MEC3

The modular communication gateway

Datasheet

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MADE IN GERMANY

Qualitätsmanagement ISO 9001
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DEKRA zertifiziert

Slot 1: Power Supply Module (PS24VDC)

Operating voltage	$U_{PWR1/2}$: 24 V DC (21 - 27 V DC)
Power consumption	Max. 20 W (typ. 5.5 W) (with two modules – PS24VDC & CPU2E2S)
Holding time	~ 100 ms at 15 W Protection against short-time voltage interruptions
“FAIL” status relay (software-controlled)	Maximum voltage: 25 V AC / 30 V DC Maximum current: 2 A
Line cross-section	0.129 – 3.31 mm² (solid or stranded wire)
Features	Redundant voltage feed-in The ground (GND) is galvanically connected directly to the protective earth (PE) Undervoltage and overvoltage protection (see EMC)
Diagnostic LEDs:	
PWR	Power supply indicator (CH1 / CH2)
CH1	Power supply connected via channel 1
CH2	Power supply connected via channel 2
Reset button:	
RNS	Reset network settings

Slot 2: CPU Module (CPU2E2S)

CPU	ARM Cortex-A72 (1.5 GHz Quad Core)
Memory	4 GB RAM
Flash	2 GB industrial microSD card SLC-NAND up to 20,000 write cycles MTBF > 3,000,000 h
Ethernet interface	2x RJ45 10/100/1000 BASE-T
Serial interface	2x RJ45 RS232 / RS422 / RS485 baud rate: 300 – 115200 baud
USB interface	1x USB 2.0 up to 480 Mbps “high speed” port type A
Diagnostic LEDs:	
- PWR	Power supply indicator
- USR	LED freely configurable by software
- CPU	LED to show different software conditions
- COM1 / COM2	Send and receive LED for serial interfaces
- ETH0 / ETH1	Link and activity LED for Ethernet interfaces

Slot 3 & 4: Optional Modules

Serial Ethernet Module (COMM2E2S)

Ethernet interface	2x RJ45 10/100/1000 BASE-T
Serial interface	2x RJ45 RS232 / RS422 / RS485 baud rate: 300 – 115200 baud
Diagnostic LEDs	- Power supply indicator - Link and activity indicator for both Ethernet interfaces - Send and receive indicator for both serial interfaces

Digital I/O Module (8DI8DO)

General / VSO / GND	Line cross-section: 0.129 – 3.31 mm² (solid or stranded wire) Supply voltage for digital outputs 1..8: U_{VSO}: 24 V DC (12 – 30 V DC); I_{VSO}: max. 4 A The ground (GND) is galvanically connected directly to the protective earth (PE)
Digital inputs 1..8	The levels for low/high (hysteresis levels) are freely configurable on the software side. Input level low: -3 V .. 4 V DC (default) – compliant with EN 61131-2 type 1/3 Input level high: 16 V .. 30 V DC (default) – compliant with EN 61131-2 type 1/3 Input impedance: 6.86 kΩ Sampling rate: max. 20 Hz per input Status LED for digital input: $DI_{1..8}$ (green if high level)
Digital outputs 1..8	Highside switch (MOSFET P-Channel): Output voltage $U_{DO1..8} = U_{VSO}$ (see above) Output current: $I_{DO1..8}$ max. 500 mA (default) Overcurrent protection - switchover to high-impedance state in the event of a fault: - if 500 mA limit is exceeded - switch-off time < 1 ms - deactivation switch-off of outputs can be reset by software Max. sampling rate: 20 Hz per digital output Status LED for digital output: $DO_{1..8}$ (green if output is active; red if output deactivated due to error)

Additional Functions and Features

Linux OS	ipLinux
Real time clock	Battery buffered real time clock (RTC; CR2032)
State relay “FAIL”	The changeover switch can be individually controlled by the gateway software
Hardware watchdog	☑
Temperature monitoring	☑
Power supply monitoring	☑
Undervoltage and overvoltage protection	The power supply and all interfaces are ESD, surge, and burst protected (see EMC)

Housing

Housing material	Plastic housing
Mounting	35 mm DIN-Rail
IP Code	IP30
Rotating parts	None
Dimensions (W x H x D)	approx. 107 mm x 125 mm x 97 mm (without front connectors)
Weight	approx. 0.43 kg (two modules) approx. 0.65 kg (four modules) The exact weight depends on the modules used

Operating Environment

Operating temperature	-20 °C to +60 °C
Storage temperature	-40 °C to +85 °C
Relative humidity	5% to 90% not condensing

Approval, Standards and Conformity

Conformity	CE (EMC), FCC, ICES, UKCA, RoHS, REACH, WEEE
Standards	EN IEC 61000-6-2:2019 #EN61850-3:2014 (partial tests in the areas of EMC, heat, cold, vibration, and shock) 47 CFR FCC Part 15 Subpart B ICES-003:2020 (Issue 7) ANSI C63.4-2014

Electromagnetic Compatibility (EMC – Emission / Immunity Requirements)

EN IEC 61000-6-4:2019	Conducted Voltage Emission (150 kHz - 30 MHz) on Supply line DC (all Channels)
EN IEC 61000-6-4:2019 / #EN61850-3:2014	Conducted Voltage Emission (150 kHz - 30 MHz) on Ethernet (CPU2E2S ETH1) Conducted Voltage Emission (150 kHz - 30 MHz) on Ethernet (COMM2E2S ETH3) Conducted Voltage Emission (150 kHz - 30 MHz) on RS232 (CPU2E2S COM 2) Conducted Voltage Emission (150 kHz - 30 MHz) on RS232 (COMM2E2S COM 4)
EN IEC 61000-6-2:2019 / #EN61850-3:2014, table 13	Conducted Voltage Immunity on Earth Port
EN IEC 61000-6-2:2019, table 2 / #EN61850-3:2014, table 10	Electrical fast transient/burst immunity test on Ethernet (CPU2E2S ETH1) Electrical fast transient/burst immunity test on Ethernet (COMM2E2S ETH3) Surge immunity test on Signal line_(CPU2E2S ETH1) Surge immunity test on Ethernet (COMM2E2S ETH3) Surge immunity test on I/O (DI8DO Output) Surge immunity test on I/O (DI8DO Input) Surge immunity test on RS232 (COM 2) + RS232 (COM4) Conducted Voltage Immunity (150 kHz - 80 MHz) on Ethernet (CPU2E2S ETH1) Conducted Voltage Immunity (150 kHz - 80 MHz) on Ethernet (COMM2E2S ETH3) Conducted Voltage Immunity (150 kHz - 80 MHz) on RS232 (CPU2E2S COM2) Conducted Voltage Immunity (150 kHz - 80 MHz) on RS232 (COMM2E2S COM 4) Conducted Voltage Immunity (150 kHz - 80 MHz) on Digital I/O (DI8DO Input) Conducted Voltage Immunity (150 kHz - 80 MHz) on Digital I/O (DI8DO Output)
Immunity Signal: EN IEC 61000-6-2:2019, table 2 / #EN61850-3:2014, table 10	Electrical fast transient/burst immunity test on Digital I/O (DI8DO Input) Electrical fast transient/burst immunity test on Digital I/O (DI8DO Output) Electrical fast transient/burst immunity test on RS232 (COMM2E2S COM 4) Electrical fast transient/burst immunity test on RS232 (CPU2E2S COM 2)
EN IEC 61000-6-2:2019, table 3 / #EN61850-3:2014, table 12	Electrical fast transient/burst immunity test on Supply line (DC Ch1 / Ch2) Electrical fast transient/burst immunity test on Supply line (DC VSO) Surge immunity test on Supply line (DC Ch1 / Ch 2) Surge immunity test on Supply line (DC VSO) Conducted Voltage Immunity (150 kHz - 80 MHz) on Supply line (DC Ch1 / Ch 2) Conducted Voltage Immunity (150 kHz - 80 MHz) on Supply line (DC VSO)
EC 61000-6-4:2019, table 3 / #EN61850-3:2014, table 16	Radiated Electric Emission (30 MHz - 1 GHz)
EC 61000-6-4:2019, table 3 / #EN61850-3:2014, table 17	Radiated Electric Emission (1 GHz - 7,5 GHz)
EN IEC 61000-6-2:2019 / #EN61850-3:2014, clause 6.7	Power frequency magnetic field immunity test Electrostatic discharge immunity test Radiated Electric Immunity (80 MHz - 6 GHz), Enclosure (front) Radiated Electric Immunity (80 MHz - 6 GHz), Enclosure (right) Radiated Electric Immunity (80 MHz - 6 GHz), Enclosure (rear) Radiated Electric Immunity (80 MHz - 6 GHz), Enclosure (left)
#EN61850-3:2014, table 12	Damped oscillatory wave immunity test on Burst_Supply line (DC Ch1 / Ch2) Damped oscillatory wave immunity test on Burst_Supply line (DC VSO) Voltage dips, short interruptions and voltage variations immunity tests on Supply line (DC all channels together) Immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz on Supply line (DC all channels together) Immunity to ripple at the d.c. input power port of electrical or electronic equipment on Supply line (DC all channels together)
47 CFR FCC Part 15 Subpart B section §15.107	Conducted Voltage Emission (150 kHz - 30 MHz) on AC supply (120 V, 60 Hz)
47 CFR FCC Part 15 Subpart B section §15.109	Radiated Electric Emission (30 MHz - 1 GHz) Radiated Electric Emission (1 GHz - 7,5 GHz)

Environmental testing #EN61850-3:2014 (heat, cold, vibration, shock)

EN 60068-2-2:2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat, Operational testing
EN 60068-2-1:2007	Environmental testing - Part 2-1: Tests - Test A: Cold, Operational testing
EN 60068-2-2:2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat, Maximum storage temperature
EN 60068-2-1:2007	Environmental testing - Part 2-1: Tests - Test A: Cold, Lowest storage temperature
EN 60068-2-14:2009	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
EN 60068-2-78:2001	Environmental testing - Part 2-78: Tests; Test Cab: Damp heat, steady state
EN 60068-2-30:2005	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
EN 60068-2-6:2008	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal), Function test sine vibration, Class 1
EN 60068-2-6:2008	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal), Continuous stress sine vibration, Class 1
EN 60068-2-27:2009	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock, Shock test for functionality, Class 1
EN 60068-2-27:2009	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock, Shock test for resistance, Class 1
EN 60068-2-27:2009	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock, Continuous shock test, Class 1