



Installation guide eBus

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Installation guide eBus

The KBR eBus is the communication basis in the fieldbus area. In comparison to other bus systems such as the Modbus or Profibus, it offers special advantages in energy data management such as time and period synchronization. The physical structure consists of serial RS 485 segments connected to the local system centers (eBus master) via TCP/IP gateways. The eBus master not only synchronizes the individual bus segments and devices connected but also links the bus devices to the visual energy 4 web.

The KBR eBus is based on the EIA RS-485 standard. It consists of a 2-wire line and works according to the master/slave principle. This means that there is only one master at the eBus, which automatically sends requests to the other bus devices (slaves) and analyzes their responses. All devices with the KBR eBus interface are available as slaves.



Note

For mounting and wiring, applicable VDE regulations must be observed.

Line structure

The KBR eBus is wired in a line structure. Other topologies such as tree and ring structures are not permitted, or only permitted taking into account the following information. The line is terminated with a terminating resistor at the beginning and end of the bus (most remote bus device). The individual bus devices are wired directly on the terminal.



Note

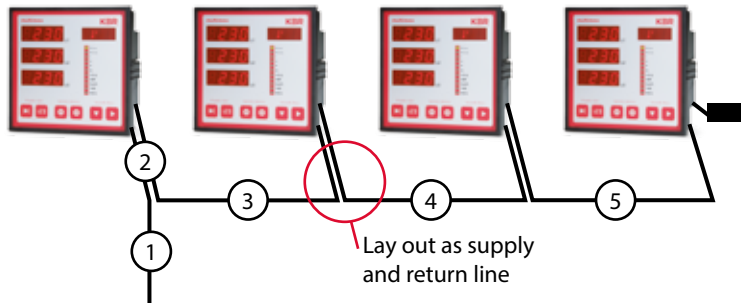
Stubs are to be avoided in all cases, also for short distances. Otherwise, communication disruptions may occur.

A line structure may consist of several bus segments.

Bus segment

A bus segment is either limited by its total line length or the number of connected bus devices. The maximum number of connected bus devices is 32 (including repeaters etc.). The total line length in a bus segment must not exceed 1200 m. If one bus segment is not sufficient, additional bus segments can be connected via a repeater. Several repeaters can be connected to a bus segment. When using repeaters, no more than 3 repeaters may be installed between 2 bus devices (DIN 19245 Part 1). If several repeaters are connected to a bus segment, the KBR eBus assumes a tree structure.

The line length in a bus segment is determined by summing up the



Bus segment length = 1 + 2 + 3 + 4 + 5

length of all lines. The line length must not exceed 1200 m.

Stub

No stubs are permitted for the KBR eBus. If stubs are necessary, they will have to be laid out as supply and return line. Branching is only permitted via a repeater. Please also observe the section on bus segments in this chapter.

Line material

The bus cable must be a shielded, twisted two-pair cable. The shield serves to improve electromagnetic compatibility. Shielding should be connected to PE with low inductance and on a large surface. We recommend using the "J-Y(St)Y EIB" line type. The table lists the most important technical data of this type.

	J-Y(St)Y EIB
Surge impedance:	110 Ohm (10Hz - 100 kHz)
Capacitance per unit length:	100 pF / m
Loop impedance:	130 Ohm / km
Wire diameter:	0.8mm
Wire cross-section:	0.63mm ²

Table 3: Technical data J-Y(St)Y EIB

The transmission channels A and B must be connected to a twisted wire pair. Using one of the unattached lines, the GND terminals of the bus device can be interconnected if required. This way, the differences in the potentials of the bus devices are minimized. Joining several wires will not improve transmission quality.



Note

If the KBR eBus is operated with one or several repeaters, the GND terminal must not be connected via the repeater.

Line termination

Every bus segment must be terminated with a terminating resistor at the beginning and end of a line. The resistor is installed between lines A and B. In case of mismatches between line termination and surge impedance of the line, data transmission on the line may be impaired or even impossible. The "J-Y(St)Y EIB" line type must be terminated with a terminating resistor in accordance with the following table.

Resistance:	110 Ohm \pm 1 %
Power:	min 0.25 W

Table 4: Technical data terminating resistor

If a different line type is used, the terminating resistor must be selected in accordance with the cable manufacturer's specifications.

Overvoltage protection

If the KBR eBus is wired across building boundaries, we recommend to install overvoltage protection to prevent our high-quality electronic devices from damage. Lightning protection has to be provided for all devices connected to lines subject to lightning hazard.

Technical parameters

System:	KBR eBus according to the master/slave principle, RS 485. Half-duplex operation, asynchronous with fixed baud rate: 38,400 baud, 8 data bits, 1 stop bit, parity even
Topology:	Line structure, tree structure with bus repeaters
Stub:	None
Branching:	Via bus repeater
Line type:	Shielded and twisted two-pair line J-Y(St)Y EIB
Bus line length:	1200 m max. per bus segment
Line termination:	110 Ohm \pm 1%, min. 0.25 Watt, or depending on the line material chosen
Bus device:	A maximum of 32 bus devices including repeater and master per bus segment.
Safety device:	Telex checksum by XOR link

Table 5: Technical data KBR eBus

KBR Kompensationsanlagenbau GmbH

Am Kiefernschlag 7
D-91126 Schwabach,
Germany

T +49 (0) 9122 6373-0
F +49 (0) 9122 6373-83
E info@kbr.de

www.kbr.de