Ultrasonic SMS Installation Guide

Thank you for purchasing the Tekelek Ultrasonic SMS sensor which uses ultrasonic technology to measure the liquid level of your tank and then communicates this data via SMS.

STEP 1: Activation

- To activate the sensor, hold the supplied magnet to the hot spot, a beep will be heard to indicate correct placement of magnet.

- Keep the magnet held to the hot spot until a second beep is heard, remove magnet from hot spot once this has been achieved.
- After 10 seconds repetitive beeping will begin and continues until the unit begins to log in and registers on the GSM network, at which point the frequency of the beeping increases.
- When the unit is logged in a beep is sounded every 5 seconds. To save the battery, the device will shut down after 20 minutes and will reawaken to send scheduled messages as configured.
- The unit can only receive an SMS command when it is connected to the GSM network, either when it connects on schedule or activated with a magnet. See Appendix 2 for list of SMS commands.

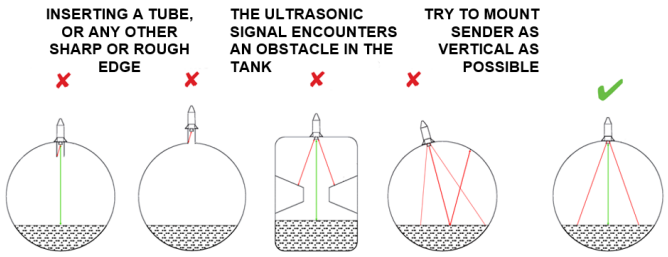
Beep Patterns:

Beep Pattern	Definition
Low beep once per second	Network Registration
High beep once per second	GPRS Registration
Low beep once every 4 seconds	Network / TCP Listen
Low beep once every 2 seconds	Re-establish Network / TCP
High / Low combination beep	Incoming Data
Low / High combination beep	Outgoing Data
Low double-beep every 4 seconds	Network Listen (Data Received & Unit Active)
Low double-beep every 2 seconds	Re-establish Network
High double-beep every 4 seconds	TCP Listen (Data Received & Unit Active)
High double-beep every 2 seconds	Re-establish TCP

STEP 2: Installation

The following outlines the sensor mounting options.

- The sensor must sit in a vertical position on top of the tank and be fitted such that the sensor has a clear path to the tank contents. Position it so that there are no internal obstructions that may interfere with the ultrasonic signal.



- If obstacles cannot be avoided, then a waveguide may be required. Please refer to Appendix 3 for further details.
- Locate a suitably positioned threaded opening on the top of the tank to hold the sensor.
  - The sensor will fit directly into threaded 1 ¼", 1 ½" or 2" BSP (British Standard Pipe) existing tank connections.
  - Ensure that the gasket is placed, and that the sensor is screwed correctly into the tank.
- For tanks that do not contain a suitably positioned threaded opening on the top of the tank to hold the sensor, please refer to Appendix 1.

Appendix 1: Drilling Procedure

- Choose a flat spot on the top of the tank.
- Use a 45.5mm tapping drill to drill a 1 ½" BSP hole on the surface of the tank.
- Place the foam gasket over the hole followed by the mounting adaptor.
- Tighten on to tank with 2 stainless steel self-tapping, counter sunk screws, supplied. Do not over tighten!
- Screw the sensor into the adaptor. Ensure that the sensor is vertical on the tank and screwed correctly into the base and that the threads have not crossed, to give a secure seal

Appendix 2: List of SMS commands:

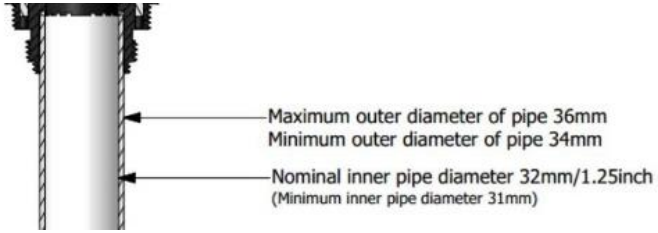
Command	Meaning
Report	Return a standard report to the sender or to all numbers on whitelist if enabled
Type A	Define the tank type that the sensor is to be attached to. There are 3 tank types to choose from. • Type A is rectangular or vertical cylindrical • Type B is a horizontal oval/cylinder • Type C is a low-profile tank
Volume 123	Set the tank volume to 123 litres – valid range is 100 litres to 65535 litres
Height 123	Set the tank height to 123cm – range 50cm to 300cm
Width 123	Set the tank width to 123cm – range 50cm to 300cm (Tank dimensions are required for unit to calculate volume of liquid)
Outlet 12	Set the outlet height to 12cm – range 0cm to 30cm. This is used to calculate the effective available capacity remaining in the tank.
Offset 12	Set the mounting offset of the sensor to 12cm – range 0cm to 50cm. This is required if the sensor is mounted with an offset relative to the top of the tank.
Geometry	Return all tank dimensions configured in unit
Schedule 7d	Set the schedule for standard reports to be sent e.g. 7d means that the unit will send a scheduled report once per week. The only exception is a value of 2H which will result in a scheduled message every 2 hours. Note that this will greatly impact on battery life. Range limited to 30 days.
Time 08:30	Set the time for scheduled reports to be delivered to 8:30am. Valid range 00:00 to 23:59
Alarm on	Turn alarm functionality on
High 85	Set the unit to generate an alarm if the tank contents exceed 85% capacity. Range 0 to 95. A value of 0 will disable this alarm.
Low 15	Set the unit to generate an alarm if the tank contents drop below 15%. Range 0 to 95. A value of 0 will disable this alarm.
Whitelist 123456 +9715012 +9715013	Specify up to 5 numbers (including the international country code) to which messages can be sent. Numbers are separated with a space. The value 123456 is the default password.
Password IMEI 234	Change the password to 234. The IMEI number is the 15-digit number listed under the bar code on the front of the unit.

Appendix 3: Waveguide

Note: The default sensor configuration is non-waveguide mode and the measurements will be inaccurate unless a waveguide configuration mode is used.

- Source a suitable pipe to act as the waveguide. This pipe should conform the dimensions in the figure below in order to fit the sensor. The recommended pipe material is PVC (domestic waste pipe is often used). Other materials are possible but should be checked for chemical resistance to fuel oil.

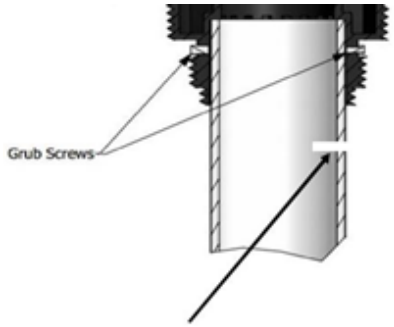
- Cross-section of waveguide pipe assembly:



- The pipe should be cleanly cut to length. The length required should be measured from the top of the tank (where the sensor is to be mounted) to that of the fuel outlet point (as shown).

Note: The bottom of the pipe should be a minimum of 5cm from the base (floor) of the tank to prevent it from touching in the case of tank dimensional changes due to temperature etc.

- The waveguide pipe should be securely attached via the two grub screws and hand tightened with an M1.5 Allen key (Note: over-tightening the grub screws can damage the plastic). Care should be taken to keep the sensor and pipe vertically aligned and supported, while fitting during the installation.



Note: Depending on the weight, length and surface finish of the pipe, it may be necessary to glue it into position. In this case a hole should be drilled near the top of the waveguide pipe, just below the adapter, to ensure that any trapped air can exit.

- Insert the correctly sized rubber seal ring, as required for the tank opening (supplied), and position it on the face of the adapter that is screwed onto the top of the tank.

- Insert the whole assembly carefully into the tank, taking care not to loosen the pipe, and fit into position. Hand tighten the assembly until the rubber seal locks into position.

For more information on the Tekelek Ultrasonic SMS sensor please visit our website www.tekelek.ie where a link to our YouTube page can also be found.

9-5964-02