

# Gateway

## 1 Application and Function

The Gateway is designed to collect, filter and decode wireless M-Bus telegrams from Engelmann / OMS-compliant radio devices and forward the data to an e-mail and/or an FTP server account using a GSM/GPRS connection in various file formats.

## 2 Contents of the Package

- Gateway
- Installation kit
- Installation and Operating Instructions
- Declaration of Conformity

## 3 General Information

- The technical regulations for electrical installations must be observed.
- This product fulfils the requirements of the European Council Directive on Electromagnetic Compatibility (EMC Directive) 2014/30/EU.
- The Gateway left the factory in conformance with all applicable safety regulations. All maintenance and repair work is to be carried out only by qualified and authorized technical personnel.
- The instrument must be stored and transported at temperatures above-freezing.
- **Instruments with activated radio function are not allowed on air freight.**
- To clean the Gateway (only if necessary), use a slightly moist cloth.
- To protect against damage and dirt the Gateway should only be removed from the packaging directly before installation.
- All specifications and instructions listed on the data sheet and in the Application Notes must be adhered to.
- Instruments, parts and batteries which have been replaced or exchanged must be disposed of according to relevant environmental regulations.
- The Gateway does not require any maintenance.
- Further information can be obtained at [www.engelmann.de](http://www.engelmann.de).

## 4 Connectors on the Circuit Board

- 1 Connector battery 1
  - 2 Connector battery 2
  - 3 Connector power pack
  - 4 Micro-B USB connector
- Battery 1  
Battery 2

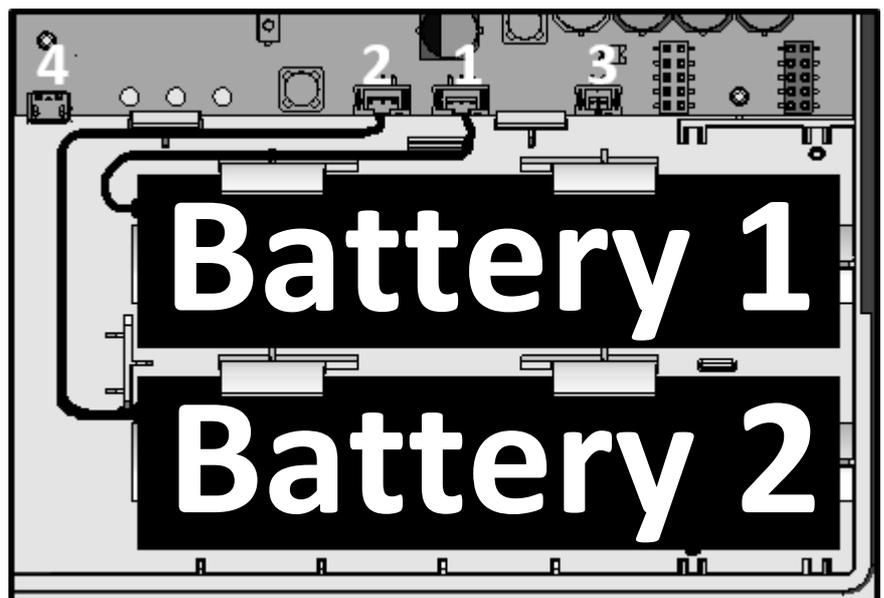


Fig.1 Gateway inside bottom right view

## 5 Mounting the Gateway

### 5.1 Installation site

- An interference-free data connection and unimpaired radio reception are mandatory.
- The wall should be flat and smooth, and suitable for drilling holes.
- Before drilling, please ensure that no electrical wires, supply lines or pipes inside of the wall will be hit.

- The Gateway has to be mounted with at least two opposite screws.
- To prevent overheating direct sunlight must be avoided.

## 5.2 Mounting tools

- Concrete drill (6) mounted in a (hammer) driller.
- Screwdriver (TX25) or cordless electric screwdriver with 5 cm extension and TX25 bit.

## 5.3 Mounting part 1: case (bottom)

- Remove the cover (unlock the black clamps by pressing them a bit into the housing).
- Mark the position of the mounting holes on the wall and drill them.
- Mount the case on the wall using the enclosed screws and dowels.

## 6 Commissioning

- Plug the batteries plug into the corresponding connectors (see Fig.1).  
The green diode will now flash every 30 seconds.
- Connect your laptop using a USB cord (Micro-B plug to A plug) with the Gateway.  
The green diode will begin to flash every second.
- **Configure the Gateway with the Engemann software „Device Monitor“.**
- Disconnect the USB cord from the Gateway. The green diode will once again flash every 30 seconds.

## 7 Mounting Part 2: Case (Cover)

- Press the cover onto the bottom case until the black clamps snap in.
- Mount the numbered adhesive seal enclosed on the appropriate place. The added bar code label can be used for the purpose of documentation.

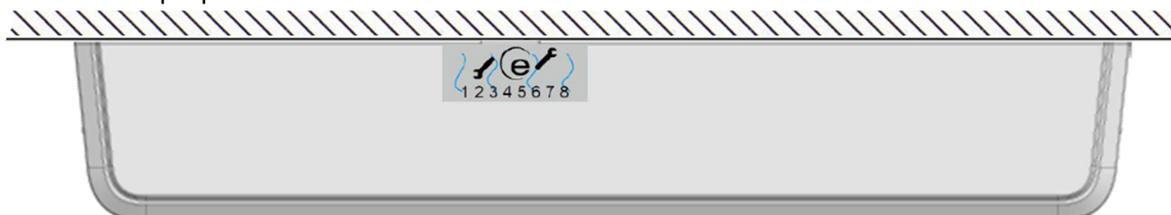


Fig.2 Top view

## 8 Battery Change

Only approved batteries are allowed to be used:

Manufacturer	Type	Part number	Voltage	Electric current
SAFT	2.M20SV	0020400007	6 V	12,6 Ah

- Remove the cover (unlock the black clamps by pressing them a bit into the housing).
- Exchange the battery. Press the cover into the case till the black clamps snap into the cover.
- Apply the new adhesive seal enclosed. The added bar code label can be used for the purpose of documentation.
- The old batteries must be disposed of according to relevant environmental regulations.

## 9 Operating Conditions

	Battery (6 V)	Mains (5 V)
Possible interfaces in addition to wireless M-Bus	GSM/GPRS	GSM/GPRS; Ethernet; M-Bus
Ambient temperature	-20 °C to 60 °C	-20 °C to 30 °C
Protection class	IP65 (GSM/GPRS)	
Lifetime estimated, two batteries	5 years (limited read-outs of wireless M-Bus telegrams; limited GSM/GPRS data transmissions)	

## 10 Time

The Gateway has an integrated real-time-clock, to ensure timing functions. The clock must be set during the first configuration. Automatic changeover between standard and summer time is not supported. The time will be synchronized with the stored NTP server every time an upload of the data starts.

Parameter	Possible settings	Factory setting
Time zone (GMT)	-11 to +12	+1

## 11 Interfaces and Options

### General information about wireless M-Bus and GSM/GPRS radio transmission:

Installation of radio components between or behind heating pipes, or the presence of other bulky metallic obstacles directly over or in front of the housing must be avoided.

The transmission quality (range, telegram processing) of radio components can be negatively influenced by instruments or equipment with electromagnetic emissions, such as telephones (particularly LTE mobile radio standard), Wi-Fi routers, baby monitors, remote controls, electric motors, etc.

In addition, the construction of the building has a strong influence on the transmission range and coverage.

Furthermore, when using installation boxes (substations) they must be equipped with non-metallic covers or doors.

**The mentioned factory settings refer to a Gateway with two batteries.**

### 11.1 Radio interface wireless M-Bus EN 13757-3, -4

Interface for reception of meter data.

#### 11.1.1 Technical data wireless M-Bus

Frequency	868 MHz
Protocol	wireless M-Bus based on EN 13757-3,-4
Selectable modes	T1; C1; S1
Telegrams	- short telegram for AMR (in conformity to OMS 2.x.x, 3.x.x, 4.x.x) - long telegram with monthly values (in conformity to Engelmann specification)
Encryption	AES: Advanced Encryption Standard; key length: 128 bits

In battery power mode the data from up to 1000 devices (1500 in external power supply mode) can be processed. To reduce the number of collectable devices, it is possible to use whitelist for desired and blacklist for not-desired devices. Each list supports wildcards and up to 1000 entries. The whitelist can also be restricted by the blacklist.

#### 11.1.2 Configuration wireless M-Bus

Parameter	Possible settings	Factory setting
Mode	S1, T1, C1; unidirectional	T1&C1; unidirectional
Antenna	internal, external	internal
AES-128-Encryption	- not encrypted - encrypted (mode 5/7): - Master Key - key per meter	- not encrypted - Engelmann Master Key

#### 11.1.3 Timings wireless M-Bus

Parameter	Possible settings	Factory setting
Collect time	00:00 - 23:59	00:15
Collect time frame	1 - 255 minutes	32 minutes
Weekdays	Monday - Sunday (any weekday)	Sunday
Weeks in a month	1 - 5	2; 4
Point in month	begin, middle, end of month	-
Months	1 - 12	1 - 12

## 11.2 GSM/GPRS radio interface

The interface serves for the upload of the collected, time synchronization with an NTP server and firmware updates.

### 11.2.1 Technical data GSM/GPRS

Frequencies	850, 900, 1800, 1900 MHz	
Class	quad-band GPRS class 10	
SIM chip slot	mini-SIM size 2FF	
Embedded SIM chip	yes	
Output power	- class 4 (2 W, 33 dBm) @ 850, 900 MHz	- class 1 (1 W, 30 dBm) @ 1800, 1900 MHz
Sensitivity	-107 dBm	

### 11.2.2 Configuration GSM/GPRS

Parameter	Possible settings	Factory setting
Access Point Name	freely configurable	internetm2m.air.com (Telit GSM card)

### 11.2.3 Configuration data transmission

Parameter	Possible settings	Factory setting
File format	CSV; XML; RAW	CSV
File name (estate)	The first part can be chosen freely (the IMEI number will be used if this part is empty). The second part is the current timestamp.	

The following table shows the possible settings (factory settings is Engelmann SMTP server).

Type	E-mail dispatch	FTP upload
Mode	EHLO,HELO; SSL (on/off)	active, passive
Server	adjustable	adjustable
User / password	adjustable	adjustable
E-Mail address sender	adjustable	
E-Mail address receiver	4 slots; adjustable; The delivery will be done separate for every address.	

### 11.2.4 Timing configuration data transmission

Parameter	Possible settings	Factory setting		
Type	all	E-mail dispatch	FTP upload	SMS standby
Upload time	00:00 - 24:00	-	01:00	14:00
Upload timeframe	1 - 255 minutes	-	30 minutes	15 minutes
Weekdays	Monday - Sunday	-	Sunday	Monday - Sunday
Weeks in a month	1 - 5	-	2; 4	1 - 6
Point in month	begin, middle, end of month	-	-	not possible
Months	1 - 12	-	1 - 12	1 - 12

### 11.3 USB interface

The USB interface (Micro-B connector, Figure 1 connector 4) is used to configure the Gateway with the „Device Monitor“ software. (A converter chip inside of the Gateway provides a COM-port.)

### 11.4 Option: external antenna connector

Depending on the installation site, the wireless M-Bus and/or mobile radio receiving strength might vary. Using external antennas and their cables, receiving strength can be enhanced on site or moved to locations with better reception. To use an external antenna, the antenna connectors on the PC must be fed through the housing.

### 11.5 Option: external power supply

For more frequent collect and transition of device data, the Gateway batteries can be replaced with the internal Power Supply Gateway.

## 12 Manufacturer

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