



DC3 RADAR TLM LTE Installation Guide



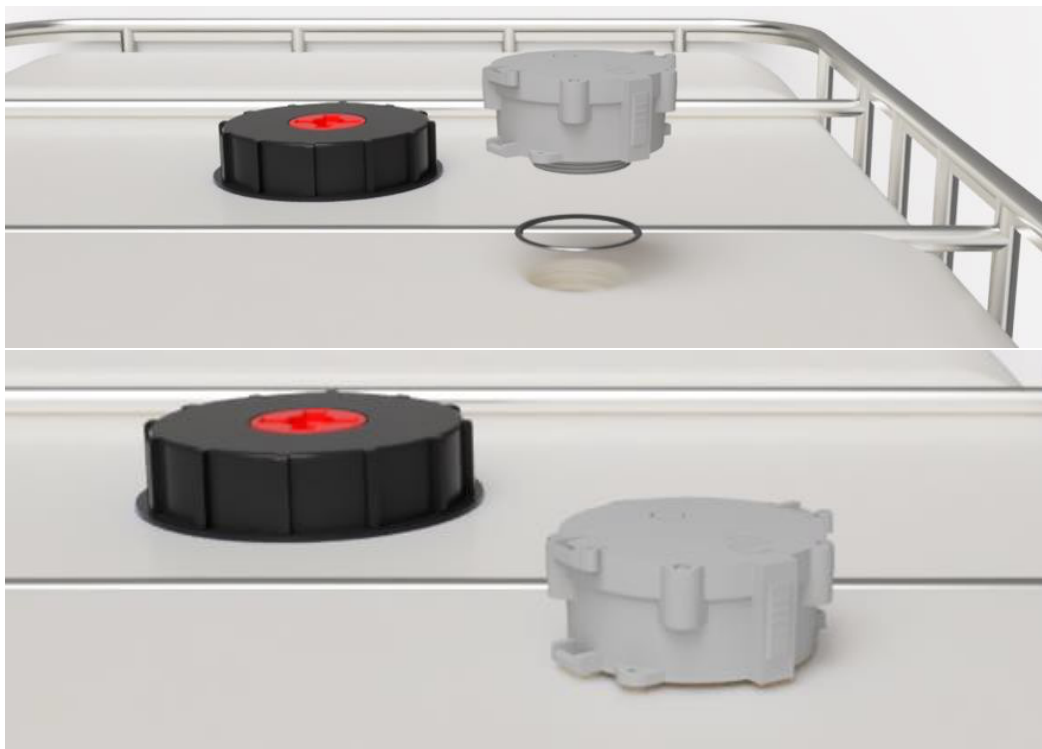
1. Installation / user guide of the DC3 RADAR TLM device

This document provides guidance of the physical installation of the DC3 RADAR TLM and how to activate the sensor.

The DC3 RADAR TLM uses high frequency radar pulses to determine the ullage distance (or headspace) in a tank. By measuring the time of flight from the bottom of the device to the surface of the liquid, tank % full volume can be calculated.

Invasive installation

DC3 RADAR TLM device has a 2" BSP threaded opening to allow it to be screwed into an existing 2" opening of a tank or lid. An O-ring is supplied and should be used to ensure a watertight seal.



Non-invasive installation

Plastic tanks allow a non-invasive installation as an option. It is used where either a mounting hole is unavailable or where it is undesirable to cut a mounting hole in the tank. It involves installing an adapter on the top surface of the tank and mounting the sensor on this adapter.

Note - this option only applies for non-metallic, or tank made from materials which do not block the passage of a radar signal.

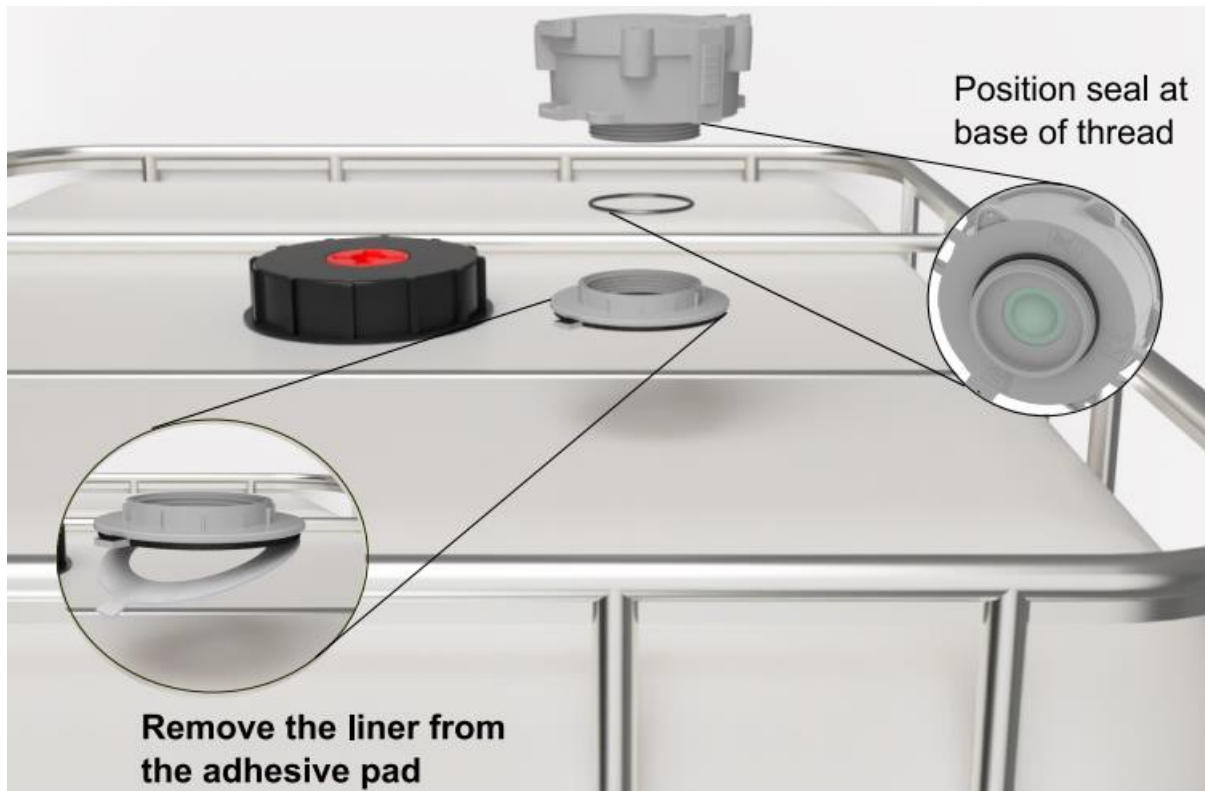
The tank area where the non-invasive adapter is to be installed should be clean, free of grease or water and dry. The adapter (with the liner removed) is mounted onto the tank and firmly pressed down to form a good seal with the tank.

The DC3 RADAR TLM device is threaded and screwed onto the adapter firmly to make a good seal. The O-ring shown below seals the non-invasive adapter to the bottom of the sensor main enclosure (the O-ring is positioned on the 2" thread).

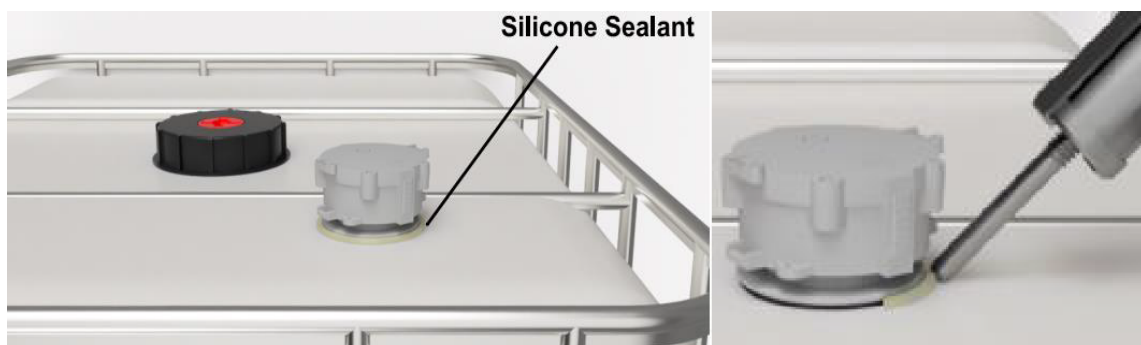
It is important to ensure that water or any other substance does not ingress inside the cavity formed by the adapter and the sensor enclosure.

The location of the non-invasive mounting should be carefully chosen to avoid internal obstacles and other obstructions that would interfere with the radar signal reaching the internal contents of the tank.

Notes: The maximum recommended plastic wall thickness for non-invasive mounting is 10mm. The radar sensor signal ullage measurement will also show an offset due to the radar signal transit time through the plastic.



Note - It is recommended, especially in cases where water can temporarily lodge near one side of the sensor, to add waterproof sealant near that side of the unit. The result should look as follows. Note: this should **not be** added around the full circumference of the unit.



Ensure Sensor Level

Below examples illustrate how to level the sensor for accurate readings and to avoid jittery readings.

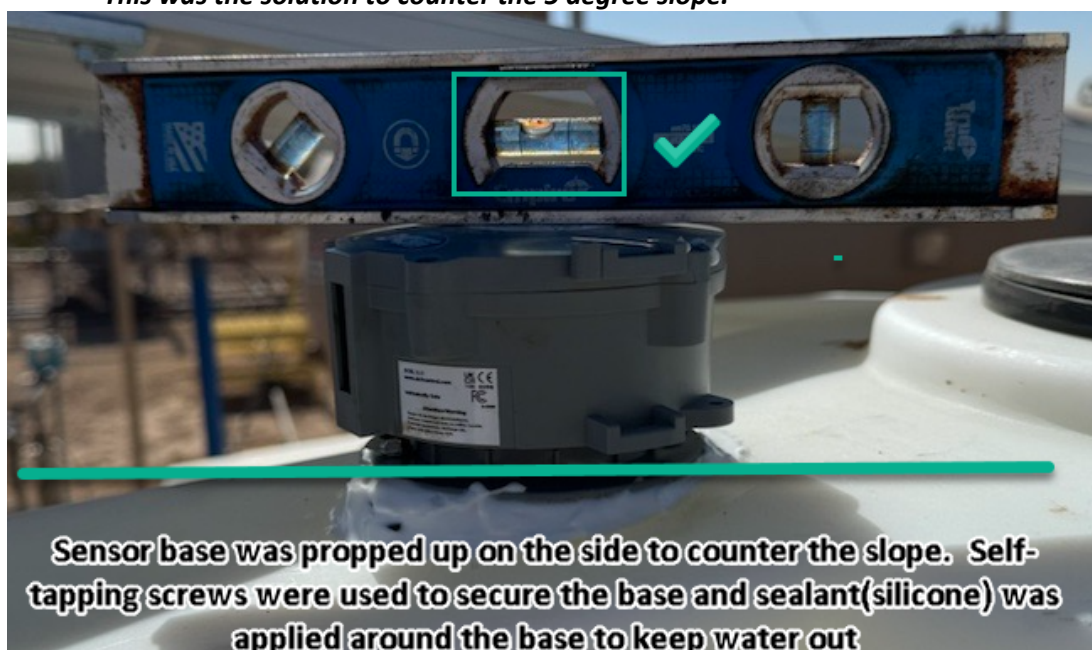
It is recommended that the flat gasket be retained and used as a shim material for small leveling adjustments. Also keep some 3/4 self tapping screws on hand for securing the base in the even that you need to excessively raise one side of the sensor to counter a severe slope.

Example 1

This example will yield poor readings.



This was the solution to counter the 5 degree slope.



Device Leveling Example 2

Without placing the level on the device, this monitor looked “level” by eyesight. However, after further investigation, it was not.

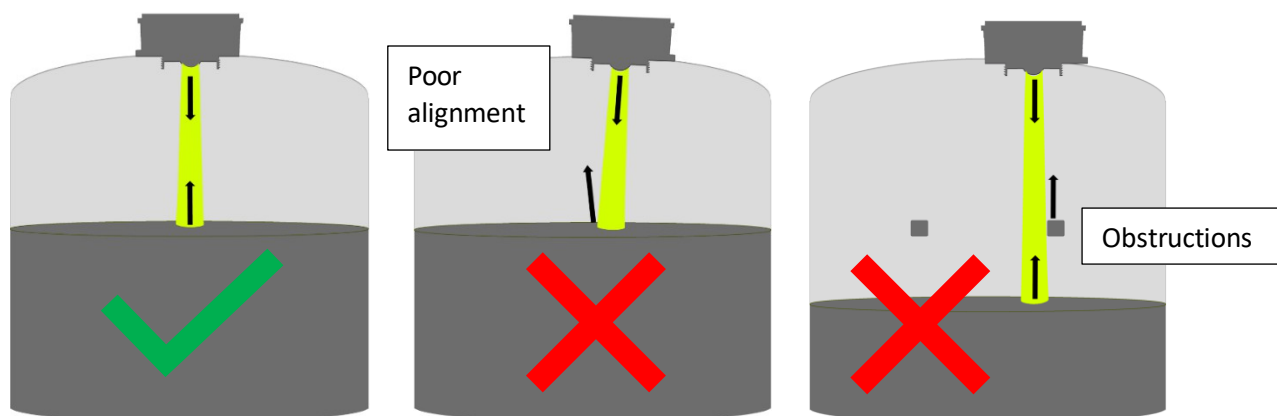


A small amount of gasket was used to shim one side of the device. Self-tapping screws secured the base to the tank. Silicone was applied after to keep pooling water from seeping in under the base around the gasket



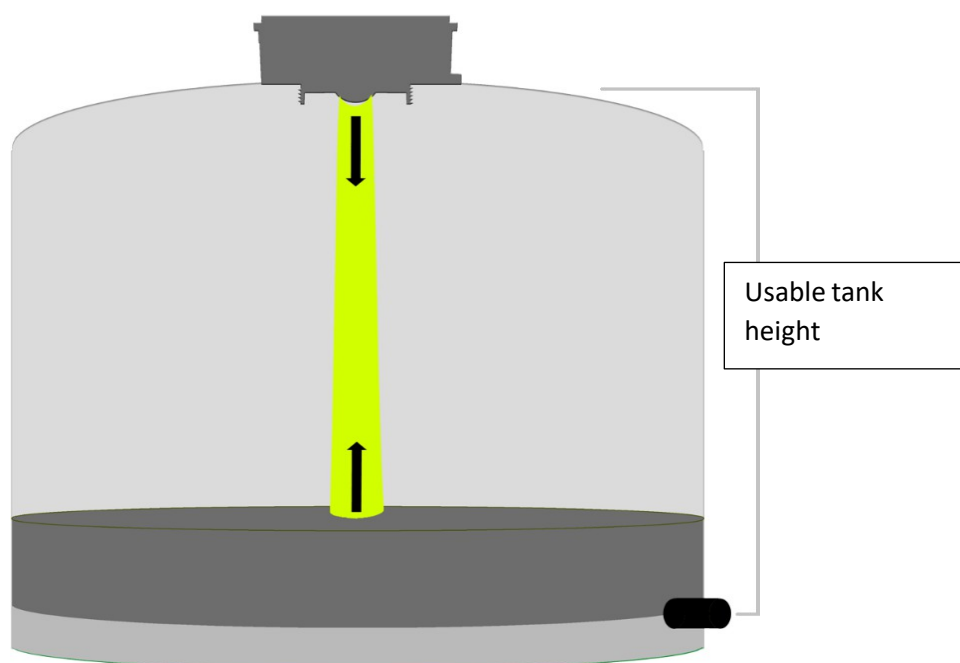
Sensor mounting

The mounting position of the DC3 RADAR TLM device is important for best results. The sensor should be mounted horizontally with a direct view of the liquid inside the tank without any obstructions. It should also not be mounted too close to the edge or near metallic objects. Please also see Appendix. Once the sensor is installed on a tank – the next steps will involve waking the sensor from dormant mode and starting communications and making measurements.



Once the sensor is mounted, it is important to carefully measure the usable tank height. This is because the radar sensor needs to know the overall scanning distance to protect the battery and prevent any erroneous reflections from pooling water from being generated.

The installer should take a measurement from the underside of the sensor to the lowest level of the usable liquid (typically the tap/outlet).

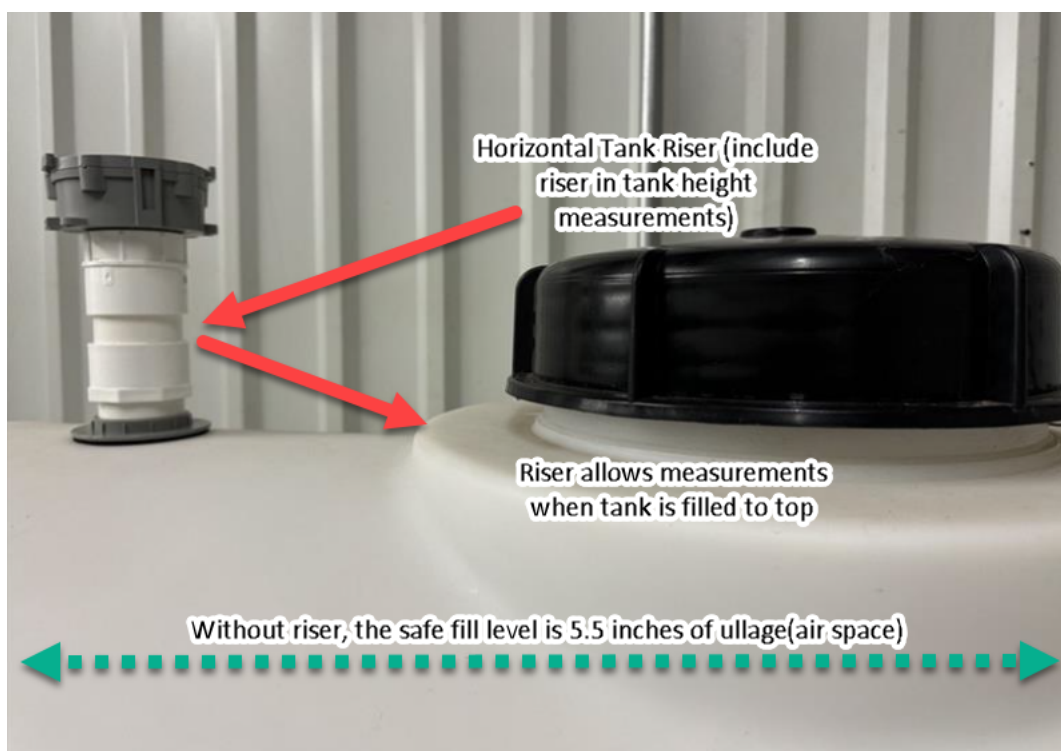


Stand-Off Pipe

Depending on the tank style you may need to mark a max fill line or install a stand-pipe to provide enough ullage for the device to read when the level is filled to the top of the tank and less than 6 inches from the sensor bottom. When there is less than 6 inches of ullage, the device typically will read 5.5 inches of ullage. This will self-correct when the tank level has been pulled down enough.

If you install an extension you will need to account for the added height by including it in the total tank height.

It is critical that you have the mounting level when using standpipe and the use of self tapping screws should be used to secure the base. ***DC3 recommends a max fill line vs the standoff pipe for most applications.***



2. DC3 RADAR TLM Sensor activation:

A magnet is supplied with the device to activate and start cell module communications. The magnet is held over the DC3 Logo 'hotspot' for approximately 5 seconds until a double beep repeating. The magnet is then removed.



The sensor will activate, make a measurement, and connect to the pre-set endpoint server to drop the data. The unit will respond a series of beeps from the internal buzzer to indicate the sensor status (refer to User manual for further detail). This may take a few minutes to execute, depending on the local LTE network. The sensor will then return to sleep mode until the next scheduled communication is due to occur.

However key parameters such as the tank height will need to setup on the device via the endpoint server.

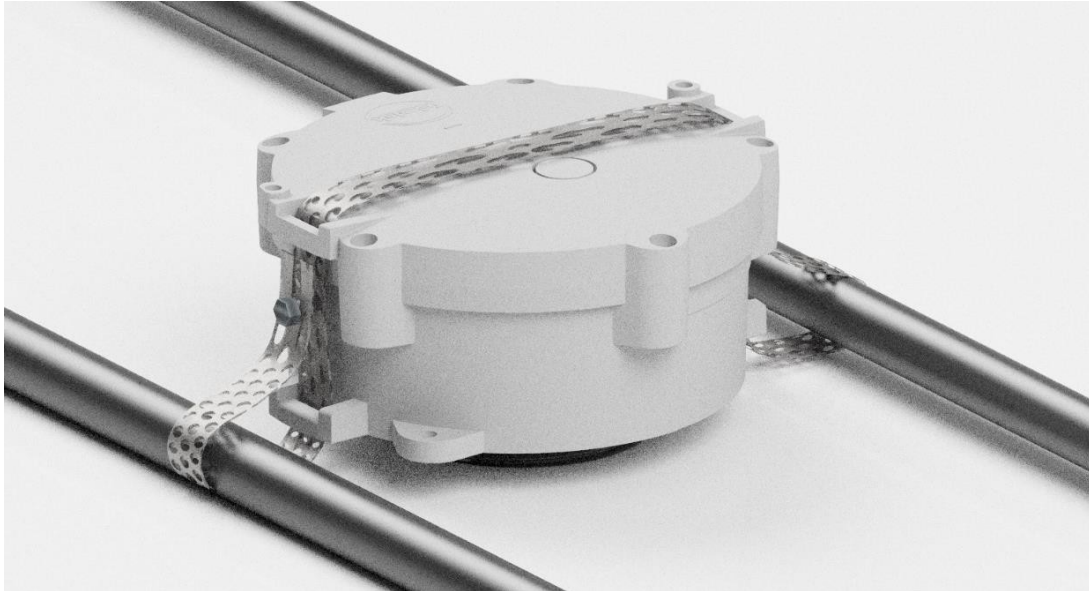
APPENDIX:

1. Signal diversion of the radar unit – typically 8 ... 10°.
2. The radar mounting position should be positioned to avoid internal obstacles or adjacent to metal parts of tank supports.
3. For metal tanks – setting the tank height is important to avoid picking up reflections off the tank bottom or objects beneath the tank.



4. The sensor should not be mounted at an angle as this gives incorrect readings. On tanks with no available flat surfaces – the use of silicone acting as a levelling compound with the non-invasive adapter can be considered. Consult factory for advice.

5. There are other methods to fix the DC3 RADAR TLM sensor to the tank. These include strapping or screwing into position on top of tank. The example below shows a DC3 RADAR TLM mounted onto a cage around a plastic tank.



CONDITIONS OF USE:

Note: this sensor operates with the following conditions:

Standard temperature range of: -25°C +50°C

The sensor is rated to IP 68. Humidity 10 – 100%.

Notes: for Condition of Use:

1. If the equipment is not used in a way intended by the manufacturer, its safety may be impaired.
2. There are no user serviceable parts. Equipment should be returned to the manufacturer in case of a malfunction.
3. The battery back can be replaced **only** by contacting DC3 for replacement part number. The sensor should be removed from an HAZLOC Zone prior to battery replacement. The lid should be unscrewed, and the battery tab carefully pulled out from the PCB connector and the new battery inserted into the enclosure battery slot and plugged back into the battery connector. Please take care not to disturb the O-ring which provides ingress (water) protection. A detailed instruction guide is available on request.
4. Please observe the all safety regulations of safe use.