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KNX-GW-MBUS SK08

KNX Gateway M-Bus	Product Group 1

Application : KNX bus coupling for counters with M-Bus interface

The bus coupler is a three times bus master of the M-Bus interface according to DIN EN 13757-2/3.
Each of the three ports provides an M-Bus master that can read one M-Bus device.

The advantage lies in an M-Bus ID independent device discovery (broadcast adressing).
There are 32 M-Bus data points available, which can be assigned freely to the different devices.

Product Data Base:	**MBUS_v4.vd5**
KNX Readable Data:	A maximum of 32 Data points (free dividable)
	For each M-Bus device
	- Device date
	- Secondary Adress

KNX-GW-MBUS	Article	Article Description	Article-No.
KNX		Document: 4420_ex_MBUS-SK08.pdf	
	KNX-GW-MBUS SK08	M-Bus Gateway for up to 3 M-Bus devices. Each M-Bus device with its own Screw-Type Terminal for M-Bus ID independent device identification. SK08 plastic housing: 115 x 65 x 55 mm IP54/65	60400008

1 Application Description

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

- 32 Data points for
  - Consumption values - Measured values
  - Date
  - Time
- 3 Data points for secondary address of the connected devices
- 3 Data points for date information of the connected devices
- 3 Data points for triggering special functions
- 1 Data point for status information

2 KNX Parameter

2.1. Global Settings	2		
2.2. MBus ID X	3	2.3. MBus Datapoint X	4

2.1 Global Settings
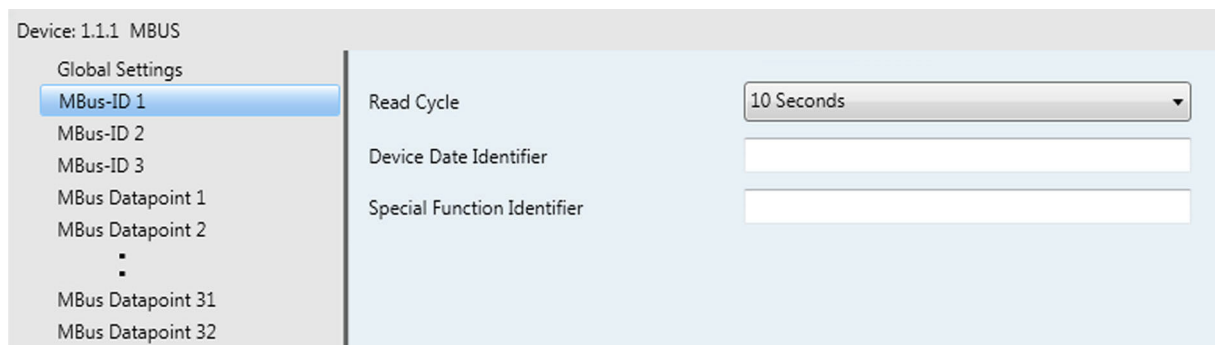
Global Settings   -   KNX-GW-MBUS SK08

Parameter	Setting	Description
KNX Sending Cycle	None 1 min .. 12 h	The measured values are sent a measurement change independently in the cycle time.
NKE	No Yes	If set to "**Yes**", SND-NKE command before each M-Bus read cycle is sent.
Baudrate	300 2400 9600	The baud rate with which communicates via the M-Bus must match the setting of the M-Bus slaves. 2400 baud is the default value.

2.2 MBus ID X
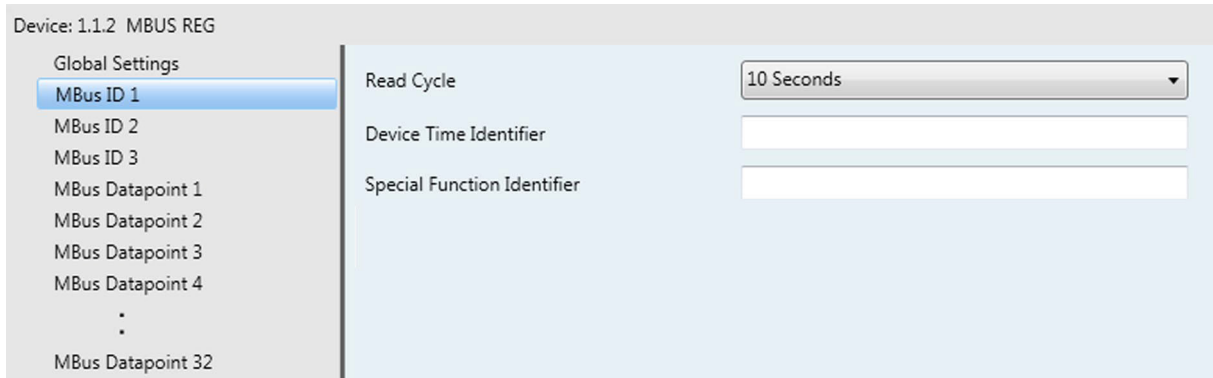
MBus-ID 1 - MBus-ID 3 corresponds to the device connections 1 - 3

MBus ID X   -   KNX-GW-MBUS SK08

Parameter	Setting	Description
Read Cycle	10 sec .. 12 h	Many M-Bus devices allow only a limited number of readings per day or a minimum readout cycle. This applies preferably for battery holder devices, but should be requested in each case from the meter manufacturer. The read cycle is adjusted accordingly. **Attention:** If the M-Bus read cycle is equal to the KNX sending cycle, it may happen that after two cycles of setting the values, a change in the value can be seen on the KNX bus.
Device Date Identifier	8 Character	Data Information Field [DIF(E)] and Value Information Field [VIF(E)] of the device date of the M-Bus device can be specified as hexadecimal values.
Special Function Identifier	32 Character	Some M-Bus devices support special functions such as reset a utility meter. The string can be specified as a string of hexadecimal values here.

2.3 MBus Datapoint X

MBus Datapoint X - KNX-GW-MBUS SK08

Parameter	Setting	Description
Send on change	No Yes	If "**Yes**", the M-Bus data point is sent when the value changes.
Send cyclical	No Yes	If "**Yes**", the M-Bus data point value of a value change is independent as under ***Global Settings*** ***Parameter "KNX Sending Cycle"*** is sent.
ID Select	None ID1 - ID3	Assignment of the data point to a M-Bus device (Connection 1 - 3 corresponds to ID1 - ID3)
MBus DPT Identifier	String, up to 8 hex-character	Data Information Field [DIF(E)] and Value Information Field [VIF(E)] of the data point can be specified as hexadecimal values (see manufacturers datasheet). The HEX characters must be specified in succession without spaces or other characters. see *4. Function Description* If more than four 1-byte hex numbers (8 characters) are required, see *4. Function Description*
KNX DPT Type	6 Byte Metering Value 4 Byte Float 4-Byte unsigned Integer Date Time	
Adjustment Value	Powers of ten of $10^{-6} ... 10^{6}$	With adjustment value, the value representation can be customized in the ETS (decimal point).
Comment	up to 64 ASCII-character	The comment uses as an overview in the parameterization.

3 KNX Objects

Objects   -   KNX-GW-MBUS SK08

No.	Label	Data Point Type		Function
0 : ..31	Output, Value x	DPT	4 Byte	MBus Value
0 : ..31	Output, Date x	DPT	3 Byte	MBus Date
0 : ..31	Output, Time x	DPT	3 Byte	MBus Time
32 34 36	Output, Secondary Address Device 1 Output, Secondary Address Device 2 Output, Secondary Address Device 3	DPT 16.000	14 Byte	Secondary Address
33 35 37	Output, Date Device 1 Output, Date Device 2 Output, Date Device 3	DPT 10.001	3 Byte	Device Date
39	Output, Status	DPT 5.*	1 Byte	Status
40 41 42	Input, Special Function ID 1 Input, Special Function ID 2 Input, Special Function ID 3	DPT 1.010	1 Bit	Send Special Function

Object Description   -   KNX-GW-MBUS SK08

Object	Description
Output, Value x	The value of a data point
Output, Date x	Date (for example, be used as a date stamp)
Output, Time x	Time (for example, be used as a time stamp)
Output, Secondary Address Device x	The secondary address of the M-Bus devices.
Output, Date Device x	The internal date of the M-Bus devices.
Output, Status	Status value = 0 : M-Bus ok, **none** device is connected or detected. Status value = 1 : M-Bus ok, **one** device is connected or detected. Status value = 2 : M-Bus ok, **two** devices are connected or detected. Status value = 3 : M-Bus ok, **three** devices are connected or detected. Bit 3 (decimal 8) corresponds to a short circuit (fault) in the M-Bus line.
Input, Special Function ID x	When writing a 1 to this object, the special function is executed. Please note the information about the meter manufacturer!

4 Function Description

The M-Bus was developed for configuration and reading of data from meters and consumption counting devices.
The M-Bus SK08 is a 3-way bus master where on each channel single device can be connected.
The advantage lies in the primary M-Bus ID independent device discovery.
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.

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 device are addressed via a broadcast address 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.

There are counters in which more than four HEX numbers (8 characters) must be entered into the parameter "MBus DPT descriptor". In this case, the 10 or multi-digit HEX code must be converted to a base64 string which must then be entered into the parameter "MBus DPT Descriptor".
You will find a program for the conversion under the following link: www.tomeko.net .

Base64 entries valid from serial number:
KNX-GW-MBUS-SK08:   1480198

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.

The status value bits:

Status value = 0 : M-Bus ok, **none** device is connected or detected.
Status value = 1 : M-Bus ok, **one** device is connected or detected.
Status value = 2 : M-Bus ok, **two** devices are connected or detected.
Status value = 3 : M-Bus ok, **three** devices are connected or detected.
Status value = 8 : The M-Bus is shorted or overloaded.

5 Product Page

The **KNX-GW-MBUS SK08** is a device that can integrate all kind of consumption measuring devices that are equipped with an M-Bus interface into the KNX-bus.

The bus coupler is a three times bus master of the M-Bus interface according to DIN EN 13757-2/3.
Each of the three ports provides an M-Bus master that can read one M-Bus device. The advantage lies in an M-Bus ID independent device discovery. (broadcast adressing).

There are 32 M-Bus data points available, which can be assigned freely to the different devices

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

The **KNX-GW-MBUS SK08** is delivered in a high-strength, extremely robust stable impact ABS plastic housing. Cover and base have a revolving groove and tongue system with neoprene gasket and achieves the protection class IP54/65.

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

Article No.: 60400008

KNX-GW-MBUS SK08

IP54/65

Applications

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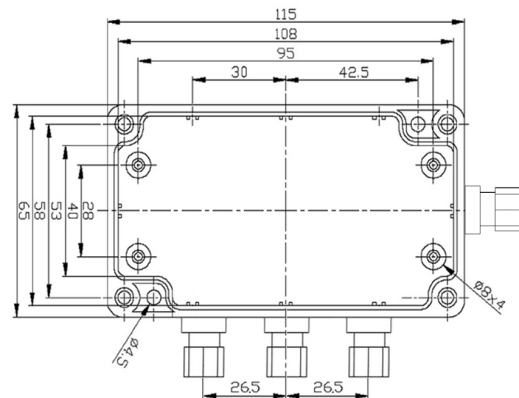- Retrofitting of existing M-Bus installations

The bus coupler is a three times bus master of the M-Bus interface according to DIN EN 13757-2/3

Each of the three ports provides an M-Bus master that can read one M-Bus device. The advantage lies in an M-Bus ID independent device discovery (broadcast adressing).

|	
Operating Temperature:	-20 .. +55°C
Storage Temperature:	-20 .. +85°C
Supply Voltage:	21 .. 32VDC
Power Consumption:	ca. 550mW (at 24VDC)
Protection Class housing:	IP54/65

Subject to change

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6 Technical Data

Technical Data   -   KNX-GW-MBUS SK08

Number of provided M-Bus devices	per connection one M-Bus device (broadcast adressing)
Maximum number of M-bus data values	32 free dividable
M-bus Reading cycle time	10s bis 12h
M-bus short circuit immunity	unlimited
Supply voltage	KNX Busvoltage 21 .. 32VDC
Power consumption	approx. 550 mW (at 24VDC)
Auxiliary power	not necessary
Bus coupler	integrated
Environment temperature	Storage: -20 .. +85 °C Operation: -20 .. +55 °C
ETS data file	**MBUS_v4.vd5**
Connections	KNX-2-pin Terminal (red / black) 2-pin terminal with screws / M-Bus device
Protection class	IP54/65
Mounting style	On wall mounting with two screws
Housing	ABS plastics, grey
Housing dimension	115 x 65 x 55 mm
Article number	60400008

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.

KNX-GW-MBUS SK08   Assembly View
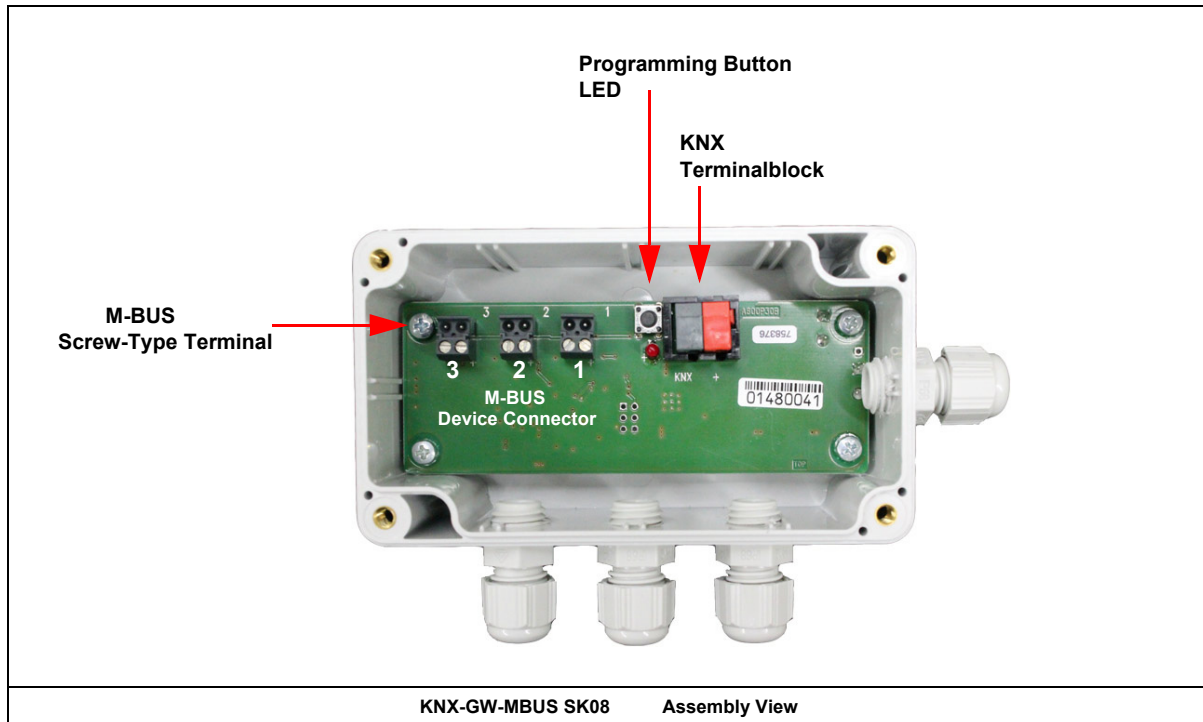
8 Assembly

The **KNX-GW-MBUS SK08** device is intended for mounting in indoor/outdoor and damp room environment.
It achieves the protection class IP54/65.
Mounting is done on wall through 2 screw holes.

In Case of Bus Voltage Recurrence

The values of M-Bus devices are available again after a new reading.
The ETS parameter settings are retained.

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 KNX bus coupler).
Press and hold the programming button while reconnecting the KNX-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.

Imprint

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Attention! Installation and mounting must be carried out by a qualified electrician.
The buyer/operator of the facility has to make sure that all relevant safety regulations, issued by VDE, TÜV and the responsible energy suppliers are respected. There is no warranty for defects and damages caused by improper use of the devices or by non-compliance with the operating manuals.

Warranty

We take over guarantees as required by law.
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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