

Installation and Operating Instructions

Radio Add-on Module for Water Meters with Modularis System

FAW

1 Application and Function

The FAW is designed for the storage and radio transmission of the consumption rate of water meters with Modularis system.

2 Contents of the Package

- Radio add-on module
- Fastening screw and adhesive seal
- Installation and Operating Instructions
- Mounting Manual
- 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 module 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.
- To clean the module use a slightly moist cloth.
- To protect against damage and dirt the radio add-on module should only be removed from the packaging directly before installation.
- All specifications listed in the device's data sheet and operating instructions must be adhered to. If this isn't done or if the mounting is shown to be faulty, any resulting expenses will be charged to the company responsible for the mounting.
- Further information can be obtained at www.engelmann.de.

4 Safety Information

- **Devices with activated radio function are not allowed on air freight.**
- The radio add-on module has a lithium battery. Do not open the batteries, do not bring the batteries into contact with water or expose them to temperatures above 80 °C. Do not charge them or short-circuit them.
- Instruments which have been replaced or exchanged must be disposed of according to relevant environmental regulations.



5 Mounting of the Radio Add-on Module

- Insert the module into the cleaned mounting slot of the water meter.
- Insert the module fully until it stops.
- Fasten the mounting screw of the radio add-on module hand-tight until it stops.
- Affix the adhesive seal over the mounting screw.

Also see "Montageanleitung_mounting_manual_FAW_xxxx-xx-xx_de_en_it".

6 Commissioning

Once attached, the radio add-on module automatically begins recording water consumption and transmitting data via radio (exception: the option "Start date of radio transmission" was set on a later moment).

7 Technical Data

Temperature range medium	°C	0 – 105
Storage temperature / ambient temperature in the field	°C	1 – 55
Minimum transport temperature	°C	-20 for 7 days
Maximum transport temperature	°C	70 for 24 hours
Protection class		IP68
Power supply	V	3; lithium battery
Battery capacity, designed	Years	12 (operation) + 1 (storage)
Data storage		E ² PROM; daily
Interfaces		Infrared; wireless M-Bus (EN 13757-4)

8 Interfaces

8.1 Optical (infrared) interface

For communication with the optical interface an optocoupler and the “Device Monitor” software are necessary. The optocoupler and “Device Monitor” are available as accessory equipment.

Baud rate: 2400 Bd.

The number of readouts via the optical interface is limited to 128 times per day.

8.2 Radio interface wireless M-Bus

The radio interface is for the transmission of meter data (absolute values).

General information about the radio interface:

Installation of radio components between or behind heating pipes, or the presence of other bulky metallic obstacles directly over 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 control units, 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 factory setting of the clock in the module is standard (winter) Central European Time (GMT+1). There is no automatic changeover to summer time.

The radio function is deactivated upon delivery (factory setting). See section “Activation of the radio interface”.

8.2.1 Technical data radio

Transmission power	dBm	13
Transmission frequency	MHz	868
Protocol		wireless M-Bus (EN 13757-4)
Selectable modes		S1 / T1 (Frame Format A) C1 (Frame Format B)
Telegrams		- “Short telegram” -> AMR (OMS-Spec_Vol2_Primary_v301_and_v402): serial number of FAW or water meter, current value, hint flag, serial number of FAW - “Long telegram” -> walk-by readout: serial number of FAW or water meter, current value, billing (due) date, billing date value, 15 monthly values, hint flag, serial number of FAW
Encryption		AES: Advanced Encryption Standard; key length: 128 bits

8.2.2 Radio configuration

Parameter	Possible settings
Radio mode	S1 / T1 / C1; unidirectional
Transmission time	12 a.m. – 12 p.m.
Transmission interval	2 – 240 minutes
Weekdays	Monday – Sunday
Weeks	1 – 4 (5)
Months	1 – 12
Start date of radio transmission	Annually variable (except Feb. 29)
AES-128-encryption	- Not encrypted - Encrypted according to MODE 5 or MODE 7: - Master Key - Key per device
Type of telegram	- "Short telegram" -> AMR (OMS-Spec_Vol2_Primary_v301_and_v402) - "Long telegram" -> walk-by readout

8.2.3 Activation of the radio interface

The radio interface **leaves the factory deactivated**. It can be activated as follows:

- Via the plug-on detection the radio module starts automatically.
- The radio function can also be activated using the software "Device Monitor". This software is available as accessory equipment.

The radio function can only be deactivated using the software "Device Monitor".

After activation of the radio function or modification of the radio parameters the device remains in installation mode for 60 minutes.

If using the **compact mode**, after activation the device transmits during installation mode format telegrams and compact telegrams alternately.

During installation mode at least one FAW must be read out with the Engelmann "Readout Software Walk-by". The format is stored locally on the PC in an **.xml file**.

After completion of the installation mode only compact telegrams will be transmitted.

9 Hint Codes

The device recognizes eight hint causes, which can also occur in combination with each other. The current status of the hint memory is output via the radio interface. The hint memory can also be read out via the optical interface.

Hint bit	Description	Hexadecimal display
Hint bit 0	Volume scanning: coil(s) defective	01
Hint bit 1	Reset	02
Hint bit 2	Checksum error	04
Hint bit 3	Removal detection	08
Hint bit 4	Magnetic manipulation	10
Hint bit 5	Leakage	20
Hint bit 6	Blockade	40
Hint bit 7	Return flow volume is too high	80

The device must be replaced and sent to the supplier for inspection only if the following hint flags appear:

- **Volume scanning: coil(s) defective**
- **Checksum error.**

All other hints are only to inform the owner of the measuring point.

9.1 Hint description

Hint	Effect	Possible cause
Volume scanning: coil(s) defective	Volume will no longer be measured.	FAW housing and scanning coil defective.
Reset	The measured values since last storage of data to the E ² PROM are lost (max. one day).	Influence of electromagnetic interference; battery low.
Checksum error	Volume will no longer be measured.	Electronics defective.
Removal detection	No influence on the calculation.	Module was removed.
Magnetic manipulation	No influence on the calculation.	Detection of a strong magnetic field.
Leakage	No influence on the calculation.	Alarm if there is no 20-minute period without volume pulses within a 2-day timeframe.
Blockade	No influence on the calculation.	Alarm if no volume is detected within a 12-week period.
Return flow volume is too high	No influence on the calculation; return flow volume will be subtracted furthermore.	Alarm if at least 100 l were continuously detected flowing backwards.

10 Manufacturer

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