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Functions module / Gateways
Application Description
Product Page
KNX-GW-MBUS   M-Bus Gateway
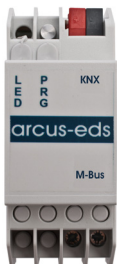
GW
MBUS

KNX-GW-MBUS

KNX Gateway M-Bus	Product Group 1

Use case: KNX bus coupling for counters with M-Bus interface

The M-bus gateway is a Master for M-Bus Systems according to the DIN 13757-2/3. The Master can supply and service up to 3 M-Bus devices. There are 16 M-Bus data points available, which can be assigned freely to the different devices.

Product Data Base: **ARC_MBus.pr4**

KNX Readable Data: For each M-Bus device

  - Device time
  - Serial number

Per M-Bus data point (16 data points)

  - Data point value as 4-byte float value
  - Associated date if existing (reference value)

KNX-GW-MBUS	Article	Article Description	Article-No.
EIB/KNX		Document: 5500_ex_KNX-GW-MBUS.pdf	
	KNX-GW-MBUS SK01	M-Bus Gateway for up to 3 M-Bus devices with EIB/KNX terminal block SK01 plastic housing: 72 x 64 x 40 mm IP65	60400001
	KNX-GW-MBUS REG	M-Bus Gateway for up to 3 M-Bus devices with EIB/KNX terminal block DIN Rail mounted housing 2 units width (35 mm) IP20	60400002

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1 Application Description

Operating Principals and Areas of Application

The M-Bus Gateway is set up using the ETS (KNX Tool Software) with the associated application program.
The device is delivered unprogrammed.
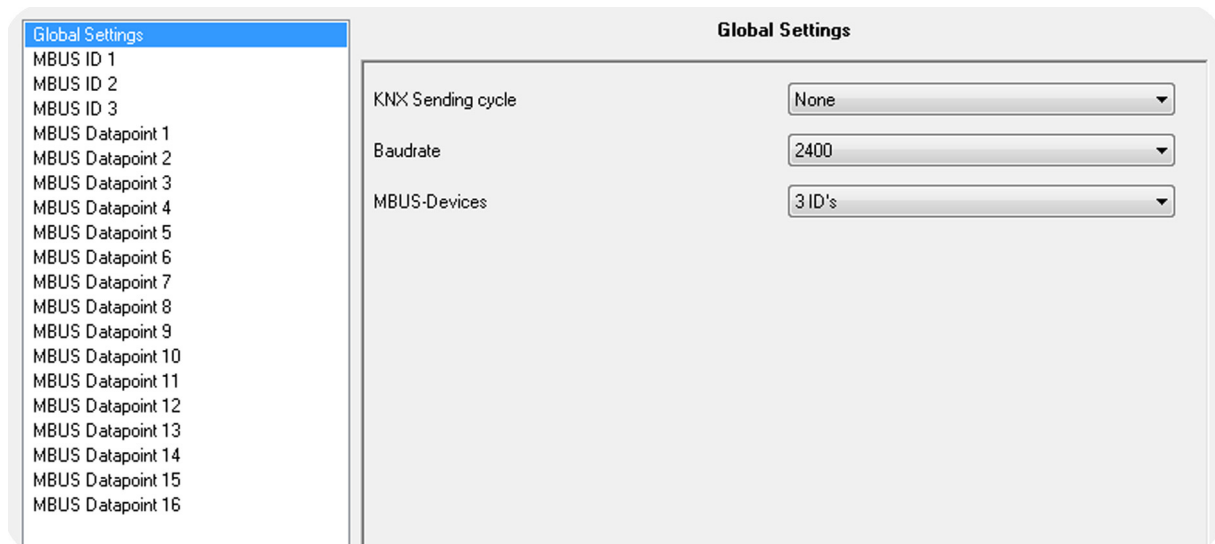All functions are parameterized and programmed by ETS.

Functions

- 16 Data points for consumption values and measured values
- 16 Data points for associated date informations (reference values)
- 3 Data points for serial numbers of the connected m-bus devices
- 3 Data points for current time information of the connected m-bus devices
- 3 Data points to trigger specialized telegrams (e.g. reset actions)
- 1 Data point for status information
- 1 Data point to set the ID of a connected device

2 KNX Parameter

2.1 Global Settings

Global Settings   -   KNX-GW-MBUS

Parameter	Setting	Description
Sending cycle for KNX-objects	1 Min .. 12 Hrs	The collected values of the m-bus devices can be sent cyclically. If no cyclical sending is required the values are sent only on change.
Baudrate	• 300 • 2400 • 9600	The baudrate for communication over the m-bus line. This value must be set to the communication rate of the m-bus devices. All devices must be set to the same baudrate. Typical setting in unprogrammed devices is 2400.
M-Bus Devices	• Singe device • Up to 3 devices	This setting determines whether only one m-bus device is present or up to 3 with different ID's. If only one is present, the ID does not matter and so parametrization is simplified.

2.2 MBUS ID 1 .. 3

MBUS ID 1 .. 3   -   KNX-GW-MBUS

Parameter	Setting	Description
M-BUS-ID (1 .. 3)	1 .. 250	Each m-bus device is addressed with a unique ID in each m-bus net. This number must be the same as programmed in the m-bus device. Commonly the preprogrammed number is noted on the device on delivery. If only one device is connected to the gateway this device is adressed over the broadcast address and the ID can be omitted.
M-Bus Device reading cycle (1 .. 3)	10 Sec .. 12 Std	Many m-bus devices only allow a certain number of readings over an amount of time to disburden the internal batteries. The m-bus reading cycle has to be set accordingly.
M-Bus Device time identifier (1 .. 3)	String of up to 8 characters	Data information field [DIF(E)] and value information field [VIF(E)] for the device time as a string of hexadecimal characters.
Specialized telegram string (1 .. 3)	String of up to 32 characters	Some m-bus devices support special telegrams to e.g. reset counters or min/max values. The telegram can be defined as a string of hexadecimal characters.

2.3 MBUS Datapoint 1 .. 16

MBUS Datapoint 1 .. 16   -   KNX-GW-MBUS

Parameter	Setting	Description
M-bus device	• none • 1 • 2 • 3	Each datapoint can be associated with one of the connected m-bus devices. This choice is unapplicible if the single device configuration is set
Send value on change	• no • yes	If „yes" the value of the data point is sent as soon as the value changes.
Send value cyclical	• no • yes	If „yes" the value of the datapoint is sent also if it has not changed. The sending cycle is set in the global settings section.
M-bus Data point identifier	String of up to 8 characters	Data information field [DIF(E)] and value information field [VIF(E)] for the data points as a string of hexadecimal characters.
Data point has date information	• no • yes	If „yes" the data point has an associated date e.g. if it is a reference value it may have a reference date.
M-bus Data point date identifier	String of up to 8 characters	Data information field [DIF(E)] and value information field [VIF(E)] for the data points as a string of hexadecimal characters.
Comment	Up to 64 characters	Comments and remarks for description and structuring purposes.

3 KNX Objects

Objects - KNX-GW-MBUS

No.	Label	Data Point Type		Function
0 2 ..30	M-bus Data point (1 .. 16)	DPT	4 Byte	Value
1 3 ..31	M-bus Date information (1 .. 16)	DPT	3 Byte	Date
32 34 36	M-bus Device time (1 .. 3)	DPT	3 Byte	Time
33 35 37	M-bus Device serial number (1 .. 3)	DPT	14 Byte	Serialnumber
38	Set M-bus ID	DPT	1 Byte	New ID
39	Status	DPT	1 Byte	Status
40 41 42	Trigger special function (1 .. 3)	DPT	1 Bit	Start

Object Description - KNX-GW-MBUS

Object	Description
M-bus Data point	The Value of the M-bus datapoint as a 4-byte floating point value.
M-bus Date information	The optional date information of the associated datapoint value.
M-bus Device time	The internal device time of the m-bus device.
M-bus Device serial number	The serial number of the m-bus device.
Set M-bus ID	The M-bus ID can be changed over the bus by this data point. For system setup only.
Status	Bit 0,1,2 (1,2,4) indicate found M-bus devices, Bit 3(8) indicates a short condition on the M-bus lines. Thes values are added.
Trigger special function	Sending a „1" to this object triggers the defined special function.

Following objects can be sent to

Object	Function
Set M-bus ID	The M-bus ID can be changed over the bus by this data point.
Trigger special function (1 .. 3)	Sending a „1" to this object triggers the defined special function.

4 Function Description

The M-bus was developed for configuration and reading of data from meters and consumption counting devices. The M-bus is a bus with a single master that powers and reads out multiple slave devices. Each slave is addressable with an individual ID that is between 1 and 250. Theoretically up to 250 slave devices could be operated in one M-Bus segment, but the practical number is determined by the ability of the master to power the devices. The topology is not critical and no termination is required. Maximum bus length is 4km in theory depending on the baudrate, in practical situations not more than 10m should be aspired for good noise immunity.

The KNX-GW-MBUS gateway can power up to 3 devices and communicate with them. If only one device is present, this can be addressed independent of its individual ID with the broadcast ID (254). This simplifies the configuration of such a minimal system.

Some M-bus devices can be powered through the M-bus, others draw current from the internal battery at readout of the data. So some M-bus devices only allow a certain number of readings over an amount of time to disburden the internal batteries. The readout cycles must be choosen accordingly.

Readout of the devices data is initiated by the master by sending a REQ_UD2 (Request User Data) telegram. The connected devices check if they are addressed by comparing their ID and return a RSP_UD (Respond User Data) telegram. The RSP_UD telegram contains up to 252 byte of user data. The user data consists of several data packages each of them beginning with some identification bytes, the DIF (Data Information Field) and the VIF (Value Information Field). DIF and VIF can have several byte, of practical relevance are 1 or 2 byte per field. With 4 byte nearly all data packages can be identified. If a value field represents a reference value there is usually a date field associated with this value. The information that can be expected in the DIF and VIF are different with every manufacturer and every device class. Generally the desired informations can be achieved from the manufacturers. The values for the DIF and VIF must be identified and written into the appropriate fields as strings of hexadecimal characters.

Examples

Water meter		
Volume information	DIF 04 VIF 13	Data to write into the parameter field: 0413
Reference value	DIF 04 VIF 80 13	Data to write into the parameter field: 048013
Electrical Meter		
Total consumption	DIF 04 VIF 03	Data to write into the parameter field: 0403
Actual consumption	DIF 02 VIF 2B	Data to write into the parameter field: 022B

These are examples only, the correct data sequences can be obtained from the manufacturer of the counters/meters.
Some meters provide extra functionalty as resettable counters or minimum/maximum values that can be reset with special data sequences. These sequences can be defined in the ETS and can be triggered by writing a „1" on an Object.

Setting the ID of a connected M-bus device:

A) If 3-ID's are selected:

1) Set the desired ID's in the Application
2) Connect the devices that shall be configured, one at a time
3) Send the desired ID (1 .. 250) to the „Set ID"-object
4) Continue with the next devices, one at a time connected to the gateway.

B) If a single device is selected

1) Connect the device that shall be configured.
2) Send the desired ID (1 .. 250) to the „Set ID"-object

The status value bits:

The status value consists of 4 bits with different meanings which are added:
These bits are computed after startup of the gateway:
    Bit 0 / value 1 if the device with the first ID was found
    Bit 1 / value 2 if the device with the second ID was found
    Bit 2 / value 4 if the device with the third ID was found
This bit is evaluated continuously:
    Bit 3 / value 8 if the M-Bus is shorted or overloaded.

5 Product Page

The M-bus gateway is a device that can integrate all kind of consumption measuring devices that are equipped with an M-bus interface into the KNX-bus.

Up to 3 M-bus devices can be supplied and up to 16 data point values can be collected and sent to the KNX-Bus. Each of these Datapoints can have a date associated in case of reference values.

The device has an integrated bus coupling unit and needs no auxiliary power.

The **KNX-GW-MBUS SK01** is delivered in a housing of an impact resistant glass pallet reinforced plastic with gasket and achieves the protection class IP65.

The **KNX-GW-MBUS REG** is delivered in a housing of fire retardent plastic meant for DIN rail mounting and achieves the protection class IP20.

The KNX-GW-MBUS is set up using the ETS (KNX Tool Software) and the applicable application program.

Articel-No.: 6040000x

KNX-GW-MBUS
Gateway   MBUS / KNX
SK01   IP65
REG   IP20
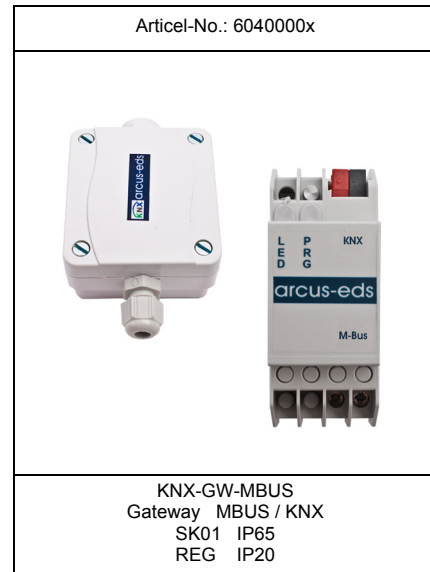
Use cases

- Integration of Meters and Consumption counters into the KNX-bus
- Acquisition and communication of consumption data in KNX environments
- Retrofitting of existing M-bus installations

The M-bus gateway is a Master for M-Bus Systems according to the DIN 13757-2/3. The Master can supply and service up to 3 M-Bus devices. There are 16 M-Bus data points available, which can be assigned freely to the different devices.

Operating Temperature Gateway: -20 .. +55°C
Storage Temperature Gateway: -20 .. +85°C

Supply Voltage: 21 .. 32VDC
Power Consumption: ca. 550mW (bei 24VDC)

Protection Class Gateway:

KNX-GW-MBUS SK01:   IP65
KNX-GW-MBUS REG: IP20

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6 Technical Data

Technical Data   -   KNX-GW-MBUS

Maximum number of M-bus devices	3
Maximum number of M-bus data values	16
M-bus Reading cycle time	10s bis 12h
M-bus short circuit immunity	unlimited
Environment temperature	Storage: -20 .. +85 °C Operation: -20 .. +55 °C
Supply voltage	EIB/KNX Bus 21 .. 32VDC
Power consumption	max ca. 550 mW (at 24VDC)
Auxiliary power	not necessary
Bus coupler	integrated
ETS data file	**ARC_MBUS.PR5**
Connections	KNX-2-pin Terminal (red / black) M-bus 2-pin terminal with screws
Protection class SK01	IP65
Mounting style	On wall mounting with two screws
Housing	Glass filled Plastics, grey
Housing dimension	72 x 64 x 40 mm
Article number	60400001
Protection class REG	IP20
Mounting style	DIN rail mounting
Housing	Plastics housing DIN rail / 2 Units (35 mm)
Article number	60400002

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e1

7 Startup

The KNX-GW-MBUS is set up using the ETS (KNX Tool Software) and the applicable application program.
The gateway is delivered unprogrammed.
All functions are programmed and parameterized with ETS.
Please read the ETS instructions.

**Programming Button
LED**

KNX Terminalblock

**M-BUS
Screw-Type Terminal**

KNX-GW-MBUS   Assembly View
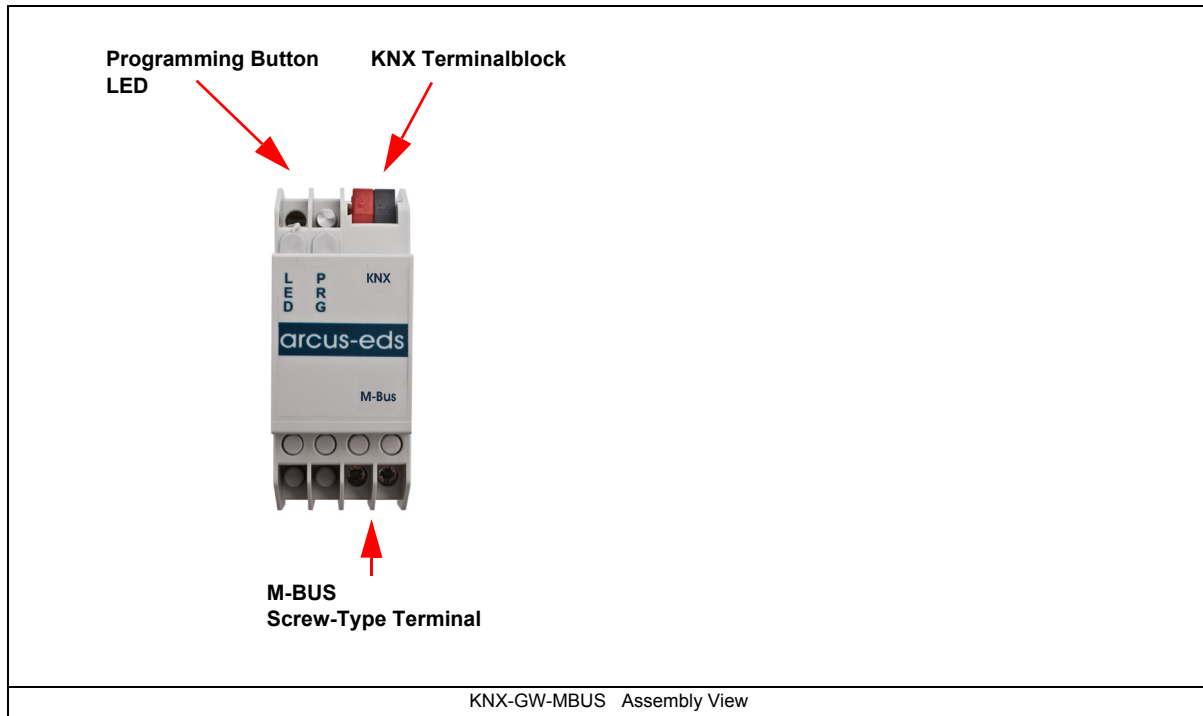
8 Assembly

The **KNX-GW-MBUS SK01** device is intended for mounting in indoor/outdoor and damp room environment.
It achieves the protection class IP65.
Mounting is done on wall through 2 screw holes.

The cover of the device can be removed by turning the screws on the top.

Feed the KNX-bus cable through the fitting into the device after mounting the gateway on the wall or ceilling. For this you must remove the connector block from the cable, after insertion the connector block can be attached again. After successfull programming the cover should be mounted again.

Be careful not to damage the electronics with tools and cable heads.

The **KNX-GW-MBUS REG** device is intended for DIN rail mounting in dry indoor environment. Mountig is done by clipping the device on the DIN rail.
Protection class IP20 is achieved.

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In Case of Bus Voltage Recurrence

All changes made using the help key for the KNX/EIB bus are saved if the device has been correctly parameterized.
The controller and outputs start with their current values and the ETS parameter settings are saved.

Discharge Program and Reset Sensor

In order to delete the programming (projecting) and to reset the module back to delivery status, it must be switched to zero potential (disconnect the EIB bus coupler).
Press and hold the programming button while reconnecting the EIB bus coupler and wait until the programming LED lights up (approx. 5-10 seconds).
Now you can release the programming button.
The module is ready for renewed projecting.
If you release the programming button too early, repeat the aforementioned procedure.

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Please contact us if malfunctions occur. In this case, please send the device including a description of the error to the company's address named below.

Manufacturer

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