Installation Guide EcoMeter S & EcoMeter S Plus (with Antenna Extension)

Ultrasonic level gauge for water tanks, cisterns or applications with faster level fluctuations (e.g. barrels) every 30 minutes

PROT-EMS-IA-v7 (updated 10/2018)

Before installing the device on the tank

1. Can the gauge be installed on the tank or in the cistern?

2. Please watch the videos on pairing/synchronizing the monitor and sensor and configuring the monitor on the following turorial:

https://www.youtube.com/watch?v=MwAuDZOAucA

3. Keep the following dimensions of your tank ready: max. filling level, max. volume, distance max. filling level - mounting position sensor

Notes on the installation

- Avoid tank nozzles with more than 0.78" height

- Please observe a safety distance of at least 5.90" between sensor and tank wall. (e.g. a basketball must be able to fall down undisturbed and must not be distracted by fixtures, etc.)

- The maximum measuring range of the sensor is 49.2 Ft from the sensor to the ground (0% mark).

- The maximum volume that can be displayed is 5.28Gallons

Additional information about the EcoMeter S Plus (antenna extension)

In radio dead areas, e.g. shafts or inside deep cisterns in the garden, it is recommended to place the transmitter unit of the sensor (here on the left in the picture) outside the shaft/cistern with the help of the antenna extension in order to guarantee the best possible radio connection.

We recommend the EcoMeter S Plus if the gauge has to be mounted deeper than 15cm below the surface! The gauge can also be attached to overflow pipes, filters or crossbars as long as the device is always perpendicular and looks directly at the liquid surface and does not come into direct contact with liquids. Please always observe the required safety distance of 5.90" to the wall (basketball analogy).

Fig.1

Applications of the EcoMeter S Plus

- **Deep and radio dead cellar**: Transmitter unit is led out through window
- **Deep cisterns**: device is mounted inside the tank and the transmitter unit is placed outside through the tank cover or a side slot so that the signal can be reliably received by the monitor. This also makes battery replacement much easier, as the tank cover no longer has to be lifted.

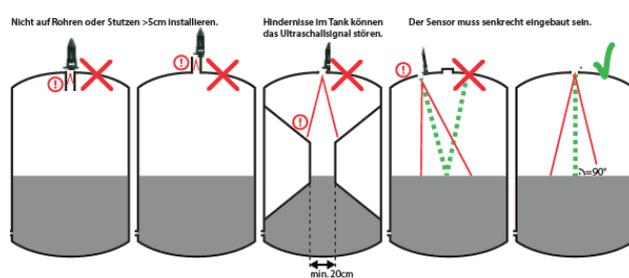## Correct orientation of the sensor

Fig. 2

Selection of the correct tank type

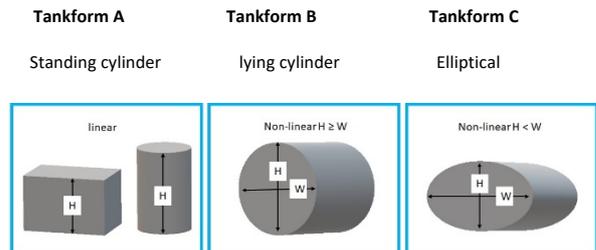| Tankform A	Tankform B	Tankform C
Standing cylinder	lying cylinder	Elliptical
linear	Non-linear H ≥ W	Non-linear H < W

Fig.3

START-UP

Step 1 - Basic configuration of the EcoMonitor

The EcoMonitor (radio display) is supplied with power first when the system is put into operation for the first time. The EcoMonitor then starts automatically in setup mode so that the hours flash (Setup 1). Enter the desired values with the ▲/▼ keys and always confirm your selection with the ENTER key (in the event of an incorrect entry, simply press the ENTER key repeatedly until you return to the menu item you want to change).
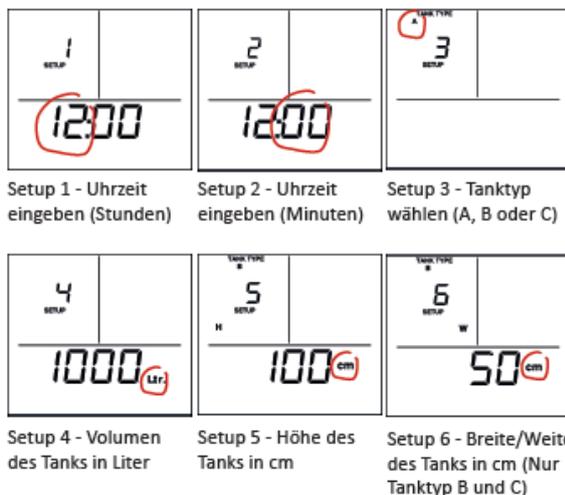

Setup 1 - Uhrzeit eingeben (Stunden)

Setup 2 - Uhrzeit eingeben (Minuten)

Setup 3 - Tanktyp wählen (A, B oder C)

Setup 4 - Volumen des Tanks in Liter

Setup 5 - Höhe des Tanks in cm

Setup 6 - Breite/Weite des Tanks in cm (Nur Tanktyp B und C)

Fig. 4

Continue in the same way with the next menu items:

Setup 1: Enter the time / hours

Setup 2: Enter the time / minutes

Setup 3: Enter tank type A/B/C (see figure 2)

Setup 4: Enter max. volume in litres

Setup 5: Enter the fill level in cm

Setup 6: Enter the width of the tank in cm (only for tank type B / C)

Setup 7: Input of the offset (OFt) in cm: Distance between max. level and mounting position of the sensor (tabs right and left are the reference point of the sensor). This distance should be 5.90". The maximum offset corresponds to the difference of 9.84Ft and max. filling height.

Setup 8: Enter the floor dead space volume (OLH) in cm (corresponds to the 0% mark which can be corrected upwards to take a sump volume or similar into account).

Setup 9: Alarm On / Off (switches the alarm on / off, levels above 90% and below 10% are recognized as alarm. The display changes and the red LED starts flashing and an alarm sounds regularly).

Setup 10: CLR, pressing and holding the ENTER key erases the stored historical data of the EcoMonitor.

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Then press the SETUP button to end the configuration process. After a few seconds the current volume should be calculated, if there is a data connection with the sensor and corresponding distance values are available.

After the first configuration, LRN appears on the monitor so that it is ready for pairing with the sensor.

After the first configuration you can enter the setup menu at any time (e.g. to change or optimize your configuration data) by holding down the SETUP button until the hours start flashing. To exit the Setup menu, simply press the Setup button briefly.

Step 2 - Pairing the EcoMeter S Sensor and EcoMonitor

This process activates the sensor and couples the sensor to the monitor for data exchange. Each sensor has a unique digital number, allowing multiple sensors and Ecomonitors to operate in parallel without interference.

In order to start the pairing process, the monitor must be in the so-called "learning mode" (Lrn flashes on the display). This is active for approx. 2 minutes and is activated each time the power supply is switched off and on. Pressing the Setup button cancels the learning mode.

> To begin the pairing process, hold the left center of the sensor (small black dot) directly against the right center of the monitor as shown in the picture below. The monitor must be in learning mode (Lrn flashing). After a few seconds, the process starts automatically, and both bar graphs must move from bottom to top. A beep and a longer LED light completes the coupling process and the sensor can be removed from the EcoMonitor.
>
> Go to www.youtube.com and search for "Proteus Ecometer" to find a video of the pairing process.

Step 3 - Mounting the sensor on tank or cistern

The two devices are now paired and the sensor is prepared for mounting on the tank.

The sensor will now continuously send data (every 2 - 3 seconds) to the Proteus Monitor (real-time mode / fast mode) for about 10 minutes. The Ecomonitor ticks and the red LED flashes continuously during this time.

To simplify the installation, the sensor should be mounted on the tank or in the cistern within these 10 minutes. This gives you the possibility to align the sensor exactly so that you can check the calculated volume immediately. If the volume does not correspond to reality, please check the set parameters in the setup. You can correct and optimize them at any time.

If the sensor cannot measure a valid distance, a warning triangle appears on the display so that you should readjust the sensor or shorten the distance to the surface. If a valid distance is detected, this is indicated by the bar or a nozzle symbol on the display of the sensor.
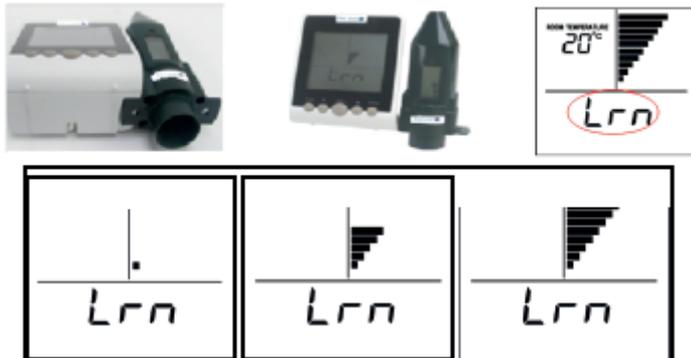

Since the sensor measures a distance using the ultrasonic method, the sensor can be mounted at any level. The tank or cistern does not have to be emptied to mount the sensor.

The Fast mode is also ideal for testing whether the sensor is still responding to distance changes.

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

Fig. 5

For tanks with 2" or 1 ½" threaded holes or sleeves:
1. Screw the sensor and adapter ring onto the threaded adapter using the supplied screws (cross).
2. Make sure that the neoprene seal is correctly seated between the sensor and the adapter ring. The neoprene seal is used for decoupling and must not be squeezed too much and screwed on only lightly.
3. Remove the cap from the threaded opening of your tank and screw the sensor onto the free thread.
4. Make sure that the sensor is perpendicular to the medium surface and that no warning triangle is visible on the rocket's display.

For cisterns with shaft:
1. Attach the sensor to the brackets on a perforated plate or bracket so that the sensor is at least 5.90" from the cistern wall.
2. Use the neoprene seal to decouple the ultrasonic signal and do not squeeze it too much.
3. Please do not use the threaded adapter, but use only the sensor with the neoprene seal.
4. If the sensor has to be mounted 5.90" below the cover, we recommend the Plus version, as this allows you to ensure that the RF signal can be received outside the cistern.
5. Depending on the cover, a plus variant must also be selected so that the transmitter unit can be positioned outside the cistern to ensure reliable radio communication.
6. If an empty conduit is available, the coaxial cable of the plus version can be separated so that the cable can simply be pulled through the empty conduit. Then connect the ground shield with the ground shield and the soul with the soul. Simple luster terminals are sufficient.
7. Make sure that the sensor is aligned perpendicular to the medium surface and that no warning triangle is visible on the display of the transmitter unit / sensor.

GENERAL INFORMATION AND NOTES

1. Functional features of the EcoMeter S / S Plus monitor and sensor
- The Ecometer S consists of a digital radio station (range up to 492Ft) and a battery powered sensor (CR2450 / CR2440), which is activated during commissioning. It is not necessary to insert a battery.
- The EcoMonitor shows the volume of tanks and cisterns up to 5.28Gallons.

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- Normal mode: monitor receives measurement data in 30min intervals
- Fast mode: Monitor receives measurement data in real time every 2-3sec for approx. 10min after the pairing process.
- Fits standard 2" and 11/2" threaded holes
- The following parts must be included in the package: Ecomonitor, sensor, thread adapter, power supply, 2 x crosshead screws, 2 x grub screws, instructions.

2. current information of the display

In normal mode, the current status and level in the tank are displayed. Use the arrow keys to switch between the following displays:
- Time
- Filling height in cm
- Tank capacity in percent
- Current tank capacity/volume in litres

The bar chart and the room temperature are always displayed. The MODE button is deactivated in this version and has no function.

The bar graph of the sensor represents only the upper 39.3" in the tank and may differ from the display on the monitor.
If the level in the tank is higher than 90%, the monitor will display "FULL" alternating with the current volume. When the alarm is on, the red LED flashes.
A warning triangle on the sensor display indicates that there is something wrong with the distance measurement. It is best to reconnect the sensor and align it correctly to the surface.

For measurements larger than 95cm, a nozzle symbol appears because the sensor does not know the tank height and only visualises the first 100cm by means of a bar.

The sensor should not come into direct contact with water, but is weatherproof, so it can be operated outdoors all year round. However, protection from intense sunlight is recommended. Under the water surface no measurements are possible and the electronics can be damaged. In order to achieve a good radio connection to the EcoMonitor, avoid placing the sensor/transmitter unit deeper than 7.78"under the ground.
To test whether a good radio connection between sensor and monitor is possible, use your cordless telephone as a reference. Place the base station where you want to place the monitor. If you have no or only weak reception in the shaft of your cistern, we recommend ordering the antenna extension (EcoMeter S Plus).
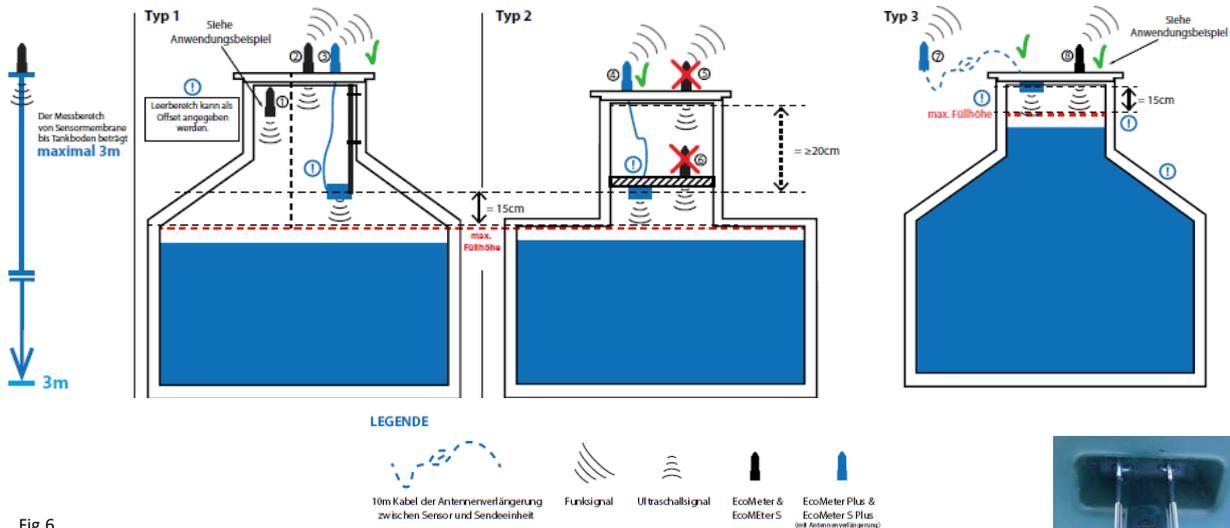
3. installation help

Fig.6

It is possible to attach the sensor of the EcoMeter S Plus to specially manufactured devices, cross struts or inlet or outlet pipes in the tank, as long as the above requirements are met. For cisterns of type 2 (cisterns with tank covers in a manhole or shaft deeper than 27.55") an EcoMeter S PLUS must be used to ensure a good positioning of the sensor and a stable radio connection to the monitor. Both versions of the EcoMeter S are suitable for type 3 cisterns. It is also possible to install the EcoMeter S inside the tank under the cover (see picture right & 1) - to cover larger distances, but it is recommended to use the antenna extension to lead the transmitter unit outside.

Fig. 7

Application example for Types 1 & 3, Fig. 7:
Gauge was fastened with 2 long screws and 4 nuts under the cistern cover.

4. configuration software

If the cistern is filled into the cone and/or shaft, the linearization table must be adapted. Please contact customer service for more information.

5. error codes

The EcoMonitor checks itself and issues corresponding error codes in the event of malfunction. These can also be found on the back of the Ecomonitor.

E01 - Readings inconstant
- Is the sensor installed vertically and correctly positioned?
- Does the sensor have a clear view of the tank contents?
- Are the screws on the sensor/thread adapter too tight?

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- Is the tank overfilled? Has the minimum distance of 5.90" between the sensor and the maximum filling level been exceeded?

- Is the sensor membrane dirty / moist?

E02 - Connection lost for more than 6 hours

- Is the sensor within range of the EcoMonitor? Try to bring the monitor closer to the tank. Note that the signal strength of the EcoMonitor may be affected by sources of radio interference such as metal objects or other electrical equipment.

E03 - Reading received, but invalid

Check the positioning of the sensor, see E01. Make sure that the gauge is correctly aligned and that no warning triangle is visible on the display.

E04 - Measuring distance is greater than max. filling level + offset

- Check the max. filling level and the entered offset. Correct this if necessary.

- Keep the Enter key pressed for approx. 15sec to force a restart of the firmware.

E05 - E06 Contact customer service

- Press and hold the Enter button for about 15 seconds to force a firmware restart.

6. **Warranty**

This product has a 24 months warranty, active from the time of purchase, which insures you against failures and defects.

This does not affect your legal rights. Normal wear and tear, damage due to negligence, accidents or improper use/installation of this equipment are not covered by the above warranty.

Any modifications or changes made by the buyer or a third party will void the warranty. This includes attempted repairs. The warranty is only valid if the device has been installed according to the instructions and connected to one of the named electrical sources.

The warranty is void if the product is resold by an end user.

E-Sensorix Sarl, its subsidiaries and distributors shall not be liable for any indirect or consequential damages or losses arising out of the use of this product.

7. **Contact information**

For further questions regarding configuration, assembly or your application in general, please visit our help page at

https://www.e-sensorix.com/en/faq-frequently-asked-questions where you can find answers to frequently asked questions (FAQs). Or contact our customer service at: fstengele@e-sensorix.com

Various help videos can be found on YouTube (www.youtube.com) where you can search for "Proteus Ecometer S".

The technical specifications of the Proteus EcoMeter, the contents of the manual and the illustrations and images contained therein are subject to change without notice. The content and images in this manual are under copyright and may not be reproduced or copied without written permission of e-sensorix Sarl.

FAQ

Which type of tank should I choose?

For concrete cisterns, please select tank type "A". For round plastic tanks, please select tank type "B". For tanks with a width greater than the height, select tank type "C".

Do I lose the configuration and pairing data if the EcoMonitor is disconnected from the network?

The configuration data and pairing data are stored via a button cell CR2450 or CR2440 (identical in construction to the sensor) and are not lost in case of voltage loss.

My EcoMonitor shows E:03 after a few months although it has not been changed!

Please note that the gauge is sensitive to condensate. Water droplets in the funnel and on the membrane can influence the measurement. As a result the error E:03 appears. Wipe out the funnel with an oil-soaked cloth so that a water-repellent film is formed.

My EcoMonitor shows E:02 after some time?

Either the radio connection is not stable and you should switch to the Plus variant, or the battery capacity has collapsed so that the power is no longer sufficient to send data.

How can I change the battery of a Proteus Ecometer?

Loosen the 4 x Phillips screws under the neoprene seal with a suitable Phillips screwdriver and then remove the cap. Then you will see the battery holder with the button cell CR2450. The Ecomonitor contains an identical CR2450, which is less stressed, so that it can be replaced if necessary.

What does the nozzle symbol on the sensor display mean?

If a distance greater than 39.37" is measured, it can no longer be visualized with the bars. The nozzle symbol is then shown, which means that the measuring distance is greater than 39.37".

Why does the EcoMonitor show too much or too little volume?

Please check the offset and floor dead space settings in SETUP 7 and 8. These two values determine the 0% and 100% mark. The standard values are 5.90"offset and 0cm floor dead space volume.