M-Bus and OMS to BACnet/IP

The demand for the M-Bus technology in facility management and building automation is growing tremendously. There are two main drivers: the requirement for energy efficiency and the need for optimizing energy costs. In any case, a growing number of intelligent meters are installed in facilities, buildings or real estates. For integrating these meters into a modern control or automation system using BACnet/IP, it is necessary to translate the meter data from M-Bus to this world.

M-Bus - An easy architecture

The M-Bus is a field bus system which is primarily used for the collection of consumption data. The transfer of the data takes place on a 2-wire bus between a master and the connected slaves (meters or sensors).

M-Bus utilizes a request-response-method and is standardized in the norm EN 13757.

The gateway that can read all meters

An extensive and complex software is required for standard-compliant data interpretation with the M-Bus. There is a powerful software stack on all the devices of the MBUS-GEB product family which allows to read out all available meters on the market without any additional configuration effort. All data can therefore be provided to auxiliary systems at no expense.

Variable primary communication

The product family MBUS-GEB handles the wired M-Bus as well the wireless M-Bus with its respective extensions.

When using wired M-Bus, the devices MBUS-GE20B and MBUS-GE80B support the operation of 20 or respectively 80 unit loads (meters) directly. The device MBUS-GEWB is the supplemental gateway for usage with wireless M-Bus communication.

The MBUS-GE5B is the inexpensive solution for small installations.

On the other hand, our MBUS GE125B/250B/500B are also available for large installations.

Wireless transmission as an alternative

As robust and simple as the wired M-Bus is, there are limitations because of the needed infrastructure. In contrast to that, wireless systems are more flexible, ease retrofitting and are better suited in residentials.

These demands are fulfilled by the wireless standard wM-Bus. It uses the 868 MHz frequency band and uses the same data representation as its wired counterpart. Therefore, the wM-Bus is also standardized in EN 13757.

Transparent mode

The transparent mode enables the direct access to the M-Bus meters to parameterize them. For example, it is possible to set the primary address or the baud rate remotely from the PC.

BACnet as communication standard

BACnet was developed under the patronage of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) since June 1987. The objective was to establish a uniform and neutral standard for the communication of building control systems.

BACnet got standardized in 1995 as ANSI / ASHRAE norm 135. In January 2003 it was published in ISO 16484-5.

BACnet/IP for connecting building control systems

Ethernet gets more and more common as a building infrastructure. That is why the version BACnet/IP is a de-facto standard in modern buildings and facilities. In contrast to this, the M-Bus is very specific and not commonly present at building control systems.

The gateways of the MBUS-GEB product family are offering an Ethernet interface which supports BACnet/IP. The central building controller can use this interface for directly accessing the data of the meters and sensors that have been read out via the M-Bus.

That makes it necessary to translate from the M-Bus protocol to the BACnet objects. The MBUS-GEB includes software for implenting the translation. The gateways take the data from the M-Bus and put it into the BACnet/IP objects. In this case, the object Analog Value is used for representing the meter values. This offers the possibility to not only transmit the value itself but also its
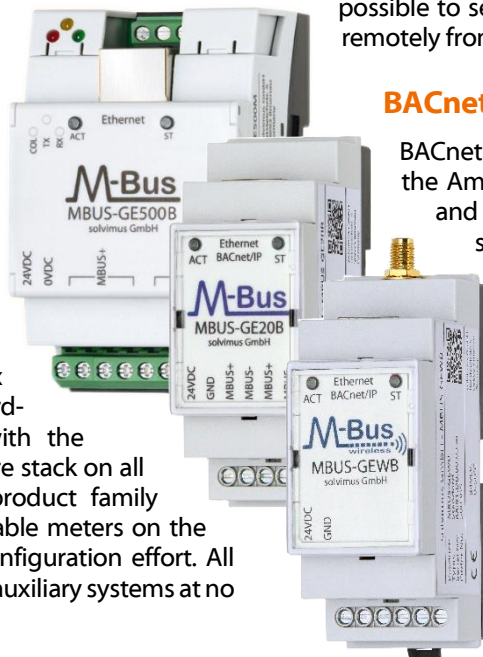
metadata like the unit, status or a description. This additional data is present on the M-Bus. Such an integration allows a continuous data communication without losing data during translation.
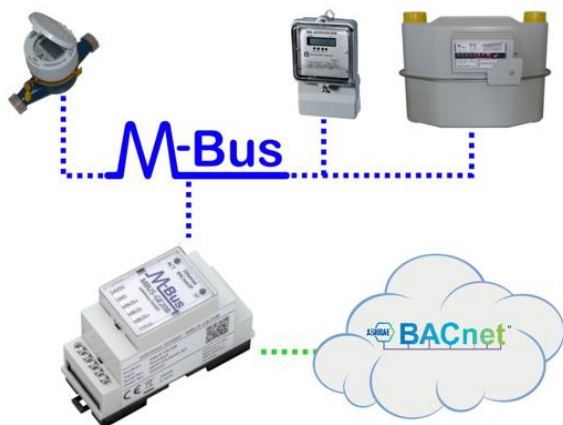
The BACnet declaration of conformity (PICS) is available on the devices. This ensures the compatibility with other BACnet devices.

In summary, this product family offers a very easy, fast and comfortable way to integrate M-Bus meters and M-Bus sensor technology into building control systems based on BACnet.

Configuration of the gateways

The gateways of the MBUS-GEB product family read out meters autonomously and convert their data. This requires a minimum initial configuration which is achieved in an easy and intuitive way. There is a built-in web server on the devices offering an integrated, platform-independent web interface. The operator can put any M-Bus or OMS meter into operation without the need for extensive prior knowledge or special software tools. The web frontend also eases the remote access.

As a rule, the provided standard settings are convenient and the operator only has to start a bus scan for initial operation. All connected M-Bus meters as well as all received OMS meters will be found and their data will be read out. The software will then generate all BACnet objects according to the data of the meters automatically and make these data directly available for any building automation system. It is possible to integrate meters or sensors into any control system within a very short time and without losing information.

BACnet features such as searching for devices and automatically listing the data points are also supported by our gateways. In this way, the integration is additionally simplified.
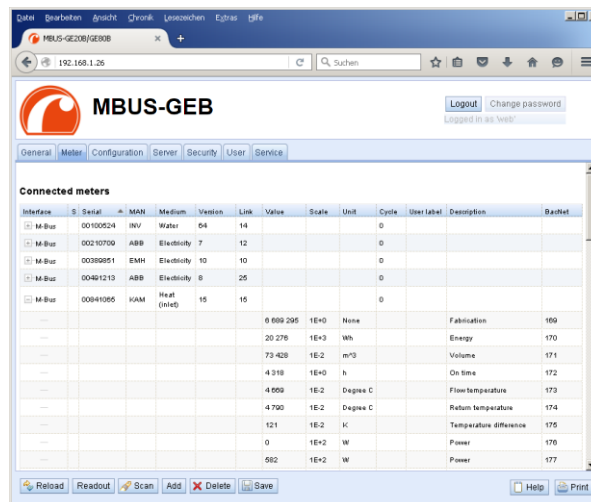
As an addition it is also possible to create a printout of all configuration settings as well as a list of connected meters for documentation purposes.

Generic technical data

Power supply MBUS-GE5B/20B/80B MBUS-GE125B/250B/500B and MBUS-GEWB	24 VDC, < 250 mA, max. 2.5 mm² 12 – 36 VDC, max. 1500 mA, max. 2.5 mm²
Ethernet connection	100 Mbit, RJ45, shielded
Dimensions MBUS-GE5B/20B/80B/GEWB MBUS-GE125B/250B/500B	35 x 90 x 59 (W x H x D in mm) 54 x 90 x 60 (W x H x D in mm)
Mounting	35 mm DIN rail, IP 20
IP addresses	Static or DHCP
TCP ports	Freely configurable
BACnet	BACnet/IP Annex J, PICS compliant
BACnet objects	AV for values of the slave Max. 5000 BACnet objects
Web server	Integrated

Wired M-Bus: MBUS-GE500B (-GE250B/125B/80B/20B/5B)

Max. baud rate	GE5/20/80B: 19200 bps GE125/250/500B: 9600 bps
Connection of M-Bus	Screw terminals, max. 2,5 mm²
Number of slaves	Max. 500 (250, 125, 80, 20, 5) unit loads

Wireless wM-Bus: MBUS-GEWB

Supported modes	S,T,C,C/T modes and 868 MHz
Antenna connection	SMA connector, female
Number of slaves	Overall max. 5000 (logically)