



SOLVIMUS
METERING SOLUTIONS

M-Bus

solvimus ... we solve.

Our claim corresponds with our company name: we solve.

solvimus GmbH was founded in 2007 and since then, the focus of our company is on the development and the distribution of customer-specific embedded systems. This is the key philosophy and appears in our company name "solvimus", Latin for "we solve".

We are your solution provider for the sector Embedded Systems, communication technology and Smart Metering. Our main focus is on Smart Metering.

Our slogan metering solutions describes our range: We are a partner for smart meters, read-out infrastructure, consulting on projects and training about M-Bus. Apart from our own products, like data concentrators, gateways and OEM

modules, which are also available as White Label products, we also offer the development of customized solutions as well as new and further development. We also support metering projects of our customers by trainings, consulting and services in the particular premises on-site.

Use our competence in the matter of M-Bus and Smart Metering for your own products and services.

History

01 | 2007

solvimus GmbH was founded, business segment: development of electronics and automation technology

10 | 2009

New business segment: Smart Metering

07 | 2011

Extension of the laboratory and manufacturing facilities

08 | 2016

Move to a new office location (head quarter)

2019

Extension of head quarter of the office and production space



Executive directors Thomas Brand, Remo Reichel and Sebastian Bauer

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1 Product portfolio



Advice: These icons function as a guide through our catalogue. This will help you to identify which product is most suitable for each application.



Solutions for reading of instantaneous values

Do you want to read meter data very often and continuously and the application is in the field of controlling and monitoring? In this case, our direct converters are the best option for it. Alternatively, also the data loggers can supply instantaneous value or, connected to a SPS or a PC, simple level converters are used.



Solutions for reading on due dates

Do you want to read meter data at the end of a period and the application is in the field of monitoring and submeter billing? In this case, our data loggers are suitable for you. They collect meter data, e.g. via M-Bus or wM-Bus and make a consolidated data export at the end of a certain interval via network or mobile communication.



Integration of M-Bus in your portfolio

Do you want to expand your own portfolio by devices for remote meter reading or to equip your products with interfaces for Smart Metering? If you want to expand your product portfolio by M-Bus or wM-Bus interfaces, our OEM products are the perfect solution. This is an easy way to integrate the M-Bus or wM-Bus into your products. Alternatively, we offer our partners to obtain our solutions as White Label products.



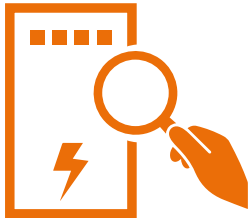
Project support

Do you want to realize projects in the field of Smart Metering and you need support? We can advise you on choice, installation, debugging or data processing. Our advisory spectrum is versatile.

- Technical support
- Conception
- Training
- Planning support
- Assessment / bug-fixing-clearing

2 Overview of product advantages

Your requirement ... we solve



Not enough space in the cabinet?

Our compact design saves space in your cabinet.



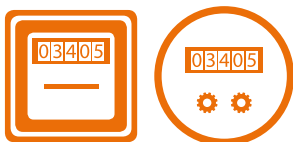
Commissioning annoys you and takes a long time?

Just push the scan button for the automatic meter search and be done with it.



Again, no experts on the hotline?

Fast and straightforward help from specialists via remote as well as on-site.



Again, some meters are missing?

100 % meter compatibility. All M-Bus meters and sensors are being read out.



Product only fits 90 % as always?

We turn it into 100 %. Customer-specific through adaptation of hardware and software.



Problems with IT?

Our intelligent products integrate their own web server. Simply use a standard web browser for configuration and visualization. Additional software or licences are not necessary.

3 M-Bus solutions for OEM customers

Our OEM modules offer the opportunity to integrate the M-Bus into your product in a cost-efficient and flexible way and without worrying about the physical interface. The robust and powerful driver stage is able to reliably drive even high-capacity loads (for e.g. long cable length).


For the development of your own products, we offer OEM modules and suitable know-how. For this, we provide a design-in support specially coordinated for you up to a product-specific adaptation.

Standardized UART interfaces with and without galvanic isolation as well as the integrated

generation of all voltages ease the integration into your design considerably.

But there is more to it than just the physical interface. The M-Bus has its own protocol. For simplifying the implementation, we are also offering convenient communication stacks for our OEM customers.

These pieces of software are working according to EN 13757-3. The whole package consisting of the modules and the software speeds up getting familiar with the M-Bus. The integration will be much more efficient.

OEM modules	
	
Product Order number	MBUS-M13-S 500325
Brief description	Master level converter UART (TTL) to M-Bus for THT mounting
Batch size	126 modules
Variants	On request
Characteristics	Mounting by pin headers (spacing 2.54 mm); Short circuit protection (polyfuse)
Logic interface	UART at TTL levels (galvanically isolated)
Power supply	24 VDC, max. 250 mA (depending on bus load), idle current ca. 27 mA; Integrated generation of the 36 VDC M-Bus voltage and the 3.3 VDC auxiliary voltage directly on the module. This could easily be used for i.e. a microcontroller.
Current rating	140 mA (M-Bus); 50 mA (3.3V logic)
Dimensions	30 x 6.5 x 33 (W x D x H) in mm
Maximum baud rate	19200 bps
Number of connectable meters	Max. 60 UL

4 M-Bus level converters

Level converters are devices which are transferring the data transparently from one side to the other without changing the content. At the same time, they are also changing the signal levels, this means the physical representation of logical 1 or 0.

Our M-Bus master level converters are directly attached to a control system or any other kind of host system. In combination with a software module for the M-Bus master, this is the easiest way to get the communication running.

These devices can be installed and configured impressively easy. The host system is the only thing that needs to be configured. All the settings are automatically recognized by the level converters. Integrated status LEDs show the operational state.

All the devices are interfacing the M-Bus to a RS-232 port at the host system.

Level converters 			
Product Order number	MBUS PS6 500374 MBUS PS32 500375	MBUS-PS20 500330 MBUS-PS80 500331	MBUS-PS125 500359 MBUS-PS250 500360 MBUS-PS500 500351
Brief description	Master level converter RS-232 to M-Bus	Master level converter RS-232 to M-Bus	Master level converter RS-232 to M-Bus
Characteristics	Status LEDs signaling transmission, receiving and collisions on the M-Bus; M-Bus and RS-232 interface is galvanically isolated; M-Bus is short circuit protected (polyfuse)	Status LEDs signaling transmission, receiving and collisions on the M-Bus; M-Bus and RS-232 interface is galvanically isolated; M-Bus is short circuit protected (polyfuse)	Status LEDs signaling transmission, receiving and collisions on the M-Bus; M-Bus and RS-232 interface is galvanically isolated; M-Bus is short circuit protected (self-resetting fuse)
Power supply	24 VDC, max. 250 mA (depending on bus load)	24 VDC, max. 250 mA (depending on bus load)	12 – 36 VDC, max. 1500 mA (depending on bus load)
Interfaces	M-Bus according to EN 13757-2, screw clamps; RS-232, screw clamps	M-Bus according to EN 13757-2, screw clamps; RS-232, D-Sub male plug, 9 contacts	M-Bus according to EN 13757-2, screw clamps; RS-232, screw clamps
Dimensions	18 x 89 x 60 (W x H x D) in mm; 1 modules width	18 x 89 x 64 (W x H x D) in mm; 1 modules width	54 x 90 x 60 (W x H x D) in mm; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20
Maximum baud rate	19200 bps	19200 bps	19200 bps
Number of connectable meters	Max. 6 UL (MBUS-PS6); Max. 32 UL (MBUS-PS32)	Max. 20 UL (MBUS-PS20); Max. 80 UL (MBUS-PS80)	Max. 125 UL (MBUS-PS125); Max. 250 UL (MBUS-PS250); Max. 500 UL (MBUS-PS500)
Weight	Ca. 58 g	Ca. 70 g	Ca. 130 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

There are further level converters. For remote applications, the MBUS-GE20V / GE80V are the best choice.

After initial configuration of network setting and baud rate they are ready for connecting the M-Bus directly to a TCP/IP port. Optionally, the devices can also be addressed directly by the host system using a virtual COM port driver. We recommend the driver from company Eltima (which has been tested by us on current operating systems).

For mobile applications as well as for field service the best option is the MBUS-PU3. It is a compact level converter for host systems with an USB interface and an installed software specialized for the M-Bus communication.

Advice: Ideal for service.

Level converters 		
Product Order number	MBUS-GE20V 500332 MBUS-GE80V 500333	MBUS-PU3 500358
Brief description	Master level converter Ethernet to M-Bus	Master level converter USB to M-Bus
Characteristics	Direct interfacing at a host system via TCP communication, optional via virtual COM port; 2 LEDs (activity & status); M-Bus is short circuit protected (self-resetting fuse)	Compact design like USB stick with status LEDs signaling transmission, receiving and power; M-Bus is short circuit protected (polyfuse)
Power supply	24 VDC, max. 250 mA (depending on bus load)	5 VDC directly via USB 2.0, max. 100 mA (depending on bus load)
Interfaces	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45	M-Bus according to EN 13757-2, spring terminals; USB male plug type A, USB transceiver SiLabs CP2104
Dimensions	35 x 89 x 58 (W x H x D) in mm; 2 modules width	19 x 12 x 80 (W x H x D) in mm
Mounting / Protection class	DIN rail, 35 mm; IP20	Direct plug-in; IP20
Maximum baud rate	19200 bps	9600 bps
Number of connectable meters	Max. 20 UL (MBUS-GE20V); Max. 80 UL (MBUS-GE80V)	Max. 3 UL
Weight	Ca. 85 g	Ca. 15 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	0.75 mm ² solid / stranded wire

5 Data concentrators for Smart Metering

Automated data acquisition is the starting point for Smart Metering.

The product series MUC.easy^{plus} and MUC500 are a family of data concentrators for Smart Metering. They are offering a quick and easy commissioning even without expert knowledge regarding the operation and the characteristics of M-Bus communication. The devices come with an integrated and easy to use configuration web page. Only a few settings might be changed before starting the scan procedure for finding the meters. After that, the read-out procedure and the data processing are completely automated.

The devices are collecting the data on their own, no matter which type of meter and which type of medium is involved. The stored data then gets standardized by the data concentrators and is provided to other systems. It is like Plug and Play, saving time and saving effort.

The MUC.easy^{plus} has an integrated M-Bus interface according to EN 13757. On top of that, it comes with three S0 pulse inputs and a serial interface (RS-485). This enables the user to read out further meters directly or by using an optical probe.

For wireless communication with meters, there is an wM-Bus interface, according to the OMS standard (Open Metering Systems).

One major part of our data concentrators is the integrated and very powerful communication software. It is responsible for all the data processing and meter recognition. Its universal operation follows the EN 13757 without basing on meter libraries. This omits the time-consuming maintenance of such libraries. In the same breath, it allows to read-out all the meters in the market, independent which manufacturer and which medium it is. All the values, units and also the metadata is recognized and represented on the device. In addition, there is an extra data field "User label" for entering unique identifiers relating to your data collection system. These systems can be connected via Ethernet and in some variants also via mobile communication. It is your choice.

A so-called system meter offers monitoring or logging system states in addition to the other meter values. For a better fault analysis, the time of the last readout is visualised, and the export interface has been extended by a scripting system. This allows the customer to use a versatile tool to individualize the data export even more and to make it more flexible.

A new feature is the Extended Maintenance. With this function, logged communication history and system events, such as status messages of reports, error codes and user logins, can be analysed. This means that the customer can do the failure mode analysis on his own and resolve the issue easier. Additionally, there is a filter function and a file export.

Furthermore, our MUC.easy^{plus} also offers Multi-Channel-Reporting (MCR). It is possible to set up 10 different configurations for sending meter data, which are executed in parallel.


The products of the family MUC500 are specialized data concentrators. They are focused on only one physical interface and are addressing huge meter installations. The performance of the physical layer and the CPU is respectively high.

Handling is the same as above. An integrated web server offers a smart configuration web page. Meters are allocated by simply scanning the M-Bus.

Regarding wired M-Bus communication the MUC500 M offers up to 500 unit loads on the bus lines. For the wireless M-Bus there are up to two receivers integrated in the MUC500 W. This enables the parallel usage of different modes like S, T and C on the same frequency or even different frequencies with the same device. Besides the common 868 MHz there are also solutions for 433 MHz and 169 MHz. Other frequencies are possible on request.

In addition, the MUC500 W has an integrated RS-232 interface. So, an external level converter can be used for reading out wired and wireless infrastructures at once.

All devices solve the challenges in huge installations and are able to handle more than 5000 meters logically.

<p>Data concentrators</p> 		
<p>Product Order number</p>	<p>MUC.easy^{plus} 500361</p>	<p>MUC.easy^{plus} 4G 500367</p>
<p>Brief description</p>	<p>Powerful data logger with 4 GB storage; Metering interfaces are M-Bus, wM-Bus (OMS), a serial interface RS-485 and three pulse counting inputs (S0). The MUC.easy^{plus} communicates via Ethernet.</p>	<p>Powerful data logger with 4 GB storage; Metering interfaces are M-Bus, wM-Bus (OMS), a serial interface RS-485 and three pulse counting inputs (S0). The MUC.easy^{plus} 4G communicates via Ethernet and WAN interface (LTE).</p>
<p>Characteristics</p>	<p>An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, easy selection of data points and generation of CSV or XML files, FTP server and FTP client, secured communication and an extensive management of user access rights;</p> <p>LEDs signaling power, status and activity;</p> <p>M-Bus is short circuit protected (self-resetting fuse);</p> <p>Consumption and sensor data are transmitted to energy management systems directly as CSV or XML file;</p> <p>Optional with Modbus TCP or BACnet/IP and load profile readout</p>	<p>An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, easy selection of data points and generation of CSV or XML files, FTP server and FTP client, secured communication and an extensive management of user access rights;</p> <p>LEDs signaling power, status, activity and WAN information;</p> <p>M-Bus is short circuit protected (self-resetting fuse);</p> <p>Consumption and sensor data are transmitted to energy management systems directly as CSV or XML file;</p> <p>Optional with Modbus TCP or BACnet/IP and load profile readout</p>
<p>Power supply</p>	<p>85 – 264 VAC, <3 W idle, <10 W max.</p>	<p>85 – 264 VAC, <3 W idle, <10 W max.</p>
<p>Interfaces</p>	<p>M-Bus according to EN 13757-2, screw clamps; wM-Bus according to EN 13757-4 and OMS, SMA female socket for external antenna, 868 MHz; 3x S0 according to IEC 62053-31, screw clamps; RS-485, screw clamps; Ethernet 100 Mbit, RJ-45; 1x digital output 24 VDC, screw clamps</p>	<p>M-Bus according to EN 13757-2, screw clamps; wM-Bus according to EN 13757-4 and OMS, SMA female socket for external antenna, 868 MHz; 3x S0 according to IEC 62053-31, screw clamps; RS-485, screw clamps; Ethernet 100 Mbit, RJ-45; 1x digital output 24 VDC, screw clamps; 4G modem, SMA female socket for external antenna, slot for Mini-SIM card</p>
<p>Dimensions</p>	<p>72 x 91 x 62 (W x H x D) in mm, without antenna connector; 4 modules width</p>	<p>72 x 91 x 62 (W x H x D) in mm, without antenna connectors; 4 modules width</p>
<p>Mounting / Protection class</p>	<p>DIN rail, 35 mm; IP20</p>	<p>DIN rail, 35 mm; IP20</p>
<p>Number of connectable meters</p>	<p>M-Bus: max. 80 UL; S0: max. 3; RS-485: max. 32; Overall max. 5000 (logically)</p>	<p>M-Bus: max. 80 UL; S0: max. 3; RS-485: max. 32; Overall max. 5000 (logically)</p>
<p>Weight</p>	<p>Ca. 210 g</p>	<p>Ca. 220 g</p>
<p>Wiring cables</p>	<p>2.5 mm² solid / stranded wire; 1.5 mm² stranded wire with ferrules</p>	<p>2.5 mm² solid / stranded wire; 1.5 mm² stranded wire with ferrules</p>

Data concentrators		
		
Product Order number	MUC500 M 125 500410 MUC500 M 250 500411 MUC500 M 500 500405	MUC500 W1 500406 MUC500 W2 500407
Brief description	Powerful data logger with 4 GB storage; Metering interface is M-Bus. The MUC500 communicates via Ethernet.	Powerful data logger with 4 GB storage; Metering interfaces are up to two independent wM-Bus (OMS) channels. The MUC500 communicates via Ethernet.
Characteristics	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, easy selection of data points and generation of CSV or XML files, FTP server and FTP client, secured communication and an extensive management of user access rights; 2 status LEDs and 3 LEDs signaling transmission, receiving and collisions / overload on the M-Bus; M-Bus is short circuit protected (self-resetting fuse); Consumption and sensor data are transmitted to energy management systems directly as CSV or XML file; Optional with Modbus TCP or BACnet/IP extension	An integrated web server offers complete configuration via a standard web browser, automatic bus scan (with external level converters), easy selection of data points and generation of CSV or XML files, FTP server and FTP client, secured communication and an extensive management of user access rights; 2 status LEDs and 3 LEDs signaling power and reception per channel on the wM-Bus; RS-232 interface for connecting an external level converter for the M-Bus; Consumption and sensor data are transmitted to energy management systems directly as CSV or XML file; Optional with Modbus TCP or BACnet/IP extension
Power supply	12 – 36 VDC, max. 1500 mA (depending on bus load)	12 – 36 VDC, max. 100 mA
Interfaces	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45	wM-Bus according to EN 13757-4 and OMS, SMA female socket for external antenna; W1: 868 MHz, W2: 868 and 433 MHz; RS-232, screw clamps; Ethernet 100 Mbit, RJ-45
Variants	–	Other frequency ranges on request
Dimensions	54 x 90 x 60 (W x H x D) in mm; 3 modules width	54 x 90 x 60 (W x H x D) in mm, without antenna connectors; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20
Number of connectable meters	Max. 125 UL (MUC500 M 125); Max. 250 UL (MUC500 M 250); Max. 500 UL (MUC500 M 500); Overall max. ca. 5000 (logically)	Overall max. ca. 5000 (logically)
Weight	Ca. 150 g	Ca. 140 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules


6 Data concentrators as second M-Bus masters

The MBUS-GSLE plays a special role in our next-generation devices family.

The specialty are its physical interfaces. It is a unique combination of an M-Bus master and an M-Bus slave. The field of application are existing M-Bus installations. The MBUS-GSLE can be installed between existing master and the connected meters. From now on, it will read the meters instead of the former master.

In addition, shorter readout cycles can be realized, and further meter data points are available without affecting the function of the existing system.

The M-Bus slave interface is used for representing the meter data also to the former master.

Data concentrators	
	
Product Order number	MBUS-GSLE125 500366 MBUS-GSLE250 500371 MBUS-GSLE500 500372
Brief description	Compact data logger with 4 GB storage, especially for already existing M-Bus installations; M-Bus master and slave interface integrated, the MBUS-GSLE communicates via Ethernet.
Characteristics	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, easy selection of data points and generation of CSV or XML files, FTP server and FTP client, secured communication and an extensive management of user access rights; M-Bus is short circuit protected (self-resetting fuse); Consumption and sensor data are transmitted to energy management systems directly as CSV or XML file, the data is also represented to the former master (M-Bus); 2 status LEDs and 3 LEDs signaling transmission, receiving and collision / overload on the M-Bus; M-Bus slave und M-Bus master are galvanically isolated; Optional with Modbus TCP or BACnet/IP extension
Power supply	12–36 VDC, max. 500 mA (depending on bus load); Current consumption M-Bus slave 2 UL
Interfaces	M-Bus according to EN 13757-2, screw clamps, master und slave; Ethernet 100 Mbit, RJ-45
Dimensions	54 x 90 x 60 (W x H x D) in mm; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20
Number of connectable meters	Max. 125 UL (MBUS-GSLE125); Max. 250 UL (MBUS-GSLE250); Max. 500 UL (MBUS-GSLE500); Overall max. 5000 (logically)
Weight	Ca. 150 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules



7 M-Bus gateways

In the field of automation, control systems are usually collecting the data. But regarding meter data, they typically cannot deal with the M-Bus. Without the possibility of direct interfacing, gateways are used. Gateways are reading and processing data via M-Bus on their own and they are translating the data for the control systems. They are ideally suited for the reading of instantaneous values.

Other benefits are the compact design as well as an intuitive and easy to operate web interface. It is like Plug and Play, saving time and saving effort.

The gateways are translating M-Bus data to quite common communication standards. The de facto standard in automation is the Modbus protocol. Our Modbus gateways are translating the M-Bus data into the Modbus standard.

Our MBUS-GE125M/250M/500M are also available for huge installations.

Gateways 		
Product Order number	MBUS-GE20M 500337 MBUS-GE80M 500338	MBUS-GE125M 500408 MBUS-GE250M 500409 MBUS-GE500M 500403
Brief description	Gateway M-Bus-Master to Modbus TCP	Gateway M-Bus-Master to Modbus TCP
Characteristics	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, automated Modbus register allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 LEDs (activity & status); M-Bus is short circuit protected (self-resetting fuse)	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, automated Modbus register allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 status LEDs and 3 LEDs signaling transmission, receiving and collision / overload on the M-Bus; M-Bus is short circuit protected (self-resetting fuse)
Power supply	24 VDC, max. 250 mA (depending on bus load)	12–36 VDC, max. 1500 mA (depending on bus load)
Interfaces	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45, Modbus TCP / UDP	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45, Modbus TCP / UDP
Dimensions	35 x 89 x 58 (W x H x D) in mm; 2 modules width	54 x 90 x 60 (W x H x D) in mm; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20
Maximum baud rate	19200 bps	19200 bps
Number of connectable meters	Max. 20 UL (MBUS-GE20M); Max. 80 UL (MBUS-GE80M)	Max. 125 UL (MBUS-GE125M); Max. 250 UL (MBUS-GE250M); Max. 500 UL (MBUS-GE500M)
Weight	Ca. 85 g	Ca. 150 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

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.

Our BACnet/IP gateways are translating the M-Bus data into BACnet objects.

Our MBUS-GE125B/250B/500B are also available for huge installations.

Gateways		
		
Product Order number	MBUS-GE20B 500352 MBUS-GE80B 500353	MBUS-GE125B 500426 MBUS-GE250B 500427 MBUS-GE500B 500404
Brief description	Gateway M-Bus-Master to BACnet/IP	Gateway M Bus-Master to BACnet/IP
Characteristics	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, automated BACnet object allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 LEDs (activity & status); M-Bus is short circuit protected (self-resetting fuse)	An integrated web server offers complete configuration via a standard web browser, some features are automated bus scan, automated BACnet object allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 status LEDs and 3 LEDs signaling transmission, receiving and collision / overload on the M-Bus; M-Bus is short circuit protected (self-resetting fuse)
Power supply	24 VDC, max. 250 mA (depending on bus load)	12–36 VDC, max. 1500 mA (depending on bus load)
Interfaces	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45, BACnet/IP	M-Bus according to EN 13757-2, screw clamps; Ethernet 100 Mbit, RJ-45, BACnet/IP
Dimensions	35 x 89 x 58 (W x H x D) in mm; 2 modules width	54 x 90 x 60 (W x H x D) in mm; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20
Maximum baud rate	19200 bps	19200 bps
Number of connectable meters	Max. 20 UL (MBUS-GE20B) Max. 500 BACnet objects; Max. 80 UL (MBUS-GE80B) Max. 5000 BACnet objects	Max. 125 UL (MBUS-GE125B); Max. 250 UL (MBUS-GE250B); Max. 500 UL (MBUS-GE500B); Max. 5000 BACnet objects
Weight	Ca. 85 g	Ca. 150 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

8 Wireless M-Bus gateways

As robust and simple 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 residential.

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.

Our two gateways are translating M-Bus data to quite common communication standards in industrial automation like Modbus TCP or in building automation like BACnet/IP.

Gateways		
		
Product Order number	MBUS-GEWM 500364	MBUS-GEWB 500365
Brief description	Gateway wireless M-Bus (OMS) to Modbus TCP	Gateway wireless M-Bus (OMS) to BACnet/IP
Characteristics	An integrated web server offers complete configuration via a standard web browser, automated Modbus register allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 LEDs (activity & status)	An integrated web server offers complete configuration via a standard web browser, automated BACnet object allocation, manufacturer independent processing of data from connected meters and an extensive management of user access rights; 2 LEDs (activity & status)
Power supply	12 – 36 VDC, max. 250 mA	12 – 36 VDC, max. 250 mA
Interfaces	wM-Bus according to EN 13757-4, OMS, SMA female socket for external antenna, 868 MHz; Ethernet 100 Mbit, RJ-45, Modbus TCP / UDP	wM-Bus according to EN 13757-4, OMS, SMA female socket for external antenna, 868 MHz; Ethernet 100 Mbit, RJ-45, BACnet/IP
Dimensions	35 x 89 x 58 (W x H x D) in mm, without antenna connectors; 2 modules width	35 x 89 x 58 (W x H x D) in mm, without antenna connectors; 2 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20	DIN rail, 35 mm; IP20
Maximum baud rate	19200 bps	19200 bps
Number of connectable meters	Overall max. ca. 5000 (logically)	Overall max. ca. 5000 (logically); Max. 5000 BACnet objects
Weight	Ca. 85 g	Ca. 85 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

9 M-Bus slaves

The typical application for the M-Bus is the transmission of meter data. So, meters and sensors are the most common slaves sending their data.

In some special applications there is also a demand for active controlling. Our MBUS-RELA4 deals with that. It is an actuator for the M-Bus. One example is the feed-in management of decentralized renewable power plants. M-Bus is used for meter reading and controlling the energy flow at the same time. The four relays can be used to switch the feed-in capacity of the inverter between 100% / 60% / 30% / 0%. The MBUS-RELA4 can also be used to activate hygienic

flushing according to regulations like the German Drinking Water Ordinance.

The MBUS-RELA4 acts like a normal slave on the M-Bus. It can be controlled by the master according to EN 13757. There are four bistable relays inside the device which are switching corresponding to the command from the master. For safety reasons, the relays can be read back and even during loss of communication or power the states of the relays are retained. The MBUS-RELA4 is a low power design. There is no external power supply. The device is completely powered by the M-Bus. The state of the relays can be read back.


Slaves	
Product Order number	MBUS-RELA4 500344
Brief description	Relay outputs which are controlled directly via the M-Bus, protocol according to EN 13757-3
Characteristics	4 relay outputs, retain state even without communication or power, support reading back
Power supply	Power supply directly via M-Bus, 2 UL, max. 42 VDC
Interfaces	M-Bus according to EN 13757-2, screw clamps
Further terminals	4 relays (bistable), 230 VAC, 60 W, nominal: 2 A / 30 VDC, galvanic isolation 1000 V, screw clamps
Dimensions	35 x 89 x 58 (W x H x D) in mm; 2 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20
Maximum baud rate	9600 bps
Weight	Ca. 80 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

10 Further M-Bus components

Typical devices for the M-Bus are level converters or the meters themselves. There is a rising market for additional system components which are pushing the benefits and the coverage of the M-Bus technology. Such components also complete our portfolio. We are using modular building blocks for creating different devices (MBUS-RELA4, MBUS-REP) for DIN rail mounting with a footprint of 2 or 3 modules width.

tions the signals like typical repeaters are doing. As a result, larger networks and longer distances can be used and a higher number of meters can be connected to the M-Bus. The MBUS-REP combines a slave interface to the logical bus master on the one side and an own master interface to the slaves or meters on the other side. The data is transparently transmitted in both directions. As the repeater powers its subnet, the physical load of the logical master is clearly reduced.

There are diverse custom-specific components. One device we are offering as a standard device is the MBUS-REP. It is a repeater for the M-Bus and recondi-

Components	
Product Order number	MBUS-REP125 500414 MBUS-REP250 500417 MBUS-REP500 500402
Brief description	Repeater for the M-Bus with transparent data transmission
Characteristics	Repeater for reconditioning the bus signals by an additional bus injection, physical extension of existing installations, further slaves can be added to the M-Bus master; M-Bus is short circuit protected (self-resetting fuse); Status LEDs signaling transmission, receiving and collisions on the M-Bus; M-Bus slave and M-Bus master are galvanically isolated
Power supply	12 – 36 VDC, max. 1500 mA (depending on bus load); Current consumption M-Bus slave 2 UL
Interfaces	M-Bus according to EN 13757-2, screw clamps, master und slave
Dimensions	54 x 90 x 60 (W x H x D) in mm; 3 modules width
Mounting / Protection class	DIN rail, 35 mm; IP20
Maximum baud rate	9600 bps
Number of connectable meters	Max. 125 UL (MBUS-REP125) Max. 250 UL (MBUS-REP250) Max. 500 UL (MBUS-REP500)
Weight	Ca. 130 g
Wiring cables	2.5 mm ² solid / stranded wire; 1.5 mm ² stranded wire with ferrules

11 Our services

Our standard products do not meet your requirements 100 %? Do you need assistance with your projects in the field of acquiring consumption data? Or do you want customised packaging and do not want to care of shipping formalities?

We are experts in M-Bus technology. We are manufacturing innovative products, developing custom-specific solutions and are offering additional services. We are passionate about being your partner. We will assist you in product consulting and also in consultancy regarding the installation of a metering infrastructure. On top of that, we will develop customer-specific devices, which are made for your individual needs.

We also support you with the logistics of your products and shipping formalities.



Support

With the increasing size and spreading of Smart Metering systems, faults occur more often in ongoing operations. Our team of experts is also available to assist you. We inspect your infrastructure on-site, investigate sources of defect and try to resolve them if necessary. At the first step, we will alternatively analyze and troubleshoot your M-Bus installation by remote access.



Hardware

One of our key activities since the company was founded, is the development of hardware. Working on customer's projects, we have numerous experiences and a deep knowledge of the current market. With that background we can estimate customer's needs and put them into practice.

Adapting and developing new products for the metering market is another focus of our work. A team of professionals attends you from conception, via development process until production. Everything with one goal: developing the ideal product for your needs.



Training / Consulting

Knowledge transfer is an important point of our consulting service. We offer individual trainings especially about Smart Metering via M-Bus and wM-Bus. Depending on audience and customer requirement, the trainings are application- or technology-oriented and take place in our training facilities or on your site.



White / Brand Labeling

If your own brand is important for you to be part of the Smart Metering market, we are also offering White Labeled goods. Benefit from the usage of your brand and the usage of our technology. If required, we can design our Smart Metering products according to your corporate design: from the logo, the company colours up to the software. solvimus takes a back seat and allows your brand to be in the public eye.



Assessment, fault-clearing

With the increasing size and spreading of automatic Smart Metering systems occur errors more often in ongoing operations. Our team of experts is also available to assist you here. At your site we inspect your infrastructure, search for error sources and try to resolve them if necessary.



Script solutions

In order to be able to import the read meter data comfortably and importable into the respective downstream system, individual solutions are required in some applications. These are created on the basis of defined customer requirements. Depending on the application we create following scripts:

- Reporting script
- Formatting script
- System counter/measurement script



Ready to use solutions

We also offer ready to use solutions for our data concentrators. Our "MUC boxes" are assembled according to customer requirements, are tested according to our test guidelines and are available for the simple wall mounting. If required, the boxes can also be equipped with a radio module for the mobile communication.



Logistics

Flexible and individual – we also take care of logistics for you. Whether customer-specific packaging, included inserts, delivery in a package or on a pallet: we adapt the packaging according to your requirements and deliver our products as you require them. In this way, we ensure that your ordered products are delivered on time and according to your requirements.



Shipping and export

For shipping, we work with different forwarding agents according to your needs. If required, delivery can also be made directly and individually to your construction sites. We commission the forwarding agents for the transport and, when necessary, take care of the customs formalities in export. We are also happy to assist you with the import by providing the necessary documents.



If you have any questions, please do not hesitate to contact us.

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Support: +49 3677 7613065 or support@solvimus.de

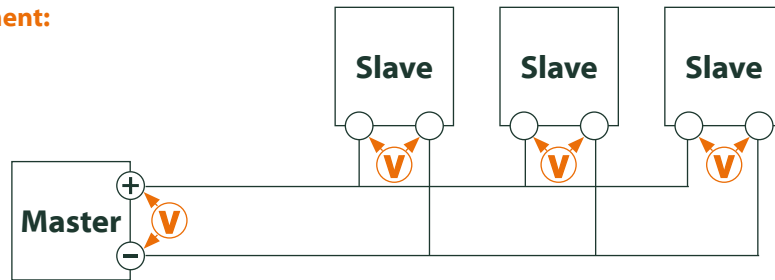
12 M-Bus cabling troubleshooting

A broken wiring is one of the most frequent reasons for troubles regarding the automated read-out via M-Bus networks. Debugging the wiring is then needed. A good starting point for analyzing the network are wiring diagrams with details on cable lengths

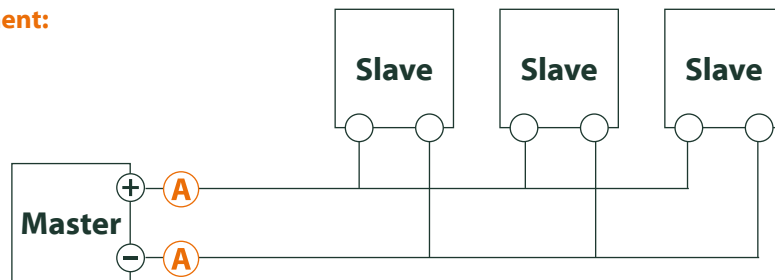
and position of junction boxes. In general, it is recommended to use a cable of type J-Y-ST-Y 2 x 2 x 0.8 mm.

Elementary faults can easily be detected and located by using a multimeter.

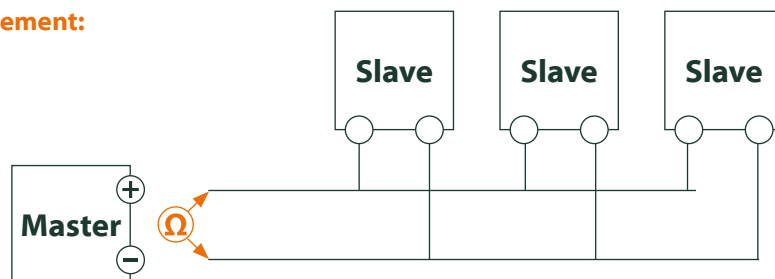
Voltage measurement:



Current measurement:



Resistance measurement:



Following measurements are showing the normal case. If these simple investigations are not successful, we can also offer a more detailed on-site analysis.

Measurement	Valid range / target value
Voltage at master	Ca. 30..40 VDC
Voltage at meter	≥24 VDC
Current through one wire	≤400 mA (at 250 unit loads)
Differential current through wires	<1 mA
Resistance M-Bus	>>470 Ohm
Resistance to protective earth	>20M Ohm



Advice: Do not hesitate to call our support or arrange an on-site appointment.

Contact

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