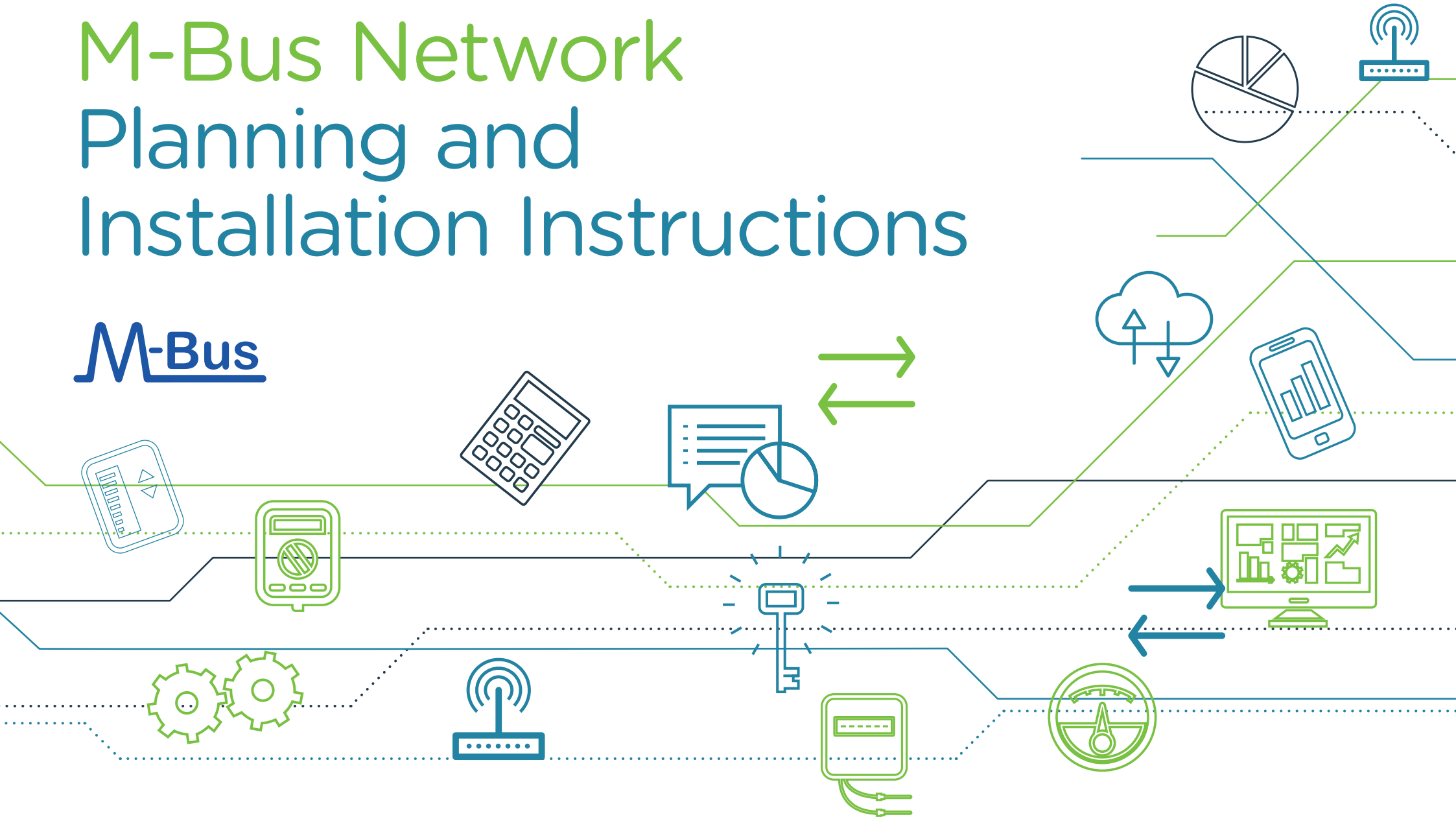




M-Bus Network Planning and Installation Instructions

M-Bus



1. Introduction


1.1 What is M-Bus

M-Bus (Meter-Bus) is a European standard (EN 13757-2 physical and link layer, EN 13757-3 application layer) for the remote reading of gas or electricity meters. M-Bus is also usable for other types of consumption meters (e.g. Heat, Hot Water, Cold Water etc). The M-Bus interface is made for communication on two wires, making it very cost effective. A radio variant of M-Bus (Wireless M-Bus) is also specified in EN 13757-4.

M-Bus was developed to fill the need for a system for the networking and remote reading of utility meters, for example to measure the consumption of gas or water in the home. This bus fulfils the special requirements of remotely powered or battery-driven systems, including consumer utility meters. When interrogated, the meters deliver the data they have collected to a common master, such as a hand-held computer, connected at periodic intervals to read all utility meters of a building. An alternative method of collecting data centrally is to transmit meter readings via GPRS or GSM.



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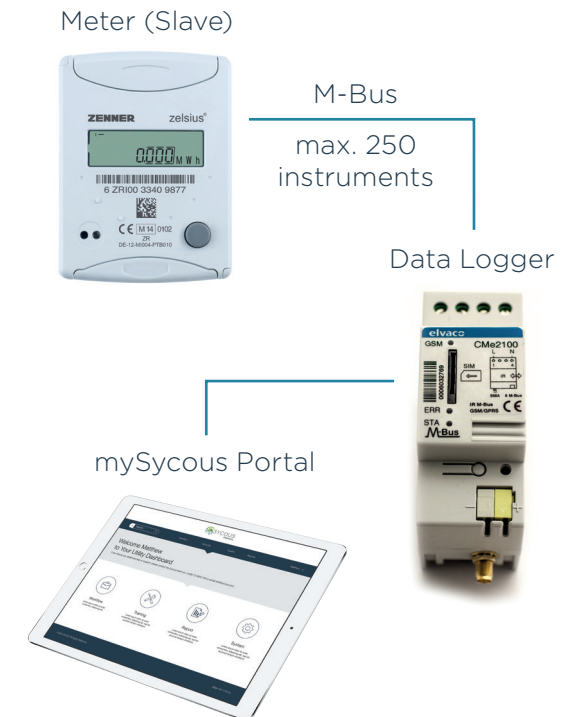
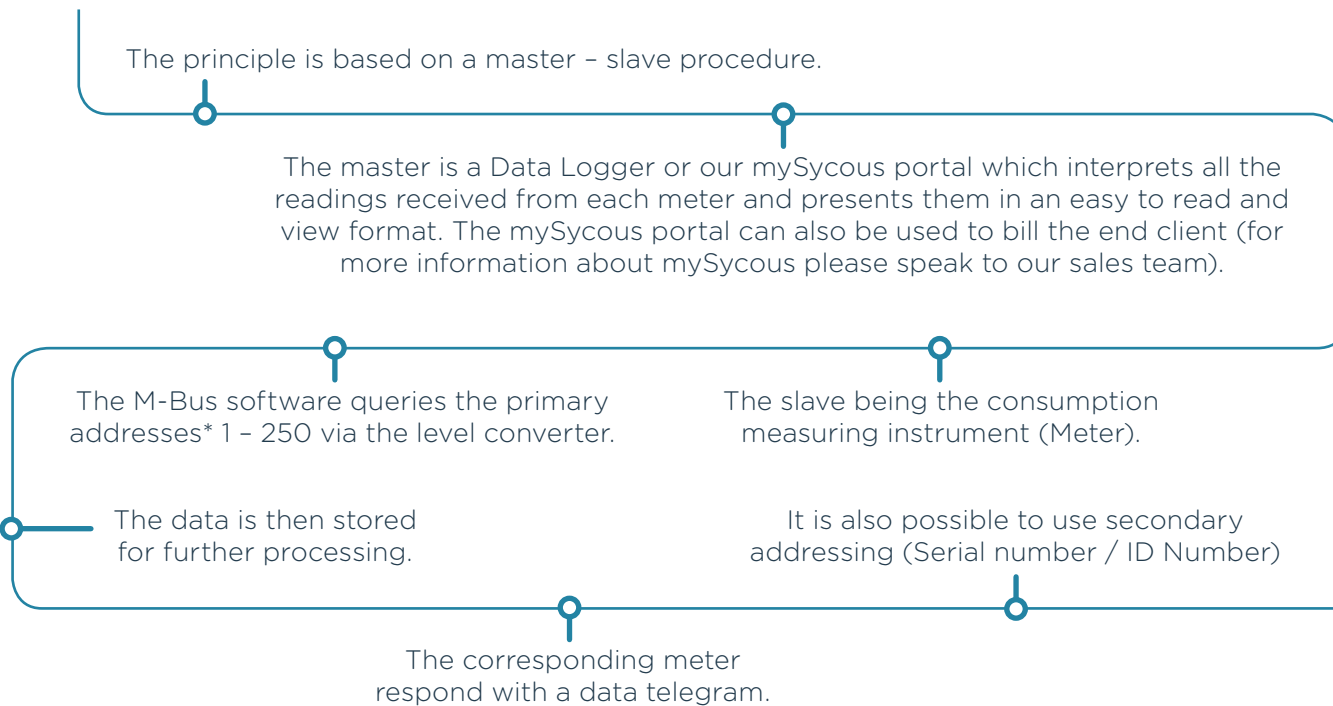
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2. System Overview

The purpose of this document is to support the planning of M-Bus networks. This document describes and illustrates important details for the installation of the cable network required for M-Bus systems.

2.1 The Principle



*The bus address is factory set to zero. Assignment of the bus address is done on location. M-bus can also use a secondary address (meter serial number) to distinguish each meter negating the assignment of primary addresses.

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2.2 Transmission speed

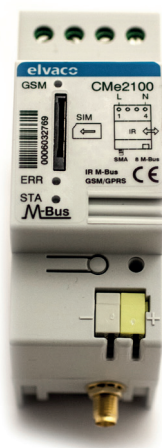
The bus interface is designed for baud rates of 300 to 9600 baud* (bit/s). Consumption Measuring Instruments from Zenner communicate at a maximum of 2400 baud and transmits data at the same rate.

Signal Transformer

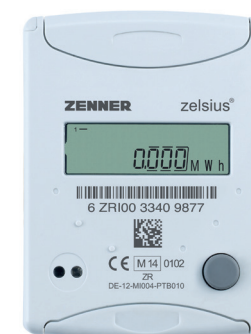
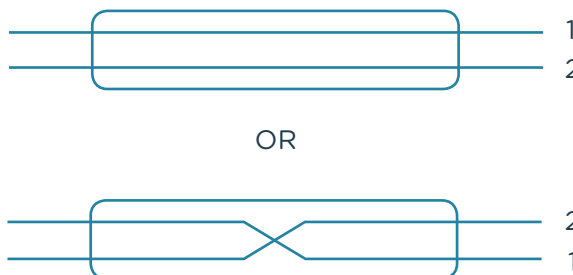
The signal transformer is the connection between the M-Bus network and the mySycous web portal which is the Data Logger.

2.3 Bus cable polarity

The M-Bus cable is protected against reverse poling. Meaning the wires can be interchanged.




M-Bus



*The baud rate is the rate at which information is transferred in a communication channel. (e.g the number of symbols sent - bits per second)

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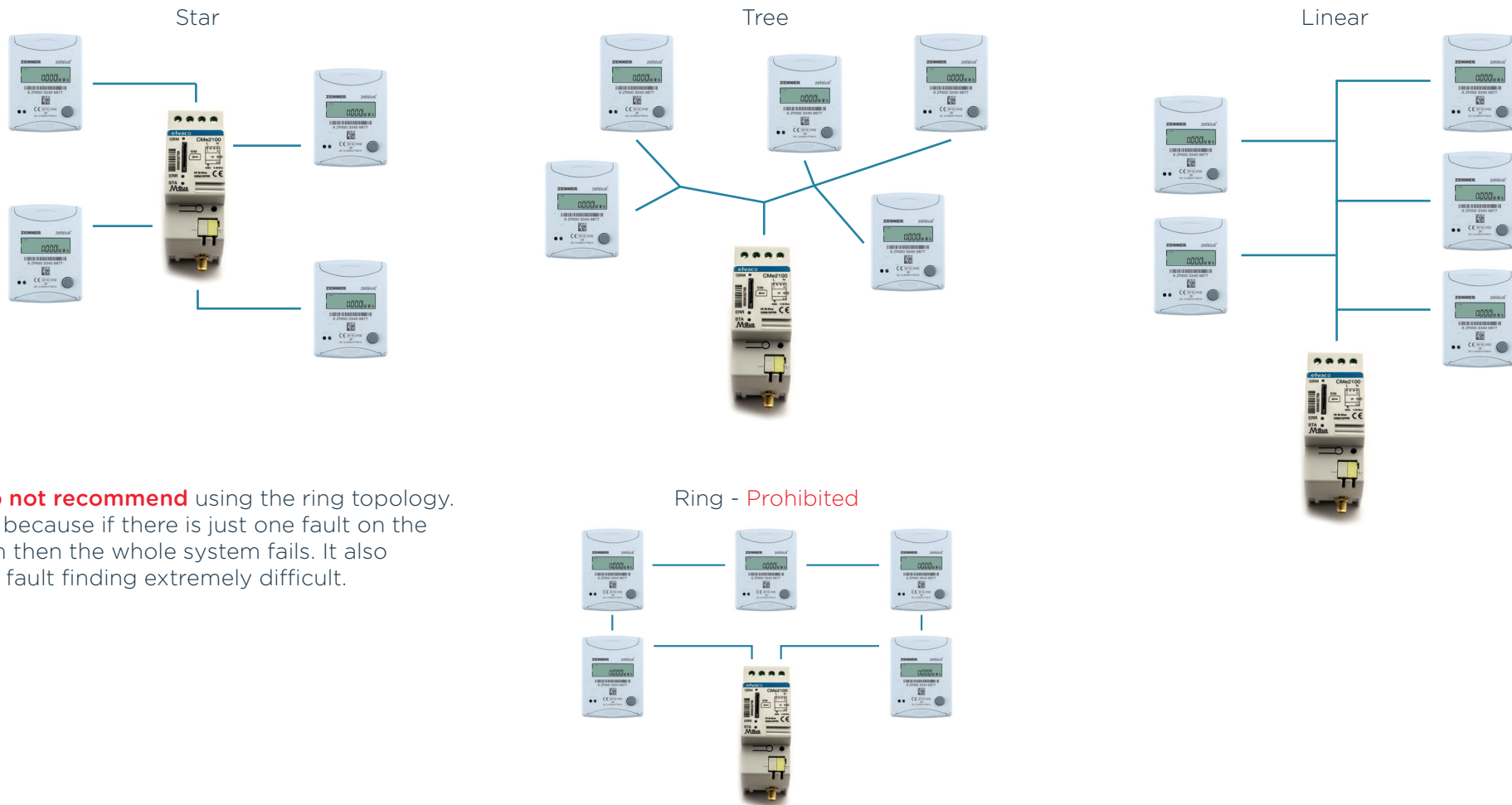
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2.4 Topology

M-Bus supports all topographies. The below are strongly advised.



We do not recommend using the ring topology. This is because if there is just one fault on the system then the whole system fails. It also makes fault finding extremely difficult.

 Recommended

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3. Cables

3.1 Cable Types

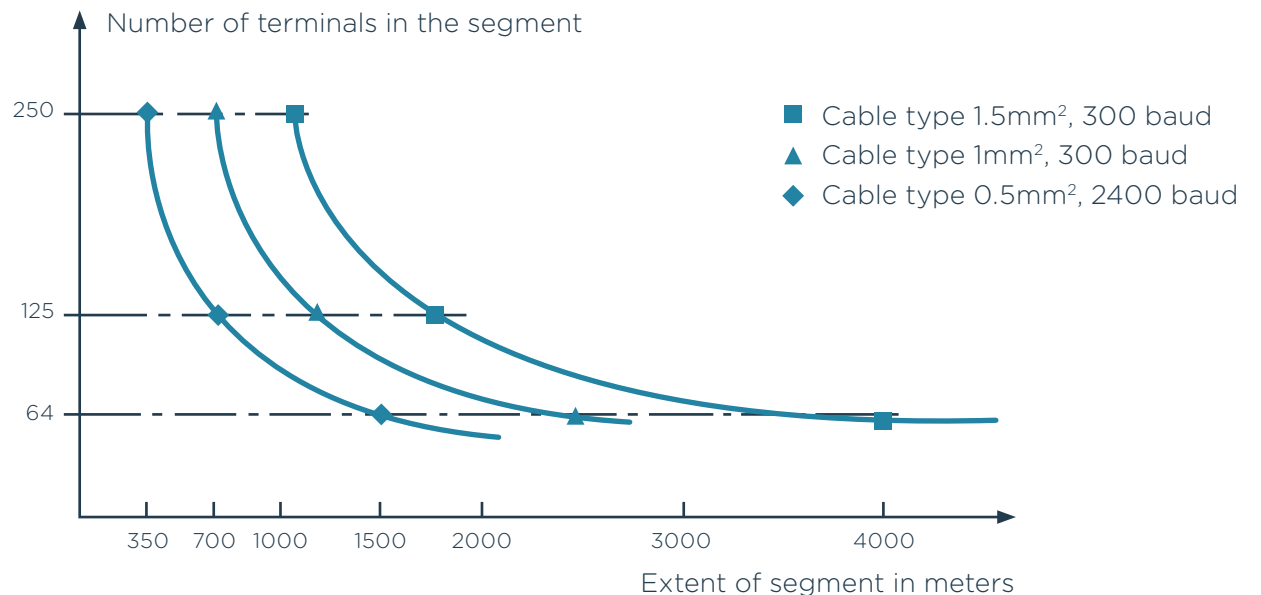
For an M-Bus line a two wire with a minimum cross-section of 2.5mm² is recommended. It is good practice to label all M-Bus cables and the connection points (distribution points and junction boxes). All M-Bus slaves are to be connected in the most direct way.

3.2 Cable Length

The maximum total length of cable in a complete M-bus network is 4000m per channel. This is dependent on the cross section of the wire (under 0.5mm² is not to be used) and on the characteristics of the cable (electrical resistance, capacity). The lower the resistance of the cable, the longer the cable can be. The maximum allowed length of cables must be strictly adhered to, otherwise transmission errors could occur, causing functional disturbances. Other variants are the amount of slaves on the network, and the baud rate setting.

3.3 Number of slaves to cable length

Up to 250 meter points (slaves) can be connected to the M-Bus network. We have a range of different Data Logger sizes of 8, 32, 64 and 250 to meet individual needs. Each meter requires its own M-Bus address (1 - 250 primary address) if not then the secondary address is used. As the maximum number of slaves on an M-Bus network is 250 this means the maximum cable length is 1000m due to the aforementioned variants above. If the number of meters is reduce the maximum cable length is increased. (See below diagram - also showing the cable types and baud rates).



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4. Installation

4.1 Connection points

For the connections between the M-Bus cables and the slaves, standard commercial connections and junction boxes can be used. To ensure good cable connections, clamp connections should be used. This is advantageous because the wires are protected from damage.

4.2 Cable

As the same materials may be used in other electrical installations it is strongly advised to permanently label all the cables used in the M-Bus network in order to prevent any confusion.

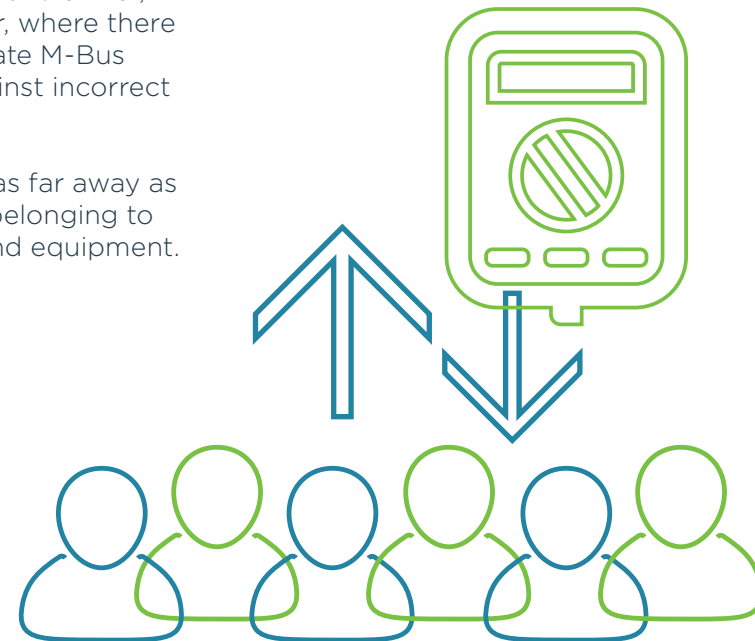
4.3 Protection against over voltage and distances to sources of interference

The slaves are not protected against voltages higher than the maximum allowed bus voltage ($\pm 50V$). Such protective measures must be carried out at either the signal transformer, the master (data logger / PC) or, where there is one, the repeater. Each separate M-Bus network must be protected against incorrect high over voltages.

The M-Bus cables must be laid as far away as possible from electrical cables belonging to other non M-Bus instruments and equipment.

4.4 Instrument Installation

The consumption measuring instrument are to be installed and put into operation by either the manufacturer or an authorised technical company (plumber / electrician).



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