT color display WXGA 1280 x 800 pixels |
| Operating field | touch screen (projective capacitive) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 800 mA (with no external devices connected) | maximum 1000 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 3.1 A (for 17 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 76 A (for 1.2 ms, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 313 x 215 x 50 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame |
| Weight | 2.1 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area) | |
| EMC noise emission | in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP65 cover: IP20 (not UL-listed) |

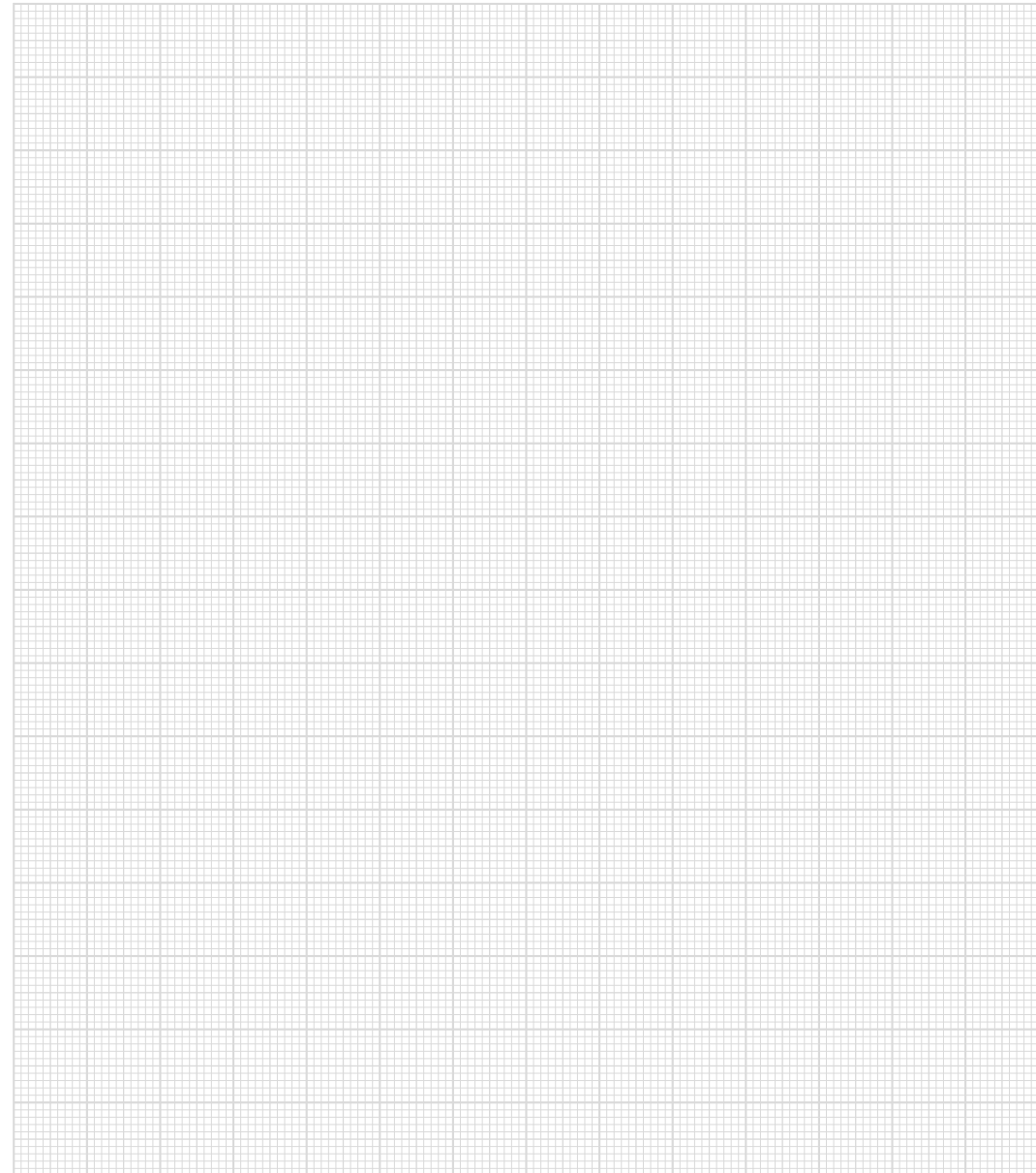
Display

| | |
|----------------|---|
| Type | 12.1" TN color display |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.204 x 0.204 mm |
| Active range | 261.12 x 163.2 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 400 cd/m ² |
| Angle CR ≥ 10 | all directions typically 89° |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 12-200-1244 |
| Operating system | - |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Touch Operating Panel ETT 312



The ETT 312 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters. To save energy, the display is deactivated in sleep mode. When the screen surface is touched, the terminal is activated and then deactivated a few minutes after the last input.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

| | | |
|--------------------|--|--|
| SDRAM | 8-Mbyte | |
| Flash | 8-Mbyte | |
| Interfaces | 1x CAN bus | |
| Data rate | maximum 1 Mbit/s | |
| Display Resolution | 3.5" TFT color display 320 x 240 pixels | |

Electrical Requirements

| | | |
|---------------------|---|-------------------------|
| Supply voltage | typically +24 V (+18-30 V DC) UL: Class 2 or LVLC | |
| Current consumption | typically 60 mA | maximum 100 mA |
| Inrush current | typically 0.9 A for 10 ms | maximum 1.2 A for 20 ms |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | | |
|---------------------------|---|--|
| Operating unit dimensions | 103.6 x 99.6 x 38.1 mm (W x H x D) with opposing connector 111.8 x 107.8 x 38.1 mm (W x H x D) with opposing connector and fastening clips | |
| Control cabinet cutout | minimum 92.2 x 88.2 mm (W x H) maximum 93.5 x 89.5 mm (W x H) | |
| Material | front plate: 3 mm anodized aluminum | |
| Weight | ca. 250 g | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 Indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | front: IP65 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | | |
|------------------|--|--|
| Type | 3.5" LC graphic display | |
| Resolution | 320(RGB) x 240 | |
| Pixel size | 0.219 x 0.219 mm | |
| Number of pixels | 320*3 (RGB) x 240 pixels | |
| Active surface | 70.08 x 52.56 mm | |
| Color depth | 24 bits | |
| Backlighting | 6x LED, white, regulatable | |
| Contrast | 400:1 | |
| Touch | resistive | |
| Brightness | typically 350 cd/m ² | |
| Visible field | left and right 70°, below 70°, above 60° | |

Article Number and Miscellaneous

| | | |
|----------------|----------------|--|
| Article number | 01-230-312 | |
| Standard | UL 61010-2-201 | |
| Approvals | UL, cUL, CE | |

Touch Operating Panel ETT 352



The ETT 352 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters. To save energy, the display is deactivated in sleep mode. When the screen surface is touched, the terminal is activated and then deactivated a few minutes after the last input.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

| | |
|----------------------|--|
| SDRAM | 8-Mbyte |
| Flash | 1-Mbyte |
| Interfaces | 1x CAN bus (fixed terminal strip) |
| Terminating resistor | 120 Ω settable with DIP-Switch |
| Data rate | maximum 1 Mbit/s |
| Display Resolution | 3.5" TFT color display 320 x 240 pixels |
| Control panel | 4-wire touch screen (analog resistive) |

Electrical Requirements

| | | |
|---------------------|---|----------------|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption | typically 50 mA | maximum 100 mA |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | | |
|---|---|--|
| Operating unit dimensions | 93.3 x 93.3 x 12.1 mm (W x H x D) | |
| Installation measurements with panel mounting | 52 x 52 x 30 mm (W x H x D) Corner hole clearance 81.3 | |
| Material | plastic | |
| Weight | circa 120 g | |

Environmental Conditions

| | | |
|---------------------------|---|---------------------|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC product norm | EN 60730-1 | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| EMC stability | in accordance with EN 61000-6-3 (living area) | |
| Protection type | EN 60529 | |
| | mounting in a panel | IP30 (no UL-rating) |

Display

| | | |
|------------------|--|--|
| Type | 3.5" LC graphic display | |
| Resolution | 320(RGB) x 240 | |
| Pixel size | 0.219 x 0.219 mm | |
| Number of pixels | 320*3 (RGB) x 240 pixels | |
| Active surface | 70.08 x 52.56 mm | |
| Color depth | 24 bits | |
| Backlighting | 6x LED, white, regulatable | |
| Contrast | 400:1 | |
| Touch | resistive | |
| Brightness | typically 350 cd/m² | |
| Visible field | left and right 70°, below 70°, above 60° | |

Article Number and Miscellaneous

| | | |
|----------------|----------------|--|
| Article number | 01-230-352-1 | |
| Standard | UL 61010-2-201 | |
| Approvals | UL, cUL, CE | |

Touch Operating Panel ETT 353



The ETT 353 is a touch operating panel with a 3.5" TFT color display. The resistive touch screen serves as the input medium for process data and parameters.

With the LASAL SCREEN mask editor, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged over CAN bus.

Performance Data

| | |
|------------|------------------|
| Interfaces | 1x CAN bus |
| Data rate | maximum 1 Mbit/s |

Electrical Requirements

| | | |
|---------------------|--|----------------|
| Supply voltage | typically +24 V (+18-30 V DC) supplied from Class 2 or LVLC | |
| Current consumption | typically 65 mA | maximum 100 mA |

Controller

| | |
|--|-----------|
| Controller | Cortex-M3 |
| Internal data memory for visualization (SDRAM) | 8-Mbyte |
| Internal data memory for visualization (flash) | 8-Mbyte |

Terminal

| | | |
|---------------------------|-------------------------------|--|
| Operating unit dimensions | 110 x 157 x 59 mm (W x H x D) | |
| Material | plastic color: RAL7035 | |
| Weight | circa 300 g | |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| EMC stability | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP54 |

Display

| | | |
|------------------|--|--|
| Type | 3.5" LC graphic display | |
| Resolution | 320(RGB) x 240 | |
| Pixel size | 0.219 x 0.219 mm | |
| Number of pixels | 320*3 (RGB) x 240 pixels | |
| Active surface | 70.08 x 52.56 mm | |
| Color depth | 24 bits | |
| Backlighting | 6x LED, white, regulatable | |
| Contrast | 400:1 | |
| Touch | resistive | |
| Brightness | typically 350 cd/m ² | |
| Visible field | left and right 70°, below 70°, above 60° | |

Article Number and Miscellaneous

| | | |
|------------------|---|--|
| Article number | 01-230-353 | |
| Connection cable | 05-980-020 (2 m) 05-980-050 (5 m) 05-980-100 (10 m) | |
| Standard | UL 508 (E247993) | |
| Approvals | UL, cUL, CE | |

Touch Operating Panel ETT 412



The ETT 412 is used to visualize automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this control. A projected capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 4.3" TFT color display.

With a LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the terminal. Data is exchanged with the CPU via the CAN bus.

The display is constructed with a black anodized aluminum front.

Performance Data

| | | |
|------------|--|--|
| Interfaces | 1x CAN bus Data rate maximum 1 MBit/s | |
|------------|--|--|

Electrical Requirements

| | | |
|---------------------------------|-------------------------------|-------------------------|
| Supply voltage | typically +24 V (+18-30 V DC) | |
| Current consumption at +24 V DC | typically 75 mA | maximum 130 mA |
| Inrush current | typically 0.8 A für 10 ms | maximum 1.2 A für 20 ms |

Controller

| | | |
|--|-----------|--|
| Controller | Cortex M3 | |
| Internal data memory for visualization (SDRAM) | 8-Mbyte | |
| Internal data memory for visualization (flash) | 8-Mbyte | |

Terminal

| | | |
|---------------------------|---|--|
| Operating unit dimensions | 132 x 94 x 35.5 mm (W x H x D) (with opposing connector) | |
| Material | front: 0.7 mm glass (touch screen) in black anodized 3 mm aluminum frame cover: 0.8 mm chromed sheet steel | |
| Weight | 300 g | |

Environmental Conditions

| | | |
|---------------------------------------|--|---|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environment temperature by 0.5°C per 100 m | |
| Operating conditions | pollution degree 2 indoor use | |
| EMC resistance | in accordance with EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm von 5-8.4 Hz 1 g von 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | front: IP65 cover: IP20 |

Display

| | | |
|------------------|---|--|
| Type | 4.3" TFT-LCD color display | |
| Resolution | 480 x 272 | |
| Pixel size | 0.198 x 0.198 mm | |
| Number of pixels | 480*3 (RGB) x 272 pixels | |
| Active surface | 95.04 x 53.86 mm | |
| Color depth | 24-bit | |
| Backlighting | 10x LED, white, adjustable | |
| Contrast | 600:1 | |
| Touch | projective capacitive | |
| Brightness | typically 400 cd/m² | |
| Visible field | left, right 80, above 70° and below 60° | |

Article Number and Miscellaneous

| | | |
|----------------|------------|--|
| Article number | 01-230-412 | |
| Standard | CE | |

Touch Operating Panel ETT 731



with 7" WVGA TFT color display

The ETT 731 is an intelligent terminal for programming and visualization of automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display with an LED backlight. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the build-in terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte NAND Flash |
| Internal I/O | no |
| Interfaces | 2x USB 2.0, Type A (1x front, 1x back) 1x Ethernet 10/100 (RJ45) 2x CAN bus (6-pin Weidmüller) 1x RS232 (9-pin DSub) |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |
| Display Resolution | 7" TFT color display 800 x 480 pixels |

| | |
|------------------|--|
| Control panel | 4-wire touch screen (analog resistive) |
| Signal generator | no |
| Status LEDs | 1 front green LED (controllable through the application) |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption of power supply at +24 V | typically 210 mA (without externally connected devices) | maximum 360 mA (with externally connected devices) |
| Current consumption of stand-by voltage at +24 V | typically 110 mA (without externally connected devices) | maximum 180 mA (with externally connected devices) |
| Inrush current | 600 mA (1 ms) | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|--|
| Dimensions | 180 x 135 x 40.9 mm (W x H x D) |
| Material | front plate: 3 mm aluminum, black anodized |
| Weight | circa 600 g |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC stability | in accordance with product standard EN 60730-1 | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 Shocks |
| Protection type | EN 60529 protection through housing | front: IP54 (no UL-rating) cover: IP20 (no UL-rating) |

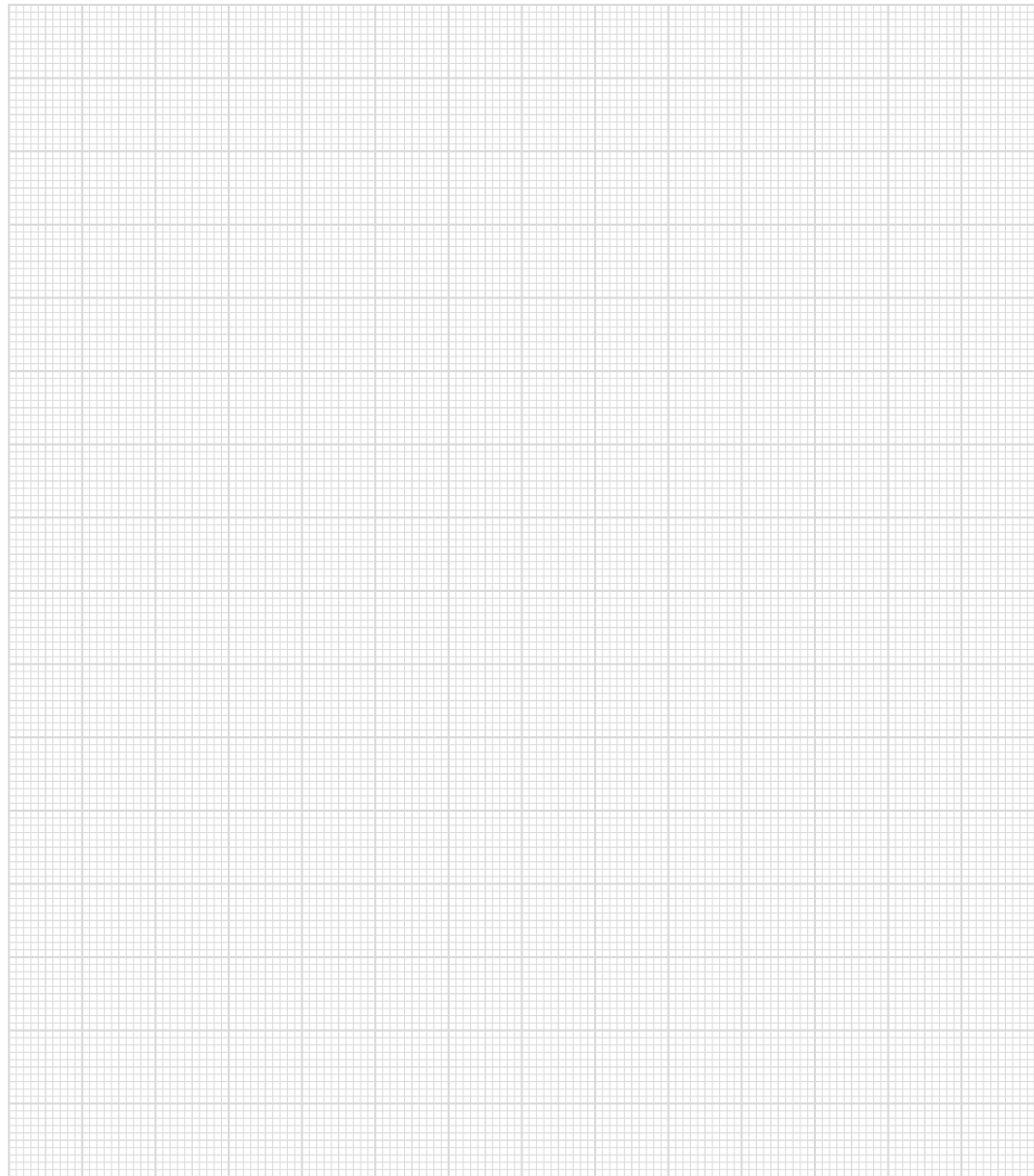
7" VGA Display incl. Touch

| | |
|------------------|--|
| Type | 7" TFT LCD color display |
| Resolution | WVGA 800 x 480 pixels |
| Color depth | 16-bit RGB (65K colors) |
| LCD mode | normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.1926 mm x 0.1790 mm |
| Number of pixels | 800*3 (RGB) x 480 |
| Active surface | 154.08 mm x 85.92 mm |
| Backlighting | LED |
| Contrast | 500:1 |
| Brightness | typically 280 cd/m² |
| Visible field | left and right 70°, below 70°, above 50° |

Article Number and Miscellaneous

| | |
|----------------|----------------|
| Article number | 01-230-731 |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Notes



Touch Operating Panel ETT 771



with 7" WVGA TFT color display

The build-in touch terminal is an intelligent panel for visualizing, operating and monitoring automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the build-in touch terminal. The available interfaces can be used to exchange process data or configure the build-in touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 256-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | no |
| Interfaces | 1x USB-OTG (Host/Device) (for service purposes only) 1x Ethernet 10/100 (RJ45) 1x CAN bus (6-pin Weidmüller) 1x RS485/Modbus (6-pin Weidmüller) 1x RS232 (9-pin D-Sub) |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |
| Display Resolution | 7" TFT color display 800 x 480 pixels |

| | |
|------------------|--|
| Control panel | 4-wire touch screen (analog resistive) |
| Signal generator | no |
| Status LEDs | 1x front LED bi-color RED/GREEN (controllable through the application) |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption of power supply at +24 V | typically 180 mA (without externally connected devices) | maximum 290 mA (with externally connected devices) |
| Current consumption of standby voltage at +24 V | typically 110 mA (without externally connected devices) | maximum 180 mA (with externally connected devices) |
| Inrush current | 600 mA (1 ms) | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 180 x 135 x 50 mm (W x H x D) |
| Material | front plate: 3 mm aluminum, unadulterated |
| Weight | circa 591 g |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC stability | in accordance with product standard EN 60730-1 | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 Shocks |
| Protection type | EN 60529 protection through housing | front: IP54 (no UL-rating) cover: IP20 (no UL-rating) |

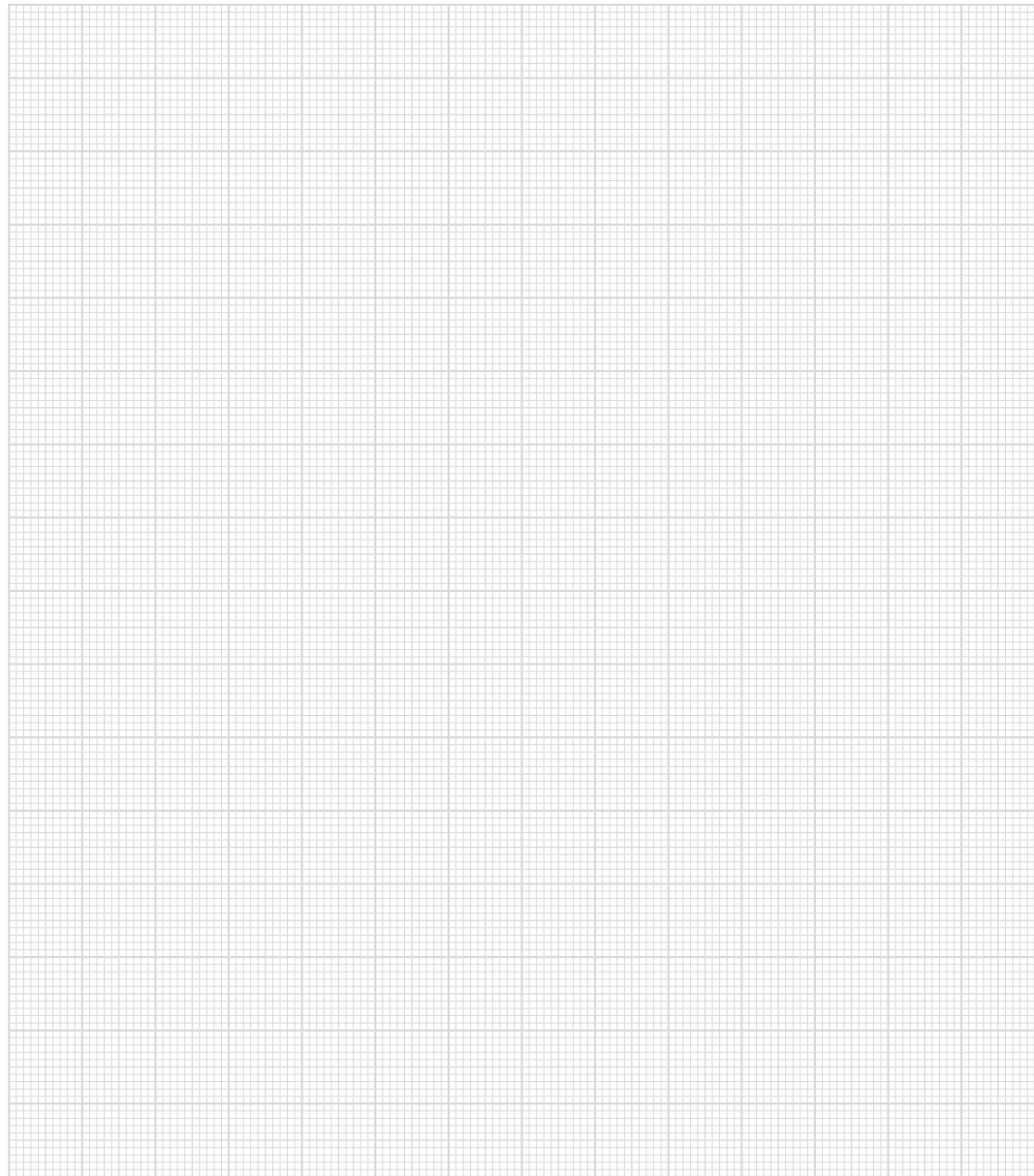
7" VGA Display incl. Touch

| | |
|------------------|--|
| Type | 7" TFT LCD color display |
| Resolution | WVGA 800 x 480 pixels |
| Color depth | 16-bit RGB (65K colors) |
| LCD mode | normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.1926 mm x 0.1790 mm |
| Number of pixels | 800*3 (RGB) x 480 |
| Active surface | 154.08 mm x 85.92 mm |
| Backlighting | LED |
| Contrast | 500:1 |
| Brightness | typically 280 cd/m² |
| Visible field | left and right 70°, below 70°, above 50° |

Article Number and Miscellaneous

| | |
|----------------|----------------|
| Article number | 01-230-771 |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Notes



Touch Operating Panel ETT 775



with 7" WVGA TFT color display

The build-in touch terminal is an intelligent panel for visualizing, operating and monitoring automated processes. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 7" WVGA TFT color display. With a LASAL visualization tool, graphics can be created on the PC, then stored and displayed on the build-in touch terminal. The available interfaces can be used to exchange process data or configure the build-in touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|---|--|
| Processor | EDGE2-Technology |
| Processor core | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-MByte |
| Internal remnant data memory | 256 kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | no |
| Interfaces | 1x USB 2.0 (Type A front) 1x USB device 1.1, Type Mini-B (back) 1x Ethernet 10/100 1x CAN bus 1x RS485 / Modbus 1x RS232 1x TTY for a max. of 6 participants |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |

| | | | |
|--------------------|--|--|--|
| Display Resolution | 7" TFT color display 800 x 480 pixels | | |
| Control panel | 4-wire touch screen (analog resistive) | | |
| Signal generator | no | | |
| Status LEDs | 1x front LED bi-color RED / GREEN (controllable through the application) | | |
| Real-time clock | yes | | |
| Cooling | passive (fanless) | | |

TTY Specifications

| | | | |
|------------------------------------|---|-------------|------|
| Number of interfaces | 1 | | |
| Adjustable data transfer rate | 2400 Baud, 4800 Baud, 9600 Baud | | |
| Over voltage protection | TTY | Pin 20 mA | 70 V |
| Voltage drop | Rx < 3 V | Tx < 2 V | |
| Maximum number of TTY participants | depends on the voltage drop on the participants, cables and connectors (maximum of 6) | | |
| Short-circuit proof | yes | | |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of power supply at +24 V | typically 260 mA (without externally connected devices) | maximum 390 mA (with external devices connected) |
| Current consumption of standby voltage at +24 V | typically 160 mA (without externally connected devices) | maximum 265 mA (with external devices connected) |
| Inrush current | maximum 16.9 A for 50 µs | |

Terminal

| | |
|------------|-------------------------------------|
| Dimensions | 180 x 135 x 50 mm (W x H x D) |
| Material | front plate: 3 mm aluminum, natural |
| Weight | circa 591 g |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| EMC resistance | in accordance with EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 Shocks |
| Protection type | EN 60529 protection through housing | front: IP54 cover: IP20 |

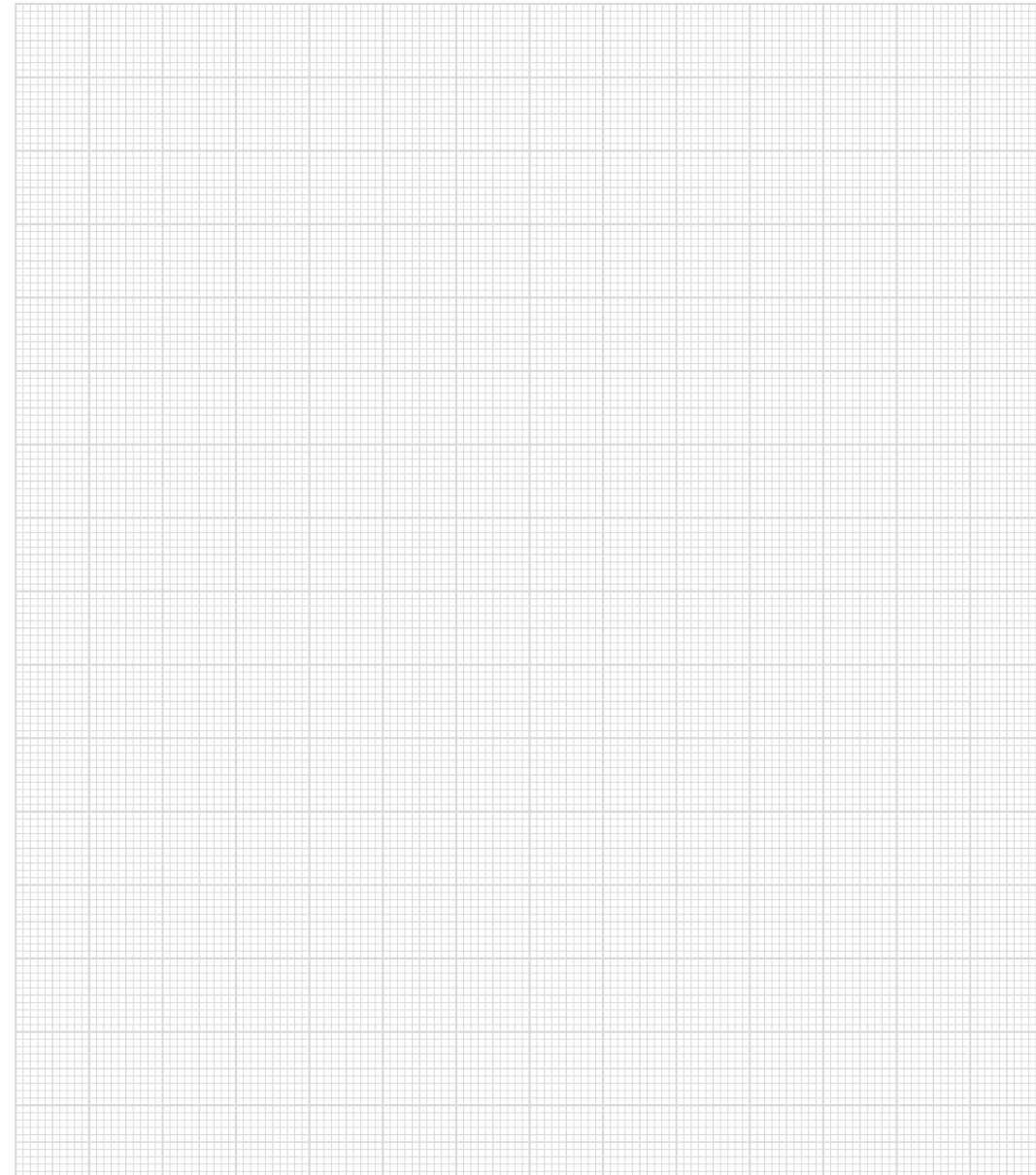
7" WVGA Display incl. Touch

| | | |
|------------------|--|--|
| Type | 7" TFT LCD color display | |
| Resolution | WVGA 800 x 480 Pixel | |
| Color depth | 16 Bit RGB (65K colors) | |
| LCD mode | normal white | |
| LCD Polarizer | transmissive | |
| Pixel size | 0.1926 x 0.1790 mm | |
| Number of pixels | 800*3 (RGB) x 480 | |
| Active surface | 154.08 x 85.92 mm | |
| Backlighting | LED | |
| Contrast | 500:1 | |
| Brightness | typically 280 cd/m ² | |
| Visible field | left and right 70°, below 70°, above 50° | |

Article Number and Miscellaneous

| | | |
|----------------|-------------------|--|
| Article number | 01-230-775 | |
| Standard | UL in preparation | |
| Approvals | CE | |

Notes



Control Panel VARAN ETV 0551



with 5.7" VGA TFT color display
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGE Technology combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and therefore not bound to a specific topology when constructing your system. The available interface connections can be programmed completely from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN Editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Internal cache | 32-kbyte L1 cache 256-kbyte L2 cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Interfaces | 2x USB Type A 2.0 (full speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN Out (Manager) 1x CAN bus |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 5.7" TFT color display 640 x 480 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption Power supply +24 V | typically 335 mA (without externally connected devices) | maximum 610 mA (with externally connected devices) |
| Inrush current | maximum 28 A for 20 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 180 x 135 x 40 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | 650 g |

Control Unit

| | |
|-------------|---|
| Touch panel | analog resistive film-glass touch panel |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------------------|-----------------------------------|
| Type | 5.7" LCD color display |
| Resolution | VGA, 640 x 480 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.18 mm x 0.18 mm |
| Active surface | 115.2 mm x 86.4 mm |
| Backlight | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 350 cd/m ² |
| Viewing angle CR > 10 from | left, right, below 75°, above 60° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8 channels) | 6 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (output inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Maximum breaking energy braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

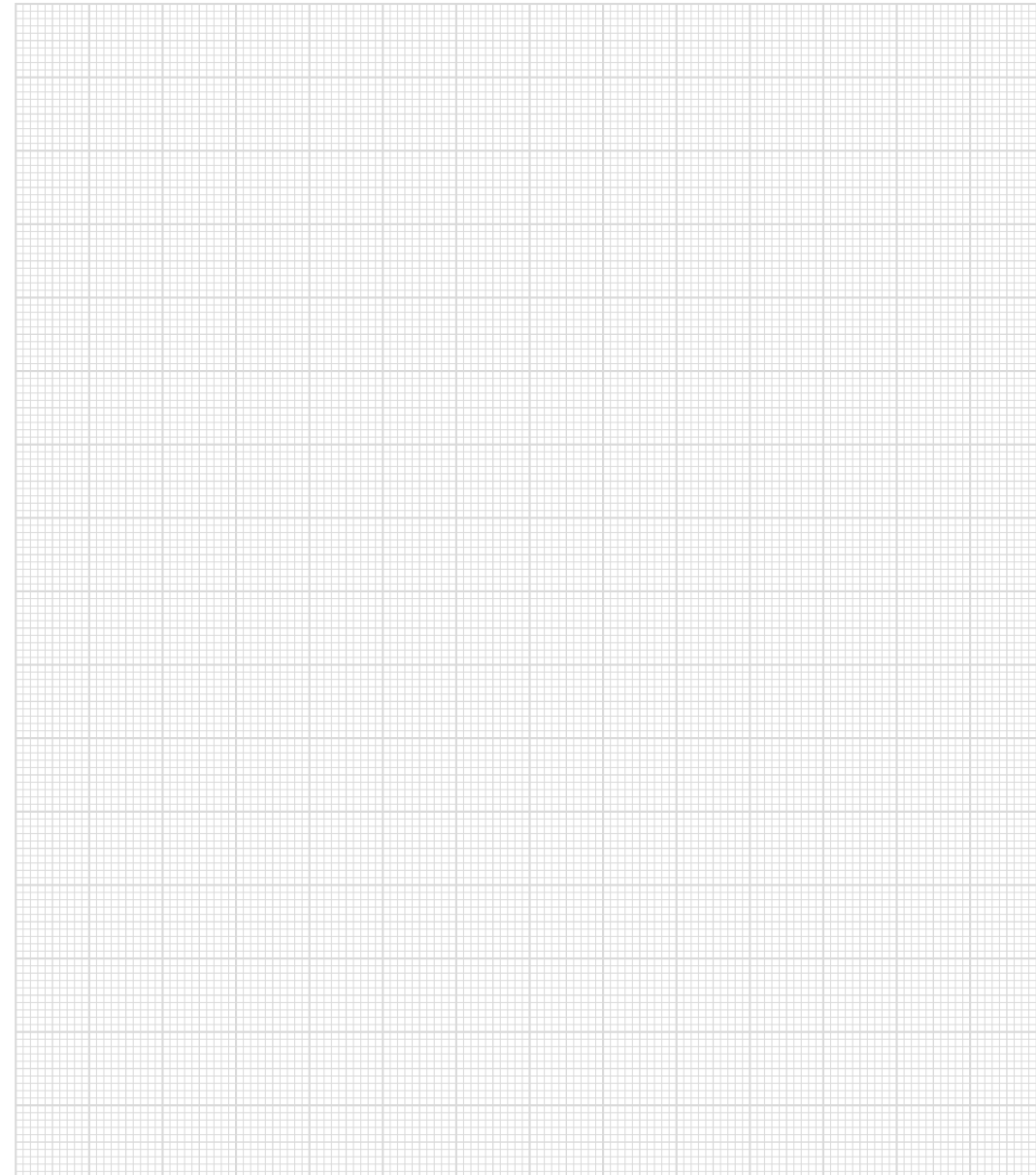
Article Number and Miscellaneous

| | | |
|------------------|------------------|--|
| Article number | 12-230-0551 | |
| Hardware version | 1.x | |
| Standard | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | front: IP54 cover: IP20 |

Notes



Control Panel VARAN ETV 0552



with glass touch screen, front-side IP65 protected
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGE Technology combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and therefore not bound to a specific topology when constructing your system. The available interface connections can be programmed completely from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN Editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Cache | 32-kbyte L1 cache 256-kbyte L2 cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Interfaces | 1x USB Type A 2.0 (full speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN Out (Manager) 1x CAN bus |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 5.7" TFT color display 640 x 480 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---------------------------------------|-----------------------------|------------------|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of voltage supply | typically 335 mA (at +24 V) | maximum 460 mA |
| Inrush current | maximum 25 A for 20 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 180 x 135 x 40 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | 650 g |

Control Unit

| | |
|-------------|---|
| Touch panel | TOP Glass Substrate: Anti-Reflection Hard Coating |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------|-----------------------------------|
| Type | 5.7" LCD color display |
| Resolution | VGA, 640 x 480 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.18 mm x 0.18 mm |
| Active surface | 115.2 mm x 86.4 mm |
| Backlight | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 350 cd/m ² |
| Angle CR > 10 | left, right, below 75°, above 60° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8-channels) | 6 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (output inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 ms | |
| Turn-off delay | < 400 ms | |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

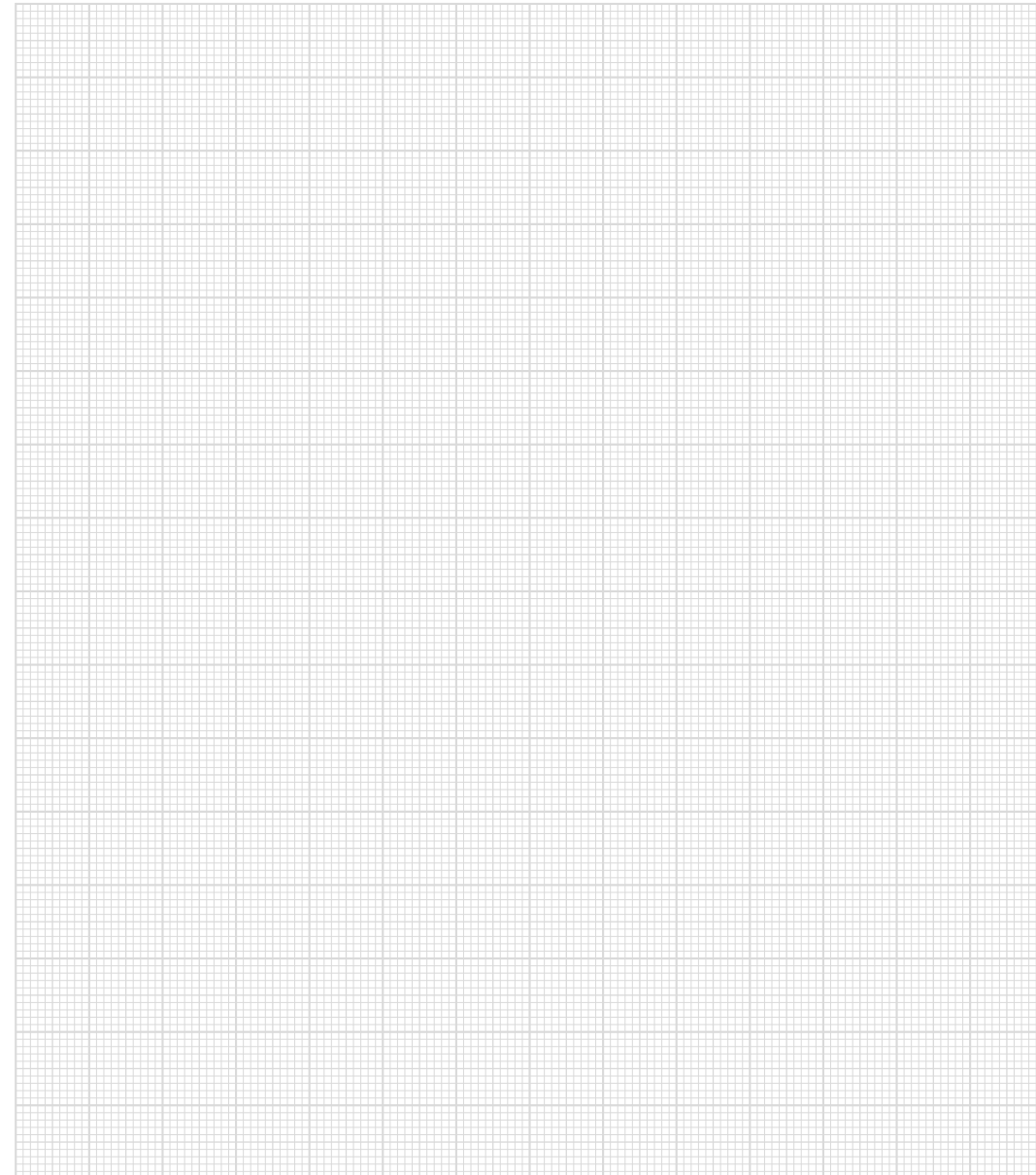
Article Number and Miscellaneous

| | | |
|------------------|------------------|--|
| Article number | 12-230-0552 | |
| Hardware version | 1.x | |
| Standard | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | front: IP65 cover: IP20 |

Notes



Control Panel VARAN ETV 0555



with 5.7" VGA TFT LCD color display
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGE Technology combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and therefore not bound to a specific topology when constructing your system. The available interface connections can be programmed completely from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN Editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Internal cache | 32-kbyte L1 cache 256-kbyte L2 cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD or 1-Gbyte microSD |
| Interfaces | 2x USB Type A 2.0 (full speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN Out (Manager) 1x CAN bus |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 5.7" TFT color display 640 x 480 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption Power supply +24 V | typically 335 mA (without externally connected devices) | maximum 610 mA (with externally connected devices) |
| Inrush current | maximum 28 A for 20 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 180 x 135 x 40.4 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | 650 g |

Control Unit

| | |
|-------------|---|
| Touch panel | analog resistive film-glass touch panel |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------------------|-----------------------------------|
| Type | 5.7" LCD color display |
| Resolution | VGA, 640 x 480 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.18 mm x 0.18 mm |
| Active surface | 115.2 mm x 86.4 mm |
| Backlight | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 350 cd/m ² |
| Viewing angle CR > 10 from | left, right, below 75°, above 60° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8 channels) | 6 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (output inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Maximum breaking energy braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

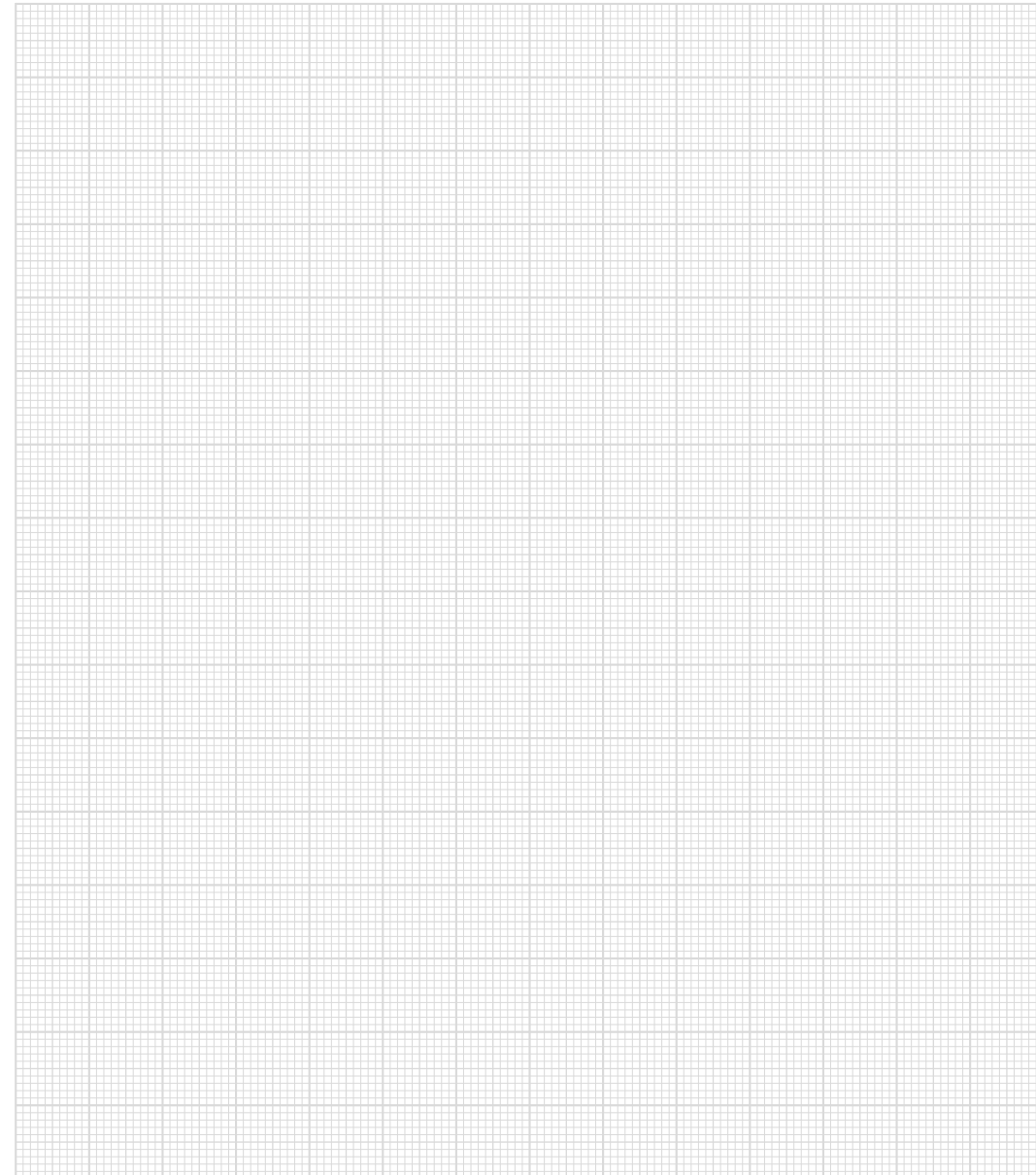
Article Number and Miscellaneous

| | | |
|------------------|--|--|
| Article number | 12-230-0555 (512-Mbyte microSD card) 12-230-0555-1 (1-Gbyte microSD card) | |
| Hardware version | 1.x | |
| Standard | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | front: IP54 cover: IP20 |

Notes



Control Panel VARAN ETV 0851



with 8.4" SVGA TFT color display
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGDE Technology combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and therefore not bound to a specific topology when constructing your system. The available interface connections can be programmed completely from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN Editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Internal cache | 32-kbyte L1 cache 256-kbyte L2 cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Interfaces | 2x USB Type A 2.0 (full speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN bus 1x CAN bus |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 8.4" TFT color display 800 x 600 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption Power supply +24 V | typically 400 mA (with no external devices connected) | maximum 450 mA (with external devices connected) |
| Inrush current | maximum 27 A for 9 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 240 x 200 x 40.5 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | 1.5 kg |

Control Unit

| | |
|-------------|---|
| Touch panel | analog resistive film-glass touch panel |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------|--|
| Type | 8.4" TFT LCD color display |
| Resolution | SVGA, 800 x 600 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.213 mm x 0.213 mm |
| Active surface | 170.40 mm x 127.80 mm |
| Backlight | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 250 cd/m ² |
| Angle CR ≥ 10 | left and right 75°, below 70°, above 60° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number of outputs | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8 channels) | 6 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (output inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Maximum breaking energy braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

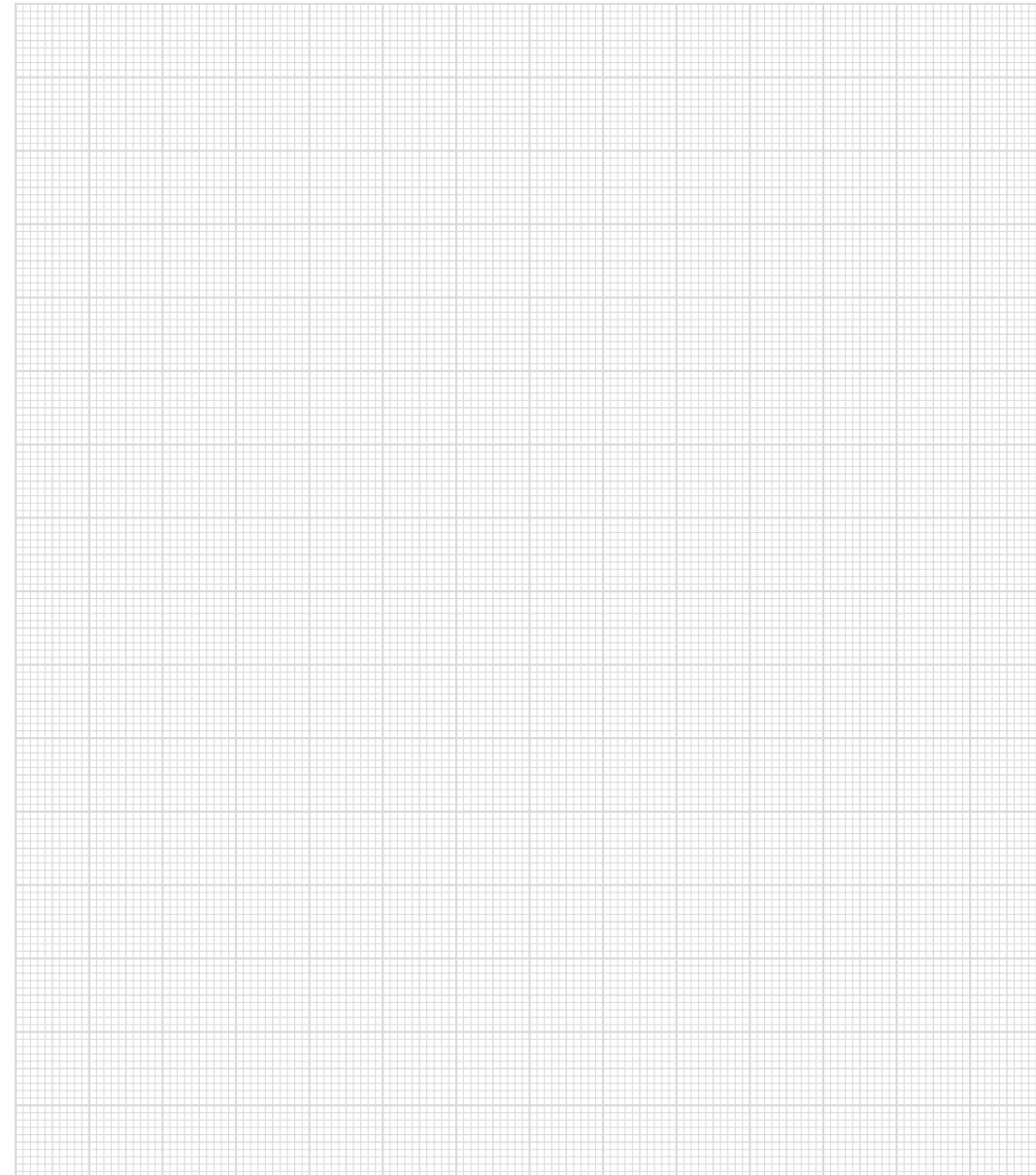
Article Number and Miscellaneous

| | | |
|------------------|------------------|--|
| Article number | 12-230-0851 | |
| Hardware version | 1.x | |
| Standard | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | front: IP54 cover: IP20 |

Notes



Control Panel VARAN ETV 0851-I



with 8.4" SVGA TFT color display
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGDE Technology and optic adhesive film glass touch combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and are therefore not bound to a specific topology when constructing your system. The available interface connections can be freely programmed from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Internal cache | 32-kbyte L1 Cache 256-kbyte L2 Cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remanent data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Interface connections | 1x USB Type A 2.0 (Full Speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN bus 1x CAN bus |
| Internal interface connections and devices | 1x TFT color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 8.4" TFT color display 800 x 600 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of the +24 V supply | typically 400 mA (with no external devices connected) | maximum 450 mA (with external devices connected) |
| Inrush current | maximum 27 A for 9 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 240 x 200 x 40.5 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | typically 1.5 kg |

Control Unit

| | |
|-------------|------------------------------------|
| Touch panel | analog resistive glass touch panel |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|-----------------------|--|
| Type | 8.4" TFT LCD color display |
| Resolution | SVGA, 800 x 600 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.213 mm x 0.213 mm |
| Active surface | 170.40 mm x 127.80 mm |
| Background lighting | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 250 cd/m ² |
| Visible field CR ≥ 10 | left and right 75°, below 70°, above 60° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number of outputs | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8-channels) | 6 A (100 % of on-time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual output current (inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number of inputs | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

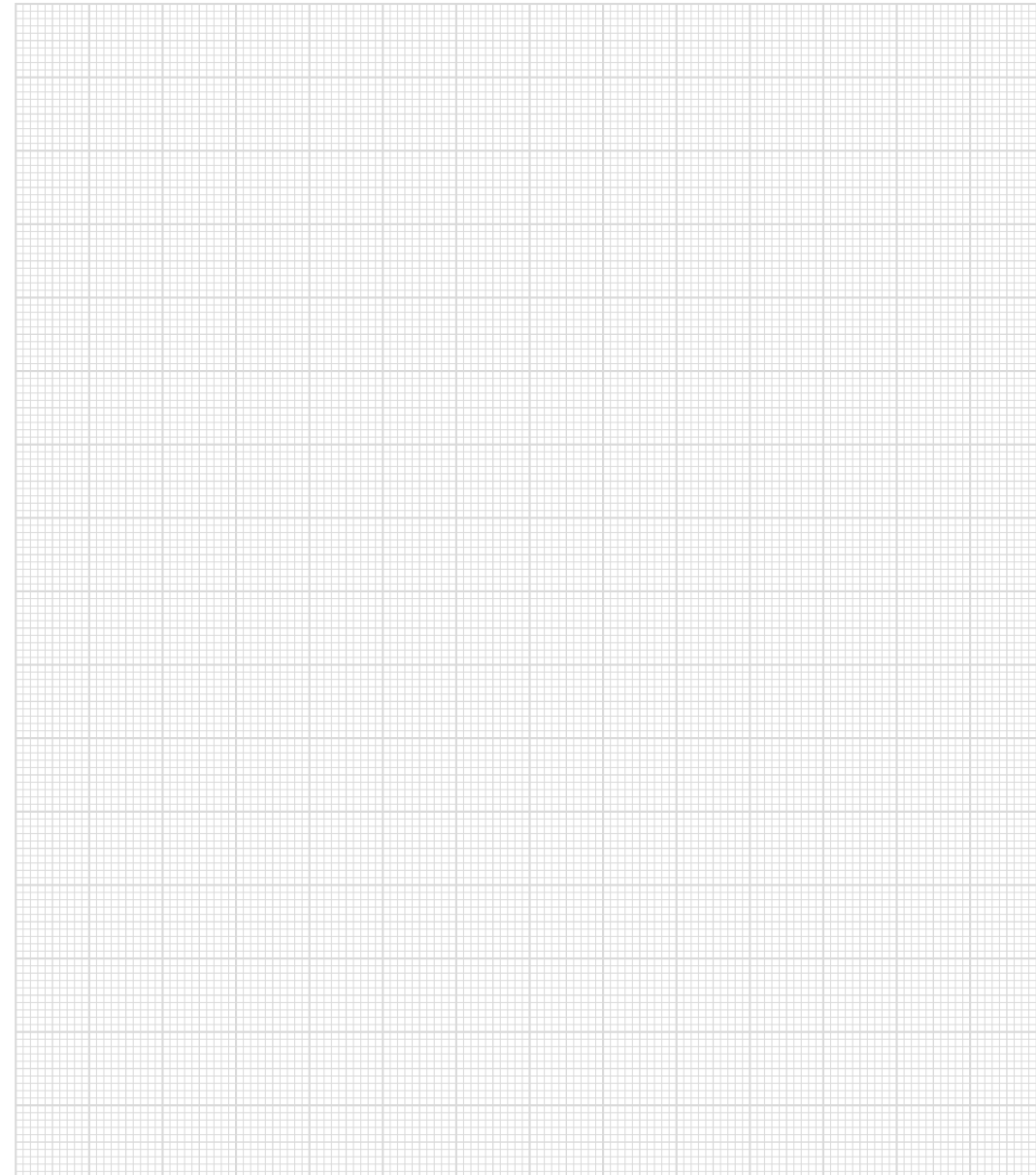
Article Number and Miscellaneous

| | | |
|------------------|------------------|--|
| Article number | 12-230-0851-I | |
| Hardware version | 1.x | |
| Standardization | UL 508 (E247993) | |

Environmental Conditions

| | | |
|---------------------------|--|---|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non condensing | |
| EMC stability | EN 61000-6-2: noise resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection Type | EN 60529: protection through housing | front: IP65 cover: IP20 |

Notes



Control Panel

ETV 0853-3



The control panel is an intelligent terminal for programming and visualization of automated processes. Process diagnosis as well as operating and monitoring automated procedures is simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4" SVGA TFT color display.

The available interface connections can be used to exchange process data or configure the terminal. A microSD card serves as the storage medium for the operating system, application and application data. The integrated, high-performance VARAN bus can be used to control I/O modules directly.

Performance Data

| | |
|---|---|
| Processor | EDGE-Technology X86 compatible |
| Internal cache | 32-kbyte L1 Cache 256-kbyte L2 Cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 256-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | microSD card |
| Internal I/O | yes |
| Interface connections | 1x USB 2.0, Type A (Full speed 12 Mbit/s) 1x USB 1.1, Type Mini B 1x Ethernet 1x VARAN bus (maximum length: 100 m) 1x CAN bus |
| Internal interface connections and devices | 1 x TFT-LCD color display 1 x projective capacitive touch |
| Display Resolution | 8.4" TFT color display 800 x 600 pixels |

| | |
|------------------|--------------------------------------|
| Control Panel | Touch screen (projective capacitive) |
| Data buffer | yes |
| Signal generator | no |
| Status LEDs | no |
| Real-time clock | yes (buffering via battery) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of the supply +24 V | typically 350 mA (with no external devices connected) | maximum 400 mA (with external devices connected) |
| Inrush current | maximum 27 A for 9 µs | |

Terminal

| | |
|------------|---|
| Dimensions | 220 x 172 x 33.7 mm (W/H/T) |
| Material | Front plate: 4 mm black anodized aluminum |
| Weight | typically 1.1 kg |

Article Number and Miscellaneous

| | |
|------------------|---------------|
| Article number | 12-230-0853-3 |
| Hardware version | 1.x |
| Operating system | Salamander |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, uncondensed | |
| EMC stability | EN 61000-6-2: noise resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 protection through housing | Front: IP65 Cover: IP20 |

Control Panel

ETV 0855



The control panel is an intelligent terminal for programming and visualization of automated processes. Process diagnosis as well as operating and monitoring automated procedures is simplified using this terminal. A touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4" SVGA TFT color display.

The available interface connections can be used to exchange process data or configure the terminal. A microSD card serves as the storage medium for the operating system, application and application data. The integrated, high-performance VARAN bus can be used to control I/O modules directly.

Performance Data

| | |
|---|---|
| Processor | EDGE-Technology X86 compatible |
| Internal cache | 32-kbyte L1 Cache 256-kbyte L2 Cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Internal I/O | yes |
| Interface connections | 2x USB 2.0, Type A (Full speed 12 Mbit/s) 1x USB 1.1, Type Mini B 1x Ethernet 1x VARAN-Bus (maximum length: 100 m) 1x CAN-Bus |
| Internal interface connections and devices | 1x TFT-LCD color display 1x Touch |
| Display Resolution | 8.4" TFT color display 800 x 600 pixels |

| | |
|------------------|--|
| Control panel | 4-wire touch screen (analog resistive) |
| Data buffer | yes |
| Signal generator | no |
| Status leds | yes |
| Real-time clock | yes (buffering via battery) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of the supply (+24 V) | typically 400 mA (with no external devices connected) | maximum 450 mA (with external devices connected) |
| | Inrush current | |
| | | maximum 27 A for 9 µs |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 240 x 200 x 40.5 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | typically 1.5 kg |

Article Number and Miscellaneous

| | |
|------------------|-------------|
| Article number | 12-230-0855 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -10 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, uncondensed | |
| EMC stability | EN 61000-6-2: noise resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| | Shock resistance | |
| | | EN 60068-2-27 |
| | | 150 m/s ² |
| Protection type | EN 60529 | |
| | protection through housing | Front: IP54 Cover: IP20 |

Control Panel VARAN ETV 1251



with 12.1" SVGA TFT LCD color display
8 digital inputs
8 digital outputs

The ETV Control Panel with EDGDE Technology combines control, operation and visualization in a single unit. Local as well as decentralized I/O systems can be connected over the VARAN bus and therefore not bound to a specific topology when constructing your system. The available interface connections can be programmed completely from the application. A microSD card serves as the storage medium for the operating system, application and application data. Naturally, the panel can also be configured with the LASAL SCREEN Editor.

Performance Data

| | |
|---|---|
| Processor | EDGE Technology X86 compatible |
| Internal cache | 32-kbyte L1 cache 256-kbyte L2 cache |
| BIOS | AMI |
| Internal program and data memory (DDR2 RAM) | 64-Mbyte |
| Internal remnant data memory | 512-kbyte |
| Internal storage device (IDE) | 512-Mbyte microSD |
| Interfaces | 2x USB Type A 2.0 (full speed 12 Mbit/s) 1x USB Type Mini B 1.1 1x Ethernet 1x VARAN bus 1x CAN bus |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | 4-wire touch screen (analog resistive) |
| Display | 12.1" TFT color display 800 x 600 pixels |
| Data buffer | yes |

| | |
|------------------|-------------------|
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption Power supply +24 V | typically 610 mA (without externally connected devices) | maximum 670 mA (with external devices connected) |
| Inrush current | maximum 27 A for 9 µs | |

Terminal

| | |
|------------|---------------------------------------|
| Dimensions | 320 x 260 x 47.5 mm (W x H x D) |
| Material | front plate: 3.5 mm anodized aluminum |
| Weight | 3.4 kg |

Control Unit

| | |
|-------------|---|
| Touch panel | analog resistive film-glass touch panel |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------|--|
| Type | 12.1" TFT LCD color display |
| Resolution | SVGA, 800 x 600 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.3075 mm x 0.3075 mm |
| Active surface | 246.0 mm x 184.5 mm |
| Backlight | LED |
| Contrast | typically 700 : 1 |
| Brightness | typically 450 cd/m ² |
| Angle CR ≥ 10 | left and right 80°, above 65°, below 75° |

Digital Outputs

| | | |
|---|-------------------------|--|
| Number | 8 | |
| Short-circuit proof | yes | |
| Maximum continuous current load allowed per channel | 2 A | |
| Maximum total current (all 8 channels) | 6 A (100 % of on time) | |
| Voltage drop over power supply (output active) | ≤ 1 V | |
| Residual current (output inactive) | ≤ 12 µA | |
| Turn-on delay | < 400 µs | |
| Turn-off delay | < 400 µs | |
| Maximum breaking energy braking energy of inductive loads | 1 channel 0.12 [Joules] | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

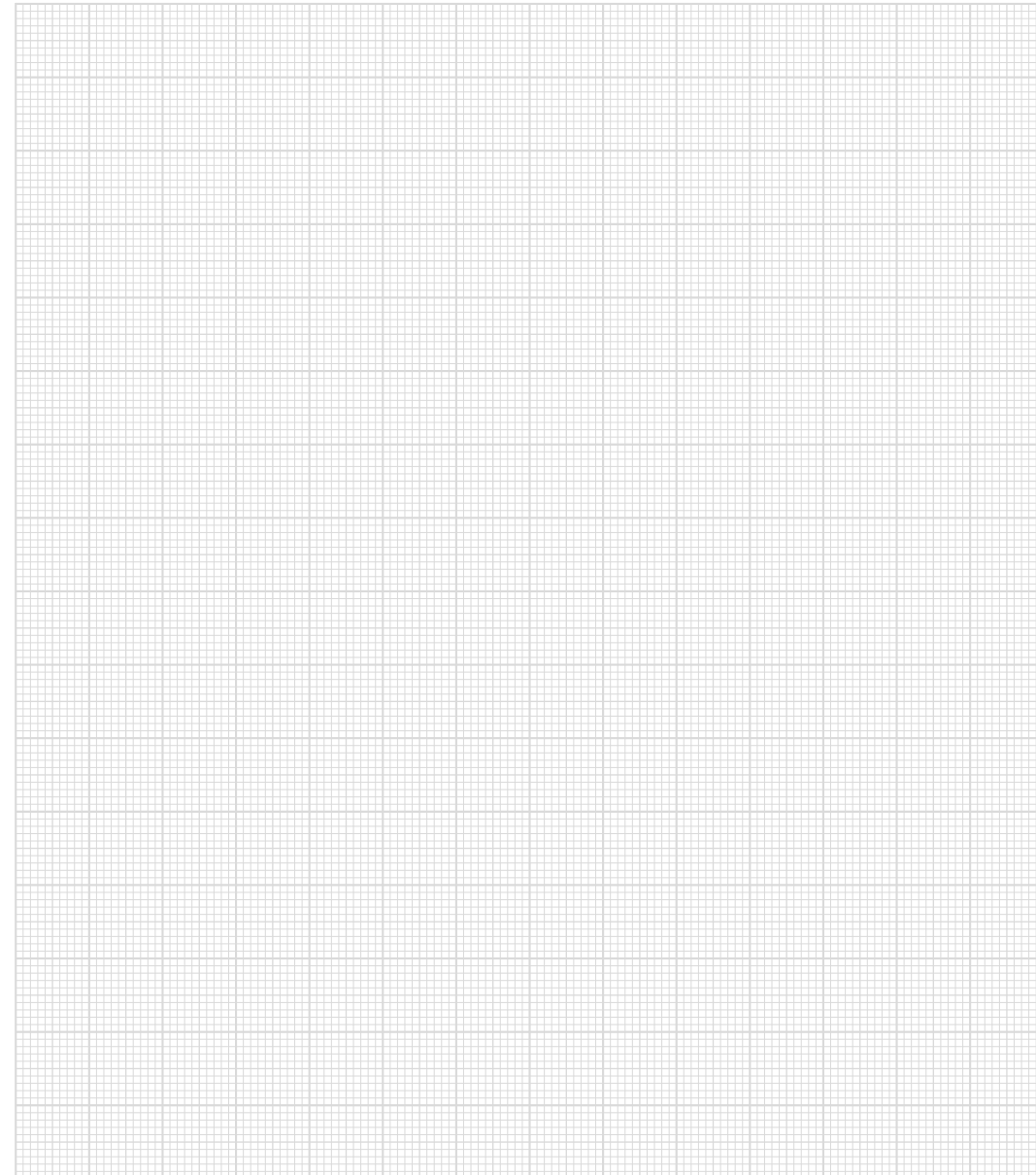
Article Number and Miscellaneous

| | | |
|------------------|--------------|--|
| Article number | 12-230-1251 | |
| Hardware version | 1.x | |
| Standard | UL (E247993) | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC stability | EN 61000-6-2: EMC resistance noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | front: IP54 cover: IP20 |

Notes



Multi-touch Operating Panel ETT 1533

with 15" XGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 15" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.



Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | yes |
| Interfaces | 2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated) |
| Internal interface connections and devices | 1x TFT-color display 1x USB (touch connection) |
| Display Resolution | 15" TFT color display 1024 x 768 pixels |
| Control panel | Touch screen (projective capacitive) |
| Logo backlighting | optional (RGB) |

| | |
|-----------------|------------------------|
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption Power supply +24 V | typically 730 mA (without ext. connected devices) | maximum 890 mA (with ext. connected devices) |
| Inrush current | maximum 2 A for 10 µs | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 376.1 x 310.1 x 47.9 mm (W x H x D) |
| Material | front plate: 4 mm glass on 1.5 mm aluminium frame |
| Weight | typically 4.7 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +75 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | |
|----------------|--|
| Type | 15" TFT color display |
| Resolution | XGA, 1024 x 768 pixels |
| Color depth | 24 Bit RGB |
| LCD mode | normally black |
| LCD polarizer | transmissive |
| Pixel size | 0.297 x 0.297 mm |
| Active surface | 304.1 x 228.1 mm |
| Backlighting | LED |
| Contrast | typically 1500: |
| Brightness | typically 400 cd/m ² |
| Angle CR ≥ 10 | left, right, below, above 85° |
| Lifespan | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Control Unit

| | |
|-------------|---|
| Touch panel | projective capacitive touch panel |
| Surface | 4 mm front glass with black frame + SIGMATEK logo |

Digital Outputs

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum permitted continuous load current/channel | 0.5 A |
| Maximum total current (all 8-channels) | 2 A (100 % of on time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 400 µs |
| Turn-off delay | < 400 µs |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] |

Digital Inputs

| | |
|---------------------|------------------------------------|
| Number | 8 |
| Input voltage | typically +24 V maximum +30 V |
| Signal level | low: < +4.5 V high: > +14 V |
| Switching threshold | typically +11 V |
| Input current | typically 5 mA at + 24 V |
| Input delay | typically 5 ms |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 01-230-1533 |
| Operating system | Salamander |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Build-in Touch Terminal ETT 1534



The ETT 1534 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15.6" TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (RAM) | 1-Gbyte DDR3 |
| Internal remnant data memory | 512 kByte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet |
| Internal interfaces | 1x IPS color display 1x USB (touch connection) 1x Panel Interface Connector |

| | | |
|--------------------|---|--|
| Display Resolution | 15.6" TFT color display WXGA 1366 x 768 pixels | |
| Operating panel | Touch screen (projective capacitive) | |
| Signal generator | no | |
| Status LEDs | 2 (red & green) | |
| Real-time clock | yes | |
| Cooling | passiv (fanless) | |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | typically +24 V DC | |
| | minimal +18 V DC | maximum +30 V DC |
| Current consumption of (+24 V) power supply | typically 850 mA (without external devices connected) | maximum 1 A (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.5 A (für 15 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 65 A (für 25 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 399 x 248 x 58 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing; sheet steel |
| Weight | ca. 3.4 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

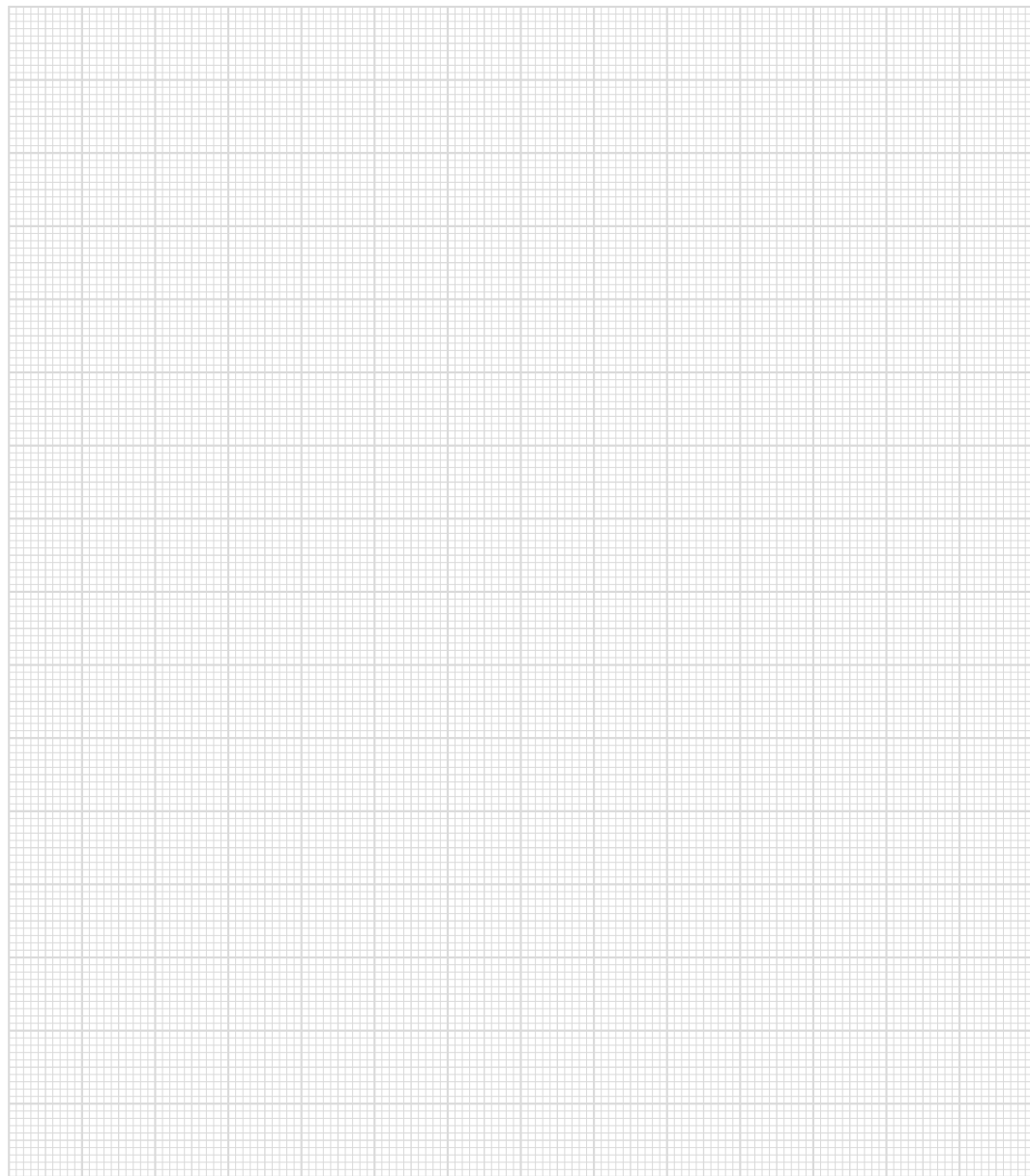
15.6" WXGA Display

| | |
|----------------|---------------------------------|
| Type | 15.6" TN color display |
| Resolution | WXGA 1366 x 768 pixles |
| Color depth | 24-bit RGB |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.252 x 0.252 mm |
| Active surface | 344.23 x 193.54 mm |
| Backlighting | LED |
| Contrast | typically 500 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | all directions typically 80° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1534 |
| Operating system | Salamander |
| Approvals | CE ETT 1534 consists of TP 1561 und PIM 031, both UL certified „UL _{us} (E247993) |

Notes



Build-in Touch Terminal ETT 1544



The ETT 1544 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15.6" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J4005 |
| Processor cores | 2 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 2-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 600 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 15.6" TFT color display WXGA 1366 x 768 pixels |

| | |
|-----------------|--------------------------------------|
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1100 mA (without externally connected devices) | maximum 1600 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 3.7 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 398.5 x 248 x 93 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum |
| Weight | 4.2 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating; > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

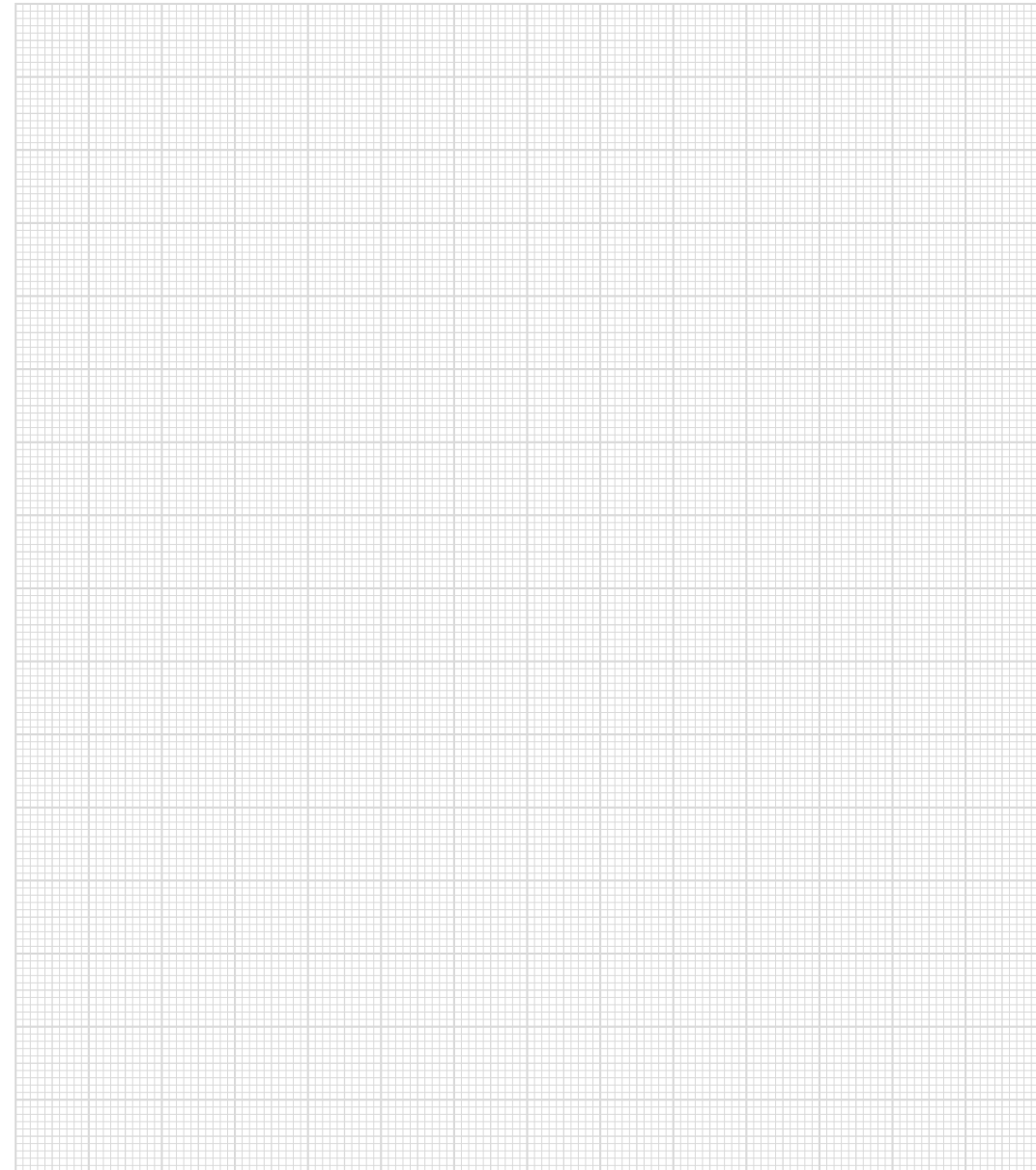
Display

| | |
|----------------|--|
| Type | 15.6" TN color display |
| Resolution | WXGA 1366 x 768 pixles |
| Color depth | 24-bit RGB |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.252 x 0.252 mm |
| Active surface | 344.23 x 193.54 mm |
| Backlighting | LED |
| Contrast ratio | typically 500:1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | all directions typically 80° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1544 |
| Operating system | Gecko |
| Approvals | CE; the ETT 1544 consists of a TP 1561 (cULus (E247993)) and a PIM 041 (UL in preparation) |

Notes



Build-in Touch Terminal TAE 1544



The multi-touch operating panel TAE 1544 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 15.6" TFT color display with LED backlighting. This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP) |
| Internal interfaces (via Panel Interface Connector) | USB 2.0 (for touch and front USB, if available on the TP) |
| Status LEDs | 1x green 1x red (depends on OS) |
| Display Resolution | 15.6" TFT color display WXGA 1366 x 768 pixels |
| Operating field | touch screen (projective capacitive) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1000 mA (with no external devices connected) | maximum 1200 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 3 A (for 16 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 67 A (for 1.5 ms, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 398.5 x 248 x 58 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame |
| Weight | 3.4 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area) | |
| EMC noise emission | in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP65 cover: IP20 (not UL-listed) |

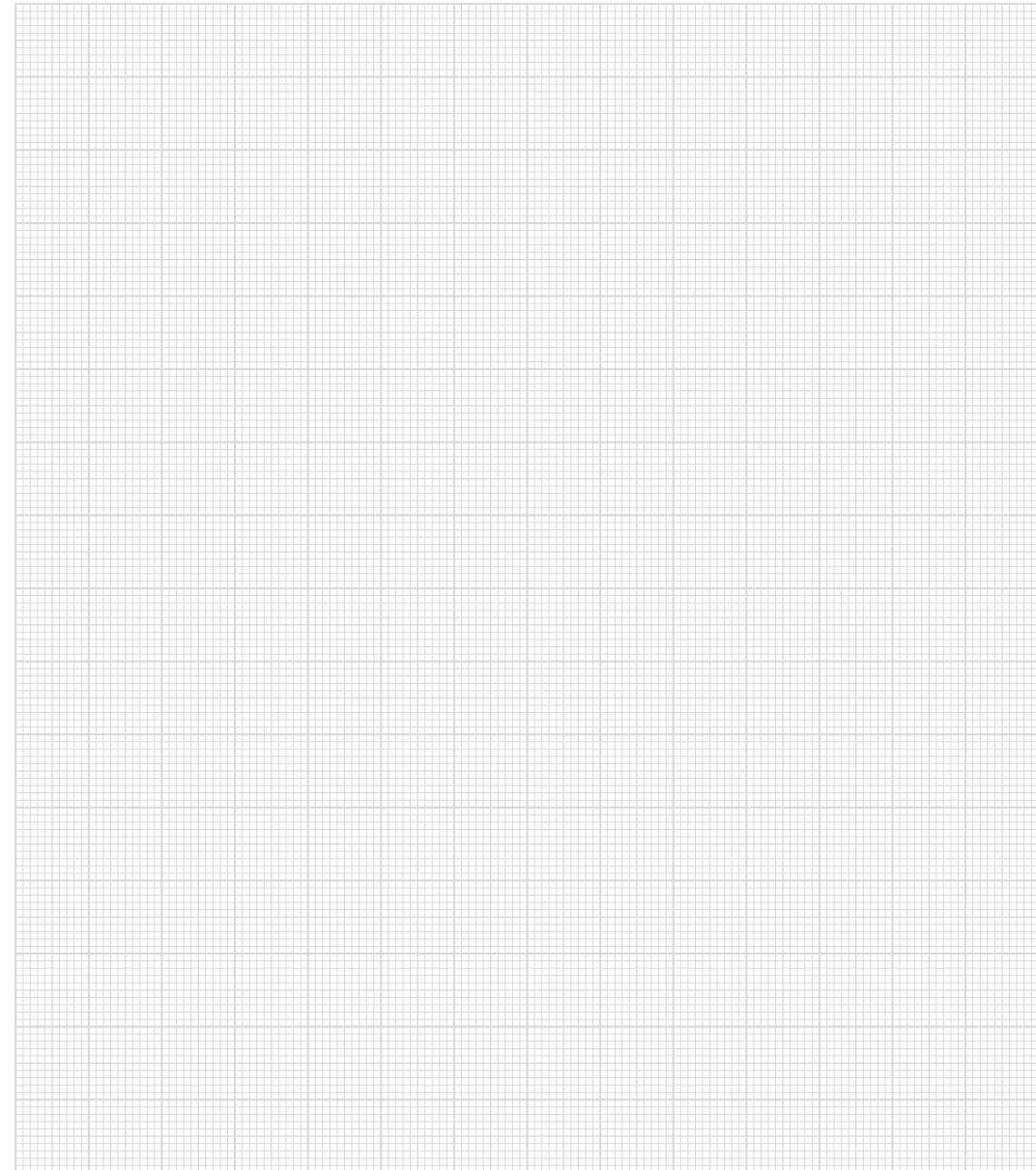
Display

| | |
|----------------|---|
| Type | 15.6" TN color display |
| Resolution | WXGA 1366 x 768 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.252 x 0.252 mm |
| Active range | 344.23 x 193.54 mm |
| Backlighting | LED |
| Contrast ratio | typically 500:1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | all directions typically 80° |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 12-200-1544 |
| Operating system | - |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Build-in Touch Terminal ETT 1834



The ETT 1834 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5" TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (RAM) | 1-Gbyte DDR3 |
| Internal remnant data memory | 512 kByte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet |
| Internal interfaces | 1x TN color display 1x USB (touch connection) 1x Panel Interface Connector |

| | |
|--------------------|---|
| Display Resolution | 18.5" TFT color display WXGA 1366 x 768 pixels |
| Operating panel | Touch screen (projective capacitive) |
| Signal generator | no |
| Status LEDs | 2 (red & green) |
| Real-time clock | yes |
| Cooling | passiv (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | typically +24 V DC | |
| | minimal +18 V DC | maximum +30 V DC |
| Current consumption of (+24 V) power supply | typically 850 mA (without external devices connected) | maximum 1 A (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.5 A (für 15 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 65 A (für 25 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 464 x 285 x 54 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing; sheet steel |
| Weight | ca. 4.1 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

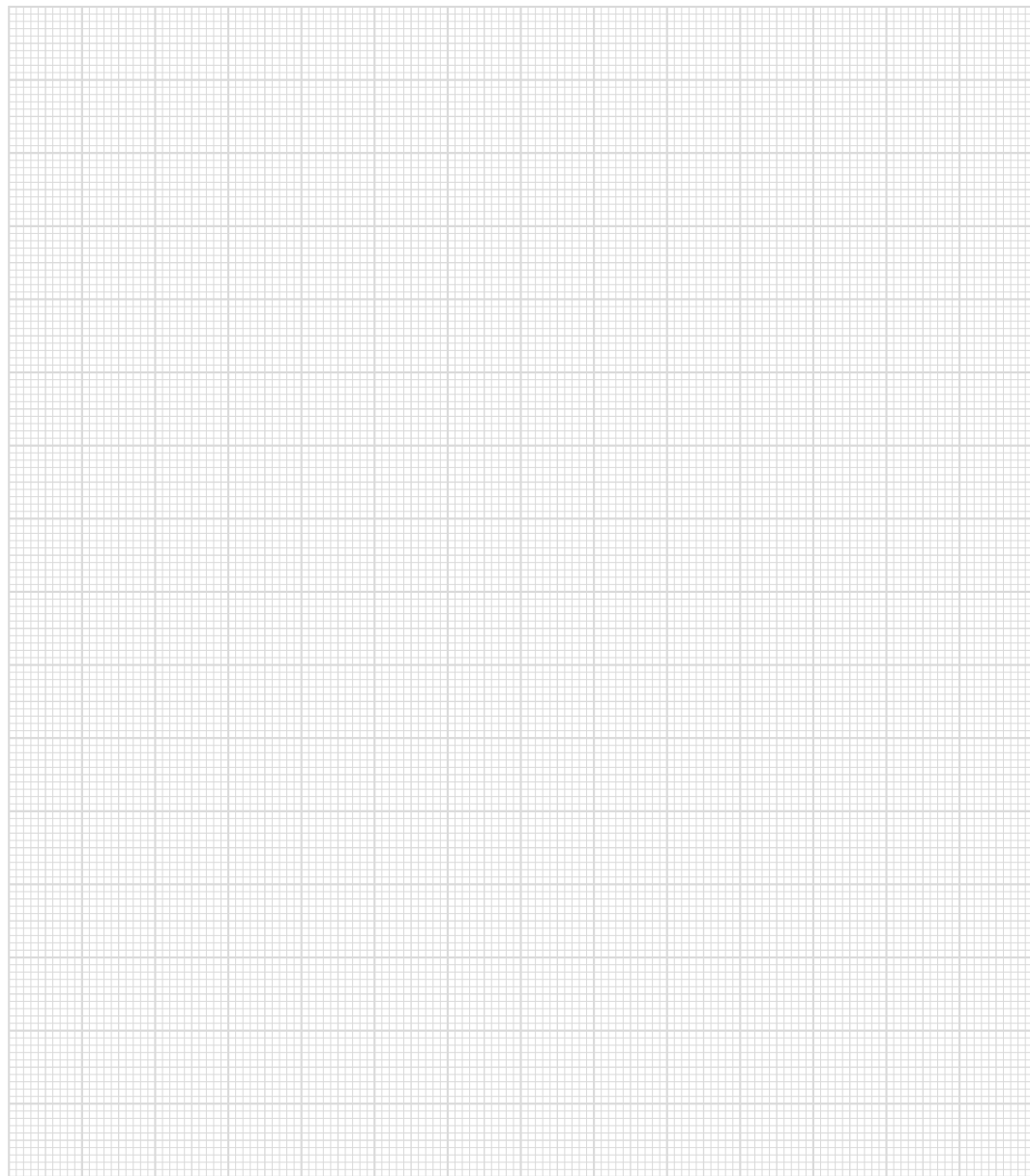
18.5" WXGA Display

| | |
|----------------|---------------------------------|
| Type | 18.5" TFT color display |
| Resolution | WXGA 1366 x 768 pixels |
| Color depth | 18 Bit RGB + Hi-FRC |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.3 x 0.3 mm |
| Active surface | 409.8 x 230.4 mm |
| Backlighting | LED |
| Contrast | typically 1000 |
| Brightness | typically 450 cd/m ² |
| Angle CR ≥ 10 | left right: 85° / top down: 80° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-1834 |
| Operating system | Salamander |
| Approvals | CE ETT 1834 consists of TP 1861 und PIM 031, both UL certified „UL _{us} (E247993) |

Notes



Build-in Touch Terminal ETT 1844



The ETT 1844 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J4005 |
| Processor cores | 2 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 2-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 600 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 18.5" TFT color display WXGA 1366 x 768 pixels |

| | |
|-----------------|--------------------------------------|
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1200 mA (without externally connected devices) | maximum 1700 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 5.2 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 464 x 285 x 89 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum |
| Weight | 4.9 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

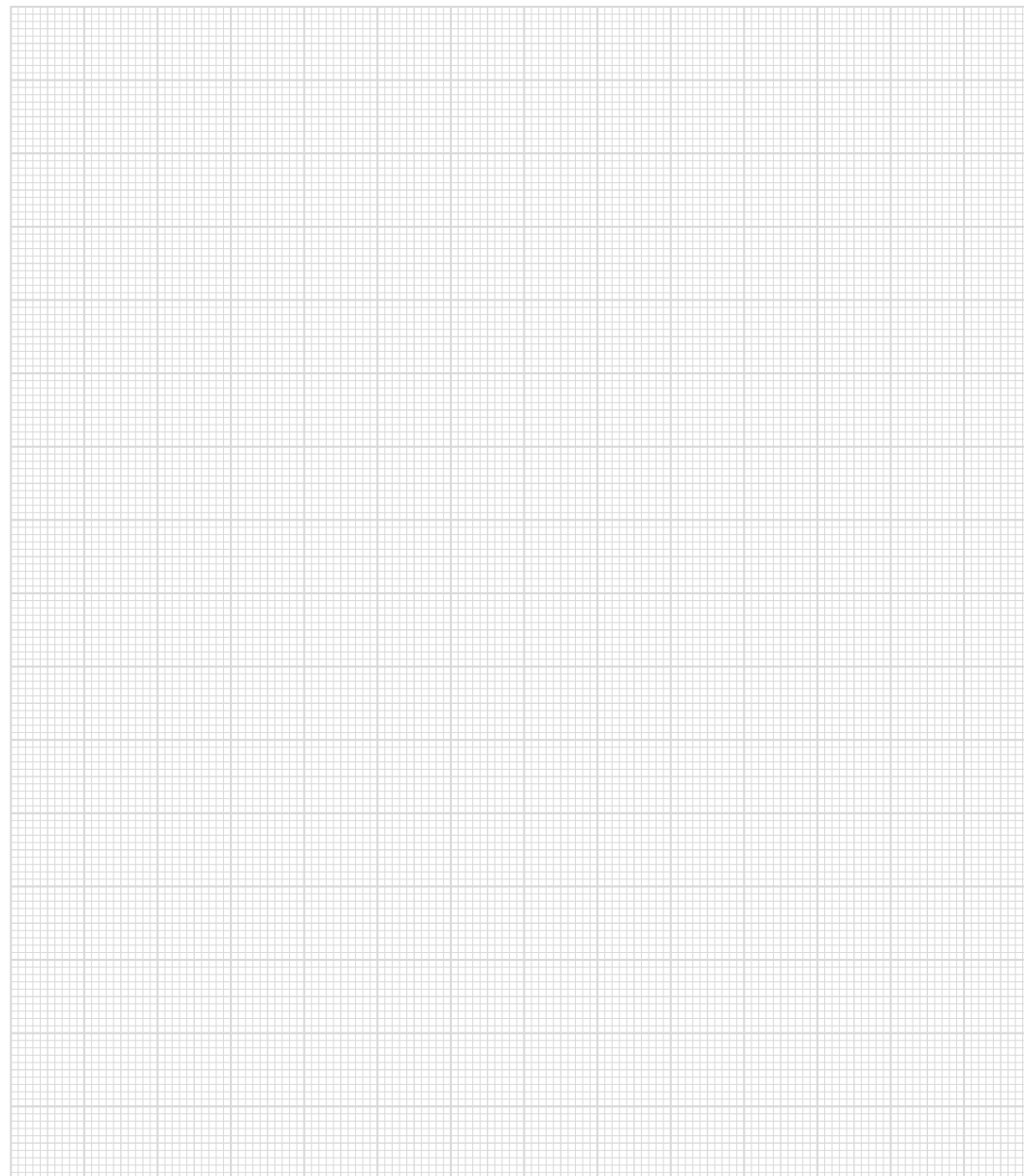
Display

| | |
|----------------|--|
| Type | 18.5" TN color display |
| Resolution | WXGA 1366 x 768 pixles |
| Color depth | 18 Bit RGB + Hi-FRC |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.3 x 0.3 mm |
| Active surface | 409.8 x 230.4 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 450 cd/m ² |
| Angle CR ≥ 10 | left right: 85° / top down: 80° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|--|--|
| Article number | 01-230-1844 |
| Operating system | Gecko |
| Default IP address Intel Ethernet (X3) Realtek Ethernet (X4) | automatic (DHCP) automatic (DHCP) |
| Approvals | CE; the ETT 1844 consists of a TP 1861 (cULus (E247993)) and a PIM 041 (UL in preparation) |

Notes



Build-in Touch Terminal TAE 1844



The multi-touch operating panel TAE 1844 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 18.5" TFT color display with LED backlighting. This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP) |
| Internal interfaces (via Panel Interface Connector) | USB 2.0 (for touch and front USB, if available on the TP) |
| Status LEDs | 1x green 1x red (depends on OS) |
| Display Resolution | 18.5" TFT color display WXGA 1366 x 768 pixels |
| Operating field | touch screen (projective capacitive) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1000 mA (with no external devices connected) | maximum 1200 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 3 A (for 17 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 69 A (for 1.5 ms, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 464 x 285 x 54 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame |
| Weight | 4.1 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area) | |
| EMC noise emission | in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP65 cover: IP20 (not UL-listed) |

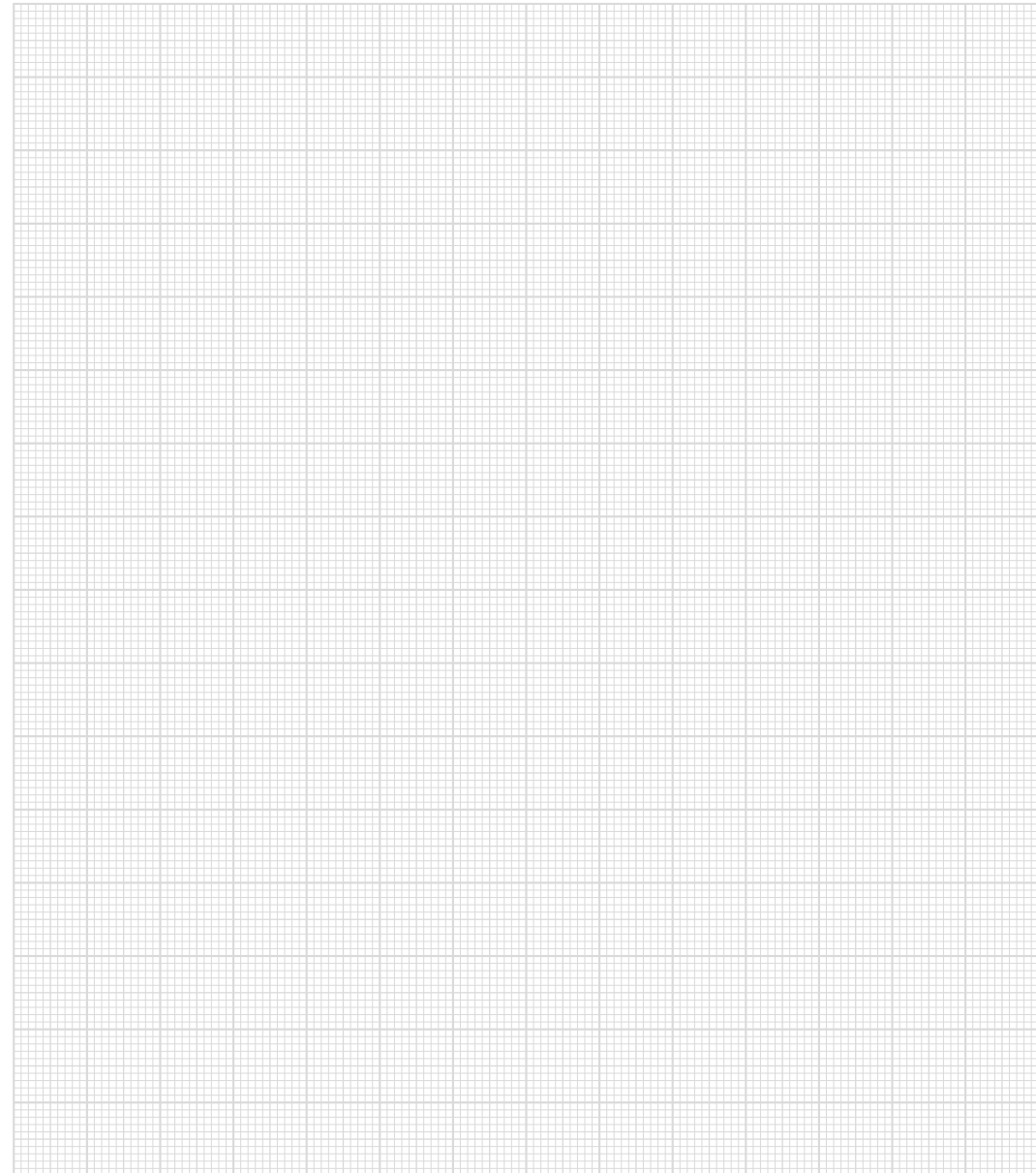
Display

| | |
|----------------|---|
| Type | 18.5" TN color display |
| Resolution | WXGA 1366 x 768 pixels |
| Color depth | 18-bit RGB + Hi-FRC |
| LCD mode | normally white |
| LCD Polarizer | transmissive |
| Pixel size | 0.3 x 0.3 mm |
| Active range | 409.8 x 230.4 mm |
| Backlighting | LED |
| Contrast ratio | typically 1000:1 |
| Brightness | typically 450 cd/m ² |
| Angle CR ≥ 10 | left, right 85° / top, below 80° |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 12-200-1844 |
| Operating system | - |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Multi-touch Operating Panel ETT 1933

with 19" SXGA TFT color display

The multi-touch operating panel is used for visualizing, operating and monitoring automated processes. A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on an 19" SXGA TFT color display.

The available interfaces can be used to exchange process data or configure the multi touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.



Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Internal I/O | yes |
| Interfaces | 2x USB-Host 2.0, type A 1x USB-OTG (host/device), type Mini B 2x Ethernet 1x CAN bus (not galvanically separated) |
| Internal interface connections and devices | 1x TFT-color display 1x USB (touch connection) |
| Display Resolution | 19" TFT color display 1280 x 1024 pixels |
| Control panel | Touch screen (projective capacitive) |
| Logo backlighting | optional (RGB) |

| | |
|-----------------|------------------------|
| Real-time clock | yes (battery buffered) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|---|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption Power supply +24 V | typically 940 mA (without ext. connected devices) | maximum 980 mA (with ext. connected devices) |
| Inrush current | maximum 2 A for 10 µs | |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|------------|---|
| Dimensions | 446.3 x 383.1 x 47.9 mm (W x H x D) |
| Material | front plate: 4 mm glass on 1.5 mm aluminium frame |
| Weight | typically 7.5 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +75 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3,5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | |
|----------------|--|
| Type | 19" TFT color display |
| Resolution | SXGA, 1280 x 1024 pixels |
| Color depth | 24 Bit RGB |
| LCD mode | normally black |
| LCD polarizer | transmissive |
| Pixel size | 0.294 x 0.294 mm |
| Active surface | 376.32 x 301.06 mm |
| Backlighting | LED |
| Contrast | typically 1500 |
| Brightness | typically 350 cd/m ² |
| Angle CR ≥ 10 | left, right, below, above 85° |
| Lifespan | by compliance with the ambient conditions, the brightness of the display sinks after 70,000 operating hours to 50 % of the original brightness |

Control Unit

| | |
|-------------|---|
| Touch panel | projective capacitive touch panel |
| Surface | 4 mm front glass with black frame + SIGMATEK logo |

Digital Outputs

| | |
|---|-------------------------|
| Number | 8 |
| Short-circuit proof | yes |
| Maximum permitted continuous load current/channel | 0.5 A |
| Maximum total current (all 8-channels) | 2 A (100 % of on time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (off) | ≤ 12 µA |
| Turn-on delay | < 400 µs |
| Turn-off delay | < 400 µs |
| Max. braking energy of inductive loads | 1 channel 0.12 [Joules] |

Digital Inputs

| | | |
|---------------------|--------------------------|---------------|
| Number | 8 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +14 V |
| Switching threshold | typically +11 V | |
| Input current | typically 5 mA at + 24 V | |
| Input delay | typically 5 ms | |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 01-230-1933 |
| Operating system | Salamander |
| Standard | UL 61010-2-201 |
| Approvals | UL, cUL, CE |

Build-in Touch Terminal ETT 2134



The ETT 2134 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5" TFT color display.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. A microSD card serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (RAM) | 1-Gbyte DDR3 |
| Internal remnant data memory | 512 kByte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 1x USB-Host 2.0, Typ A (1x back) 1x Online-USB (Device), Typ Mini-B 2x Ethernet |
| Internal interfaces | 1x TN color display 1x USB (touch connection) 1x Panel Interface Connector |

| | |
|--------------------|--|
| Display Resolution | 21.5" TFT color display FullHD 1920 x 1080 pixels |
| Operating panel | Touch screen (projective capacitive) |
| Signal generator | no |
| Status LEDs | 2 (red & green) |
| Real-time clock | yes |
| Cooling | passiv (fanless) |

Electrical Requirements

| | | |
|--|---|---|
| Supply voltage | typically +24 V DC | |
| | minimal +18 V DC | maximum +30 V DC |
| Current consumption of (+24 V) power supply | typically 1.5 A (without external devices connected) | maximum 1.65 A (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 1.5 A (für 15 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 65 A (für 25 µs, load-dependent) | |

Terminal

| | |
|------------|--|
| Dimensions | 539 x 331 x 55 mm (W x H x D) |
| Material | front plate: 1.8 mm glass (touch screen) in black anodized aluminum frame housing; sheet steel |
| Weight | ca. 5.7 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating, > 2000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN 61000-6-2:2007 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (9.81 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) duration 11 ms, 18 shocks |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

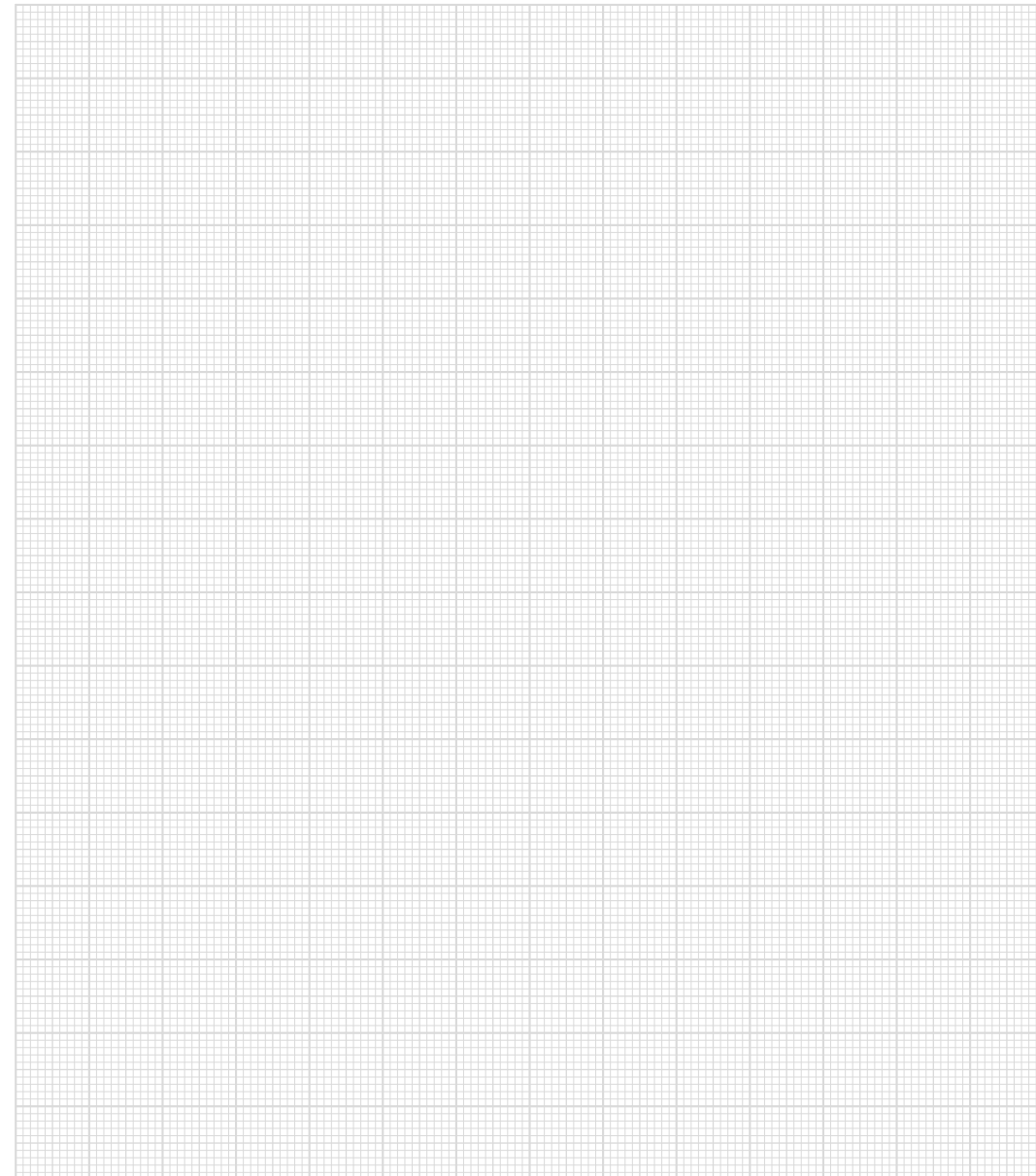
12.1" WXGA Display

| | |
|----------------|--|
| Type | 12.1" IPS color display |
| Resolution | WXGA 1280 x 800 pixles |
| Color depth | 24-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.204 x 0.204 mm |
| Active surface | 261.12 x 163.2 mm |
| Backlighting | LED |
| Contrast | typically 1000 |
| Brightness | typically 400 cd/m ² |
| Blickwinkel | left, right, top, bottom typically 89° |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-2134 |
| Operating system | Salamander |
| Approvals | CE ETT 2134 consists of TP 2161 und PIM 031, both UL certified „UL _{us} (E247993) |

Notes



Build-in Touch Terminal ETT 2144



The ETT 2144 is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J4005 |
| Processor cores | 2 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 2-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 600 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |
| Display Resolution | 21.5" TFT color display Full HD 1920 x 1080 pixels |

| | |
|-----------------|--------------------------------------|
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | +18-30 V DC (SELV/PELV), typically +24 V DC UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1500 mA (without externally connected devices) | maximum 2000 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 3.5 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 539 x 331 x 90 mm (W x H x D) |
| Material | front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum |
| Weight | 6.5 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

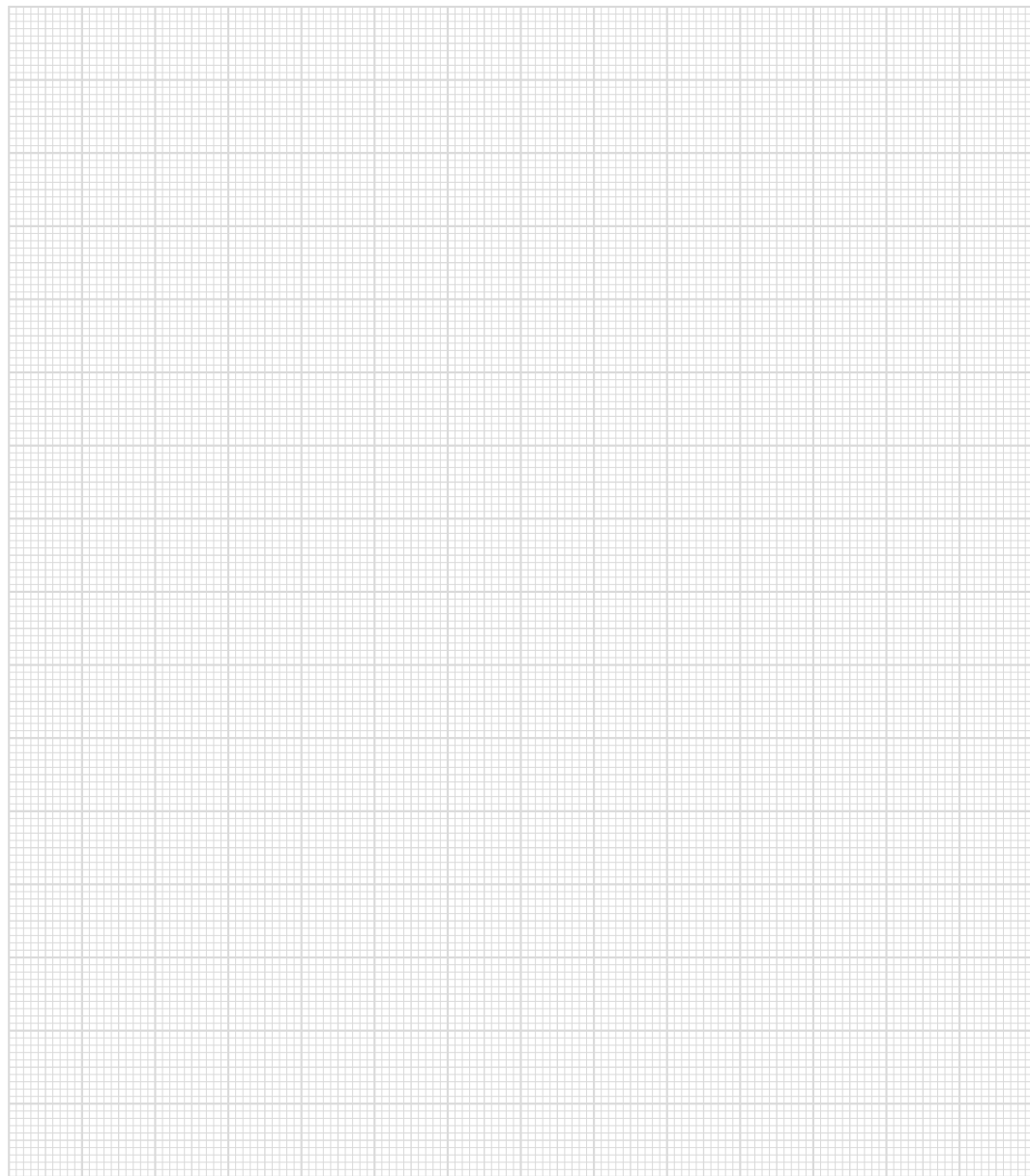
Display

| | |
|----------------|--|
| Type | 21.5" TN color display |
| Resolution | FullHD 1920 x 1080 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.248 x 0.248 mm |
| Active surface | 476.64 x 268.11 |
| Backlighting | LED |
| Contrast ratio | typically 5000:1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | left, right, top, bottom typically 89° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|---|
| Article number | 01-230-2144 |
| Operating system | Gecko |
| Approvals | CE; the ETT 2144 consists of a TP 2161 (cULus (E247993)) and a PIM 041 (UL in preparation) |

Notes



Build-in Touch Terminal ETT 2154-W



The ETT 2154-W is an intelligent panel for visualizing, operating and monitoring automated processes.

A capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 21.5" TFT color display.

Via the high-performance processor, complex HTML5 applications can be displayed without problems.

The available interfaces can be used to exchange process data or configure the multi-touch terminal. An M.2 SSD serves as the storage medium for the operating system, application and application data.

Performance Data

| | |
|--|---|
| Processor | Intel® Celeron® J5005 |
| Processor cores | 4 |
| Processor clock | 2.0-2.7 GHz |
| Internal cache | 4 Mbytes |
| Internal program and data memory (RAM) | 4-Gbyte DDR4 (SODIMM) |
| Graphics | Intel® UHD Graphics 605 |
| Hard drive | 64-Gbyte SATA M.2 SSD |
| Interfaces | 4x USB 2.0 (Type A) 1x DisplayPort output V1.2a (max. 1920 x 1200 px at 60 Hz) 2x Ethernet (Gbit) |
| Internal interfaces | 1x Panel Interface Connector |
| Signal generator | no |

| | |
|--------------------|---|
| Display Resolution | 21.5" TFT color display Full HD 1920 x 1080 pixels |
| Operating panel | touch screen (projective capacitive) |
| Status LEDs | 1x red, 1x green |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1650 mA (without externally connected devices) | maximum 2150 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 2.2 A (for 1.8 ms, load-dependent) | |
| Inrush current without current limiting supply | maximum 3.5 A (for 6 µs, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 539 x 331 x 90 mm (W x H x D) |
| Material | front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame housing: sheet steel heat sink: anodized aluminum |
| Weight | 6.5 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m with derating of the maximum environment temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover IP20 |

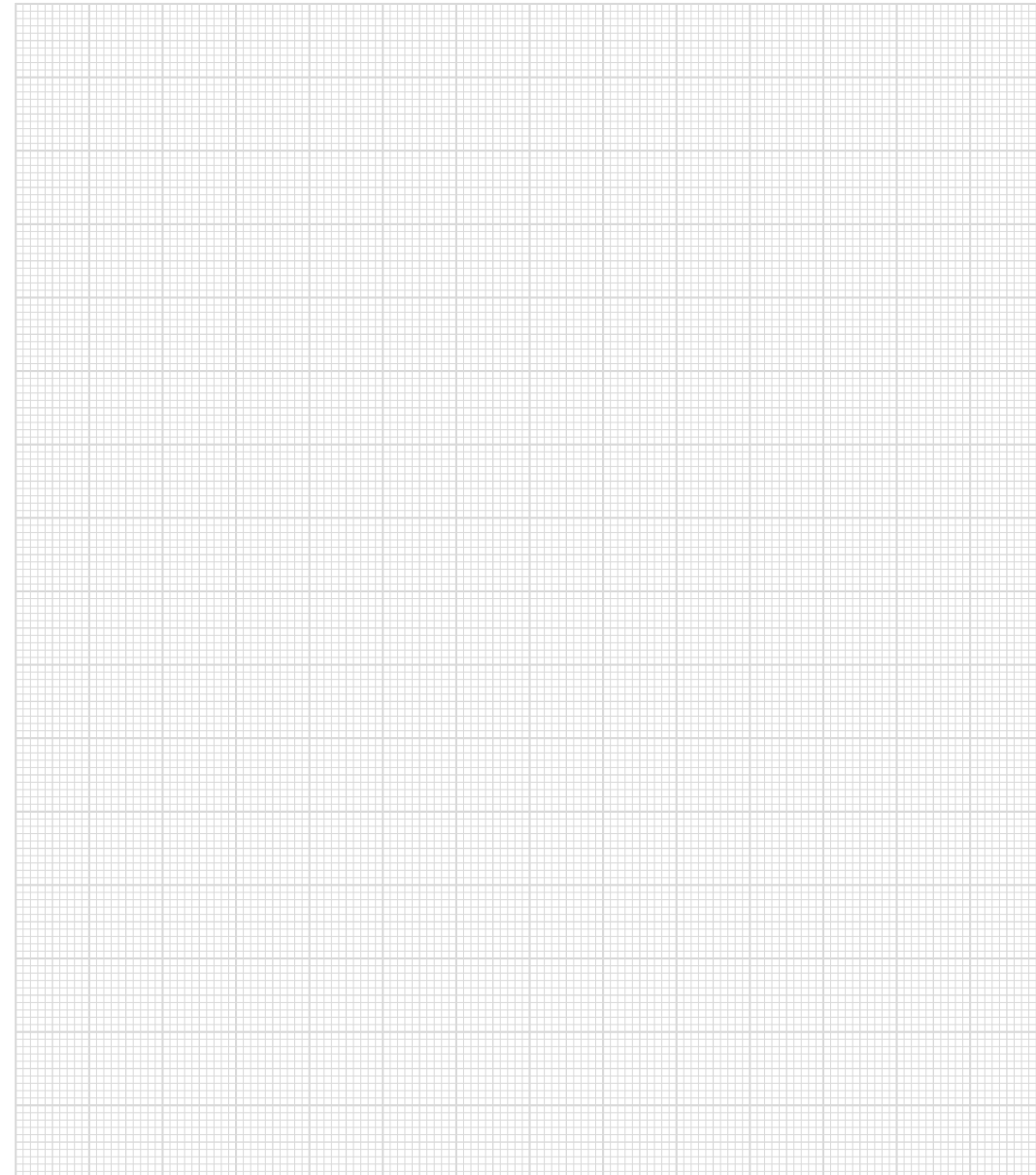
Display

| | |
|----------------|--|
| Type | 21.5" TN color display |
| Resolution | FullHD 1920 x 1080 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.248 x 0.248 mm |
| Active surface | 476.64 x 268.11 |
| Backlighting | LED |
| Contrast ratio | typically 5000:1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | left, right, top, bottom typically 89° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

Article Number and Miscellaneous

| | |
|------------------|--|
| Article number | 01-230-2154-W |
| Operating system | Windows 10 IOT |
| Approvals | CE; ETT 2154-W consists of a TP 2161 (UL _{US} (E247993)) and a PIM 051-W (UL in preparation) |

Notes



Build-in Touch Terminal TAE 2144



The multi-touch operating panel TAE 2144 is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is shown on a 21.5" TFT color display with LED backlighting. This module operates with SIGMATEK HMI-LINK generation 2.1 (G2.1). This allows a transmission from the display, as well as USB signals using standard cables (CAT-5e or CAT-6) from a remote PC to a terminal (up to 100 m). With the 2 integrated USB connection, external end devices (mouse, keyboard ...) or memory (USB stick) can be connection on the HMI side.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2.1) 2x USB 2.0 Type A OUT 1x Panel Interface Connector (for connecting a SIGMATEK TP) |
| Internal interfaces (via Panel Interface Connector) | USB 2.0 (for touch and front USB, if available on the TP) |
| Status LEDs | 1x green 1x red (depends on OS) |
| Display Resolution | 21.5" TFT color display FullHD 1920 x 1080 pixels |
| Operating field | touch screen (projective capacitive) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | +24 V DC $\pm 20\%$ (SELV/PELV) UL: Class 2 or LVLC | |
| Current consumption of (+24 V) power supply | typically 1500 mA (with no external devices connected) | maximum 1700 mA (with external devices connected) |
| Inrush current with 24 V/10 A fixed voltage supply | maximum 3.1 A (for 17 ms, load-dependent) | |
| Inrush current without current-limiting supply | maximum 63 A (for 1.5 ms, load-dependent) | |

Terminal

| | |
|------------|---|
| Dimensions | 539 x 331 x 55 mm (W x H x D) |
| Material | front plate: 2.8 mm glass (touch screen) in black anodized aluminum frame |
| Weight | 5.7 kg |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -25 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) in accordance with EN 61000-6-1 (living area) | |
| EMC noise emission | in accordance with EN 61000-6-4 (industrial area) in accordance with EN 61000-6-3 (living area) | |
| Vibration resistance | EN 60068-2-6 | 5-200 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Protection type | EN 60529 protection through housing | front: IP65 cover: IP20 (not UL-listed) |

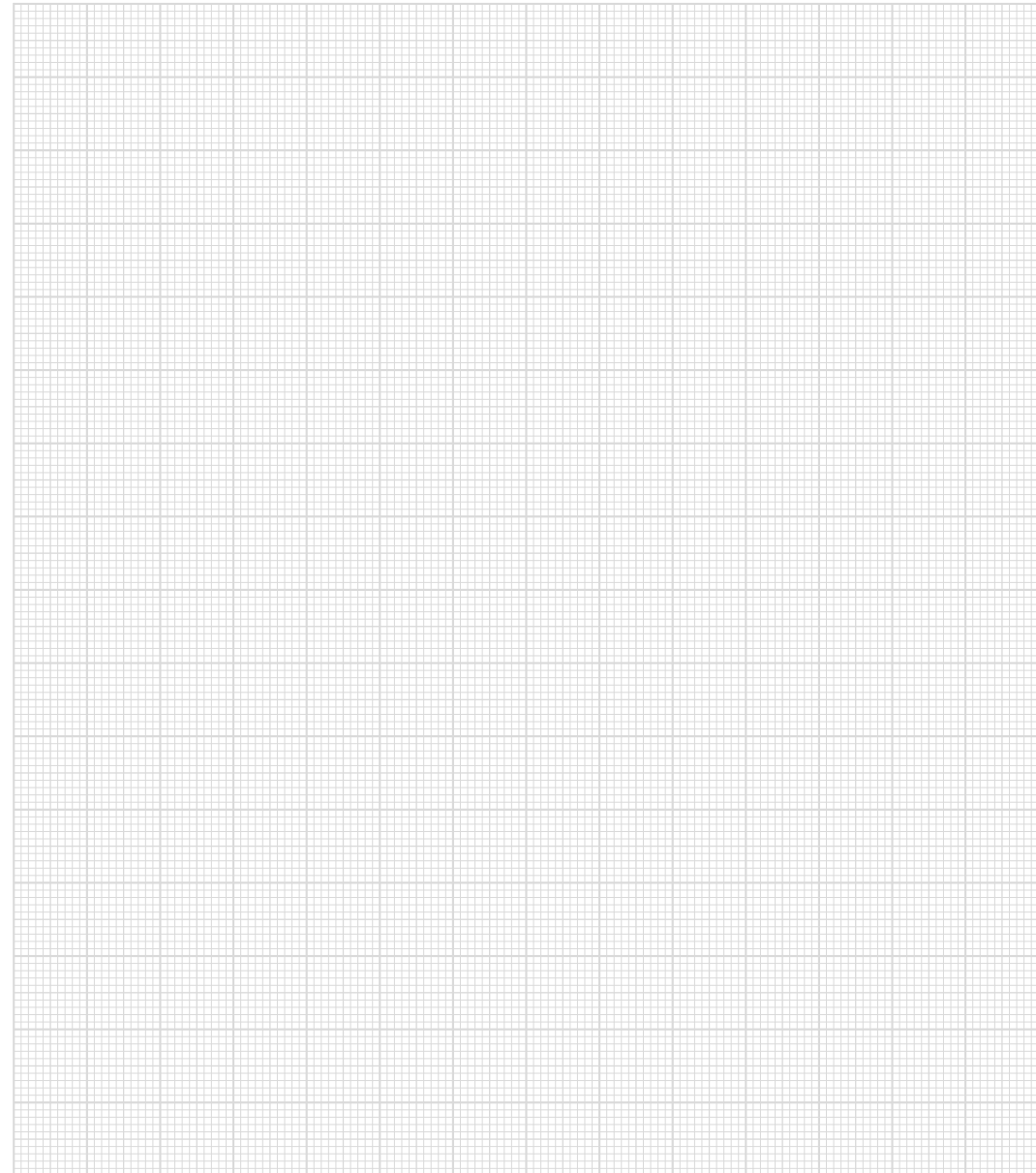
Display

| | |
|----------------|---|
| Type | 21.5" TN color display |
| Resolution | FullHD 1920 x 1080 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normally black |
| LCD Polarizer | transmissive |
| Pixel size | 0.248 x 0.248 mm |
| Active range | 476.64 x 268.11 mm |
| Backlighting | LED |
| Contrast ratio | typically 5000:1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | all directions typically 89° |
| Life span | By compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness. |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 12-200-2144 |
| Operating system | - |
| Standard | UL in preparation |
| Approvals | CE |

Notes



Multi-touch Operating Panel TT 1533



with 15" XGA TFT color display

The TT 1533 is an intelligent terminal for programming and visualization of automated processes and designed for a carrier arm mount. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display.

The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device | 512-Mbyte microSD |
| Internal I/O | no |
| Interfaces | 4x USB 2.0, Type A 2x Ethernet 1x CAN bus not galvanically separated |
| Internal interface connections and devices | 1x TFT LCD color display 1x USB (touch connection) |
| Display Resolution | 15" TFT color display 1024 x 768 pixels |
| Control panel | Touch screen (projective capacitive) |

| | |
|-----------------|-------------------|
| Real-time clock | no |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | 18-30 V DC (Class 2, LVLC) in preparation | |
| Current consumption of power supply at +24 V | typically 500 mA (without externally connected devices) | maximum 1.2 A (with externally connected devices) |
| Inrush current | maximum 33 A for 25 µs | |

Terminal

| | |
|------------|--|
| Dimensions | 357.9 x 342.2 x 47.7 mm (W x H x D) |
| Material | Frame und front: aluminum/glass Backside: sheet steel |
| Weight | typically 5.1 kg |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -10 ... +80 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | Carrier arm mount with VESA75 whose connection also meets IP54 | |
| | EN 60529 protected through the housing | front: IP54 rear panel: IP54 |

Display

| | |
|------------------|--|
| Type | 15" TFT color display |
| Resolution | XGA, 1024 x 768 pixels |
| Color depth | 262K colors |
| LCD mode | normally black |
| LCD polarizer | transmissive |
| Pixel size | 0.297 x 0.297 mm |
| Number of pixels | 1024*3 (RGB) x 768 |
| Active surface | 304.1 x 228.1 mm |
| Backlighting | LED |
| Contrast | typically 1500:1 |
| Brightness | typically 400 cd/m ² |
| Angle CR ≥ 10 | left, right, below, above 85° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 50,000 operating hours to 50 % of the original brightness |

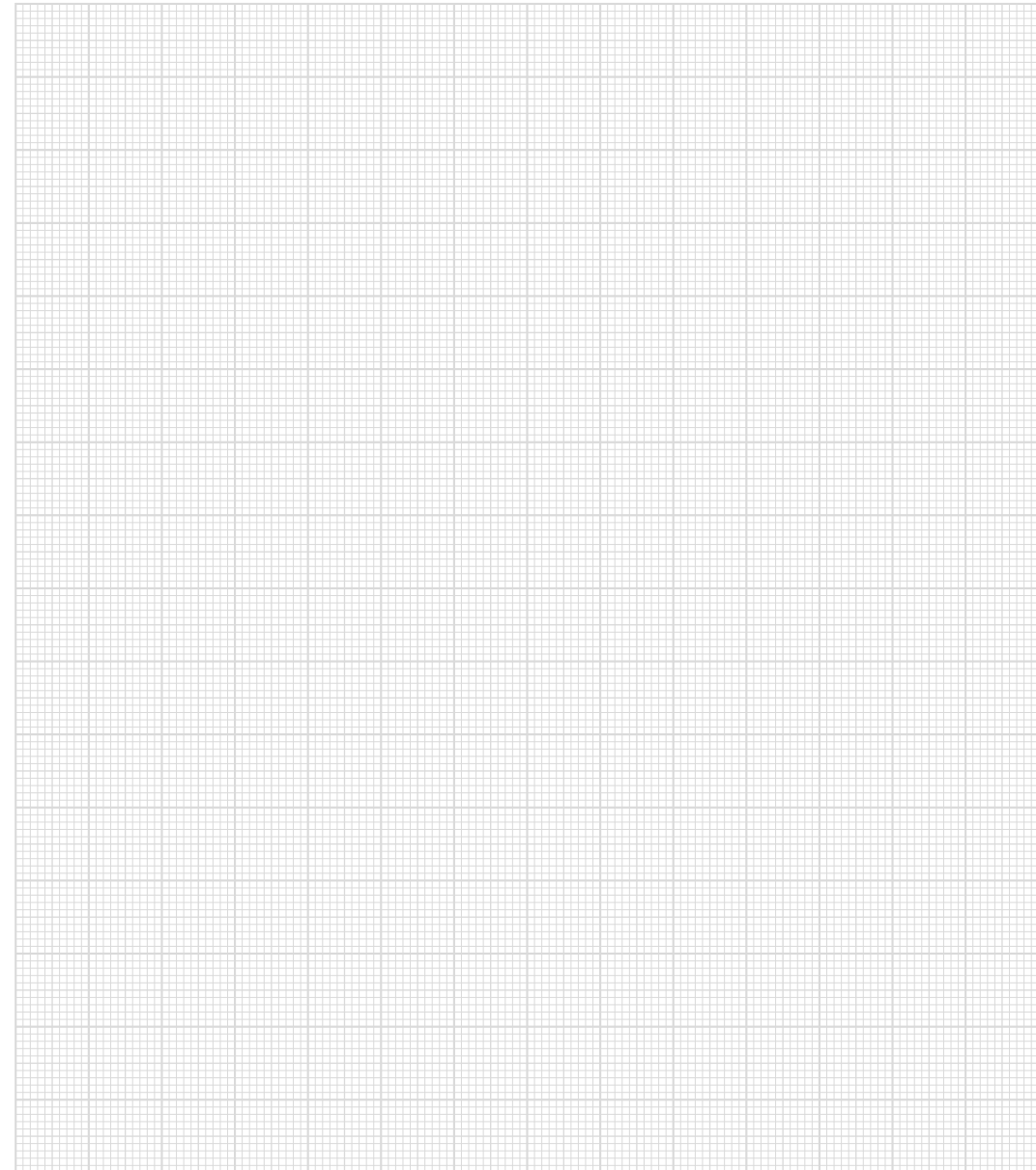
Control Unit

| | |
|-------------|---|
| Touch panel | Projective capacitive glass touch panel |
| Sensor type | Film glass |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 01-270-1533 |
| Operating system | Salamander |
| Standard | UL in preparation |
| Approvals | UL, cUL, CE |

Notes



Multi-touch Operating Panel TT 1933-S



with 18.5" WXGA TFT color display

The TT 1933-S is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A projective capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 18.5" TFT color display.

The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device (IDE) | 1-Gbyte microSD |
| Internal I/O | no |
| Interfaces | 3x USB 2.0, Type A 2x Ethernet |
| Internal interface connections and devices | 1x TFT LCD color display 1x USB (touch connection) |
| Display Resolution | 18.5" TFT color display 1366 x 768 pixels |
| Control panel | Touch screen (projective capacitive) |

| | |
|-----------------|-------------------|
| Real-time clock | no |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|---|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption of power supply at +24 V | typically 650 mA (without externally connected devices) | maximum 850 mA (with externally connected devices) |
| Inrush current | maximum 30 A for 35 µs | |
| UL-Standard | For UL: must be powered with SELV / PELV and limited energy; digital outputs must also be powered with SELV / limited energy | |

Terminal

| | |
|------------|--|
| Dimensions | 471.6 x 344.5 x 44 mm (W x H x D) |
| Material | Frame und front: aluminum/glass Backside: sheet steel ESD lacquer |
| Weight | typically 5 kg |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +45 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 Indoor areas only altitude up to 2000 m | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²) duration 11 ms, 18 shocks |
| Protection type | VESA100 carrier arm mount: IP54 VESA75 carrier arm mount: IP54, whereby the VESA100 mounting holes must be closed with protective caps or screws | |
| | EN 60529 protected through the housing | front: IP54 (not UL-listed) rear panel: IP54 (not UL-listed) |

Display

| | |
|-----------------------|--|
| Type | 18.5" TFT color display |
| Resolution | WXGA 1366 x 768 pixels |
| Color depth | 16.7M (6-bit RGB + Hi_FRC) |
| LCD mode | normally white (1) |
| LCD polarizer | transmissive 2 |
| Pixel size | 0.3 x 0.3 mm |
| Number of pixels | 1024*3 (RGB) x 768 |
| Active surface | 409.8 x 230.4 mm |
| Backlighting | LED |
| Contrast | typically 1000:1 |
| Brightness | typically 250 cd/m ² |
| Typical angle CR = 10 | left, right 85° bottom, top 80° |
| Life span | by compliance with the ambient conditions, the brightness of the display sinks after 30,000 operating hours to 50 % of the original brightness |

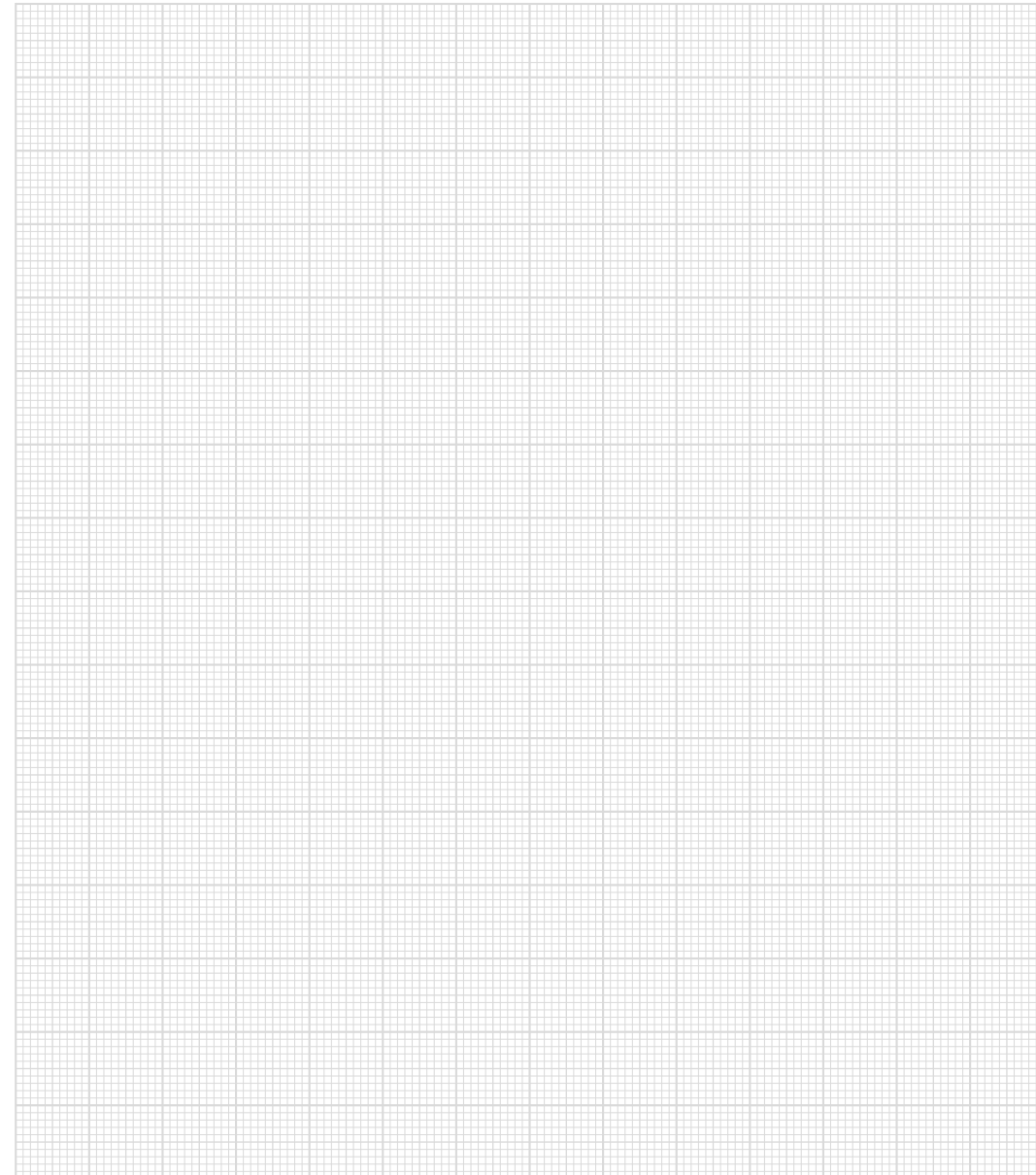
Control Unit

| | |
|-------------|---|
| Touch panel | Projective capacitive glass touch panel |
| Sensor type | Film glass |

Article Number and Miscellaneous

| | |
|------------------|-------------------|
| Article number | 01-270-1933-S |
| Operating system | Salamander |
| Standard | UL in preparation |
| Approvals | UL, cUL, CE |

Notes



Multi-touch Operating Panel

TAE 2343



The TAE 2343 multi-touch operating panel is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

The projective capacitive touch screen is used to enter process data and parameters. The output is displayed on a 23.8" full HD TFT color display with LED backlighting.

On the PC side, a SIGMATEK HMI-Link G2 is required, which processes the display and USB signal feeds and transmits them to the terminal over a standard Ethernet cable (CAT-5e or CAT-6). A secure connection over distance of up to 100 m between the PC and terminal is therewith possible.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI Remote IN (HMI-Link G2) 1x USB 2.0 Typ A OUT (left or right) 1x RFID reader HF (13,56 MHz) - multi-Iso protocol-capable |
| Internal interface connections and devices | 1x TFT color display 1x projective capacitive touch screen |
| Control panel | Touch screen (projective capacitive) |
| Display | 23.8" TFT color display Full HD, 1920 x 1080 Pixels LED Backlight |

Electrical Requirements

| | | |
|---|---|-------------|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Supply voltage (UL) | +18-30 V DC Class 2 | |
| Current consumption Power supply +24 V | typically 1.45 A | maximum 2 A |
| UL standard | for UL: must be supplied with SELV / PELV and Limited Energy Digital output also is SELV / Limited Energy. | |

Terminal

| | |
|-------------------------------|--|
| Material | front: glass rear panel including covers: Powder coated steel sheet wrap-around aluminum borders |
| Dimensions | 385 x 664.6 x 49.3 mm (W x H x D) |
| Weight incl. mounting bracket | 11.5 kg |

Environmental Conditions

| | | |
|---------------------------------------|---|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +45 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 indoor use altitude up to 2000 m | |
| EMC resistance | according to EN 61000-6-2 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Radio Communication Conformity Europe | according to ETSI EN 300 330 (2014/53/EU, RED Directive) | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 Shocks |
| Protection type | EN 60529: protected through the housing | front: IP54 (no UL-rating) cover: IP20 (no UL-rating) |

Display

| | | |
|----------------|---|--|
| Type | 23.8" TFT color display | |
| Resolution | Full HD, 1920 x 1080 pixels | |
| Color depth | 6 Bit + AFRC | |
| LCD mode | normally black | |
| LCD Polarizer | transmissive | |
| Pixel size | 0.2745 x 0.2745 mm | |
| Active surface | 527.04 x 296.46 mm | |
| Backlighting | LED backlight | |
| Contrast | typically 1000 | |
| Brightness | typically 250 cd/m ² | |
| Angle CR ≥ 10 | left, right, below, above 178° | |
| Life span | after 30,000 hours at an ambient temperature of 25 °C, the brightness reduces to 50% or less of the original power. | |

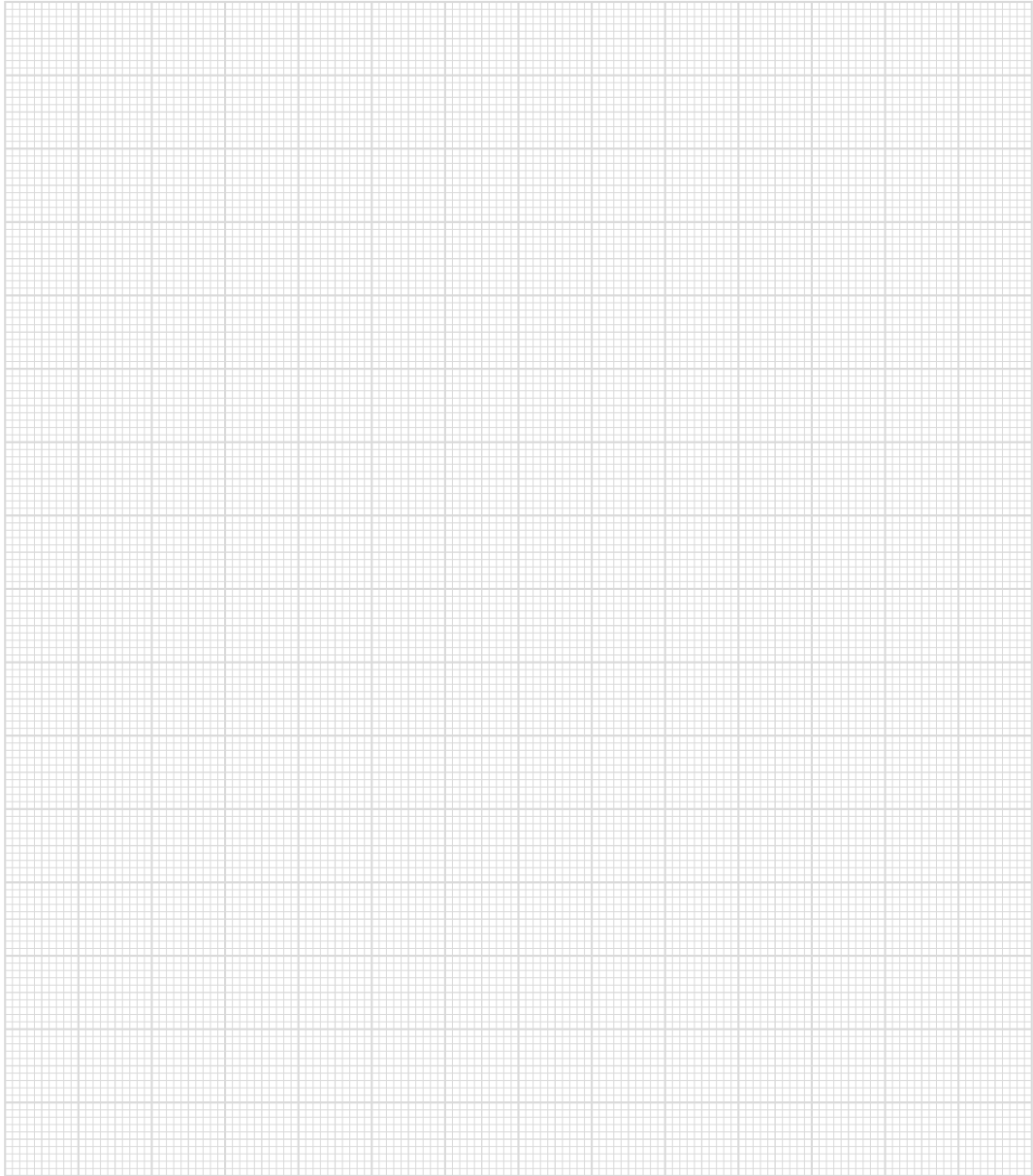
Control Unit

| | |
|-------------|---|
| Touch panel | projective capacitive glass touch panel |
| Sensor type | Film glass |

Article Number and Miscellaneous

| | |
|----------------|-----------------------|
| Article number | 12-200-2343 |
| Touch pen | 01-690-059-3 |
| Standard | UL (E247993) |
| Approvals | CE, cUL _{us} |

Notes



Touch Display Panel TAE 151



with 15" XGA TFT color display

The TAE 151 Build-in touch terminal is used for the visualization of automated processes. Process diagnosis, operating and monitoring automated functions are simplified using this terminal.

A touch foil serves as the input medium for process data and parameters.

The output is shown on a 15" XGA TFT color display.

Performance Data

| | |
|--------------|---|
| Display | 15" TFT color (6-bit RGB) |
| Control Unit | Touch pad |
| Interfaces | front side: 3x USB V1.1 back side: S-DVI 1x USB Typ-A V1.1 1x CAN with 2 connections |

Electrical Requirements

| | | |
|---------------------------------------|--|------------------|
| Supply voltage | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | +18-30 V DC Class 2 | |
| Current consumption of voltage supply | typically 825 mA (at +24 V) (measured without connected external devices) | |

(the supply voltage is provided by the IPC over the S-DVI cable, which is available in lengths of 0.3 m/2 m/3 m/5 m/10 m/and 15 m.)

Terminal

| | |
|------------|-------------------------------|
| Dimensions | 358 x 313 x 62 mm (W x H x D) |
| Material | housing: ASA Plastic |
| Weight | typically 4.2 kg |

Control Unit

| | |
|-----------------------------|---|
| Touch pad | analog resistant film-glass touch panel |
| Dimensions | 325.5 x 249.3 x 2.2 mm (W x H x D) |
| Active surface | 304.1 mm x 228.1 mm |
| Resolution | 12-bit controller (USB) |
| Data wheel | no |
| Buttons | no |
| LEDs | no |
| Signal generator | yes |
| Automatic display detection | yes |

Display

| | |
|----------------------|---|
| Type | 15" TFT color (6-bit RGB) |
| Resolution | 1024 x 768 pixels |
| Color depth | 18-bit (262 144 colors) |
| Pixel grid | 0.297 mm x 0.297 mm |
| Active area | 304.128 mm x 228.096 mm |
| Background lightning | LED |
| Brightness | typically 350 cd/m ² |
| Contrast | typically 700 : 1 |
| Perspective of | left and right 80°, above and below 70° |

Article Number and Miscellaneous

| | |
|------------------|--|
| Article number | 12-200-151 without foil: 12-200-151-0 |
| Hardware version | 9.x |
| Standard | UL (E247993) |
| Approvals | CE, _c UL _{us} |

Environmental Conditions

| | | |
|---------------------------|--------------------------------|---|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 20-95 %, non condensing | |
| EMC stability | EN 61000-6-2 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | front: IP54 with USB covers back panel: IP20 without cable channel cover (with cable channel cover IP54) |

Touch Operating Terminal ETT 1561



with 15" XGA TFT color display

The ETT 1561 is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A resistive touch screen serves as the input medium for process data and parameters. The output is shown on a 15" XGA TFT color display. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal.

In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 512-Mbyte microSD card |
| Interfaces | 3x USB 2.0 Type A (front) 2x Ethernet 10/100 (RJ45) 1x CAN bus (6-pin Weidmüller) not galvanically separated |
| Internal interface connections and devices | 1x TFT LCD color display 1x USB (touch connection) |
| Display Resolution | 15" TFT color display 1024 x 768 pixels |
| Control panel | Touch screen (resistive touch) |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|--|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | 18-30 V DC (Class 2, LVLC) | |
| Current consumption of power supply at +24 V | typically 700 mA (without externally connected devices) | maximum 1.2 A (with externally connected devices) |
| Inrush current | 2 A (10 ms) | |

Terminal

| | |
|------------|-------------------------------|
| Dimensions | 358 x 313 x 62 mm (W x H x D) |
| Material | housing: ASA Plastic |
| Weight | typically 4.2 kg |

Display

| | |
|----------------|---|
| Type | 15" TFT color display |
| Resolution | XGA, 1024 x 768 pixels |
| Color depth | 262K colors |
| LCD mode | normal white |
| LCD Polarizer | transmissive |
| Pixel size | 0.297 x 0.297 mm |
| Active surface | 304.1 x 228.1 mm |
| Touch panel | analog resistive glass touch panel |
| Backlighting | LED |
| Contrast | typically 700:1 |
| Brightness | typically 400 cd/m² |
| Visible field | left, right 70, above 60° and below 55° |

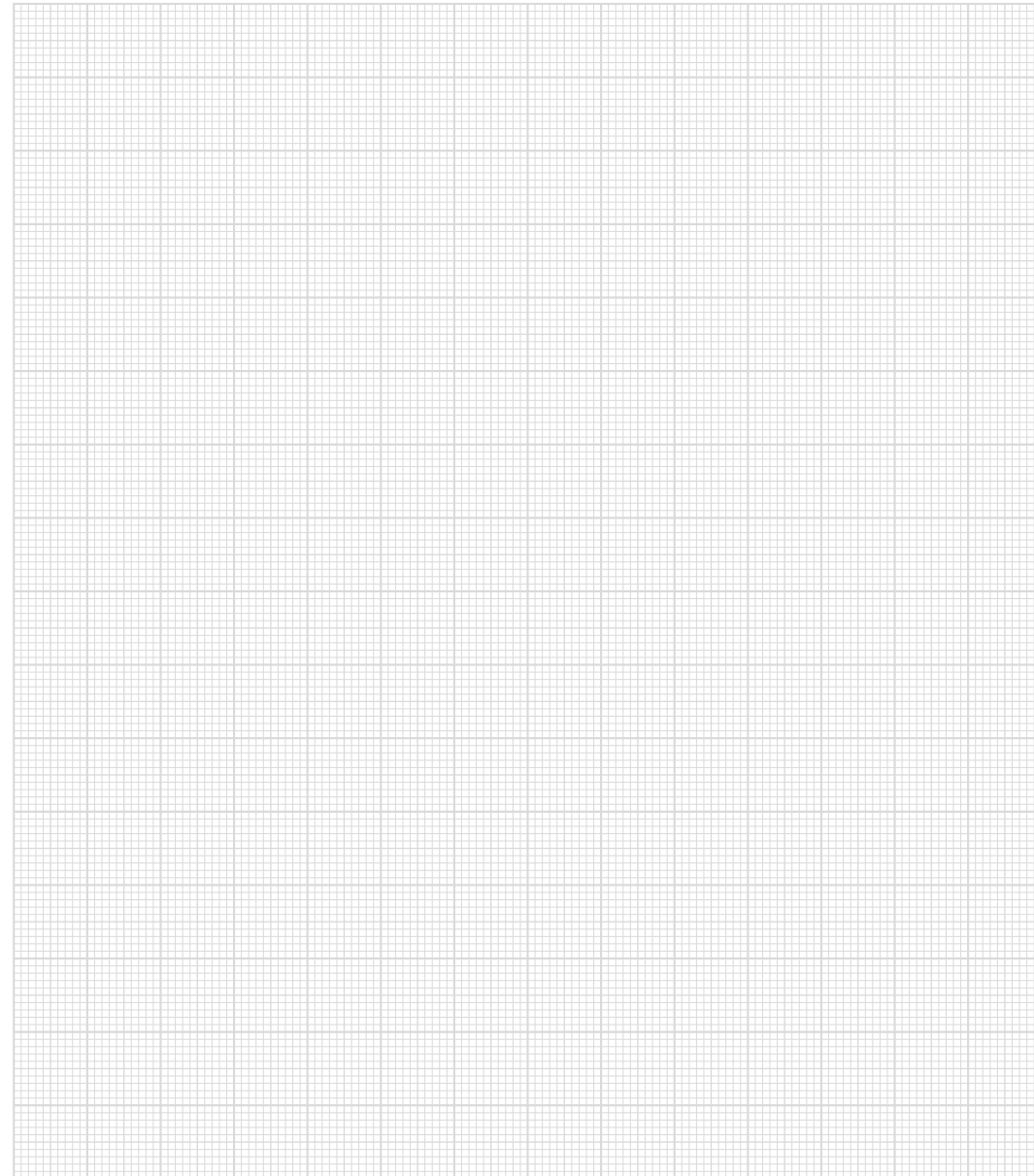
Article Number and Miscellaneous

| | |
|----------------|------------------|
| Article number | 01-230-1561 |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | | | | |
|---------------------------|--|--|--|--|--|
| Storage temperature | -10 ... +80 °C | | | | |
| Environmental temperature | 0 ... +45 °C | | | | |
| Humidity | 10-95 %, non-condensing | | | | |
| EMC stability | in accordance with product standard EN 61131-2 | | | | |
| Vibration resistance | EN 60068-2-6 | | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) | | |
| Shock resistance | EN 60068-2-27 | | 15 g (150 m/s ²) duration 11 ms, 18 Shocks | | |
| Protection type | | Control cabinet mount with USB cover | Control cabinet mount without USB cover | Carrier arm mount with USB cover | Carrier arm mount without USB cover |
| | EN 60529 | front: IP54 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom | front: IP20 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom | front: IP54 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom | front: IP20 rear panel: IP20 With IP43 cable channel, if the cable outlet is located on the bottom |
| | NEMA 250 (UL50) | Type 12 | Type 1 | Type 1 | Type 1 |

Notes



Touch Operating Panel ETT 1962



with 19" SXGA TFT color display

The ETT 1962 is an intelligent terminal for programming and visualization of automated processes. Process diagnostics as well as operating and monitoring automated procedures are simplified using this terminal. A resistive glass touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display. With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the terminal. The available interfaces can be used to exchange process data or configure the terminal. In the internal Flash memory, the operating system, application and application data are stored.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal Cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 512-kbyte SRAM (battery buffered) |
| Internal storage device | 1-Gbyte microSD card |
| Internal I/O | no |
| Interfaces | 1x USB Host 2.0, Type A (front) 1x USB Host 2.0, Type A (rear, on circuit board) 2x Ethernet 10/100 (RJ45) |
| Internal interface connections and devices | 1x TFT LCD color display 1x USB (touch connection) |
| Display Resolution | 19" TFT color display 1280 x 1024 pixels |

| | |
|-----------------|--------------------------------------|
| Control panel | Glass touch screen (resistive touch) |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|--|---|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of power supply at +24 V | 0.85 A (without externally connected devices) | 1 A (without externally connected devices) |
| Inrush current | 1.2 A (3 ms) | |

Terminal

| | |
|--------------------------------|-------------------------------|
| Dimensions | 360 x 462 x 57 mm (W x H x D) |
| Weight incl. Mounting brackets | typically 7 kg |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4: Noise emission | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 Shocks |
| Protection type | EN 60529 protected through the housing | Front: IP54 Cover: IP20 |

Display

| | |
|--------------------|---|
| Type | 19" TFT color display |
| Resolution | SXGA, 1280 x 1024 pixels |
| Color depth | 24-bit (16 777 216 colors) |
| Pixel size | 0.294 x 0.294 mm |
| Active surface | 376.3 x 301.1 mm |
| Backlighting | LED |
| Contrast | typically 2000 : 1 |
| Brightness | typically 300 cd/m ² |
| Angle CR > 10 from | left and right 89°, above and below 89° |

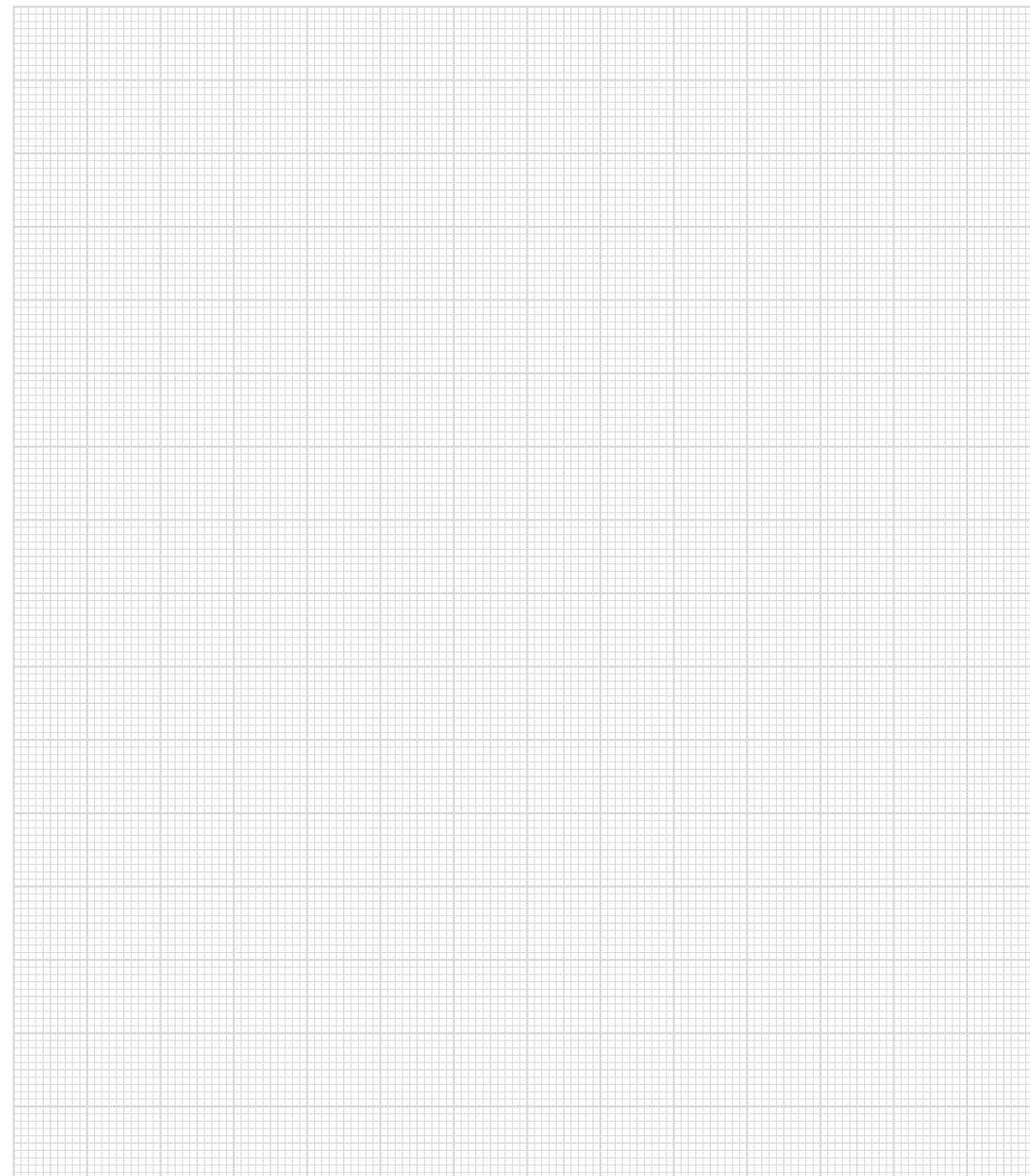
Control Unit

| | |
|-----------------|--|
| Touch pad | resistive glass foil glass touch panel |
| Active surface | 376.3 x 301.1 mm |
| Resolution | 12-bit (4096 x 4096) |
| Touch precision | < 1.5 % of maximum value (5.6 mm) |

Article Number and Miscellaneous

| | |
|------------------|--------------------------------|
| Article number | 01-230-1962 |
| Hardware version | 1.x |
| Software macro | LSE LASAL operating system |
| Project backup | internally on the microSD card |

Notes



Touch Display Panel TAE 1921



The TAE 1921 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

A signal extender is required on the PC, which processes the display and USB signals, and sends them to the terminal over a standard Ethernet cable. Therewith, a connection over distance of 100 m between the PC and terminal is possible.

Performance Data

| | |
|--|--|
| Interfaces | 1x Display IN (HMI-Link) 2x USB2.0 Type A (front + back side) 1x chip card reader (optional) |
| Internal interface connections and devices | 1x TFT color display 1x Touch |
| Control panel | Touch-Screen (resistive) |
| Display | 19" TFT color display SXGA, 1280 x 1024 pixels LED backlight |
| LEDs | Status display |

Electrical Requirements

| | | |
|------------------------------------|---------------------|------------------|
| Supply voltage | minimum +18 V DC | maximum +30 V DC |
| Supply voltage (UL) | +18-30 V DC Class 2 | |
| Current consumption/supply voltage | 1.7 A at 24 V | |
| Inrush current | maximum 43 A | |

Terminal

| | | |
|-------------------------------|-------------------------------|--|
| Dimensions | 360 x 462 x 57 mm (W x H x D) | |
| Weight incl. mounting bracket | typically 7 kg | |

Display

| | | |
|--------------|--|--|
| Type | 19" TFT color display | |
| Resolution | SXGA, 1280 x 1024 pixels | |
| Backlighting | LED backlight | |
| Lifespan | after 50.000 hours at 25 °C ambient temperature, the brightness is reduced by 50 % of the original power | |

Control Unit

| | | |
|----------------|------------------------------------|--|
| Touch panel | analog resistive glass touch panel | |
| Active surface | 376.3 mm x 301.1 mm | |

Article Number and Miscellaneous

| | | |
|----------------|-----------------------|--|
| Article number | 12-200-1921 | |
| Standard | UL (E247993) | |
| Approvals | CE, cUL _{US} | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 shocks |
| Protection type | EN 60529: protected through the housing | Front: IP54 Cover: IP20 |

Touch Display Panel TAE 1931



The TAE 1931 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

The display signals are exchanged through the Display port interface. To implement the USB connection, an A to B – USB cable is required.

Performance Data

| | |
|--|--|
| Interfaces | 1x Displayport-IN (maximum cable length: 20 m) 1x USB2.0 Type B IN (maximum cable length: 5 m) 2x USB2.0 Type A OUT (front + backside) 1x Chip card reader (optional) |
| Internal interface connections and devices | 1x TFT color display 1x Touch |
| Control panel | Touch-Screen (resistive) |
| Display | 19" TFT color display SXGA, 1280 x 1024 pixels LED backlight |
| LEDs | Status display |

Electrical Requirements

| | | |
|------------------------------------|-------------------------|------------------|
| Supply voltage | minimum +18 V DC | maximum +30 V DC |
| Current consumption/supply voltage | 1.3 A at 24 V | |
| Inrush current | maximum 28 A for < 1 ms | |

Terminal

| | | |
|-------------------------------|-------------------------------|--|
| Dimensions | 360 x 462 x 57 mm (W x H x D) | |
| Weight incl. mounting bracket | typically 7 kg | |

Display

| | | |
|--------------|--|--|
| Type | 19" TFT color display | |
| Resolution | SXGA, 1280 x 1024 pixels | |
| Backlighting | LED backlight | |
| Lifespan | after 50.000 hours at 25 °C ambient temperature, the brightness is reduced by 50 % of the original power | |

Control Unit

| | | |
|----------------|------------------------------------|--|
| Touch panel | analog resistive glass touch panel | |
| Active surface | 376.3 mm x 301.1 mm | |

Article Number and Miscellaneous

| | | |
|------------------|-------------|--|
| Article number | 12-200-1931 | |
| Hardware version | 1.x | |

Environmental Conditions

| | | |
|---------------------------|---|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 shocks |
| Protection type | EN 60529: protected through the housing | Front: IP54 Cover: IP20 |

Touch Display Panel TAE 1941



The TAE 1941 touch display unit is used to visualize automated processes. The operation and monitoring of automated procedures are simplified using this display unit.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 19" SXGA TFT color display with LED backlighting.

On the PC side, a SIGMATEK HMI-Link G2 is required, which processes the display and USB signal feeds and transmits them to the terminal over a standard Ethernet cable (CAT-5e or CAT-6). A secure connection over distance of up to 100 m between the PC and terminal is therewith possible.

Performance Data

| | |
|--|---|
| Interfaces | 1x HMI Remote IN (HMI-Link G2) 2x USB2.0 Type A |
| Internal interface connections and devices | 1x TFT color display 1x Touch |
| Control panel | Touch-Screen (resistive) |
| Display | 19" TFT color display SXGA, 1280 x 1024 pixels LED backlight |
| LEDs | Status display (HMI-Link G2) |

Electrical Requirements

| | | |
|--|----------------------------------|-------------|
| Supply voltage | typically +24 V DC (+18-30 V DC) | |
| Current consumption of power supply at +24 V | typically 1.45 A | maximum 2 A |

Terminal

| | |
|-------------------------------|-------------------------------|
| Dimensions | 360 x 462 x 57 mm (W x H x D) |
| Weight incl. mounting bracket | typically 7 kg |

Display

| | |
|--------------------|--|
| Type | 19" TFT color display |
| Resolution | SXGA, 1280 x 1024 pixels |
| Color depth | 24 Bit (16 777 216 colors) |
| Pixel size | 0.294 x 0.294 mm |
| Active surface | 376.3 x 301.1 mm |
| Backlighting | LED |
| Contrast | typically 2000 : 1 |
| Brightness | typically 300 cd/m² |
| Angle CR > 10 from | left and right 89°, above and below 89° |
| Life span | after 50,000 hours at an ambient temperature of 25 °C, the brightness reduces to 50 % of the original power. |

Control Unit

| | |
|----------------|------------------------------------|
| Touch panel | analog resistive glass touch panel |
| Active surface | 376.3 mm x 301.1 mm |

Article Number and Miscellaneous

| | |
|------------------|-------------|
| Article number | 12-200-1941 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2 (industrial area): EMC resistance EN 61000-6-4 noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: Amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s²), duration 11 ms, 18 shocks |
| Protection type | EN 60529: protected through the housing | Front: IP54 Cover: IP20 |

Handheld Control Panel 8.4"

HBG 0811



The HBG 0811 is a handheld control panel for visualizing processes. Process diagnosis, operating and monitoring functions are therewith simplified.

A touch screen serves as the input medium for process data and parameters.

The output is shown on a 8.4" SVGA TFT color display.

Performance Data

| | |
|--|--|
| Inferfaces | 1x HMI-Link 1x USB 2.0 Type A 1x Safety Interface (safety specific) |
| Internal interface connections and devices | 1x TFT color display 1x touch |
| Control panel | touch screen (analog resistive) emergency stop switch (2 normally closed) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) |
| Display | 8.4" TFT color display 800 x 600 RGB |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC (PELV) | |
| | minimum +24 V DC (PELV) | maximum +30 V DC (PELV) |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24 V | typically 310 mA (without externally connected devices) | maximum 450 mA (with externally connected devices) |
| Inrush current | maximum 8.4 A for 1 ms | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 217.4 x 187.7 x 72 mm (W x H x D) (without Emergency Stop switch/key switch) |
| Material | housing: PC/ASA |
| Weight | typically, circa 0.95 kg without connector cable |

Display

| | |
|---------------|---|
| Type | 8.4" TFT LCD color display |
| Resolution | SVGA 800 x 600 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/Normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.213 mm x 0.213 mm |
| Backlighting | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 250 cd/m ² |
| Angle CR ≥ 10 | left and right 75°, above 70° and below 60° |

Terminal

| | |
|-----------------------|--|
| Connection technology | M16 plug special connector cable minimum bend radius: 147 mm |
|-----------------------|--|

Article Number and Miscellaneous

| | |
|------------------|----------------------|
| Article number | 12-245-0811 |
| Hardware version | 1.x |
| Connector cable | optionally available |
| Standard | UL 508 (E247993) |

Environmental Conditions

| | |
|-------------------------------|--|
| Storage temperature | -10 ... +60 °C |
| Environmental temperature | 0 ... +45 °C |
| Humidity | 10-95 %, non-condensing |
| Operating conditions | pollution degree 2 altitude up to 2000 m |
| EMC stability | EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Vibration resistance | 10 m/s ² |
| Protection type | EN 60529 IP54 |
| Free fall (without packaging) | DIN EN 60068-2-31 500 mm |

Handheld Control Panel 8.4"

HGT 835



with 8.4" SVGA TFT color display

The HGT 835 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified. A touch screen serves as the input medium for process data and parameters. The output is shown on an 8.4" SVGA TFT color display.

With the LSE mask editor, graphics can be created on the PC, then stored and displayed on the handheld control panel. The available interfaces can be used to exchange process data or configure the handheld control panel. On the Flash card, the operating system, application and application data are stored.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 128-kbyte MRAM |
| Internal storage device | 1024-Mbyte microSD card |
| Interfaces | 1x Ethernet 1x USB 2.0 Type A 1x Safety Interface (safety specific) 1x VARAN |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |

| | |
|--------------------|--|
| Control panel | touch screen (analog resistive, 4-wire) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed) |
| Display/Resolution | 8.4" TFT color display 800 x 600 pixels |
| Signal generator | no |
| Real-time clock | yes (buffering approximately 10 days) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC (PELV) | |
| | minimum +24 V DC (PELV) | maximum +30 V DC (PELV) |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24 V | typically 0.35 A (without externally connected devices) | typically 0.45 A (with external devices connected) |
| Inrush current | maximum 10 A for < 50 µs | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 217.4 x 187.7 x 72 mm (W x H x D) (without emergency stop switch/key switch) |
| Material | housing: PC/ASA color: RAL7024 |
| Weight | typically, circa 0.95 kg without connector cable |

Environmental Conditions

| | | |
|-------------------------------|--|----------------------------|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC stability | EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Vibration tolerance | 10 m/s ² | |
| Protection Type | EN 60529 | IP54 (with USB cover only) |
| Free fall (without packaging) | DIN EN 60068-2-32 | 500 mm |

Display

| | |
|----------------|---|
| Type | 8.4" TFT LCD color display |
| Resolution | SVGA 800 x 600 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | TN/normal white |
| LCD polarizer | transmissive |
| Pixel size | 0.213 mm x 0.213 mm |
| Active surface | 170.40 mm x 127.80 mm |
| Backlighting | LED |
| Contrast | typically 600 : 1 |
| Brightness | typically 250 cd/m ² |
| Angle CR ≥ 10 | left and right 75°, above 70° and below 60° |

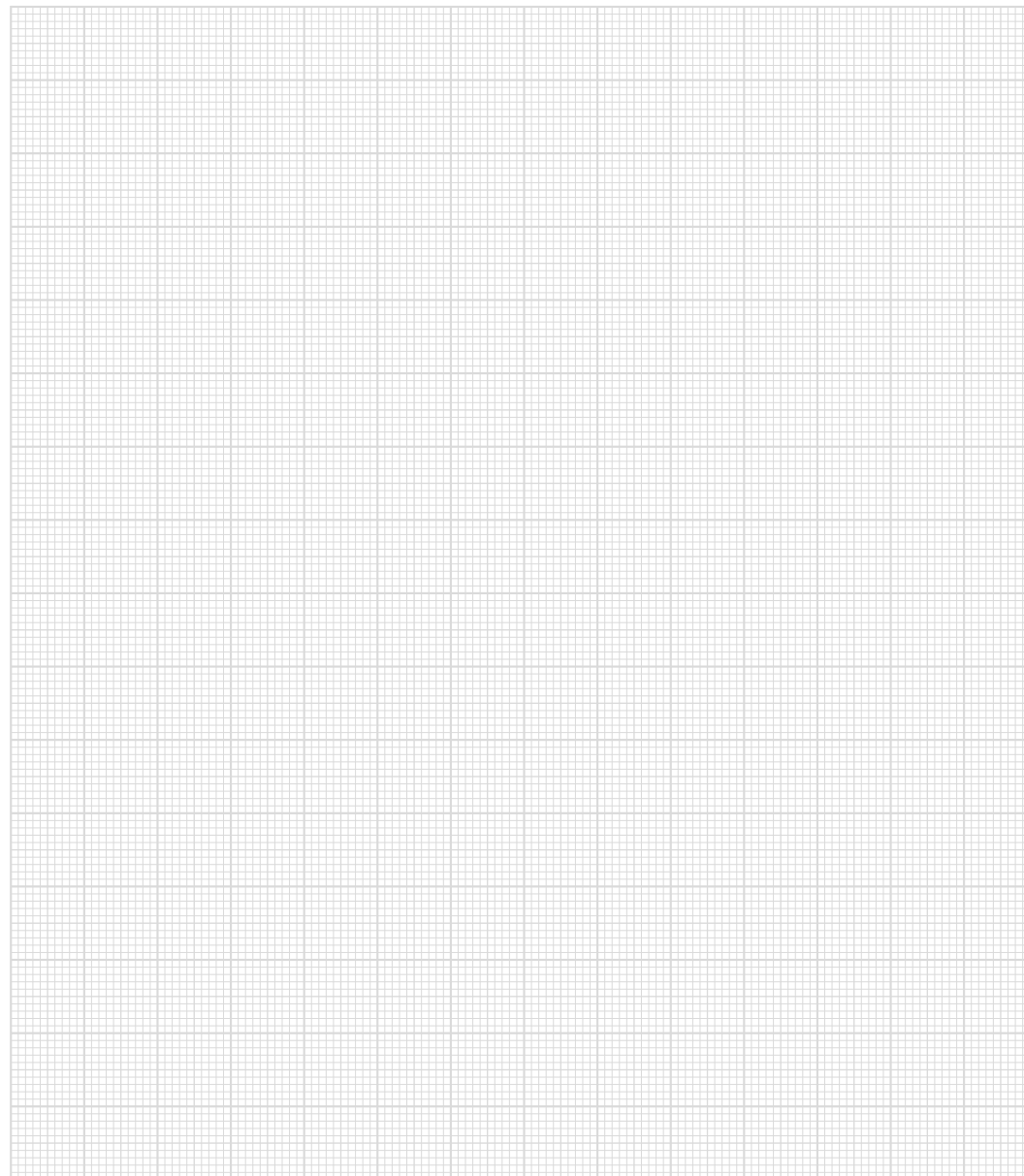
Connection Requirements

| | |
|-----------------------|--|
| Connection technology | M16 plug |
| | special connector cable minimum bend radius: 147 mm |

Article Number and Miscellaneous

| | |
|------------------|----------------------|
| Article number | 01-245-835 |
| Hardware version | 1.x |
| Connector cable | optionally available |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Notes



Handheld Control Panel 10.4"

HBG 1011



The HBG 1011 is a handheld control panel for visualizing processes. Process diagnosis, operating and monitoring functions are therewith simplified.

A touch screen serves as the input medium for process data and parameters.

The output is shown on a 10.4" XGA TFT color display.

Performance Data

| | |
|--|--|
| Interfaces | 1x HMI-Link 1x USB 2.0 Type A 1x Safety Interface (safety specific) |
| Internal interface connections and devices | 1x TFT color display 1x touch |
| Control panel | touch screen (analog resistive) emergency stop switch (2 normally closed) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) |
| Display | 10.4" TFT color display 1024 x 768 RGB |

Electrical Requirements

| | | |
|---|--|---|
| Supply voltage | typically +24 V DC (PELV) | |
| | minimum +24 V DC (PELV) | maximum +30 V DC (PELV) |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24 V | typically 550 mA (without externally connected devices) | maximum 750 mA (with externally connected devices) |
| Inrush current | maximum 9 A for 1 ms | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 264 x 226 x 73.3 mm (W x H x D) (without Emergency Stop switch/key switch) |
| Material | housing: PC/ASA color: RAL7024 |
| Weight | typically, circa 1.1 kg without connector cable |

Display

| | |
|---------------|---|
| Type | 10.4" TFT LCD color display |
| Resolution | XGA 1024 x 768 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.0685 mm x 0.2055 mm |
| Backlighting | LED |
| Contrast | typically 1000 : 1 |
| Brightness | typically 350 cd/m ² |
| Angle CR ≥ 10 | left and right 88°, above 88° and below 88° |

Terminal

| | |
|-----------------------|--|
| Connection technology | M16 plug special connector cable minimum bend radius: 147 mm |
|-----------------------|--|

Article Number and Miscellaneous

| | |
|------------------|----------------------|
| Article number | 12-245-1011 |
| Hardware version | 1.x |
| Connector cable | optionally available |
| Standard | UL 508 (E247993) |

Environmental Conditions

| | | |
|-------------------------------|--|----------------------------|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +45 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC stability | EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Vibration resistance | 10 m/s ² | |
| Protection type | EN 60529 | IP54 (with USB cover only) |
| Free fall (without packaging) | DIN EN 60068-2-31 | 500 mm |



Handheld Control Panel 10.4"

HGT 1035



The HGT 1035 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 10.4" XGA TFT color display.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 instruction cache 32-kbyte L1 data cache 512-kbyte L2 cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | 128-kbyte MRAM |
| Internal storage device | 1024-Mbyte microSD card |
| Internal I/O | no |
| Interfaces | 1x Ethernet 1x USB 2.0 Type A 1x Safety Interface (safety specific) 1x VARAN |
| Internal interface connections and devices | 1x TFT LCD color display 1x touch |

| | |
|--------------------|--|
| Control panel | touch screen (analog resistive) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed) |
| Display Resolution | 10.4" TFT color display 1024 x 768 pixels |
| Control panel | 5-wire touch screen (analog resistive) |
| Signal generator | no |
| Real-time clock | yes (buffering approximately 10 days) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|---|--|
| Supply voltage | typically +24 V DC (PELV) | |
| | minimum +24 V DC (PELV) | maximum +30 V DC (PELV) |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24 V | typically 0.5 A (without externally connected devices) | typically 0.6 A (with external devices connected) |
| Inrush current | maximum 10 A for < 50 ms | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 264 x 226 x 73.3 mm (W x H x D) (without key switch) |
| Material | housing: PC/ASA color: RAL7024 |
| Weight | typically, circa 1.1 kg without connector cable |

Display

| | |
|---------------|---------------------------------|
| Type | 10.4" TFT LCD color display |
| Resolution | XGA, 1024 x 768 pixels |
| Color depth | 18-bit RGB (262K colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.0685 mm x 0.2055 mm |
| Backlighting | LED |
| Contrast | typically 1000 : 1 |
| Brightness | typically 350 cd/m ² |
| Angle CR ≥ 10 | 88° from all sides |

Terminal Requirements

| | |
|-----------------------|--|
| Connection technology | M16 plug |
| | special connector cable minimum bend radius: 147 mm |

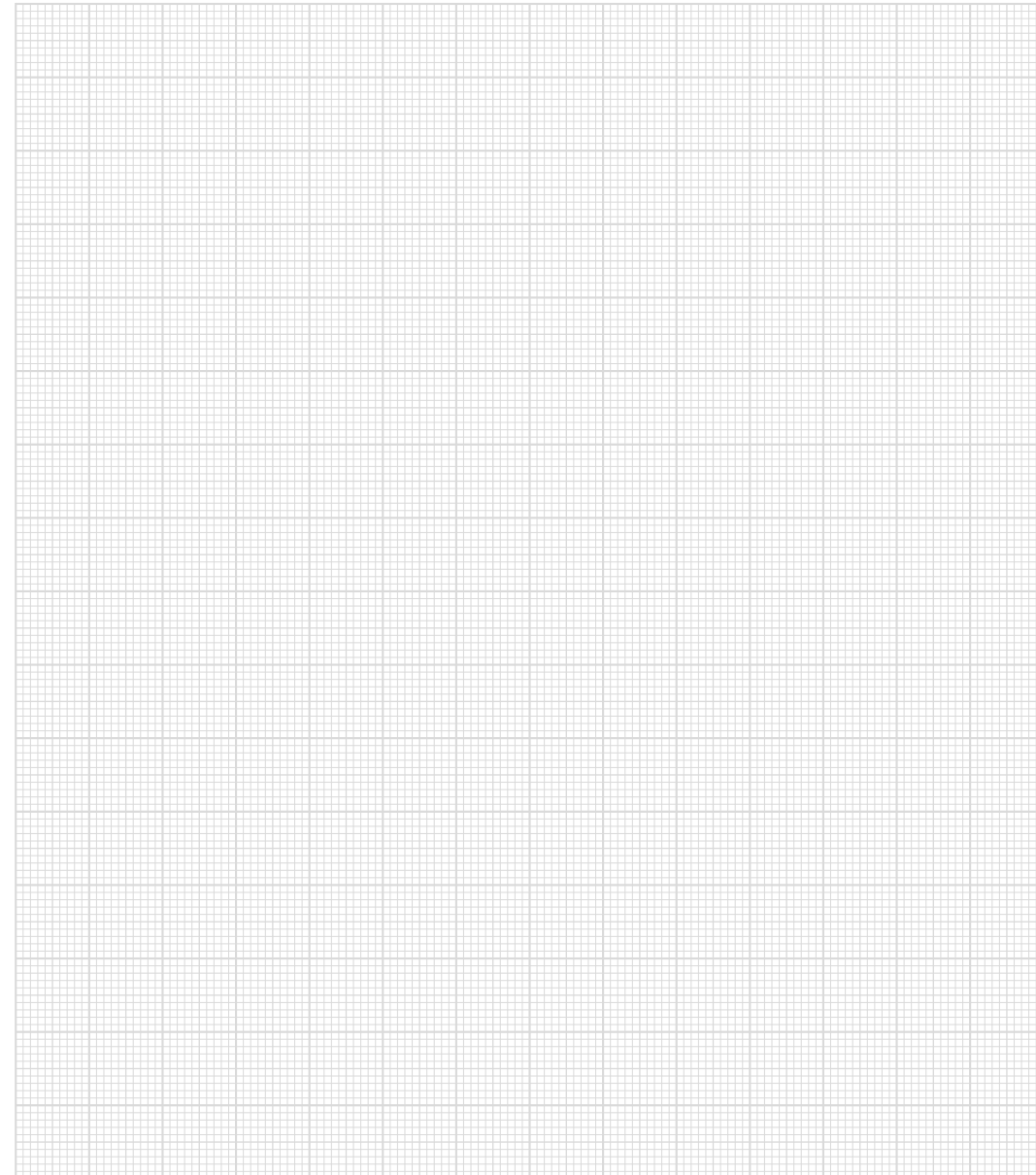
Article Number and Miscellaneous

| | |
|------------------|----------------------|
| Artikel number | 01-245-1035 |
| Hardware version | 1.x |
| Connector cable | optionally available |
| Standard | UL 508 (E247993) |
| Approvals | UL, cUL, CE |

Environmental Conditions

| | | |
|-------------------------------|--|----------------------------|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC stability | EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Vibration resistance | 10 m/s ² | |
| Protection type | EN 60529 | IP54 (with USB cover only) |
| Free fall (without packaging) | DIN EN 60068-2-31 | 500 mm |

Notes



Handheld Control Panel 10.1" HGT 1051



The HGT 1051 Control Panel is an intelligent handheld control panel used for programming and visualization of automated processes. Process diagnosis, operating and monitoring functions are thereby simplified.

A touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1" WXGA TFT color display.

Performance Data

| | |
|---|---|
| Processor | EDGE2-Technology |
| Processor cores | 2 |
| Internal cache | 32-kbyte L1 instruction cache 32-kbyte L1 data cache 512-kbyte L2 cache |
| Internal program and data memory (DDR3 RAM) | 512-Mbyte |
| Internal remnant data memory | 128-kbyte MRAM |
| Internal storage device | 1024-Mbyte microSD card |
| Internal I/O | no |
| Interfaces | 2x Ethernet 1x USB 2.0 Type A 1x Safety interface |
| Internal interface connections and devices | 1x TFT LCD color display 1x USB (touch connection) |

| | |
|--------------------|---|
| Control panel | touch screen (projective capacitive) confirmation switch (2 normally open, 3-stage) key switch (2 normally open) emergency stop switch (2 normally closed) |
| Display Resolution | 10.1" TFT color display 800 x 1200 pixels |
| Signal generator | no |
| Real-time clock | yes (buffered circa 10 days via gold foil capacitor) |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|---------------------------------------|--|---|
| Supply voltage | typically +24 V DC (PELV) | |
| | minimum +24 V DC (PELV) | maximum +30 V DC (PELV) |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24V | typically 408 mA (without externally connected devices) | maximum 464 mA (with external devices connected) |
| Inrush current | maximum 12.4 A for < 60 µs | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 226 x 264 x 76 mm (W x H x D) (without emergency/key switch) |
| Material | housing: PC/ASA color: RAL7024 |
| Weight | typically, circa 1.1 kg without connector cable |

Display

| | |
|---------------|-----------------------------|
| Type | 10.1" TFT LCD color display |
| Resolution | WXGA, 800 x 1024 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m² |
| Angle CR ≥ 10 | 85° from all sides |

Terminal Requirements

| | |
|-----------------------|--|
| Connection technology | M16 plug |
| | special connector cable minimum bend radius: 147 mm |

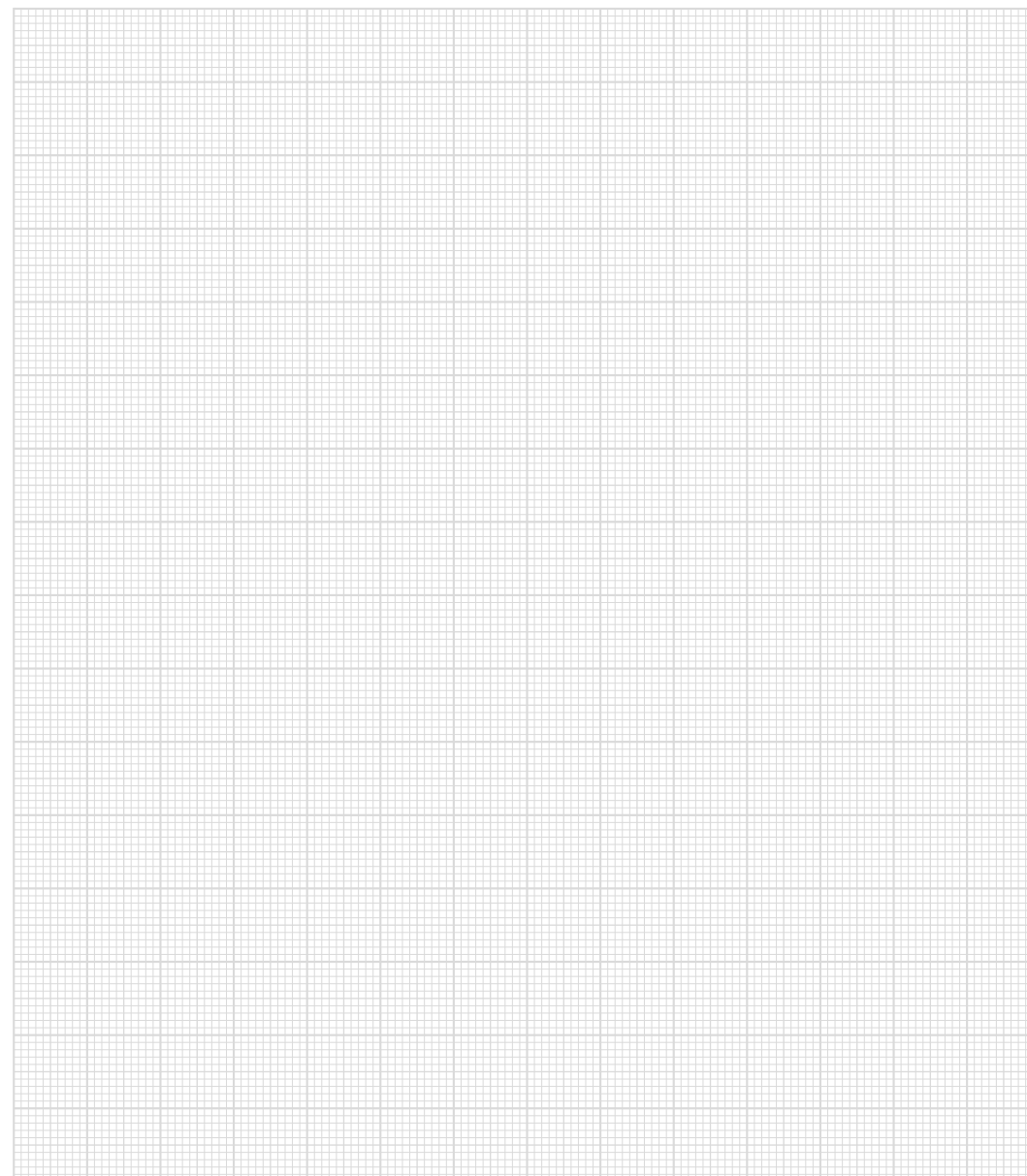
Article Number and Miscellaneous

| | |
|------------------|--|
| Artikel number | 01-245-1051 |
| Hardware version | 1.x |
| Connector cable | optionally available |
| Standard | UL 508 (E247993) in preparation |
| Approvals | CE, TÜV EC type tested, _c UL _{US} in preparation |

Environmental Conditions

| | | |
|-------------------------------|--|----------------------------|
| Storage temperature | -10 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 altitude up to 2000 m | |
| EMC stability | EN 61000-6-2, EN 62061: EMC resistance EN 61000-6-4: noise emission | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Vibration resistance | 10 m/s ² | |
| Protection type | EN 60529 | IP54 (with USB cover only) |
| Free fall (without packaging) | DIN EN 60068-2-31 | 500 mm |

Notes



Handheld Control Panel 10.1” HGT 1053



The HGT 1053 Control Panel is an intelligent panel for visualizing, operating and monitoring automated processes. Process diagnostics is therewith simplified. The projected capacitive touch screen serves as the input medium for process data and parameters. The output is shown on a 10.1-inch TFT color display (WXGA 800 x 1280) with LED backlighting.

Performance Data

| | |
|--|---|
| Processor | EDGE3-Technology |
| Processor cores | 4 |
| Internal program and data memory (RAM) | 2-GByte (DDR4) |
| Internal remnant data memory | 128-kByte FRAM |
| Internal storage device | 8-GByte eMMC |
| Optional memory expansion | microSD |
| Graphic | integrated in EDGE processor |
| Interfaces | 1x Ethernet (10/100/1000) 1x USB 2.0 Type A 1x Safety Interface |
| Internal interface connections and devices | 1x TFT color display 1x USB 2.0 Type A 1x USB (touch connection) 1x microSD card holder (SD 3.0) |

| | |
|----------------------|--|
| Operating components | Confirmation switch (2 normally open contacts, 3-stage) Key switch (2 normally open contacts) Emergency stop switch (2 normally closed contacts) |
| Signal generator | no |
| Display Resolution | 10.1" TFT color display WXGA 800 x 1280 pixels |
| Operating field | Touch screen (multi-touch, projective capacitive) |
| Status LEDs | Multi-LED (red/green) |
| Real-time clock | yes (battery buffered) |
| Cooling | semi-passive (fan activated only when required) |

Electrical Requirements

| | | |
|---------------------------------------|--|---|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) UL: Class 2 of LVLC | |
| Protection class | III | |
| Supply voltage (UL) | +24-30 V DC (NEC Class 2 or LVLC) | |
| Current consumption Power supply +24V | typically 600 mA (without externally connected devices) | maximum 700 mA (with external devices connected) |
| Inrush current | maximum 9 A for < 110 µs | |
| USB current load | maximum 0.5 A | |

Terminal

| | |
|------------|---|
| Dimensions | 226 x 264 x 76 mm (W x H x D) (without emergency/key switch) |
| Material | housing: PC/ASA color: RAL7024 |
| Weight | typically, circa 1.25 kg without connector cable |

Display

| | |
|---------------|-----------------------------|
| Type | 10.1" TFT LCD color display |
| Resolution | WXGA, 800 x 1280 pixels |
| Color depth | 24-bit RGB |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m² |
| Angle CR ≥ 10 | 85° from all sides |

Article Number and Miscellaneous

| | |
|------------------|----------------------------------|
| Artikel number | 01-245-1053 |
| Connector cable | optionally available |
| Operating system | Gecko |
| Approvals | CE, TÜV-Austria EG-type-examined |

Environmental Conditions

| | | |
|------------------------------------|--|--|
| Storage temperature | -10 ... +70 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | according to EN61000-6-2 (industrial area) (increased requirements according to EN 62061) | |
| EMC noise generation | according to EN 61000-6-3 (Household area) according to EN 61000-6-4 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²) |
| Vibration resistance | EN 60068-2-6 | 5-150 Hz: amplitude 3.5 mm transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Protection type | EN 60529 protection through housing | IP54 (only with all protective in place) |
| Free fall (with rough handling) | DIN EN 60068-2-31 | 1000 mm |
| Free fall (with packaging) | IEC 60068-2-32 | 1000 mm |

Notes

Wireless Handheld Operating Panel 10.1" HGW 1033



In combination with a BWH 001 base station, the HGW 1033 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 2048-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Battery | 3780 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button |
| Charging time | 3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase |
| Interfaces | 1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charging) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) |

| | |
|--|--|
| Internal interface connections and devices | 1x TFT color display 1x USB (touch connection) |
| Control Elements | Touch screen (multi-touch, projective capacitive) 1x illuminated on/off button (with application interface) |
| Display Resolution | 10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels |
| Status LEDs | 2x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status) |
| Signal generator | yes (at least 83 dB at 30 cm) |
| Real-time clock | yes (buffered circa 3 days via internal battery) |
| Temperature sensors | 4 (2x LP, 1x CPU, 1x battery) |
| Cooling | passive (fanless) |
| Input voltage measurement | yes |

Electrical Requirements

| | | |
|-------------------------------------|---|---------------|
| Charging voltage magnetic connector | typically +19 V DC | |
| | minimum +15 V DC | maximum +24 V |
| Charging current | via base station: up to 2.5 A at 15.5 V | |
| USB host current load | maximum 0.5 A | |

Display

| | |
|---------------|----------------------------------|
| Type | 10.1" TFT LCD color display |
| Active range | 135.6 (V) x 216.96 (H) mm |
| Resolution | WXGA 800 x 1280 pixels |
| Color depth | 18-bit RGB (16.7 million colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED, adjustable |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | 85° from all sides |

| Input | |
|--------------|---------------------------|
| Input | Multi-touch screen (PCAP) |
| Power button | 1 |

| Environmental Conditions | |
|---------------------------------------|---|
| Storage temperature | -5 ... +60 °C (in transport mode) |
| Environmental temperature discharging | 0 ... +50 °C |
| Environmental temperature charging | 0 ... +40 °C |
| Humidity | 10-95 %, non-condensing |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m |
| Operating conditions | pollution degree 2 |
| EMC resistance | EN 61000-6-2:2007 (industrial area) (increased requirements according to IEC/EN 62061) |
| EMC noise generation | EN 60068-2-6 |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Vibration resistance | 10 m/s ² |
| Protection type | EN 60529 IP54 (with USB cover only) |
| Free fall (rough handling) | DIN EN 60068-2-31 1000 mm |
| Free fall (with packaging) | IEC 60068-2-32 1000 mm |

| WLAN 2.4 GHz | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |

| WLAN 5 GHz | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz) |

| Antennae | |
|-----------------------------------|--|
| Number | 2 |
| Frequency range | 2.4/5 GHz |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/characteristic | Transmission characteristic: omnidirectional Polarization: linear |

| Article Number and Miscellaneous | |
|----------------------------------|--|
| Article number | 12-246-1033 |
| Operating system | Salamander |
| Approvals | CE |
| Dimensions | 226 x 266 x 76 mm (W x H x D) |
| Material | housing: PC/ASA color: RAL7024 front: glass 1.1 mm |
| Weight | 1.27 kg |

Wireless Handheld Operating Panel 10.1" HGW 1033-01



In combination with a BWH 001 base station, the HGW 1033-01 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-01 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 2048-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Battery | 3780 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button |
| Charging time | 3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase |
| Interfaces | 1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charging) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) |

| | |
|--|--|
| Internal interface connections and devices | 1x TFT color display 1x USB (touch connection) |
| Control Elements | Touch screen (multi-touch, projective capacitive) 1x illuminated on/off button (with application interface) |
| Display Resolution | 10.1" TFT color display, 16:10, landscape mode WXGA 1280 x 800 pixels |
| Status LEDs | 2x front (controllable via application) 1x rear (boot status/controllable via the application) 1x power switch (shows power and charge status) |
| Signal generator | yes (at least 83 dB at 30 cm) |
| Real-time clock | yes (buffered circa 3 days via internal battery) |
| Temperature sensors | 4 (2x LP, 1x CPU, 1x battery) |
| Cooling | passive (fanless) |
| Input voltage measurement | yes |

Electrical Requirements

| | | |
|-------------------------------------|---|---------------|
| Charging voltage magnetic connector | typically +19 V DC | |
| | minimum +15 V DC | maximum +24 V |
| Charging current | via base station: up to 2.5 A at 15.5 V | |
| USB host current load | maximum 0.5 A | |

Display

| | |
|---------------|----------------------------------|
| Type | 10.1" TFT LCD color display |
| Active range | 135.6 (V) x 216.96 (H) mm |
| Resolution | WXGA 1280 x 800 pixels |
| Color depth | 18-bit RGB (16.7 million colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED, adjustable |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m² |
| Angle CR ≥ 10 | 85° from all sides |

| Input | |
|--------------|---------------------------|
| Input | Multi-touch screen (PCAP) |
| Power button | 1 |

| Environmental Conditions | |
|---------------------------------------|---|
| Storage temperature | -5 ... +60 °C (in transport mode) |
| Environmental temperature discharging | 0 ... +50 °C |
| Environmental temperature charging | 0 ... +40 °C |
| Humidity | 10-95 %, non-condensing |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m |
| Operating conditions | pollution degree 2 |
| EMC resistance | EN 61000-6-2:2007 (industrial area) (increased requirements according to IEC/EN 62061) |
| EMC noise generation | EN 60068-2-6 |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Vibration resistance | 10 m/s ² |
| Protection type | EN 60529 IP54 (with USB cover only) |
| Free fall (rough handling) | DIN EN 60068-2-31 1000 mm |
| Free fall (with packaging) | IEC 60068-2-32 1000 mm |

| WLAN 2.4 GHz | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |

| WLAN 5 GHz | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz) |

| Antennae | |
|-----------------------------------|--|
| Number | 2 |
| Frequency range | 2.4/5 GHz |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/characteristic | Transmission characteristic: omnidirectional Polarization: linear |

| Article Number and Miscellaneous | |
|----------------------------------|--|
| Article number | 12-246-1033-01 |
| Operating system | Salamander |
| Approvals | CE |
| Dimensions | 266 x 226 x 76 mm (W x H x D) |
| Material | housing: PC/ASA color: RAL7024 front: glass 1.1 mm |
| Weight | 1.27 kg |

Wireless Handheld Operating Panel 10.1" HGW 1033-3



In combination with a BWH 001 base station and a safety-related PLC, the HGW 1033-3 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-3 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity.

The output is shown on a 10.1" WXGA TFT color display.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 2048-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Battery | 3780 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button |
| Charging time | 3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase |
| Interfaces | 1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port, charge: USB-PD Profile 4: 20V, 3 A, 60 W) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) |

| | |
|--|--|
| Internal interface connections and devices | 1x TFT color display 1x USB (touch connection) |
| Control Elements | Touch screen (multi-touch, projective capacitive) 1x confirmation switch (2 normally open, 3-stage) 1x key switch (2 normally open) 1x illuminated emergency stop switch (2 normally closed) 1x illuminated on/off button (with application interface) |
| Display Resolution | 10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels |
| Status LEDs | 3x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status) |
| Signal generator | yes (at least 83 dB at 30 cm) |
| Real-time clock | yes (buffered circa 3 days via internal battery) |
| Temperature sensors | 4 (2x LP, 1x CPU, 1x battery) |
| Cooling | passive (fanless) |
| Coupling display | 7-segment LED, two-digit |
| Input voltage measurement | yes |

Electrical Requirements

| | | |
|-------------------------------------|---|---------------|
| Charging voltage magnetic connector | typically +19 V DC | |
| | minimum +15 V DC | maximum +24 V |
| Charging current | via base station: up to 2.5 A at 15.5 V | |
| USB host current load | maximum 0.5 A | |

Display

| | |
|---------------|----------------------------------|
| Type | 10.1" TFT LCD color display |
| Active range | 135.6 (V) x 216.96 (H) mm |
| Resolution | WXGA 800 x 1280 pixels |
| Color depth | 18-bit RGB (16.7 million colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED, adjustable |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m² |
| Angle CR ≥ | 85° from all sides |

| Input | |
|-----------------------|--|
| Input | Multi-touch screen (PCAP) |
| Emergency stop switch | 1 |
| Confirmation switch | 1 (3 switch positions with panic function) |
| Key switch | 1 (2 switch positions) |
| Power button | 1 |

| Environmental Conditions | |
|---------------------------------------|---|
| Storage temperature | -5 ... +60 °C (in transport mode) |
| Environmental temperature discharging | 0 ... +50 °C |
| Environmental temperature charging | 0 ... +40 °C |
| Humidity | 10-95 %, non-condensing |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m |
| Operating conditions | pollution degree 2 |
| EMC resistance | EN 61000-6-2:2007 (industrial area); EN 61000-6-7:2015 (immunity industrial functional safety) (increased requirements according to IEC/EN62061) |
| EMC noise generation | EN 61000-6-4 |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Vibration resistance | 10 m/s ² |
| Protection type | EN 60529 IP54 (with USB cover only) |
| Free fall (rough handling) | DIN EN 60068-2-31 1000 mm |
| Free fall (with packaging) | IEC 60068-2-32 1000 mm |

| WLAN 2.4 GHz | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |

| WLAN 5 GHz | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz) |

| Antennae | |
|-----------------------------------|--|
| Number | 2 |
| Frequency range | 2.4/5 GHz |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/characteristic | Transmission characteristic: omnidirectional Polarization: linear |

| Article Number and Miscellaneous | |
|----------------------------------|--|
| Article number | 12-246-1033-3 |
| Operating system | Salamander |
| Approvals | CE, TÜV-Austria EG-type-examined |
| Safety | SIL 3, PL e, Kat 4 |
| Dimensions | 226 x 276 x 76 mm (W x H x D) |
| Material | housing: PC/ASA color: RAL7024 front: glass 1.1 mm |
| Weight | 1.35 kg |

Wireless Handheld Operating Panel 10.1" HGW 1033-32



In combination with a BWH 001 base station and a safety-related PLC, the HGW 1033-32 is a wireless, intelligent manual operating unit with emergency stop function that enables the programming, visualization and diagnosis of processes and systems control.

The HGW 1033-32 can be coupled with machines via base stations, which allows the flexible application of the operating station.

The interfaces can be used to configure the terminal. The integrated battery pack enables 2 hours of operation at full capacity. The output is shown on a 10.1" WXGA TFT color display. Additionally, three rotary encoders are integrated into the front of the HGW 1033-32.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 2 |
| Internal cache | 32 kByte L1 Instruction Cache 32 kByte L1 Data Cache 512 kByte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 2048-Mbyte |
| Internal remnant data memory | 512-kbyte MRAM |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Battery | 3780 mAh Lithium-Ion Runtime: > 2 h continuous operation with new battery Charge/status display via the on/off button |
| Charging time | 3 h via USB-C as well as base station at 25 °C with a rising temperature and active use of the device, the charge time may increase |
| Interfaces | 1x USB 2.0 Type-A (Host) 1x USB 2.0 Type-C (Dual Role Port) charge: USB-PD Profile 4: 20 V, 3 A, 60 W) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) |

| | |
|--|--|
| Internal interface connections and devices | 1x TFT color display 1x USB (touch connection) |
| Control Elements | Touch screen (multi-touch, projective capacitive) 1x confirmation switch (2 normally open, 3-stage) 1x key switch (2 normally open) 1x illuminated emergency stop switch (2 normally closed) 1x illuminated on/off button (with application interface) 3x rotary encoder (analyzable via the application) |
| Display Resolution | 10.1" TFT color display, 16:10, portrait mode WXGA 800 x 1280 pixels |
| Status LEDs | 3x front (controllable via application) 1x rear (boot status/controllable via the application) 1x normally open gate (shows power and charge status) |
| Signal generator | yes (at least 83 dB at 30 cm) |
| Real-time clock | yes (buffered circa 3 days via internal battery) |
| Temperature sensors | 4 (2x LP, 1x CPU, 1x battery) |
| Cooling | passive (fanless) |
| Coupling display | 7-segment LED, two-digit |
| Input voltage measurement | yes |

Electrical Requirements

| | | |
|-------------------------------------|---|---------------|
| Charging voltage magnetic connector | typically +19 V DC | |
| | minimum +15 V DC | maximum +24 V |
| Charging current | via base station: up to 2.5 A at 15.5 V | |
| USB host current load | maximum 0.5 A | |

Display

| | |
|---------------|----------------------------------|
| Type | 10.1" TFT LCD color display |
| Active range | 135.6 (V) x 216.96 (H) mm |
| Resolution | WXGA 800 x 1280 pixels |
| Color depth | 18-bit RGB (16.7 million colors) |
| LCD mode | normal black |
| LCD polarizer | transmissive |
| Pixel size | 0.1695 x 0.1695 mm |
| Backlighting | LED, adjustable |
| Contrast | typically 800 : 1 |
| Brightness | typically 300 cd/m ² |
| Angle CR ≥ 10 | 85° from all sides |

| Input | |
|-----------------------|--|
| Input | Multi-touch screen (PCAP) |
| Emergency stop switch | 1 |
| Confirmation switch | 1 (3 switch positions with panic function) |
| Key switch | 1 (2 switch positions) |
| Power button | 1 |
| Rotary encoder | 3 |

| Environmental Conditions | |
|---------------------------------------|---|
| Storage temperature | -5 ... +60 °C (in transport mode) |
| Environmental temperature discharging | 0 ... +50 °C |
| Environmental temperature charging | 0 ... +40 °C |
| Humidity | 10-95 %, non-condensing |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100m |
| Operating conditions | pollution degree 2 |
| EMC resistance | EN 61000-6-2:2007 (industrial area); EN 61000-6-7:2015 (immunity industrial functional safety) (increased requirements according to IEC/EN62061) |
| EMC noise generation | EN 61000-6-4 |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Vibration resistance | 10 m/s ² |
| Protection type | EN 60529 IP54 (with USB cover only) |
| Free fall (rough handling) | DIN EN 60068-2-31 1000 mm |
| Free fall (with packaging) | IEC 60068-2-32 1000 mm |

| WLAN 2.4 GHz | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |

| WLAN 5 GHz | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz) |

| Antennae | |
|-----------------------------------|--|
| Number | 2 |
| Frequency range | 2.4/5 GHz |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-4 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/characteristic | Transmission characteristic: omnidirectional Polarization: linear |

| Article Number and Miscellaneous | |
|----------------------------------|--|
| Article number | 12-246-1033-32 |
| Operating system | Salamander |
| Approvals | CE, TÜV-Austria EG-type-examined |
| Safety | SIL 3, PL e, Kat 4 |
| Dimensions | 226 x 276 x 96 mm (W x H x D) |
| Material | housing: PC/ASA color: RAL7024 front: glass 1.1 mm |
| Weight | 1.39 kg |

WLAN HGW Base Station BWH 001



The BWH 001 base station acts as a gateway and establishes a connection between an HGW and a machine control. Depending on the S-DIAS controller used (e.g. CP/SCP 111), both safety data (via black channel) and non-safety data can be transmitted redundantly. In addition, the BWH 001 serves as a receiving and charging station for the HGW.

The signal lamp allows a simple coupling between HGW and machine. States can be made visible via programmable pictogram LEDs. The base station can also communicate with other controllers over an Ethernet interface.

Performance Data

| | |
|---|--|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-Kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256-Mbyte |
| Internal remnant data memory | no |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Interfaces | 1x magnetic connector for charging the battery 1x M12 connector supply and Ethernet 1x M12 connector Ethernet 1x USB 2.0 Type-C (Dual Role Port) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) |
| Status LEDs | 1x Power 1x HGW-Link (freely programmable) 2x Network (freely programmable) 1x application-/RUN-LED |

| | |
|---------------------------|-------------------|
| Signal generator | no |
| Cooling | passive (fanless) |
| Coupling confirmation | signal light |
| Input voltage measurement | no |

Electrical Requirements

| | | |
|---|---|------------------|
| Supply voltage | typically +24 V DC (SELV/PELV) | |
| | minimum +20 V DC | maximum +30 V DC |
| Protection class | 3 | |
| Inrush current | 16.1 A for 1 ns | |
| Current consumption of +24 V power supply | ca. 200 mA in CLI maximum 2.5 A charging at full capacity at +24 V | |
| USB Host current load | maximum 0.5 A | |

Environmental Conditions

| | | |
|----------------------------|--------------------------------|----------------------|
| Storage temperature | -5 ... +60 °C | |
| Environmental temperature | 0 ...+50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC resistance | EN 61000-6-2 (industrial area) | |
| EMC noise generation | EN 61000-6-4 | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Vibration resistance | 10 m/s ² | |
| Protection type | EN 60529 | IP54 |
| Free fall (with packaging) | IEC 60068-2-32 | 500 mm |

WLAN 2.4 GHz

| | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |
| Standards | IEEE 802.11 b/g/n |

WLAN 5 GHz

| | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz |
| | 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745-5825 MHz) |
| Standards | IEEE 802.11 a/n/ac |

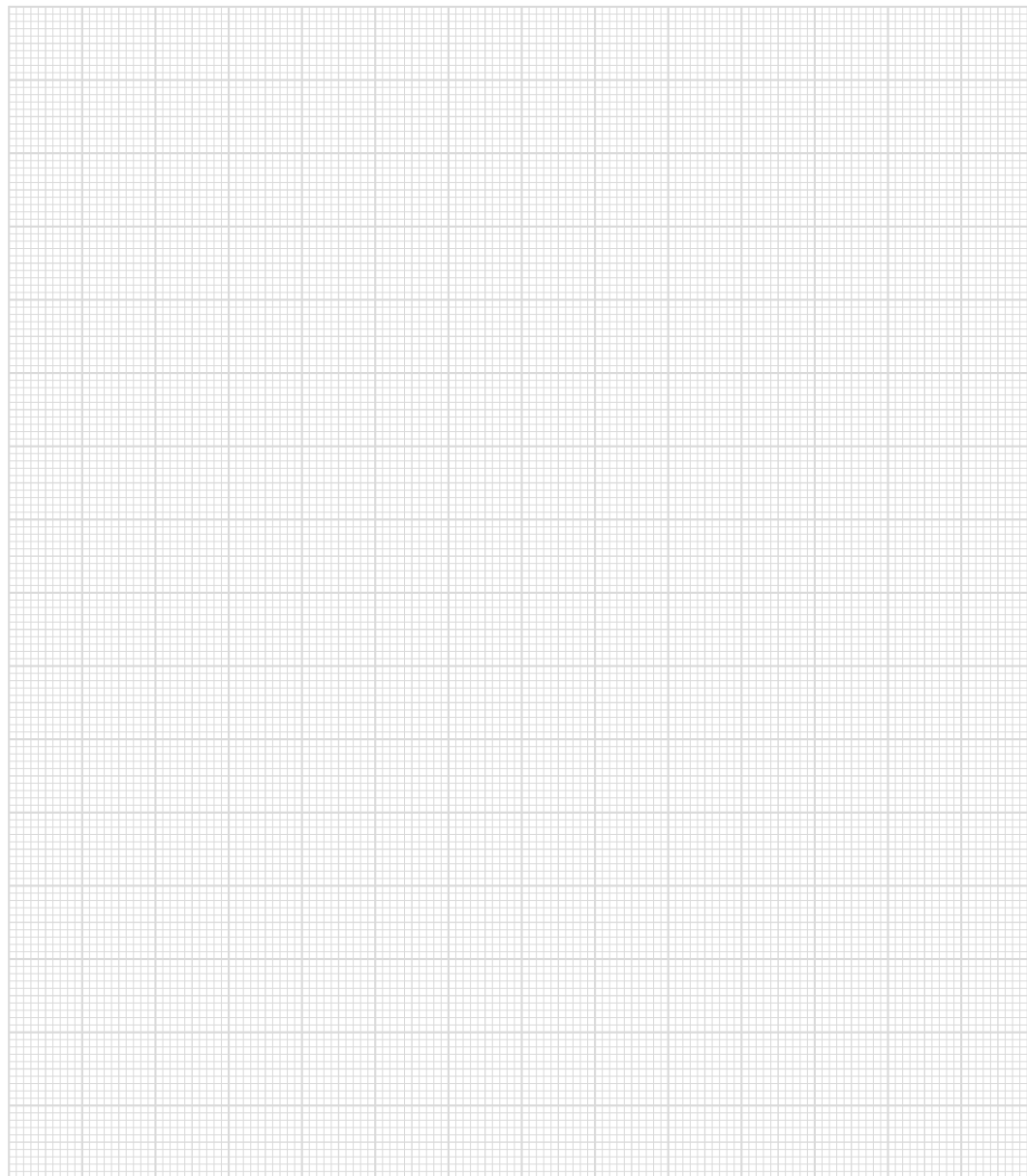
Antennae

| | |
|--|---|
| Number | 2 |
| Frequency range | 2.4/5 GHz |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-5.2 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/ characteristics | transmission characteristics: omnidirectional Polarization: linear |

Article Number and Miscellaneous

| | |
|----------------|---|
| Article number | 12-246-001 |
| Approvals | CE |
| Dimensions | 175 x 267.4 x 52.9 mm (W x H x D) |
| Material | housing: steel color: RAL7024 (powder coated) front: plexiglass |
| Weight | typically 1.55 kg |

Notes



WLAN HGW Base Station BWH 011



The BWH 011 base station serves as the gateway of a connection between an HGW and a machine control. Safety (via Black Channel), as well as non-Safety data can be redundantly transmitted – independent of the S-DIAS control used (e.g. CP/SCP 111).

Status can be displayed via programmable LEDs The base station can also communicate with other controls over Ethernet interfaces.

Performance Data

| | |
|---|---|
| Processor | EDGE2 Technology |
| Processor cores | 1 |
| Internal cache | 32-kbyte L1 Instruction Cache 32-kbyte L1 Data Cache 512-kbyte L2 Cache |
| Internal program and data memory (DDR3 RAM) | 256 Mbytes |
| Internal remnant data memory | no |
| Internal storage device | 512-Mbyte microSD card, expandable |
| Internal I/O | no |
| Interfaces | 1x M12 connector supply and Ethernet 1x M12 connector Ethernet 1x USB 2.0 Type-C (Dual Role Port) 1x WLAN dual-band (2.4 GHz, 5 GHz simultaneously) 1x LED connection for the blink-code output |

| | |
|---------------------------|---|
| Status LEDs | 1x Power 1x HGW-Link (freely programmable) 2x Network (freely programmable) 1x application/RUN-LED |
| Signal generator | no |
| Cooling | passive (fanless) |
| Coupling confirmation | by means of a signal light: either via external control with digital output (e.g.: CP 111 with TO 161) or via the internal LED connection |
| Input voltage measurement | no |

Electrical Requirements

| | |
|---|----------------------------|
| Supply voltage | +24 V DC ±20 % (SELV/PELV) |
| Protection class | 3 |
| Inrush current | 16.1 A for 1 ns |
| Current consumption of +24 V power supply | ca. 200 mA in CLI |
| USB Host current load | maximum 0.5 A |

Environmental Conditions

| | | |
|---------------------------------------|--|--|
| Storage temperature | -5 ... +60 °C | |
| Environmental temperature | 0 ...+50 °C | |
| Humidity | 10-95 %, non-condensing | |
| Installation altitude above sea level | 0-2000 m without derating > 2000 m up to a maximum of 5000 m with derating of the maximum environmental temperature by 0.5 °C per 100 m | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 5-150 Hz: amplitude 3.5 mm Transition frequency: 8.42454 Hz acceleration: 1 g duration: 10 cycles cycle: 1 octave/minute |
| Shock resistance | EN 60068-2-27 | 15 g (147.15 m/s ²), |
| Protection type | EN 60529 | IP54 |
| Free fall(with packaging) | IEC 60068-2-32 | 1000 mm |

WLAN 2.4 GHz

| | |
|-------------------------|----------------------|
| Frequency range | 2399.5-2484.5 MHz |
| Transmission power max. | 20 dBm (100 mW) EIRP |
| Channels | 1-13 (2412-2472 MHz) |
| Standards | IEEE 802.11 b/g/n |

WLAN 5 GHz

| | |
|-------------------------|--|
| Frequency range | 5150-5350 MHz 5470-5725 MHz |
| Transmission power max. | 23 dBm (200 mW) EIRP |
| Channels | 36-48 (5180-5240 MHz) 149-165 (5745 - 5825 MHz) |
| Standards | IEEE 802.11 a/n/ac |

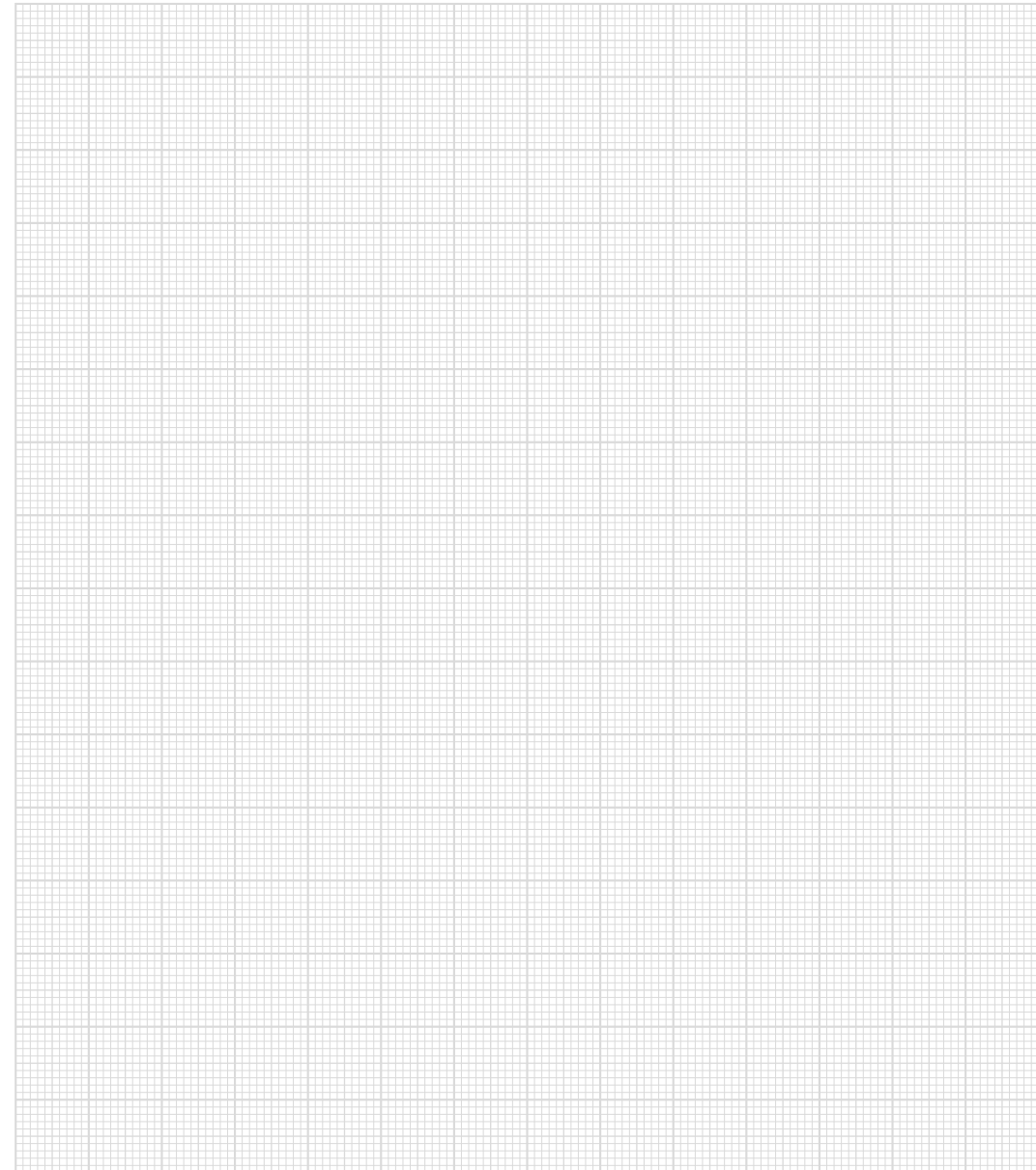
Antennae

| | |
|-----------------------------------|--|
| Number | 2 |
| Frequency range | 2.4/5 GHz (Dual-Band) |
| Transmission power max. | 25 W |
| Antenna gain | 2.4 GHz-4 dBi Peak Gain 5 GHz-5.2 dBi Peak Gain |
| Impedance | 50 Ω |
| Transmission angle/characteristic | transmission characteristics omnidirectional Polarization: linear |

Article Number and Miscellaneous

| | |
|----------------|--|
| Article number | 12-246-011 |
| Approvals | CE |
| Dimensions | 175 x 267.4 x 52.9 mm (W x H x D) |
| Material | housing: aluminum Color: anodized natural |
| Weight | typically 0.4 kg |

Notes



Keypad SIGMATEK TE 891



The keypad has a CAN bus interface and can be connected directly to a TAE display unit.

A customer-specific foil is placed on the TE 891. The buttons can be assigned as desired.

Performance Data

| | |
|------------------|---|
| Interfaces | left or right: chip card reader back panel: emergency stop connection 1x CAN with 2 connections |
| Control panel | 89x function buttons /1x emergency stop |
| Signal generator | no |

Electrical Requirements

| | |
|---------------------------------------|--|
| Emergency stop | maximum +24 V AC/2 A |
| Supply voltage | minimum +18 V DC maximum +30 V DC |
| Current consumption of voltage supply | 250 mA at +24 V |

Terminal

| | | |
|------------|-------------------------------|---|
| Dimensions | 358 x 313 x 62 mm (W x H x D) | |
| Material | housing: ASA Plastic | front plate: aluminum sheet with laminated foil |
| Weight | typically 2.5 kg | |

Article Number and Miscellaneous

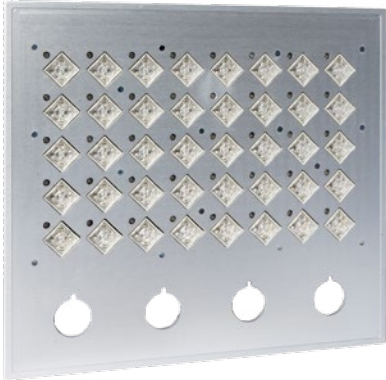
| | |
|------------------|--------------|
| Article number | 12-210-891 |
| Hardware version | 1.x |
| Standard | UL (E247993) |

Environmental Conditions

| | | | | | |
|---------------------------|--------------------------------|---|---|---|---|
| Storage temperature | -20 ... +85 °C | | | | |
| Environmental temperature | 0 ... +60 °C | | | | |
| Humidity | 0-95 %, non-condensing | | | | |
| EMC stability | EN 61000-6-2 (industrial area) | | | | |
| Shock resistance | EN 60068-2-27 | | 150 m/s ² | | |
| Protection type | | control box mount without chip card reader | control box mount with chip card reader | support arm mount without chip card reader | support arm mount with chip card reader |
| | EN 60529 | front: IP54 back panel: IP20, with IP43 cable, if the cable outlet is located below. | front: IP30 back panel: IP20, with IP43 cable, if the cable outlet is located below. | front: IP54 back panel: IP20, with IP43 cable, if the cable outlet is located below. | front: IP30 back panel: IP20, with IP43 cable, if the cable outlet is located below. |
| | NEMA 250 (UL50) | type 12 | type 1 | type 1 | type 1 |

Keypad

TE 401



The TE 401 keypad has 40 buttons and 40 LEDs. These buttons are read by the software and can then be used for any desired function. The LEDs indicate the operating status.

In addition, four external switching elements can be connected.

Article Number and Miscellaneous

| | |
|------------------|--------------|
| Article number | 12-210-401-T |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | IP20 in accordance with EN 60529 | |

Performance Data

| | | |
|------------------|--|--|
| Interfaces | 12-pin connector for 4x 3 switching elements 2-pin power connector 1x CAN with 2 connections | |
| Control panel | 40x function buttons/4x switch recesses | |
| Signal generator | no | |

Electrical Requirements

| | | |
|---------------------------------------|------------------|------------------|
| Supply voltage | minimum +18 V DC | maximum +30 V DC |
| Current consumption Supply voltage | 127 mA-175 mA | |

Terminal

| | | |
|------------|---------------------------------|-----------------------|
| Dimensions | 240 x 220 x 40.1 mm (W x H x D) | |
| Material | housing: aluminum | front plate: aluminum |

Keypad

TE 501



The TE 501 keypad has 50 buttons and 50 LEDs. These buttons are read by the software and can then be used for any desired function. The LEDs indicate the operating status.

In addition, four external switching elements can be connected.

Article Number and Miscellaneous

| | |
|------------------|--------------|
| Article number | 12-210-501-T |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +80 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | IP20 in accordance with EN 60529 | |

Performance Data

| | | |
|------------------|--|--|
| Interfaces | 12-pin connector for 4x 3 switching elements 2-pin power connector 1x CAN with 2 connections | |
| Control panel | 50x function buttons/4x switch recesses | |
| Signal generator | no | |

Electrical Requirements





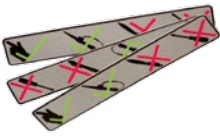
| | | |
|---------------------------------------|------------------|------------------|
| Supply voltage | minimum +18 V DC | maximum +30 V DC |
| Current consumption Supply voltage | 148 mA-207 mA | |

Terminal




| | | |
|------------|---------------------------------|-----------------------|
| Dimensions | 320 x 260 x 46.7 mm (W x H x D) | |
| Material | housing: aluminum | front plate: aluminum |

Accessories HMI

Available Products

| | Description | Article number |
|---|--|----------------|
|  | HGT 835-Z1 Wall Mount for HGT 835, HBG 0811 | 01-245-835-Z1 |
|  | HGT 1035-Z2 Wall Mount for HGT 1035, HBG 1011 | 01-245-1035-Z2 |
|  | Floppy drive DL 350 1.44 MB, 3.5" | 01-690-031 |
|  | USB Stick 2-Gbytes | 12-620-203 |
|  | Sticker "Instructions for touch operation" | on request |

Available Products

| | Description | Article number |
|---|--|----------------|
|  | Touch protection foil | on request |
|  | Touch pen V2 with holder for resistive touch | 01-690-059-2 |
|  | Touch pen V3 with holder for capacitive touch | 01-690-059-3 |

 SIGMATEK
DIAS-Drive

Motion Control System



Motion Control System

Modern machines and systems demand more efficient drive technology with greater flexibility, higher precision and reliability. With the Motion Control System from SIGMATEK, a high performance, operator-friendly and economic complete solution is provided that offers a great deal of freedom when implementing your machine and plant concepts.



Integrated Drive Technology

Motors, servo drive systems and software are fully integrated into the SIGMATEK automation system. Motion control tasks can therefore be solved simply and flexibly. The Dias Drives of the 100 or 300 series and the servo motors are designed for special requirements. In combination with the engineering tool LASAL MOTION, highly dynamic, synchronized and reliable servo applications are provided from one source. The open, Ethernet-based VARAN bus ensures extremely fast, hard real-time and nearly jitter-free communication.

DIAS Drives: Compact and Modular Servo Drive Systems

SIGMATEK has the right system for any application. Both the DIAS Drive 100 and 300 series have minimal cycle times and excellent servo performance. The functions are consciously limited to current, speed and position control. Unnecessary overhead is thereby avoided and an optimal price/performance ratio is achieved. Servo, linear, torque and asynchronous motors can be controlled and combined as desired. All conventional feedback systems (Resolver, Hiperface, EnDat encoders and high-resolution Sin/Cos encoders) are possible. Safety functions (SIL 3 bow. PL e) such as "Safe Torque Off" (STO) and "Safe Stop" (SS1), which are already integrated, simplify the integration of the drive technology into the machine's Safety concept.

DIAS Drives Series 100: Modular Multi-Axis System



The DIAS Drive 100 is a modular servo drive system, which was designed especially for multi-axis applications in the lower and middle power range. It convinces with an exceptionally compact form and optimized power loss. Each system consisting of a maximum of 4 drive modules can control up to 8 servo axes and that with an installation space of only 300 mm x 155 mm x 152 mm (width x height x depth). Depending on the power module and motor type used,

the system must be operated as 1-phase, 230 V AC or 3-phase 400-480 V AC. 2 different power modules are available to choose from as well as axis modules in various power classes for 1 or 2 servo drives. This modularity ensures the machine builder optimal integration into the machine process.

DIAS Drives 300 Compact Multi-Axis System

This servo drives of the DIAS Drive 300 series are designed for multi-axis applications in a power range from 8 to 14 kW. Up to 3 axes are contained in one housing, which saves space in the control cabinet. High efficiency, reduced power loss and an optimized cooling concept are major arguments for using the DIAS Drives 300 series.



Synchronous Servomotors and Planetary Gears

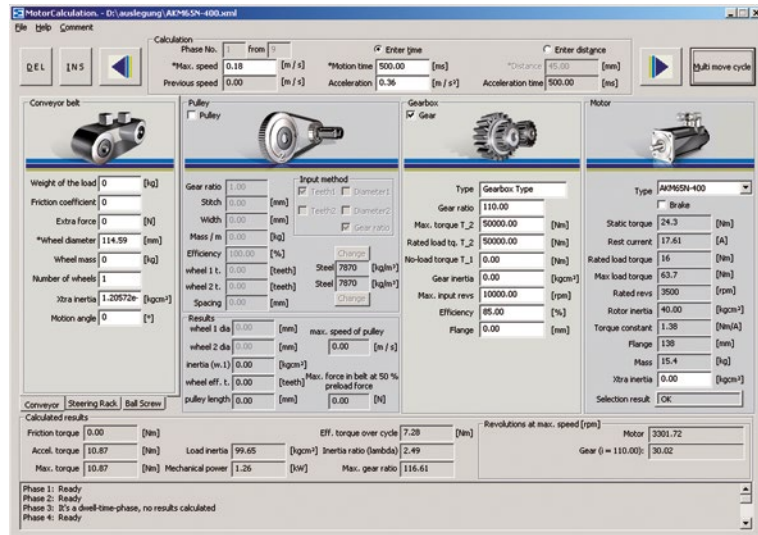


The synchronous servomotors of the AKM series are compact power packages for highly dynamic motion tasks seven sizes with standstill torques from 0.18 to 53 Nm and peak torques up to 143 Nm are available. The AKM servomotors can be combined into compact coaxially constructed drive units using planetary gears from the PEII series.

For the low voltage range, low-voltage synchronous servo motors from the AKM and SM series are available in various sizes. The compact low-voltage motors can be easily integrated into existing machines and systems.

Dimensioning, Construction of Motors and Drives

For any application: With an appropriately customized and optimized drive concept, the energy efficiency can be increased. Important thereby, are need-based dimensioning and the professional construction of the drives and motors.

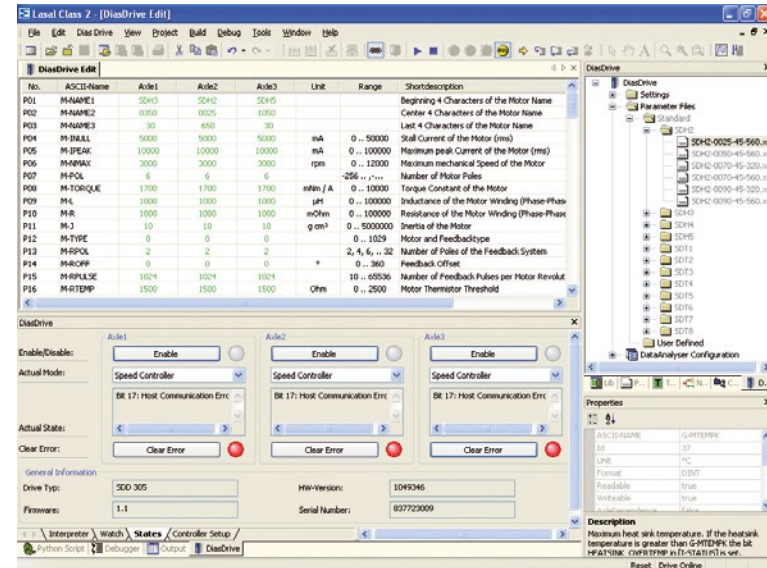


Comfortable, Simple Start-up and Maintenance

The integration of the initial start-up and parametrization software LASAL DRIVE into the object oriented project development tool LASAL, simplifies programming, parametrization and operation. No additional software is necessary and the time required for the initial start-up is reduced significantly.

In combination with LASAL MOTION, the connection to virtual lead axes, the creation and execution of profiles as well as the coupling of several axes and the use of various motion control functions is possible.

Parameters sets that can be simply linked to the application and edited are available for all SIGMATEK motors. All the parameters can be stored in the control, which guarantees that the drive always has the correct data. The servo amplifier can therefore be exchanged without additional effort and without a software tool.



LASAL MOTION



LASAL MOTION is a component of the engineering tool LASAL, which enables the seamless integration of the drive technology into the control system.

Simple, comfortable and clearly organized
LASAL MOTION's modular construction allows drive concepts to be implemented flexibly and efficiently. With this software package, the most complex axis control and regulation tasks can be solved with high precision, dynamics and little effort.

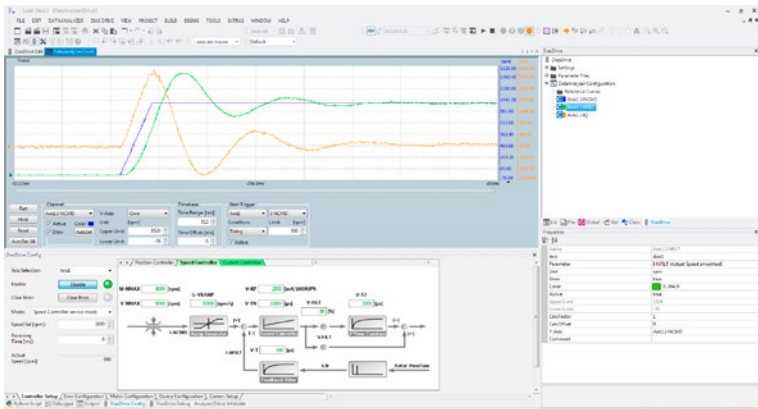
Large library with motion control and technology functions.

In the library provided, a large selection of standard motion functions is available such as absolute, relative and endless positioning as well as CNC functions, coordinated movements such as linear interpolation with up to 6 axes, circular interpolation, CAM discs, gear functions, flying saws, electronic CAMs and tracked movements. Furthermore, numerous referencing types and NC applications are available in addition to standard functions.

Data Analyzer, Graphic Representation of Controller Start-Up

The DIAS Drives have an internal data analyzer that can record data with a scan rate of 62.5 μ s. This data is recorded in the converter in real time and displayed through the software tool.

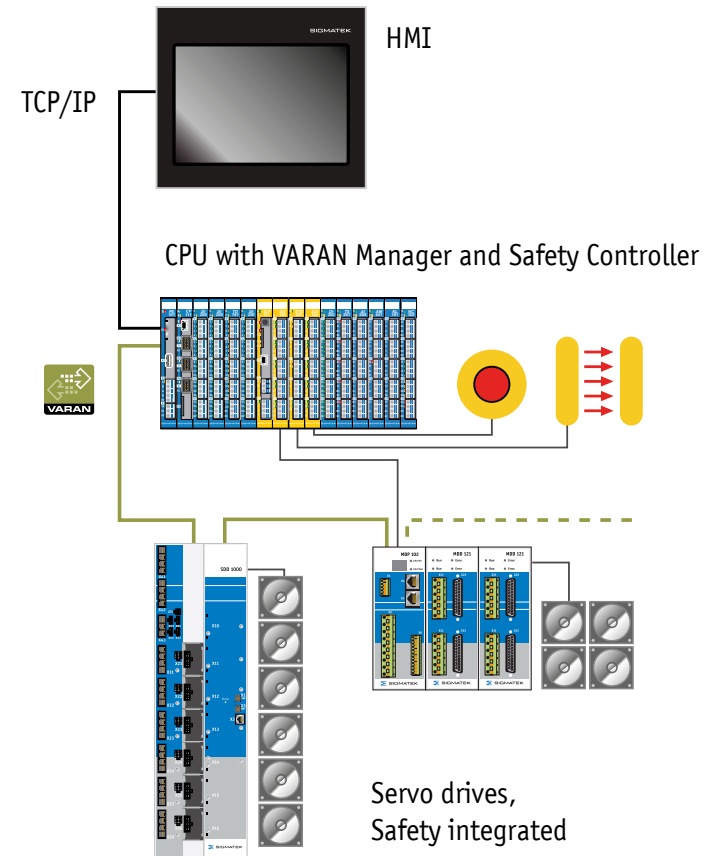
Current, rotation speed and position control are graphically displayed in the software, which ensures a clear overview at any time. All respective control parameters are visible at a glance and can be set individually.



Optimizing the controllers and displaying the data analyzer can be done in the same screen view.

Examples of Automation with DIAS Drives

With the combination of the DIAS Drives and the real-time Ethernet bus system VARAN, the user achieves high performance and safety with drive control. The DIAS Drives can be integrated into the VARAN bus network in a tree, star or linear structure.



Motion Control System

DIAS Drives

Servo Motors

Planetary Gears

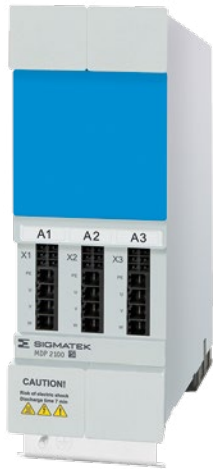
Cables

Interface Cards



DIAS Drive

MDD 2000



The DIAS-Drive 2000 series contains the power/axis modules and axis modules for a power input voltage of 400/480 V AC. The system is currently available in 3 different sizes.

In the power/axis modules (MDP), as well as the axis modules (MDD), up to 3 servo amplifiers are integrated. With a power/axis module, several axis modules can be powered.

The DIAS-Drive 2000 is a complete servo drive system for the low to mid power range, which can also be used for applications high control performance. It is completely integrated into the LASAL design environment.

Available Models

| Short Description | Type | Safety | Universal Encoder | Article Number |
|-------------------|------------------------------------|--------|-------------------|------------------|
| MDP2100-DDD-03 | Power/axis module with 3 x 5/15 A | yes | yes | 09-83-100-DDD-03 |
| MDD2100-DDD-03 | Axis module with 3 x 5/15 A | yes | yes | 09-84-100-DDD-03 |
| MDP2200-HHH-03 | Power/axis module with 3 x 10/30 A | yes | yes | 09-83-200-HHH-03 |
| MDD2200-HHH-03 | Axis module with 3 x 10/30 A | yes | yes | 09-84-200-HHH-03 |

DC-link Circuit

| Module | MDP/MDD 2102 | MDP/MDD 2100 | MDP/MDD 2200 | MDP/MDD 2300 |
|--------------------------------------|---------------------------|-----------------------|------------------------|-------------------------|
| Intermediate circuit nominal voltage | 1,3 kW 2,6 kW for 10 s | 4 kW 8 kW for 10 s | 9 kW 18 kW for 10 s | 18 kW 36 kW for 10 s |
| Intermediate circuit nominal voltage | 325 V | 565 V | | |
| Maximum DC-link voltage | 430 V | 850 V | | |
| DC-link capacitance | 1320 µF | 330 µF | 660 µF | 1155 µF |
| Maximum current via DCB | 40 A | | | |

+24 V Auxiliary Voltage

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|--------------------------------|---------------------|--------------|--------------|
| Rated input voltage | +24 V | | |
| Input voltage range | +22-30 V SELV/PELV | | |
| Current consumption per module | 1 A + brake current | | |
| Input capacitance | 1 mF | | |
| Maximum current via BCB | 20 A | | |
| Maximum cable length | 30 m | | |

Axis/Motor Connection

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|--|--|--------------|----------------------------|
| Maximum number of drives | 3 | | |
| Switching frequency | 8 kHz | | |
| Derating | 2,5 %/°C over 45 °C (axis current and DC-link power are affected) | | |
| Continuous current/peak current for 1 s per axis | 5/15 A | 10/30 A | A1: 30/90 A A2: 22/66 A |
| Maximum total current | 15 A | 30 A | 45 A |
| Maximum output frequency | 599 Hz | | |
| Maximum cable length | 30 m | | |

Safe/Capture Inputs

| Type | Safe input (Input 1-4) | Capture input (Input 5-6) |
|----------------------|---------------------------|---------------------------|
| Number | 6 | |
| Rated input voltage: | +24 V | |
| Input voltage range | +18-30 V | |
| Signal level | low: ≤ +5 V | low: ≤ +5 V, high ≥ +15 V |
| Switching threshold | typically +11 V | |
| Input current | typically 3.6 mA at +24 V | |
| Input delay | typically 0.5 ms at +24 V | typically 3 µs at +24 V |

Signal Output for Cross-Circuit Detection

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|----------------------|--|--------------|--------------|
| Number | 1x signal A per module 1x signal B per module | | |
| Rated output voltage | +24 V | | |
| Output voltage range | +22-30 V | | |
| Output current | maximum 100 mA | | |
| Short-circuit proof | yes | | |

Power Supply

| Modules | MDP 2102 | MDP 2100 | MDP 2200 | MDP 2300 |
|--|--|-------------------------------|-------------------------------|--------------|
| Rated supply voltage | 1x 230 V AC | 3x 400 V AC | | |
| Supply voltage range | 1x 230 V AC ±10% | 3x 380-480 V AC ±10 % | | |
| Over voltage category | III | | | |
| Power supply frequency | 45-65 Hz | | | |
| Rated connection load: | 2.8 kVA | 8.5 kVA | 17.25 kVA | 27.6 kVA |
| Input current | 12 A | 12 A | 25 A | 40 A |
| Inrush current | maximum 15 A | maximum 35 A | | maximum 45 A |
| Neutral point | grounded | | | |
| Maximum permissible short-circuit current | 5 kA | | | |
| Net | TN-S, TN-C-S (with grounded star point) IT (on request) | | | |
| Integrated power filter in compliance with EN 61800-3, category C3 | yes | | | |
| Maximum fuse | Line protection: 13 A Type C | Line protection: 25 A Type C | Line protection: 40 A Type C | |
| | Operating class gG (gL): 13 A | Operating class gG (gL): 25 A | Operating class gG (gL): 40 A | |

Ballast Resistance

| Module | MDP 2102 | MDP 2100 | MDP 2200 | MDP 2300 |
|---|----------------|-----------------|-----------------|---------------|
| Internal braking resistor value | yes (25 Ω) | | | |
| peak output int./ext. | 7.4 kW/12.3 kW | 28.9 kW/28.9 kW | 28.9 kW/36.1 kW | 37 kW/48.1 kW |
| continuous output int./ext. | 50 W/500 W | | 200 W/1000 W | 400 W/2000 W |
| Minimum permissible braking resistance (ext.) | 15 Ω | 25 Ω | 20 Ω | 15 Ω |
| Overload protection | yes | | | |
| Short circuit protection | yes | | | |
| Ground fault protection | no | | | |
| Maximum cable length | 3 m | | | |

Communication

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|--------|--------------|--------------|--------------|
| Bus | VARAN | | |

Motor Holding Brake

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|---------------------------------------|---------------|--------------|--------------|
| Maximum continuous current | +1.5 A | | |
| Overload and short-circuit protection | yes | | |
| Low-voltage monitor | yes | | |
| Cable break monitor | yes | | |
| Braking voltage reduction | yes (12-24 V) | | |

Mechanics

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|---------------------------|--------------------------------|--------------------|--------------------|
| Cooling | Air, cold-plate in preparation | | |
| Backplane | none required | | |
| Mounting position | vertical, hanging | | |
| Clearance above and below | at least 3 cm | | |
| Fan | yes, exchangeable | | |
| Dimensions (W x H x D) | 75 x 242 x 219 mm | 150 x 242 x 219 mm | 225 x 242 x 219 mm |
| Weight | 3 kg | 5.2 kg | 7.2 kg |

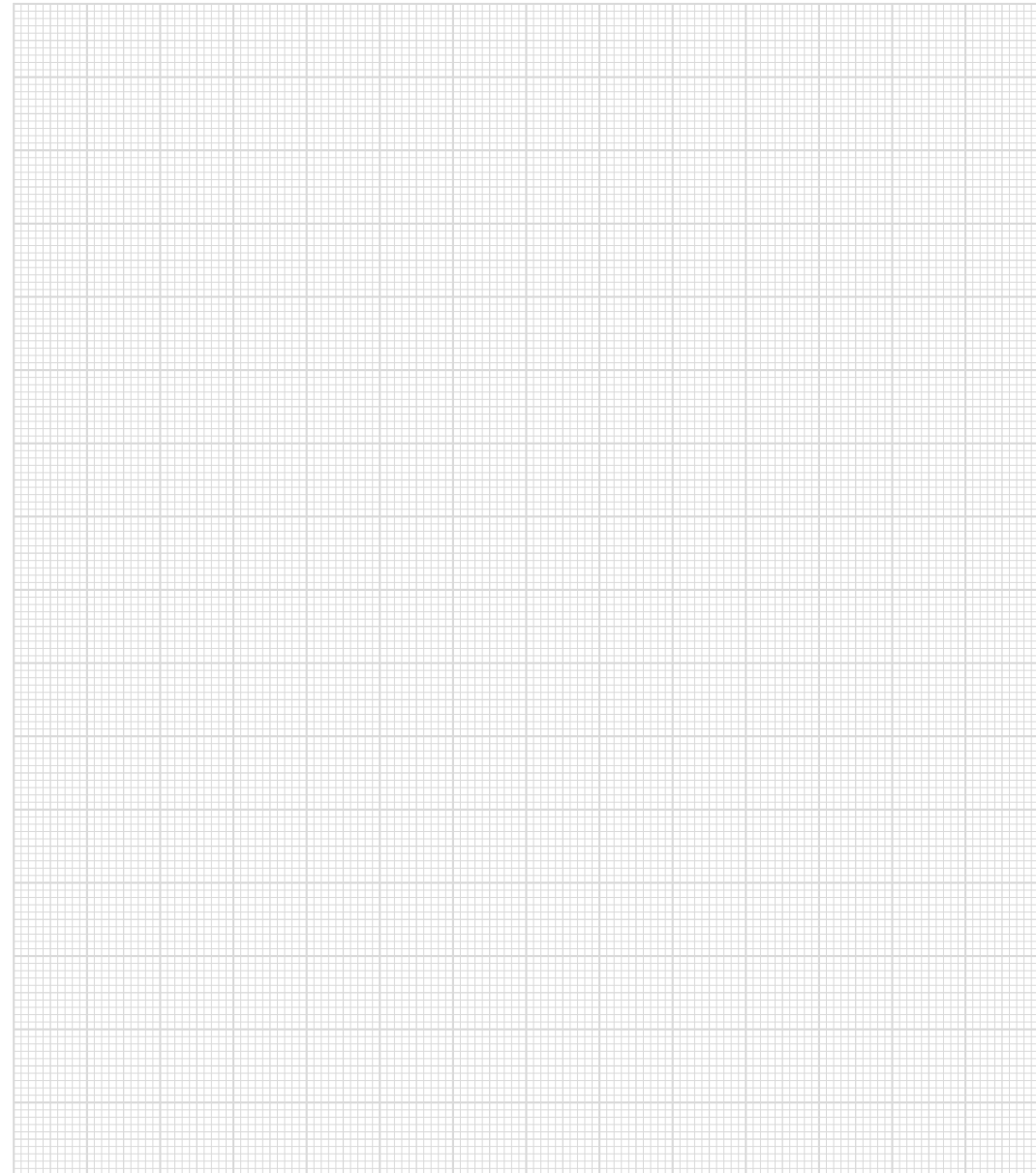
Environmental Conditions

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|-----------------------------------|--|--------------|--------------|
| Storage temperature | -25 ... +70 °C | | |
| Nominal environmental temperature | 0 ... +45 °C | | |
| Environmental temperature max. | 0 ... +55 °C (with derating 2.5 %/°C above 45 °C) | | |
| Humidity | maximum relative humidity 85 %, non-condensing | | |
| Altitude | up to 1000 m above NN at rated values 1000-3000 m above NN with reduction by 1.5 % / 100 m (rated output current and rated input power affected) | | |
| Operating conditions | pollution degree 2 | | |
| Vibration resistance | frequency: 5-150 Hz acceleration: 1 g amplitude: 0.075 mm (0.15 mm pp) | | |
| Shock resistance | acceleration: 15 g | | |
| Protection type | IP20 | | |

Miscellaneous

| Module | MDP/MDD 210X | MDP/MDD 2200 | MDP/MDD 2300 |
|-----------|----------------------------------|--------------|--------------|
| Normung | UL in preparation | | |
| Approvals | CE, TÜV-Austria EG-type-examined | | |

Notes



DIAS Drive

SDD 310



Version Cold Plate

The SDD 310 is the "standard" drive from SIGMATEK and is designed for midrange power. This three-axis device can be operated with 3x 10 A continuous and 3x 20 peak current. With the integrated auto scaling function, small motors (< 1 A rated current) can also be optimally regulated.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduced power loss using a new PWM process
- integrated class A power filter
- intermediate circuit is accessible for the coupling of additional devices
- spline interpolation implemented in addition to position control
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Values

| | | |
|---|--------------------|--|
| Rated mains voltage (symmetrically to ground) 5000 A eff. (L1, L2, L3) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Max. peak current in starting torque (limited by inrush current) | A | 2.5 |
| Rated power in S1 mode | kVA | 14 |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage protection - limit for the intermediate circuit | V _{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | 35 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 25-27 |
| Max. holding brake current per axis | A _{DC} | 2 |
| Holding brake-voltage reduction with a +24 V-BR load | V _{DC} | max. 1 (at 3x 2 A holding brake current) |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current for axis 1 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 1 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 2 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 2 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 3 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 3 from 500 ms | A _{RMS} | 7 |
| Max. continuous sum current of all axis (heat sink) | A _{RMS} | 20 |
| Peak output current of axis 1 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 2 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 3 for a max. 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Power stage loss | W/A _{RMS} | 10 |
| Output frequency of the power output stage | kHz | 8 |
| Maximum leakage current | mA | 15 |
| PWM-Frequenz | kHz | 8 |
| Reglerfrequenz | kHz | 16 |

Regen Circuit

| | | |
|---|----|-------|
| Capacitance of the intermediate circuit voltage | μF | 700 |
| External brake resistance | Ω | 25-50 |
| Internal regen resistor value | Ω | 25 |
| Rated power of the internal regen resistor | W | 200 |

G-VMAINS = 230 (rated mains voltage = 230 V)

| | | |
|---|-----------------|-----|
| Start-up limit | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 6.5 |

G-VMAINS = 400 (rated mains voltage = 400 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

G-VMAINS = 480 (rated mains voltage = 480 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Max. rated power of the external regen resistor | W | 1500 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 27 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | electronic protection |
| Regen resistor | | electronic protection |

Resolver Specifications

| | | |
|---|------------------|------------------|
| Exciter frequency ferr | kHz | 8 |
| Exciter voltage U _{Ref} | U _{eff} | 4 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage U _{sin/cos} , max | U _{eff} | 2.2 |

Connector Types

| | | |
|------------------------|--|---|
| Auxiliary supply (X1A) | | Combicon 5, 3-pin |
| Power supply (X1B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | D-Sub 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Mechanics

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Mechanics with Cold Plate

| | | |
|--------|----|-------|
| Height | mm | 428 |
| Width | mm | 152 |
| Depth | mm | 121.3 |
| Weight | kg | 6.35 |

Article Number

| | | |
|---------------|--|---------------|
| with fan unit | | 09-501-101-23 |
|---------------|--|---------------|

DIAS Drive

SDD 315



The SDD 315 is designed for midrange power. With this three-axis drive, one axis can be operated with 15 A continuous and 30 A peak current. The others are operated with 10 A nominal and 20 A peak current. Motors with different power ranges can therefore be combined.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduced power loss using a new PWM process
- integrated class A power filter
- intermediate circuit is accessible for the coupling of additional devices
- spline interpolation implemented in addition to position control
- automatic scaling function
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Values

| | | |
|---|--------------------|--|
| Rated mains voltage (symmetrically to ground) 5000 A eff. (L1, L2, L3) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Max. peak current in starting torque (limited by inrush current) | A | 2.5 |
| Rated power in S1 mode | kVA | 8 (230 V) – 14 (400-480 V) |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage protection - limit for the intermediate circuit | V _{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | 35 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 25-27 |
| Max. holding brake current per axis | A _{DC} | 2 |
| Holding brake-voltage reduction with a +24 V-BR load | V _{DC} | maximum 1 (at 3x 2 A holding brake current) |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current for axis 1 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 1 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 2 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 2 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 3 (eff. +/- 3 %) | A _{RMS} | 15 |
| Max. standstill current axis 3 from 500 ms | A _{RMS} | 10.5 |
| Max. continuous sum current of all axis (heat sink) | A _{RMS} | 20 |
| Peak output current of axis 1 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 2 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 3 for a max. 5 sec. (eff. +/- 3 %) | A _{RMS} | 30 |
| Power stage loss | W/A _{RMS} | 10 |
| Output frequency of the power output stage | kHz | 8 |
| Maximum leakage current | mA | 15 |
| PWM frequency | kHz | 8 |
| Regulator frequency | kHz | 16 |

Regen Circuit

| | | |
|---|----|-----|
| Capacitance of the intermediate circuit voltage | μF | 700 |
| External brake resistance | Ω | 25 |
| Internal regen resistor value | Ω | 25 |
| Rated power of the internal regen resistor | W | 200 |

G-VMAINS = 230 (rated mains voltage = 230 V)

| | | |
|---|-----------------|-----|
| Start-up limit | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 6.5 |

G-VMAINS = 400 (rated mains voltage = 400 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

G-VMAINS = 480 (rated mains voltage = 480 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Max. rated power of the external regen resistor | W | 1500 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 27 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | electronic protection |
| Regen resistor | | electronic protection |

Resolver Specifications

| | | |
|-------------------------------------|------------------|------------------|
| Exciter frequency f_{err} | kHz | 8 |
| Exciter voltage U_{Ref} | U _{eff} | 4 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage $U_{sin/cos, max}$ | U _{eff} | 2.2 |

Connector Types

| | | |
|-------------------------------|--|---|
| Auxiliary supply (X1 A, X2 A) | | Combicon 5, 3-pin |
| Power supply (X1B, X2B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | D-Sub 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Dimensions

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Article Number

| | | |
|---------------|--|---------------|
| with fan unit | | 09-501-151-23 |
|---------------|--|---------------|

DIAS Drive

SDD 335



The SDD 335 is designed for high power. With this three-axis drive, one axis can be operated with 10 A continuous and 20 A peak current, one axis can be operated with 10 A continuous 30 A peak current and one axis can be operated with 15 A continuous and 35 A peak current. Motors with different power ranges can therefore be combined.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduced power loss using a new PWM process
- integrated class A power filter
- intermediate circuit is accessible for the coupling of additional devices
- spline interpolation implemented in addition to position control
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Values

| | | |
|---|--------------------|--|
| Rated mains voltage (symmetrically to ground) 5000 A eff. (L1, L2, L3) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Max. peak current in starting torque (limited by inrush current) | A | 2.5 |
| Rated power in S1 mode | kVA | 14 |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage protection - limit for the intermediate circuit | V _{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | 35 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 25-27 |
| Max. holding brake current per axis | A _{DC} | 2 |
| Holding brake-voltage reduction with a +24 V-BR load | V _{DC} | max. 1 (at 3x 2 A holding brake current) |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current for axis 1 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 1 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 2 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 2 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 3 (eff. +/- 3 %) | A _{RMS} | 15 |
| Max. standstill current axis 3 from 500 ms | A _{RMS} | 10.5 |
| Max. continuous sum current of all axis (heat sink) | A _{RMS} | 20 |
| Peak output current of axis 1 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 2 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 30 |
| Peak output current of axis 3 for a max. 5 sec. (eff. +/- 3 %) | A _{RMS} | 35 |
| Power stage loss | W/A _{RMS} | 10 |
| Output frequency of the power output stage | kHz | 8 |
| Maximum leakage current | mA | 15 |
| PWM frequency | kHz | 8 |
| Regulator frequency | kHz | 16 |

Regen Circuit

| | | |
|---|----|-----|
| Capacitance of the intermediate circuit voltage | μF | 700 |
| External brake resistance | Ω | 25 |
| Internal regen resistor value | Ω | 25 |
| Rated power of the internal regen resistor | W | 200 |

G-VMAINS = 230 (rated mains voltage = 230 V)

| | | |
|---|-----------------|-----|
| Start-up limit | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 6.5 |

G-VMAINS = 400 (rated mains voltage = 400 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

G-VMAINS = 480 (rated mains voltage = 480 V)

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Max. rated power of the external regen resistor | W | 1500 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 27 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | electronic protection |
| Regen resistor | | electronic protection |

Resolver Specifications

| | | |
|-------------------------------------|-----------|------------------|
| Exciter frequency f_{err} | kHz | 8 |
| Exciter voltage U_{Ref} | U_{eff} | 4 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage $U_{sin/cos, max}$ | U_{eff} | 2.2 |

Connector Types

| | | |
|------------------------|--|---|
| Auxiliary supply (X1A) | | Combicon 5, 3-pin |
| Power supply (X1B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | D-Sub 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Dimensions

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Article Number

| | | |
|---------------|--|---------------|
| with fan unit | | 09-501-351-23 |
|---------------|--|---------------|

DIAS Drive

SDD 210



The SDD 210 is the standard drive from SIGMATEK and is designed for midrange power. This two-axis device can be operated with 2x 10 A continuous and 2x 20 peak current. With the integrated auto scaling function, small motors (< 1 A rated current) can also be optimally regulated.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduced power loss using a new PWM process
- integrated class A line filter
- intermediate circuit is accessible, coupling of additional modules is possible
- integrated spline interpolation in addition to position control
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Data

| | | |
|--|-------------|---|
| Rated mains voltage (symmetrically to ground) Maximum 500 rms symmetrical amps (L1, L2, L3) | V_{AC} | $3 \times 230 V_{-10\%} - 480 V_{+10\%}$, 45-65Hz |
| Maximum peak current at switch on of the main contactor (limited by the inrush circuit) | A | 2.5 |
| Rated installed power for S1 operation | kVA | 14 |
| Rated DC-link voltage | V_{DC} | 290-680 |
| Over voltage protection threshold of DC-link voltage | V_{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V_{DC} | 22-30 |
| Power of auxiliary supply voltage +24 V | W | 35 |
| Holding brake supply voltage +24 V-BR | V_{DC} | 25-27 |
| Maximum holding brake current per axis | A_{DC} | 2 |
| Holding brake voltage drop from +24 V-BR to output | V_{DC} | max. 1 (at 2x 2 A holding brake current) |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current axis 1 (rms +/- 3 %) | A_{RMS} | 10 |
| Max. standstill current axis 1 from 500 ms | A_{RMS} | 7 |
| Rated output current axis 2 (rms +/- 3 %) | A_{RMS} | 10 |
| Max. standstill current axis 2 from 500 ms | A_{RMS} | 7 |
| Maximum continuous sum current of all axes (heat sink) | A_{RMS} | 20 |
| Peak output current axis 1 for max. 5 sec. (rms +/- 3 %) | A_{RMS} | 20 |
| Peak output current axis 2 for max. 5 sec. (rms +/- 3 %) | A_{RMS} | 20 |
| Power stage losses | W/A_{RMS} | 10 |
| Output frequency of the power stage | kHz | 8 |
| Maximum leakage current | mA | 15 |

Regen Circuit

| | | |
|---|----------|-------|
| DC-Link capacitance | μF | 700 |
| External regen resistor value | Ω | 25-50 |
| Internal regen resistor value (not in Cold Plate) | Ω | 25 |
| Rated power of the internal regen resistor | W | 200 |

G-VMAINS = 230 (rated mains voltage = 230 V)

| | | |
|--|-----------------|-----|
| Switch-on threshold | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal regen resistor (maximum 1 sec.) | kW | 6.5 |

G-VMAINS = 400 (rated mains voltage = 400 V)

| | | |
|--|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

G-VMAINS = 480 (rated mains voltage = 480 V)

| | | |
|--|-----------------|------|
| Switch-on threshold | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Maximum rated power of the external regen resistor | W | 1500 |
| Peak power of the internal regen resistor (maximum 1 sec.) | kW | 27 |

Internal Fusing

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | Electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | Electronic protection |
| Regen resistor | | Electronic protection |

Resolver Specification

| | | |
|-------------------------------------|-----------|------------------|
| Exciter frequency f_{err} | kHz | 8 |
| Exciter voltage U_{Ref} | U_{eff} | 4 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage $U_{sin/cos, max}$ | U_{eff} | 2.2 |

Plug Types

| | | |
|------------------------|--|---|
| Auxiliary supply (X1A) | | Combicon 5, 3-pin |
| Power supply (X1B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | Sub-D 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Mechanics

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Article Number

| | | |
|---------------|--|---------------|
| with fan unit | | 09-501-102-23 |
|---------------|--|---------------|

DIAS Drive

SDD 215



The SDD 215 is a 2-axis unit designed for midrange power applications. One axis can operate with 10 A continuous and 20 A peak current, the other with 15 A nominal and 30 A peak current. This allows a varying number of axes as well as motor combinations with different capacity ranges to be implemented.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduction of power loss through a PWM process
- integrated class A power filter
- intermediate circuit is accessible for the coupling of additional devices
- spline interpolation implemented in addition to position control
- automatic scaling function
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Values

| | | |
|---|--------------------|--|
| Rated mains voltage (symmetrically to ground) 5000 A eff. (L1, L2, L3) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Max. peak current in starting torque (limited by inrush current) | A | 2.5 |
| Rated power in S1 mode | kVA | 8 (230 V) – 14 (400-480 V) |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage protection - limit for the intermediate circuit | V _{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | 35 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 25-27 |
| Max. holding brake current per axis | A _{DC} | 2 |
| Holding brake-voltage reduction with a +24 V-BR load | V _{DC} | max. 1 (at 3x 2 A holding brake current) |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current for axis 1 (eff. +/- 3 %) | A _{RMS} | 10 |
| Max. standstill current axis 1 from 500 ms | A _{RMS} | 7 |
| Rated output current for axis 3 (eff. +/- 3 %) | A _{RMS} | 15 |
| Max. standstill current axis 2 from 500 ms | A _{RMS} | 10.5 |
| Max. continuous sum current of all axis (heat sink) | A _{RMS} | 20 |
| Peak output current of axis 1 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 20 |
| Peak output current of axis 2 for a max. 5 sec. (eff. +/- 3 %) | A _{RMS} | 30 |
| Power stage loss | W/A _{RMS} | 10 |
| Output frequency of the power output stage | kHz | 8 |
| Maximum leakage current | mA | 15 |
| PWM frequency | kHz | 8 |
| Regulator frequency | kHz | 16 |

Regen Circuit

| | | |
|---|----|-------|
| Capacitance of the intermediate circuit voltage | µF | 700 |
| External brake resistance | Ω | 25 |
| Internal regen resistor value | Ω | 25-50 |
| Rated power of the internal regen resistor | W | 200 |

**G-VMAINS = 230
(rated mains voltage = 230 V)**

| | | |
|---|-----------------|-----|
| Start-up limit | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 6.5 |

**G-VMAINS = 400
(rated mains voltage = 400 V)**

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

**G-VMAINS = 480
(rated mains voltage = 480 V)**

| | | |
|---|-----------------|------|
| Start-up limit | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Max. rated power of the external regen resistor | W | 1500 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 27 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | electronic protection |
| Regen resistor | | electronic protection |

Resolver Specifications

| | | |
|--|------------------|------------------|
| Exciter frequency f _{err} | kHz | 8 |
| Exciter voltage U _{Ref} | U _{eff} | 4 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage U _{sin/cos, max} | U _{eff} | 2.2 |

Connector Types

| | | |
|------------------------|--|---|
| Auxiliary supply (X1A) | | Combicon 5, 3-pin |
| Power supply (X1B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | D-Sub 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Dimensions

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Article Number

| | | |
|---------------|--|---------------|
| with fan unit | | 09-501-152-23 |
|---------------|--|---------------|

DIAS Drive SDD 120



The SDD 120 is a 1-axis device with 20 A continuous and 40 A peak current, which makes it the most powerful drive offered by SIGMATEK.

The VARAN bus interface provides fast, hard real-time capable and nearly jitter-free communication.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT, Hiperface and Sin/Cos)
- reduced power loss using a new PWM process
- integrated class A power filter
- intermediate circuit is accessible for the coupling of additional devices
- spline interpolation implemented in addition to position control
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1

Rated Values

| | | |
|---|--------------------|--|
| Rated mains voltage (symmetrically to ground) 5000 A eff. (L1, L2, L3) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Max. peak current in starting torque (limited by inrush current) | A | 2.5 |
| Rated power in S1 mode | kVA | 14 |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage protection - limit for the intermediate circuit | V _{DC} | 450-900 |
| Auxiliary supply voltage +24 V | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | 25 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 25-27 |
| Max. holding brake current per axis | A _{DC} | 2 |
| Holding brake-voltage reduction with a +24 V-BR load | V _{DC} | max. 1 |
| Max. holding brake switching energy | mJ | 100 |
| Rated output current for axis 1 (eff. +/- 3 %) | A _{RMS} | 20 |
| Max. standstill current axis 1 from 500 ms | A _{RMS} | 14 |
| Max. continuous sum current of all axis (heat sink) | A _{RMS} | - |
| Peak output current of axis 1 for a max. of 5 sec. (eff. +/- 3 %) | A _{RMS} | 40 |
| Power stage loss | W/A _{RMS} | 10 |
| Output frequency of the power output stage | kHz | 8 |
| Maximum leakage current | mA | 15 |
| PWM frequency | kHz | 8 |
| Regulator frequency | kHz | 16 |

Regen Circuit

| | | |
|---|----|-----|
| Capacitance of the intermediate circuit voltage | µF | 700 |
| External brake resistance | Ω | 25 |
| Internal regen resistor value | Ω | 25 |
| Rated power of the internal regen resistor | W | 200 |

**G-VMAINS = 230
(rated mains voltage = 230 V)**

| | | |
|--|-----------------|-----|
| Start-up limit | V _{DC} | 420 |
| Switch-off level | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Max. rated power of the external regen resistor | W | 750 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 6.5 |

**G-VMAINS = 400
(rated mains voltage = 400 V)**

| | | |
|--|-----------------|------|
| Start-up limit | V _{DC} | 730 |
| Switch-off level | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Max. rated power of the external regen resistor | W | 1200 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 21 |

**G-VMAINS = 480
(rated mains voltage = 480 V)**

| | | |
|--|-----------------|------|
| Start-up limit | V _{DC} | 850 |
| Switch-off level | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Max. rated power of the external regen resistor | W | 1500 |
| Peak power of the internal brake resistor (max. 1 s) | kW | 27 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply 24 V (+24 V to BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (+24 V-BR to BGND) | | electronic protection |
| Regen resistor | | electronic protection |

Resolver Specifications

| | | |
|--|------------------|-----------------|
| Exciter frequency f _{err} | kHz | 8 |
| Exciter voltage U _{Ref} | U _{eff} | 4 |
| Number of poles m | - | 2, 4, 6, .., 32 |
| Resolver voltage U _{sin/cos, max} | U _{eff} | 2.2 |

Connector Types

| | | |
|-------------------------------|--|---|
| Auxiliary supply (X1 A, X2 A) | | Combicon 5, 3-pin |
| Power supply (X1B, X2B) | | Power Combicon 7.62, 8-pin, 4 mm ² |
| Feedback (X6, X7, X8) | | D-Sub 25-pin (female) |
| Motor (X3, X4, X5) | | Power Combicon 7.62, 6-pin, 4 mm ² |

Dimensions

| | | |
|---------------------------|----|---------|
| Height with/without plugs | mm | 472/378 |
| Width | mm | 158 |
| Depth | mm | 240 |
| Weight | kg | 10 |

Article Number

| | | |
|---------------|--|----------------|
| with fan unit | | 09-501-201 -23 |
|---------------|--|----------------|

DIAS Drive

MDP 101-1



The MDP 101 is a power supply module with a 3 kVA rating at an input voltage of 400/480 V.

This power module is the head station for each MDD 100 servo drive system. The MDP 101-1 forms the communication interface and is responsible for the bus communication with the connected axis modules.

Integrated in the module are eight digital capture inputs and a safety input.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT[®] encoder, Hiperface[®] encoder, high-resolution Sin/Cos encoder)
- integrated power filter
- integrated Safety functions „Safe Torque Off“ STO and „Safe Stop 1“ SS1
- fast capture inputs

| Rated Data | | |
|---|-----------------|--|
| Input voltage (symmetrically opposing ground) | V _{AC} | 3x 230 V _{-10%} – 480 V ^{10%} , 45-65 Hz |
| Maximum peak current with activation of the mains contact (limited by inrush circuit) | A | 3 |
| Rated power in S1 mode | kVA | 3 |
| Rated power in S1 mod for input voltage < 400 V | kVA | 3 kVA - 7.5 W * (400 - input voltage/V) |
| Rated DC-link voltage | V _{DC} | 290-680 |
| Over voltage threshold of the DC-link voltage | V _{DC} | 450, 800, 900 |
| +24 V auxiliary voltage | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | maximum 50 |
| Maximum leakage current | mA | 30 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 23 to 26 (depending on selected holding brake type) |
| Brake Switch | | |
| Capacitance of the intermediate circuit voltage | µF | 135 |
| G-VMAINS = 230 (rated mains voltage = 230 V) | | |
| Switch-on threshold | V _{DC} | 420 |
| Switch-off threshold | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Peak power of the internal ballast resistance (max. 1 s) | kW | 5.3 |
| G-VMAINS = 400 (rated supply voltage = 400 V) | | |
| Switch-on threshold | V _{DC} | 730 |
| Switch-off threshold | V _{DC} | 690 |
| Over voltage protection | V _{DC} | 800 |
| Peak power of the internal ballast resistance (max. 1 s) | kW | 21 |
| G-VMAINS = 480 (rated mains voltage = 480 V) | | |
| Switch-on threshold | V _{DC} | 850 |
| Switch-off threshold | V _{DC} | 810 |
| Over voltage protection | V _{DC} | 900 |
| Peak power of the int. ballast resistance (max. 1 s) | kW | 27 |
| Safety Input | | |
| Input voltage between ENABLE_H (+) and ENABLE_L (-) | V | typically 24 V to a maximum of 30 V |
| Signal level between ENABLE_H (+) and ENABLE_L (-) | V | low: ≤ +5, high ≥ +15 |
| Input current | mA | typically 10 mA at 24 V |
| Input switching delay times | s | switch-on delay circa 0.02 s turn-off delay min. 0.5 s, maximum 1 sec |
| Relay output (S1, S2) | | no |
| Switching power | | maximum 30 V DC, 42 V AC, 100 µA to maximum 0.5 A |

Digital Inputs

| | | |
|----------------------------------|----|-------------------------------------|
| Input voltage Dig_IN1 to Dig_IN8 | V | typically 24 V to a maximum of 30 V |
| Signal level | V | low: $\leq +5$, high $\geq +15$ |
| Input current | mA | typically 10 mA at 24 V |
| Input switching delay times | ms | typically 0.1 |

Safety Conformity

| | | |
|--|---------------------------------------|-------|
| Safety Integrity Level in accordance with IEC EN 62061 | | SIL 3 |
| Performance Level in accordance with EN ISO 13849-1 | | PLe |
| Probability of failure per hour | PFH _D [10 ⁻⁹] | 0.3 |
| Mean time to dangerous failure | MTTF _D symmetrized [Years] | high |
| Proof Test Interval [years] | | 20 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply voltage +24 V (+24 V - BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (24 V-BR - BGND) | | electronic fuse |
| Ballast resistance | | electronic protection |

Resolver Specifications

| | | |
|--|------------------|------------------|
| Exciter frequency f_{err} | kHz | 8 |
| Exciter voltage U_{Ref} | U_{eff} | 2.8 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage $U_{\text{sin/cos, max}}$ | U_{eff} | 1.9 |

Connector Types

| | | |
|---------------------|--|--------------------------------|
| Safety Inputs (X1) | | Phoenix FMC1.5/5-ST-3.5 |
| Power supply (X2) | | Phoenix GMSTB 2.5HCV/9-ST-7.62 |
| VARAN bus (X3, X4) | | RJ 45 |
| Digital inputs (X6) | | Phoenix FMC1.5/12-ST-3.5 |

Dimensions

| | | |
|--|----|---------|
| Height | mm | 155 |
| Width | mm | 60 |
| Depth with module carrier (without/with plugs) | mm | 152/195 |
| Weight | kg | 1.2 |

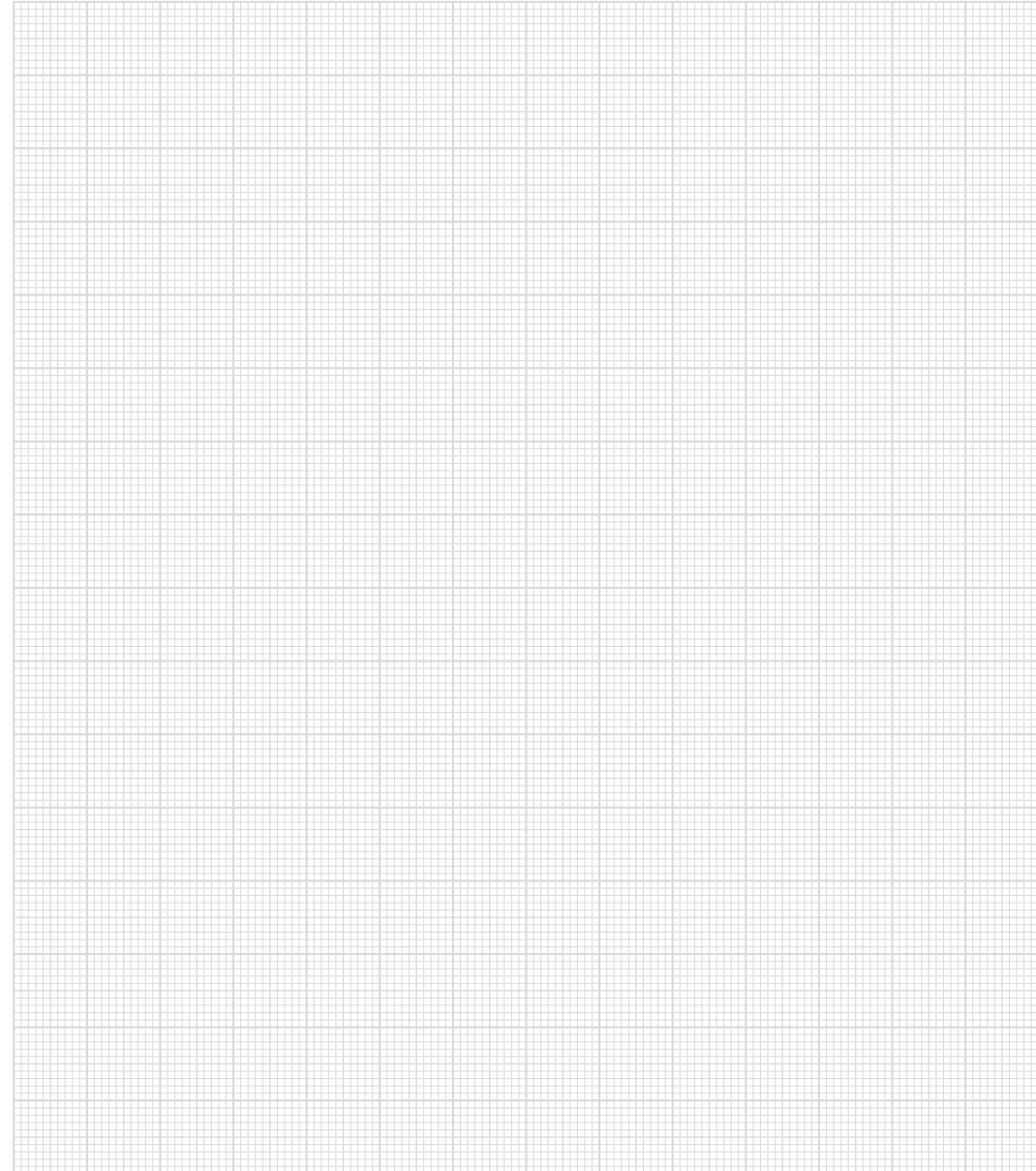
Article Number

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| | | 09-403-101-1 |
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Standard

| | | |
|--|--|-----------------------|
| | | UL 508C, NMMS.E336350 |
|--|--|-----------------------|

Notes



DIAS Drive

MDP 102-1



The MDP 102-1 is a supply module that has a 2 kVA rating with an input voltage of 230 V. The supply module is designed for the 1-phase connection, with an input voltage of 115 V, it can be powered with a 3-phase connection.

This power module is a head station for each MDD 100 servo drive system. The MDP 102-1 forms the communication interface for the control and is responsible for the bus communication with connected axis modules.

Integrated in the module are eight digital capture inputs and a safety input.

Additional Characteristics:

- various feedback systems (Resolver, EnDAT[®] encoder, Hiperface[®] encoder, high-resolution Sin/Cos encoder)
- integrated power filter
- integrated Safety functions „Safe Torque Off” STO and „Safe Stop 1” SS1
- fast capture inputs

| Rated Data | | |
|---|-----------------|--|
| Input voltage (symmetrically opposing ground) | V _{AC} | 1 or 3x 115 V _{-10%} /1x 230 V ^{+10%} , 45-65 Hz |
| Maximum peak current with activation of the mains contact (limited by inrush circuit) | A | 2 |
| Rated power in S1 mode | kVA | 2 |
| Rated power in S1 mode for input voltage < 230 V | kVA | 2 kVA-8.7 W * (230 - input voltage/V) |
| Rated DC-link voltage | V _{DC} | 150-360 |
| Over voltage threshold of the DC-link voltage | V _{DC} | 450 |
| +24 V auxiliary voltage | V _{DC} | 22-30 |
| +24 V auxiliary supply power | W | maximum 50 |
| Maximum leakage current | mA | 30 |
| Holding brake supply voltage +24 V-BR | V _{DC} | 23 to 26 (depending on selected holding brake type) |

| Brake Switch | | |
|---|----|-----|
| Capacitance of the intermediate circuit voltage | µF | 540 |

| G-VMAINS = 230 (rated mains voltage = 230 V) | | |
|--|-----------------|-----|
| Switch-on threshold | V _{DC} | 420 |
| Switch-off threshold | V _{DC} | 400 |
| Over voltage protection | V _{DC} | 450 |
| Peak power of the internal ballast resistance (max. 1 s) | kW | 5.3 |

| Safety Input | | |
|---|----|--|
| Input voltage between ENABLE_H (+) and ENABLE_L (-) | V | typically 24 V to a maximum of 30 V |
| Signal level between ENABLE_H (+) and ENABLE_L (-) | V | low: ≤ +5, high ≥ +15 |
| Input current | mA | typically 10 mA at 24 V |
| Input switching delay times | s | switch-on delay circa 0.02 s turn-off delay min. 0.5 s, maximum 1 sec |
| Relay output (S1, S2) | | no |
| Switching power | | maximum 30 V DC, 42 V AC, 100 µA to maximum 0.5 A |

Digital Inputs

| | | |
|----------------------------------|----|-------------------------------------|
| Input voltage Dig_IN1 to Dig_IN8 | V | typically 24 V to a maximum of 30 V |
| Signal level | V | low: $\leq +5$, high $\geq +15$ |
| Input current | mA | typically 10 mA at 24 V |
| Input switching delay times | ms | typically 0.1 |

Safety Conformity

| | | |
|--|---------------------------------------|-------|
| Safety Integrity Level in accordance with IEC EN 62061 | | SIL 3 |
| Performance Level in accordance with EN ISO 13849-1 | | PLe |
| Probability of failure per hour | PFH _D [10 ⁻⁹] | 0.3 |
| Mean time to dangerous failure | MTTF _D symmetrized [Years] | high |
| Proof Test Interval [years] | | 20 |

Internal Fuse

| | | |
|---|--|-----------------------|
| Auxiliary supply voltage +24 V (+24 V - BGND) | | electronic fuse |
| Holding brake supply 24 V-BR (24 V-BR - BGND) | | electronic fuse |
| Ballast resistance | | electronic protection |

Resolver Specifications

| | | |
|-------------------------------------|-----------|------------------|
| Exciter frequency f_{err} | kHz | 8 |
| Exciter voltage U_{Ref} | U_{eff} | 2.8 |
| Number of poles m | - | 2, 4, 6, ..., 32 |
| Resolver voltage $U_{sin/cos, max}$ | U_{eff} | 1.9 |

Connector Types

| | | |
|---------------------|--|--------------------------------|
| Safety Inputs (X1) | | Phoenix FMC1.5/5-ST-3.5 |
| Power supply (X2) | | Phoenix GMSTB 2.5HCV/9-ST-7.62 |
| VARAN bus (X3, X4) | | RJ 45 |
| Digital inputs (X6) | | Phoenix FMC1.5/12-ST-3.5 |

Dimensions

| | | |
|--|----|---------|
| Height | mm | 155 |
| Width | mm | 60 |
| Depth with module carrier (without/with plugs) | mm | 152/195 |
| Weight | kg | 1.2 |

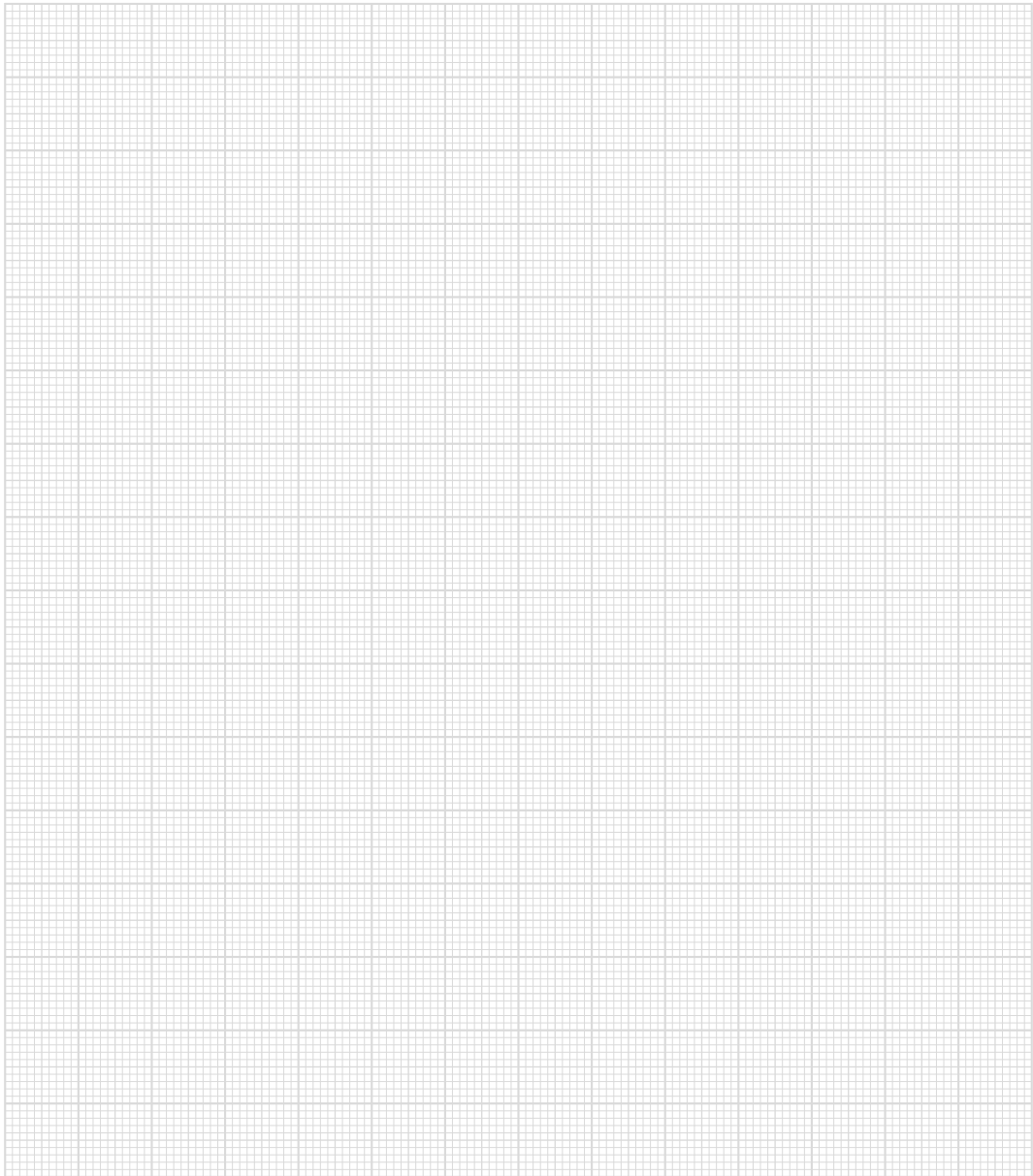
Article Number

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| | | 09-403-102-1 |
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Standard

| | | |
|--|--|-----------------------|
| | | UL 508C, NMMS.E336350 |
|--|--|-----------------------|

Notes



DIAS Drive

MDD 111-1



The MDD 111-1 is an axis module for one axis with a rated output current of 6 A at 230 V, 4 A at 400/480 V and a peak output current of 15 A at 230 V and 9 A at 400/480 V.

| Rated Data | | |
|---|--------------------|--|
| Maximum holding brake current per axis | A _{DC} | 1 |
| Holding brake voltage drop from the 24 V-BR to the output | V _{DC} | maximum 1 (at 1 A holding brake current) |
| Maximum total continuous current of axes 1 and 2 (heat sink) at 230 V | A _{RMS} | - |
| Rated output current of axis 1 (rms +/-3 %) at 230 V | A _{RMS} | 6 |
| Rated output current of axis 2 (rms +/-3 %) at 230 V | A _{RMS} | - |
| Maximum total continuous current of axes 1 and 2 (heat sink) at 400 V/480 V | A _{RMS} | - |
| Rated output current of axis 1 (rms +/-3 %) at 400 V/480 V | A _{RMS} | 4 |
| Rated output current of axis 2 (rms +/- 3 %) at 400 V/480 V | A _{RMS} | - |
| Maximum peak sum current of axes 1 and 2 at 230 V for maximum 5 sec. | A _{RMS} | - |
| Peak output current axis 1 for maximum 5 sec. (rms +/- 3 %) at 230 V | A _{RMS} | 15 |
| Peak output current axis 2 for maximum 5 sec. (rms +/- 3 %) at 230 V | A _{RMS} | - |
| Maximum peak sum current of axes 1 and 2 at 400 V/480 V for max 5 sec. | A _{RMS} | - |
| Peak output current axis 1 for maximum 5 sec. (rms +/- 3 %) at 400 V/480 V | A _{RMS} | 9 |
| Peak output current axis 2 for maximum 5 sec. (rms +/- 3 %) at 400 V/480 V | A _{RMS} | - |
| Power stage losses (multiply the average current of axis with the factor), without regen losses | W/A _{RMS} | 10 |
| Output frequency of the power stage | kHz | 8 |
| Regulator frequency | kHz | 16 |
| Intermediate circuit capacitance | µF | 60 |
| Connector Types | | |
| Feedback (X12, X22) | | D-Sub 25-pin (female) |
| Motor (X11, X21) | | Phoenix GMSTB 2.5HCV/ 6-ST-7.62 |
| Dimensions | | |
| Height | mm | 155 |
| Width | mm | 60 |
| Depth with module carrier (without/with plugs) | mm | 152/195 |
| Weight | kg | 1.2 |
| Article Number | | |
| | | 09-404-111-1 |
| Standard | | |
| | | UL 508C, NMMS.E336350 |

DIAS Drive

MDD 121-1



The MDD 121-1 is an axis module for two axes with a continuous sum current of 6 A at 230 V, 4 A at 400/480 V and a peak current of 18 A at 230 V and 12 A at 400/480 V.

| Rated Data | | |
|--|--------------------|--|
| Maximum holding brake current per axis | A _{DC} | 1 |
| Holding brake voltage drop from the 24 V-BR to the output | V _{DC} | maximum 1 (at 1 A holding brake current) |
| Maximum total continuous current of axes 1 and 2 (heat sink) at 230 V | A _{RMS} | 6 |
| Rated output current of axis 1 (rms +/-3 %) at 230 V | A _{RMS} | 3, maximum 5* |
| Rated output current of axis 2 (rms +/-3 %) at 230 V | A _{RMS} | 3 |
| Maximum total continuous current of axes 1 and 2 (heat sink) at 400 V/480 V | A _{RMS} | 4 |
| Rated output current of axis 1 (rms +/-3 %) at 400 V/480 V | A _{RMS} | 2, maximum 3* |
| Rated output current of axis 2 (rms +/- 3 %) at 400 V/480 V | A _{RMS} | 2 |
| Maximum peak sum current of axes 1 and 2 at 230 V for maximum 5 sec.. | A _{RMS} | 18 |
| Peak output current axis 1 for maximum 5 sec. (rms +/- 3 %) at 230 V | A _{RMS} | 9, maximum 15** |
| Peak output current axis 2 for maximum 5 sec. (rms +/- 3 %) at 230 V | A _{RMS} | 9 |
| Maximum peak sum current of axes 1 and 2 at 400 V/480 V for max 5 sec. | A _{RMS} | 12 |
| Peak output current axis 1 for maximum 5 sec. (rms +/- 3 %) at 400 V/480 V | A _{RMS} | 6, maximum 9** |
| Peak output current axis 2 for maximum 5 sec. (rms +/- 3 %) at 400 V/480 V | A _{RMS} | 6 |
| Power stage losses (multiply the average current of axis wit the factor), without ballast losses | W/A _{RMS} | 10 |
| Output frequency of the power stage | kHz | 8 |
| Regulator frequency | kHz | 16 |
| Intermediate circuit capacitance | µF | 60 |
| Connector Types | | |
| Feedback (X12, X22) | | D-Sub 25-pin (female) |
| Motor (X11, X21) | | Phoenix GMSTB 2.5HCV/ 6-ST-7.62 |
| Dimensions | | |
| Height | mm | 155 |
| Width | mm | 60 |
| Depth with module carrier (without/with plugs) | mm | 152/195 |
| Weight | kg | 1.2 |
| Article Number | | |
| | | 09-404-121-1 |
| Normung | | |
| | | UL 508C, NMMS.E336350 |

*) The sum of both continuous currents of the axes is limited to the total continuous current, depending on axis 2

***) The sum of both peak currents of the axes is limited to the total peak current, depending on axis 2

Module Carrier

MDM 011, 021, 031 and 041



The module carrier MDM serves as a mount for the individual modules of the MDD 100 drive system in the control cabinet.

Each module carrier consists of an aluminum carrier and a bus circuit board for the electrical connection between the axis modules and power supply module.

For the highest possible flexibility and to optimize the control cabinet space, the module carrier is available for a power supply module and 1, 2, 3 or 4 axes modules.

MDM 011-0, 021-0, 031-0 and 041-0 have a connection for an external regen resistor.

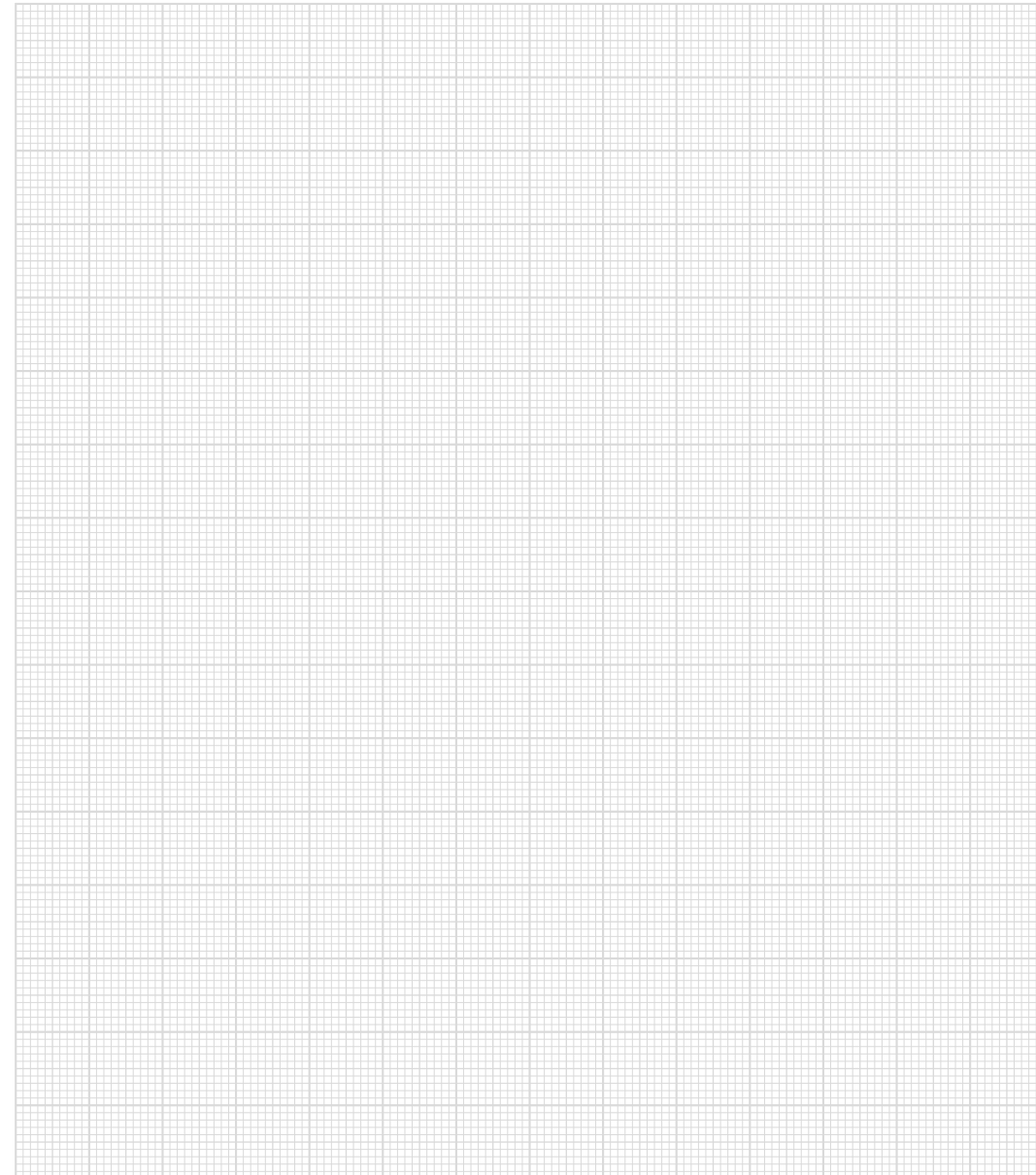
| | | MDM 011 | MDM 021 | MDM 031 | MDM 041 |
|---|----|--------------|--------------|--------------|--------------|
| Rated Data | | | | | |
| Ballast resistor power *) | W | 30 | 50 | 50 | 70 |
| Internal ballast resistance | Ω | 100 | | 33 | |
| Number of axis modules | | 1 | 2 | 3 | 4 |
| Dimensions | | | | | |
| Height | mm | 187.5 | | | |
| Width | mm | 120 | 180 | 240 | 300 |
| Depth | mm | 18 | | | |
| Weight | kg | 0.6 | 0.8 | 1 | 1.2 |
| Article Number | | | | | |
| | | 09-402-011 | 09-402-021 | 09-402-031 | 09-402-041 |
| External regen resistor | | 09-402-011-0 | 09-402-021-0 | 09-402-031-0 | 09-402-041-0 |
| Printed circuit board with protective lacquer | | | | | 09-402-041-X |

*) The wattage of the regen resistor is calculated for a mounting plate size in the control cabinet. Thereby, a size of $0.5 \text{ m} \times 0.5 \text{ m} = 0.25 \text{ m}^2$ is required. If a smaller size is used, the wattage of the ballast resistor has to be reduced using the following formula:

$$P_{\text{regen_red}} = A_{\text{mp}} / 0.25 \text{ m}^2 * P_{\text{regen_max}}$$

P_regen_max: Value given from the table
 A_mp: Mounting plate size in m²
 P_regen_red: Reduced value for the ballast power

Notes



Regen Resistor MDM 011-Z1

The regen resistor 09-402-011-Z1 is an accessory for the MDM 0x1-0.



Regen Resistor

| | | |
|---------------------------------------|-------------|---|
| Resistance | 25 Ω | |
| Continuous power | 200 W | with cooling at an environmental temperature at 25 °C |
| Nominal temperature at rated power | 250 °C | maximum surface temperature |
| U _{max} | 1000 V | |

Mechanics

| | | |
|--------------|------------------------------|--|
| Dimensions | 104 x 36 x 27 mm (W x H x D) | |
| Weight | 200 g | |
| Cable length | 600 mm | |

Environmental Conditions, Ventilation and Mounting

| | |
|---|--|
| Storage temperature | -10 ... +50 °C |
| Environmental temperature | 0 ... +55 °C (32 ... 131 °F) |
| Humidity | 0-85 %, non-condensing |
| Operating Conditions | pollution degree 2 Elevation up to 1000 m at rated values Elevation from 1000 to 2500 m above sea level with a reduction of 1.5 %/100 m |
| Protection type of the servo drive housing | IP55 |

Article Number and Miscellaneous

| | |
|----------------|---------------|
| Article number | 09-402-011-Z1 |
|----------------|---------------|

VARAN Stepper Module VST 012



The VST 012 is a VARAN module designed for the control of a stepper motor up to a maximum 10 A RMS. The available operating modes are full step, half step and micro step. The maximum switching frequency of the output stage is 50 kHz.

The motor output is released through the Enable input. An incremental encoder input is available for position control of the stepper motor.

The module also provides four digital inputs and four digital outputs. The VARAN Out port allows the configuration of the VARAN bus in a linear structure.

Interfaces

| | |
|------------|--|
| Interfaces | 1x VARAN In (RJ45) 1x VARAN Out (RJ45) (maximum length: 100 m) |
|------------|--|

Incremental Encoder Input

| | |
|----------------------|---|
| Number of channels | 1 |
| Input signals | Incremental encoder signals (A, /A, B, /B, R, /R) RS422 level 150 Ω termination |
| Input frequency | maximum 250 kHz |
| Counter frequency | maximum 1 MHz |
| Signal evaluation | 4X |
| Counter resolution | 16-bit |
| Power supply | +5 V/±5%/0.2 A short-circuit protected |
| Encoder cable length | maximum 30 m |

Enable Input

| | | |
|---------------------|-------------------------|---------------|
| Number of inputs | 1 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +14 V |
| Switching threshold | typically +9.5 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |
| Status display | green LEDs | |

Digital Inputs

| | | |
|---------------------|-------------------------|---------------|
| Number of inputs | 4 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +5 V | high: > +14 V |
| Switching threshold | typically +9.5 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 10 μs | |
| Status display | green LEDs | |

Digital Outputs

| | | |
|---|------------------------|--|
| Number of outputs | 4 | |
| Short-circuit proof | yes | |
| Maximum permitted continuous load current/channel | 2 A | |
| Maximum total current (entire module) | 6 A (100 % of on time) | |
| Residual current (off) | ≤ 12 mA | |
| Turn-on delay | < 400 ms | |
| Turn-off delay | < 400 ms | |
| Status display | yellow LEDs | |

Stepper Motor Output

| | | |
|---|---|--|
| Number of phases | 2 | |
| Output voltage | dependent on the supply (18-60 V) | |
| Controller frequency | maximum 50 kHz | |
| Output current | maximum 10 A continuous current in full step mode maximum 10 A continuous current in half step mode maximum 10 A RMS continuous current in micro step mode | |
| Output current over the environmental temperature | maximum 10 A RMS continuous current at 45 °C maximum 8.6 A RMS continuous current at 50 °C maximum 6.3 A RMS continuous current at 55 °C maximum 5 A RMS continuous current at 60 °C | |

| | |
|----------------------------------|--|
| Intermediate circuit capacitance | 440 μ F |
| Step resolution | 32 micro steps per full step |
| Voltage measurement | 15-73 V with an under voltage < 15 V or over voltage > 73 V, the motor output is shut down through the hardware. |
| Temperature measurement | 45-125 °C using an NTC at the mounting bracket Temperature warning at 85 °C => software warning over temperature at 95 °C => hardware shutdown of the motor output |
| Motor cable length | maximum 30 m |

Electrical Requirements

| | |
|---|--|
| Power supply +24 V | 18-30 V DC |
| Current consumption power supply +24 V | maximum 300 mA (electronic supply) + load on the digital outputs |
| Supply voltage stepper motor | 18-60 V DC |
| Current consumption of stepper motor supply | corresponds to the load on the stepper motor |

Voltage Monitor

| | |
|------------------------------|---|
| Power supply +24 V | supply voltage > 18 V (DC OK-LED lights green) |
| Supply voltage stepper motor | supply voltage > 18 V and < 60 V (DC OK-LED lights green) |

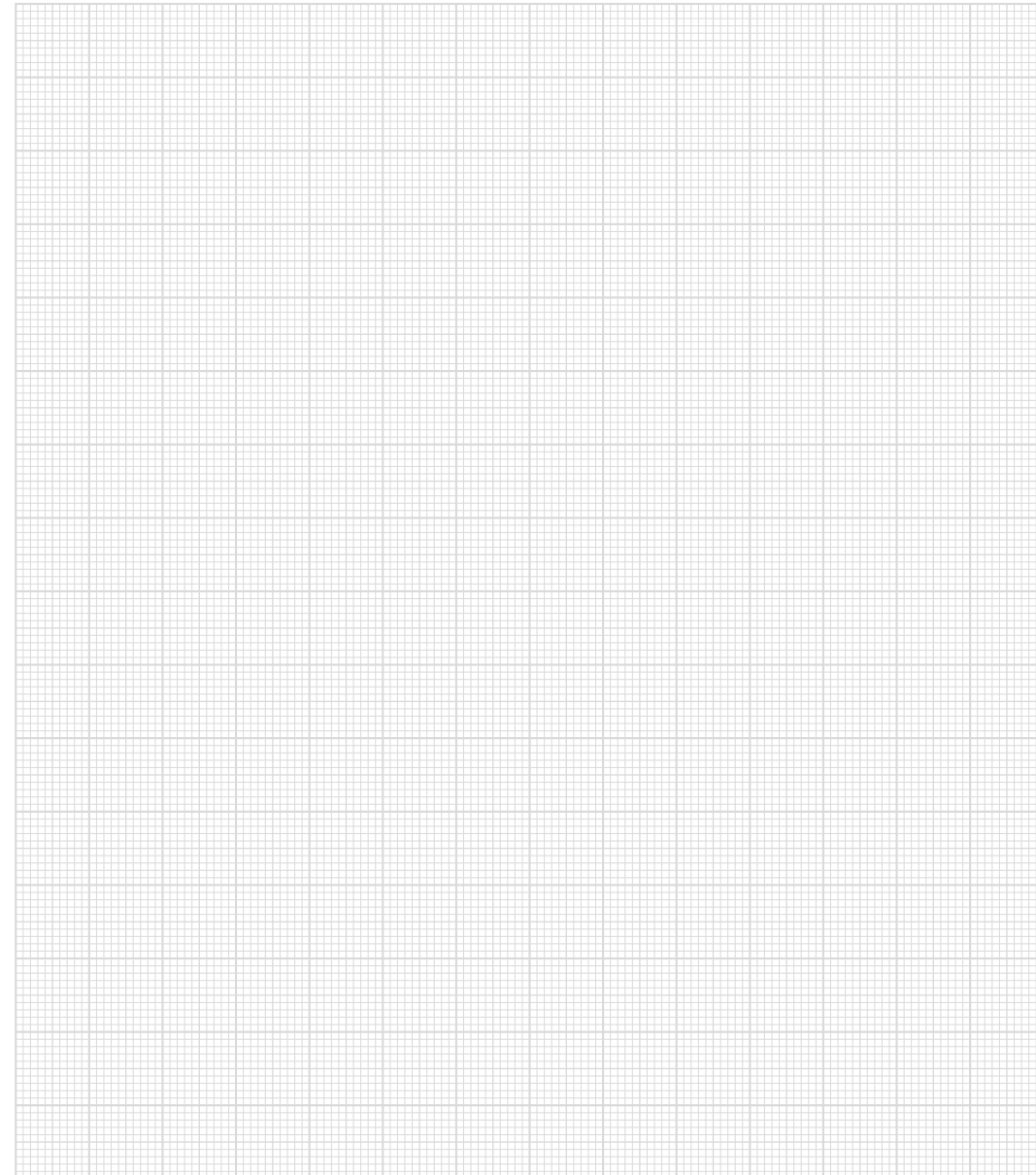
Article Number and Miscellaneous

| | |
|-----------------------|---------------------------------|
| Article number | 16-014-012 |
| Approval | CE, cUL_{us} |
| Mechanical dimensions | 26 x 151 x 121.5 mm (W x H x D) |

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| Operating conditions | pollution degree 2 | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection Type | EN 60529 | IP20 |

Notes



Servo Motors

Series AKM



The synchronous servomotors from the AKM series are brushless, rotary current motors with three-phase windings for demanding servo applications. These motors have permanent magnets in the rotor. The neodymium magnet material and the low inertial moment contribute significantly to making these motors highly dynamic and allow them to have a very low cogging. The robust, compact motors with high power density are available in seven sizes and fine graduations, whereby customization is possible.

Motors are available with idling torques from 0.18 to 53 Nm and a peak torque of up to 143 Nm.

Motor and sensor cables in standard 5 m/10 m/15 m/20 m/25 m lengths are also available.

Standard Configuration:

Smooth wave, IP65 protection, 2-pin resolver, temperature sensors in the stator windings for monitoring the temperature, UL-conforming configuration

Options:

Fitted key, holding brake (AKM2-7), shaft seal (IP67), rotatable plug, various sensor systems

Technical Data

| Motor | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | |
|------------|-------------------------|----------------|----------------------------|----------------------|-------------|--------------------|---------------|--------------|--------------------------|-----------------------|---------------|-------------------------------|----------------------|----------------------|----------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Holding torque | Holding brake torque | Holding brake weight | Rated supply voltage 230 V |
| M_0 (Nm) | M_n (Nm) | M_{max} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |

AKM1

| | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|-----|------|-------|------|---|---|---|---|
| AKM11B | 0.18 | 0.17 | 0.61 | 8000 | 0.14 | 1.16 | 1.06 | 4.6 | 0.16 | 0.017 | 0.35 | - | - | - | X |
| AKM12C | 0.31 | 0.28 | 1.08 | 8000 | 0.23 | 1.51 | 1.33 | 6 | 0.21 | 0.031 | 0.49 | - | - | - | X |
| AKM13C | 0.41 | 0.36 | 1.46 | 8000 | 0.30 | 1.48 | 1.29 | 5.9 | 0.28 | 0.045 | 0.63 | - | - | - | X |

AKM2

| | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|---|
| AKM21C | 0.48 | 0.39 | 1.47 | 8000 | 0.32 | 1.58 | 1.30 | 6.3 | 0.30 | 0.11 | 0.82 | 1.42 | 0.011 | 0.27 | X |
| AKM22C | 0.84 | 0.78 | 2.73 | 3500 | 0.29 | 1.39 | 1.28 | 5.6 | 0.61 | 0.16 | 1.1 | 1.42 | 0.011 | 0.27 | X |
| AKM22C | 0.84 | 0.68 | 2.73 | 8000 | 0.57 | 1.39 | 1.11 | 5.6 | 0.61 | 0.16 | 1.1 | 1.42 | 0.011 | 0.27 | X |
| AKM22E | 0.87 | 0.70 | 2.76 | 8000 | 0.59 | 2.73 | 2.19 | 11 | 0.32 | 0.16 | 1.1 | 1.42 | 0.011 | 0.27 | X |
| AKM23C | 1.13 | 1.08 | 3.77 | 2500 | 0.28 | 1.41 | 1.35 | 5.6 | 0.80 | 0.22 | 1.38 | 1.42 | 0.011 | 0.27 | X |
| AKM23C | 1.13 | 0.99 | 3.77 | 5500 | 0.57 | 1.41 | 1.24 | 5.6 | 0.80 | 0.22 | 1.38 | 1.42 | 0.011 | 0.27 | X |
| AKM23D | 1.16 | 1.03 | 3.84 | 5000 | 0.54 | 2.19 | 1.98 | 8.8 | 0.52 | 0.22 | 1.38 | 1.42 | 0.011 | 0.27 | X |
| AKM23D | 1.16 | 0.92 | 3.84 | 8000 | 0.77 | 2.19 | 1.77 | 8.8 | 0.52 | 0.22 | 1.38 | 1.42 | 0.011 | 0.27 | X |
| AKM23F | 1.18 | 0.94 | 3.88 | 8000 | 0.79 | 4.31 | 3.48 | 17.2 | 0.27 | 0.22 | 1.38 | 1.42 | 0.011 | 0.27 | X |
| AKM24C | 1.38 | 1.32 | 4.67 | 2000 | 0.28 | 1.42 | 1.36 | 5.7 | 0.97 | 0.27 | 1.66 | 1.42 | 0.011 | 0.27 | X |
| AKM24C | 1.38 | 1.25 | 4.67 | 4500 | 0.59 | 1.42 | 1.29 | 5.7 | 0.97 | 0.27 | 1.66 | 1.42 | 0.011 | 0.27 | X |
| AKM24D | 1.41 | 1.29 | 4.76 | 4000 | 0.54 | 2.21 | 2.05 | 8.8 | 0.63 | 0.27 | 1.66 | 1.42 | 0.011 | 0.27 | X |
| AKM24D | 1.41 | 1.11 | 4.76 | 8000 | 0.93 | 2.21 | 1.76 | 8.8 | 0.63 | 0.27 | 1.66 | 1.42 | 0.011 | 0.27 | X |
| AKM24F | 1.42 | 1.12 | 4.82 | 8000 | 0.94 | 3.89 | 3.11 | 15.6 | 0.36 | 0.27 | 1.66 | 1.42 | 0.011 | 0.27 | X |

AKM3

| | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|-----|------|------|------|-----|-------|------|---|
| AKM31C | 1.15 | 1.12 | 3.88 | 2500 | 0.29 | 1.37 | 1.32 | 5.5 | 0.85 | 0.33 | 1.55 | 2.5 | 0.011 | 0.35 | X |
| AKM31C | 1.15 | 1.0 | 3.88 | 5000 | 0.52 | 1.37 | 1.18 | 5.5 | 0.85 | 0.33 | 1.55 | 2.5 | 0.011 | 0.35 | X |
| AKM31E | 1.20 | 0.95 | 4.0 | 6000 | 0.60 | 2.99 | 2.32 | 12 | 0.41 | 0.33 | 1.55 | 2.5 | 0.011 | 0.35 | X |
| AKM32C | 2.0 | 1.95 | 6.92 | 1500 | 0.31 | 1.44 | 1.39 | 5.8 | 1.40 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | X |
| AKM32C | 2.0 | 1.86 | 6.92 | 3000 | 0.58 | 1.44 | 1.33 | 5.8 | 1.40 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | X |

Technical Data

| Motor | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | | |
|--------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|--------------|----------------|-------------------------------|----------------------|----------------------------|----------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Holding torque | Holding brake torque | Holding brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |
| AKM32D | 2.04 | 1.93 | 7.1 | 2500 | 0.51 | 2.23 | 2.10 | 8.9 | 0.92 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | X | |
| AKM32D | 2.04 | 1.65 | 7.1 | 5500 | 0.95 | 2.23 | 1.79 | 8.9 | 0.92 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | | X |
| AKM32E | 2.04 | 1.87 | 7.11 | 3500 | 0.69 | 2.82 | 2.56 | 11.3 | 0.73 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | X | |
| AKM32E | 2.04 | 1.41 | 7.11 | 7000 | 1.03 | 2.82 | 1.93 | 11.3 | 0.73 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | | X |
| AKM32H | 2.10 | 1.45 | 7.26 | 7000 | 1.06 | 5.50 | 3.72 | 22 | 0.39 | 0.59 | 2.23 | 2.5 | 0.011 | 0.35 | X | |
| AKM33C | 2.71 | 2.64 | 9.76 | 1000 | 0.28 | 1.47 | 1.42 | 5.9 | 1.86 | 0.85 | 2.9 | 2.5 | 0.011 | 0.35 | X | |
| AKM33C | 2.71 | 2.54 | 9.76 | 2000 | 0.53 | 1.47 | 1.37 | 5.9 | 1.86 | 0.85 | 2.9 | 2.5 | 0.011 | 0.35 | | X |
| AKM33E | 2.79 | 2.62 | 9.96 | 2000 | 0.55 | 2.58 | 2.38 | 10.3 | 1.10 | 0.85 | 2.9 | 2.5 | 0.011 | 0.35 | X | |
| AKM33E | 2.79 | 2.34 | 9.96 | 4500 | 1.10 | 2.58 | 2.13 | 10.3 | 1.10 | 0.85 | 2.9 | 2.5 | 0.011 | 0.35 | | X |
| AKM33H | 2.88 | 2.27 | 10.22 | 5500 | 1.31 | 5.62 | 4.37 | 22.5 | 0.52 | 0.85 | 2.9 | 2.5 | 0.011 | 0.35 | X | |

AKM4

| | | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|------|------|------|---|-------|------|---|---|
| AKM41C | 1.95 | 1.88 | 6.12 | 1200 | 0.24 | 1.46 | 1.40 | 5.8 | 1.34 | 0.81 | 2.44 | 6 | 0.068 | 0.63 | X | |
| AKM41C | 1.95 | 1.77 | 6.12 | 3000 | 0.56 | 1.46 | 1.32 | 5.8 | 1.34 | 0.81 | 2.44 | 6 | 0.068 | 0.63 | | X |
| AKM41E | 2.02 | 1.82 | 6.28 | 3000 | 0.57 | 2.85 | 2.56 | 11.4 | 0.71 | 0.81 | 2.44 | 6 | 0.068 | 0.63 | X | |
| AKM41E | 2.02 | 1.58 | 6.28 | 6000 | 0.99 | 2.85 | 2.23 | 11.4 | 0.71 | 0.81 | 2.44 | 6 | 0.068 | 0.63 | | X |
| AKM41H | 2.06 | 1.62 | 6.36 | 6000 | 1.02 | 5.60 | 4.38 | 22.4 | 0.37 | 0.81 | 2.44 | 6 | 0.068 | 0.63 | X | |
| AKM42C | 3.35 | 3.10 | 11.3 | 1500 | 0.49 | 1.40 | 1.29 | 5.6 | 2.40 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | | X |
| AKM42E | 3.42 | 3.12 | 11.3 | 1800 | 0.59 | 2.74 | 2.48 | 11 | 1.26 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | X | |
| AKM42E | 3.42 | 2.81 | 11.3 | 3500 | 1.03 | 2.74 | 2.23 | 11 | 1.26 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | | X |
| AKM42G | 3.53 | 2.90 | 11.5 | 3500 | 1.06 | 4.80 | 3.92 | 19.2 | 0.74 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | X | |
| AKM42G | 3.53 | 2.35 | 11.5 | 6000 | 1.48 | 4.80 | 3.18 | 19.2 | 0.74 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | | X |
| AKM42J | 3.56 | 2.38 | 11.6 | 6000 | 1.5 | 8.4 | 5.53 | 33.6 | 0.43 | 1.5 | 3.39 | 6 | 0.068 | 0.63 | X | |
| AKM43E | 4.70 | 4.24 | 15.9 | 1500 | 0.67 | 2.76 | 2.47 | 11 | 1.72 | 2.1 | 4.35 | 6 | 0.068 | 0.63 | X | |
| AKM43E | 4.70 | 3.92 | 15.9 | 2500 | 1.03 | 2.76 | 2.28 | 11 | 1.72 | 2.1 | 4.35 | 6 | 0.068 | 0.63 | | X |
| AKM43G | 4.80 | 4.00 | 16.1 | 2500 | 1.05 | 4.87 | 4.04 | 19.5 | 0.99 | 2.1 | 4.35 | 6 | 0.068 | 0.63 | X | |
| AKM43G | 4.80 | 3.01 | 16.1 | 5000 | 1.58 | 4.87 | 3.04 | 19.5 | 0.99 | 2.1 | 4.35 | 6 | 0.068 | 0.63 | | X |

Technical Data

| Motor | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | | |
|--------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|--------------|----------------|-------------------------------|----------------------|----------------------------|----------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Holding torque | Holding brake torque | Holding brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |
| AKM43K | 4.9 | 2.62 | 16.4 | 6000 | 1.65 | 9.6 | 5.04 | 38.4 | 0.52 | 2.1 | 4.35 | 6 | 0.068 | 0.63 | X | |
| AKM44E | 5.76 | 5.22 | 19.9 | 1200 | 0.66 | 2.90 | 2.55 | 11.4 | 2.04 | 2.7 | 5.30 | 6 | 0.068 | 0.63 | X | |
| AKM44E | 5.76 | 4.80 | 19.9 | 2000 | 1.01 | 2.90 | 2.35 | 11.4 | 2.04 | 2.7 | 5.30 | 6 | 0.068 | 0.63 | | X |
| AKM44G | 5.88 | 4.90 | 20.3 | 2000 | 1.03 | 5.0 | 4.12 | 20 | 1.19 | 2.7 | 5.30 | 6 | 0.068 | 0.63 | X | |
| AKM44G | 5.88 | 3.76 | 20.3 | 4000 | 1.57 | 5.0 | 3.16 | 20 | 1.19 | 2.7 | 5.30 | 6 | 0.068 | 0.63 | | X |
| AKM44J | 6.00 | 2.75 | 20.4 | 6000 | 1.73 | 8.80 | 3.99 | 35.2 | 0.69 | 2.7 | 5.30 | 6 | 0.068 | 0.63 | | X |

AKM5

| | | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|------|-----|-----|------|-------|-----|---|---|
| AKM51E | 4.70 | 4.41 | 11.6 | 1200 | 0.55 | 2.75 | 2.56 | 8.2 | 1.72 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | X | |
| AKM51E | 4.70 | 3.98 | 11.6 | 2500 | 1.04 | 2.75 | 2.31 | 8.2 | 1.72 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | | X |
| AKM51G | 4.75 | 4.02 | 11.7 | 2500 | 1.05 | 4.84 | 4.07 | 14.5 | 0.99 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | X | |
| AKM51G | 4.75 | 2.62 | 11.7 | 5000 | 1.37 | 4.84 | 2.65 | 14.5 | 0.99 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | | X |
| AKM51H | 4.79 | 3.87 | 11.7 | 3000 | 1.22 | 6 | 4.84 | 18 | 0.8 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | X | |
| AKM51H | 4.79 | 1.95 | 11.7 | 6000 | 1.23 | 6 | 2.44 | 18 | 0.8 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | | X |
| AKM51K | 4.9 | 2.35 | 11.9 | 5500 | 1.35 | 9.4 | 4.52 | 28.2 | 0.52 | 3.4 | 4.2 | 14.5 | 0.173 | 1.1 | X | |
| AKM52E | 8.34 | 7.61 | 21.3 | 1500 | 1.20 | 2.99 | 2.73 | 9 | 2.79 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | | X |
| AKM52G | 8.43 | 7.69 | 21.5 | 1500 | 1.21 | 4.72 | 4.30 | 14.2 | 1.79 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | X | |
| AKM52G | 8.43 | 7.06 | 21.5 | 2500 | 1.85 | 4.72 | 3.94 | 14.2 | 1.79 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | | X |
| AKM52H | 8.48 | 7.53 | 21.6 | 1800 | 1.42 | 5.9 | 5.22 | 17.7 | 1.44 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | X | |
| AKM52H | 8.48 | 6.26 | 21.6 | 3500 | 2.3 | 5.9 | 4.35 | 17.7 | 1.44 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | | X |
| AKM52K | 8.60 | 3.90 | 21.9 | 5500 | 2.25 | 9.3 | 4.19 | 27.9 | 0.93 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | | X |
| AKM52L | 8.67 | 6.40 | 30.1 | 3500 | 2.35 | 11.6 | 8.53 | 58 | 0.75 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | X | |
| AKM52L | 8.67 | 3.27 | 30.1 | 6000 | 2.06 | 11.6 | 4.36 | 58 | 0.75 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | | X |
| AKM52M | 8.6 | 5.2 | 21.9 | 4500 | 2.45 | 13.1 | 7.88 | 39.4 | 0.66 | 6.2 | 5.8 | 14.5 | 0.173 | 1.1 | X | |
| AKM53G | 11.4 | 10.7 | 29.7 | 1000 | 1.12 | 4.77 | 4.48 | 14.3 | 2.39 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | X | |
| AKM53G | 11.4 | 9.85 | 29.7 | 2000 | 2.06 | 4.77 | 4.12 | 14.3 | 2.39 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | | X |
| AKM53H | 11.5 | 8.83 | 30.0 | 3000 | 2.77 | 6.6 | 5.05 | 19.8 | 1.75 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | | X |



Technical Data

| Motor | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | | |
|--------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|--------------|----------------|-------------------------------|----------------------|----------------------------|----------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Holding torque | Holding brake torque | Holding brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |
| AKM53K | 11.6 | 7.65 | 30.3 | 4000 | 3.20 | 9.4 | 6.17 | 28.2 | 1.24 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | | X |
| AKM53M | 11.4 | 8.72 | 29.7 | 3000 | 2.74 | 13.4 | 10.26 | 40.2 | 0.85 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | | X |
| AKM53P | 11.4 | 5.88 | 29.8 | 5000 | 3.08 | 19.1 | 9.8 | 57.4 | 0.6 | 9.1 | 7.4 | 14.5 | 0.173 | 1.1 | | X |
| AKM54G | 14.3 | 12.9 | 38.0 | 1500 | 2.03 | 5.0 | 4.48 | 15 | 2.88 | 12 | 9 | 14.5 | 0.173 | 1.1 | | X |
| AKM54H | 14.2 | 12.6 | 37.5 | 1500 | 2.38 | 5.5 | 4.9 | 16.5 | 2.57 | 12 | 9 | 14.5 | 0.173 | 1.1 | | X |
| AKM54K | 14.4 | 10.0 | 38.4 | 3500 | 3.68 | 9.7 | 6.73 | 29.2 | 1.50 | 12 | 9 | 14.5 | 0.173 | 1.1 | | X |
| AKM54L | 14.1 | 8.13 | 37.5 | 4500 | 3.83 | 12.5 | 7.19 | 37.5 | 1.13 | 12 | 9 | 14.5 | 0.173 | 1.1 | | X |
| AKM54N | 14.1 | 9.85 | 37.6 | 3500 | 3.61 | 17.8 | 12.31 | 53.4 | 0.8 | 12 | 9 | 14.5 | 0.173 | 1.1 | X | |

AKM6

| | | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|-------|------|------|----|------|----|------|---|---|---|
| AKM62G | 11.9 | 10.4 | 29.7 | 1800 | 1.96 | 4.9 | 4.33 | 14.7 | 2.47 | 17 | 8.9 | 25 | 0.61 | 2 | | X |
| AKM62K | 12.2 | 9.00 | 30.2 | 3500 | 3.30 | 9.6 | 7.04 | 28.8 | 1.28 | 17 | 8.9 | 25 | 0.61 | 2 | | X |
| AKM62M | 12.2 | 5.70 | 30.2 | 6000 | 3.58 | 13.4 | 6.31 | 40.3 | 0.91 | 17 | 8.9 | 25 | 0.61 | 2 | | X |
| AKM62P | 12.3 | 8.1 | 30.3 | 4500 | 3.82 | 18.8 | 12.27 | 56.4 | 0.66 | 17 | 8.9 | 25 | 0.61 | 2 | X | |
| AKM63G | 16.5 | 14.9 | 42.1 | 1200 | 1.87 | 4.5 | 4.14 | 13.5 | 3.70 | 24 | 11.1 | 25 | 0.61 | 2 | | X |
| AKM63K | 16.8 | 12.9 | 42.6 | 3000 | 4.05 | 9.9 | 7.54 | 29.7 | 1.71 | 24 | 11.1 | 25 | 0.61 | 2 | | X |
| AKM63M | 17.0 | 11.3 | 43.0 | 4000 | 4.73 | 13.8 | 9.11 | 41.4 | 1.24 | 24 | 11.1 | 25 | 0.61 | 2 | | X |
| AKM63N | 17.0 | 9.60 | 43.0 | 5000 | 5.03 | 17.4 | 9.80 | 52.2 | 0.98 | 24 | 11.1 | 25 | 0.61 | 2 | | X |
| AKM64K | 20.8 | 17.2 | 53.5 | 2000 | 3.60 | 9.2 | 7.54 | 27.6 | 2.28 | 32 | 13.3 | 25 | 0.61 | 2 | | X |
| AKM64L | 21.0 | 15.6 | 54.1 | 3000 | 4.90 | 12.8 | 9.40 | 38.4 | 1.66 | 32 | 13.3 | 25 | 0.61 | 2 | | X |
| AKM64P | 20.4 | 11.9 | 52.9 | 4500 | 5.61 | 18.6 | 10.82 | 55.9 | 1.10 | 32 | 13.3 | 25 | 0.61 | 2 | | X |
| AKM64Q | 20 | 15.3 | 53.2 | 3000 | 4.81 | 20.7 | 15.3 | 62.1 | 1 | 32 | 13.3 | 25 | 0.61 | 2 | X | |
| AKM64Q | 20 | 10.7 | 53.2 | 5000 | 6.45 | 20.7 | 10.7 | 62.1 | 1 | 32 | 13.3 | 25 | 0.61 | 2 | | X |
| AKM65K | 24.8 | 20.2 | 64.5 | 2000 | 4.23 | 9.8 | 7.95 | 29.1 | 2.54 | 40 | 15.4 | 25 | 0.61 | 2 | | X |
| AKM65M | 25.0 | 19.2 | 65.2 | 2500 | 5.03 | 13.6 | 10.38 | 40.8 | 1.85 | 40 | 15.4 | 25 | 0.61 | 2 | | X |
| AKM65N | 24.3 | 16.0 | 63.7 | 3500 | 5.86 | 17.8 | 11.59 | 53.4 | 1.38 | 40 | 15.4 | 25 | 0.61 | 2 | | X |

Technical Data

| Motor | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | | |
|--------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|--------------|----------------|-------------------------------|----------------------|----------------------------|----------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Holding torque | Holding brake torque | Holding brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |
| AKM65P | 24.5 | 19.1 | 64.1 | 2400 | 4.8 | 19.8 | 14.69 | 59.3 | 1.3 | 40 | 15.4 | 25 | 0.61 | 2 | X | |
| AKM65P | 24.5 | 14.9 | 64.1 | 4000 | 6.24 | 19.8 | 11.46 | 59.3 | 1.3 | 40 | 15.4 | 25 | 0.61 | 2 | | X |

AKM7

| | | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|-------|------|------|-----|------|----|------|-----|---|---|
| AKM72K | 29.7 | 25.1 | 79.4 | 1500 | 3.94 | 9.3 | 7.77 | 27.9 | 3.23 | 65 | 19.7 | 53 | 1.64 | 2.1 | | X |
| AKM72M | 30.0 | 23.6 | 79.8 | 2000 | 4.94 | 13.0 | 10.13 | 39.0 | 2.33 | 65 | 19.7 | 53 | 1.64 | 2.1 | | X |
| AKM72P | 29.4 | 20.1 | 78.5 | 3000 | 6.31 | 18.7 | 12.72 | 56.1 | 1.58 | 65 | 19.7 | 53 | 1.64 | 2.1 | | X |
| AKM72Q | 29.5 | 23.2 | 78.4 | 2000 | 4.86 | 23.5 | 17.85 | 70.5 | 1.3 | 65 | 19.7 | 53 | 1.64 | 2.1 | X | |
| AKM72Q | 29.5 | 16.3 | 78.4 | 4000 | 6.83 | 23.5 | 12.54 | 70.5 | 1.3 | 65 | 19.7 | 53 | 1.64 | 2.1 | | X |
| AKM73M | 42.0 | 33.8 | 112 | 1500 | 5.31 | 13.6 | 10.90 | 40.8 | 3.10 | 92 | 26.7 | 53 | 1.64 | 2.1 | | X |
| AKM73P | 41.6 | 28.5 | 111 | 2400 | 7.16 | 19.5 | 13.38 | 58.6 | 2.13 | 92 | 26.7 | 53 | 1.64 | 2.1 | | X |
| AKM73Q | 41.5 | 33.4 | 111 | 1500 | 5.25 | 24.5 | 19.65 | 73.5 | 1.7 | 92 | 26.7 | 53 | 1.64 | 2.1 | X | |
| AKM73Q | 41.5 | 25.2 | 111 | 3000 | 7.92 | 24.5 | 14.82 | 73.5 | 1.7 | 92 | 26.7 | 53 | 1.64 | 2.1 | | X |
| AKM74L | 53.0 | 43.5 | 143 | 1200 | 5.47 | 12.9 | 10.99 | 38.7 | 4.14 | 120 | 33.6 | 53 | 1.64 | 2.1 | | X |
| AKM74P | 52.5 | 39.6 | 142 | 1800 | 7.46 | 18.5 | 13.24 | 55.5 | 2.84 | 120 | 33.6 | 53 | 1.64 | 2.1 | | X |
| AKM74Q | 52.2 | 41.9 | 141 | 1300 | 5.71 | 26.1 | 20.95 | 78.3 | 2 | 120 | 33.6 | 53 | 1.64 | 2.1 | X | |
| AKM74Q | 52.2 | 31.5 | 141 | 2500 | 8.25 | 26.1 | 15.75 | 78.3 | 2 | 120 | 33.6 | 53 | 1.64 | 2.1 | | X |

Servo Motors

Series AKM Low Voltage

Technical Data

| Motor | | Motor - Data | | | | | | | | | | Drive | |
|-------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|------------------------|--------------|---------------------------|---------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Motor weight | Rated supply voltage 24 V | Rated supply voltage 48 V |
| | M_0 (Nm) | M_n (Nm) | M_{0max} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | | |

AKM 1 Low Voltage

| | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|--------|-------|------|---|---|
| AKM11F | 0.18 | 0.18 | 0.59 | 1000 | 0.02 | 3.87 | 3.95 | 15.5 | 0.0456 | 0.017 | 0.35 | X | |
| AKM11F | 0.18 | 0.17 | 0.59 | 5000 | 0.09 | 3.87 | 3.73 | 15.5 | 0.0456 | 0.017 | 0.35 | | X |
| AKM12E | 0.31 | 0.30 | 1.05 | 1500 | 0.05 | 2.73 | 2.67 | 10.9 | 0.1125 | 0.031 | 0.49 | | X |

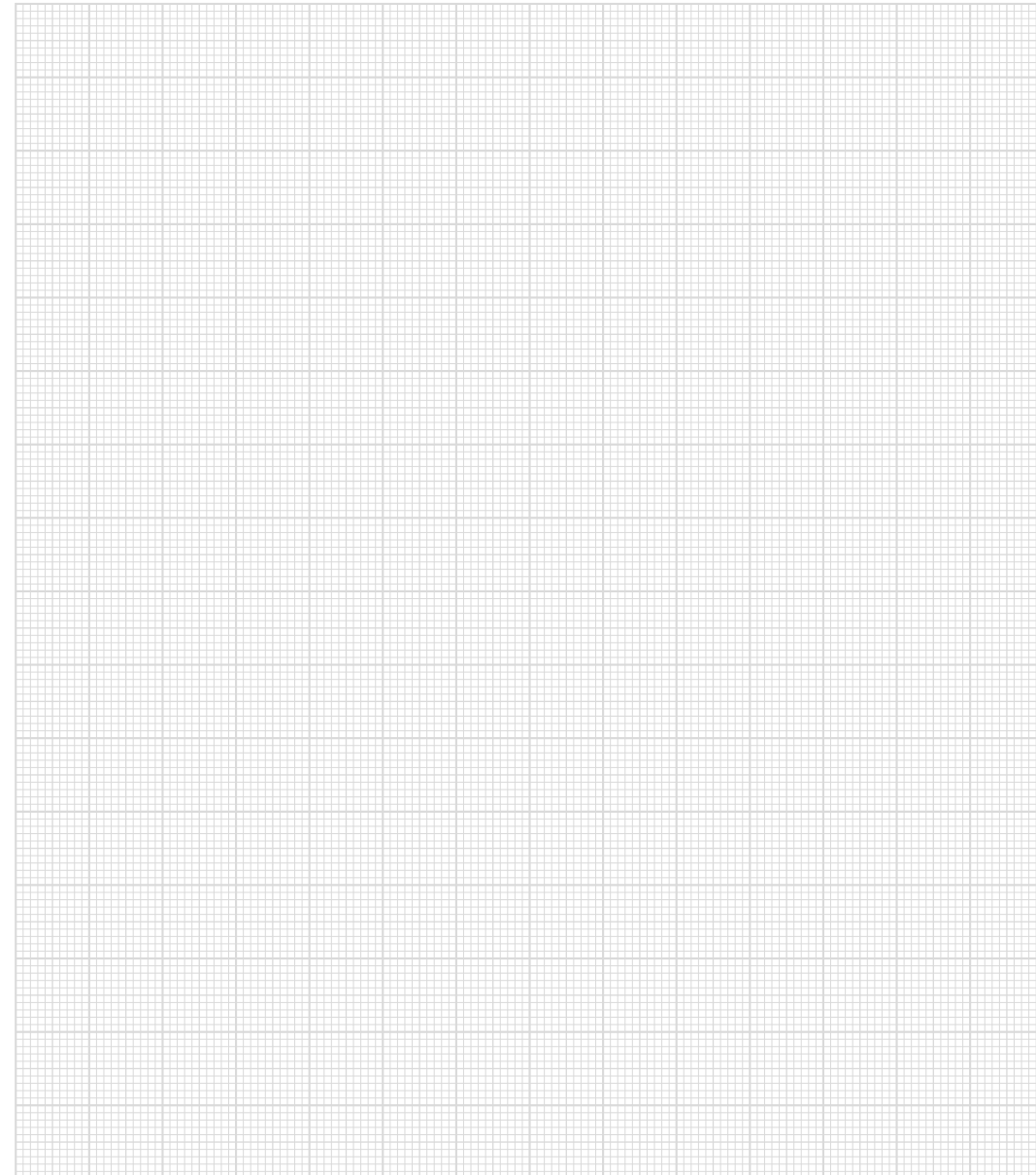
AKM 2 Low Voltage

| | | | | | | | | | | | | | |
|--------|------|------|------|------|------|------|------|------|--------|------|------|---|---|
| AKM21J | 0.43 | 0.42 | 1.38 | 1200 | 0.05 | 7.3 | 6.93 | 28.5 | 0.0606 | 0.11 | 0.82 | X | |
| AKM21J | 0.43 | 0.39 | 1.38 | 4500 | 0.18 | 7.3 | 6.44 | 28.5 | 0.0606 | 0.11 | 0.82 | | X |
| AKM22H | 0.88 | 0.85 | 2.80 | 1500 | 0.13 | 5.41 | 5.21 | 21.6 | 0.1632 | 0.16 | 1.10 | | X |

AKM 3 Low Voltage

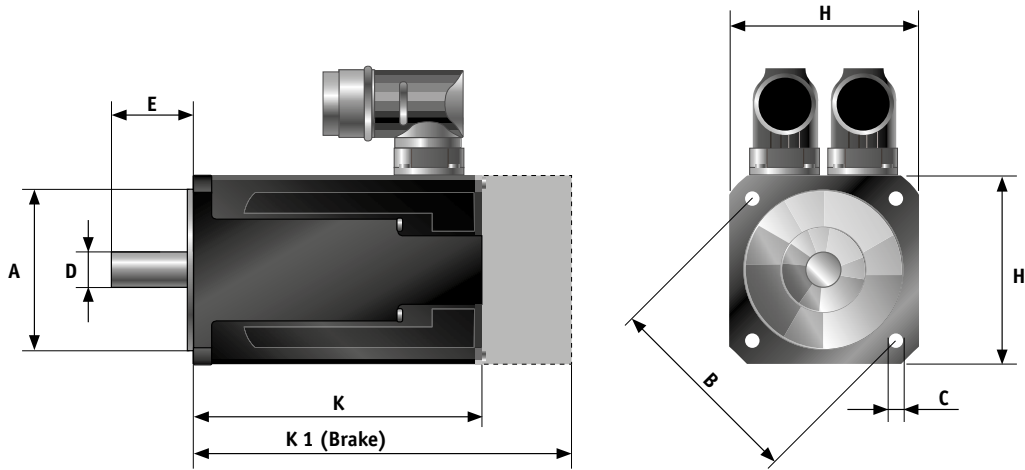
| | | | | | | | | | | | | | |
|--------|------|------|------|------|------|-----|------|------|--------|------|------|--|---|
| AKM31K | 1.25 | 1.23 | 4.12 | 2000 | 0.26 | 9.1 | 8.82 | 36.4 | 0.1395 | 0.33 | 1.55 | | X |
|--------|------|------|------|------|------|-----|------|------|--------|------|------|--|---|

Notes



Servo Motors

Mechanical Dimensions AKM



Mechanical Dimensions

| Motor type | A | B | C | D | E | H | K (Resolver) | K1 (Resolver) | K (Hiperface) | K1 (Hiperface) |
|-----------------------------|------|----|-----|-----|----|----|-----------------|------------------|------------------|-------------------|
| AKM1 | | | | | | | | | | |
| AKM11 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 69.6 | 106.6 | 79 | 116 |
| AKM11F | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 69.6 | - | 79 | - |
| AKM12 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 88.6 | 125.6 | 98 | 135 |
| AKM12E | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 88.6 | - | 98 | - |
| AKM13 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 107.6 | 144.6 | 117 | 154 |
| AKM1 with Y-TEC plug | | | | | | | | | | |
| AKM11 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 79 | 116 | 87.5 | 124.5 |
| AKM11F | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 79 | - | 87.5 | - |
| AKM12 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 98 | 135 | 107.5 | 144.5 |
| AKM12E | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 98 | - | 107.5 | - |
| AKM13 | 30h7 | 46 | 4.3 | 8h7 | 25 | 40 | 117 | 154 | 126.5 | 163.5 |

Mechanical Dimensions

| Motor type | A | B | C | D | E | H | K (Resolver) | K1 (Resolver) | K (Hiperface) | K1 (Hiperface) |
|-------------|-------|-----|------|------|----|-----|-----------------|------------------|------------------|-------------------|
| AKM2 | | | | | | | | | | |
| AKM21 | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 95.4 | 129.5 | 113.4 | 147.1 |
| AKM21J | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 95.4 | - | 113.4 | - |
| AKM22 | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 114.4 | 148.5 | 132.4 | 166.1 |
| AKM22H | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 114.4 | - | 132.4 | - |
| AKM23 | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 133.4 | 167.5 | 151.4 | 185.1 |
| AKM24 | 40j6 | 63 | 4.8 | 9k6 | 20 | 58 | 152.4 | 186.5 | 170.4 | 204.1 |
| AKM3 | | | | | | | | | | |
| AKM31 | 60j6 | 75 | 5.8 | 14k6 | 30 | 70 | 109.8 | 141.3 | 125.3 | 159.3 |
| AKM31K | 60j6 | 75 | 5.8 | 14k6 | 30 | 70 | 109.8 | - | 125.3 | - |
| AKM32 | 60j6 | 75 | 5.8 | 14k6 | 30 | 70 | 140.8 | 172.3 | 156.3 | 190.3 |
| AKM33 | 60j6 | 75 | 5.8 | 14k6 | 30 | 70 | 171.8 | 203.3 | 187.3 | 221.3 |
| AKM4 | | | | | | | | | | |
| AKM41 | 80j6 | 100 | 7 | 19k6 | 40 | 84 | 118.8 | 152.3 | 136.8 | 170.3 |
| AKM42 | 80j6 | 100 | 7 | 19k6 | 40 | 84 | 147.8 | 181.3 | 165.8 | 199.3 |
| AKM43 | 80j6 | 100 | 7 | 19k6 | 40 | 84 | 176.8 | 210.3 | 194.8 | 228.3 |
| AKM44 | 80j6 | 100 | 7 | 19k6 | 40 | 84 | 205.8 | 239.3 | 223.8 | 257.3 |
| AKM5 | | | | | | | | | | |
| AKM51 | 110j6 | 130 | 9 | 24k6 | 50 | 108 | 127.5 | 172.5 | 146 | 189 |
| AKM52 | 110j6 | 130 | 9 | 24k6 | 50 | 108 | 158.5 | 203.5 | 177 | 220 |
| AKM53 | 110j6 | 130 | 9 | 24k6 | 50 | 108 | 189.5 | 234.5 | 208 | 251 |
| AKM54 | 110j6 | 130 | 9 | 24k6 | 50 | 108 | 220.5 | 265.5 | 239 | 282 |
| AKM6 | | | | | | | | | | |
| AKM62 | 130j6 | 165 | 11 | 32k6 | 58 | 138 | 153.7 | 200.7 | 172.2 | 219.7 |
| AKM63 | 130j6 | 165 | 11 | 32k6 | 58 | 138 | 178.7 | 225.7 | 197.2 | 244.7 |
| AKM64 | 130j6 | 165 | 11 | 32k6 | 58 | 138 | 203.7 | 250.7 | 222.2 | 269.7 |
| AKM65 | 130j6 | 165 | 11 | 32k6 | 58 | 138 | 228.7 | 275.7 | 247.2 | 294.7 |
| AKM7 | | | | | | | | | | |
| AKM72 | 180j6 | 215 | 13.5 | 38k6 | 80 | 188 | 192.5 | 234.5 | 201.7 | 253.3 |
| AKM73 | 180j6 | 215 | 13.5 | 38k6 | 80 | 188 | 226.5 | 268.8 | 235.7 | 287.3 |
| AKM74 | 180j6 | 215 | 13.5 | 38k6 | 80 | 188 | 260.5 | 302.5 | 269.7 | 321.3 |

Order Code AKM

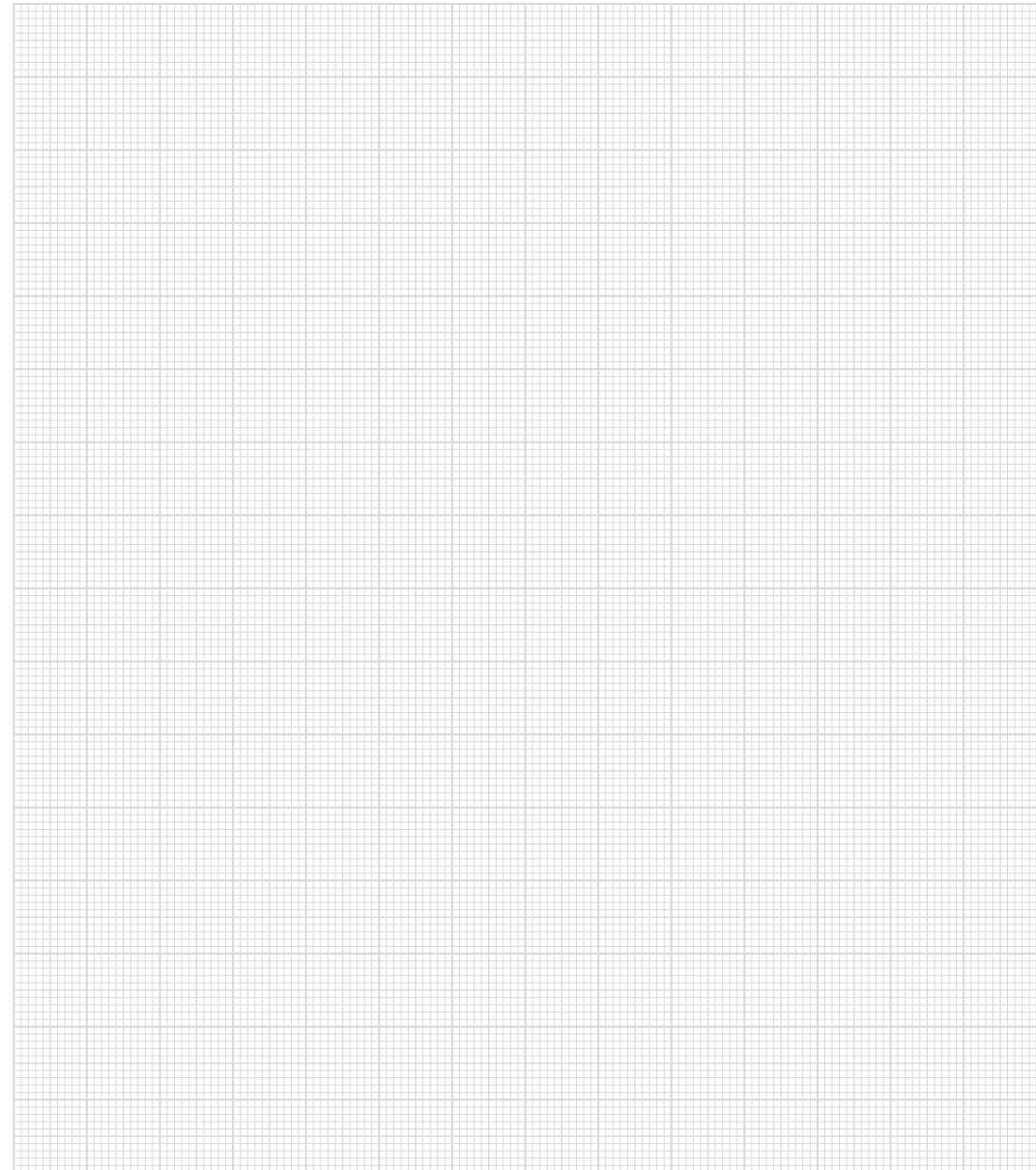
Notes

AKM 4 4 J-AN C N GB B0

| | |
|---|--|
| Flange size: 1 40 mm 2 58 mm 3 70 mm 4 84 mm 5 108 mm 6 138 mm 7 188 mm | Shaft sealing: B0 standard B1 with shaft sealing xx special |
| Rotor length: 1 2 3 4 5 | Feedback unit: DA EnDat 2.1 (AKM2...7) ENC-1113/1313 (Single Turn opt.) DB EnDat 2.1 (AKM2...7) EQN-1125/1325 (Multi Turn opt.) LA EnDat 2.1 (AKM2...7) ECI-1118/1319 (Single Turn ind.) LB EnDat 2.1 (AKM2...7) EQI-1130/1331 (Multi Turn ind.) GA Hiperface SKS36 (Single Turn opt.) GB Hiperface (AKM2...7) SKM36 (Multi Turn opt.) GD Hiperface (AKM1) SEL34 (Multi Turn kap.) R resolver (Single Turn ind.) S special |
| Winding type: A ... Z S special | Brake: 2 24 V holding brake N without brake S special |
| Flange: A IEC B NEMA C alternative IEC standard D other standard G alternative IEC standard H alternative IEC standard R IEC with tolerance R | Connections: B angled connector, rotatable (AKM2) C 0.5 m shielded cable with IP65 connector, (AKM1/2) angled connector, rotatable (AKM3...7) Y y-tec plug IP65 (AKM1) S special |
| Shaft: C feather key groove K open feather key groove N smooth shaft S special | |

Example Servo Motor AKM 4 4 J-AN C N GB B0:
 Motortype AKM 44J, flange according to IEC standard, smooth shaft, rotatable connectors, without brake, multiturn encoder SKM36

Detailed motor data can be found in the technical documentation.



Low Voltage Synchronous Servo Motors Series SM



The low-voltage synchronous servomotors from the SM series are brushless, rotary current motors with permanent magnets in the rotor and three-phase windings for special servo applications. The neodymium magnet material and the low inertial moment contribute significantly to making these motors highly dynamic and allow them to have a very low cogging. The robust and compact motor with high power density is available in three performance classes 60, 100 and 200 watts.

Motors are available in two flange sizes with idling torques from 0.2 to 0.68 Nm and peak torques of up to 1.8 Nm.

Motor and sensor cables in standard 1.5 m/3 m/5 m/10 m lengths can also be obtained.

Standard configuration:

Shaft with keyway, IP65 protection, 2-pin optical incremental encoder (2500 ppr)

Optional:

Holding brake

Technical Data

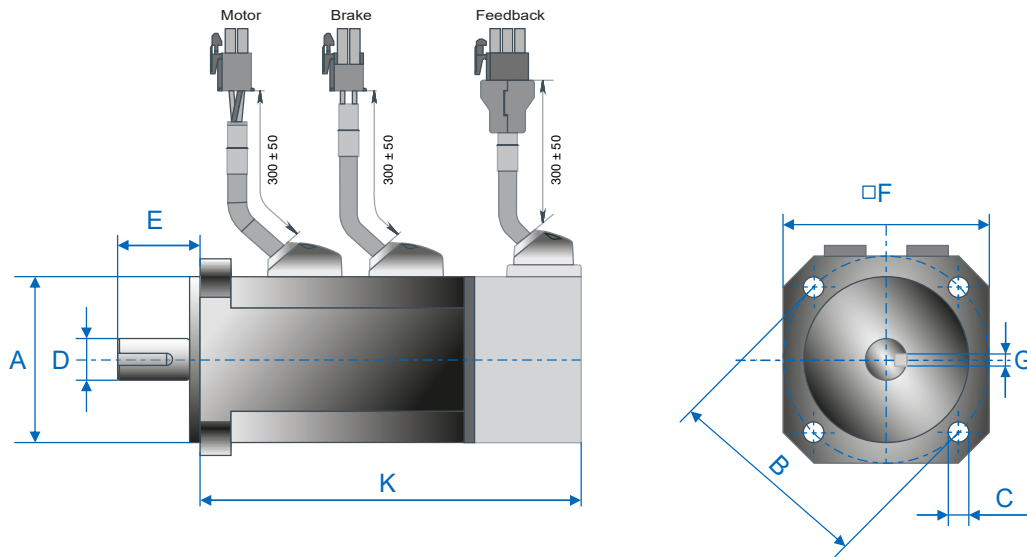
| Motor | Motor - Data | | | | | | | | | | | | Brake - Data | | | Drive DC 062 |
|-------|-------------------------|--------------|----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|-------------|--------------|----------------|--------------------------------------|----------------------|---------------------------------|
| | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Flange size | Motor weight | Holding torque | Inertial torque of the holding brake | Holding brake weight | Rated supply voltage 24-48 V DC |
| | M_0 (Nm) | M_n (Nm) | M_{max} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_r (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | L (mm) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | |

Series SM

| | | | | | | | | | | | | | | | | |
|--------|------|------|------|------|------|-----|-----|------|-------|--------|----|------|------|-------|------|---|
| SM0401 | 0.2 | 0.19 | 0.46 | 3000 | 0.06 | 5.7 | 5.4 | 13.5 | 0.035 | 0.0232 | 40 | 0.4 | 0.35 | 0.048 | 0.25 | X |
| SM0402 | 0.34 | 0.32 | 0.91 | 3000 | 0.1 | 5.6 | 5.2 | 15.6 | 0.061 | 0.0422 | 40 | 0.55 | 0.35 | 0.048 | 0.25 | X |
| SM0601 | 0.68 | 0.64 | 1.8 | 3000 | 0.2 | 5.2 | 4.9 | 15 | 0.133 | 0.094 | 60 | 1.1 | 2 | 0.046 | 0.5 | X |

Servo Motors

Mechanical Dimensions SM



Mechanical Dimensions

| Motor type | A | B | C | D | E | F | G | K (without brake) | K (with brake) |
|------------------|------|----|-----|------|----|----|-----|----------------------|-------------------|
| SM Series | | | | | | | | | |
| SM0401 | 30h7 | 46 | 4.2 | 8h6 | 25 | 40 | 3h9 | 92 | 129 |
| SM0402 | 30h7 | 46 | 4.2 | 8h6 | 25 | 40 | 3h9 | 109 | 147 |
| SM0601 | 50h7 | 70 | 5.5 | 14h6 | 30 | 60 | 5h9 | 98 | 138 |

Order Code SM

SM 060 2 E E2 - K CD - N N V

| | | |
|--|---|--|
| ■ Series: SM Servo Motor | → | ■ Version: V with shaft seal included |
| ■ Flanges size: 40 40 mm 60 60 mm | → | ■ Temperature sensor: N no sensor |
| ■ Rotor length: 1 2 | → | ■ Brake: N without brake B 24 V DC Brake |
| ■ Windings type: E 80 V DC F 60 V DC H 36 V DC | → | ■ Connectors: CD 300 mm (12") shielded cable with non-sealed Connectors - for windings up to 6.5 Ampere |
| ■ Feedback: E2 2500 ppr optical encoder with separate commutation signals | → | ■ Shaft: K Standard keyway |

AC Servo Motors

Series DSM5



The synchronous servo motors of the DSM5 series are brushless AC motors with three-phase winding for high-quality servo applications. In combination with our digital servo drives, they are ideal for industrial robot positioning tasks, machine tools and transfer lines with high dynamics and stability requirements.

The compact servo motors have permanent magnets in the rotor. The neodymium magnet material plays an essential role in making the motors highly dynamic. The DSM5 motors are available in 7 sizes for optimal tuning to the respective servo application.

Standard features:

For the encoder system, resolver or Hiperface and Hiperface DSL are available.

Technical Data

| Motor | Winding code | Motor - Data | | | | | | | | | | Brake - Data | | | Drive | |
|-------|--------------|--------------|------------|-----------------|----------------------------|------------|-----------|-----------|---------------|--------------|--------------------------|--------------|---------------|--------------------------------|---------------|----------------------------|
| | | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (Kgcmm ²) | G_{br} (kg) | Rated supply voltage 230 V |

DSM5-0

| | | | | | | | | | | | | | | | | | |
|--------|---|------|------|-----|------|-------|------|------|-----|------|-------|------|-----|-------|-----|---|--|
| DSM504 | 1 | 0.19 | 0.15 | 0.6 | 8000 | 0.126 | 0.78 | 0.60 | 3.1 | 0.24 | 0.037 | 0.53 | 0.4 | 0.019 | 0.2 | X | |
| DSM505 | 1 | 0.38 | 0.29 | 1.3 | 8000 | 0.243 | 1.21 | 0.09 | 4.8 | 0.31 | 0.061 | 0.68 | 0.4 | 0.019 | 0.2 | X | |

DSM5-2

| | | | | | | | | | | | | | | | | | |
|--------|---|-----|------|-----|------|------|------|------|-----|------|------|-----|---|-------|-----|---|---|
| DSM521 | 1 | 0.7 | 0.58 | 2.4 | 6200 | 0.38 | 1.57 | 1.29 | 6.4 | 0.45 | 0.13 | 1.2 | 2 | 0.045 | 0.2 | X | |
| DSM521 | 2 | 0.7 | 0.65 | 2.4 | 3600 | 0.25 | 0.96 | 0.89 | 3.9 | 0.73 | 0.13 | 1.2 | 2 | 0.045 | 0.2 | X | |
| DSM521 | 1 | 0.7 | 0.52 | 2.4 | 8000 | 0.44 | 1.57 | 1.16 | 6.4 | 0.45 | 0.13 | 1.2 | 2 | 0.045 | 0.2 | | X |
| DSM521 | 2 | 0.7 | 0.6 | 2.4 | 6000 | 0.38 | 0.96 | 0.82 | 3.9 | 0.73 | 0.13 | 1.2 | 2 | 0.045 | 0.2 | | X |
| DSM522 | 1 | 1.4 | 0.9 | 4.6 | 6300 | 0.59 | 2.8 | 1.80 | 11 | 0.5 | 0.23 | 1.7 | 2 | 0.045 | 0.2 | X | |
| DSM522 | 2 | 1.4 | 1.1 | 4.6 | 3900 | 0.45 | 1.73 | 1.34 | 6.6 | 0.81 | 0.23 | 1.7 | 2 | 0.045 | 0.2 | X | |
| DSM522 | 1 | 1.4 | 0.8 | 4.6 | 8000 | 0.67 | 2.8 | 1.60 | 11 | 0.5 | 0.23 | 1.7 | 2 | 0.045 | 0.2 | | X |
| DSM522 | 2 | 1.4 | 1 | 4.6 | 6000 | 0.63 | 1.73 | 1.22 | 6.6 | 0.81 | 0.23 | 1.7 | 2 | 0.045 | 0.2 | | X |

DSM5-3

| | | | | | | | | | | | | | | | | | |
|--------|---|-----|------|-----|------|------|------|------|------|------|------|-----|----|------|-----|---|---|
| DSM531 | 1 | 1.5 | 1.22 | 5.1 | 3100 | 0.4 | 1.65 | 1.34 | 6.6 | 0.91 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | X | |
| DSM531 | 2 | 1.5 | 1.38 | 4.8 | 1800 | 0.26 | 1.1 | 0.97 | 4 | 1.42 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | X | |
| DSM531 | 3 | 1.5 | 1.11 | 6.4 | 5000 | 0.58 | 2.6 | 1.91 | 13 | 0.58 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | X | |
| DSM531 | 1 | 1.5 | 1.1 | 5.1 | 6000 | 0.69 | 1.65 | 1.21 | 6.6 | 0.91 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | | X |
| DSM531 | 2 | 1.5 | 1.3 | 4.8 | 3500 | 0.48 | 1.1 | 0.92 | 4 | 1.42 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | | X |
| DSM531 | 3 | 1.5 | 1.8 | 6.4 | 6500 | 0.74 | 2.6 | 1.86 | 13 | 0.58 | 0.92 | 2.4 | 11 | 1.06 | 0.6 | | X |
| DSM532 | 1 | 2.9 | 2.31 | 10 | 3200 | 0.77 | 3.2 | 2.54 | 12.8 | 0.91 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | X | |
| DSM532 | 2 | 2.9 | 2.5 | 10 | 1900 | 0.5 | 2 | 1.72 | 8 | 1.46 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | X | |
| DSM532 | 8 | 2.9 | 2.05 | 10 | 5400 | 1.16 | 5.2 | 3.66 | 21 | 0.56 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | X | |
| DSM532 | 1 | 2.9 | 1.95 | 10 | 6000 | 1.23 | 3.2 | 2.14 | 12.8 | 0.91 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | | X |
| DSM532 | 2 | 2.9 | 2.3 | 10 | 3500 | 0.84 | 2 | 1.59 | 8 | 1.46 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | | X |
| DSM532 | 8 | 2.9 | 1.89 | 10 | 6500 | 1.29 | 5.2 | 3.38 | 21 | 0.56 | 1.72 | 3.5 | 11 | 1.06 | 0.6 | | X |

Technical Data

| Motor | | Motor - Data | | | | | | | | | | | Brake - Data | | | Drive | |
|--------------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|-----------------|--------------------------|-------------------------------|---------------|----------------------------|----------------------------|--|
| Winding code | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Weight standard | Holding torque at 120 °C | Holding brake torque | Brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V | |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | | |
| DSM533 | 1 | 4.2 | 3.22 | 14 | 3300 | 1.113 | 4.6 | 3.54 | 18 | 0.91 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM533 | 2 | 4.2 | 3.6 | 14 | 2000 | 0.75 | 2.9 | 2.48 | 11 | 1.46 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM533 | 4 | 4.2 | 2.38 | 14 | 5200 | 1.54 | 7.1 | 4.80 | 28 | 0.6 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM533 | 1 | 4.2 | 2.65 | 14 | 6000 | 1.665 | 4.6 | 2.91 | 18 | 0.91 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM533 | 2 | 4.2 | 3.35 | 14 | 3500 | 1.228 | 2.9 | 2.31 | 11 | 1.46 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM533 | 4 | 4.2 | 2.53 | 14 | 6500 | 1.722 | 7.1 | 4.29 | 28 | 0.6 | 2.53 | 4.6 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 1 | 5.3 | 4 | 18 | 3300 | 1.38 | 5.8 | 4.40 | 23 | 0.91 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 2 | 5.3 | 4.4 | 18 | 1900 | 0.88 | 3.4 | 2.86 | 14 | 1.54 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 4 | 5.3 | 3.56 | 18 | 4700 | 1.75 | 8 | 5.39 | 32 | 0.66 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 1 | 5.3 | 3.6 | 18 | 5000 | 1.885 | 5.8 | 3.96 | 23 | 0.91 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 2 | 5.3 | 4.1 | 18 | 3000 | 1.288 | 3.4 | 2.66 | 14 | 1.54 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |
| DSM534 | 4 | 5.3 | 3.08 | 18 | 5000 | 1.613 | 8 | 4.67 | 32 | 0.66 | 3.33 | 5.7 | 11 | 1.06 | 0.6 | X | |

DSM5-4

| | | | | | | | | | | | | | | | | |
|--------|---|-----|------|----|------|------|-----|------|----|------|-----|-----|----|-----|-----|---|
| DSM541 | 1 | 4 | 3.21 | 14 | 3200 | 1.08 | 4.4 | 3.53 | 18 | 0.91 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM541 | 2 | 4 | 3.46 | 14 | 1800 | 0.65 | 2.5 | 2.18 | 10 | 1.59 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM541 | 3 | 4 | 3.17 | 14 | 4100 | 1.36 | 5.4 | 4.34 | 23 | 0.73 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM541 | 1 | 4 | 2.7 | 14 | 6000 | 1.7 | 4.4 | 2.97 | 18 | 0.91 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM541 | 2 | 4 | 3.35 | 14 | 3000 | 1.05 | 2.5 | 2.11 | 10 | 1.59 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM541 | 3 | 4 | 2.77 | 14 | 6000 | 1.74 | 5.4 | 3.79 | 23 | 0.73 | 5 | 5.6 | 22 | 3.6 | 1.1 | X |
| DSM542 | 1 | 7.6 | 5.84 | 26 | 3200 | 1.96 | 7.8 | 5.96 | 32 | 0.98 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |
| DSM542 | 2 | 7.6 | 6.43 | 26 | 1800 | 1.21 | 4.7 | 3.97 | 19 | 1.62 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |
| DSM542 | 4 | 7.6 | 6.72 | 26 | 1000 | 0.70 | 2.8 | 2.46 | 11 | 2.73 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |
| DSM542 | 1 | 7.6 | 5 | 26 | 5000 | 2.62 | 7.8 | 5.10 | 32 | 0.98 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |
| DSM542 | 2 | 7.6 | 6 | 26 | 3000 | 1.89 | 4.7 | 3.70 | 19 | 1.62 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |
| DSM542 | 4 | 7.6 | 6.38 | 26 | 1900 | 1.27 | 2.8 | 2.34 | 11 | 2.73 | 9.6 | 8.5 | 22 | 3.6 | 1.1 | X |

Technical Data

| Motor | | Motor - Data | | | | | | | | | | | Brake - Data | | | Drive | |
|--------------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|-----------------|--------------------------|-------------------------------|---------------|----------------------------|----------------------------|--|
| Winding code | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Weight standard | Holding torque at 120 °C | Holding brake torque | Brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V | |
| | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | | |
| DSM543 | 1 | 11.3 | 8.56 | 40 | 3300 | 2.96 | 12 | 8.73 | 48 | 0.98 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |
| DSM543 | 2 | 11.3 | 9.54 | 39 | 1800 | 1.80 | 7 | 5.89 | 29 | 1.62 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |
| DSM543 | 3 | 11.3 | 7.29 | 39 | 4800 | 3.66 | 17 | 10.72 | 68 | 0.68 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |
| DSM543 | 1 | 11.3 | 7.5 | 40 | 5000 | 3.927 | 12 | 7.65 | 48 | 0.98 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |
| DSM543 | 2 | 11.3 | 8.8 | 39 | 3000 | 2.764 | 7 | 5.43 | 29 | 1.62 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |
| DSM543 | 3 | 11.3 | 6.27 | 39 | 6000 | 3.94 | 17 | 9.22 | 68 | 0.68 | 14 | 11.4 | 22 | 3.6 | 1.1 | X | |

DSM5-5

| | | | | | | | | | | | | | | | | |
|--------|---|----|------|-----|------|------|-----|-------|-----|------|----|----|----|-----|-----|---|
| DSM551 | 1 | 10 | 8.1 | 35 | 3000 | 2.54 | 9.8 | 7.94 | 41 | 1.03 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM551 | 2 | 10 | 8.1 | 35 | 1900 | 1.61 | 6.5 | 5.26 | 27 | 1.54 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM551 | 3 | 10 | 7.47 | 35 | 3800 | 2.97 | 12 | 9.22 | 51 | 0.81 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM551 | 1 | 10 | 7 | 35 | 5000 | 3.67 | 9.8 | 6.86 | 41 | 1.03 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM551 | 2 | 10 | 7.8 | 35 | 3000 | 2.45 | 6.5 | 5.06 | 27 | 1.54 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM551 | 3 | 10 | 6 | 35 | 6000 | 3.77 | 12 | 7.41 | 51 | 0.81 | 22 | 11 | 40 | 9.5 | 1.4 | X |
| DSM552 | 1 | 19 | 10 | 64 | 4000 | 4.1 | 16 | 8.3 | 64 | 1.19 | 43 | 16 | 40 | 9.5 | 1.4 | X |
| DSM552 | 2 | 19 | 15.2 | 64 | 3000 | 4.8 | 12 | 9.87 | 50 | 1.54 | 43 | 16 | 40 | 9.5 | 1.4 | X |
| DSM552 | 3 | 19 | 10.2 | 64 | 4000 | 4.27 | 21 | 10.97 | 82 | 0.93 | 43 | 16 | 40 | 9.5 | 1.4 | X |
| DSM553 | 1 | 27 | 16 | 94 | 3000 | 5 | 21 | 12.30 | 84 | 1.29 | 65 | 21 | 40 | 9.5 | 1.4 | X |
| DSM553 | 2 | 27 | 15.4 | 94 | 3000 | 4.8 | 15 | 8.80 | 62 | 1.75 | 65 | 21 | 40 | 9.5 | 1.4 | X |
| DSM553 | 3 | 27 | 10 | 94 | 4000 | 4.19 | 25 | 9.09 | 104 | 1.09 | 65 | 21 | 40 | 9.5 | 1.4 | X |
| DSM553 | 4 | 27 | 21.4 | 118 | 1900 | 4.26 | 9.6 | 7.64 | 42 | 2.81 | 65 | 21 | 40 | 9.5 | 1.4 | X |
| DSM554 | 1 | 35 | 20.8 | 118 | 2500 | 5.4 | 25 | 14.80 | 100 | 1.41 | 87 | 26 | 40 | 9.5 | 1.4 | X |
| DSM554 | 2 | 35 | 20.8 | 118 | 2500 | 5.4 | 20 | 12.00 | 80 | 1.75 | 87 | 26 | 40 | 9.5 | 1.4 | X |

DSM5-6

| | | | | | | | | | | | | | | | | |
|--------|---|----|------|----|------|------|-----|------|----|------|----|----|----|------|-----|---|
| DSM561 | 1 | 15 | 8.50 | 40 | 2000 | 1.78 | 11 | 6.44 | 37 | 1.31 | 54 | 17 | 80 | 31.8 | 4.1 | X |
| DSM561 | 2 | 15 | 8.00 | 40 | 2000 | 1.68 | 9.1 | 4.82 | 27 | 1.65 | 54 | 17 | 80 | 31.8 | 4.1 | X |

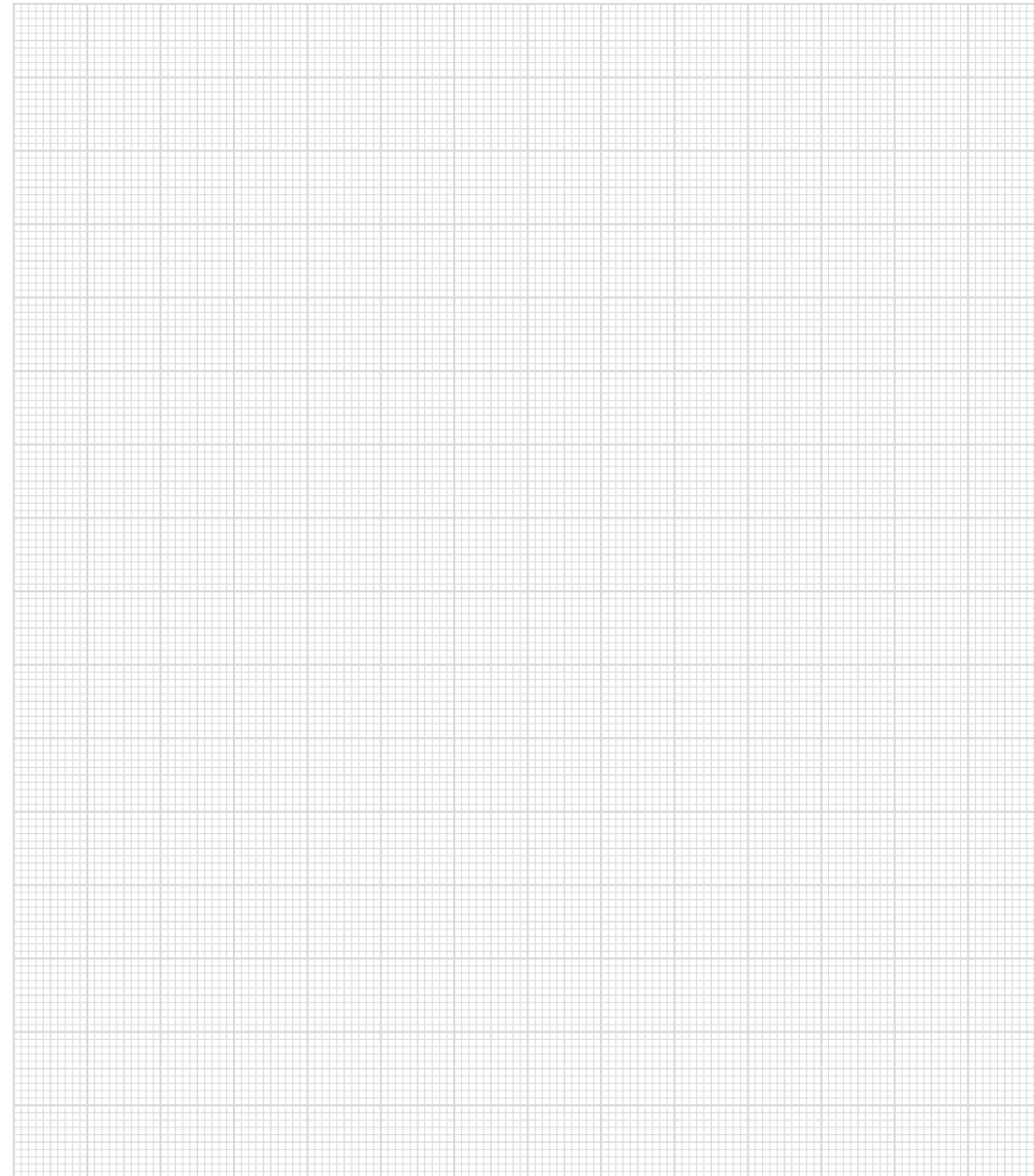
Technical Data

| Motor | | Motor - Data | | | | | | | | | | | Brake - Data | | | Drive | |
|--------|--------------|-------------------------|--------------|-----------------|----------------------------|-------------|--------------------|---------------|---------------|-----------------|--------------------------|-----------------|--------------------------|-------------------------------|---------------|----------------------------|----------------------------|
| | Winding code | Motor standstill torque | Rated torque | Peak torque | Rated rotation speed | Rated power | Standstill current | Rated current | Peak current | Torque constant | Rotor inertial torque | Weight standard | Holding torque at 120 °C | Holding brake torque | Brake weight | Rated supply voltage 230 V | Rated supply voltage 400 V |
| | | M_0 (Nm) | M_n (Nm) | M_{pmax} (Nm) | n_n (min ⁻¹) | P_n (kW) | I_0 (A) | I_n (A) | I_{max} (A) | K_t (Nm/A) | J (kgcm ²) | G (kg) | M_{br} (Nm) | J_{br} (kgcm ²) | G_{br} (kg) | | |
| DSM562 | 1 | 28 | 15.8 | 72 | 2000 | 3.3 | 24 | 13.50 | 72 | 1.17 | 91 | 23 | 80 | 31.8 | 4.1 | | X |
| DSM562 | 2 | 28 | 15.8 | 72 | 2000 | 3.3 | 13 | 7.10 | 38 | 2.22 | 91 | 23 | 80 | 31.8 | 4.1 | | X |
| DSM563 | 2 | 50 | 27.4 | 130 | 2000 | 5.74 | 18 | 9.79 | 55 | 2.8 | 177 | 36 | 80 | 31.8 | 4.1 | | X |
| DSM563 | 3 | 50 | 43.2 | 177 | 500 | 2.26 | 5 | 4.35 | 16 | 9.92 | 177 | 36 | 80 | 31.8 | 4.1 | | X |
| DSM564 | 3 | 70 | 58 | 180 | 350 | 2.1 | 5 | 4.36 | 16 | 13.2 | 264 | 50 | 80 | 31.8 | 4.1 | | X |

DSM5-7

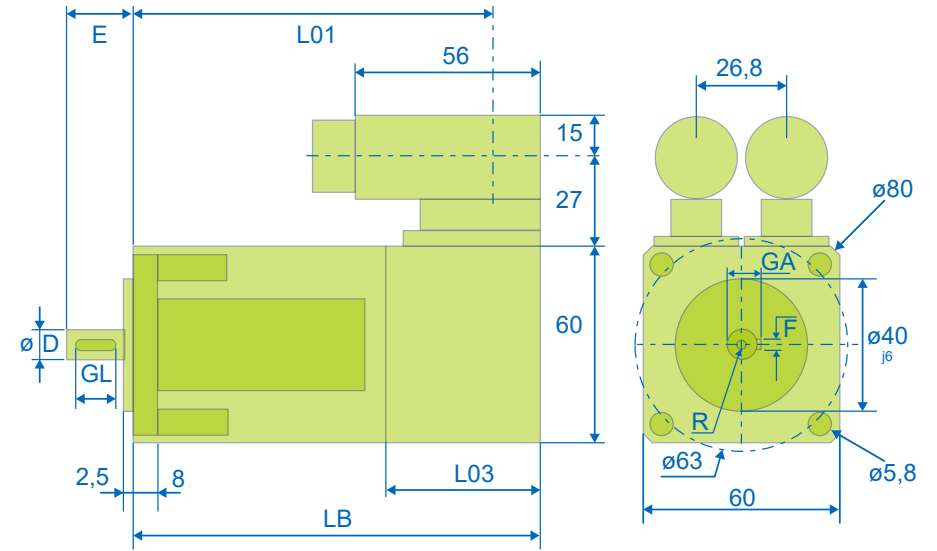
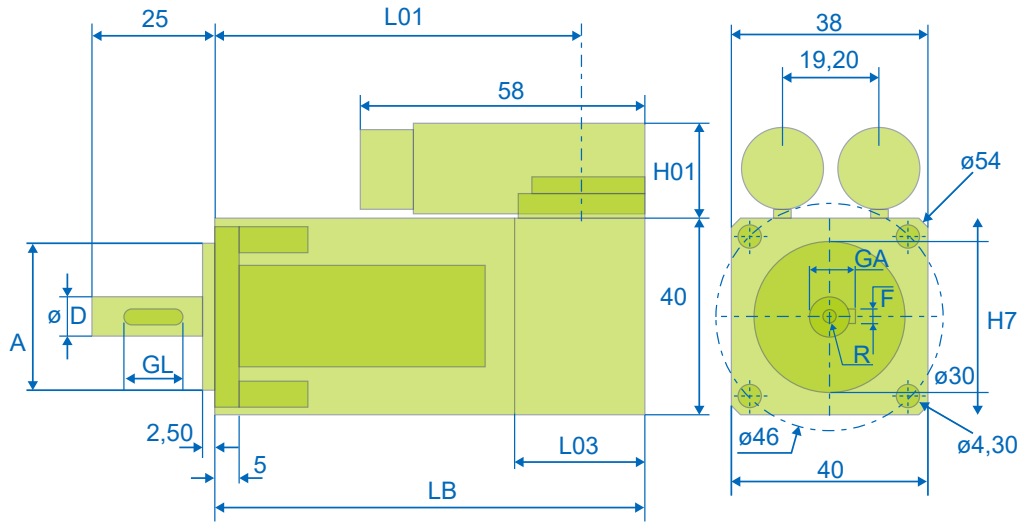
| | | | | | | | | | | | | | | | | | |
|--------|---|----|------|-----|------|------|----|------|----|-----|-----|----|-----|------|---|--|---|
| DSM571 | 2 | 76 | 44.3 | 200 | 1800 | 8.35 | 25 | 14.7 | 73 | 3.3 | 484 | 50 | 120 | 57.5 | 6 | | X |
|--------|---|----|------|-----|------|------|----|------|----|-----|-----|----|-----|------|---|--|---|

Notizen



Servo Motors

Mechanical Dimensions



DSM5-0 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-------|------|-----------|-----|-----|
| | LB | L01 | L03 | LB | L01 | L03 |
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.04 | 87.5 | 74.5 | 26.5 | 104 | 91 | 43 |
| DSM5.05 | 105.5 | 92.5 | | 122 | 109 | |
| DSM5.04 brake | 119.5 | 106.5 | | 136 | 123 | |
| DSM5.05 brake | 137.5 | 124.5 | | 154 | 141 | |

SHAFT, dimension in mm

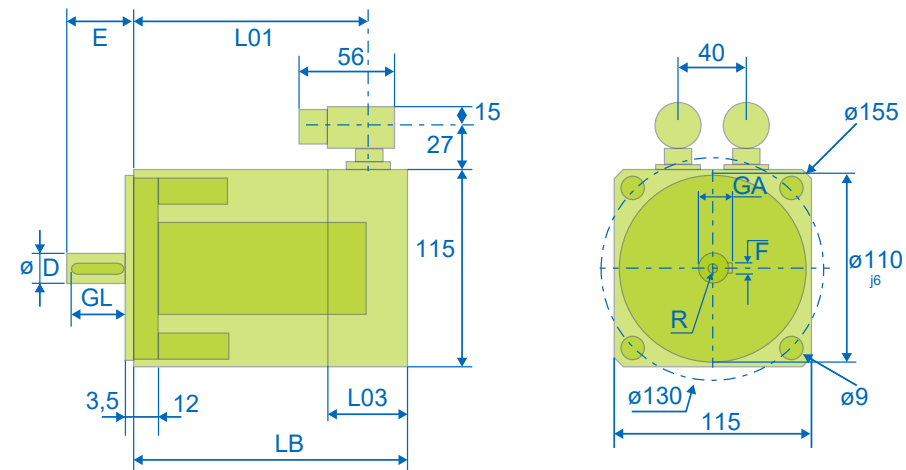
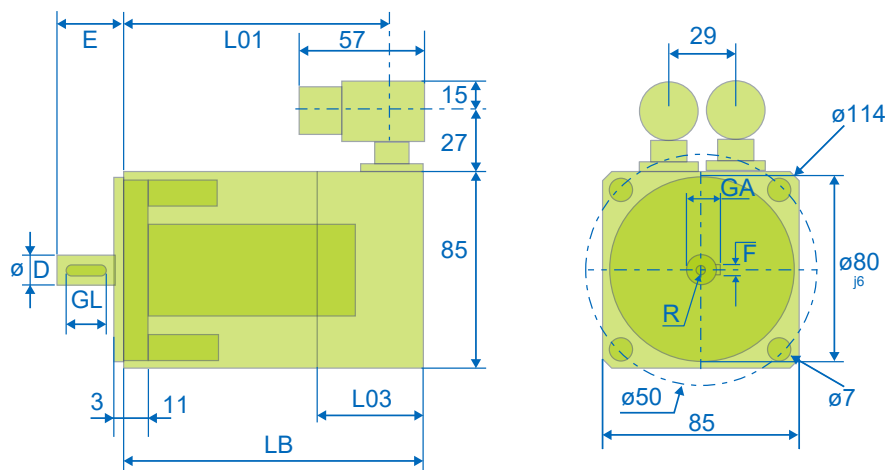
| | |
|----|------|
| D | 8h6 |
| E | 25 |
| GL | 12 |
| GA | 9.2 |
| F | 3 |
| R | M3x8 |

DSM5-2 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-------|-----|-----------|-------|-----|
| | LB | L01 | L03 | LB | L01 | L03 |
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.21 | 104 | 90 | 28 | 122 | 106 | 46 |
| DSM5.22 | 132 | 118 | | 150 | 134 | |
| DSM5.21 brake | 134.5 | 120.4 | | 152.4 | 136.4 | |
| DSM5.22 brake | 162.4 | 148.4 | | 180.4 | 164.4 | |

SHAFT, dimension in mm

| | | |
|----|-----------------|----------------|
| D | 9j6 (Option 62) | 11j6 (Default) |
| E | 20 | 23 |
| GL | 12 | 15 |
| GA | 10.2 | 12.5 |
| F | 3 | 4 |
| R | - | M4x10 |



DSM5-3 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-----|-----|-----------|-----|-----|
| | LB | L01 | L03 | LB | L01 | L03 |
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.31 | 115 | 101 | 31 | 130 | 116 | 46 |
| DSM5.32 | 145 | 131 | | 160 | 146 | |
| DSM5.33 | 175 | 161 | | 190 | 176 | |
| DSM5.34 | 205 | 191 | | 220 | 206 | |
| DSM5.31 brake | 163 | 149 | | 178 | 164 | |
| DSM5.32 brake | 193 | 179 | | 208 | 194 | |
| DSM5.33 brake | 223 | 209 | | 238 | 224 | |
| DSM5.34 brake | 253 | 283 | | 268 | 254 | |

DSM5-4 - Dimension in mm

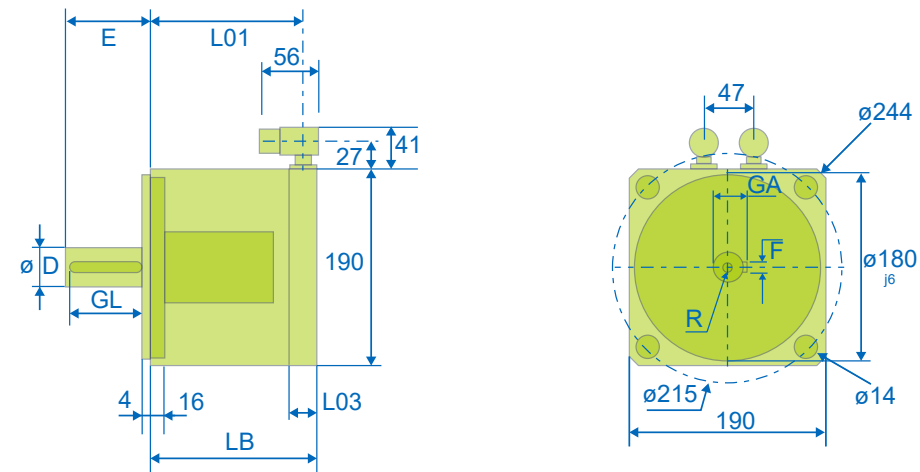
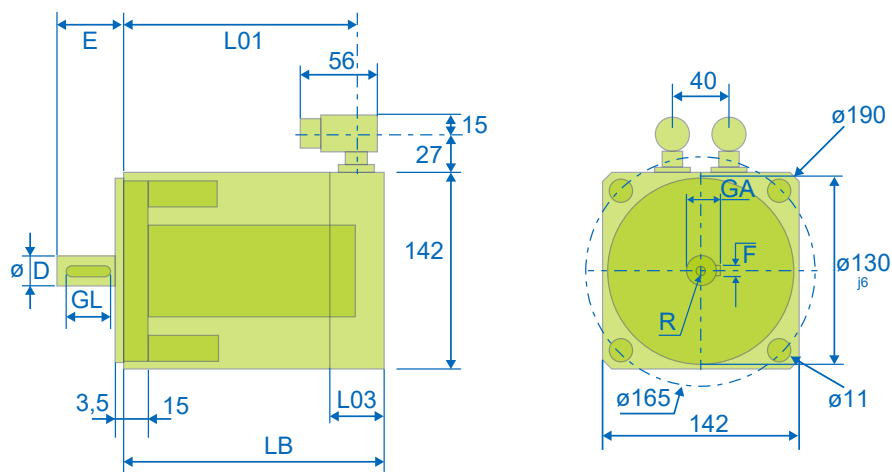
| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-------|-----|-----------|-------|-----|
| | LB | L01 | L03 | LB | L01 | L03 |
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.41 | 146.5 | 123.5 | 32 | 160.5 | 137.5 | 46 |
| DSM5.42 | 186.5 | 163.5 | | 200.5 | 177.5 | |
| DSM5.43 | 226.5 | 203.5 | | 240.5 | 217.5 | |
| DSM5.41 brake | 195.5 | 172.5 | | 209.5 | 186.6 | |
| DSM5.42 brake | 235.5 | 212.5 | | 249.5 | 226.5 | |
| DSM5.43 brake | 275.5 | 232.5 | | 289.5 | 246.5 | |

SHAFT, dimension in mm

| | |
|----|-------|
| D | 14j6 |
| E | 30 |
| GL | 20 |
| GA | 16 |
| F | 5 |
| R | M5x15 |

SHAFT, dimension in mm

| | |
|----|-------|
| D | 19j6 |
| E | 40 |
| GL | 32 |
| GA | 21.5 |
| F | 6 |
| R | M6x16 |



DSM5-5 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-------|-----|-----------|-------|-----|
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.51 | 174 | 154 | 27 | 187 | 167 | 40 |
| DSM5.52 | 224 | 204 | | 237 | 217 | |
| DSM5.53 | 274 | 254 | | 287 | 267 | |
| DSM5.54 | 324 | 304 | | 337 | 317 | |
| DSM5.51 brake | 227.5 | 207.5 | | 240.5 | 220.5 | |
| DSM5.52 brake | 277.5 | 257.5 | | 290.5 | 270.5 | |
| DSM5.53 brake | 327.5 | 307.5 | | 340.5 | 320.5 | |
| DSM5.54 brake | 377.5 | 357.5 | | 390.5 | 370.5 | |

SHAFT, dimension in mm

| | |
|----|-------|
| D | 24j6 |
| E | 50 |
| GL | 32 |
| GA | 27 |
| F | 8 |
| R | M8x15 |

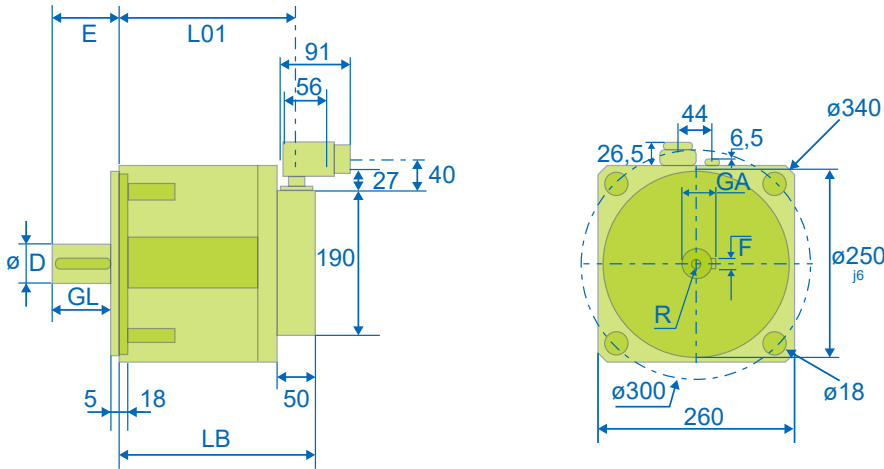
DSM5-6 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-------|-----|-----------|-------|-----|
| Dimensions of | LB | L01 | L03 | LB | L01 | L03 |
| DSM5.61 | 163 | 139.5 | 27 | 183 | 159.5 | 47 |
| DSM5.62 | 198 | 174.5 | | 218 | 194.5 | |
| DSM5.63 | 288 | 264.5 | 47 | 288 | 264.5 | |
| DSM5.64 | 334.5 | 334.5 | | 334.5 | 334.5 | |
| DSM5.61 brake | 233.5 | 210 | 27 | 253.5 | 230 | |
| DSM5.62 brake | 268.5 | 245 | | 288.5 | 265 | |
| DSM5.63 brake | 358.5 | 335 | 47 | 358.5 | 335 | |
| DSM5.64 brake | 428.5 | 405 | | 428.5 | 405 | |

SHAFT, dimension in mm

| | |
|----|--------|
| D | 38k6 |
| E | 80 |
| GL | 70 |
| GA | 41 |
| F | 10 |
| R | M12x28 |

Order Code



DSM522 . 2 0 9 6 . 26 62 66

- **Product:** DSM5 Synchronous motor self-cooling
- **Motor size:** Size 0-7
- **Motor length:** Length 1-4
- **Voltage configuration:** Winding Code 1-8
- **Brake:** 0 without brake
1 with brake 24 VDC

- **Options:** 26 Smooth shaft
62 Thin shaft 9x20 flange 40/63 (motor size 2 only)
66 Shaft seal
Multi-response possible
- If 26 is not specified, the default shaft version with key is provided.
If 62 is not specified, the default shaft diameter (11x23 with size 2) is provided.

- **Connector type:** 6 M23 motor connector, M23 Encoder/Resolver
9 M40 motor connector, M23 Encoder/Resolver
J Y-TEC M15 round connector with size 0 Y-TEC possible only
- If DSL encoders are used (W, Y), variant 6 with a single M23 round connector and variant 9 with a single M40 round connector are provided. (single-cable solution).
M40 motor connectors should be used for a continuous current larger than 20 A. Motors with an M40 connector are longer.
Y-TEC round connectors are available up to size 2 (continuous current < 10 A).

- **Encoder system:** 9 Resolver size 15 2p 7V 10KHz
W Sick encoder EKS36 17bit NO SIL, DSL
Y Sick encoder EKM36 17bit Multi-turn NO SIL, DSL
Z Sick encoder SKM36 Hipurface 128i PPT Multi-turn
- Motors with resolvers (9) have a different length than motors with encoders (W, Y, Z).
The DSL variants (W, Y) are for single-cable solutions.
The encoder system W, Y and Z are available by request with SIL2/SIL3 safety class.

DSM5-7 - Dimension in mm

| ENCODER | RESOLVER | | | HIPERFACE | | |
|---------------|----------|-----|-----|-----------|-----|-----|
| | LB | L01 | L03 | LB | L01 | L03 |
| Dimensions of | | | | | | |
| DSM5.71 | 261 | 214 | 47 | 261 | 214 | 47 |
| DSM5.71 brake | 314 | 267 | | 314 | 267 | |

SHAFT, dimension in mm

| | |
|----|--------|
| D | 48k6 |
| E | 82 |
| GL | 70 |
| GA | 51.5 |
| F | 14 |
| R | M16x25 |

Planetary Gears

Series PEII

The servomotors can be combined into compact coaxially constructed drive units using planetary gears from the PEII-series. The gears are built into the A side of the servomotor.

The gears assigned to the individual motors as well as the available i gear ratios for these motor gear combinations are listed in the selection tables. During selection, the maximum allowable input speed of the gear (equal to the maximum speed of the motor) must be considered.

PEII series



- Straight gearing
- Geometric 50/70/90/120/155 flange size
- Backlash to < 10 angular minutes
- High torsional stiffness

Standard Configuration:

IP65, lifetime lubrication, double center mounting

Options:

Food grease lubrication, low backlash classes, stainless steel motor adapter plates

Technical Data

| | Gear ratio | Stages | Nominal output torque | Emergency stop torque | Max. acceleration torque | Backlash | Torsional stiffness | Nominal input speed | Max. input speed | Running noise | Moment of inertia | Weight | Input shaft diameter |
|--|------------|--------|-----------------------|-----------------------|--------------------------|----------------------------|---------------------|---------------------|------------------|---------------|---------------------------|--------|--------------------------|
| | i | | T_{2N} (Nm) | T_{2stop} (Nm) | T_{2B} (Nm) | $\Delta\varphi 2$ (arcmin) | $C2$ (Nm/arcmin) | n_{1N} (rpm) | n_{1B} (rpm) | LPA (dB) | J (kg·cm ²) | kg | $\varnothing^{(A)}$ (mm) |

PEII 050

| | | | | | | | | | | | | |
|-----|---|----|----|------|------|-----|------|------|------|---------|-----|------|
| 3 | 1 | 16 | 48 | 28.8 | ≤ 8 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.7 | 8-14 |
| 4 | 1 | 16 | 48 | 28.8 | ≤ 8 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.7 | 8-14 |
| 5 | 1 | 15 | 45 | 27 | ≤ 8 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.7 | 8-14 |
| 7 | 1 | 12 | 36 | 21.6 | ≤ 8 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.7 | 8-14 |
| 10 | 1 | 10 | 30 | 18 | ≤ 8 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.7 | 8-14 |
| 15 | 2 | 15 | 45 | 27 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 16 | 2 | 16 | 48 | 28.8 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 20 | 2 | 16 | 48 | 28.8 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 25 | 2 | 15 | 45 | 27 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 30 | 2 | 15 | 45 | 27 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 35 | 2 | 12 | 36 | 21.6 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 40 | 2 | 16 | 48 | 28.8 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 50 | 2 | 15 | 45 | 27 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 70 | 2 | 12 | 36 | 21.6 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |
| 100 | 2 | 10 | 30 | 18 | ≤ 10 | 0.9 | 4500 | 8000 | ≤ 60 | 0.1-0.2 | 0.9 | 8-14 |

PEII 070

| | | | | | | | | | | | | |
|----|---|----|-----|------|-----|-----|------|------|------|----------|-----|------|
| 3 | 1 | 42 | 126 | 75.6 | ≤ 7 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 1.9 | 8-19 |
| 4 | 1 | 42 | 126 | 75.6 | ≤ 7 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 1.9 | 8-19 |
| 5 | 1 | 40 | 120 | 72 | ≤ 7 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 1.9 | 8-19 |
| 7 | 1 | 35 | 105 | 63 | ≤ 7 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 1.9 | 8-19 |
| 10 | 1 | 27 | 81 | 48.6 | ≤ 7 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 1.9 | 8-19 |
| 15 | 2 | 40 | 120 | 72 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| 16 | 2 | 42 | 126 | 75.6 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| 20 | 2 | 42 | 126 | 75.6 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| 25 | 2 | 40 | 120 | 72 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| 30 | 2 | 40 | 120 | 72 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| 35 | 2 | 35 | 105 | 63 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |

Technical Data

| | Gear ratio | Stages | Nominal output torque | Emergency stop torque | Max. acceleration torque | Backlash | Torsional stiffness | Nominal input speed | Max. input speed | Running noise | Moment of inertia | Weight | Input shaft diameter |
|--|------------|--------|-----------------------|-------------------------|--------------------------|--------------|---------------------|-----------------------|-----------------------|---------------|-------------------------|--------|-----------------------|
| | i | | T _{2N} (Nm) | T _{2stop} (Nm) | T _{2B} (Nm) | Δφ2 (arcmin) | C2 (Nm/arcmin) | n _{1N} (rpm) | n _{1B} (rpm) | LPA (dB) | J (kg·cm ²) | kg | Ø ^(A) (mm) |
| | 40 | 2 | 43 | 129 | 77.4 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| | 50 | 2 | 40 | 120 | 72 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| | 70 | 2 | 35 | 105 | 63 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |
| | 100 | 2 | 27 | 81 | 48.6 | ≤ 9 | 2.2 | 4000 | 6000 | ≤ 62 | 0.1-1.53 | 2.3 | 8-19 |

PEII 090

| | | | | | | | | | | | | | |
|--|-----|---|-----|-----|-------|-----|---|------|------|------|----------|-----|-------|
| | 3 | 1 | 110 | 330 | 198 | ≤ 6 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 3.4 | 14-28 |
| | 4 | 1 | 113 | 339 | 203.4 | ≤ 6 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 3.4 | 14-28 |
| | 5 | 1 | 118 | 354 | 212.4 | ≤ 6 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 3.4 | 14-28 |
| | 7 | 1 | 96 | 288 | 172.8 | ≤ 6 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 3.4 | 14-28 |
| | 10 | 1 | 68 | 204 | 122.4 | ≤ 6 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 3.4 | 14-28 |
| | 15 | 2 | 109 | 327 | 196.2 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 16 | 2 | 116 | 348 | 208.8 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 20 | 2 | 116 | 348 | 208.8 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 25 | 2 | 123 | 369 | 221.4 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 30 | 2 | 108 | 324 | 194.4 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 35 | 2 | 100 | 300 | 180 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 40 | 2 | 117 | 351 | 210.6 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 50 | 2 | 123 | 369 | 221.4 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 70 | 2 | 100 | 300 | 180 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |
| | 100 | 2 | 70 | 210 | 126 | ≤ 8 | 8 | 3600 | 6000 | ≤ 64 | 0.2-2.68 | 4.3 | 14-28 |

PEII 120

| | | | | | | | | | | | | | |
|--|----|---|-----|-----|-------|-----|----|------|------|------|--------|------|-------|
| | 3 | 1 | 217 | 651 | 390.6 | ≤ 6 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 11.8 | 19-38 |
| | 4 | 1 | 223 | 669 | 401.4 | ≤ 6 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 11.8 | 19-38 |
| | 5 | 1 | 220 | 660 | 396 | ≤ 6 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 11.8 | 19-38 |
| | 7 | 1 | 198 | 594 | 356.4 | ≤ 6 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 11.8 | 19-38 |
| | 10 | 1 | 155 | 465 | 279 | ≤ 6 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 11.8 | 19-38 |

Technical Data

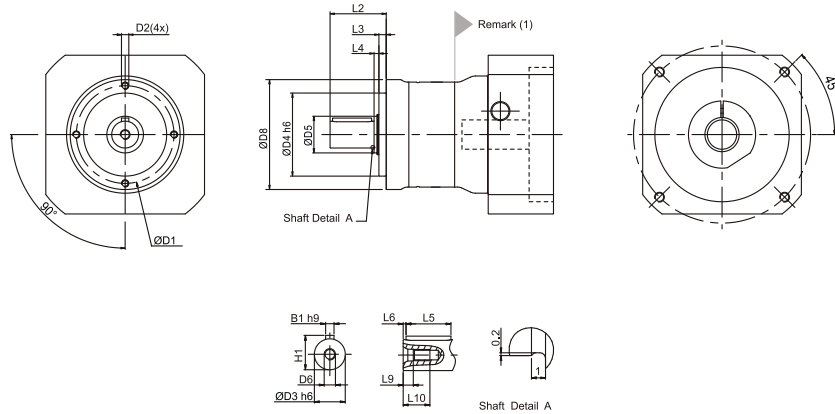
| | Gear ratio | Stages | Nominal output torque | Emergency stop torque | Max. acceleration torque | Backlash | Torsional stiffness | Nominal input speed | Max. input speed | Running noise | Moment of inertia | Weight | Input shaft diameter |
|--|------------|--------|-----------------------|-------------------------|--------------------------|--------------|---------------------|-----------------------|-----------------------|---------------|-------------------------|--------|-----------------------|
| | i | | T _{2N} (Nm) | T _{2stop} (Nm) | T _{2B} (Nm) | Δφ2 (arcmin) | C2 (Nm/arcmin) | n _{1N} (rpm) | n _{1B} (rpm) | LPA (dB) | J (kg·cm ²) | kg | Ø ^(A) (mm) |
| | 15 | 2 | 213 | 639 | 383.4 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 16 | 2 | 228 | 684 | 410.4 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 20 | 2 | 230 | 690 | 414 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 25 | 2 | 228 | 684 | 410.4 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 30 | 2 | 212 | 636 | 381.6 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 35 | 2 | 206 | 618 | 370.8 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 40 | 2 | 232 | 696 | 417.6 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 50 | 2 | 228 | 684 | 410.4 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 70 | 2 | 206 | 618 | 370.8 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |
| | 100 | 2 | 162 | 486 | 291.6 | ≤ 8 | 12 | 3600 | 4800 | ≤ 66 | 1.6-14 | 13.8 | 19-38 |

PEII 155

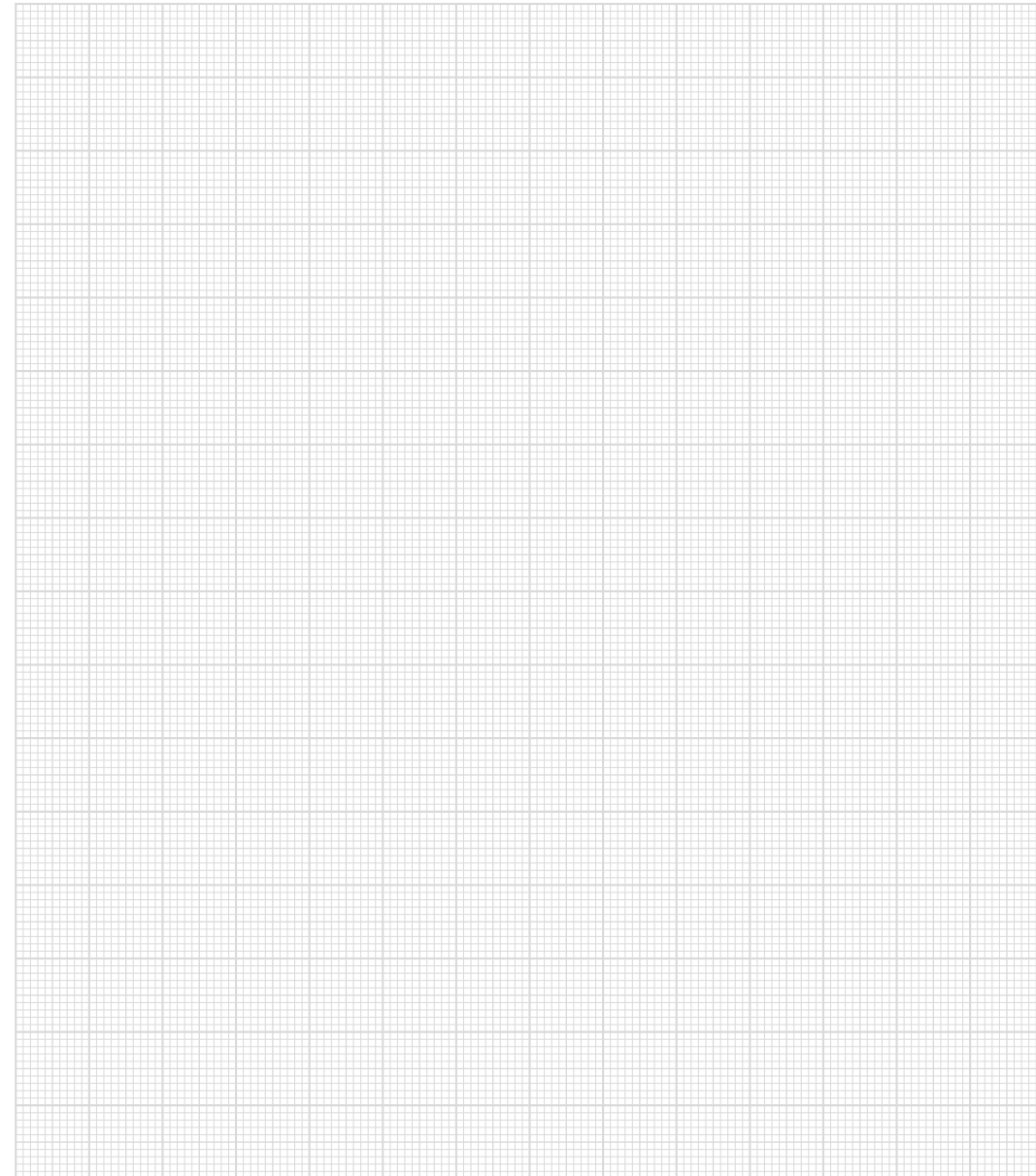
| | | | | | | | | | | | | | |
|--|-----|---|-----|------|-------|-----|----|------|------|------|-----------|------|-------|
| | 3 | 1 | 430 | 1290 | 774 | ≤ 6 | 16 | 2500 | 3600 | ≤ 68 | 2.23-24.5 | 16.5 | 24-42 |
| | 4 | 1 | 440 | 1320 | 792 | ≤ 6 | 16 | 2500 | 3600 | ≤ 68 | 2.23-24.5 | 16.5 | 24-42 |
| | 5 | 1 | 435 | 1305 | 783 | ≤ 6 | 16 | 2500 | 3600 | ≤ 68 | 2.23-24.5 | 16.5 | 24-42 |
| | 7 | 1 | 366 | 1098 | 658.8 | ≤ 6 | 16 | 2500 | 3600 | ≤ 68 | 2.23-24.5 | 16.5 | 24-42 |
| | 10 | 1 | 295 | 885 | 531 | ≤ 6 | 16 | 2500 | 3600 | ≤ 68 | 2.23-24.5 | 16.5 | 24-42 |
| | 15 | 2 | 424 | 1272 | 763.2 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 16 | 2 | 452 | 1356 | 813.6 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 20 | 2 | 454 | 1362 | 817.2 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 25 | 2 | 450 | 1350 | 810 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 30 | 2 | 422 | 1266 | 759.6 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 35 | 2 | 382 | 1146 | 687.6 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 40 | 2 | 459 | 1377 | 826.2 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 50 | 2 | 450 | 1350 | 810 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 70 | 2 | 382 | 1146 | 687.6 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |
| | 100 | 2 | 308 | 924 | 554.4 | ≤ 8 | 16 | 2500 | 3600 | ≤ 68 | 1.69-14.2 | 20.1 | 19-38 |

Planetary Gears Series PEII

Mechanical Dimensions



Notes



Mechanical Dimensions

| Dimension | PEII 050 | | PEII 070 | | PEII 090 | | PEII 120 | | PEII 155 | |
|------------------|----------|---------|----------|---------|----------|---------|-----------|---------|----------|---------|
| | 1-stage | 2-stage | 1-stage | 2-stage | 1-stage | 2-stage | 1-stage | 2-stage | 1-stage | 2-stage |
| D1 | 44 | | 62 | | 80 | | 108 | | 140 | |
| D2 | M4X9 | | M5X10 | | M6X12 | | M8X15 | | M10X18 | |
| D3 _{h6} | 12 | | 16 | | 22 | | 32 | | 40 | |
| D4 _{h6} | 35 | | 52 | | 68 | | 90 | | 120 | |
| D5 | 17 | | 22 | | 30 | | 40 | | 55 | |
| D6 | M4X0.7P | | M5X0.8P | | M8X1.25P | | M12X1.75P | | M16X2P | |
| D8 | 50 | | 70 | | 90 | | 120 | | 155 | |
| L2 | 24.5 | | 36 | | 46 | | 70 | | 97 | |
| L3 | 4 | | 4.5 | | 6 | | 7 | | 9.5 | |
| L4 | 2.5 | | 3.5 | | 4 | | 5 | | 5.5 | |
| L5 | 14 | | 25 | | 32 | | 50 | | 70 | |
| L6 | 2 | | 2 | | 2 | | 4 | | 6 | |
| L9 | 4.5 | | 4.8 | | 7.2 | | 10 | | 12 | |
| L10 | 10 | | 12.5 | | 19 | | 28 | | 36 | |
| B1 _{h9} | 4 | | 5 | | 6 | | 10 | | 12 | |
| H1 | 13.5 | | 18 | | 24.5 | | 35 | | 43 | |

Cable

Sensor Cables



For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.

Sensor Cables DC, SDD

Shielded, assembled on both sides, drag chain suitable, highly flexible (5 million bend cycles), with round connector on the motor and device connector

Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C

Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.5-4.0 mm²: 10 x D; from 4.0 mm²: 12 x D

| Article Number | Feedback systems used by the motor | Length | Outside Diameter |
|-------------------|------------------------------------|------------|------------------|
| F-R0-061-015-0-00 | Resolver | 1.5 meters | approx. 6.4 mm |
| F-R0-061-015-3-00 | Resolver | 1.5 meters | approx. 6.4 mm |
| F-R0-061-030-0-00 | Resolver | 3 meters | approx. 6.4 mm |
| F-R0-061-030-3-00 | Resolver | 3 meters | approx. 6.4 mm |
| F-R0-061-050-0-00 | Resolver | 5 meters | approx. 6.4 mm |
| F-R0-061-050-3-00 | Resolver | 5 meters | approx. 6.4 mm |
| F-R0-061-100-0-00 | Resolver | 10 meters | approx. 6.4 mm |
| F-R0-061-100-3-00 | Resolver | 10 meters | approx. 6.4 mm |

| | | | |
|-------------------|------------------|-----------|----------------|
| F-R0-300-010-0-00 | Resolver | 1 meter | approx. 6.4 mm |
| F-R0-300-020-0-00 | Resolver | 2 meters | approx. 6.4 mm |
| F-R0-300-030-0-00 | Resolver | 3 meters | approx. 6.4 mm |
| F-R0-300-040-0-00 | Resolver | 4 meters | approx. 6.4 mm |
| F-R0-300-050-0-00 | Resolver | 5 meters | approx. 6.4 mm |
| F-R0-300-100-0-00 | Resolver | 10 meters | approx. 6.4 mm |
| F-R0-300-150-0-00 | Resolver | 15 meters | approx. 6.4 mm |
| F-R0-300-200-0-00 | Resolver | 20 meters | approx. 6.4 mm |
| F-EE-300-010-0-00 | EnDat sensor | 1 meter | approx. 7.8 mm |
| F-EE-300-020-0-00 | EnDat sensor | 2 meters | approx. 7.8 mm |
| F-EE-300-030-0-00 | EnDat sensor | 3 meters | approx. 7.8 mm |
| F-EE-300-040-0-00 | EnDat sensor | 4 meters | approx. 7.8 mm |
| F-EE-300-050-0-00 | EnDat sensor | 5 meters | approx. 7.8 mm |
| F-EE-300-100-0-00 | EnDat sensor | 10 meters | approx. 7.8 mm |
| F-EE-300-150-0-00 | EnDat sensor | 15 meters | approx. 7.8 mm |
| F-EE-300-200-0-00 | EnDat sensor | 20 meters | approx. 7.8 mm |
| F-EH-300-010-0-00 | Hiperface sensor | 1 meter | approx. 7.8 mm |
| F-EH-300-020-0-00 | Hiperface sensor | 2 meters | approx. 7.8 mm |
| F-EH-300-030-0-00 | Hiperface sensor | 3 meters | approx. 7.8 mm |
| F-EH-300-040-0-00 | Hiperface sensor | 4 meters | approx. 7.8 mm |
| F-EH-300-050-0-00 | Hiperface sensor | 5 meters | approx. 7.8 mm |
| F-EH-300-100-0-00 | Hiperface sensor | 10 meters | approx. 7.8 mm |
| F-EH-300-150-0-00 | Hiperface sensor | 15 meters | approx. 7.8 mm |
| F-EH-300-200-0-00 | Hiperface sensor | 20 meters | approx. 7.8 mm |

Sensor Cables MDD 2000

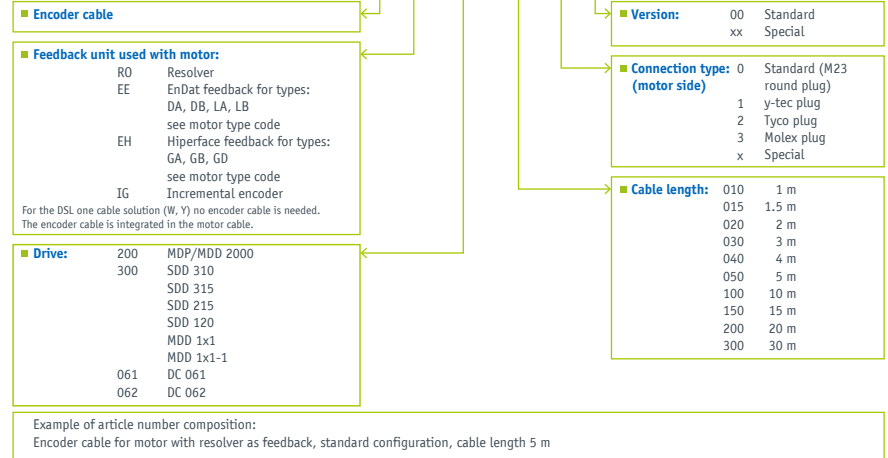
Shielded, assembled on both sides, drag chain suitable, highly flexible (10 million bend cycles), with round connector on the motor and device connector

Temperature range: moving: -20 ... +60 °C/stationary: -50 ... +80 °C

Minimum bend radius: permanent wiring: 4 x D/flexible use: 8 x D

| Article Number | Feedback systems used by the motor | Length | Outside Diameters |
|-------------------|------------------------------------|-----------|-------------------|
| F-RO-200-010-0-00 | Resolver | 1 meters | approx. 6.4 mm |
| F-RO-200-020-0-00 | Resolver | 2 meters | approx. 6.4 mm |
| F-RO-200-030-0-00 | Resolver | 3 meters | approx. 6.4 mm |
| F-RO-200-040-0-00 | Resolver | 4 meters | approx. 6.4 mm |
| F-RO-200-050-0-00 | Resolver | 5 meters | approx. 6.4 mm |
| F-RO-200-100-0-00 | Resolver | 10 meters | approx. 6.4 mm |
| F-RO-200-150-0-00 | Resolver | 15 meters | approx. 6.4 mm |
| F-RO-200-200-0-00 | Resolver | 20 meters | approx. 6.4 mm |
| F-RO-200-300-0-00 | Resolver | 30 meters | approx. 6.4 mm |
| | | | |
| F-EE-200-010-0-00 | EnDat Geber | 1 meters | approx. 7.8 mm |
| F-EE-200-020-0-00 | EnDat Geber | 2 meters | approx. 7.8 mm |
| F-EE-200-030-0-00 | EnDat Geber | 3 meters | approx. 7.8 mm |
| F-EE-200-040-0-00 | EnDat Geber | 4 meters | approx. 7.8 mm |
| F-EE-200-050-0-00 | EnDat Geber | 5 meters | approx. 7.8 mm |
| F-EE-200-100-0-00 | EnDat Geber | 10 meters | approx. 7.8 mm |
| F-EE-200-150-0-00 | EnDat Geber | 15 meters | approx. 7.8 mm |
| F-EE-200-200-0-00 | EnDat Geber | 20 meters | approx. 7.8 mm |
| F-EE-200-300-0-00 | EnDat Geber | 30 meters | approx. 7.8 mm |
| | | | |
| F-EH-200-010-0-00 | Hiperface | 1 meters | approx. 7.8 mm |
| F-EH-200-020-0-00 | Hiperface | 2 meters | approx. 7.8 mm |
| F-EH-200-030-0-00 | Hiperface | 3 meters | approx. 7.8 mm |
| F-EH-200-040-0-00 | Hiperface | 4 meters | approx. 7.8 mm |
| F-EH-200-050-0-00 | Hiperface | 5 meters | approx. 7.8 mm |
| F-EH-200-100-0-00 | Hiperface | 10 meters | approx. 7.8 mm |
| F-EH-200-150-0-00 | Hiperface | 15 meters | approx. 7.8 mm |
| F-EH-200-200-0-00 | Hiperface | 20 meters | approx. 7.8 mm |
| F-EH-200-300-0-00 | Hiperface | 30 meters | approx. 7.8 mm |

F-RO-200-050-0-00



Cable

Motor Cable MDD 2000

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.



Motor Cable without Hiperface DSL

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
 Temperature range: moving: -40 ... +90 °C (UL: +80 °C)/stationary: -50 ... +90 °C (UL: +80 °C)
 Minimum bend radius: permanent wiring: 4 x D/flexible use: ≤ 16 mm²; from 7.5 x D

| Article Number | Brake | Length | Cable Diameter | Outside Diameter |
|---------------------|-------|-----------|---|------------------|
| M200B-15-1-010-0-00 | X | 1 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-020-0-00 | X | 2 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-030-0-00 | X | 3 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-040-0-00 | X | 4 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-050-0-00 | X | 5 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-100-0-00 | X | 10 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-150-0-00 | X | 15 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-200-0-00 | X | 20 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |
| M200B-15-1-300-0-00 | X | 30 meters | 4x1.5 mm ² + 2x0.5 mm ² | 12 mm |

Motor Cable with Hiperface DSL

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector
 Temperature range: moving: -40 ... +90 °C (UL: +80 °C)/stationary: -50 ... +90 °C (UL: +80 °C)
 Minimum bend radius: permanent wiring: 5 x D/flexible use: 7.5 x D

| Article Number | Brake | Length | Cable Diameter | Outside Diameter |
|---------------------|-------|-----------|--|------------------|
| M200B-15-0-010-0-02 | | 1 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-020-0-02 | | 2 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-030-0-02 | | 3 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-040-0-02 | | 4 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-050-0-02 | | 5 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-100-0-02 | | 10 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-150-0-02 | | 15 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-200-0-02 | | 20 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-0-300-0-02 | | 30 meters | 4x1.5 mm ² + 2x22 AWG | 11.2 mm |
| M200B-15-1-010-0-02 | X | 1 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-020-0-02 | X | 2 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-030-0-02 | X | 3 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-040-0-02 | X | 4 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-050-0-02 | X | 5 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-100-0-02 | X | 10 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-150-0-02 | X | 15 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-200-0-02 | X | 20 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |
| M200B-15-1-300-0-02 | X | 30 meters | 4x1.5 mm ² + 2x1.0 mm ² + 2x22 AWG | 13.2 mm |

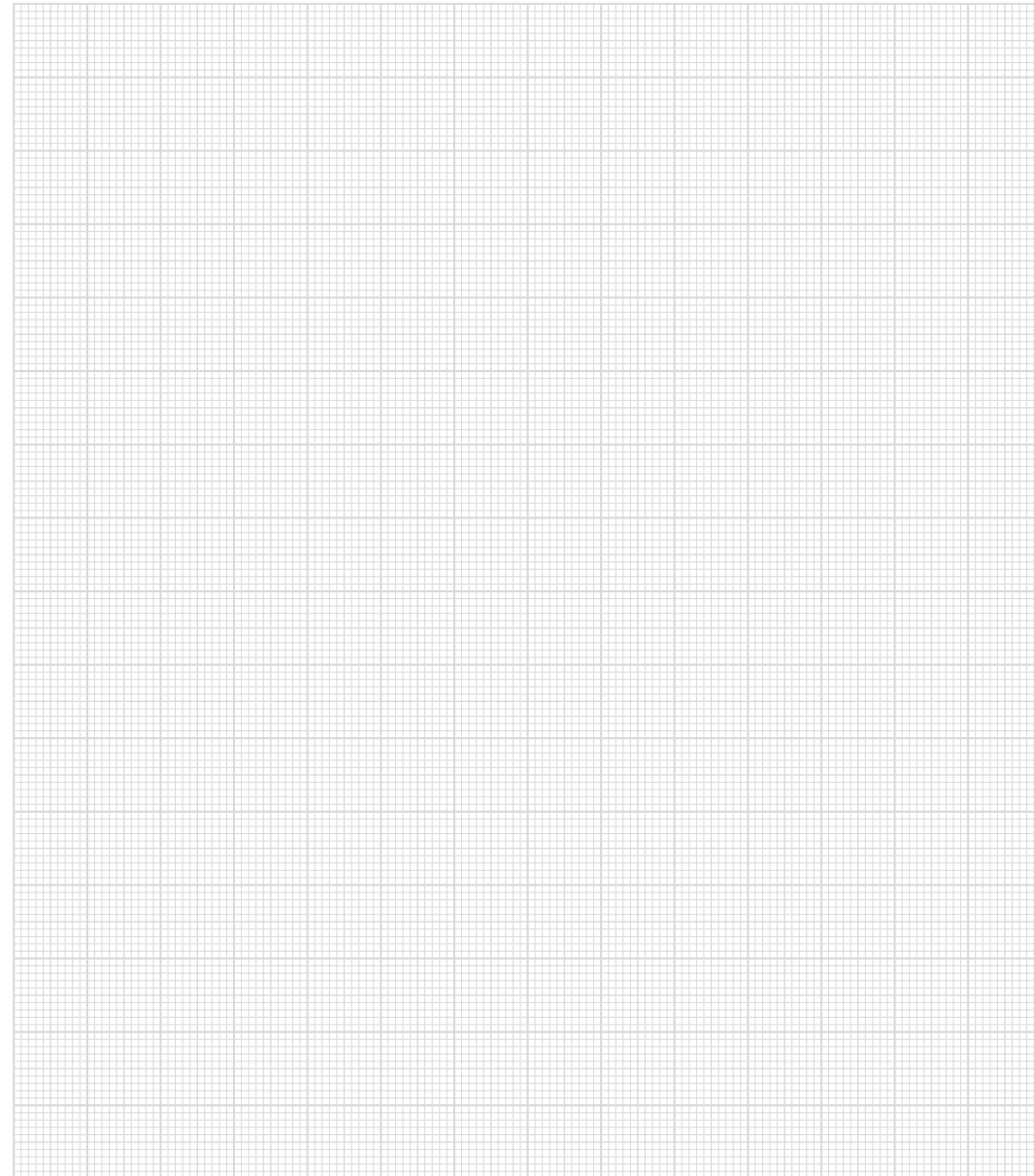
M 200 B-15-0-050-0-00

| | |
|---|--|
| Motor cable | |
| Drive: | 200 MDP/MDD 2000 310 SDD 310 SDD 315 SDD 215 SDD 120 100 MDD 111 MDD121 101 MDD 111-1 MDD 121-1 061 DC 061-1 062 DC 062 |
| Assembly: | B both sides *E one-sided *with y-tec only one side is possible |
| Cable cross section: | *10 1.0 mm ² 15 1.5 mm ² 25 2.5 mm ² 40 4.0 mm ² *with DC and MDD 10X, only 10 possible |
| Version: | 00 Standard 01 drive type 310 only without shield plate *02 Hiperface DSL (only Drive type 200) 03 Motor thermostat (only Drive type 200) x Special *for encoder types W and Y |
| Connction type: (motor side) | 0 Standard (M23 round plug) 1 y-tec plug 2 Tyco plug 3 Molex plug 4 M40 Round connectors x Special |
| Cable length: | *010 1 m **015 1.5 m *020 2 m * *030 3 m *040 4 m 050 5 m 100 10 m 150 15 m 200 20 m 300 30 m *possible for MDD only **possible for DC only |
| Brake:* | 0 no brake 1 brake (+2x0.5 mm ²) *only MDD with brake |

Example of article number composition:

Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², withou brake, cable length 5 m, Standard configuration

Notes



Cable

Motor Cable SDD 310/315/335/215/120

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.



Motor Cable

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector

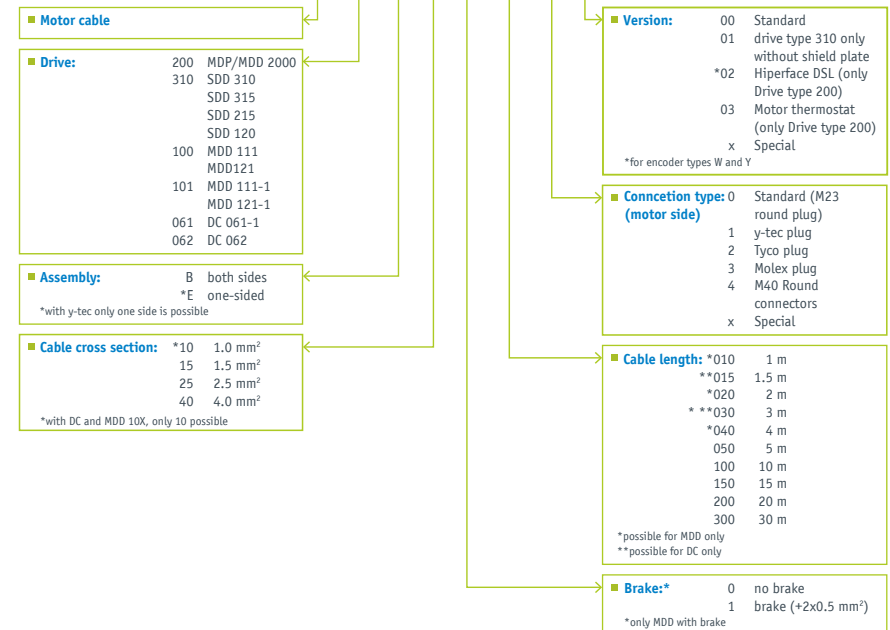
Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C

Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.0-4.0 mm²: 10 x D; from 4.0 mm²: 12 x D

| Article Number | Brake | Length | Cable Diameter | Outside Diameter |
|---------------------|-------|-----------|---------------------|------------------|
| M310B-10-1-050-0-00 | X | 5 meters | 1.0 mm ² | 10 mm |
| M310B-10-1-100-0-00 | X | 10 meters | 1.0 mm ² | 10 mm |
| M310B-10-1-150-0-00 | X | 15 meters | 1.0 mm ² | 10 mm |
| M310B-10-1-200-0-00 | X | 20 meters | 1.0 mm ² | 10 mm |
| M310B-15-0-050-0-00 | | 5 meters | 1.5 mm ² | 9.1 ± 0.4 mm |
| M310B-15-0-100-0-00 | | 10 meters | 1.5 mm ² | 9.1 ± 0.4 mm |
| M310B-15-0-150-0-00 | | 15 meters | 1.5 mm ² | 9.1 ± 0.4 mm |
| M310B-15-0-200-0-00 | | 20 meters | 1.5 mm ² | 9.1 ± 0.4 mm |

| | | | | |
|---------------------|---|-----------|---------------------|---------------|
| M310B-15-1-050-0-00 | X | 5 meters | 1.5 mm ² | 11.5 mm |
| M310B-15-1-100-0-00 | X | 10 meters | 1.5 mm ² | 11.5 mm |
| M310B-15-1-150-0-00 | X | 15 meters | 1.5 mm ² | 11.5 mm |
| M310B-15-1-200-0-00 | X | 20 meters | 1.5 mm ² | 11.5 mm |
| M310B-25-0-050-0-00 | | 5 meters | 2.5 mm ² | 10.6 ± 0.4 mm |
| M310B-25-0-100-0-00 | | 10 meters | 2.5 mm ² | 10.6 ± 0.4 mm |
| M310B-25-0-150-0-00 | | 15 meters | 2.5 mm ² | 10.6 ± 0.4 mm |
| M310B-25-0-200-0-00 | | 20 meters | 2.5 mm ² | 10.6 ± 0.4 mm |
| M310B-25-1-050-0-00 | X | 5 meters | 2.5 mm ² | 13.2 mm |
| M310B-25-1-100-0-00 | X | 10 meters | 2.5 mm ² | 13.2 mm |
| M310B-25-1-150-0-00 | X | 15 meters | 2.5 mm ² | 13.2 mm |
| M310B-25-1-200-0-00 | X | 20 meters | 2.5 mm ² | 13.2 mm |

M 200 B-15-0-050-0-00



Example of article number composition:

Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², withou brake, cable length 5 m, Standard configuration

Cable

Motor Cable MDD 100 and DC 061-1/062

For the power connection, prefabricated shielded motor cables with plugs as well as connectors for the DIAS drive are used; all cables can also be used as drag cables.

The technical data is based on moving applications of the cable with a life span of 5 million bend cycles.



Motor Cable MDD 100

For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector

Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C

Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.0-4.0 mm²: 10 x D; from 4.0 mm²: 12 x D

| Article Number | Length | Cable Diameter | Outside Diameter |
|---------------------|-----------|---|------------------|
| M101B-10-1-010-0-00 | 1 meter | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-020-0-00 | 2 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-030-0-00 | 3 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-040-0-00 | 4 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-050-0-00 | 5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-100-0-00 | 10 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-150-0-00 | 15 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-200-0-00 | 20 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M101B-10-1-250-0-00 | 25 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |

Motor Cable DC 061-1/062

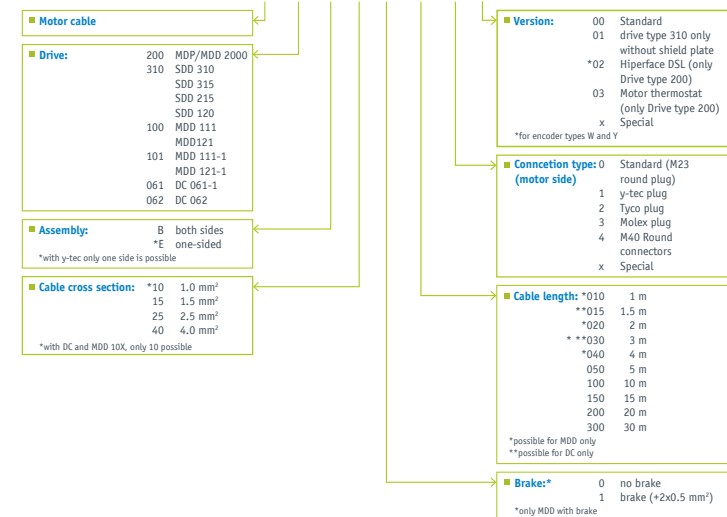
For motors **with/without holding brakes**, shielded, double-side assembled, drag chain suitable, highly flexible (5 million bend cycles), with round plug on the motor side and module connector

Temperature range: moving: -10 ... +60 °C/stationary: -50 ... +80 °C

Minimum bend radius: permanent wiring: 7.5 x D/flexible use: 1.5 mm²-4.0 mm²: 10 x D from 4.0 mm²: 12 x D

| Article Number | Brake | Length | Cable Diameter | Outside Diameter |
|--------------------|-------|------------|---|------------------|
| M061E-10-0-015-0-0 | | 1.5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-015-3-0 | | 1.5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-030-0-0 | | 3 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-030-3-0 | | 3 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-050-0-0 | | 5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-050-3-0 | | 5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-100-0-0 | | 10 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-0-100-3-0 | | 10 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-015-0-0 | X | 1.5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-015-3-0 | X | 1.5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-030-0-0 | X | 3 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-030-3-0 | X | 3 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-050-0-0 | X | 5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-050-3-0 | X | 5 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-100-0-0 | X | 10 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |
| M061E-10-1-100-3-0 | X | 10 meters | 4x1 mm ² + 2x0.5 mm ² | 10 mm |

M 200 B-15-0-050-0-00

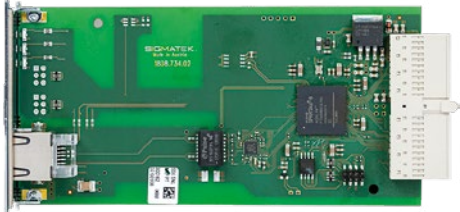


Example of article number composition:
Motor cable for MDD type 2000, assembled on both sides, wire cross section 1.5 mm², without brake, cable length 5 m, Standard configuration

VARAN Baumüller Interface

VBI 021

This interface card serves as the communication between a Baumüller server amplifier (b maXX - 4000 series) and control over the VARAN bus.



Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Performance Data

| | | |
|-----------------|---|--|
| Internal memory | serial Flash ((W25Q80)) | |
| Interfaces | 1x VARAN bus 1x „BACI“ bus | |
| LEDs | 1x PLL sync. (green) 1x DCOK (green) 1x Error (red) | |

Electrical Requirements

| | | |
|---------------------------------------|---|----------------|
| Supply voltage „BACI“ | typically +5 V DC (provided by the converter) | |
| Current consumption of voltage supply | typically 170 mA | maximum 400 mA |

Article Number and Miscellaneous

| | | |
|------------------|------------|--|
| Article number | 16-071-021 | |
| Hardware version | 3.x | |

VARAN-KEB-F5 INTERFACE VKI 021



This VARAN interface card is used for communication between the KEB-F5 servo and frequency converter and the VARAN control.

Communication is established over a DUAL-PORT RAM.

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Performance Data

| | | |
|--------------------|--|--|
| Interfaces | HSP5 (RS232 for frequency converter): D-SUB plug 9-pin (incl. +24 V DC supply) HSP5 (diagnostic): 8-pin RJ45 socket VARAN bus: 1x RJ45 Connector with LEDs | |
| Xilinx | XC3S250E FT256 | |
| Temperature sensor | MAX6575 | |
| 1-Mbit Flash | AT25F1024 | |

Electrical Requirements

| | | |
|---------------------------------------|--|----------------|
| Supply voltage | +24 V DC (provided by the frequency inverter) | |
| Current consumption of voltage supply | typically 40 mA | maximum 100 mA |

Article Number and Miscellaneous

| | | |
|------------------|--------------|--|
| Article number | 16-061-021 | |
| Hardware version | 1.x | |
| Standard | UL (E247993) | |

VARAN-KEB-F5 INTERFACE

VKI 022



This VARAN interface card is used for communication between the KEB-F5 servo and frequency converter and the VARAN control.

A VARAN bus splitter function is integrated.

Communication is established over a DUAL-PORT RAM.

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

General

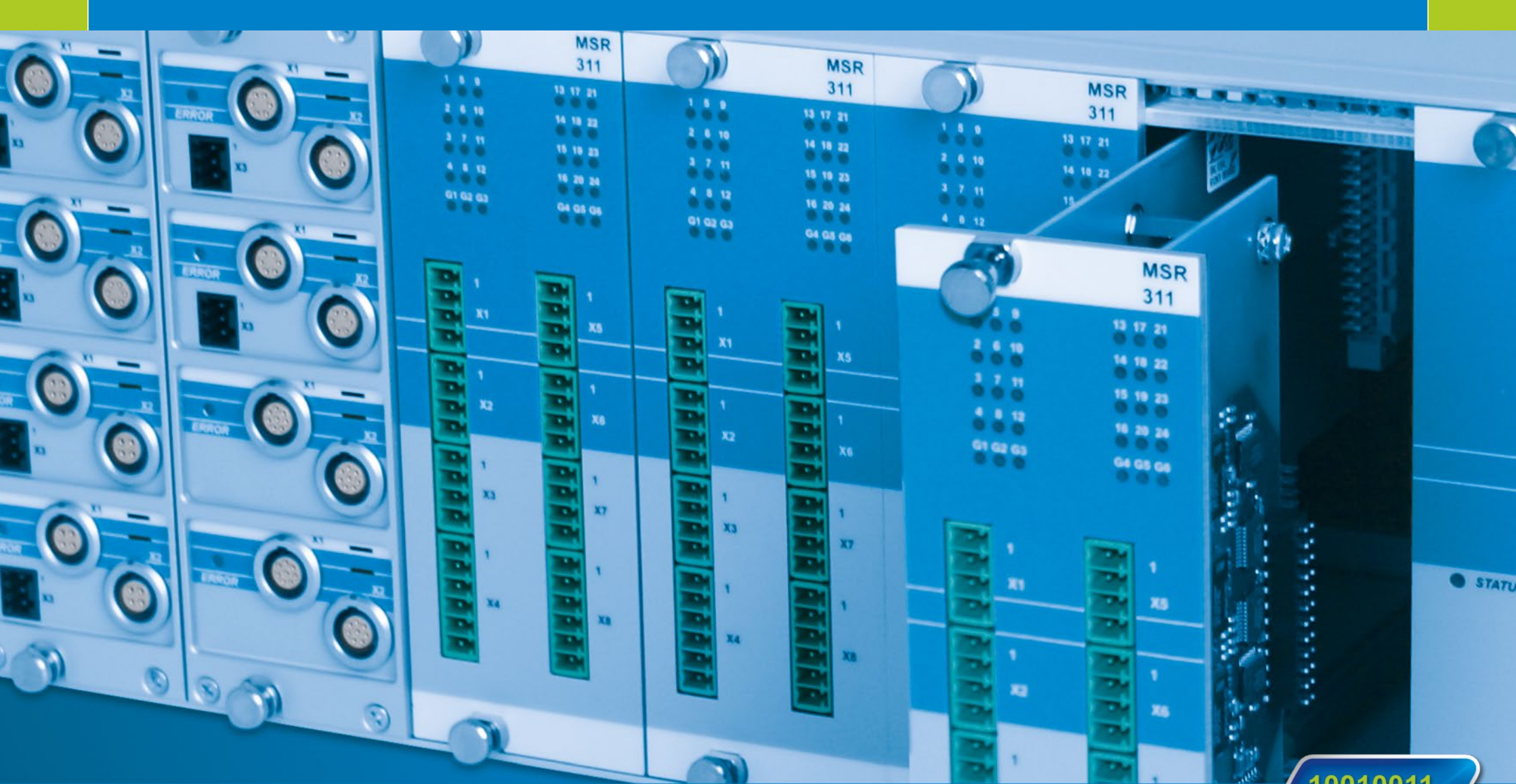
| | | |
|--------------|--|--|
| Interfaces | HSP5 (RS232 for frequency converter): DSUB plug 9-pin (incl. +24 V DC supply) HSP5 (diagnostic): 8-pin RJ45 socket 2x VARAN bus (distributor function): 2x RJ45 connector with LEDs | |
| Xilinx | XC3S250E CP132 | |
| 4-Mbit Flash | M25P40 | |

Electrical Requirements

| | | |
|---------------------------------------|---|----------------|
| Supply voltage | +24 V DC (provided by the frequency converter) | |
| Current consumption of voltage supply | typically 65 mA | maximum 100 mA |

Article Number and Miscellaneous

| | | |
|------------------|--------------|--|
| Article number | 16-061-022 | |
| Hardware version | 1.x | |
| Standard | UL (E247993) | |



MSR System



MSR System

Through its modularity, the innovative MSR system from SIGMATEK is optimally suited for the most varied tasks in measuring and regulation technology. The measured values can be collected decentrally close to the sensors and transmitted over the VARAN Ethernet bus system with the highest data security.

The module carrier in 19" format with 3 RU can have up to 8 base modules mounted, each of which can be equipped with 24 digital channels or 8 analog channels. A flexible configuration is therefore produced, with up to 192 digital or 64 analog I/Os. The conversion time is 25 μ s per channel (40 kHz). As the CPU, a Compact-IPC can be used.

All measurement values in the entire system can be recorded and processed with the highest synchronously and possible data security using VARAN. The isochronous cycle time of the system is 200 μ s.

MSR System

Module Carrier

Interface Module

Fan Module

Analog Measuring Module

Digital Measuring Module



Module Carrier MSR 111



The measuring system is used to record analog and digital measurement values. The connection to the C-IPC is made over the VARAN bus directly to the module carrier. The module carrier connects the eight modules with an LVDS bus (one LVDS connection per module). Up to eight modules can be operated per module carrier. To connect the VARAN and power plugs on the same plane as the Lemo-plug, an interface module is available. On the front side of the module carrier is a diagnostic connector for each module socket, which tests the function of the module. To dissipate the waste heat generated, the MSR 131 fan module can be integrated. This fan module is mounted on a circuit board and can therefore be exchanged.

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|--|
| Interfaces | 8x LVDS bus (with distributor function) 1x interface module (for VARAN In, VARAN Out and supply) 1x fan module |
|------------|--|

Electrical Requirements

| | |
|---------------------------------------|--|
| Supply voltage | 18-30 V DC |
| Current consumption of voltage supply | the current consumption is dependent on the connected loads maximum 9 A |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-111 |
| Hardware version | 1.x |

Interface Module MSR 121



With this module, the VARAN bus and the power plug are connected to the front panel. In addition, the interface module has an inrush current limiter. To avoid misplugging, a DIN connector (connection to the module carrier) is offset from I/O base or fan module.

The VARAN Out port allows the construction of the VARAN bus in a line structure.

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|------------|---|
| Interfaces | 1x VARAN In (RJ45) 1x VARAN Out (RJ45) |
|------------|---|

Electrical Requirements

| | |
|---------------------------------------|---|
| Supply voltage | 18-30 V DC |
| Current consumption of voltage supply | the current consumption is dependent on the connected loads. CAUTION: the maximum current is 9 A! |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-121 |
| Hardware version | 1.x |

Fan Module

MSR 131



The fan module is an exchangeable unit. Here, a radial fan is mounted on a circuit board. The side intake air is distributed through an air duct in the 19" housing. The fan is activated over the module carrier. To avoid misplugging, a DIN connector (connection to the module carrier) is offset from I/O base or interface module.

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Performance Data

| | |
|-------------------|---------------------------|
| Type | side intake DC radial fan |
| Nominal voltage | 24 V |
| Rotation speed | 4400 min ⁻¹ |
| Speed signal | yes |
| Volume flow | 28 m ³ /h |
| Lifespan at 40 °C | 60.000 h |
| Lifespan at 70 °C | 30.000 h |

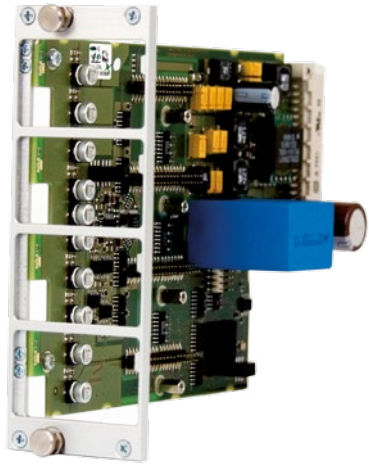
Consumables

| | |
|------------|---|
| Filter mat | 65 mm x 65 mm type P12-150B (1.6 m ² , RS order number 229-251) |
|------------|---|

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-131 |
| Hardware version | 1.x |

Base Module MSR 211



The base module serves as the interface for the insert modules. The base module serves as the interface for the insertable modules; it is addressed over the LVDS bus. In the base module, galvanic isolation is implemented for the analog modules.

There is no galvanic isolation between the analog channels of a base (the 8B module is an exception). The base module has space for a maximum of 4 insertable modules. The ± 5 V analog input signals are converted with the 18-bit converter in the base module.

The base module provides a short-circuit proof, galvanically isolated 24 V supply voltage for the AI, AO and 8B modules. This voltage can be shut off and has a 100 mA load capacity per channel.

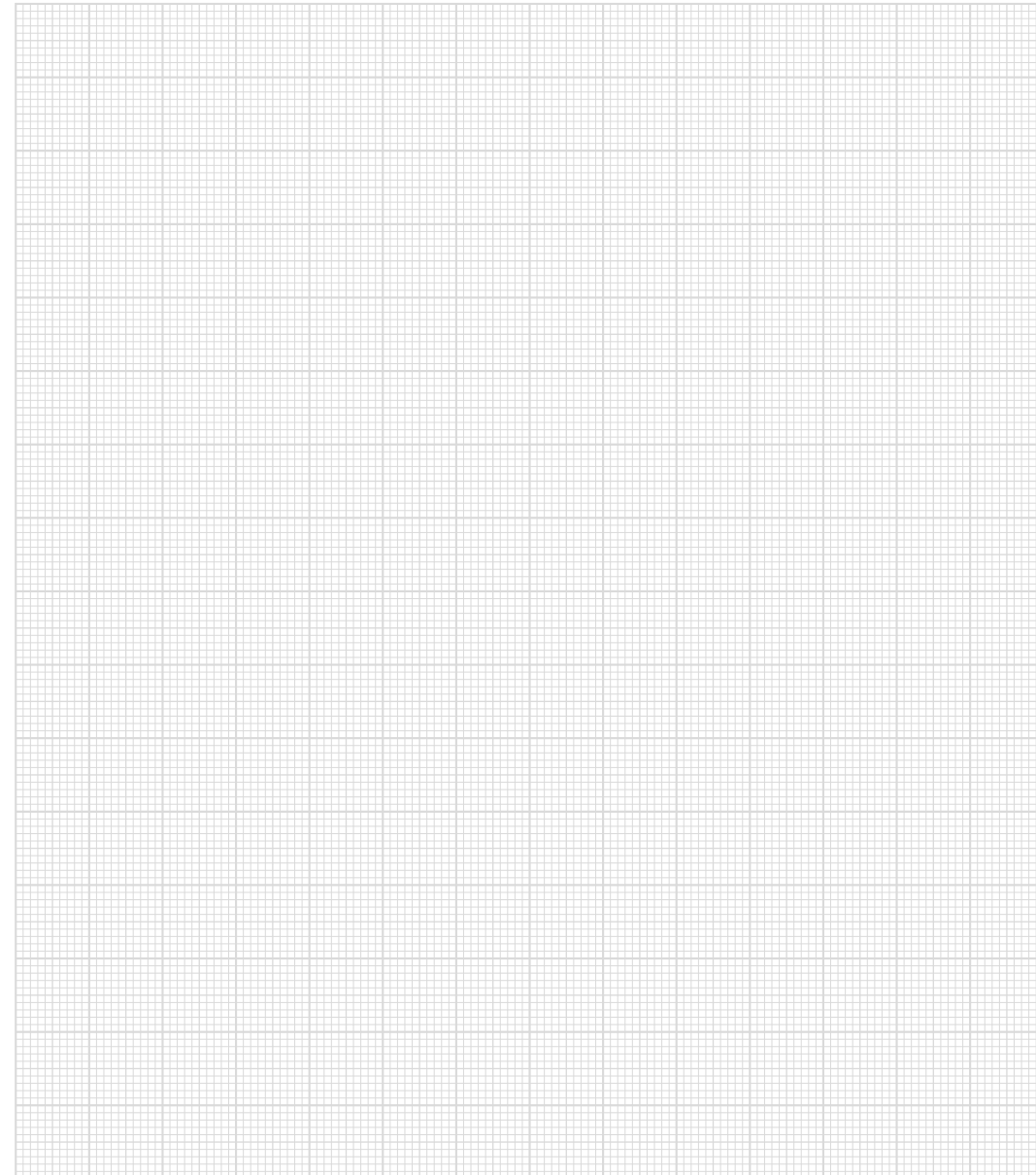
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-211 |
| Hardware version | 1.x |

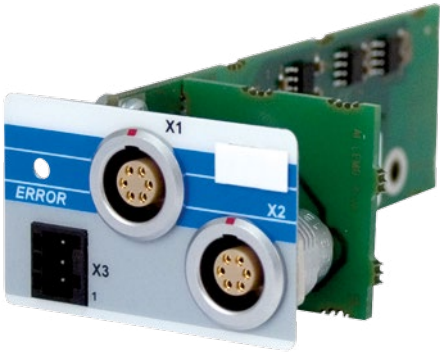
Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Notes



AI Insetable Module MSR 221



This analog input module is used to record voltages in the range of ± 10 V. The module has two channels, each with a short-circuit proof reference voltage of 10 V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the processed input signals can be measured. The signal in the diagnostic connectors can only be used for diagnostic purposes and cannot be calibrated.

Analog Channel Specifications

| | |
|---|--|
| Number of channels | 2 |
| Measurement range [Volt] | ± 10 V |
| Measurement range [Digit] | -100.000 ... +100.000 in 0.1 mV increments an open input returns 999.999 (sensor break detection) |
| Resolution [Volt] | 333.3 μ V/LSB |
| Resolution [bits] | 16 |
| Sensor break detection | 10 M Ω between AI- and -15 V 10 M Ω between AI+ and +15 V |
| Conversion time per channel | ≤ 25 μ s |
| Common mode range | ± 12 V |
| Input resistance | > 1 M Ω |
| Analog channel accuracy from end value 0 °C ... 60 °C | typically ± 0.0205 % |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit serial SAR |
| Galvanic isolation | 500 V DC |

Analog Channel Accuracy

| | | |
|---|---|--|
| Integral non-linearity error | typically ± 0.006 % | maximum ± 0.01 % |
| Noise voltage | typically ± 0.01 % ≈ 300 μ V rms | maximum ± 0.015 % ≈ 450 μ V rms |
| Temperature drift 0 ... +60 °C | typically ± 0.002 % | maximum ± 0.01 % |
| Cross talk from previous channel -10 ... +10 V | typically ± 0.0025 % | maximum ± 0.0035 % |
| Total error | typically ± 0.0205 % | maximum ± 0.0385 % |
| Long-term drift 1000 h | typically ± 0.006 % | |

Reference Output

| | | |
|---|--|----------------------|
| Rated voltage 25 °C | +10,000 V | |
| Initial accuracy 25 °C | typically ± 0.01 % | maximum ± 0.05 % |
| Temperature drift 0 ... +60 °C | typically ± 0.01 % | maximum ± 0.03 % |
| Total error 0 ... +60 °C | typically ± 0.02 % | maximum ± 0.08 % |
| Additional error with load 0 ... 1 mA 0 ... 10 mA | typically ± 0.001 % typically ± 0.015 % | |
| Long-term drift 1000 h | typically ± 0.005 % | |
| Maximum load (per channel) | 10 mA short-circuit proof | |

Supply Voltage 0 ... +60 °C

| | |
|---------------------------|---------------------------------------|
| Output voltage | +23.343 V ... 24.330 V ... 25.127 V |
| Output current/channel | maximum 100 mA short-circuit proof |
| Total current/base module | maximum 800 mA |
| Galvanic isolation | 500 V DC |

Diagnostic Connector

| | |
|---------------------|-----------|
| Voltage range | ± 5 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

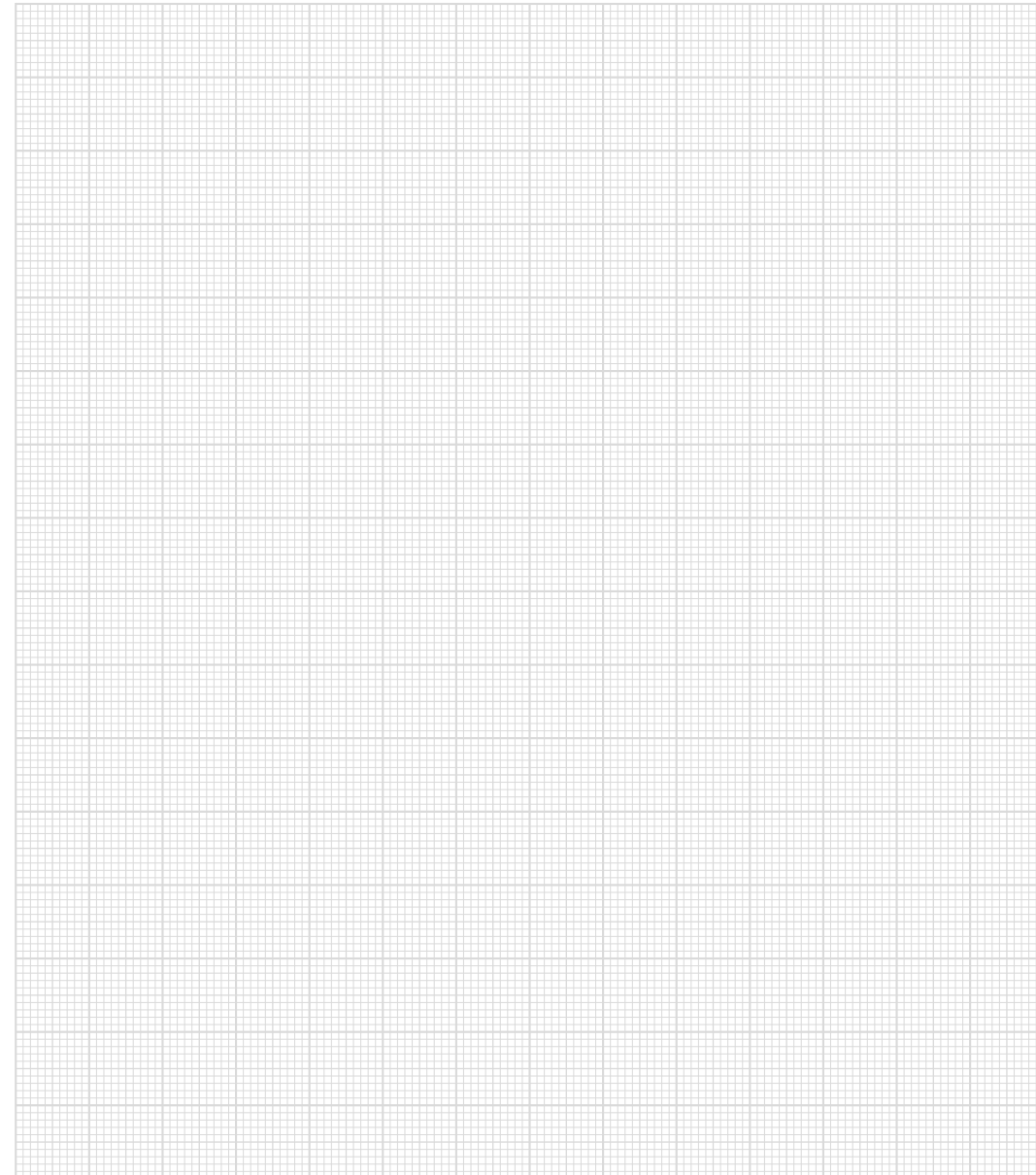
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-221 |
| Hardware version | 2.x |

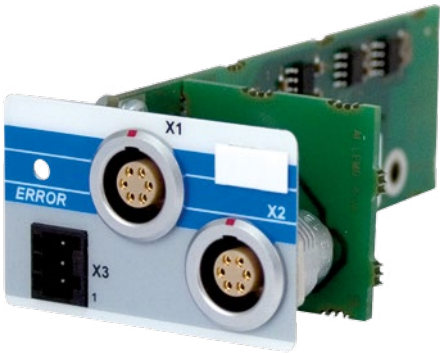
Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Notes



AI Insetable Module MSR 222



This analog insert module is used to detect currents from 0 to 20 mA. The module has two channels, each with a short-circuit proof reference voltage of 10 V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the processed input signals are measured (0...20 mA \approx 0...5 V). The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

| | |
|--|---------------------------------------|
| Number of channels | 2 |
| Measurement range [mA] | 0 ... 20 mA |
| Measurement range [Digit] | 0...200,000 in 0.1 μ A increments |
| Resolution [Ampere] | 666.7 nA/LSB |
| Resolution [Bit] | 16 |
| Sensor break detection | using a measurement of 4 ... 20 mA |
| Conversion time per channel | \leq 25 μ s |
| Common mode range | \pm 12 V |
| Shunt resistor | typically 50 Ω |
| Analog channel accuracy from end value 0 ... 60 $^{\circ}$ C | typically \pm 0.027 % |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit serial SAR |
| Galvanic isolation | 500 V DC |

Analog Channel Accuracy

| | | |
|---|--|--|
| Integral non-linearity error | typically \pm 0.006 % | maximum \pm 0.01 % |
| Noise | typically \pm 0.01 % | maximum \pm 0.015 % |
| Temperature input 0 ... 40 $^{\circ}$ C 0 ... 60 $^{\circ}$ C | typically \pm 0.004 % typically \pm 0.01 % | maximum \pm 0.02 % maximum \pm 0.03 % |
| Cross talk from previous channel 0 ... 20 mA | typically \pm 0.001 % | maximum \pm 0.002 % |
| Total error 0 ... 40 $^{\circ}$ C 0 ... 60 $^{\circ}$ C | typically \pm 0.021 % typically \pm 0.027 % | maximum \pm 0.047 % maximum \pm 0.057 % |
| Long-term drift 1000 h | typically \pm 0.006 % | |

Reference Output

| | | |
|---|--|----------------------|
| Rated voltage 25 $^{\circ}$ C | +10,000 V | |
| Accuracy 25 $^{\circ}$ C | typically \pm 0.01 % | maximum \pm 0.05 % |
| Temperature input 0 ... +60 $^{\circ}$ C | typically \pm 0.01 % | maximum \pm 0.03 % |
| Total error 0 ... +60 $^{\circ}$ C | typically \pm 0.02 % | maximum \pm 0.08 % |
| Additional error with load 0 ... 1 mA 0 ... 10 mA | typically \pm 0.001 % typically \pm 0.015 % | |
| Long-term drift 1000 h | typically \pm 0.005 % | |
| Maximum load (per channel) | 10 mA short-circuit proof | |

Supply Voltage 0 ... +60 $^{\circ}$ C

| | |
|---------------------------|---------------------------------------|
| Output voltage | +23.343 V ... 24.330 V ... 25.127 V |
| Output current/channel | maximum 100 mA short-circuit proof |
| Total current/base module | maximum 800 mA |
| Galvanic isolation | 500 V DC |

Diagnostic Connector

| | |
|---------------------|--------------------------------|
| Voltage range | 0...5 V (\approx 0...20 mA) |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

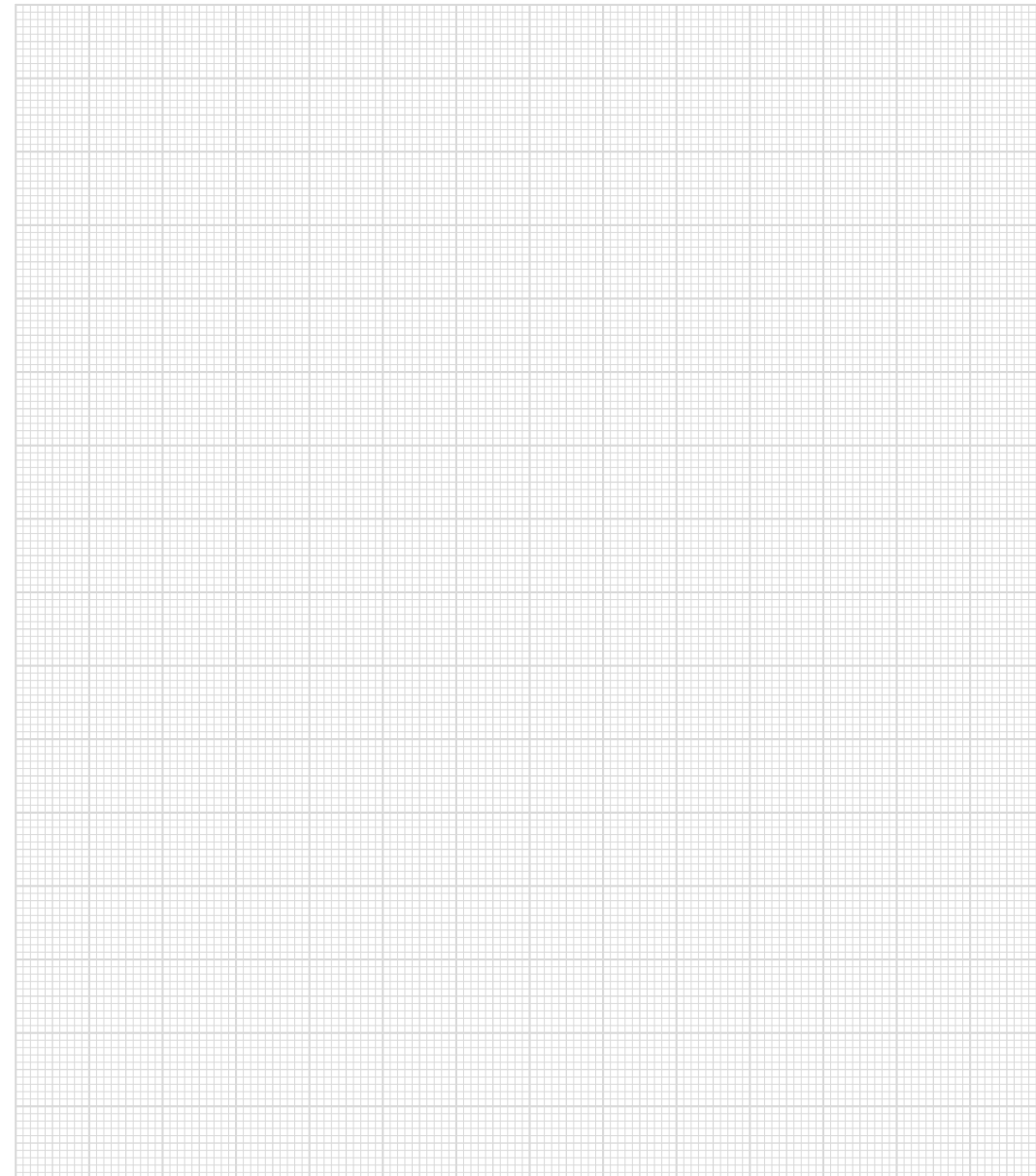
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-222 |
| Hardware version | 2.x |

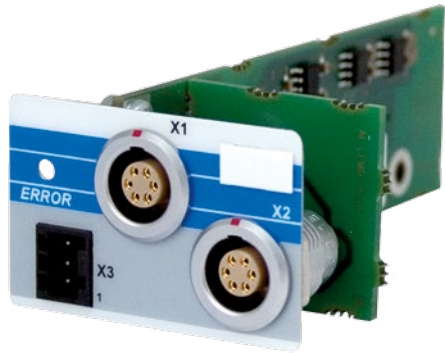
Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Notes



AI-Einsteckmodul MSR 223



This analog insert module is used to detect temperatures in the range of $-200 \dots +250 \text{ }^\circ\text{C}$ ($-328 \dots +482 \text{ }^\circ\text{F}$). A Pt100 resistance thermometer is used as the temperature sensor in a 2 or 4-wire configuration. The module has two channels. Additionally, each channel has a switchable 24 V supply voltage.

On the diagnostic connector, the processed input signals can be measured. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

| | |
|--|--|
| Number of channels | 2 |
| Measurement range | $-200 \dots +250 \text{ }^\circ\text{C}$ An open input returns 9999.99 $^\circ\text{C}$ |
| Resolution | 0,01 K |
| Resolution [Bit] | 16 |
| Sensor break detection | yes |
| Conversion time per channel | $\leq 25 \text{ } \mu\text{s}$ |
| Sensor current | typically 0.34 mA |
| Sensor voltage | maximum 10 V |
| Analog channel accuracy from end value $0 \dots 60 \text{ }^\circ\text{C}$ | typically 0.3 K |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit Serial SAR |
| Galvanic isolation | 500 V DC |

Analog Channel Accuracy

| | | |
|---|---|--|
| Accuracy | typically $\pm 0.095 \text{ K}$ | maximum $\pm 0.15 \text{ K}$ |
| Noise | typically $\pm 0.1 \text{ K}$ | maximum $\pm 0.14 \text{ K}$ |
| Temperature input $0 \dots 40 \text{ }^\circ\text{C}$ $0 \dots 60 \text{ }^\circ\text{C}$ | typically $\pm 0.05 \text{ K}$ typically $\pm 0.1 \text{ K}$ | maximum $\pm 0.1 \text{ K}$ maximum $\pm 0.2 \text{ K}$ |
| Cross talk from previous channel. $-200 \dots +250 \text{ }^\circ\text{C}$ | typically $\pm 0.005 \text{ K}$ | maximum $\pm 0.01 \text{ K}$ |
| Total error $0 \dots 40 \text{ }^\circ\text{C}$ $0 \dots 60 \text{ }^\circ\text{C}$ | typically $\pm 0.25 \text{ K}$ typically $\pm 0.3 \text{ K}$ | maximum $\pm 0.4 \text{ K}$ maximum $\pm 0.5 \text{ K}$ |
| Long-term drift 1000 h | typically $\pm 0.03 \text{ K}$ | |

Supply Voltage $0 \dots +60 \text{ }^\circ\text{C}$

| | |
|---------------------------|---|
| Output voltage | $+23,343 \text{ V} \dots 24,330 \text{ V} \dots 25,127 \text{ V}$ |
| Output current/channel | 100 mA maximum, short-circuit proof |
| Total current/base module | maximum 800 mA |
| Galvanic isolation | 500 V DC |

Diagnostic Connector

| | |
|--------------------------------|---|
| Voltage range with cable break | circa 0.5 V to 5 V, 0 V or circa 7 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-223 |
| Hardware version | 1.x |

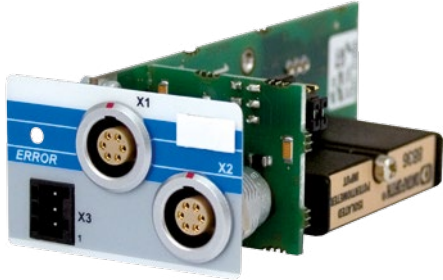
Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | $-30 \dots +85 \text{ }^\circ\text{C}$ | |
| Environmental temperature | $0 \dots +60 \text{ }^\circ\text{C}$ | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

8B Insertable Module MSR 231

This module is used as a carrier for two 8B modules. In addition, each channel has a 24 V supply voltage.

Over the diagnostic connector, the processed input signals can be measured.



Analog Channel Specifications

| | |
|--|--|
| Number of channels | 2 |
| Measurement range [Volt] | according to 8B module specification |
| Measurement range [Digit] | ±30000 |
| Resolution [Volt] | 166.6 µV/bits output signal of the 8B modules (±5 V) |
| Resolution [bits] | 16 |
| Sensor break detection | according to 8B module specification |
| Conversion time per channel | ≤ 25 µs |
| Input filter | according to 8B module specification |
| Common mode range | according to 8B module specification |
| Input resistance | according to 8B module specification |
| Measurement precision (based on the measurement range) | according to 8B module specification typically ± 0.0205 % |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit serial SAR |

List of Maximum Current Consumption of 8B Modules

| 8B module used | Current consumption | Note |
|---------------------|---------------------|---------------------------------|
| Voltage input | 25 mA | |
| PT100 | 25 mA | |
| Potentiometer | 25 mA | |
| Thermocouple | 30 mA | |
| Frequency input | 45 mA | |
| Current output | 100 mA | |
| Voltage output | 120 mA | (no load: 55 mA) |
| Current transmitter | 125 mA | |
| Strain gauge input | 150 mA | (without bridge supply: 110 mA) |

Supply Voltage 0 ... +60 °C

| | |
|---------------------------|---------------------------------------|
| Output voltage | +23.343 V ... 24.330 V ... 25.127 V |
| Output current/channel | maximum 100 mA short-circuit proof |
| Total current/base module | maximum 800 mA |
| Galvanic isolation | 500 V DC |

Diagnostic Connector

| | |
|---------------------|-------|
| Voltage range | ±5 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

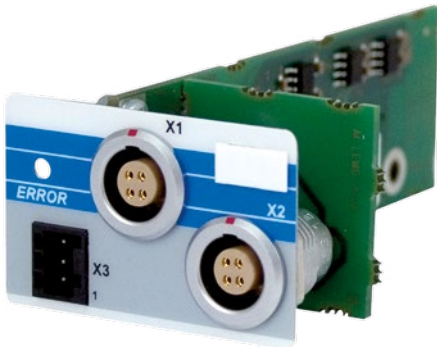
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-231 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

A0 Insettable Module MSR 241



This analog module is used to output voltages in the range of ± 10 V. The module has 2 channels, each with a short-circuit proof reference voltage of $-10 \dots +10$ V. In addition, each channel has a 24 V supply voltage.

On the diagnostic connector, the output signals can be measured.

Analog Channel Specifications

| | | |
|--|--|-------------------------|
| Number of channels | 2 | |
| Measurement range [Volt] | ± 10 V DC | |
| Measurement range [Digit] | $-100.000 \dots +100.000$ in 0.1 mV increments | |
| Resolution [bits] | 16 | |
| Resolution [Volt] | 333.3 μ V/LSB | |
| Output voltage capacity | maximum 10 mA | |
| Capacitive load of the output voltage | < 100 nF | |
| Short-circuit proof | yes | |
| Settling time -10 V ... $+10$ V | typically 150 μ s (with a load of 10 kW 100 nF) | |
| Ambient temperature | 0 ... $+40$ °C | 0 ... $+60$ °C |
| Analog channel accuracy of final value | typically ± 0.008 % | typically ± 0.023 % |
| Status display | ERROR (red) (located on the base) | |
| Galvanic isolation | 500 V DC | |

Settling Time

| | |
|--|--|
| Hardware settling time $-10 \dots +10$ V/ $+10 \dots -10$ V | typically 150 μ s (with a load of 10 kW 100 nF) |
|--|--|

Analog Channel Accuracy

| | | |
|---|--|--|
| Integral non-linearity error | typically ± 0.003 % | maximum ± 0.005 % |
| Temperature drift 0 ... $+40$ °C 0 ... $+60$ °C | typically ± 0.005 % typically ± 0.02 % | maximum ± 0.02 % maximum ± 0.04 % |
| Cross talk between both channels | typically 0 | maximum ± 0.0015 % |
| total error 0 ... $+40$ °C 0 ... $+60$ °C | typically ± 0.008 % typically ± 0.023 % | maximum ± 0.0265 % maximum ± 0.0465 % |
| Additional error under load 0 ... 1 mA | typically ± 0.001 % | |
| Additional error under load 0 ... 10 mA | typically ± 0.015 % | |
| Long-term drift 1000 h | typically ± 0.0065 % | |

Supply Voltage 0 ... $+60$ °C

| | |
|---------------------------|---|
| Output voltage | $+23.343$ V ... 24.330 V ... 25.127 V |
| Output current/channel | maximum 100 mA |
| Total current/base module | maximum 800 mA |
| Galvanic isolation | 500 V DC |

Diagnostic Connector

| | |
|---------------------|------------|
| Voltage range | ± 10 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

Article Number and Miscellaneous

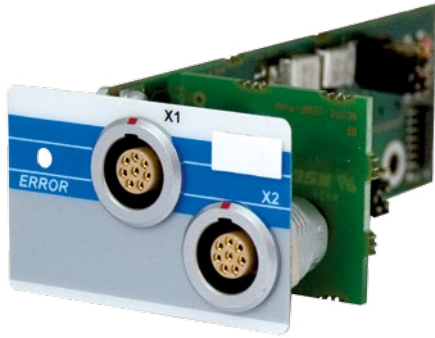
| | |
|------------------|------------|
| Article number | 18-001-241 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | $-30 \dots +85$ °C | |
| Environmental temperature | 0 ... $+60$ °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

FC Insetable Module MSR 251

This module has two counter or SSI (Serial Synchronous Interface) inputs. The counters are 32 bits wide and can be used as a counter or frequency meter. The two channels can be configured through the software as counters or an SSI interface. The SSI interface is designed to function as an SSI sensor. Uncoded and Gray encoded sensors are supported.



Analog Channel Specifications

| | | |
|---|---|--|
| Number of channels | 2 counter inputs (or SSI) | |
| Counter width | 32-bit | |
| Counter frequency | 50 MHz internal 5 MHz external | |
| Time base accuracy | quartz frequency stability: ± 100 ppm, aging: ± 5 ppm p.a. | |
| Signal level (can be selected for each channel using a jumper) | RS422 inputs: 150 Ohm bus termination, per 1.2-Ohm resistor to 5 volts spread and mass | +5 V/+24 V (GND-based) switching threshold: typically 2 V input filter: 50 μ s counter frequency: max. 10 kHz |
| Prescaler | 16-bit, software configurable | |
| Pulse suppression | 16-bit counter with 1 MHz, software configurable (0-65.53 ms in 1 μ s steps) | |
| Configuration | Up/Down ENABLE LOAD Flank Counter source | per software per software per software per software per software |
| Inputs | 2 inputs, which can be optionally used as counters or SSI data inputs. | |
| Reference counter | internal counter with programmable prescaler. If the counter of the respective channel is raised, the reference counter is saved. | |

SSI Encoder Specifications

| | |
|--------------------------|--|
| Number of channels | 2 SSI (or 2 counter inputs) |
| SSI signal level | RS422 inputs: 150 Ohm bus termination, per 1.2-Ohm resistor to 5 volts spread and mass outputs: without spreading or bus termination |
| Shift register frequency | 125 kHz-1 MHz |
| Shift register length | maximum 32 bits |
| Signal evaluation | Gray code or binary |

Output Voltage

| | |
|------------------------------|--|
| Output voltage | +5 V/short-circuit protected 4.5 V-5.5 V/0.1 A 4.0 V-5.5 V/0.2 A |
| Total current 5 V per module | 400 mA |
| Total current 5 V per base | 1.6 A |
| Total current 5 V per system | 3 A |

Article Number and Miscellaneous

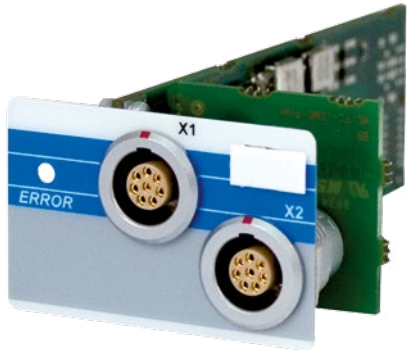
| | |
|------------------|------------|
| Article number | 18-001-251 |
| Hardware version | 1.x |

Environmental Conditions

| | |
|---------------------------|--|
| Storage temperature | -30 ... +85 °C |
| Environmental temperature | 0 ... +60 °C |
| Humidity | 0-95 %, non-condensing |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) |
| Shock resistance | EN 60068-2-27 150 m/s ² |
| Protection type | EN 60529 IP00 |

NC Insertable Module MSR 261

This input module has two independent counter stages for incremental encoder with a RS422 signal. The module provides a 16-bit counter resolution with a maximum input frequency of 125 kHz.



Incremental Encoder Connection

| | |
|--------------------|--|
| Number of channels | 2 |
| Input signals | incremental encoder signals (A, /A, B, /B, R, /R) RS422 signal with a 150 Ω termination |
| Input frequency | maximum 125 kHz |
| Counter frequency | maximum 500 kHz |
| Signal evaluation | 4X |
| Counter resolution | 16-bit |

Output Voltage

| | |
|------------------------------|--|
| Output voltage | +5 V/short-circuit protected 4.5 V-5.5 V/0.1 A 4.0 V-5.5 V/0.2 A |
| Total current 5 V per module | 400 mA |
| Total current 5 V per base | 1.6 A |
| Total current 5 V per system | 3 A |

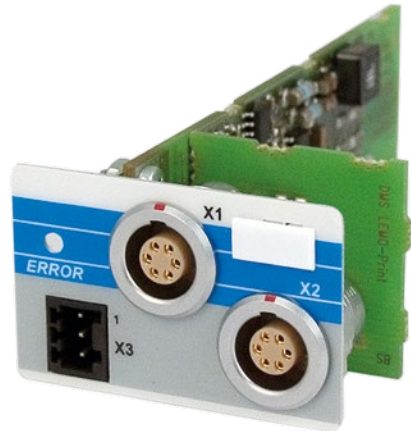
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-261 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

DMS Insert Module MSR 281



This input module is used to measure the expanding or compression of strain gauges with a Wheatstone bridge. The module has two channels, each with a short-circuit proof excitation voltage of 3.333 V. The measurement range of the Wheatstone bridge is 3 mV/V. Other measuring ranges starting from 1.5 mV/V are available on request. The strain gauges can be connected with 4 or 6-wire technology. Drift correction (zeroing) is possible.

The processed input signals can be measured over the diagnostic connector. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

| | |
|---|-----------------------------------|
| Number of channels | 2 |
| Excitation voltage | 3.333 V |
| Measurement range | 3 mV/V |
| Bridge resistance | 100-5000 Ω |
| Measurement range [Digit] | ± 100.000 |
| Resolution [Bit] | 16 |
| Sensor break detection | yes |
| Input filter | 8 kHz (-3 dB) -60 dB/decade |
| Conversion time per channel | $\leq 25 \mu\text{s}$ |
| Common mode range | 1-2.3 V |
| Analog channel accuracy from end value, 25 °C | typically $\pm 0.0565 \%$ |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit Serial SAR |
| Galvanic isolation | 500 V DC |

Analog Channel Accuracy

| | | |
|--|---|---|
| Integral non-linearity | typically $\pm 0.008 \%$ | maximum $\pm 0.02 \%$ |
| Noise voltage | typically $\pm 0.046 \%$ $\cong 1.4 \mu\text{V rms}$ | maximum $\pm 0.056 \%$ $\cong 1.7 \mu\text{V rms}$ |
| Cross talk from previous channel -10 mV ... +10 mV | typically $\pm 0.0025 \%$ | maximum $\pm 0.0035 \%$ |
| Temperature drift 0 ... +40 °C 0 ... +60 °C | typically $\pm 0.065 \%$ typically $\pm 0.15 \%$ | maximum $\pm 0.2 \%$ maximum $\pm 0.45 \%$ |
| Total error +25 °C 0 ... +40 °C 0 ... +60 °C | typically $\pm 0.0565 \%$ typically $\pm 0.1215 \%$ typically $\pm 0.2065 \%$ | maximum $\pm 0.0795 \%$ maximum $\pm 0.2795 \%$ maximum $\pm 0.5295 \%$ |
| Effects of the supply line resistance. $\Delta R = \pm 1 \%$ from the bridge resistance 4-wire measurement 6-wire measurement | typically $\pm 1 \%$ typically $\pm 1 \text{ ppm}$ | maximum $\pm 1 \%$ maximum $\pm 3 \text{ ppm}$ |
| Long-term drift 1000 h | typically $\pm 0.007 \%$ | |

Drift Correction

| | | |
|---------------|------------------|----------------|
| Turn-on time | typically 80 ms | maximum 120 ms |
| Turn-off time | typically 105 ms | maximum 160 ms |

Excitation Voltage

| | | |
|--|---|--|
| Rated voltage +25 °C | +3.333 V | |
| Initial accuracy +25 °C | typically $\pm 0.05 \%$ | maximum $\pm 0.3 \%$ |
| Temperature drift 0 °C ... +40 °C 0 °C ... +60 °C | typically $\pm 0.01 \%$ typically $\pm 0.025 \%$ | maximum $\pm 0.03 \%$ maximum $\pm 0.05 \%$ |
| Total error 0 °C ... +40 °C 0 °C ... +60 °C | typically $\pm 0.06 \%$ typically $\pm 0.075 \%$ | maximum $\pm 0.33 \%$ maximum $\pm 0.35 \%$ |
| Additional error under load $R_{\text{Bridge}} = 5 \text{ k}\Omega$ $R_{\text{Bridge}} = 100 \Omega$ | typically 0.0003 % typically 0.03 % | maximum 0.0015 % maximum 0.06 % |
| Long-term drift 1000 h | typically $\pm 0.007 \%$ | |
| Maximum load (per channel) | 35 mA | |
| Short-circuit proof | yes | |

Diagnostic Connector

| | |
|--------------------------------|---|
| Voltage range with cable break | -5 V ... +5 V (\cong -10 mV ... +10 mV) ca. +14 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

Article Number and Miscellaneous

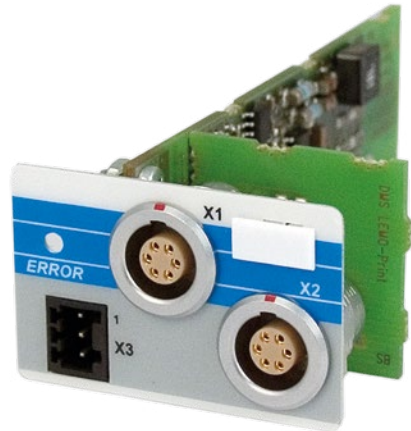
| | |
|------------------|------------|
| Article number | 18-001-281 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Notes

DMS Insert Module MSR 282



This input module is used to measure the expanding or compression of strain gauges with a Wheatstone bridge. The module has two channels, each with a short-circuit proof excitation voltage of 3.333 V. The measurement range of the Wheatstone bridge is 10 mV/V. Other measuring ranges starting from 1.5 mV/V are available on request. The strain gauges can be connected with 4 or 6-wire technology. Drift correction (zeroing) is possible.

The processed input signals can be measured over the diagnostic connector. The signals on the diagnostic connector are for diagnostic purposes only and cannot be calibrated.

Analog Channel Specifications

| | |
|---|-----------------------------------|
| Number of channels | 2 |
| Excitation voltage | 3.333 V |
| Measurement range | 10 mV/V |
| Bridge resistance | 100-5000 Ω |
| Measurement range [Digit] | ± 100.000 |
| Resolution [Bit] | 16 |
| Sensor break detection | yes |
| Input filter | 8 kHz (-3 dB) -60 dB/decade |
| Conversion time per channel | $\leq 25 \mu\text{s}$ |
| Common mode range | 1-2.3 V |
| Analog channel accuracy from end value, 25 °C | typisch $\pm 0.0565 \%$ |
| Status display | ERROR (red) (located on the base) |
| Converter | 18-bit Serial SAR |
| Galvanic isolation | 500 V DC |

Analog Channel Accuracy

| | | |
|--|---|---|
| Integral non-linearity | typically $\pm 0.008 \%$ | maximum $\pm 0.02 \%$ |
| Noise voltage | typically $\pm 0.046 \%$ $\cong 1.4 \mu\text{V rms}$ | maximum $\pm 0.056 \%$ $\cong 1.7 \mu\text{V rms}$ |
| Cross talk from previous channel -10 mV ... +10 mV | typically $\pm 0.0025 \%$ | maximum $\pm 0.0035 \%$ |
| Temperature drift 0 ... +40 °C 0 ... +60 °C | typically $\pm 0.065 \%$ typically $\pm 0.15 \%$ | maximum $\pm 0.2 \%$ maximum $\pm 0.45 \%$ |
| Total error +25 °C 0 ... +40 °C 0 ... +60 °C | typically $\pm 0.0565 \%$ typically $\pm 0.1215 \%$ typically $\pm 0.2065 \%$ | maximum $\pm 0.0795 \%$ maximum $\pm 0.2795 \%$ maximum $\pm 0.5295 \%$ |
| Effects of the supply line resistance. $\Delta R = \pm 1 \%$ from the bridge resistance 4-wire measurement 6-wire measurement | typically $\pm 1 \%$ typically $\pm 1 \text{ ppm}$ | maximum $\pm 1 \%$ maximum $\pm 3 \text{ ppm}$ |
| Long-term drift 1000 h | typically $\pm 0.007 \%$ | |

Drift Correction

| | | |
|---------------|------------------|----------------|
| Turn-on time | typically 80 ms | maximum 120 ms |
| Turn-off time | typically 105 ms | maximum 160 ms |

Excitation Voltage

| | | |
|--|---|--|
| Rated voltage +25 °C | +3.333 V | |
| Initial accuracy +25 °C | typically $\pm 0.05 \%$ | maximum $\pm 0.3 \%$ |
| Temperature drift 0 °C ... +40 °C 0 °C ... +60 °C | typically $\pm 0.01 \%$ typically $\pm 0.025 \%$ | maximum $\pm 0.03 \%$ maximum $\pm 0.05 \%$ |
| Total error 0 °C ... +40 °C 0 °C ... +60 °C | typically $\pm 0.06 \%$ typically $\pm 0.075 \%$ | maximum $\pm 0.33 \%$ maximum $\pm 0.35 \%$ |
| Additional error under load $R_{\text{Bridge}} = 5 \text{ k}\Omega$ $R_{\text{Bridge}} = 100 \Omega$ | typically 0.0003 % typically 0.03 % | maximum 0.0015 % maximum 0.06 % |
| Long-term drift 1000 h | typically $\pm 0.007 \%$ | |
| Maximum load (per channel) | 35 mA | |
| Short-circuit proof | yes | |

Diagnostic Connector

| | |
|--------------------------------|---|
| Voltage range with cable break | -5 V ... +5 V ($\cong -33.3 \text{ mV} \dots +33.33 \text{ mV}$) ca. +14 V |
| Load capacity | 10 mA |
| Short-circuit proof | yes |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-281 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP00 |

Notes

I/O Modules

MSR 311



This module has 24 short-circuit proof +24 V/2 A (positive switching) digital outputs, which are back-readable and therefore can also be used as inputs with a +24 V level for reading the signal conditions 0 and 1.

The power supply for each channel group is monitored for over voltage.

Digital Outputs

| | |
|---|---|
| Number of outputs | 24 (back-readable) |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 2 A |
| Maximum total current 4 outputs | 6 A (100 % of on time) |
| Maximum total current (complete module) | 36 A (100 % of on time) |
| Voltage drop over power supply (output active) | ≤ 1 V |
| Residual current (output inactive) | ≤ 12 mA |
| Turn-on delay | typically 100 μs |
| Turn-off delay | typically 100 μs |
| Status display | LEDs: outputs yellow, voltage monitor red |

Status of the Back-Readable Outputs

| | | |
|---------------------|-------------------------|---------------|
| Number | 24 | |
| Input voltage | typically +24 V | maximum +30 V |
| Signal level | low: < +4.5 V | high: > +12 V |
| Switching threshold | typically +8 V | |
| Input current | typically 5 mA at +24 V | |
| Input delay | typically 5 ms | |

Electrical Requirements

| | |
|--|--|
| Supply voltage for Outputs +24 V /1-6 | 18-30 V DC |
| Current consumption of supply voltage for the outputs +24 V /1-6 | corresponds to the load on the digital outputs (maximum of 6 A per group of 4) |

Voltage Monitor

| | |
|---------------------------|--|
| Supply voltage +24 V /1-6 | power supply < 18 V (error LED lights red) |
|---------------------------|--|

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 18-001-311 |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -30 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2:2001 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529 | IP20 |

Accessories



Accessories General

Batteries

CAN Bus

S-DVI Interface Cable

Diverse Cables

CompactFlash Floppy

Memory Cards and Miscellaneous




Connection Technology



Accessories

CAN Bus

| Available Products | | Description | Article number |
|---|--|--------------------------------|----------------|
|  | | CAN bus termination plug SG004 | 01-019-004 |
|  | | CAN bus termination plug SG005 | 01-019-005 |
|  | | CAN bus cable 2-pin shielded | 01-690-013 |
|  | | CAN bus protection plug SG 001 | 01-019-001 |

| Available Products | | Description | Article number |
|--|--|-------------------------------|----------------|
|  | | CAN bus protection plug SG002 | 01-019-002 |
|  | | CAN bus interface BU105 | 01-016-105 |
|  | | C-DIAS CAN bus adapter cable | 01-016-041 |

Accessories

S-DVI Interface Cable

This cable is used for connections between the C-IPC and TAE terminals.







Available Cables

| Length | Article number |
|------------|----------------|
| 0.3 meters | 05-950-003 |
| 2 meters | 05-950-020 |
| 3 meters | 05-950-030 |
| 3.5 meters | 05-950-035 |
| 5 meters | 05-950-050 |
| 7 meters | 05-950-070 |
| 10 meters | 05-950-100 |
| 15 meters | 05-950-150 |



Accessories

Cable

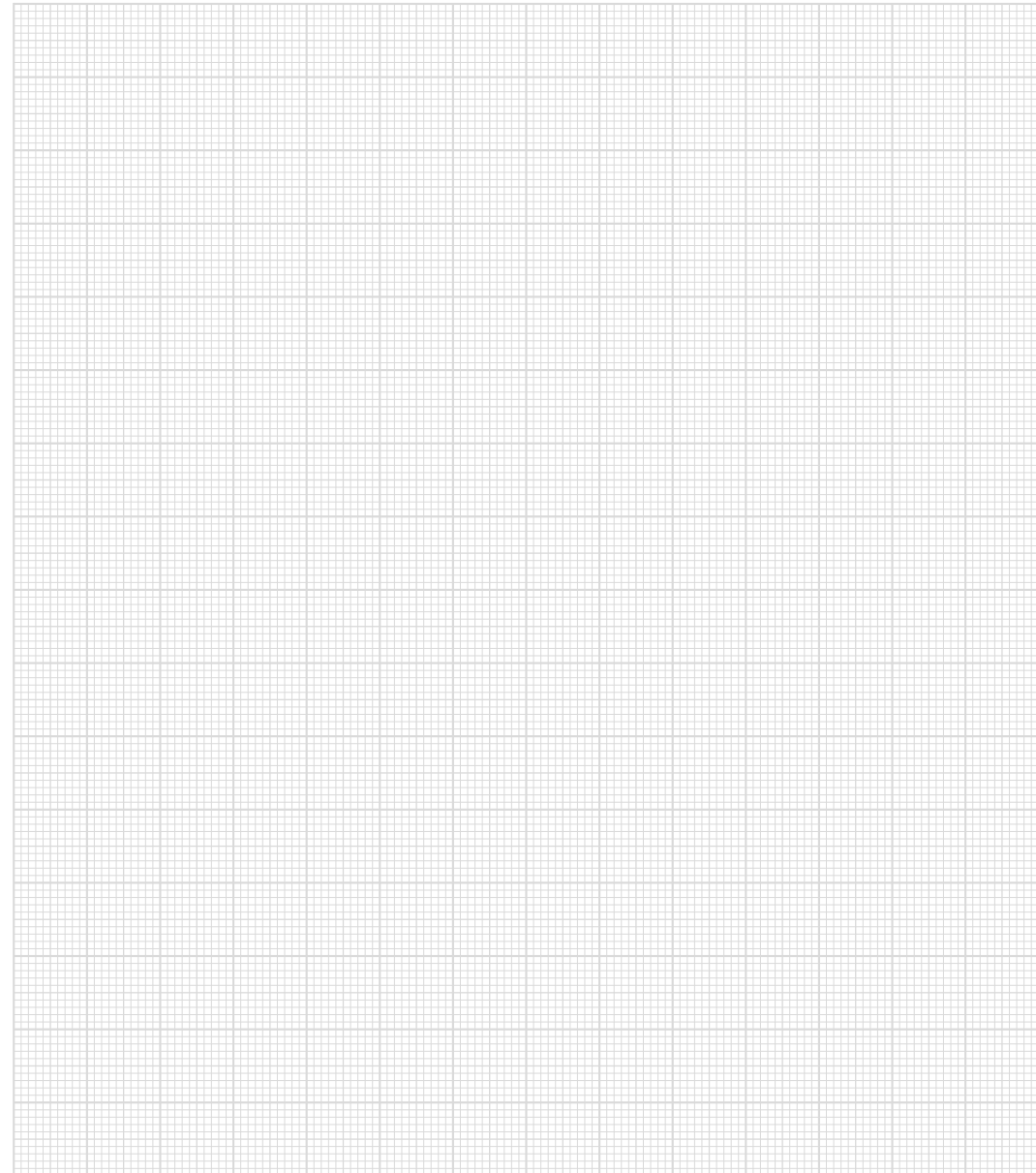
Available Products

| | Description | Article number |
|---|---|--------------------------|
|  | Connection cable CT032-25 2.5 meters | 01-900-070 |
|  | IPC-DIAS cable (2 connectors) 0.7 meters | 01-359-007 |
|  | Online cable COL09 | 01-900-001 |
|  | USB 1.1 cable A/m-B/m 3 meters 5 meters | 05-970-030 05-970-050 |

Available Products

| | Description | Article number |
|---|--|---|
|  | <p>Connection cable IPC – DIAS</p> <p>0.7 meters 2 meters 10 meters</p> | <p>01-358-007 01-358-020 01-358-100</p> |
|  | <p>Interface cable</p> <p>0.3 meters 2 meters 5 meters 10 meters 15 meters</p> | <p>05-960-003 05-960-020 05-960-050 05-960-100 05-960-150</p> |

Notes



CompactFlash Floppy CFF 011



The CompactFlash floppy drive is designed as a replacement for the current 3.5" floppy drive. It should replace the existing floppy drive and store the data on a CompactFlash card. The CF card provides the capacity of several disks, which can be selected using buttons. The selection is shown on a 2-digit display; an LED shows the active status.

To ensure vertical or horizontal mounting, the 7-segment display can be rotated 90°.

Performance Data

| | |
|--|---|
| Interfaces | 1x CompactFlash connector 1x floppy connector (34-pin) 1x power plug (4-pin) 1x jumper (6-pin) 1x jumper (10-pin) |
| Internal interface connections and devices | 2 buttons |
| Display | 2x 7-segment display 1 LED |

Electrical Requirements

| | | |
|---------------------------------------|--------------------------|-----------------|
| Supply voltage | typically +5 V | |
| | maximum +4.75 V | maximum +5.25 V |
| Current consumption of voltage supply | circa 150 mA (typically) | |
| Inrush current | 4 A (maximum 800 µs) | |

Outer Dimensions

| | | |
|-------------------------|---|--|
| Dimensions | 25.4 x 101.6 x 149 mm (W x H x D) | |
| Weight | 315 g | |
| Material (front, cover) | polycarbonate plastic/sheet steel, hot-dip galvanized | |

Article Number and Miscellaneous

| | | |
|----------------|--|--|
| Article number | 01-510-001 (horizontal) 01-510-002 (vertical) | |
| | Hardware version | |
| | 3.x | |

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | in accordance with EN 61000-6-2 (industrial area) | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |
| Protection type | EN 60529: protected through the housing | IP20 |

Regen Resistor

DC 06X-Z1



Power resistance in thick-film technologies on steel substrate

- pulse strong
- low inductive
- easy mounting

Article Number and Miscellaneous

| | |
|----------------|---|
| Article number | 20-014-061-Z1 |
| Dimensions | 61 x 41 x 1 mm (Length x Width x Thickness) |

Specification

| | |
|---------------------------------------|---|
| Resistance value | 15 Ω |
| Tolerance | $\pm 10\%$ |
| Temperature coefficient | 150 ppm/ $^{\circ}\text{C}$ |
| Operating voltage | 1000 V DC |
| Withstand voltage of the isolation | 2.5 KV DC, 60 s at 50 Hz |
| Stability (maximum $\Delta R/R$) | $\pm 20\%$ |
| Higher inductivity | $< 6 \mu\text{H}$ |
| Temperature range (operation/storage) | -50 ... +200 $^{\circ}\text{C}$ / -40 ... +105 $^{\circ}\text{C}$ |
| Tightening torque (Mounting screws) | 6 Nm |
| Cover | glass |
| Protection type | IP00 |
| Connection type | 400 mm strand |
| Nominal power | 100 W (heat sink necessary) |
| Mounting | M5 |
| Weight | 20 g |

Regen Resistor assembled DC 061-Z3



Power resistance in thick-film technologies on steel substrate

- pulse strong
- low inductive
- easy mounting
- Fabricated connector MOLEX 042816-0212

Article Number and Miscellaneous

| | |
|----------------|---|
| Article number | 20-014-061-Z3 |
| Dimensions | 61 x 41 x 1 mm (Length x Width x Thickness) |

Specification

| | |
|---------------------------------------|---|
| Resistance value | 15 Ω |
| Tolerance | $\pm 10\%$ |
| Temperature coefficient | 150 ppm/ $^{\circ}\text{C}$ |
| Operating voltage | 1000 V DC |
| Withstand voltage of the isolation | 2.5 KV DC, 60 s at 50 Hz |
| Stability (maximum $\Delta R/R$) | $\pm 20\%$ |
| Higher inductivity | $< 6 \mu\text{H}$ |
| Temperature range (operation/storage) | -50 ... +200 $^{\circ}\text{C}$ / -40 ... +105 $^{\circ}\text{C}$ |
| Tightening torque (Mounting screws) | 6 Nm |
| Cover | glass |
| Protection type | IP00 |
| Connection type | connector plug Molex 042816-0212 cable length 250 mm |
| Nominal power | 100 W (heat sink necessary) |
| Mounting | M5 |
| Weight | 20 g (resistor) |

RFID-Reader

RFID 131

with 1 USB device 2.0
1 CAN bus



The RFID reader is an installable device for reading and writing to RFID card. Communication with other bus participants is established over the CAN bus or USB interface. The reader is supplied with +24 V.

The RFID reader is installed in a cutaway of the control cabinet.

Performance Data

| | |
|---------------------|--|
| Protocol | ISO 15693, ISO 14443A, ISO 14443B |
| Supported cards | Mifare Ultralight/Ultralight C Mifare Classic Mini/1K/4K Mifare Desfire EV1 2K, 4K 8K Mifare Pro, Plus ISO15693 NXP ICOD SLI, TI TagIT, standard cards |
| RF power | 100 mW EIRP |
| Operating frequency | 13.56 MHz |
| Reading distance | up to 5 cm (depending on the tag, antenna and ambient conditions) |
| Write distance | approximately 70 % of the read distance |
| Interfaces | 1x USB device 2.0, (Type Mini-B) 1x CAN bus |
| Status LEDs | yes, blinks in 1 s frequency and indicates the readiness of the device |

Electrical Requirements

| | | |
|---|--------------------|------------------|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption Power supply +24 V | minimum 45 mA | maximum 60 mA |
| Inrush current | 2 A for 2 ms | |

RFID Reader

| | |
|----------|---|
| Material | front: acrylic glass back: chromated sheet steel |
| Weight | 110 g |

Environmental Conditions

| | | |
|--|--|--|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +55 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC resistance | according to EN 61000-6-2 (industrial area) | |
| EMC noise generation | according to EN 61000-6-4 (industrial area) | |
| Radio Communication Conformity Europe | according to ETSI EN 300 330 (2014/53/EU, RED Directive) | |
| Radio Communication Conformity USA | FCC CFR 47 Part 15 | |
| Product safety | EN 60950-1:2006 | |
| Vibration resistance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 h (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | duration 11 ms, 18 Shocks 15 g (150 m/s ²) |
| Protection type | EN 60529 protected through the housing | front: IP65 cover: IP20 |

Article Number and Miscellaneous

| | |
|----------------|-------------------------------|
| Article number | 01-691-131 |
| Dimensions | 90 x 57 x 30.8 mm (W x H x D) |

Remote Access Router RAR 24XX



with 5 Ethernet ports
1 USB 2.0

The RAR 24XX is the standard and most supported hardware for SIGMATEK's Remote Access Platform (RAP). The RAR 24XX makes it convenient to remotely connect to your equipment, while the built-in firewall keeps your equipment safe from outside threats. Configuration is as easy as inserting a USB flash drive, which contains your configuration file, into the RAR 24XX's USB port.

Technical Data

| | |
|----------------------------|--|
| Power supply (recommended) | 12-24 VDC \pm 20 % LPS 2 A |
| Power consumption | 10 W max, about 2.5-5 W* idle |
| Operating temperature | -20 ... +65 °C |
| Relative humidity | 10-95 % non-condensing |
| Operating altitude | up to maximum 2000 m |
| Storage temperature | -20 ... +65 °C |
| Storage humidity | 10-95 % non-condensing |
| Storage altitude | up to maximum 3000 m |
| Ethernet ports | five 1 Gbps (4x LAN, 1x WAN) |
| USB | USB 2.0 |
| Processor | MIPS 800 MHz |
| Digital Input | yes |
| Degree of protection | IP20 |
| Mounting | DIN rail |
| Size | 95 x 116 x 28 mm (excl. DIN rail clip) |
| Weight | 270-310 g |

| | |
|--|---|
| Certifications | CE, FCC Verification, RoHS, REACH |
| Class | 5 bands GPRS/EDGE Class 12 |
| Speed | HSPA+ - Max.14.4 Mbps (DL)/Max.5.76 Mbps (UL) UMTS - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps |
| SIM size | Standard SIM card (size 2FF) |
| FCC ID | XMR201510UC20 |
| LTE additional specifications: 4G-G protocols and frequencies (Global) | FDD-LTE - B1, B3, B5, B7, B8, B20 WCDMA - B1, B5, B8 GSM/GPRS/EDGE - 850, 900, 1800, 1900 MHz |
| Speed | LTE-FDD - Max.100 Mbps (DL)/Max.50 Mbps (UL) LTE-TDD - Max.61 Mbps (DL)/Max.18 Mbps (UL) DC-HSPA+ - Max.42 Mbps (DL)/Max.5.76 Mbps (UL) TD-SCDMA - Max.4.2 Mbps (DL)/Max.2.2 Mbps (UL) WCDMA - Max.384 Kbps (DL)/Max.384 Kbps (UL) EDGE - Max.236.8 Kbps (DL)/Max.236.8 Kbps (UL) GPRS - Max.85.6 Kbps (DL)/Max.85.6 Kbps (UL) CSD - 14.4 Kbps |
| SIM size | Standard SIM card (size 2FF) |
| Wi-Fi additional specifications: WI-FI IEEE 802.11 version | b/g/n |
| Wi-Fi modes | Station (Client) Mode and Access Point |
| Speed | 72 Mbps |
| FCC ID | Q0QWF111 |

Electrical Requirements

| | |
|-----------------------------|--------------------------------------|
| Power supply | 12-24 VDC \pm 20 % LPS 2 A |
| Internal voltage protection | maximum 29 V |
| Input protection | protected against polarity inversion |
| Isolation | 1.5 kV |

Digital Input

| | |
|----------------------------|--------------------|
| Type | Optocoupler |
| Voltage range | 0-29 VDC |
| Voltage range (OFF state) | 0-3 VDC |
| Voltage range (ON state) | 7-29 VDC |
| Current voltage (ON state) | 2-5 mA (typically) |

Article Number and Miscellaneous

The RAR 24XX contains different FCC certified modules, depending on the variant.

| Type | Enclosed Module | Article Number |
|-------------------|------------------------------|----------------|
| RAR 2400 | - | 01-692-2400 |
| RAR 2405 | 4G Global | 01-692-2405 |
| RAR 2410 | Wi-Fi | 01-692-2410 |
| RAR 2415 | Wi-Fi + Global | 01-692-2415 |
| Dimensions | 28 x 116 x 95 mm (W x H x D) | |

Notes

A large grid area for taking notes, consisting of a 20x20 grid of squares. The grid is empty and occupies the right half of the page.

WiFi Adapter

WIFI 011



- WiFi 802,11 b/g/n
- 1x1 MIMO technology improves effective throughput and range over existing 802.11 b/g/n products
- up to 150 Mbps data transfer rate
- BPSK, QPSK, 16-QAM, DBPSK, DQPSK and CCK modulation schemes
- WEP, TKIP, AES, WPA and WPA2 hardware encryption schemes

Performance Data

| | |
|--------------------------|--|
| Wireless standard | 802.11 b/g/n |
| Module type | Host Controller Interface (HCI) |
| Tested operating systems | Salamander, Gecko OS1) |
| Security | WEP 64 bit, WEP 128 bit, TKIP, AES, WPA, WPA2 |
| Network architecture | Ad hoc mode (peer-to-peer) and infrastructure mode |

Hardware

| | |
|------------|----------------------|
| Chipset | Realtek |
| Antenna | Onboard chip antenna |
| Interfaces | USB 2.0 |
| LED | Power |

RF Characteristics

| | |
|-----------------------|---|
| Tx output power | (±2 dBm): 13 dBm @ 11 n, 17 dBm @ 11 b, 15 dBm @ 11 g |
| Rx sensitivity | 11 Mbps -80 dBm @ 8 % 54 Mbps -70 dBm @ 10 % 150 Mbps -64 dBm @ 10 % |
| Range (in open space) | indoor: up to 100 m outdoor: up to 180 m |
| Current consumption | transmit: average 125 mA receive: average 68 mA transmit and receive: average 104 mA |
| Data transfer rate | 1, 2, 5, 5, 6, 11, 12, 18, 22, 24, 30, 36, 48, 54, 60, 90, 120 Mbps to a maximum of 150 Mbps |
| Frequency | 2.4 GHz ISM band |
| Modulation scheme | BPSK/QPSK/16-QAM/DBPSK/DQPSK/CCK |
| Spektrum | IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n: OFDM (Orthogonal Frequency Division Multiplexing) |

Environmental Conditions

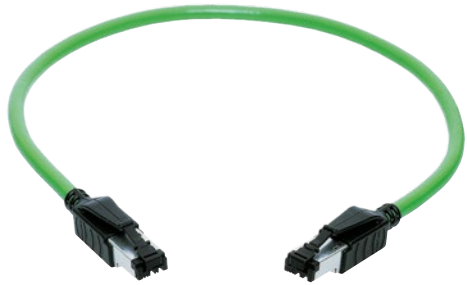
| | |
|---------------------------|------------------------|
| Storage temperature | -20 ... +70 °C |
| Environmental temperature | -10 ... +60 °C |
| Humidity | 5-90 %, non-condensing |

Article Number and Miscellaneous

| | |
|-----------------------|---|
| Article number | 12-640-011 |
| Mechanical dimensions | 17.00 x 15.00 x 8.00 mm (L x W x H) |
| Weight | 1.80 g ±0.25 g tolerance 25.36 g in retail pack |
| Approvals | ROHS, REACH, WEEE (in EU, Brazil, Canada, Japan and USA) |

VARAN Bus Connection Technology Prefabricated Connector Cable

VARAN bus connection cable for
DRAG CHAIN wiring

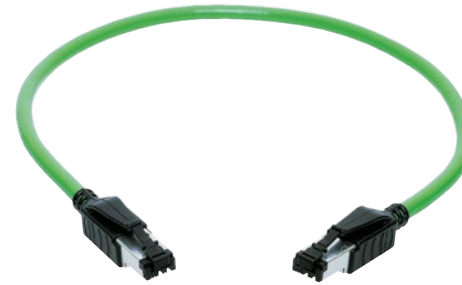


Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.

VARAN bus connection cable for drag chain application 2x RJ45 industrial, 4-pin, overmolded housings, prefabricated

| | | |
|-------------------------|---|-----------------------|
| Connector | 2x HARTING RJ Industrial IP20 Data with overmoulded housings | |
| Cable type | drag chain system cable 4-pin, 2x2xAWG22/7, double shielding | |
| Protection type | IP20 (when mated) | |
| Sheath | PUR green | |
| Mating interface | 2x RJ45 in accordance with IEC 60603-7 | |
| | Length | Article number |
| | 1.5 meters | 16-910-015 |
| | 3 meters | 16-910-030 |
| | 5 meters | 16-910-050 |
| | 10 meters | 16-910-100 |
| | 20 meters | 16-910-200 |
| | 50 meters | 16-910-500 |

VARAN Bus Connection Technology Prefabricated Connector Cable



VARAN bus connection cable for flexible application 2x RJ45 industrial, 4-pin, overmolded housings, prefabricated

| | | |
|-------------------------|---|-----------------------|
| Connector | 2x HARTING RJ Industrial IP20 Data with overmoulded housings | |
| Cable type | flexible system cable 4-pin, 2x2xAWG26/7, double shielding | |
| Protection type | IP20 (when mated) | |
| Sheath | PVC green | |
| Mating interface | 2x RJ45 in accordance with IEC 60603-7 | |
| | Length | Article number |
| | 1.5 meters | 16-900-015 |
| | 3 meters | 16-900-030 |
| | 5 meters | 16-900-050 |
| | 10 meters | 16-900-100 |
| | 20 meters | 16-900-200 |
| | 50 meters | 16-900-500 |

VARAN Bus Connection Technology Prefabricated Connector Cable

VARAN bus connection cable for
DRAG CHAIN wiring

Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.



VARAN bus connection cable for drag chain application 1x RJ45 industrial to 1x Mini I/O, 4-pin, prefabricated

| | |
|-------------------------|--|
| Connector | 1x HARTING RJ Industrial IP20 Data 1x Industrial Mini I/O Type 1 plug IP20 Data |
| Cable type | drag chain system cable 4-pin, 2x2xAWG22/7, double shielding |
| Protection type | IP20 (when mated) |
| Sheath | PUR green |
| Mating interface | 1x RJ45 in accordance with IEC 60603-7, 1x Mini I/O Type 1 |

| Length | Article number |
|------------|----------------|
| 0.5 meters | 16-911-005 |
| 1 meters | 16-911-010 |
| 1.5 meters | 16-911-015 |
| 2 meters | 16-911-020 |
| 3 meters | 16-911-030 |
| 5 meters | 16-911-050 |
| 10 meters | 16-911-100 |
| 20 meters | 16-911-200 |
| 50 meters | 16-911-500 |

VARAN Bus Connection Technology Prefabricated Connector Cable

VARAN bus connection cable for
FLEXIBLE wiring

Prefabricated 4-pin, flexible system cable for the IP20 area, tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.



VARAN bus connection cable for flexible application 1x RJ45 industrial to 1x Mini I/O, 4-pin, prefabricated

| | |
|-------------------------|--|
| Connector | 1x HARTING RJ Industrial IP20 Data 1x Industrial Mini I/O Type 1 plug IP20 Data |
| Cable type | flexible system cable 4-pin, 2x2xAWG26/7, double shielding |
| Protection type | IP20 (when mated) |
| Sheath | PVC green |
| Mating interface | 1x RJ45 in accordance with IEC 60603-7, 1x Mini I/O Type 1 |

| Length | Article number |
|------------|----------------|
| 0.2 meters | 16-901-002 |
| 0.5 meters | 16-901-005 |
| 1 meters | 16-901-010 |
| 1.5 meters | 16-901-015 |
| 2 meters | 16-901-020 |
| 3 meters | 16-901-030 |
| 5 meters | 16-901-050 |
| 10 meters | 16-901-100 |
| 20 meters | 16-901-200 |

VARAN Bus Connection Technology Prefabricated Connector Cable

VARAN bus connection cable for
DRAG CHAIN wiring

Prefabricated 4-pin, flexible system cable for the drag chain (IP20 area), tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.



VARAN bus connection cable for drag chain application 2x Mini I/O, 4-pin, prefabricated

| | | |
|-------------------------|---|----------------|
| Connector | 2x Industrial Mini I/O Type 1 plug IP20 Data | |
| Cable type | drag chain system cable 4-pin, 2x2xAWG22/7, double shielding | |
| Protection type | IP20 (when mated) | |
| Sheath | PUR green | |
| Mating interface | 2x Mini I/O Type 1 | |
| | Length | Article number |
| | 0.5 meters | 16-912-005 |
| | 1 meters | 16-912-010 |
| | 1.5 meters | 16-912-015 |
| | 2 meters | 16-912-020 |
| | 3 meters | 16-912-030 |
| | 5 meters | 16-912-050 |
| | 10 meters | 16-912-100 |
| | 20 meters | 16-912-200 |

VARAN Bus Connection Technology Prefabricated Connector Cable

VARAN bus connection cable for
FLEXIBLE wiring

Prefabricated 4-pin, flexible system cable for the IP20 area, tested for its industrial suitability. The connector cable is recommended for the IP20 area by the VNO (VARAN BUS USER ORGANIZATION), since real-time Ethernet in industrial automation requires higher quality and robustness for cables and connectors than office Ethernet.



VARAN bus connection cable for flexible application 2x Mini I/O, 4-pin, prefabricated

| | | |
|-------------------------|---|----------------|
| Connector | 2x Industrial Mini I/O Type 1 plug IP20 Data | |
| Cable type | flexible system cable 4-pin, 2x2xAWG26/7, double shielding | |
| Protection type | IP20 (when mated) | |
| Sheath | PVC green | |
| Mating interface | 2x Mini I/O Type 1 | |
| | Length | Article number |
| | 0.5 meters | 16-902-005 |
| | 1 meters | 16-902-010 |
| | 1.5 meters | 16-902-015 |
| | 2 meters | 16-902-020 |
| | 3 meters | 16-902-030 |
| | 5 meters | 16-902-050 |
| | 10 meters | 16-902-100 |
| | 20 meters | 16-902-200 |

VARAN Bus Connection Technology Connector Cable CAT5

VARAN bus connector cable CAT5 for
DRAG CHAIN wiring

The CAT5 connector cable is used with the RJ45 connector set for constructing specific on-site cable systems.



Industrial Ethernet Cable

| | | | |
|-----------------------|--|----------------|--------------|
| Cable type | drag chain capable connector cable 4-pin , 2x2xAWG22/7, double shielded | | |
| Sheath | PUR green | | |
| Article number | Description | Length | Cable |
| 16-915-002 | industrial Ethernet connection for drag chain wiring, 4-pin CAT5, PUR insulation green | 100 meter ring | 2x2xAWG22/7 |

VARAN Bus Connection Technology Connector Cable CAT5

VARAN bus connector cable CAT5 for
FLEXIBLE wiring

The CAT5 connector cable is used with the RJ45 or
Mini I/O connector set for constructing specific on-
site cable systems.



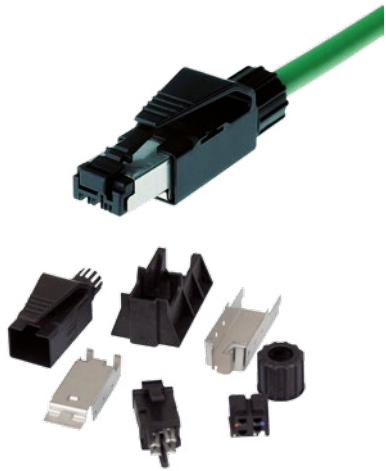
Industrial Ethernet Cable for RJ45 Connector Set

| | | | |
|-----------------------|---|----------------|--------------|
| Cable type | flexible connection cable 4-pin, 2x2xAWG26/7, double shielding | | |
| Sheath | PVC green | | |
| Article number | Description | Length | Cable |
| 16-915-001 | industrial Ethernet cable for flexible wiring, 4-pin CAT5, PVC insulation green | 100 meter ring | 2x2xAWG26/7 |

Industrial Ethernet Cable for Mini I/O Connector Set

| | | | |
|-----------------------|---|----------------|--------------|
| Cable type | flexible connection cable 4-pin, 1x4xAWG26/7, double shielding | | |
| Sheath | PVC green | | |
| Article number | Description | Length | Cable |
| 16-915-001-1 | industrial Ethernet cable for flexible wiring, 4-pin CAT5, PVC insulation green | 100 meter ring | 1x4xAWG26/7 |

VARAN Bus Connection Technology RJ45 Connector Set CAT5



IP20 data connector

The RJ45 connector set is used with the CAT5 connector cable for constructing specific cable on-site systems.

RJ45 Industrial Connector

| | |
|-------------------------|--|
| Housing material | plastic version |
| Protection type | IP20 |
| Mating interface | RJ45 in accordance with IEC 60603-7 |
| Article number | Description |
| 16-915-011 | RJ45 industrial plug 4-pin cable assembly without tools CAT5 |

VARAN Bus Connection Technology Mini I/O Connector Set CAT5



IP20 data connector

The Mini I/O connector set is used with the CAT5 connector cable for constructing specific cable on-site systems.

RJ45 Industrial Connector

| | |
|-------------------------|--|
| Housing material | plastic version |
| Protection type | IP20 |
| Mating interface | RJ45 in accordance with IEC 60603-7 |
| Article number | Description |
| 16-915-011 | Mini I/O industrial plug 4-pin cable assembly CAT5 |

VARAN Boards/Analyzer

Manager Board

Client Boards

Demo Boards

Analyzer



VARAN Manager Board VEB 031

The VARAN Manager board is used to equip all peripheral devices with the VARAN bus as simply as possible. By using the VEB 031 and with minimal external wiring, the peripheral device is expanded over the PCI bus with 2 VARAN Manager interfaces.



Performance Data

| | | |
|--------------------------------|---|------------------------------------|
| Internal memory | serial 16-Mbit Flash | |
| Interfaces | 2x VARAN (Manager) | |
| | PCI bus (32-bit, 33 MHz) | Vendor ID: 5112 Device ID: 0C00 |
| Connection to periphery device | over two 50-pin board-to-board connector slots with 0.8 mm contact spacing (type: ERNI Microstac, order number. 114713) | |

Electrical Requirements

| | | |
|---------------------------------------|---|----------------|
| Internal power supply (VDD) | typically +3.3 V DC ($\pm 4\%$) (provided by the peripheral device over the 50-pin connector slot) | |
| Current consumption of voltage supply | typically 400 mA | maximum 450 mA |

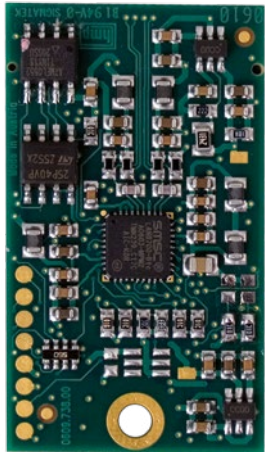
Article Number and Miscellaneous

| | | |
|------------------|------------|--|
| Article number | 16-081-031 | |
| Hardware version | 1.x | |

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. the environmental temperature of the VEB must not exceed +70 °C. | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

VARAN Client Board VEB 011



The VEB 011 VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus. Operating temperature 0-70 °C (commercial grade).

Environmental Conditions

| | | |
|---------------------------|---|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. The environmental temperature of the VEB must not exceed +70 °C. | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

Performance Data

| | |
|--------------------------------|---|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 1x VARAN (client) 1x periphery interface |
| Connection to periphery device | via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713) |

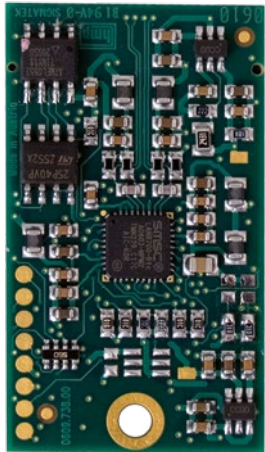
Electrical Requirements

| | |
|---------------------------------------|---|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector) |
| Current consumption of voltage supply | minimum 250 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 16-081-011 |
| Hardware version | 1.x |

VARAN Client Board VEB 011C



The VEB 011C VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus.

Data exchange can be done via CANopen[®] or DPRAM. Operating temperature 0-83 °C (industrial grade).

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0-85 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

Performance Data

| | |
|--------------------------------|---|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 1x VARAN (client) 1x periphery interface |
| Connection to periphery device | via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713) |

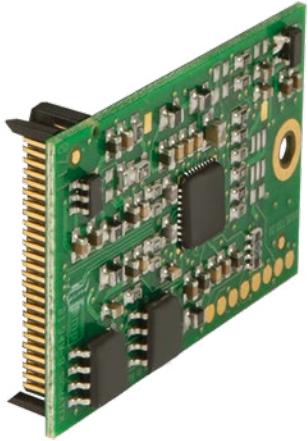
Electrical Requirements

| | |
|---------------------------------------|---|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector) |
| Current consumption of voltage supply | minimum 250 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|-------------|
| Article number | 16-081-011C |
| Hardware version | 1.x |

VARAN Client Board VEB 011-SPI



This client board is used to easily equip any periphery device with the VARAN bus. Data can be exchanged over an alternating buffer and DPRAM.

Environmental Conditions

| | |
|---------------------------|--|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0-70 °C (according to component specifications) |
| Humidity | 0-95 %, non-condensing |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. |
| Shock resistance | 150 m/s ² |

Performance Data

| | |
|--------------------------------|---|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 1x VARAN (client) 1x periphery interface |
| Connection to periphery device | via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713) |

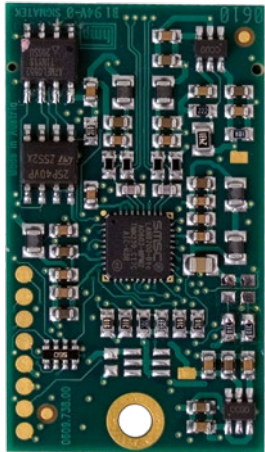
Electrical Requirements

| | |
|---------------------------------------|---|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector) |
| Current consumption of voltage supply | minimum 250 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 16-081-011-SPI |
| Hardware version | 1.x |

VARAN Client Board VEB 012



The VEB 012 VARAN client board serves to easily expand all possible peripheral devices with the VARAN bus.
Operating temperature 0-85 °C (industrial grade).

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0-85 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

Performance Data

| | |
|--------------------------------|---|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 1x VARAN (client) 1x periphery interface |
| Connection to periphery device | via 50-pin board-to-board plug connector, 0.8 mm spacing (type ERNI Microstac, order Nr. 114713) |

Electrical Requirements

| | |
|---------------------------------------|---|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (provided by the peripheral device via 50-pin plug connector) |
| Current consumption of voltage supply | minimum 250 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 16-081-012 |
| Hardware version | 1.x |

VARAN Client Board VEB 013



The VEB 013 VARAN client board serves to simply expand all possible peripheral devices with the VARAN bus.

With help from the integrated splitter function, the devices are provided with two VARAN ports (VARAN In and VARAN Out). Operating temperature 0-70 °C (commercial grade).

Environmental Conditions

| | | |
|---------------------------|--|----------------------|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0-70 °C (according to component specifications) the operating temperature for the entire unit must be specifically defined for each application, as the operating conditions (mounting position, housing, heat sources in the vicinity of the VEB) are unknown. | |
| Humidity | 0-95 %, non-condensing | |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. | |
| Shock resistance | EN 60068-2-27 | 150 m/s ² |

Performance Data

| | |
|--------------------------------|--|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 2x VARAN (Client In/Out) 1x periphery interface |
| Connection to periphery device | 50-pin board-to-board plug connector (type ERNI Microstac, order Nr. 114713) 12-pin Board-to-Board plug connector (type ERNI Microstac, order Nr. 114712) |

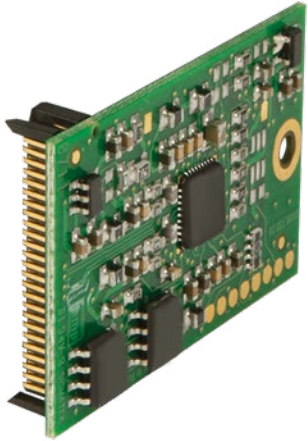
Electrical Requirements

| | |
|---------------------------------------|---|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (provided by the peripheral device) |
| Current consumption of voltage supply | minimum 200 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 16-081-013 |
| Hardware version | 1.x |

VARAN Client Board VEB 013-SPI



This client board is used to easily equip any periphery device with the VARAN bus.

Data can be exchanged over alternating buffer and DPRAM.

Environmental Conditions

| | |
|---------------------------|--|
| Storage temperature | -20 ... +85 °C |
| Environmental temperature | 0-70 °C (according to component specifications) |
| Humidity | 0-95 %, non-condensing |
| EMC stability | the EMC stability has to be tested separately in the complete system for each application. |
| Shock resistance | 150 m/s ² |

Performance Data

| | |
|--------------------------------|--|
| Internal memory | serial 4-Mbit Flash |
| Interfaces | 1x VARAN In 1x VARAN Out 1x Periphery interface |
| Connection to periphery device | 50-pin board-to-board plug connector (type ERNI Microstac, order Nr. 114713) 12-pin Board-to-Board plug connector (type ERNI Microstac, order Nr. 114712) |

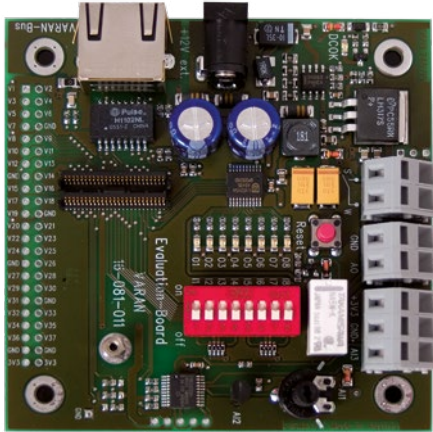
Electrical Requirements

| | |
|---------------------------------------|--|
| Internal power supply (VDD) | typically +3.3 V DC (±4 %) (Provided from the periphery module over a 50-pin connector) |
| Current consumption of voltage supply | minimum 250 mA (depending on the external circuit) |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 16-081-013-SPI |
| Hardware version | 1.x |

VARAN Demo Board VEB 021



The VARAN VEB 021 demo board provides VARAN users and sensor/actuator manufacturers with simple hardware so that they can implement this bus system in their products quickly and easily.

The VEB 011 or VEB 012 client board is simply connected to the demo board and the VARAN bus to the RJ45 socket.

Digital Outputs

| | |
|---------------------|---------------------------|
| Number of outputs | 8 |
| Output to connect | yellow LED per output |
| Supply voltage LEDs | +3V3 |
| Output current | typically 3 mA per output |

Relay Output (for signal switch)

| | |
|------------------------|----------------------|
| Number | 1 |
| Relay type | 1x converter |
| Relays | NA-5W-K |
| Power supply | +5 V/typically 30 mA |
| Minimum switch current | 10 mA |
| Switching time | maximum 10 ms |
| Switching range | 4 V-6 V |
| Switching power | 0.5 A/30 V DC |

Digital Inputs

| | |
|-----------------|-------------------------|
| Number | 8 |
| Input type | switched via DIP switch |
| Input voltage | typically + 3V3 |
| Input current | typically 1 mA |
| Status Displays | no |

Controller for Analog I/Os

| | |
|-----------------------|---|
| Controller | PSoC CY8C24223A |
| Clock speed | 24 MHz |
| Storage (On-Board) | 4-kbyte Flash 256 bytes SRAM |
| Communication | via I ² C-interface |
| Software requirements | the analog I/Os are read/written via the I ² C bus |

Number of Inputs

| | |
|------------------------------|--------------|
| Number | 3 |
| Resolution | 12-bit |
| Measurement range | 0 ... +3.3 V |
| Reference voltage for AI3 | +3.3 V |
| Sensor type at AI2 | KTY10-6 |
| Analog measurement precision | ±0.2 % |

Analog Output

| | |
|-------------------------|--------------|
| Number | 1 |
| Output voltage | 0 ... +3.3 V |
| Resolution | 6-bit |
| Analog channel accuracy | ±1 % |
| Maximum output current | 20 mA |

Electrical Requirements

| | | |
|---|--------------------------------------|----------------|
| Supply voltage | 10-30 V DC | |
| Supply of external power supply | +12 V for internal supply (optional) | |
| Voltage supply from C-DIAS bus | +24 V for internal supplies | |
| Data Exchange on the VARAN Bus (+24 V power supply) | typically 70 mA | maximum 100 mA |
| Current consumption of the external supply (+12 V supply) | typically 140 mA | maximum 200 mA |
| Status display | Power LED | |

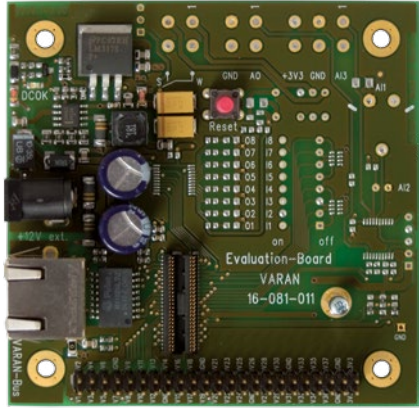
Article Number and Miscellaneous

| | |
|------------------|------------|
| Article number | 16-081-021 |
| Hardware version | 1.x |

Notes

A large grid area for taking notes, consisting of a 20x20 grid of squares. The grid is empty and occupies the right half of the page.

VARAN Demo Board VEB 022



The VARAN VEB 022 demo board provides VARAN users and sensor/actuator manufacturers with simple hardware so that they can implement this bus system in their products quickly and easily.

The respective VEB 011 or VEB 022 client board is simply connected to the demo board and the VARAN bus to the RJ45 socket.

Unlike the VEB 021, the VEB 022 is a less populated demo board. The DPRAM mode is defined for this board by default. External hardware can be connected over the connector strip.

Mechanical Dimensions

| | |
|----------------------------|----------------------------------|
| Circuit board | 85.0 x 85.0 mm |
| Mounting hole clearance | 69.00 mm horizontal and vertical |
| Diameter of mounting holes | 3.5 mm |

Electrical Requirements

| | | |
|--|--------------------------------------|----------------|
| Supply voltage | 10-30 V DC | |
| Voltage from external supply | +12 V for internal supply (optional) | |
| Voltage supply from C-DIAS bus | +24 V for internal supplies | |
| Current consumption of VARAN bus (+24 V supply) | typically 90 mA | maximum 110 mA |
| If the +24 V supply is not set over the VARAN bus, an external +12 V power supply must be connected to plug X2! | | |
| Current consumption of the external supply (+12 V supply) | typically 150 mA | maximum 200 mA |
| Status display | LED | |
| +3V3 for external applications (connectable by a strip) | maximum 50 mA | |

Article Number and Miscellaneous

| | |
|---------------------------------|----------------|
| Article number | 16-081-022 |
| Applicable power supply 12 V DC | 16-081-022-Z1 |
| Hardware version | 1.x |
| Preset mode (Mode pins) | 010 DPRAM mode |
| LASAL class | veb022 |

VARAN Valve Interface VVO 323



with 32 short-circuit proof digital outputs for valve terminal with EX250 flange connection

The VVO 323 module has 32 short-circuit digital outputs proof (+24 V/50 mA/short-circuit proof). The supply voltage is divided into two groups. Both groups are monitored for under and over voltage.

Digital Output Specifications

| | |
|---|-------------------------|
| Number | 32 |
| Short-circuit proof | yes |
| Maximum continuous current load allowed per channel | 50 mA |
| Maximum total current (entire module) | 1.6 A (100% of on-time) |
| Residual current (off) | ≤ 10 µA |
| Turn-on delay | < 100 µs |
| Turn-off delay | < 100 µs |

Electrical Requirements

| | |
|---|--|
| Force supply +24 V DC | +18-30 V DC |
| Current consumption of +24 V supply voltage | corresponds to the load on the digital outputs |

Voltage Monitor

| | |
|--------------------|--|
| Power supply +24 V | supply voltage > 18 V (corresponding DC OK-LED lights green) supply voltage < 30 V (corresponding DC OK-LED lights green) |
|--------------------|--|

Article Number and Miscellaneous

| | |
|---------------------|--|
| Article number | 16-050-323 |
| Hardware version | 1.x |
| Standard | UL 61010-1 UL 61010-2-201 CAN/CSA-C22.2 No. 61010-1-12 CAN/CSA-IEC 61010-2-201:14 |
| Dimensions Standard | 89 x 79.8 x 167 mm (W x H x D) |

Environmental Conditions

| | | |
|---------------------------|---|---|
| Storage temperature | -20 ... +85 °C | |
| Environmental temperature | 0 ... +60 °C | |
| Humidity | 0-95 %, non-condensing | |
| EMC resistance | in accordance with EN 61000-6-2 (industrial area) | |
| EMC-noise generation | in accordance with EN 61000-6-4 (industrial area) | |
| Vibration resistance | EN 60068-2-6 | 3.5 mm from 5-8.4 Hz 1 g from 8.4-150 Hz |
| Shock resistance | EN 60068-2-27 | 15 g |
| Protection type | EN 60529 | IP67 |

VARAN Analyzer ETVA 0501



with 5.7" VGA TFT color display

With the ETVA 0501 VARAN Analyzer, the communication for a real-time Ethernet VARAN bus network can be analyzed. The connection is made over a free VARAN port. If no port is available, an existing VARAN bus connection can simply be removed and the VARAN Analyzer inserted.

The ETV 0501-SK is operated through the menus on touch screen. On the 5.7" VGA TFT color display, diagnostic data are clearly shown. The VARAN Analyzer has a USB socket for connecting external storage devices.

Performance Data

| | |
|---|--|
| Processor | ELAN SC520 |
| Cache | 16-kbyte write-back cache |
| BIOS | yes |
| Internal main memory (SDRAM) 133 MHZ | 64-Mbyte |
| Battery buffered internal expanded memory (SRAM) | 256-kbyte |
| Internal program memory | 10-Mbyte |
| Internal data memory | 40-Mbyte |
| Internal storage device (IDE) | 64-Mbyte CompactFlash |
| Interfaces | 1x VARAN In (RJ45) 1x VARAN Out or Ethernet 10/100 Mbits (RJ45) 1x USB V1.1 type A |
| Internal interface connections and devices | 1x TFT LCD color display 1x Touch |
| Control panel | touch screen (analog resistive) |

| | |
|------------------|--|
| Display | 5.7" TFT color display 640 x 480 pixels |
| Data buffer | lithium battery |
| Signal generator | no |
| Real-time clock | yes |
| Cooling | passive (fanless) |

Electrical Requirements

| | | |
|--|-----------------------------|------------------|
| Supply voltage | typically +24 V DC | |
| | minimum +18 V DC | maximum +30 V DC |
| Current consumption of voltage supply | typically 350 mA (at +24 V) | maximum 500 mA |
| Current load on the VARAN bus (I/O module power supply) | typically 530 mA (at +24 V) | |
| Inrush current | maximum 2.4 A for 7 ms | |

Terminal

| | |
|------------|-------------------------------------|
| Dimensions | 203.5 x 170.1 x 47.5 mm (W x H x D) |
| Material | aluminium, anodized |
| Weight | circa 1kg |

Control Unit

| | |
|------------|--|
| Touch pad | integrated into display (TOP ITO Film: Anti-Glare Hard Coating & Anti-Newton RingSheet resistance : 450±50 Ω BOTTOM GLASS: sheet resistance : 500±50 Ω) |
| Resolution | 12-bit (4096 x 4096) |

Display

| | |
|----------------|---|
| Type | 5.7" TFT color display |
| Resolution | VGA, 640 x 480 pixels |
| Color depth | 16-bit (65 536 colors) |
| Pixel size | 0.1815 mm x 0.1815 mm |
| Active surface | 116.16 mm x 87.12 mm |
| Backlight | LED |
| Contrast | 300 : 1 |
| Brightness | typically 220 cd/m ² |
| Angle CR > 10 | left and right 100°, above and below 100° |

Article Number and Miscellaneous

| | |
|------------------|----------------|
| Article number | 12-230-0501-VA |
| Hardware version | 1.x |

Environmental Conditions

| | | |
|---------------------------|--|--|
| Storage temperature | -20 ... +60 °C | |
| Environmental temperature | 0 ... +50 °C | |
| Humidity | 10-95 %, non-condensing | |
| EMC tolerance | EN 61000-6-2: noise resistance EN 61000-6-4: noise emission | |
| Vibration tolerance | EN 60068-2-6 | 2-9 Hz: amplitude 3.5 mm 9-200 Hz: 1 g (10 m/s ²) |
| Shock resistance | EN 60068-2-27 | 15 g (150 m/s ²), duration 11 ms, 18 shocks |
| Protection type | EN 60529: protected through the housing | cover: IP20 |

Notes



Engineering Tool LASAL



```
FUNCTION GLOBAL
VAR_INPUT
EAX : UDINT;
END_VAR
VAR_OUTPUT
state (EAX) : UDINT;
END_VAR
// Read value from connected server
Sampleclient := sampleclient;
// current server value from client
state := substract
```

```
state := READY;
END_FUNCTION
Sampleclient := substract
```

```
(eBreak) <-[]->
ShortCircuit) <-[]->
Input 1 (TMP_1) <-[ActTempZ3_X3.1]-> HeatZone5.ActTemp
Input 2 (TMP_2) <-[ActTempZ4_X3.1]-> HeatZone6.ActTemp
Input 3 (TMP_3) <-[ActTempZ6_X3.1]-> HeatZone6.ActTemp
```

Engineering Tool LASAL

LASAL CLASS

LASAL SCREEN

LASAL MOTION

LASAL SAFETYDesigner

LASAL SERVICE



Integrated and Object Oriented: Engineering Tool LASAL

The all-in-one engineering tool LASAL offers all the advantages of a modern and integrated engineering environment: Innovative programming techniques allow the simple and fast implementation of machine applications. With LASAL, engineering times and time-to-market cycles are significantly reduced - achieving a higher software quality.

LASAL CLASS

Object-oriented programming with graphic representation

LASAL SCREEN

Visualization fast and simple

LASAL MOTION

For regulation and control tasks in drive technology

LASAL SAFETY

Safety programming and configuration

LASAL SERVICE

Tools for remote maintenance, simulation, software updates, data exchange

"All-in-one": One Tool for all Aspects of Automation

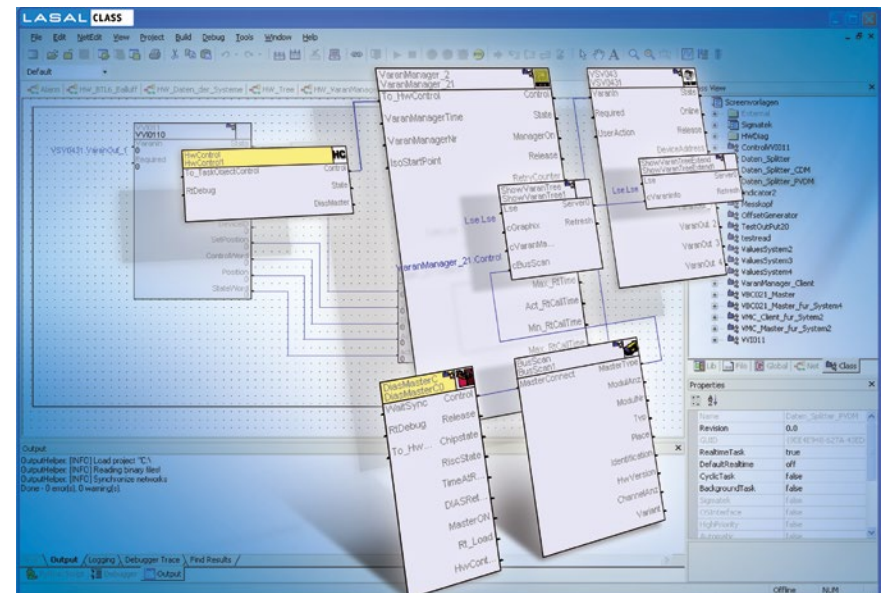
LASAL provides all necessary functions for solving automation tasks in one tool: PLC programming, visualization, motion control, Safety diagnosis and remote maintenance. The individual software modules can be combined like a modular toolbox system. The integrated development environment reduces the engineering times and costs significantly.

Object Oriented Programming

Object oriented programming ensures the highest possible flexibility for the machine builder, since the object oriented construction of the software allows a quick reaction to customer-specific needs.

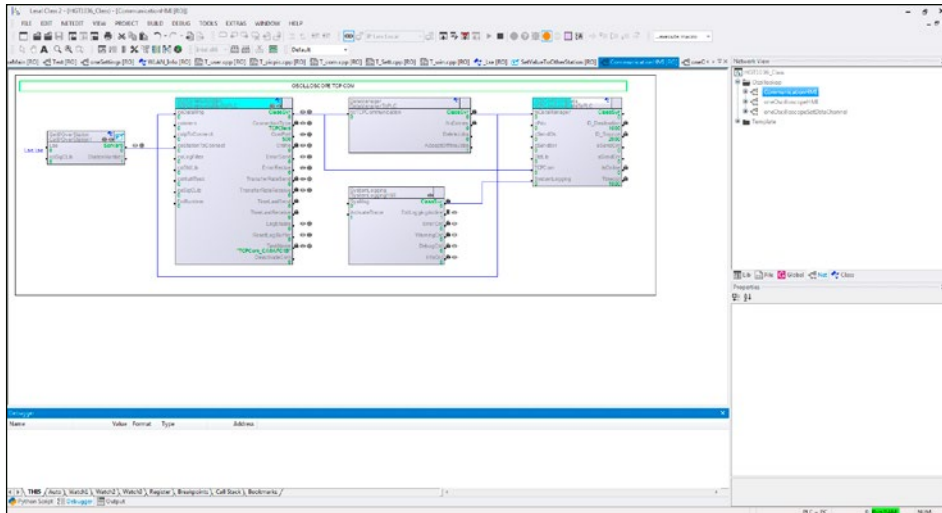
In 2000, SIGMATEK was the first to integrate object oriented programming with graphic representation and client/server communication into automation technology. With object orientation, LASAL sets a new standard for modularity and reusability. Through the inheritance of class properties, a structure of program components in hierarchical levels is possible.

Through the modular structure, previously created application sections can be changed or reused easily.



Clear Organization with Graphic Representation

Through the graphic representation of program components, the complexity of the program is encapsulated. This means that the program code is not visible at the first glance. The relationships between the program sections as well as the most important program data are shown. The interconnections of the individual modules are thereby clarified.



Object oriented programming and graphic representation ensure clear software structures.

Comprehensive and Future-Proof

LASAL can be used on all platforms. The entire SIGMATEK product palette such as CPUs, terminals and industrial PCs are supported. In addition, the hardware platform can be changed without having to adapt the software. The automation system can therefore be easily expanded at any time; the user has a future-proof system.

LASAL highlights at a Glance

■ Comprehensive engineering

With LASAL, all automation tasks are comfortably implemented: PLC, visualization, motion control, Safety, diagnostics. An integrated and simple to operate tool for all phases of the engineering process is thereby provided: from project development to programming to initial start-up and service of the machine in the field. The programming is significantly reduced and the engineering and maintenance times are drastically shortened.

■ Efficient and clear

Object oriented programming with graphic representation enables the highest modularity, reusability and clear structuring of the software.

■ Comfortable: several integrated tools

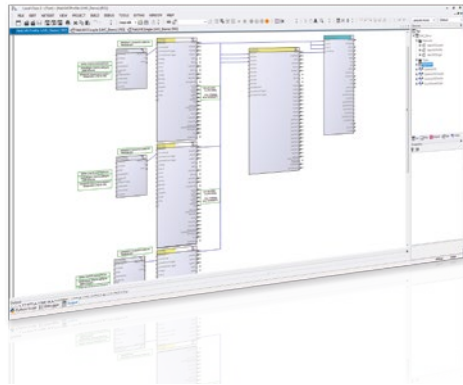
The fast development and comprehensive analysis of programs are supported by an extensive collection of tools such as

- Online debugger with all the functions one expects from an integrated development environment
- Real-time oscilloscope and trend recording
- Time response analysis of the real-time multitasking operating system (PlcTraceView)
- Project comparison



LASAL
reflects your machine

Project Development According to IEC 61131-3 Standard LASAL CLASS



LASAL CLASS (Control Logic Application Software) is THE engineering tool to solve your automation tasks. With an integrated operating concept and clearly organized surface, LASAL CLASS offers a comfortable design environment for object oriented programming - from the simplest machine to complex applications.

Object Oriented Programming

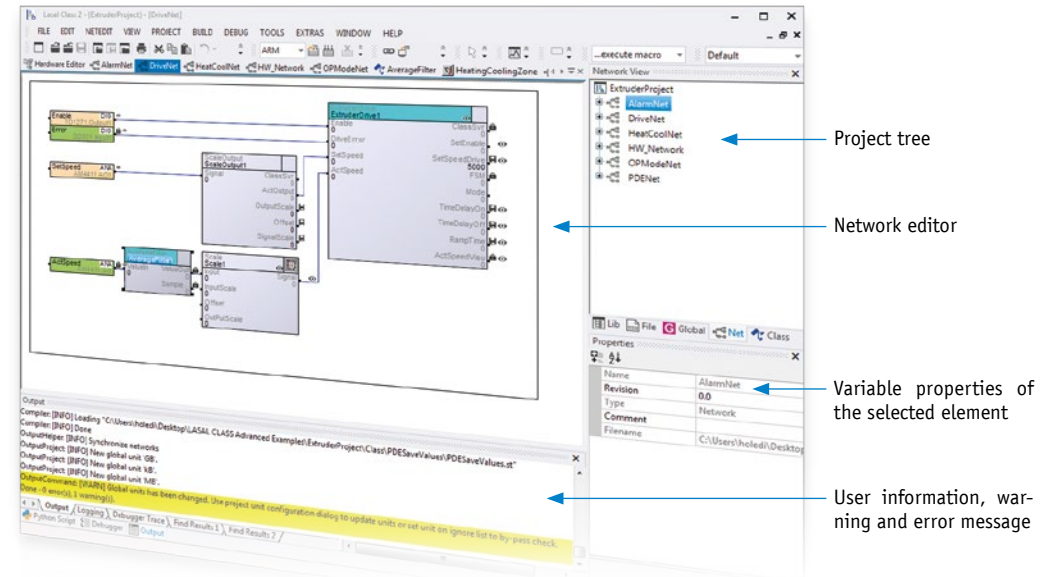
LASAL expands the IEC 61131-3 standard with object oriented programming and ensures the simple and clear creation of applications. Thanks to the modularity, the reusability of the classes and the encapsulation of user programs, the application is more efficient and easier to test. The development time and engineering costs are therefore reduced significantly.

With object oriented programming, the various components of a machine or system are represented in the form of objects. Behind each object, there is a class containing the program code and the corresponding data elements. The usual separation of data and program code with procedural programming languages is eliminated.

Each class can therefore assume a specific task, such as measuring and evaluating temperatures, a filter function, motor control, etc. The various classes are managed in a clearly organized library.

Through importation, the classes are integrated into the project tree. For the exchange of information, defined interfaces (connections) are available, which can send and receive data.

A class can be placed in the network by Drag & Drop from the project tree and thereby creating an instanced, real object. The objects must only be connected to one another and an application is generated. The objects need only be connected to one another and an application is created.



Article Number

LASAL CLASS

02-010-041

LASAL Machine Manager

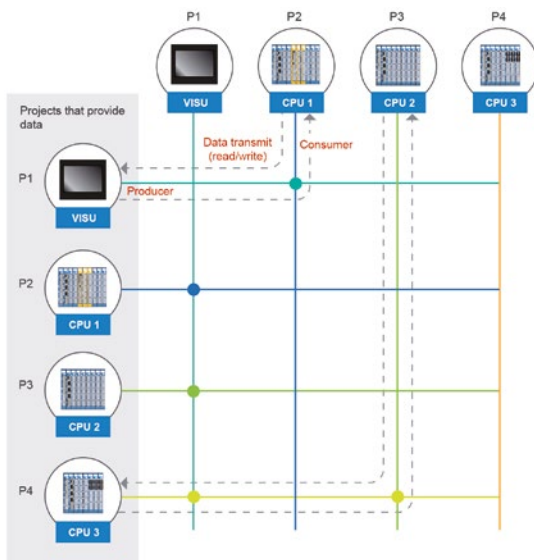
With „smart factories“ and „Industry 4.0“ in sight, SIGMATEK focuses on modular, decentral automation solutions. Machine or plant functions are organized in logical, mechatronic units – equipped with decentral compact CPUs.

The system configuration can there-with be assembled from a toolkit specifically to a customer's needs and later expanded with optional function units, such as a handling robot.

To perfectly reproduce this intelligent modularity in the software, the „Machine Manager“ was developed.

It enables the organized display of individual software projects in a machine or system and regulates the communication of distributed intelligences - who can exchange which data with whom.

Data exchange with external equipment components and the connection to higher-level systems can also be implemented with the help of the machine manager. This reduces the work for initial start-up and handling, and simplifies the implementation of adaptive production strategies.



OPC UA

OPC UA – the new protocol generation in M2M communication – enables manufacturer and platform-independent data exchange in one future-oriented intelligent control network of machines and plants.

LASAL supports the OPC UA communications protocol. The LASAL OPC UA server runs directly in the control or HMI. The OPC UA clients from MES and ERP systems can log in to exchange process data over the OPC UA server or for example, manage production orders. Via the settings in the project, it is possible to specify which process data can be read or written.

C-Code Models

In Matlab Simulink, existing C-code models can be directly inserted into LASAL. This reduces the development times considerably.

During import to LASAL, the C-code is packed into the class automatically. Input and return values are defined by the user; LASAL generates the code automatically.

The C-code model can be thereby easily used. Possible changes to the model can be made in Matlab Simulink and reimported into the LASAL project with the push of a button.

Convincing Visualization Comfortably Applied LASAL SCREEN



LASAL SCREEN is an HMI tool for visualization on all graphic display units from SIGMATEK. The system is Unicode-based and can therefore be used with any language in the world. An online language and unit converter is already integrated.

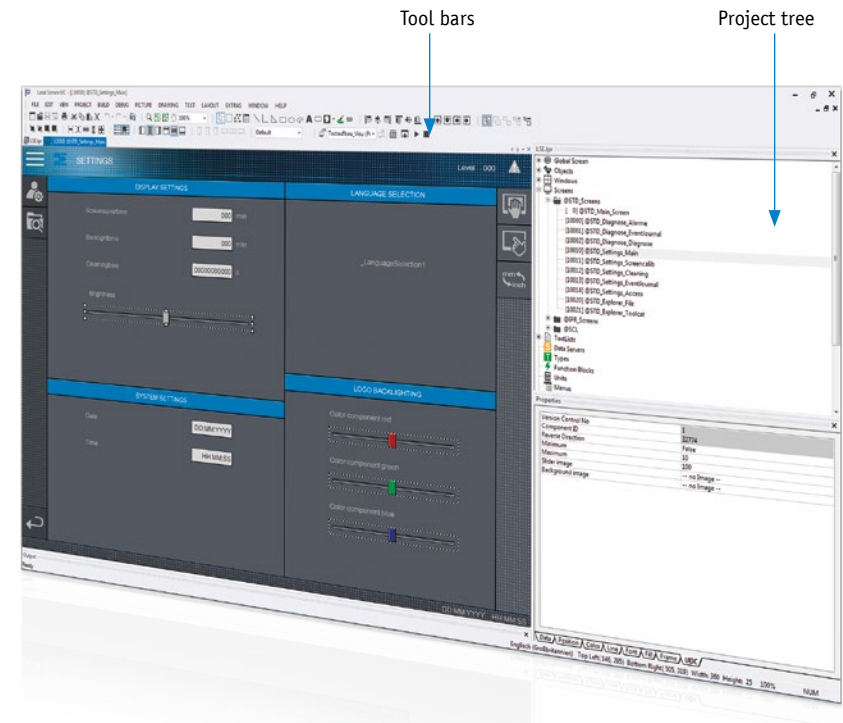
Programming knowledge is not required for creating the visualization. LASAL CLASS defines the variables available for the visualization.

Flexible Screen Construction

With LASAL SCREEN, graphics can be easily created in the corporate design of the company. For project development, integrated designs and a large graphic pool (library) is available. In addition, user-defined graphics in standard formats can also be imported (BMP, JPG).

With the definition of a global screen and the individual screens derived there from, the project development time can be significantly reduced. LASAL SCREEN supports all resolutions of the various SIGMATEK displays.

Additionally, LASAL SCREEN offers the user such functions as alarm and event management (logbook), trend display, bar diagrams, recipe management, etc.



Editor for creating screens

Article Number

LASAL SCREEN

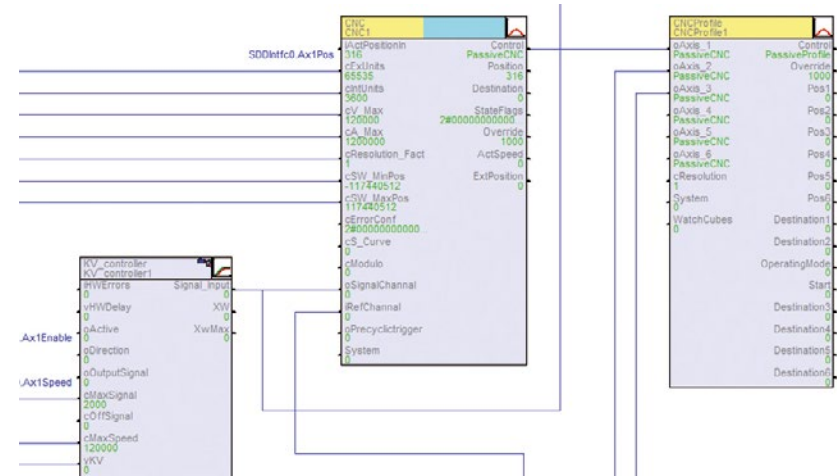
02-010-051

High Performance Tool for Drive Technology

LASAL MOTION



LASAL MOTION simplifies all drive technology tasks and is fully integrated in LASAL CLASS. The modular construction enables the efficient implementation of the drive concept. The project development and start-up software for the SIGMATEK drives is also integrated. In addition, a large drive library is available.

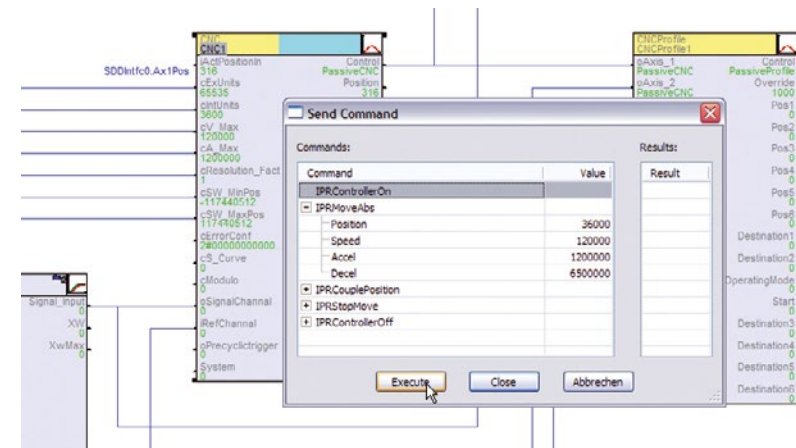


Axial movements can be executed using simple data inputs or instructions without any programming.

Numerous Motion Control Components

In the library provided, a large selection of standard motion functions is available such as absolute, relative and endless positioning as well as CNC functions, coordinated movements such as linear interpolation with up to 6 axes, circular interpolation, curved disks, gear functions, flying saws, electrical waves and tracked movements. Furthermore, numerous types of referencing and NC applications are available in addition to standard functions.

Existing motion control components can be tailored to customer-specific requirements with little effort. For the most common drive systems from various manufacturers and the bus systems used (VARAN bus CAN bus, Profibus, etc), LASAL MOTION offers standard components for simple control.



Article Number

LASAL MOTION

02-010-081

Safety Seamlessly Integrated with the LASAL SAFETYDesigner



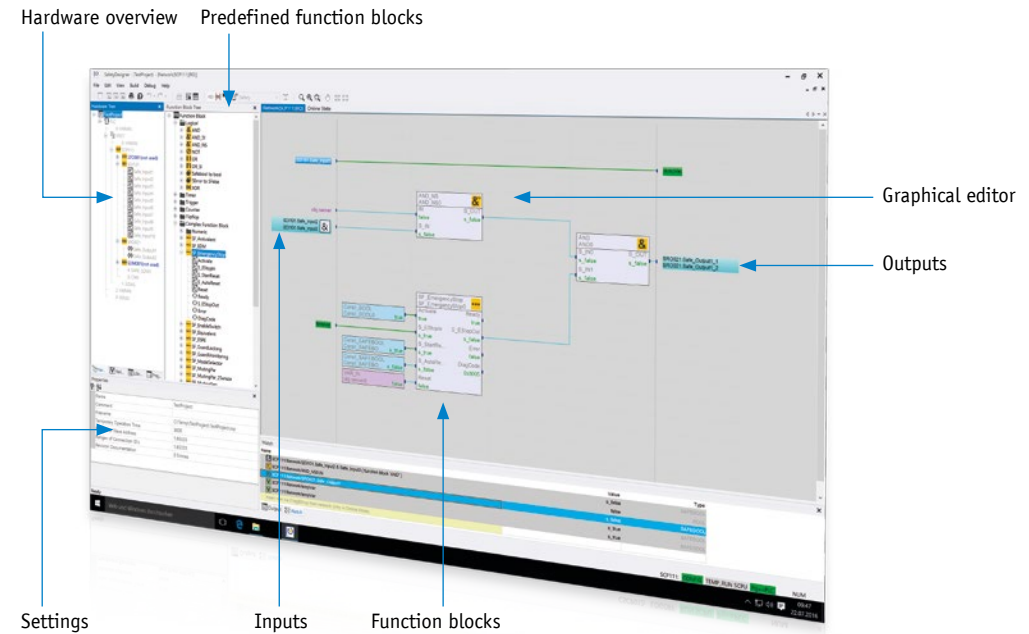
For Safety programming and configuration, a comfortable tool is provided with the LASAL SAFETYDesigner.

Safety Made Easy

The LASAL SAFETYDesigner simplifies the programming and configuration of the Safety controller. Logic connections and I/O configurations can be created comfortably.

Based on a functions library, which in addition to standard function blocks, also provides functions based on the PLCopen standard such as Emergency Stop, 2 Hand Control or Guard Locking. Logic connections to the safety-related processes can thereby be easily created. In the integrated graphic editor, function blocks and I/Os can be easily placed through Drag & Drop and connected to the non-safe variables of the PLC.

Downloading, online monitoring and debugging are done over LASAL's online interface. Several Safety controllers can be used per project, whereby the program in each Safety controller can be distributed over any number of networks. The simple operation and clearly organized display reduce the time and effort for programming, maintenance, diagnosis and especially for the validation.



Article Number

LASAL SAFETYDesigner

02-010-141

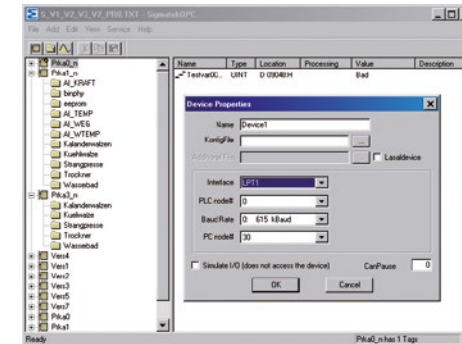
Simple Diagnosis, Service and Remote Maintenance with LASAL SERVICE



The all-in-one engineering tool is equipped with numerous service tools. Remote maintenance, software updates and data exchange are comfortably realized with LASAL SERVICE tools and additional SIGMATEK add-ons.

OPC UA Client & Server

The OPC Unified Architecture communications protocol enables manufacturer and platform-independent data exchange, which makes a good choice for implementing Industry 4.0 concepts. OPC UA functions according to the client-server principle and is supported by LASAL. In LASAL CLASS the user can define which process data can be read or written.



Webserver

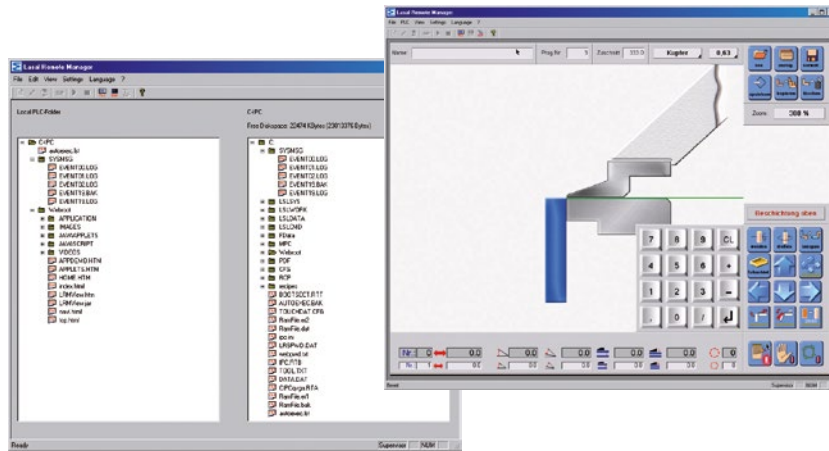
The web server in the control provides information on the Hypertext Transfer Protocol (HTTP). The websites created by the user must be written in HTML and located in a user-defined directory in the control. Using a browser (e.g. Internet Explorer), the website can be viewed. For remote maintenance, data in the PLC can also be accessed regardless of where the active visualization is located. Naturally, access can be protected by a password.

LRS API

With the LRS API (Application Programming Interface), any type of remote maintenance or visualization tool can access the world of SIGMATEK controls online. The API is part of a Windows DLL. All communication interfaces such as RS232, CAN bus, Ethernet and Modem are supported.

LASAL Remote Manager

The LASAL Remote Manager (LRM) is used for remote maintenance of machines. In addition to a tabular overview of user-defined machines (controls), this tool offers a remote view of the visualization. For data transfer between the PC and control, a control explorer is provided. Additional features: Application start and stop, CPU reboot, software updates (application and operating system), setting and reading application data, etc. The connection between the PC (LASAL Remote Manager) and the control can be established over RS232, CAN bus Ethernet and Modem.



LRMView

LRMView is an add-on software for the control. It offers the possibility to display or control an on-site visualization through a standard web browser, (e.g. internet explorer) without having to install special software on the PC. Naturally, the system is protected with user names and passwords for secure access. LRMView is a modern Java applet with so-called PUSH technology, which can be used in connection with the web server in the control.

FTP-Client and FTP-Server

The operating LASAL OS operating system provides a standard F(ile)T(ransfer)P(rotocol), with which files can be loaded to an FTP protocol-based server. The CPU can also be used as an FTP server.

Functions:

- Create/terminate connections
- Send, receive, attach, rename, delete or move files
- Create, delete, rename or move directories
- List files and directories

SIGMATEK System Manager

The SIGMATEK System Manager (SSM) supports the user with maintaining, securing and restoring SIGMATEK systems. The SSM is installed using a USB stick and provides a simple and comfortable user guide. All necessary functions such as data backup, hard drive formatting and driver installation are covered.

LARS

LARS, a Windows-based simulation of control programs and visualizations, serves the development of visualization projects on the Windows PC. In Addition, LARS can be used for demo applications for presentations and offers remote maintenance support.

LASAL SERVICE & Article Number

| Description | Article number |
|---------------------------------------|----------------|
| LASAL SERVICE (LRM, LRMView, LRS API) | 02-010-091 |
| OPC Server | 02-010-031 |
| Web Server | 02-010-101 |
| FTP Client and FTP Server | 02-010-111 |
| SIGMATEK System Manager | 02-010-131 |
| LARS | 02-010-121 |
| PDF License | 02-010-071 |

Findex

A

| | |
|---------------------------|----------|
| Accessories General | 773 |
| Accessories HMI | 612 |
| Accessories IPC | 358 |
| AI 022 | 144 |
| AI 022-1 | 146 |
| AI 023 | 148 |
| AI 031 | 220 |
| AI 040 | 222 |
| AI 043 | 148, 152 |
| AI 046 | 156 |
| AI 047 | 160 |
| AI 075 | 164 |
| AI 084 | 168 |
| AI 088 | 172 |
| AI 088-1 | 176 |
| AI 0812..... | 170 |
| AKM Servo Motors | 676 |
| AM 221 | 190 |
| AM 222 | 194 |
| AM 441 | 198 |
| AM 442 | 202 |
| AO 026 | 180 |
| AO 046 | 184 |
| AO 081..... | 188 |

B

| | |
|----------------|----------|
| Batteries..... | 776 |
| BL 011 | 294 |
| BWH 001..... | 598, 602 |
| BWH 011..... | 602 |

C

| | |
|---------------------------|-----|
| Cable | 781 |
| CAN Bus | 778 |
| C-Code Modelle | 851 |
| CFF 011 | 784 |
| CO 041 | 268 |
| CompactFlash Floppy | 784 |
| CP 101 | 50 |
| CP 102 | 52 |
| CP 111 | 54 |
| CP 112 | 56 |
| CP 311 | 58 |
| CP 312 | 60 |
| CP 313 | 62 |
| CP 731 | 64 |
| CP 733 | 66 |

D

| | |
|-----------------------------|-----|
| Data Recording PC..... | 352 |
| DC 061-1 | 234 |
| DC 062..... | 238 |
| DC 101 | 242 |
| DC 102 | 246 |
| DEE 021 | 296 |
| DI 080 | 94 |
| DI 160 | 96 |
| DI 169 | 98 |
| DI 200 | 100 |
| DI 202 | 102 |
| DI 203 | 104 |
| DI 204 | 206 |
| DI 205 | 106 |
| DIAS Drive..... | 626 |
| DIAS Drive Series 100 | 656 |
| DIAS Drives Series 300..... | 632 |
| DM 046 | 122 |

| | |
|-----------------------------|-----|
| DM 081 | 124 |
| DM 108 | 126 |
| DM 161 | 130 |
| DM 162 | 132 |
| DM 167 | 134 |
| DM 811 | 224 |
| DM 821 | 270 |
| DM 822..... | 228 |
| Drives..... | 618 |
| Drives Interface Cards..... | 724 |

E

| | |
|------------------------------|----------|
| EC 121 | 68 |
| EE 121 | 230 |
| Energy Measuring Module..... | 296 |
| Engineering Tool LASAL..... | 841, 844 |
| ETT 312 | 438 |
| ETT 352..... | 440 |
| ETT 353..... | 442 |
| ETT 412 | 444 |
| ETT 731 | 446 |
| ETT 732..... | 386, 390 |
| ETT 764 | 394 |
| ETT 771 | 450 |
| ETT 0833 | 398 |
| ETT 1033 | 402 |
| ETT 1034 | 406, 410 |
| ETT 1054-W | 414 |
| ETT 1233 | 422 |
| ETT 1234 | 426, 430 |
| ETT 1533 | 486 |
| ETT 1534 | 490, 494 |
| ETT 1561 | 548 |
| ETT 1834 | 502, 506 |
| ETT 1933 | 514 |

| | |
|------------------------|----------|
| ETT 1962 | 552 |
| ETT 2134 | 518, 522 |
| ETT 2154-W | 526 |
| ETV 0551..... | 458 |
| ETV 0552 | 462 |
| ETV 0555 | 466 |
| ETV 0851..... | 470 |
| ETV 0851-I | 474 |
| ETV 0853-3 | 478 |
| ETV 0855 | 480 |
| ETV 1251 | 482 |
| ETV 1591..... | 354 |
| ETVA 0501 | 836 |
| ETV Control Panel..... | 458 |
| EZ 101 | 272 |
| EZ 102 | 274 |
| EZ 122 | 276 |

F

| | |
|---------------------------------|-----|
| FC 021 | 208 |
| Floppy drive..... | 612 |
| FTP-Client and FTP-Server | 861 |

H

| | |
|-----------------------------------|-----|
| Handheld Control Panel | 562 |
| Handheld Control Panel 8.4" | 564 |
| HBG 0811 | 562 |
| HBG 1011 | 568 |
| HGT 835..... | 564 |
| HGT 1035 | 570 |
| HGT 1051 | 574 |
| HGT 1053 | 578 |
| HGW 1033 | 582 |
| HGW 1033-01 | 586 |
| HGW 1033-3 | 590 |

| | |
|--------------------------|-----|
| HGW 1033-32 | 594 |
| HMI-Link Expansion | 360 |
| HMI-Link G2 Device | 362 |
| HMIs | 381 |

I

| | |
|-----------------------|-----|
| ICA 011 | 72 |
| ICA 012 | 74 |
| IIO 041 | 76 |
| Industrial PCs | 341 |
| International | 40 |
| IO 011 | 136 |
| IO 011S | 140 |
| IPC 221 | 346 |
| IPC Accessories | 358 |
| IPN 021 | 80 |
| ISE 021 | 82 |
| ISE 031 | 84 |

K

| | |
|--------------|-----|
| Keypad | 606 |
| KL 090 | 278 |
| KL 091 | 280 |
| KL 180 | 282 |
| KL 181 | 284 |

L

| | |
|-----------------------------|-----|
| LARS | 861 |
| LASAL | 841 |
| LASAL CLASS | 848 |
| LASAL Machine Manager | 850 |
| LASAL MOTION | 854 |
| LASAL Remote Manager | 860 |
| LASAL Safety Designer | 856 |
| LASAL SCREEN | 852 |

| | |
|---------------------|-----|
| LASAL SERVICE | 858 |
| LRMView | 860 |
| LRS API | 859 |

M

| | |
|---|-----|
| MDD 111-1 | 664 |
| MDD 121-1 | 666 |
| MDD 2000 | 626 |
| MDM 011, 021, 031 and 041 | 668 |
| MDM 011-Z1 | 670 |
| MDP 101-1 | 656 |
| MDP 102-1 | 660 |
| Mechanical Dimensions AKM | 684 |
| Mechanical Dimensions SM | 690 |
| Memory Cards and Miscellaneous | 798 |
| Mobile Panels | 562 |
| Motion Control System | 615 |
| Motor Cable DIAS Drive Series 100 | 722 |
| Motor Cable DIAS Drive Series 300 | 720 |
| Motor Cable MDD 2000 | 716 |
| MSR 111 | 736 |
| MSR 121 | 738 |
| MSR 131 | 740 |
| MSR 211 | 742 |
| MSR 221 | 744 |
| MSR 222 | 748 |
| MSR 223 | 752 |
| MSR 231 | 754 |
| MSR 241 | 756 |
| MSR 251 | 758 |
| MSR 261 | 760 |
| MSR 281 | 762 |
| MSR 282 | 766 |
| MSR 311 | 770 |
| MSR Analog Measuring Modules | 744 |

| | |
|------------------------------------|-----|
| MSR Base Module | 742 |
| MSR Digital Measuring Module | 770 |
| MSR Fan Module | 740 |
| MSR Interface Module | 738 |
| MSR Module Carrier | 736 |
| MSR System | 731 |

N

| | |
|--------------|-----|
| NC 100 | 212 |
|--------------|-----|

O

| | |
|------------------------------|-----|
| OPC Server | |
| OPC UA | 851 |
| OPC UA Client & Server | 859 |
| Order Code AKM | 686 |
| Order Code SM | 691 |

P

| | |
|--|----------|
| PC 301-E8 | 362, 364 |
| PC 521 | 352 |
| PCD 101 | 372 |
| PCD 111 | 374 |
| PCD 403 | 376 |
| PCD 412 | 378 |
| PCV 521 | 366 |
| PCV 522 | 368 |
| PCV 531 | 370 |
| P-DIAS I/O System (IP67) | 327 |
| PL 221 | 286 |
| Prefabricated Connector Cable | 800 |
| Protected VARAN Digital Mixed Module | 334 |
| Protected VARAN DMS Module | 338 |
| PSB 001 | 288 |
| PVAI 011 | 338 |
| PVDM 086 | 334 |
| PVDM 087 | 336 |

| | |
|--------------|-----|
| PW 022 | 114 |
| PW 161 | 116 |

R

| | |
|---------------------------------|-----|
| RAR 24XX | 792 |
| RAR 2400 | 794 |
| RAR 2405 | 794 |
| RAR 2410 | 794 |
| RAR 2415 | 794 |
| RC 001 | 290 |
| Regen Resistor assembled | 788 |
| Regen Resistor DC 06X | 786 |
| Regen Resistor MDM 011-Z1 | 670 |
| Remote Access Router | 792 |
| Representatives | 40 |
| RFID 131 | 790 |
| RFID-Reader | 790 |
| RO 041 | 118 |
| RO 051 | 120 |

S

| | |
|--|-----|
| SAFETY | 299 |
| Safety Input Box | 324 |
| SCP 011 | 302 |
| SCP 111 | 304 |
| SCP 211 | 306 |
| SDD 120 | 652 |
| SDD 210 | 644 |
| SDD 215 | 648 |
| SDD 310 | 632 |
| SDD 315 | 636 |
| SDD 335 | 640 |
| SDI 101 | 308 |
| S-DIAS | 43 |
| S-DIAS 0 V Potential Distributor | 282 |
| S-DIAS +24 V Potential Distributor | 284 |

| | |
|--|----------|
| S-DIAS Absolute Pressure Input Module | 224 |
| S-DIAS AC Current Measuring Module | 220 |
| S-DIAS Analog Input Module | 164 |
| S-DIAS Analog Mixed Module | 190 |
| S-DIAS Analog Output Module | 180, 188 |
| S-DIAS Axis Module | 234 |
| S-DIAS Control Module EtherCAT | 68 |
| S-DIAS Control Module VARAN | 70 |
| S-DIAS Counter Input Module | 208 |
| S-DIAS CPU Module | 50 |
| S-DIAS Current Controller Module | 254 |
| S-DIAS Current Output Module | 268 |
| S-DIAS DC Motor Output Stage | 250 |
| S-DIAS Differential Pressure Input Module | 270 |
| S-DIAS Digital Input Module | 94 |
| S-DIAS Digital Mixed Module | 122 |
| S-DIAS Digital Output Module | 108 |
| S-DIAS Dummy Module | 294 |
| S-DIAS Interface Module | 72 |
| S-DIAS Interface SDCI Master Module | 76 |
| S-DIAS Pixel LED Module | 286 |
| S-DIAS Positioning Module | 212 |
| S-DIAS Power Supply | 278 |
| S-DIAS PROFINET I/O Slave | 80 |
| S-DIAS Pulse Width Module | |
| S-DIAS RealTimeClock Module | 290 |
| S-DIAS Relay Output Module | 118 |
| S-DIAS SAFETY | 299 |
| S-DIAS Safety CPU Module | 302 |
| S-DIAS Safety Digital Input Module | 308 |
| S-DIAS Safety Digital Mixed Module | 310 |
| S-DIAS Safety Digital Output Module | 322 |
| S-DIAS Safety Relay Output Module | 316, 318 |
| S-DIAS Safety SNC Incremental Encoder Module | 314 |
| S-DIAS Safety SSI Absolute Value Encoder | 320 |
| S-DIAS Splitter Ethernet | 86 |
| S-DIAS Splitter VARAN | 90 |
| S-DIAS SSI Interface Module | 216 |
| S-DIAS Stepper Module | 260 |
| S-DIAS Strain Gauge Input Module | 144 |
| S-DIAS Transsonar Module | 218 |
| S-DIAS VARAN Analyzer | 292 |
| SDM 081 | 310 |
| S-DVI Interface Cable | 780 |
| SE 051 | 86 |
| SE 052 | 88 |
| Sensor Cables | 712 |
| Series AKM | 676 |
| Series AKM Low Voltage | 682 |
| Series DSM5 | 692 |
| Series PEII | 706 |
| Series SM | 688 |
| Servo Controllers | 618 |
| Servo Motors | 676 |
| SI 021 | 216 |
| SIB 061 | 324 |
| SIGMATEK System Manager | 861 |
| SNC 021 | 314 |
| Software LASAL | 841 |
| SR 011 | 250 |
| SR 020 | 254 |
| SR 022 | 256 |
| SRO 021 | 316, 318 |
| SSI 021 | 320 |
| ST 011 | 260 |
| ST 151 | 264 |
| STO 081 | 322 |
| SV 141 | 90 |
| SV 142 | 92 |

T

| | |
|-------------------------|-----|
| TAE 151 | 546 |
| TAE 1044 | 418 |
| TAE 1244 | 434 |
| TAE 1544 | 498 |
| TAE 1844 | 510 |
| TAE 1921 | 556 |
| TAE 1931 | 558 |
| TAE 1941 | 560 |
| TAE 2144 | 530 |
| TAE 2343 | 542 |
| TE 401 | 608 |
| TE 501 | 610 |
| TE 891 | 606 |
| Terminals | 381 |
| TO 081 | 108 |
| TO 127 | 110 |
| TO 161 | 112 |
| Topologies | 32 |
| Touch pen V2 resistive | 613 |
| Touch pen V3 capacitive | 613 |
| TS 041 | 218 |
| TS 051 | 218 |
| TT 1533 | 534 |
| TT 1933-S | 538 |

U

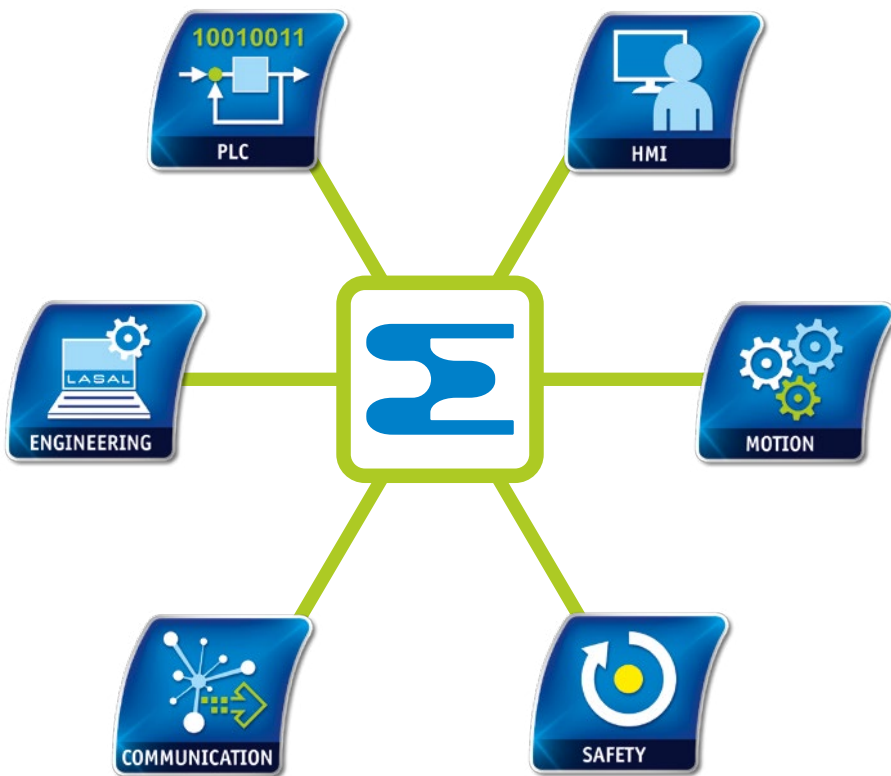
| | |
|-----------|----------|
| USB Stick | 612, 798 |
| USV 011 | 358 |

V

| | |
|---------------------------------|-----|
| VA 011 | 292 |
| VARAN Analyzer | 836 |
| VARAN Bus Connection Technology | 800 |
| VARAN Client Boards | 816 |
| VARAN Demo Board | 828 |
| VARAN Manager Board | 814 |
| VARAN Stepper Module | 672 |
| VARAN Valve Interface | 834 |
| VBI 021 | 724 |
| VEB 011 | 816 |
| VEB 011C | 818 |
| VEB 011-SPI | 820 |
| VEB 012 | 822 |
| VEB 013 | 824 |
| VEB 013-SPI | 826 |
| VEB 021 | 828 |
| VEB 022 | 832 |
| VEB 031 | 814 |
| VI 021 | 70 |
| VKI 021 | 726 |
| VKI 022 | 728 |
| VST 012 | 672 |
| VVO 323 | 834 |

W

| | |
|-------------------------|-----|
| Wall Mount for HBG 0811 | 612 |
| Wall Mount for HBG 1011 | 612 |
| Wall Mount for HGT 835 | 612 |
| Wall Mount for HGT 1035 | 612 |
| Web Server | 858 |
| WIFI 011 | 796 |



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