EthMBus-XL SMART

M-Bus to Ethernet converter

- > **Versions for connecting 20, 45, 80, 120, 190 M-Bus slave devices.**
- > **10/100 Mbps Ethernet interface**
- > **TCP or UDP datagram message transmission**
- > **Supported connection modes: client or server**
- > **Simple web interface for configuration**
- > **Extended error indication with multiple status LEDs**
- > **Standard operating voltage range DC 12 to 30V**
- > **Protections and filters ensuring high durability of the entire device against surges and failures.**

Overview

EthMBus-XL is a communication converter for remote communication with M-Bus meters using the Ethernet computer network in industry, building automation.

In the Smart M-Bus mode the converter works as a server. It communicates with the M-Bus meters independently, processes their data and stores it in its own memory.

The meter data is simultaneously available in form of:
- table on a webpage
- xml, xml(REST) and csv export
- M-Bus protocol communication
- e-mail with attached xml, csv exports
- exports uploaded to an FTP server

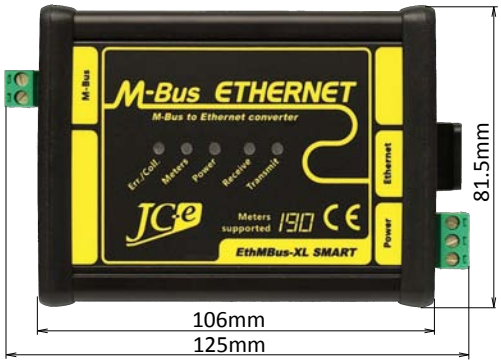
In the basic mode the converter works as a transparent gateway for transfer of M-Bus messages using TCP or UDP Ethernet protocols.

Technical parameters

Ethernet communication interface	
Communications interface	10BASE-T, alebo 100BASE-TX (auto-sensing)
Communication protocols	ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, SNMP
Connector	RJ45
Compatibility	Ethernet: Version 2.0/IEEE 802.3
M-Bus Master communication interface	
Number of attachable devices	five versions: 1 to 20, 45, 80, 120, 190 M-Bus slave devices
Baud rate	300 - 9600 bps
Protection	- overvoltage protection TVS 1500W - electronic protection against overloads, short circuit and external voltage on the line. Time of recovery to normal operation within 1 second.
Galvanic separation	1kV from power supply, >1kV from Ethernet
Power Supply	
DC power	12V to 30V. Model XL190 20V to 30V.
Protection	overvoltage protection TVS 1500W
Power consumption	1.8W to 16W Depends on M-Bus line load, power supply, converter model. Consumption falls to min. value during short and overload on M-Bus line.
Temperature	
Operating range	-40°C to 60°C

Mechanical parameters of the converter

The converter is made from a robust aluminium box which ensures excellent mechanical durability, enhanced interference resistance and improved heat dissipation from the converter to the environment. The converter is designed to be mounted on a 35 mm DIN rail (EN 50022 top hat rail). Weight of the converters ranges from 230g to 250g depending on model.



Top view

Side view with DIN rail attached

LED indication

ⓘ *Operational states indication*

LED	State
Power LED turned on	Converter and power supply is alright.
Transmit LED flashing	Data is transmitted to the M-Bus line.
Receive LED flashing	Data is received from the M-Bus line.
Meters LED turned on	Load on M-Bus line. Meters are connected to the line.
Meters LED turned off	Disconnected M-Bus line. No meters are connected to the line.
Meters LED fast flashing	Max. amount of meters on M-Bus line reached (2 meters tolerance).

⚠ *Malfunction states indication*

LED	State
Power LED flashing	Internal converter error.
Power LED flashing + turned on **Err./Coll. LED**	External voltage on M-Bus line or Internal converter error.
Err./Coll. LED flashing or turned on	Converter overload - too many meters, short on the M-Bus line or capacitive overload on M-Bus line (C of line >5µF). When turning on the power - capacitive overload on M-Bus line (C of line >1µF). Increased capacitance may be caused by meters during power up. Capacitance can afterwards fall bellow 1µF.
Err./Coll. LED turned on for a short while	During data reception - flashing **Receive LED**. Communication collision. Simultaneous reply from multiple meters. During data transmission - flashing **Transmit LED**. An error occurs during transmission (incorrect voltages on the M-Bus line). Internal converter error or capacitive overload on M-Bus line.

EMC compatibility

EMC compatibility of the M-Bus converter has been tested according to the following industrial environment standards in an accredited laboratory.

EMC emission tests

Standard	Test	Level
EN 55011	Power line - CONDUCTED EMISSIONS 10/150 kHz - 30 MHz	Class A
EN 55011	RADIATED EMISSIONS (Electric Field) 30 MHz - 1000 MHz	Class A

EMC immunity tests

Standard	Test	Level
EN 61000-4-2	ELECTROSTATIC DISCHARGE (ESD) - Contact discharge	± 4kV
EN 61000-4-2	ELECTROSTATIC DISCHARGE (ESD) - Air discharge	± 8kV
EN 61000-4-3	RADIATED RADIO-FREQUENCY ELECTROMAG. FIELD 80MHz - 1GHz	10 V/m
EN 61000-4-3	RADIATED RADIO-FREQUENCY ELECTROMAG. FIELD 1.4GHz - 2GHz	10 V/m
EN 61000-4-3	RADIATED RADIO-FREQUENCY ELECTROMAG. FIELD 2GHz - 2.7GHz	3 V/m
EN 61000-4-4	ELECTRICAL FAST TRANSIENT/BURST - Power line	± 4 kV
EN 61000-4-4	ELECTRICAL FAST TRANSIENT/BURST - M-Bus line	± 4 kV
EN 61000-4-5	SURGE IMMUNITY - Power line. Common/differential mode.	± 1kV / ± 500 V
EN 61000-4-5	SURGE IMMUNITY - M-Bus line. Cable shielding.	± 4 kV
EN 61000-4-5	SURGE IMMUNITY - M-Bus line. Common/differential mode.*	± 4kV / ± 2kV
EN 61000-4-6	CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS 0,15MHz - 80 MHZ. M-Bus line.	10 V

* Test carried out at the request of the manufacturer. The M-Bus port of the converter achieves the highest level of overvoltage protection according to the EN 61000-4-5 standard. Carrying out this type of test is not required with the use of shield cable. Reaching the highest level of protection on the M-Bus port also guarantees the highest achievable reliability of the converter. The M-Bus interface often poses the greatest risk of overvoltage and the ensuing destruction of the converter.

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