Installation Guide
EcoMeter S & EcoMeter S Plus (with antenna extension)

Ultrasonic level indicator for water tanks, cisterns or application with rapid level fluctuations PROT-EMS-A-v3_9-5679 (status as at 01/2016)

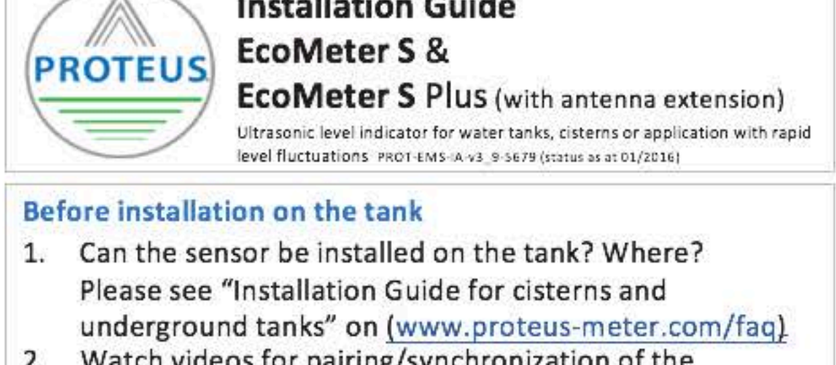
Before installation on the tank

1. Can the sensor be installed on the tank? Where? Please see "Installation Guide for cisterns and underground tanks" on (www.proteus-meter.com/faq)
2. Watch videos for pairing/synchronization of the monitor with sensor and for configuring the monitor (www.proteus-meter.com/faq), if possible.
3. Have the dimensions of a tank ready at hand.

Note!

- Avoid flanges higher than 2cm (5 cm for flanges with 2" diameter)
- Please keep safe distance of 15cm between the sensor and maximum fill level
- The maximum measuring range of the sensor is 3m
- The maximum measurable volume is 19,999 liters.

Correct sensor orientation



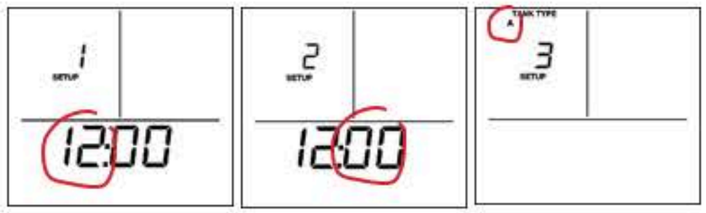
Choosing correct tank type

Tank type A	Tank type B	Tank type C
		
Rectangular/cylindrical (vertical)	(H ≥ W) oval / cylindrical (horizontal)	(W > H) low Profile

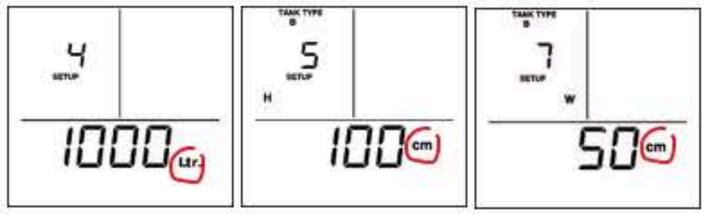
Note!
See www.proteus-meter.com/faq or page 4 for information about installation in underground tanks and cisterns.

Step 1 - Basic configuration

During initial startup EcoMeter S monitor automatically starts in setup mode, if the EcoMeter S monitor was previously switched on, press and hold the Setup button for a few seconds. EcoMeter S monitor displays SETUP 1 message then. You may now begin configuring the EcoMeter S.
Use the ▲ / ▼ buttons to set desired values, confirm your selection with the ENTER button located in the center of the monitor.
In case of an incorrect entry simply press the ENTER button repeatedly until you return to the menu item you want to change.



Setup 1 - Time setup (hours) | Setup 1 - Time setup (minutes) | Setup 3 - Choose tank type (A, B or C)



Setup 4 - Tank volume in liters | Setup 5 - Tank height in cm | Setup 6 - Tank width/ length in cm (only types B and C)

Proceed in the same way with next menu items.

Under Setup 8 enable or disable the alarm using the ▲ / ▼ buttons when the tank content falls below 5% or rise over 95% of the total tank volume.
Confirm data entered with ENTER key and press the SETUP button to finish the configuration process.

Proceed to step 2 of the installation procedure.

Step 2 - pairing EcoMeter S sensor and monitor

This process activates the sensor and synchronizes data exchange with the monitor.
To start this process monitor must be in the so-called "learning mode" (Lrn flashing on the display). This mode is active for 2 minutes only, but activated after each startup following power loss. The learning mode can be cancelled by pressing the Setup button.
The configuration data is stored and will not be lost in case of power loss.

To start the pairing process keep the left middle part of the sensor (small black dot) close to the right middle part of the monitor, as shown in the picture below.
The monitor must be in the learning mode (Lrn flashing).
After a few seconds the process starts automatically.

Note!
Visit www.proteus-meter.com/faq for videos about pairing EcoMeter S sensor and monitor.

As soon as the monitor detects the sensor, the bar graph will flash on both the EcoMeter monitor and sensor displays and rise over time. If all 10 bars will flash, the monitor makes a loud beep and the red LED on the sensor flashes.
Both devices are now paired, and the sensor is ready for installation on the tank.
After pairing the sensor device sends continuously sends data to Proteus monitor (in quick mode) for approximately 10 minutes.
To obtain current measurement data, the sensor should be mounted on the tank as fast as possible within these 10 minutes.

Note!
The configuration procedures of EcoMeter S (standard version) and the EcoMeter S Plus (with antenna extension) are identical.

Installation Guide (Annex I)
EcoMeter S &
EcoMeter S Plus (with antenna extension)

Ultrasonic level indicator for water tanks, cisterns or application with rapid level fluctuations PROT-EMS-(A-v3_9-5679 (status as at 01/2016)

Installation of Proteus sensor on the tank

The same procedure applies for mounting on old and new tanks, no matter if tanks are full or empty.

See also "Installation guide for cisterns and underground tanks" on www.proteus-meter.com/faq

For tanks with 2", 1 ½" or 1 ¼" threaded opening or connectors:

1. Screw the sensor and adapter ring using screws supplied screws (crosshead) with the thread adapter.
2. Make sure that the weather seal is properly seated between the sensor and adapter ring. Please do not tighten too much, as the neoprene seal also works as an ultrasonic isolation.
3. Remove the cap of your tank's threaded opening and screw the sensor onto the free opening.
4. Make sure the sensor is vertically mounted on the top of the tank.

For tanks without pre-drilled holes (only for tanks that are not under TÜV guidelines, like rainwater tanks):

1. If the tank has no pre-drilled opening, then drill a hole in top of the tank of 30/32 mm diameter. Select an appropriate area for easy sensor installation and correct measurements ability. Place the sensor to avoid any potential internal obstacles (like tank walls, crossbars, etc.) that can interfere with the sensor's ultrasonic signal.
2. Place the weather seal and attach the sensor with two 19mm tapping screws supplied. Do not use longer screws. Do not tighten the screws too tightly, so the neoprene seal can work as the ultrasound isolation. Seals tightened too much can cause incorrect measurements.
3. Make sure that the sensor is mounted safely and vertically on the top of the tank, so that the ultrasonic signals reach the medium surface at the 90° degree.

Main features of Proteus EcoMeter S

- Digital radio transmitter (range up to 150m).
- Measures tanks and cisterns up to 19,999 liters
- Normal mode: Monitor processes data in 30 min intervals.
- Fast Mode: Monitor receives measurement data in real time.
- Fits standard 2", 1¼" and 1½" threaded openings.
- Indication of the liquid level in centimeters
- Indication of the liquid level in liters and percent.
- A graphical representation of the tank using a bar graph (sensor and monitor).
- Ambient temperature

Information about EcoMeter S Plus (with antenna extension)

In radio dead areas such as deep manholes and hatches or deeply located cisterns in the garden, it is recommended to use the antenna extension with the transmitter unit of the sensor (see picture on the left) to ensure the best possible wireless connection.

If the transmitter has to be mounted below the ground level deeper than 20cm, it is recommended to use EcoMeter S Plus.

The sensor can also be attached to the overflow pipes, filters or crossbars, as long as the sensor is always positioned upright, aims directly at the liquid surface and has not direct contact with the liquid. Please note however, that the required safety distance between the maximum fill level and the sensor is at least 15 cm (=offset).

Applications of EcoMeter S Plus

(See "Installation Guide for cisterns and underground tanks" on www.proteus-meter.com/faq):

- **Deep cisterns or wells** (example: sensor is mounted inside deep shaft/well and optimal positioning of antenna / transmitter unit is to mount it outside the well.)

Product details of EcoMeter S Plus

- The EcoMeter S Plus has 9m cable between sensor and transmitter unit
- Both parts are splash proof but should not be immersed in water
- The maximum measuring range is 3m
- Measurement accuracy is +/- 10mm

EcoMeter Plus sensor:

EcoMeter Plus Transmitter:

EcoMeter sensor (with thread adapter):

EcoMeter sensor (without thread adapter):

EcoMeter universal thread adapter:

EcoMeter adapter ring:

Operation Manual

EcoMeter S &

EcoMeter S Plus (with antenna extension)

Ultrasonic level indicator for water tanks, cisterns or application with rapid level fluctuations PROT-EMS-A-v3_9-5679 (status as at 01/2016)

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- Fits standard 2", 1¼" and 1½" threaded openings.
- Indication of the liquid level in centimeters
- Indication of the liquid level in liters and percent.
- A graphical representation of the tank using a bar graph (sensor and monitor).
- Ambient temperature
- Cold weather warning
- Low/high level warning
- Battery status alarm

1. Display

Current information

In normal mode display shows current status and level data in the tank. You can change displayed data using arrow keys:

- **Time of day**
- **Fuel capacity/volume in liters**
- **Fuel capacity in percent**

The bar chart and the room temperature are always displayed. The ạ MODE button is then disabled.

Note!
The bar graph of the sensor covers only the top 100 cm of the tank and its indications therefore may differ from the monitor data.

2. Warnings

If the liquid level in the tank drops below 7% of the usable volume, "LTR" (display in liters) and "LO" (low level) will be displayed interchangeably.
If the fill level reaches above 95%, "FULL" and "LTR" will be displayed interchangeably.
The red light will flash and 5 beeps will be heard hourly - until the fill level rises or drops again.
If the liquid level in the tank drops over 12cm below the tank top, monitor will indicate the "FULL" (tank full) and max. volume.

3. Troubleshooting

If the EcoMeter monitor cannot receive RF (radio) signal coming from the sensor, an error message on its display will be shown. The error message will switch between "Err" and "E: 02".

Error codes

E01 - Inconsistent readings

- Is the sensor mounted vertically and positioned correctly?
- Has the sensor clear view of the tank content?
- Are the screws on the sensor/thread adapter tightened too much?
- Is the tank overfilled? Is the minimum distance of 15 cm between the sensor and the max filling height kept?
- Is the sensor membrane dirty?

E02 - Connection lost for more than 6 hours

- Is the sensor within range of the EcoMeter monitor? Try to move the monitor closer to the tank. Note that signal strength may be reduced because of radio interference, such as metal objects or other electric devices in EcoMeter monitor vicinity.

E03 - Invalid readings received

- Check the positioning of the sensor, see E01. For double-walled tanks please make sure that the sensor is mounted on the inner tank.

E04 - Total volume declared is too large

- Check tank dimensions/total volume data.
- Is the tank size set correctly? Simultaneously press both arrow keys to display the current configuration. Repeat the configuration steps (SETUP) if the information stored is wrong. The new data will be displayed after up to 3 hours.
- See also E01.

E05 - Contact Customer Service

- The device is defective, please contact the Customer Service.

E06 - Contact Customer Service

- See E05.

You have following reset options :
Soft reset: Hold down the ENTER button until the monitor starts to beep. Time must then be set again. All other parameters are kept.
Hard Reset: Hold down the ENTER key and press reset button on the back using needle/paperclip. All data will be deleted and the unit will revert to default setup. A new sensor pairing must be performed.

4. Warranty

This product has a warranty period of 24 months, running from the date of purchase, protecting you against device loss and failure.
This does not affect your legal rights.
Normal wear, damage due to negligence, accident or improper use/installation of this device is not covered by the warranty.

Any modifications or changes that were carried out by the purchaser or a third party, including repair attempts, cancel the warranty provisions.
The warranty is valid only if the device has been installed according to the instructions and connected to an electrical power supply with parameters specified.
The warranty is canceled as soon as the equipment has been resold by customer.
This product may only be used in the private sector.
The obligations of the Inno-Tec GmbH are limited to repair or, at will, to replace the product.
The unit should be returned only after receiving confirmation by the customer.
To contact the customer service, please fill out a form on our website www.proteus-meter.com. If asked, you must return the complete package, so that device can be checked for errors and need of exchange to the new one could be confirmed.
Inno-Tec GmbH, its sub-subsidiaries and distributors shall not be liable for any indirect or consequential loss or damage that may be caused by the use of this product.

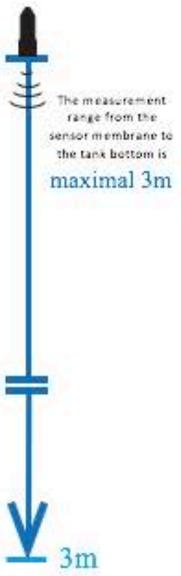
5. Contact data

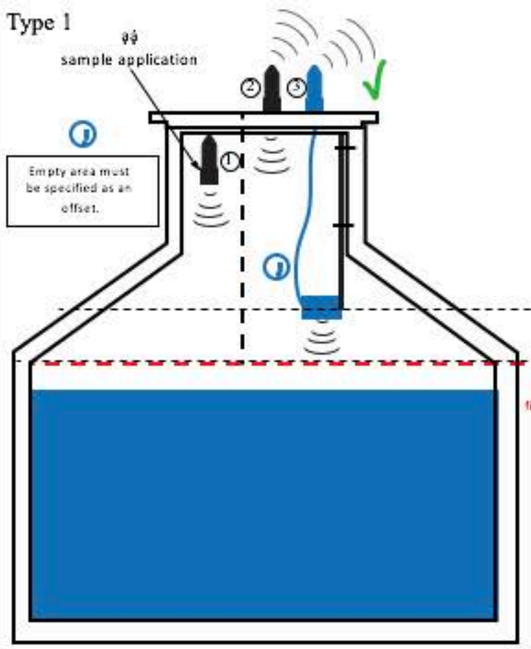
If you have further questions about the configuration, installation or general usage of the device, please visit our Help page on www.proteus-meter.com/faq, where you will find videos and answers to frequently asked questions (FAQs), or contact us using our free customer service:
Phone: +49 (0)173 300 12 59
e-mail: support@proteus-meter.com

Installation guide for EcoMeter S and EcoMeter S Plus (antenna extension) installation in underground tanks and cisterns

EMS-(P)-IH-v1.6, status as at 01/2016

For configuration and startup of EcoMeter S please read the installation instructions.



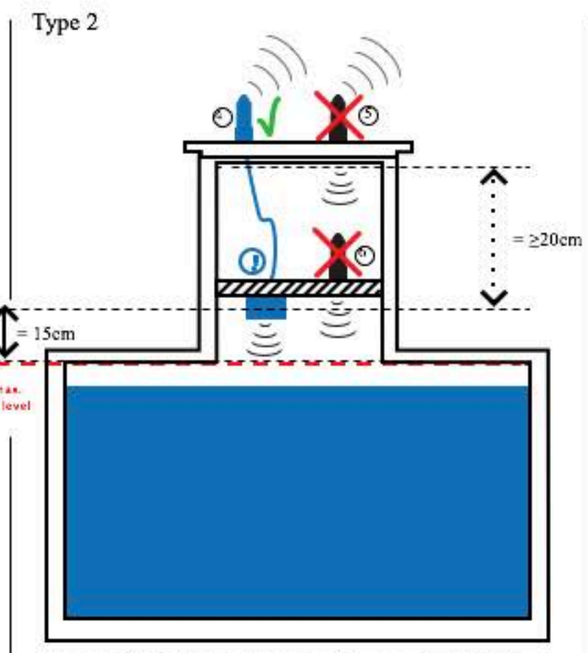


There are several methods to use the sensor depending on mounting type, note however, that the sensor, regardless of model, should always be mounted with a minimum distance of 15cm to maximum filling height.

If the distance is greater than 15cm, it should be entered as an offset in Setup 7.

Contact the Proteus Customer Service for more info. Please note that the offset of max. measuring range (3m) is deducted, so the max. fill level is reduced.

It is possible to mount the EcoMeter S Plus sensor on custom supports, crossbars or inlet or outlet pipes in the tank as long as the above requirements are met.

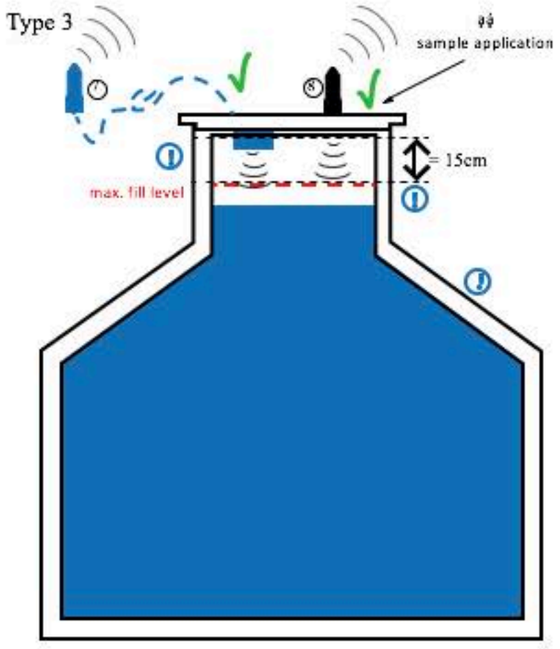


For type 2 tanks (cisterns with cap located in a manhole or shaft deeper than 20cm) EcoMeter S PLUS must be used, so it's important to ensure good placement of the sensor and a stable wireless connection to the monitor.

It is also possible to mount the sensor to crossbars, inlet or outlet pipes, on the underside or in the threaded opening as long as the standard installation requirements are met.

⑤ = Ultrasonic signal cannot penetrate the water table

⑥ = If the depth of the sensor mount is greater than 20cm, no stable wireless connection to monitor is possible, so an antenna extension must be used ④



For type 3 tanks both versions of EcoMeter S are suitable. There is also the possibility to mount EcoMeter S inside the tank under the lid (see image on right and ①) - in order to cover longer distances it is recommended to use the antenna extension to allow the transmitting unit to be placed outdoors.

Sample application

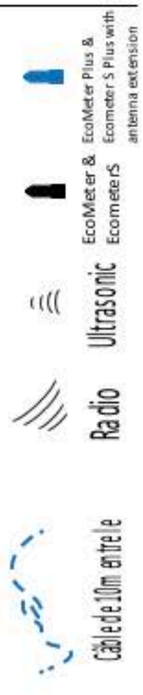
Example for tank types 1 & 3:
Sensor is mounted with 2 long screws and 4 nuts fastened under the cistern lid.
WARNING!
This setup requires a reprogramming of the offset range for installation in type 1 tank to eliminate measurements of the empty area. For this Proteus configuration software is required (see below)

① CONFIGURATION SOFTWARE

For accurate measurements the safety distance of 15 cm must be kept between maximum filling height and sensor. If the tank is filled up in the cone and/or flange (see (7),(8)), the linearization table must be updated.

The linearization table and offset of EcoMeter can be customized using the USB interface and our configuration software.
It is available to download from www.proteus-meter.com/faq webpage.

LEGEND



NOTE

The sensor should not come directly into contact with water, but is splashproof.
Under the surface measurement is not possible and the device electronics can be damaged. To obtain a good radio connection to the monitor, avoid to place the sensor/ transmitter deeper than 20cm under ground level.

TIP

To test whether a good radio link between sensor and monitor can be established, use your wireless phone as a test device. Place the base station where you want to place the monitor. If you have no signal or only poor quality near your tank, we recommend you to use the antenna extension (EcoMeter (S) Plus).

CUSTOMER SUPPORT

If you have further questions about the configuration, installation or general usage of the device, please visit our Help page on www.proteus-meter.com/faq, where you will find videos and answers to frequently asked questions.
Phone: +49 (0)173 300 1259
e-mail: support@e-sensorix.com