LPG LoRaWAN Installation Guide

Thank you for purchasing the Tekelek LPG LoRaWAN sensor which is an ATEX certified LPG LoRaWAN flexible and configurable battery-operated level sensor with an integrated LoRaWAN radio.

Safety Information:

The LPG LoRaWAN sensor is ATEX compliant, but if installing in a harsh environment first check local applicable regulatory and safety guideline to ensure installer security. Please refer to the Short Instruction Manual for more information on the warnings and hazards.

STEP 1: Installation

***Note**: For the LPG LoRaWAN sensor, warnings detailed in the Short Instruction Manual must be considered.*

When possible, install the LPG LoRaWAN sensor as high as possible off the ground (>2meters is ideal).
The LPG LoRaWAN sensor can be easily mounted in these different ways: (screws & cable ties not provided)

- Wall mounting with M6 screws
- Vertical tube mounting with polyamide cable ties
- Horizontal tube mounting with polyamide cable ties
- Sensor may also be glued in place if required

These different configurations are detailed in the following steps.

1.1 Wall Mounting

The LPG LoRaWAN sensor has a wall mount system for M6 screws. When mounting, ensure that the antenna is vertical and avoid having the antenna too close to another wall, or any obstacle.

Figure 1: Example of wall mounting

1.2 Vertical tube mounting

Mounting and installation of the LPG LoRaWAN sensor on a vertical tube:

- Use 1 weather resistant polyamide cable tie (width < 5mm and length > 250mm)

Follow these steps:

- Position the LPG LoRaWAN sensor on the vertical tube
- Insert cable ties through holes on underside of the sensor
- Tighten the cable ties so that the sensor is held securely in place.

Figure 2: Example of vertical tube mounting

1.3 Horizontal tube mounting

Mounting and installation of the LPG LoRaWAN sensor on a horizontal tube:

- Use 2 weather resistant polyamide cable ties (width < 5mm and length > 250mm)

Follow these steps:

- Position the LPG LoRaWAN sensor on the horizontal tube
- Tighten the cable ties so that the sensor is held securely in place.

Figure 3: Example of horizontal tube mounting

STEP 2: Antenna considerations

The position of the LPG LoRaWAN sensor and its antenna is key in the performance of the LoRa network. The position and the orientation of the LPG LoRaWAN sensor must be chosen carefully to offer the best performance.
Some recommendations are provided below.

- Orientation:

The antenna must be kept vertical, in the nominal position of the LPG LoRaWAN sensor.

- Metal plate, metallic parts:

Performance of the antenna may be degraded by metal parts within 20cm above or beside the antenna

- Height / ground effect:

The ground has a significant impact on the radio signal attenuation. The closer to the ground the LPG LoRaWAN sensor is, the higher the attenuation will be.

- Sensor interface:

The cable between the Rochester gauge and the LPG LoRaWAN sensor should be guided such that it is not close to the antenna. Also avoid creating any loop with the cable, close to the LPG LoRaWAN sensor enclosure.

STEP 3: Activation

Before installation the LPG LoRaWAN sensor must first be registered to a LoRaWAN network. Access to the LoRaWAN backend server is required to verify that the unit has correctly joined the network.

- Once the sensor has been installed, activate the slide switch for 1 second to connect to the LoRaWAN network and upload a status message. (See Figure 4)
- The LED will stay illuminated as the sensor registers:
  - **Red** LED = The sensor is registering & connecting for the first time. (Sensor is shipped in dormant state).
  - **Green** LED = The sensor is already registered. The connection process will take between 20 & 40 seconds.
- After the connection has completed, the LED will flash on & off (to indicate whether the connection was a success or failure). See STEP 4.

Figure 4: Slide Switch Activation

STEP 4: LED Patterns

Once the sensor has been installed successfully, it is recommended to force a manual connection 4-5 times to test the strength of the radio signal.

- Activate the slide switch for approximately 1 second, until the LED turns green.
- Wait approximately 10-20 seconds and observe if the LED flashes green or red.
- If the LED flashes red on greater than 50% of attempts, consider elevating the sensor to improve the radio frequency performance.

See the following for description of Green/Red LED flash codes.

LED Radio Signal Strength Flash Codes:

LED Pattern	Function
Green X 3 Flashes	Excellent signal strength
Green X 2 Flashes	Good signal strength
Green X 1 Flash	Adequate signal strength
Alternate Green/Red Flash	Weak signal strength

LED Error Flash Codes:

LED Pattern	Function
Red X 1 Flash	Authentication or LoRaWAN join request fail
Red X 2 Flashes	No response from LoRaWAN network
Red X 3 Flashes	General Error. Please try again. If the error persists, contact the supplier for support.
Red X 5 Flashes	Maximum number of allowed activations exceeded (up to 6 per hour allowed).

STEP 5: Fitting Rochester gauge

Where applicable, remove existing gauge from the LPG tank by loosening and removing the screws holding the gauge in position.

Place the new gauge of the LPG LoRaWAN sensor onto the LPG tank and secure with screws.

APPENDIX:

Addition documentation:

- 9-5854 Short Instructional Manual
- 9-5929 LPG LoRaWAN User Manual

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

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