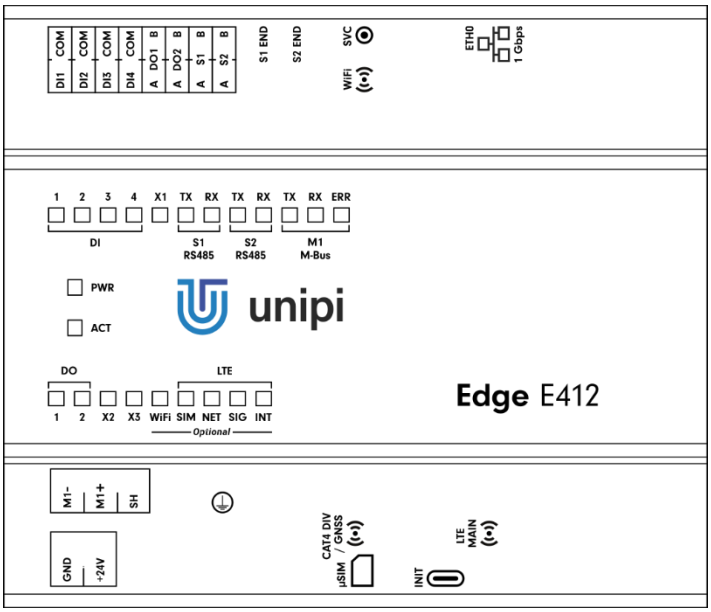
Unipi Edge E412 M-Bus



Installation and operating conditions

Control type by purpose	Operating control
Control type by design	Independently mounted control
Operational conditions	Temperature range -20 ... 60 °C, relative humidity 10 ... 95 %, without aggressive substances, condensing vapor and fog, Altitude up to 2000 m
Storage conditions	Temperature range -40 ... 85 °C, relative humidity 10 ... 95 %, without aggressive substances, condensing vapor and fog
EMC immunity zone	B (IEC 61000-6-2 compliant)
Protection class	III
Overvoltage category	II
Pollution degree	2
Automatic action control type	1
Software function class	A
Control function class	A
Ingress Protection (IEC 529)	IP 20
Operation position	Horizontal inside vertical enclosure
Installation	On DIN rail (EN 60715, 35 mm) into distribution box (holder and screws included)

Power supply

Reverse polarity protection	Yes	
Rated voltage – SELV (recommended)	24 V⎓	
Absolute limits of input voltage	20 V⎓ ... 32.2 V⎓	
Variant	**LTE Cat 1 / Cat 4**	**Without LTE**
Typical input current (at rated voltage, 24 V⎓)	0.25 A	0.18 A
Max. input current (at rated voltage, 24 V⎓)	1 A	0.7 A
RTC power supply	CR2032 lithium battery, lifetime approx. 10 years	

Dimensions and weights

Dimensions (W × H × D)	108 × 90 × 56 mm	6 DIN modules
Weight	Approx. 240 g	
DIN holder variant	**Default**	**Alternative**
Name	AL	TSH-35
Holder thickness	3.5 mm	7 mm
Holder weight	61 g	14 g
Holder material	Aluminium	Plastic

Connectors

Connector purpose	**Power supply**	**Other**
Min. wire gauge	0.75 mm^2, AWG18	0.2 mm^2, AWG24
Max. wire gauge	2.5 mm^2, AWG14	1.5 mm^2, AWG16
Terminal pitch	5.08 mm	3.5 mm
Max. tightening torque	0.4 Nm	-
Connector type	Pluggable terminal blocks	

General

Compute module	Raspberry Pi Compute Module 4
Processor	quad-core CPU (Arm© Cortex©-A72, max. 1.5 GHz)
RAM	LPDDR4 RAM
Size of RAM	Options 1, 2, 4 or 8 GB
Internal storage	eMMC
Size of internal storage	Options 8, 16 or 32 GB
Retain memory	NVRAM
Size of retain memory	128 kB
TPM 2.0	Yes
Hardware Watchdog	Yes
User LED	3 × green
Operating System	Linux based OS – Debian

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Digital inputs

No. of Inputs × groups	4 × 1
Input terminals	DI
Common ground	COM
Input type	SINK
Log. 0	< 5 V⎓
Log. 1	> 9 V⎓
Maximum voltage	35 V⎓
Input resistance for log. 1	6 200 Ω
Minimum pulse length	20 µs
0–>1 / 1–>0 typical delay	20 µs / 60 µs
Max. CNT counter input frequency	10 kHz
Functions of input	Counter (incl. Memory), Direct switch
Galvanic isolation	Functional, see manual for more details
LED indication	Yes

Digital outputs

No. of outputs × groups	2 × 1
Output terminals	DO – A, B
Output type	MOSFET SSR (resistive load)
Max. switchable voltage	48 V⎓
Switchable current continuous	500 mA
Switchable current pulse	1.5 A
Highest short-circuit current	6 A
Total rated load	48 V⎓, 500 mA
Inductive load protection	No, external snubber needed
Max. switching speed	500 Hz / 8 bits
Functions of output	PWM
PWM max. frequency	200 Hz
PWM max. resolution	16 bits
Galvanic isolation	Functional, see manual for more details
LED indication	Yes

Communication

Ethernet	1 × 1 Gbps Ethernet
Serial/bus channels	2 × RS-485
RS-485 baudrates	50 baud ... 3 000 000 baud
RS-485 pull-up resistor	Yes, 560 Ω
RS-485 pull-down resistor	Yes, 560 Ω
RS-485 terminating resistor	Built-in attachable, 120 Ω
RS-485 galvanic isolation	Functional, see manual for more details

WLAN (Optional)

Optional variants	Without WLAN Wi-Fi and Bluetooth
Wi-Fi	2.4 GHz, 5 GHz IEEE 802.11b/g/n/ac
Frequency ranges (5 GHz)	5150–5350 MHz, 5470–5725 MHz
Bluetooth	5.0, Low energy (BLE)
RF power (max.)	max. 20 dBm (2.4 GHz) / 23 dBm (5 GHz) e.i.r.p.
WLAN antenna connector	RP-SMA female

LTE (Optional)

Optional variants	Without LTE, LTE Cat 1, LTE Cat 4, LTE Cat 1 with GNSS	
LTE variants	**Cat 1**	**Cat 4**
LTE modem	Quectel EC200U-EU MINIPCIE (Cat 1, Cat 1 with GNSS)	Quectel EC200A-EU MINIPCIE (Cat 4)
LTE category	Cat 1 (10/5 Mbps)	Cat 4 (150/50 Mbps)
GNSS (only selected variants)	GPS, GLONASS, BeiDou, Galileo, QZSS	-
GPRS/EDGE class	12/-	12/12
LTE-FDD bands	B1/3/5/7/8/20/28	
LTE-TDD bands	B38/40/41	
WCDMA bands	B1/5/8 (Cat 4 only)	
GNSS frequency range	1559–1610 MHz (receiving only)	
GSM	GSM900/DCS1800	
GSM900 RF power	max. 35 dBm	
DCS1800 RF power	max. 32 dBm	
LTE/WCDMA RF power	max. 25 dBm	
SIM card	Micro SIM	
LTE a GNSS antenna connector	SMA female	

M-Bus

Data wire gauge	0.2 mm² ... 2.5 mm²; AWG24 ... AWG14
Function	Master
Baudrate	300, 600, 1200, 2400, 4800
Galvanic isolation	Between bus and other parts 1 MOhm / 500 V 1.5 kV DC (2 kV burst/surge)
Short-circuit protection	Yes
Standard	EN 13757-2
Variant	**M2**
Unit load	1x 120 UL*
Max. continuous current	185 mA*
Max. input current (LTE Cat 1 / Cat 4)	2.0 A
Max. input current (without LTE)	1.7 A
Variant	**M5**
Unit load	1x 10 UL

Max. continuous current	25 mA
Max. input current (LTE Cat 1 / Cat 4)	1.1 A
Max. input current (without LTE)	0.8 A
Variant	**M6**
Unit load	1x 60 UL
Max. continuous current	95 mA
Max. input current (LTE Cat 1 / Cat 4)	1.5 A
Max. input current (without LTE)	1.2 A

** Valid only for ambient temperature up to 55 °C. For higher ambient temperatures (up to 60 °C) it is necessary to lower the maximum values to 90 UL and 135 mA.*

Note:
Surge protectors are necessary for connected cables leaving the LPS zone (installation class 4). For example, SP-MBUS-40V-L.

Directive compliance

RED 2014/53/EU	
GPSR 2023/988/EU	EN IEC 60730-1
EMC 2014/30/EU	EN IEC 61000-6-2 EN IEC 61000-6-3
RoHS 2015/863/EU	
WEEE 2012/19/EU	