1. Safety information

⚠ Comply with ESD protection measures.

⚠ Avoid short-circuits on the PCB

⚠ Route connecting cables through the cable grommets of the meter only.

⚠ Do not cut the grommets shorter than necessary since this may lower the degree of protection.

⚠ Changes in the data telegram or the transmission rate affect the battery life.

⚠ The meter sends no data telegram after delivery ex-factory. The transmission starts after the installation of the meter.

⚠ The module must not be plugged in during testing / calibrating a meter on a test bench! For mounting or removing the module, the 6-pole connector shall be used for handling only!

2. Description of function

The radio module (firmware ≥ 4.69, see label on the rear side) is an add-on module for the following types of meter: T550 (UH50…) firmware ≥ 5.17 and T550 (UC50…).

ⓘ **Note:** For meter of the type T550 (UH50…) firmware ≥ 5.23, new functions are available (C1 mode, OMS 4.1.2 with security profile B).
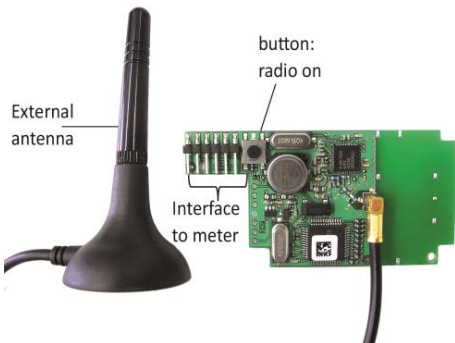
The module enables the meter to communicate with a mobile or stationary receiver using 868 MHz radio frequency.
The module supports OMS[1] - compliant data transmission.

The radio module is available in 2 different versions:
- With integrated antenna (WZU-RF)
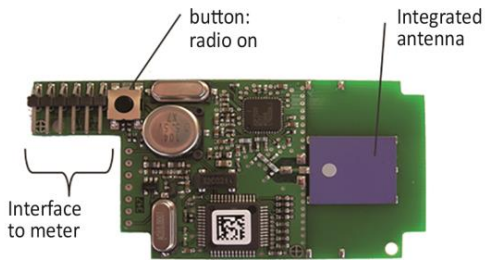
- With external antenna (WZU-RF-EXT; cable length about 2,50 m)

[1]) Open Metering System Specification: Industry standard of a community of interest of companies and associations. It develops open and vendor independent specifications for communication interfaces and basic requirements for meters - http://oms-group.org

3. Installation and assembly

Up to 2 communication modules can be installed.
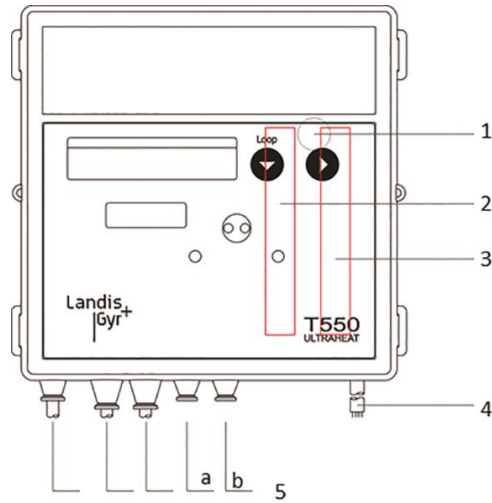
Number	Description
1	Service button (under the housing cover)
2	Slot "module 1"
3	Slot "module 2"
4	Bushing for power cable
5	Cable grommets

ⓘ **Note:** You will find the permitted module combinations in the respective Technical Description. The radio functions depend on the T550 firmware.

Installing the communication module

The communication modules are connected via a 6-pole reaction-free connector so that installation or replacement is possible at any time.
To install a communication module proceed as follows:
- Press the 4 side lugs of the housing cover inwards and remove the cover.
- Put the communication module into the correct position.

ⓘ **Note:** The module WZU-RF and WZU-RF-EXT may be fitted at slot module 2 only.

- Place the communication module carefully in both guide slots and push it in.
- To connect the antenna of WZU-RF-EXT, open one grommet matching the cross section of the antenna cable.

ⓘ **Note:** Open the cable grommets in such a way that they enclose the cable tightly.

- Guide the antenna cable through the grommet from outside.
- Plug the antenna cable to the module.

ⓘ **Note:** When retrofitting a meter with radio module, the voltage supply must be checked and, if necessary, replaced. A battery type D or a power supply is required to operate a radio module.

4. OMS-compliant data output

The meter sends data telegrams acc. to the "open metering system specification":
- Volume 2 Primary Communication Issue 2.0.0: 2009-07-20 or
- Volume 2 Primary Communication Issue 4.1.2: 2016-12-16

> **Note:** The module sends in T1 or C1 mode (unidirectional) acc. to EN 13757-4.

> **Note:** For data security, encryption acc. to OMS is available: security profile A (Encryption Mode 5) or security profile B (Encryption Mode 7).

The following data telegrams can be ordered:
- Stationary P600 – with current values:
  - Current energy
  - Current volume
  - Current flow
  - Current power
  - Current temperatures hot and cold side
  - Errors (manufacturer specific)
  - Current time stamp (type I)
- Mobile P601 – with monthly and yearly set day:
  - Current energy
  - Current volume
  - Energy on monthly set day
  - Volume on monthly set day
  - Monthly set day
  - Energy at yearly set day
  - Yearly set day
  - Error (manufacturer specific)
  - Current time stamp (type I)
- Mobile P602 – with tariffs, cold / heat:
  - Current energy
  - Tariff register 1
  - Tariff register 2
  - Storage date 1. previous month
  - Heat quantity previous year
  - Tariff register 1. previous month
  - Tariff register 2. previous month
  - Errors (manufacturer specific)
  - Errors (manufacturer specific)

The data telegrams can also be parameterized with the service software UltraAssist afterwards.

5. LCD

> **Note:** Both display range and data displayed can differ from this description depending on the meter parameterization. Certain button functions can also be blocked.

Service loop "LOOP 4"

`L.OOP 4`	Head of the loop
…	...
`Modul 2 RF`	
`T 1 rF on --` or	Type "RF" in slot module 2 in 2-sec. cycles with send mode "Turned off (rf off)" or "Turned on (rf on)"; see additional notes in 6.6
`T 1 rF on --A` or	
`T 1 rF on --B` or	
`C 1 rF on --` or	
`C 1 rF on --A` or	
`C 1 rF on --B`	

6. Parameterization

The parameters for the radio operation such as
- Radio mode,
- Encryption,
- Data telegram / telegram composition,
- Transmission interval,

are pre-parameterized by the manufacturer. Adaption can be done by using the service software UltraAssist.

> **Attention**: Changes in the data telegram or the transmission rate affect the battery life.

> **Note:** Detailed information for the parameterization with the service software can be found in the UltraAssist user manual.

> **Note:** Support for ordering can be found in the Technical Description.

6.1 Call up parameterization operation

To call up the parameterization mode, proceed as follows:
- Hold the service button for about 3 seconds, until `PRUEF----` appears on the LCD.

6.2 Starting the service software UltraAssist

To start the service software, proceed as follows:
- Put the optical head on the optical interface.
- Start the service software.

The service software starts automatically the status query.
After a few seconds the following message appears:

"Type T550 as UX50 (Version X. XX/ X.XX / flashversion) in Pb (with calibration seal) found."

If the service software is already started, just click on the ✓ icon in the Quick launch bar.

6.3 Parameterization

To parameterize the radio module, proceed as follows:
- Select the menu
  Parameterization → *Radio Module 868 MHz*

The following window appears for T550 (UH50...) ≥ FW 5.23. For T550 (UH50) < FW 5.23 the new functions are not offered for selection:

The following parameters can be configured:

> **Note:** The parameters have to be adapted to the deployed radio receiver.

1. Radio mode and encryption (security profile acc. OMS) [1]

- Select the radio mode: C1 or T1.
- Select the encryption: *"None"* or *" OMS security profile A (mode 5)"* or *"…B (mode 7)"* (higher security).

> **Note:** In Germany, encryption according to the OMS security profile B (encryption mode 7) is necessary for radio transmission to a smart meter gateway.

2. Data telegram [2]
- Select the required data telegram.

> **Note:** If an encryption is selected for the data telegram, the data telegram names are extended by the addition "OMS-…"

3. Transmission interval [3]
- Set the transmission interval in 2-seconds steps.

The transmission interval can be set from a range of 16 seconds to about 18 hours.

Example for 15 minutes: 15 x 60 = 900 seconds

> **Note:** The update of the data between meter and the radio module is always done in a fixed pattern. This pattern is 10 seconds for mains supply and 15 minutes for battery operation.

4. Telegram composition [4]
- The telegram composition can be selected individually for the data telegram "*wM-Bus / OMS – user-defined*".

Proceed as follows to compose the data telegram individually:
- Select the required values from the column "*Available values*".
- Transfer the required values in the column "*Data Telegram*" by drag & drop.

The values not required can be transferred from the column "*Data Telegram*" into the column "*Available values*" by drag & drop.

> **Note:** The frequency band allocation is automatically checked. If the frequency band allocation is above 100%, the transmission interval or the telegram composition must be adjusted. The minimum transmission interval is automatically displayed as a suggestion.

5. Age of Data [5]

The radio module retrieves data from the T550 calculator in a time grid of 15 minutes. The transmission interval has a different, parameterizable time grid. The "age of data" indicates the time difference between the transmission and the fetching of the data.
- Put a tick by *"Age of Data"*.

> **Note:** In Germany, this option must be activated when connected to a Smart Meter Gateway.

6.4 Apply settings

Proceed as follows to apply the settings:
- Click on the "*OK*" button.

After a successful parameterization the following message appears:

"OMS Parameters have been set."

6.5 Leave parameterization

Proceed as follows to leave the parameterization operation:

- Click on the 🏠 icon in the quick launch bar.

After a few seconds the following message appears:

"Meter is in Nb."

The meter is now in normal operation (Nb-Mode) and the parameterization is completed.

6.6 Activating the radio module

Proceed as follows to activate the radio module:
- Press the button on the radio module for at least 2 seconds.

The module immediately starts to send data telegrams according to the selected parameterization.

The status and the radio mode of the radio module can be checked in "Loop 4" on the meter.

`Modul 2     RF`   Type "RF" in slot "Module 2" in 2 s. cycles with one of the lower rows:

- For T550 (UH50…) FW ≥ 5.23:

Radio mode						Telegram format A	Security profile
T	1	r	F	o	n	--	--
T	1	r	F	o	n	--	A
T	1	r	F	o	n	--	B
C	1	r	F	o	n	--	--
C	1	r	F	o	n	--	A
C	1	r	F	o	n	--	B

- For T550 (UH50…) FW < 5.23 und T550 (UC50…):

`bind 04`

> **Note:** Each further press of the radio button triggers the transmission of a data telegram with updated data.

6.7 Deactivating the radio module

Radio deactivation by Service Software

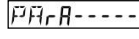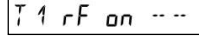Proceed as follows to deactivate the sending of data telegrams:
- In the menu bar, select the menu *Parameterization* → *Radio module 868 MHz*

For T550 (UH50…) ≥ FW 5.23, the following window appears:

- Remove the tick from the option "Radio" [6].

Radio deactivation by Para-menu

Proceed as follows to deactivate the sending of data telegrams:
- Press the service button for at least 3 seconds until `PRUEF----` appears on the LCD.
- Press the button 1 to switch the display until `PArA-----` appears on the LCD.
- Press the button 2 to select the menu.
- Press the button 1 until `T 1 rF on --` (exemplary; see LCD displays) appears on the display.

- Press the button 2 until $\boxed{\text{T 1 rF oFF-- --}}$ (exemplary; see LCD displays) appears on the display.
- Press the button 1 until $\boxed{\text{Nb--------}}$ appears.
- Press the button 2.

7. Technical data

Standard	Open Metering System Specification Vol.2 Issue 2.0.0: 2009 or 4.1.2: 2016 EN 13757-3:2016; EN 13757-4:2014
Transmission frequency for T1	868.95 MHz (min. 868.90 MHz to max. 869.00 MHz)
Transmission frequency for C1	868.95 MHz (min. 868.928 MHz to max. 868.972 MHz)
Transmission power (ERP)	Min. 3.16 mW (5 dBm) to max. 25 mW (13.9 dBm)
Range *)	
- Free field	Up to max. 400 m
- Inside building	e. g. horizontally 30 meter
Power supply	
- via meter **)	Battery type D Mobile radio (16 seconds) battery for 11 years Stationary radio (15 minutes) battery for 16 years
- via power supply	110 / 230 / 24 V
Sending interval	
- Mobile data reading	16 seconds
- Stationary data reading	15 minutes
- User defined data telegrams	acc. to telegram length 16 - 900 seconds

*) Can deviate significantly depending on the structure of the building.

**) If the battery of the meter is of any other type, it must be replaced by a battery of type D. This battery life time is valid for the standard data telegrams (P600, P601) and T550 with standard measuring interval for flow and temperature.

8. Ordering data

As accessory	WZU-RF	With integrated antenna
	WZU-RF-EXT	With external antenna
For power pack	WZU-AC110-xxx	
	WZU-ACD230-xxx	
	WZU-ACDC24-00	
For meters with radio module [1]	UH50-xxxx-xxxx-xxx-YxZx-xxx UC50- xxxx-xxxx-xxx-YxZx-xxx	
OMS **v2.0**, T1, Profil A (Mode 5)	Z = E	Module with integrated antenna
	Z = F	Module with external antenna
OMS **v4.1.2** (BSI), T1 oder C1, Profil B (Mode 7)	Z = Q	Module with integrated antenna
	Z = W	Module with external antenna
	Y = E, F	Battery operation D-cell 11 years, 16 years
	Y = R	Supply voltage 110 V
	Y = N, P	Supply voltage 230 V
	Y = M	Supply voltage 24 V ACDC

[1] For processing your order of meters with radio module, additional ordering information for the required parameterization in the production are needed (see for example the respective "Technical Description").