

General

The M-Bus system is a data transmission system for acquiring, evaluating, optimizing and controlling energy and process data. Modular components permit networking of a large number of different energy meters and computer-controlled terminals. The high degree of noise immunity, even in noisy environments, ensures reliably and error-free measured value transmission. Via modem interfaces, it is also possible to cover large distances to connect modular expansions or complex substation systems. The M-Bus system is the system preferred by operators supplying numerous consumers (e.g. industry and technology parks, trade fairs, building managements, etc.).

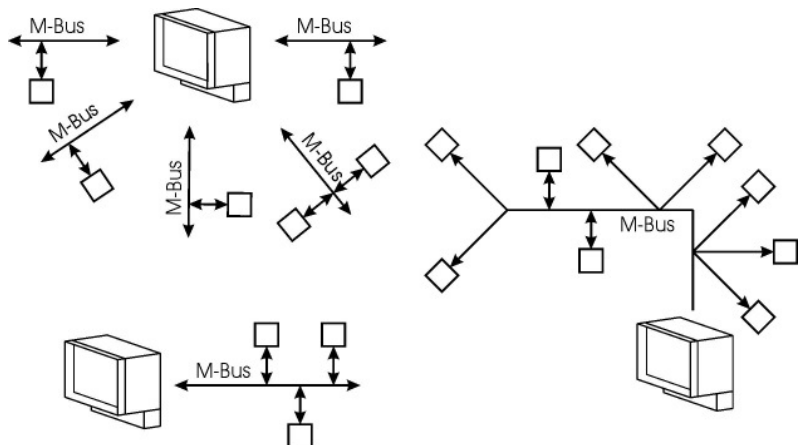
Bus structure

An M-Bus system consists of user specifically configurable and task specific system components and different repeaters that are grouped together in one or more segments via a simple twisted-pair cable. The structure of an M-Bus segment can be designed as a:

- Star structure
- Linear structure
- Tree structure

Each segment is terminated with a repeater and connects up to 250 devices/terminals. Repeaters can be cascaded, i.e. segments can branch to lower level segments.

The control centre of an M-Bus system is formed by the M-Bus master. It consists of an M-Bus repeater connected to a normal commercially available PC.



Data transfer

Data transfer at the M-Bus is executed in the direction from the repeater to the devices/terminals by lowering M-Bus voltage by 12VDC (Standard: 36VDC). The devices/terminals send their data by demanding increased current (11 to 20mA) from the repeater.

Sending data to the devices/terminals is signaled by the **yellow** LED (21VDC < Bus voltage < 24VDC, LED goes on), reception over the hardwired interface is displayed by the **green** or **yellow** LED (LED goes off).

M-Bus Master

The standard **M-Bus master** is used in medium to large M-Bus systems. Its specific functions are implemented with the following elements:

- Power supply module: the M-Bus master can power up to 250 devices/terminals with a maximum current requirement of 1.5mA each. In cascaded operation, the master can itself be the terminal for a higher-level bus segment and support the power supply. Current limitation protects the master from an overload or short circuit on the M-Bus. The cable length can be up to 10 km.
- Interfaces
 - M-Bus (active) for connecting the devices/terminals (output)
 - RS232 service interface for parameterization and error analysis of the devices/terminals connected
 - Exchangeable interface card for data transmission to the control centre: RS232 or M-Bus passive (input)

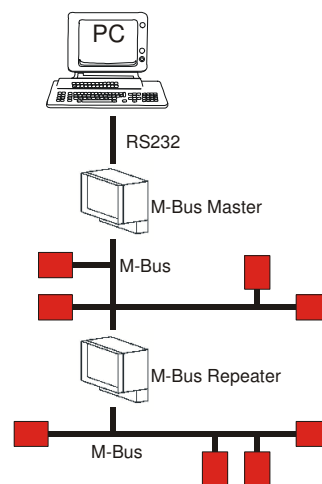
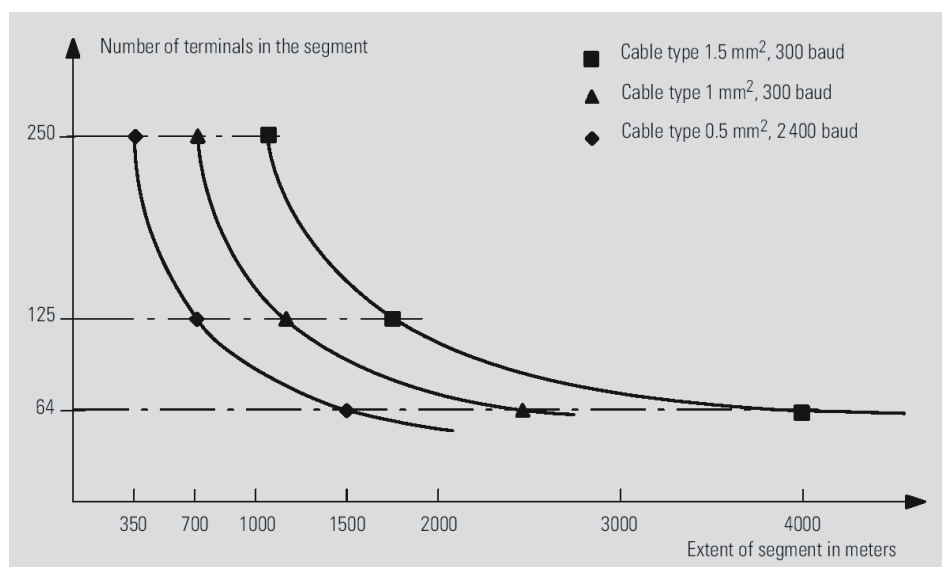
M-Bus Repeater

The **M-Bus repeater** is a special version of standard M-Bus master with follow interfaces:

- Output: M-Bus active
- RS232 service interface
- Input: M-Bus passive for connecting the terminals

Segment configuration

The number of terminals that can be connected to a repeater and the structure of the segments within an extended M-Bus system is determined by the type of cable and the baud rate:



LED displays

The most important functions of the M-Bus master are displayed by four LED's:

- Operation (green): M-Bus is provided with 36V; Standard: LED on
- Send (yellow): Data transmit by voltage decrease (ca. -12VDC); Standard: LED off
- Error (red): Power consumption higher then 0.4A; Standard: LED off
- Receive (green): Data receive by request of a higher current (11mA to 20mA); Standard LED on
At the M-Bus repeater is the receive LED yellow.

Housing

The housing of the M-Bus master/repeater is for wall mounting (degree of protection: IP54).

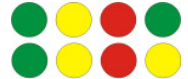
Power supply

The M-Bus master/repeater has got an own power supply (230VAC or 115VAC, see chapter "Terminal assignment") with a fuse.

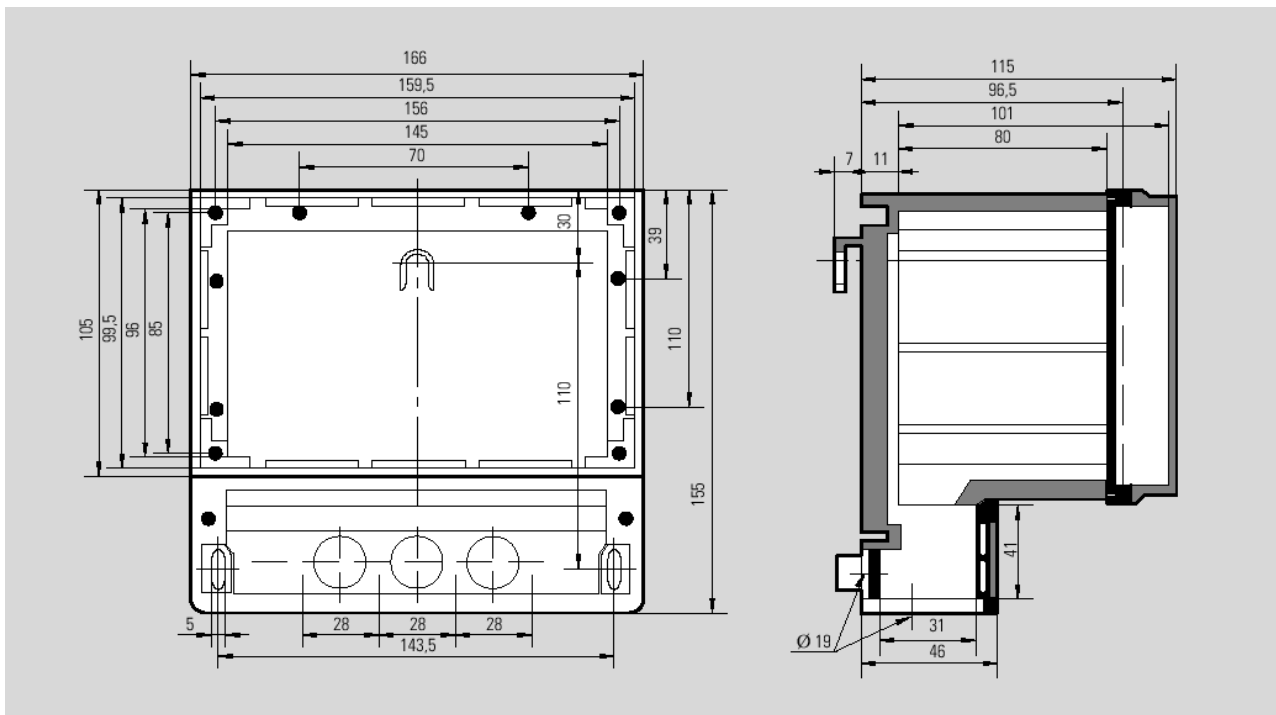
The maximal power consumption is up to 30VA.

Technical data

Housing:	Control housing for wall mounting
Degree of protection:	IP54 (IEC)
Dimensions:	166mm × 155mm × 115mm (W×H×D)
Nominal voltage:	230VAC ±15%, 50/60Hz; optional 115VAC
Power consumption:	ca. 30VA
Fuse:	315mA, slow (for 230VAC) 630mA, slow (for 115VAC)
Display:	4 LED: Master: green – yellow – red – green Repeater: green – yellow – red – yellow
Interfaces:	M-Bus (active, on terminals): data transfer to the terminals Data interface (on terminals): Master: RS232 to PC Repeater: M-Bus (passive) to next M-Bus segment RS232 (9 poles Sub-D socket: female connector): service interface
M-Bus connection:	Max. 250 devices à 1.5mA (e.g. heat meters) according DIN EN 1434-3 and ISO-OSI Reference Model
Baud rate:	300 to 19200 Baud
Data format:	7E1, 8N1, 8E1, ...
Transmission protocol:	All protocols are possible (transparent data transmission)
Temperature range:	-25°C to +60°C (operational) -40°C to +90°C (storage temperature)

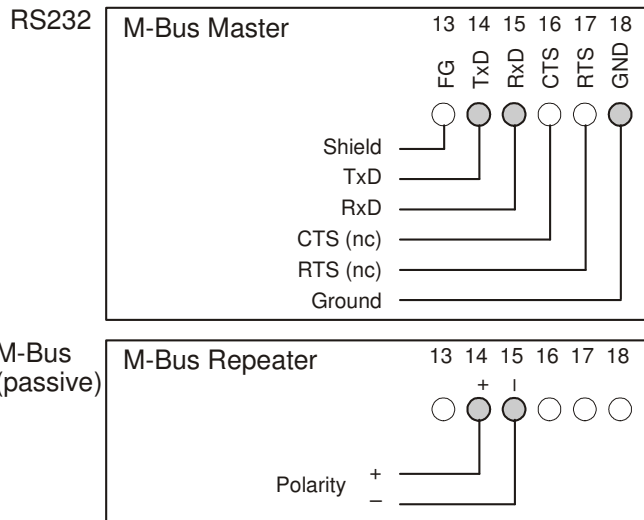
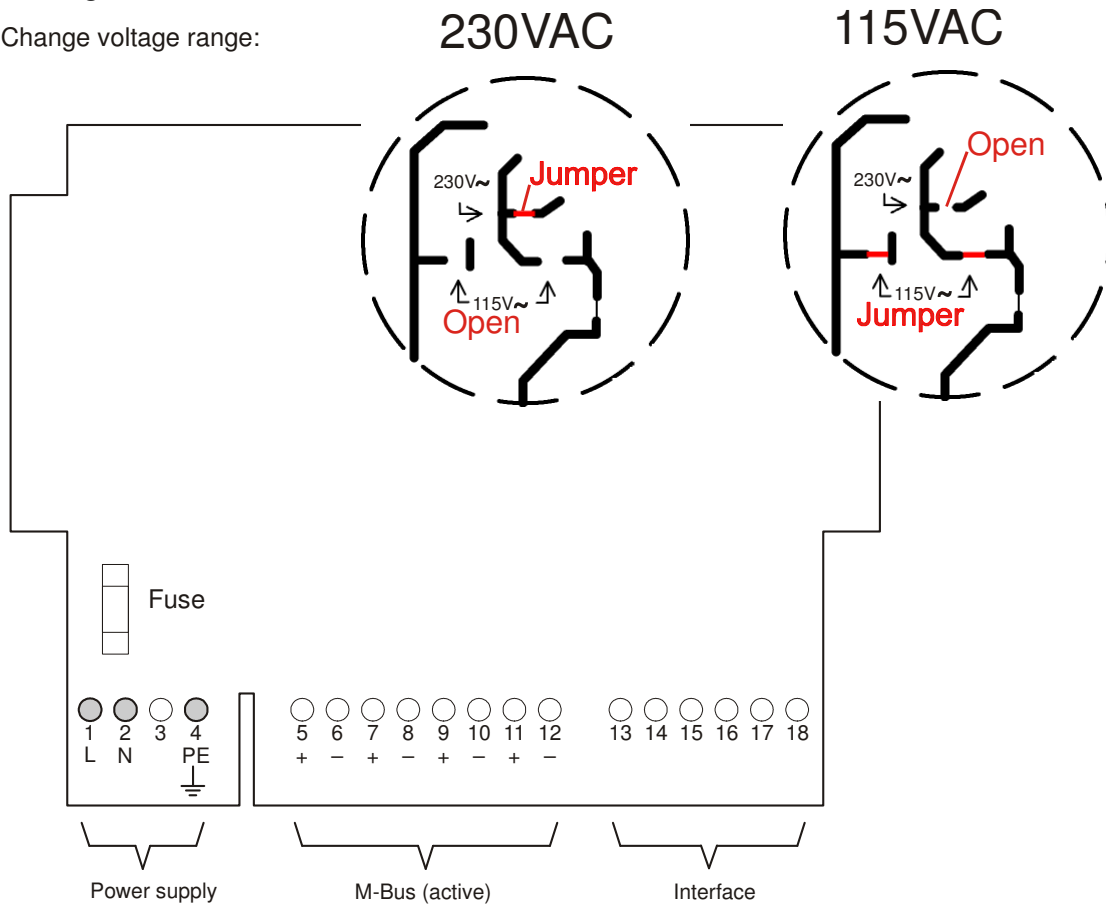


Dimensions



Terminal assignment

Change voltage range:



The valid terminal connection is always displayed at the terminal block of the device!