



## Application Note

Rev 01

### AN50 - Installing the IMS Sensor Gateway & Tank Level Monitor

Follow the TLM setup wizard [www.ims.gtech.co.nz/tlm](http://www.ims.gtech.co.nz/tlm) to step through the process of account creation (if needed), adding & testing a new gateway (if needed) and adding and testing the Tank Level Monitor.

The physical installation of a gateway and a TLM are described separately.

#### Tools Required

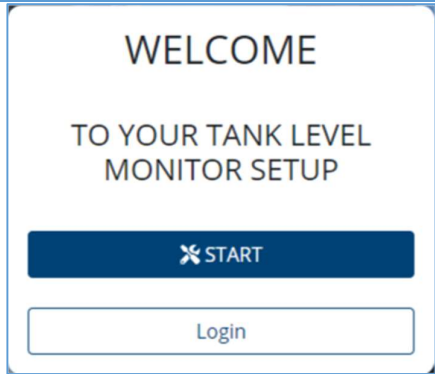
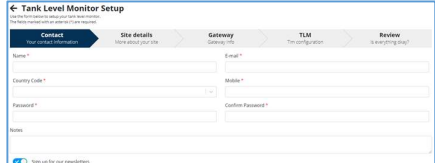
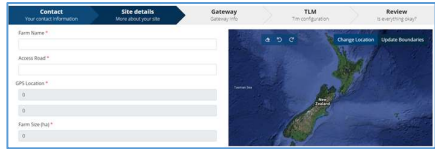
- Screw driver or electric drill/driver (pozi-drive & 8mm hex socket)
- Hole saw for sensor probe entry (30mm)
- Adjustable spanners to tighten cable gland
- General purpose cable ties or other means of tying cables back
- An internet connected phone/tablet/PC running a web browser (Google Chrome, Microsoft edge, Apple Safari or similar).


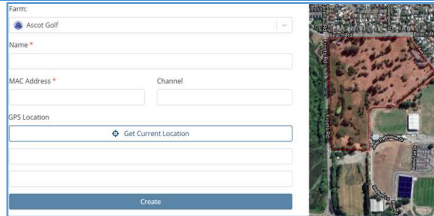

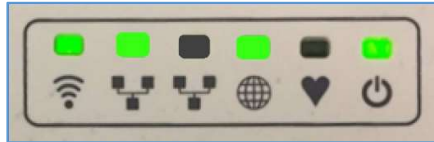
### Installing the IMS Sensor Gateway

#### Introduction

This step assumes that you have an internet connection on your premises. If you do not have an internet connection you cannot view the Tank Level Monitor information. The preferred method of connection is using an ethernet LAN patch cable to connect from the gateway to your Internet router, modem or switch hub.

If you need assistance with installing the gateway please contact Water-Insight.

Step	Process	Note
1.	- Open a web browser on your phone/tablet/PC and navigate to <a href="http://www.ims.gtech.co.nz/tlm">www.ims.gtech.co.nz/tlm</a>	
2.	- Select <b>START</b> to <b>create</b> an IMS account – if this is your first IMS device or - <b>Login</b> to your existing IMS account - Select <b>START</b> (skip to step 5)	
3.	- Enter required account details Name, e-mail, mobile phone number, password	
4.	- Enter "Farm" details Name, Access road (address) - Select Change Location and place the location on the map - Select Update Boundaries and draw the outline of the site boundaries	
5.	<b>Do you already own a gateway?</b>	

Step	Process	Note
	<p>Yes, and is already installed (go to <b>Installing the IMS TLM</b>)</p> <ul style="list-style-type: none"> <li>- There is an existing gateway for existing sensors on site</li> </ul> <p>Yes, and I need to install it (go to step 6)</p> <ul style="list-style-type: none"> <li>- You have the gateway that came packaged with your TLM, but need to install it</li> </ul> <p>No, what do I do?</p> <ul style="list-style-type: none"> <li>- A gateway is required, one must be purchased</li> </ul>	
6.	<p><b>Adding a Gateway</b></p> <ul style="list-style-type: none"> <li>- <b>Farm</b> - Choose the Farm/Site this gateway is for</li> <li>- <b>Name</b> - Give the gateway a unique identifying name</li> <li>- <b>Serial Number</b> – Printed on the gateway label</li> <li>- <b>MAC address</b> – Automatically populated based on serial number</li> <li>- <b>Channel</b> - must match the TLM (see TLM label)</li> <li>- <b>GPS Location</b> - Click on the map to identify the gateway location</li> <li>- Click <b>Create</b></li> </ul>	
7.	<p><b>Install Gateway</b></p> <p>The gateway needs to be mounted</p> <ul style="list-style-type: none"> <li>- Indoors within 10m of cable run to your Internet access point (router, modem or switch)</li> <li>- Near a mains power socket</li> <li>- Within a 5m cable run to external antenna mounting location</li> <li>- Mount the external antenna provided</li> <li>- Plug one end of the LAN patch cable supplied into the <b>WAN</b> socket on the gateway and the other end into an available socket on your internet access point</li> </ul> <p><b>WARNING</b> - If you are adding a second TLM sensor to an existing site you only need one gateway.</p>	<p><b>An available internet connection is required in order to view the Tank Level Monitor information</b></p> <p>Longer cable lengths (preferably under 30m) are acceptable to connect from the gateway to your Internet access point but are not supplied with the gateway.</p> <p>The antenna should be mounted outside, as high as possible. All radio systems work most reliably when the path between the antennae is clear “line of sight”, i.e. free from obstructions such as trees, hills and buildings.</p> <p>If you need assistance installing the gateway, please contact Water-Insight.</p>
8.	<p><b>Check Gateway Connectivity</b></p> <ul style="list-style-type: none"> <li>- Plug the mains power adaptor for the gateway into the power socket and power the gateway on</li> <li>- Select <b>Check Connectivity</b></li> <li>- Expect a <b>Connected at &lt;date&gt;&lt;time&gt;</b> message</li> <li>- This can take 3-4min</li> </ul> <p>Connection status can be confirmed from the LED behaviour</p> <ul style="list-style-type: none"> <li>- <b>Power</b> LED ON, <b>WAN</b> LED ON (2nd from left, may blink)</li> <li>- <b>Internet connection</b> - <b>Globe</b> LED Flashes (4th from left)</li> <li>- <b>Connection to IMS</b> - <b>Globe</b> LED Solid</li> </ul> <p>The <b>WiFi</b> LED (leftmost) can be on or off</p>	 <p><b>Connected at 31/07/2020 11:12</b></p> <p>Checking for connection</p> 
9.	<ul style="list-style-type: none"> <li>- Proceed to <b>Adding a TLM to IMS and Installing</b></li> </ul>	

#### Antenna mounting notes

- Antenna should be mounted outside, as high as possible in clear space.
- All radio systems work most reliably when the path between the antennae is clear “line of sight”, i.e. free from obstructions such as trees, hills and buildings.

#### Connection Troubleshooting

- Confirm the gateway is connected to a power supply and turned on.
  - Initially at least the power LED should be lit.
- Confirm the LAN patch cable is connected to the **WAN** socket of the gateway and the other end is connected to a **LAN** socket of your internet access point.
- Confirm your internet access point has an internet connection.
  - Check that another device (laptop, phone, etc) connected to your internet access point can access the internet.

If you are still unsuccessful, please contact Water-Insight [www.waterinsight.co.nz/contact-us/](http://www.waterinsight.co.nz/contact-us/)

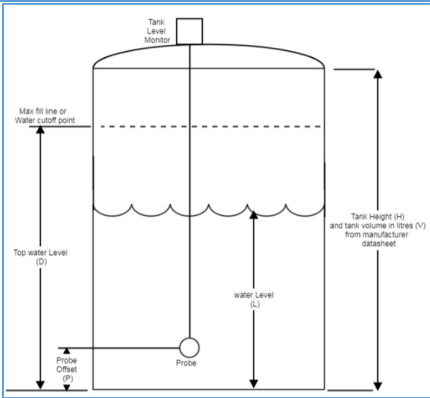
# Adding a Tank Level Monitor (TLM) to IMS and Installing

## Introduction

Your TLM must first be added to your IMS account, connection and data transmission confirmed and then installed on the tank.

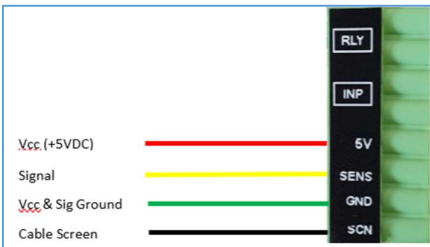
In order to accurately record the water level, the following information is required:

Item	Description
<b>Top Water Level (D)</b>	This is the effective maximum depth of water in the tank. If there is an overflow outlet, measure from this to the base of the tank. Record the measurement in mm
<b>Probe Offset (P)</b>	This is the distance from the tip of the probe to the base of the tank (when installed). Often the probe tip will be set at about 100 mm from the base of the tank to avoid sludge getting into the probe. Record the measurement in mm when fitting the probe.
<b>Tank Height (H)</b>	Take tank height and volume from the manufacturer's datasheet. Record in mm
<b>Tank Volume (V)</b>	Take tank height and volume from the manufacturer's datasheet. Record in mm



## Sensor Wiring

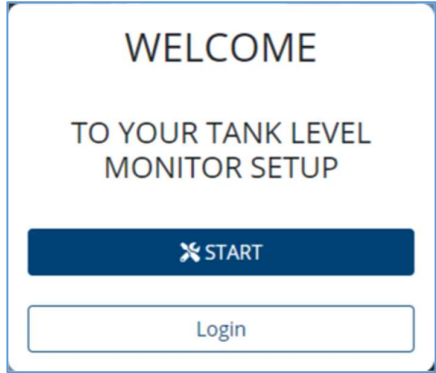

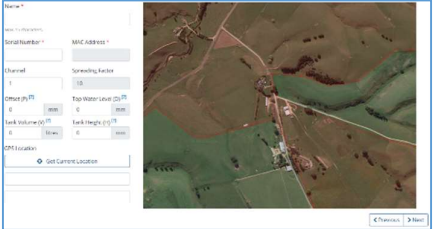
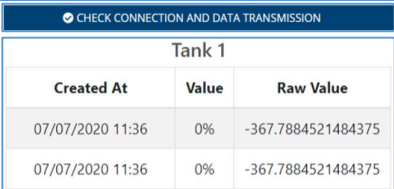
The pressure sensor is wired as shown.



## Add TLM to IMS and Check Connection to IMS Gateway

**Before installing the TLM on the tank, communication with the IMS gateway must be confirmed.**

It is required that the sensor gateway be installed first in order to confirm the TLM makes a successful connection.

Step	Process	Note												
1.	<ul style="list-style-type: none"> <li>Open a web browser on your phone/tablet/PC and navigate to <a href="http://www.ims.qtech.co.nz/tlm">www.ims.qtech.co.nz/tlm</a></li> </ul>													
2.	<ul style="list-style-type: none"> <li><b>Login</b> to your existing IMS account</li> <li>Select <b>START</b></li> </ul> <p>If you are already logged in and have just followed the gateway installation steps, skip to step 4.</p>													
3.	<p><b>Do you already own a gateway?</b></p> <p>Yes, and is already installed</p> <ul style="list-style-type: none"> <li>There is an existing gateway for existing sensors on site</li> </ul>													
4.	<p><b>Adding a TLM</b></p> <ul style="list-style-type: none"> <li><b>Name</b> – A short name for the tank being monitored</li> <li><b>Serial Number</b> – Printed on the TLM label (<b>numeric digits only</b>)</li> <li><b>MAC Address</b> – Automatically populated based on serial number</li> <li><b>Channel</b> – Printed on the TLM label</li> <li><b>Probe Offset(P) (mm)</b> – The installed sensor position relative to the bottom of the tank. Recommend 100mm</li> <li><b>Top Water Level(D) (mm)</b> – The effective maximum depth of water in the tank. If there is an overflow outlet measure from this to the base of the tank</li> <li><b>Tank Height(H) (mm)</b> – As stated in the manufacture's datasheet</li> <li><b>Tank Volume(V) (litres)</b> – As stated in the manufacture's datasheet</li> <li><b>GPS Location</b> – click on the map to identify the tank location</li> <li>Click <b>Next</b> to add the TLM</li> </ul>													
5.	<p><b>Check connection and Data Transmission</b></p> <p>Before installing the TLM on a tank, communication with the IMS gateway must be confirmed.</p> <ul style="list-style-type: none"> <li>Remove the TLM rear cover and connect the battery (white inline connector)</li> <li><b>STAT LED</b> will give 4 short flashes, then 1 flash every 4s</li> <li>Submerge the sensor probe in a bucket of water such that at least the whole probe body is covered</li> <li>Press the <b>MODE</b> button for <b>2s</b> to enter installation mode</li> <li><b>STAT LED</b> changes to flashing once per second</li> <li>Click <b>Check Connection and Data Transmission</b></li> <li>Data should appear approx. every 20s</li> </ul>	 <table border="1"> <thead> <tr> <th colspan="3">Tank 1</th> </tr> <tr> <th>Created At</th> <th>Value</th> <th>Raw Value</th> </tr> </thead> <tbody> <tr> <td>07/07/2020 11:36</td> <td>0%</td> <td>-367.7884521484375</td> </tr> <tr> <td>07/07/2020 11:36</td> <td>0%</td> <td>-367.7884521484375</td> </tr> </tbody> </table>	Tank 1			Created At	Value	Raw Value	07/07/2020 11:36	0%	-367.7884521484375	07/07/2020 11:36	0%	-367.7884521484375
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6.	<ul style="list-style-type: none"> <li>Press the <b>MODE</b> button for 2s to exit installation mode and re-install the rear cover</li> </ul>	<b>STAT LED</b> will return to 1 flash every 4s												
7.	<ul style="list-style-type: none"> <li>Proceed to <b>Installing the TLM on a Tank</b></li> </ul>													

## Connection Troubleshooting

If no data from the TLM is seen, confirm the following:


- Confirm the sensor gateway is powered, has an internet connection and is connected to IMS (Globe LED solid)
- Confirm the TLM battery is connected and is in installation mode (STAT LED long flash once per second)

If you are still unsuccessful, please contact Water-Insight [www.waterinsight.co.nz/contact-us/](http://www.waterinsight.co.nz/contact-us/)

## Installing the TLM on a Tank

The procedure for mounting the TLM on a water tank will vary somewhat according to the construction and size of the tank. General procedures are described here including checks to avoid common mistakes.

**Please ensure you follow appropriate health and safety procedures when installing the TLM.**


Step	Process	Note
1.	<ul style="list-style-type: none"> <li>- Loosen TLM bracket knobs to allow free rotation</li> <li>- In the identified location, mount the TLM bracket using the provided mounting holes</li> <li>- Remove the TLM rear cover</li> </ul>	Mounting location should give the <b>solar panel an unobstructed North facing view</b> (with the cables exiting the bottom of the case) and allow the <b>sensor probe to be lowered to the full depth of the tank.</b>
2.	<ul style="list-style-type: none"> <li>- Drill a hole (30mm) for the sensor probe to pass through</li> <li>- Loosen the cable gland in the cover plate</li> <li>- Feed the sensor probe through the hole and fix the cover plate to the tank (suitable fixings for plastic tanks provided)</li> <li>- Do not tighten the bracket knobs yet</li> </ul>	<p>For concrete tanks it is especially important that the cover plate is fixed in place to avoid the sensor cable wearing on the hole</p> <p>It is recommended to position the sensor probe away from the main outflow pipe. While this is not essential it will result in optimum system performance.</p>
3.	<ul style="list-style-type: none"> <li>- Connect the battery to the main board (white in-line battery connector)</li> </ul>	On power up the <b>STAT</b> LED will flash quickly a few times then blink once every 4s
4.	<ul style="list-style-type: none"> <li>- Press the <b>MODE</b> button for 2s to enter installation mode</li> <li>- Gradually lower the sensor probe into the tank and confirm the <b>STAT</b> LED changes to <b>rapid flashing</b></li> <li>- Lower the probe to the bottom of the tank, then raise back up by 100mm (recommended) and tighten gland to clamp cable in position</li> </ul>	<p>The <b>STAT</b> LED will flash once per second</p> <p>This mode is used to check that the probe is operating correctly. <b>STAT</b> LED behaviour changes once probe is submersed approx 0.5m and confirms sensor is functional.</p>
5.	<ul style="list-style-type: none"> <li>- If an internet connection is available, check the sensor readings are updating in IMS.</li> <li>- Readings should be updating every 20s</li> </ul>	See <b>Verifying TLM Operation in IMS</b>
6.	<ul style="list-style-type: none"> <li>- Press <b>MODE</b> button for 2s to exit installation mode.</li> <li>- Reinstall the rear cover, tilt solar panel to approx. 45°, align the antenna vertically and tighten the side knobs to fix in place</li> </ul> <p><b>The unit is now ready for operation in IMS</b></p> 	<p>Once exit install mode <b>STAT</b> LED returns to flashing every 4s</p> <p>Ensure all cables are secured to prevent movement in strong wind</p>

## Verifying TLM operation in IMS

This section is applicable when editing an existing TLM, confirming TLM operation once installed on a tank or at any other time when not following the TLM setup workflow.

Once installed the TLM automatically samples the probe transducer (15min intervals), calculates the corresponding depth and transmits the result to the IMS gateway.

These readings are displayed automatically on the dashboard in IMS. To verify operation in IMS follow these steps:

Step	Process	Note
1.	<ul style="list-style-type: none"> <li>- Sign in to IMS if you have not already. You can do this on your smartphone if you have cellular coverage at the tank site or sign in at your desktop.</li> <li>- Click the <b>settings icon</b> (cog) in the top right corner of your farm card</li> <li>- A menu will appear</li> <li>- Click <b>Manage Assets</b></li> <li>- Then click <b>Sensors</b></li> <li>- The Sensors page will be displayed along with a list of existing sensors on your site</li> </ul>	

Step	Process	Note
2.	<ul style="list-style-type: none"> <li>Click the Edit icon (pencil) to the right of the tank name.</li> </ul>	
3.	<ul style="list-style-type: none"> <li>Fill in the tank details</li> <li><b>Offset (mm)</b> – The installed sensor position relative to the bottom of the tank. Recommend 100mm</li> <li><b>Top Water Level (mm)</b> - The height at which the tank is considered full, measured from the bottom of the tank</li> <li><b>Tank Volume (litres)</b> – The volume stated by the manufacturer</li> <li><b>Tank Height (mm)</b> – The height stated by the manufacturer (for the stated volume)</li> <li>Select <b>Update</b></li> </ul>	
4.	<ul style="list-style-type: none"> <li>Click the <b>status icon</b> to the left of the tank name.</li> <li>If the icon is coloured green then data is being received from the tank</li> <li>If the icon is coloured red then there is a communications issue, contact Water-Insight for support</li> </ul>	
5.	<ul style="list-style-type: none"> <li>By clicking on the icon the three most recent data transmissions are displayed. Check that the value is consistent with the expected depth of water.</li> </ul> <p><b>When TLM is installed on the tank</b></p> <ul style="list-style-type: none"> <li>Measure the <b>current water level</b> from the bottom of the tank</li> <li>Subtract the installed <b>sensor position offset</b></li> <li>Confirm this value is consistent with the displayed <b>Raw Value</b></li> </ul>	
6.	<ul style="list-style-type: none"> <li>Click the <b>Close</b> button</li> <li>click the <b>Home</b> icon to return to the top level Farm card</li> <li>Click the <b>Dashboard</b> icon to display a summary view of the tank</li> </ul>	<p>Home icon: </p> <p>Dashboard icon: </p>

For more information email [support@waterinsight.co.nz](mailto:support@waterinsight.co.nz)