



# Operating Instructions

**TEK – 608A**

**Broadband Modem with Ultrasonic Sensor**



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# 1 Introduction

The TEK-608A is a Broadband modem, allowing to connect up to 4 Ultrasonic Tank Monitoring Sensors and transmit the data to the Timitoo Tank Monitoring Website.

In this online application the level of the tanks can be read in a diagram, showing the consumption over time, as well as the current level and remaining days of supply.

The tanks can also be set up as tanks that are filling up, i.e. Waste liquid tanks. Individual alarms can be set to notify of tanks that are becoming empty, or in case of waste tanks, becoming full.

# 2 Contents of Package



Transmitter Sensor



Broadband Modem



Adapter Kit



RJ45 Network Cable



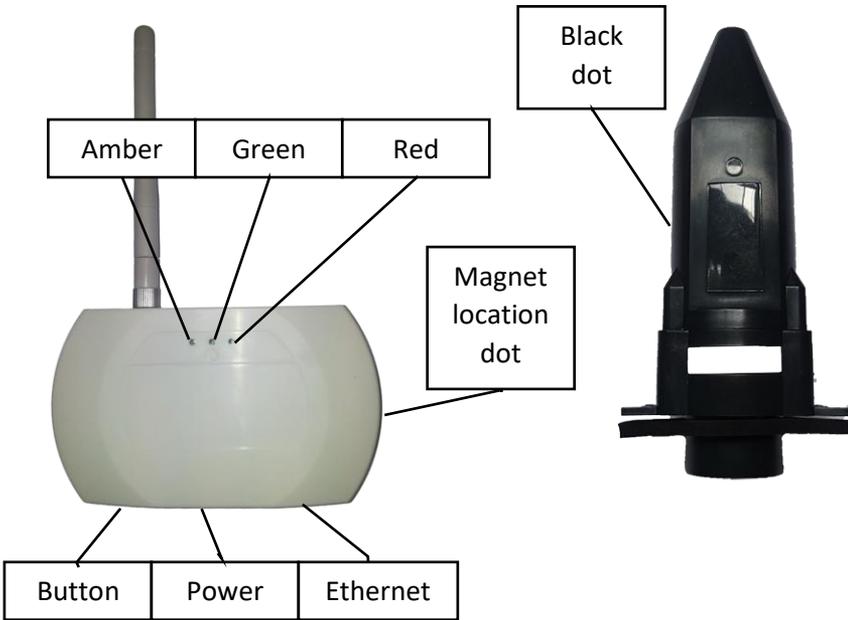
Power Supply



Weather Seal

### 3 Modem User Interface

The TEK-608A has a simple user interface of 3 LEDs (Yellow, Green and Red) and a momentary push button.



The table below describes the functions and a brief summary of the LED lights of the TEK-608A broadband modem.

	LED Color	Primary Function	Secondary Function
	Amber	Power LED. On solid when Power is on	
	Green	RF Data LED. Flashes when RF data packet is received.	During firmware download process it will flash rapidly.
	Red	Error LED Display Error Flash Codes: 1: No RF reading received for 6 hours 2: MAC Address/IP link failed 3: No valid IP 4: Unable to connect to Server 5: Server did not respond correctly	During boot loading process indicates flash memory programming.

		6: File download failed 7: RF self-test failed	
	Amber + Green	LED's On solid indicate unit is attempting to connect to the server.	Amber + Green double flash to indicate a successful connection to the server.
	Amber + Green + Red	All three LED's on solid indicate the unit is powering up. If this does not clear, please contact support.	Indicates a sensor is being activated (and matched if sensor matching is enabled).

### 3 Installing the Broadband Modem

Please unpack the broadband modem from the packaging and screw the antenna onto the unit, if it is not already pre-installed.



The Ethernet port (right hand of the picture) must be connected to your internet high speed connection router. No additional bridges or routers are required. The modem should have “line of sight” to the tank sensor transmitter and should not exceed 250ft of distance.

Please note that the distance will decrease with obstacles such as walls or glass between the modem and the transmitter.

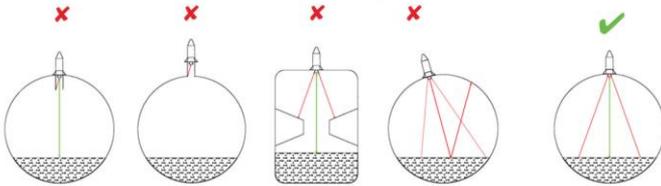
The Ethernet-cable delivered is approximately 1m/3ft long, but a longer cable of up to 100m/328ft can be used.

The left plug in the picture above is for the power supply, which is also delivered in the packaging.

Upon correct installation and activation the green LED light in the corner of the Ethernet plug will blink. If this light remains off, the connection to the Router is faulty.

## 4 Preparing the Tank

- a. To avoid errors, the Tank Gauge Transmitter must sit in a vertical position on top of the tank and have a direct perpendicular line of sight to the liquid level in the tank, through the bottom ultrasonic cone, without any interference from i.e. window configurations or tank braces.
- b. Install the supplied metal adapter into the pre-drilled 2" NPT opening on the top of the tank. Apply pipe sealant on the adapter thread and tighten appropriately. For basement tanks, temporarily place a rag/cover over the adapter to minimize fuel odors until transmitter is synchronized. Tanks with 1½ and 1¼ " NPT openings or European style double-wall tanks require adapters (see parts sold separately). Do not use an extension pipe when mounting the adapter; this can cause inaccurate measurement and malfunction.
- c. **Installation Help:**  
Avoid tanks with braces, as it can reflect the ultrasound and cause wrong readings.



## 4 Define Tank Height

Accurately measure the height of your tank from the liquid outlet at the bottom of your tank to the bottom of the ultrasonic Sensor Transmitter. The sensor measures the distance from the sensor to the level of the surface of the liquid within the tank. Any setting for the shape of the tank, its content and the volume of the tank are entered into the online setup of the Tank Monitoring website:

<https://online.tankmonitoring.net>



## 5 Activating the Sensor

- Remove the sensor from packaging
- Recycle the power on the modem and it will enter the “Learn mode” for two minutes. Hold the black dots of the modem and the black dot on the sensor together.
- All 3 LED’s will flash while the transmitter is matching to the receiver.
- Once the matching process is complete the green LED will light up for 5 seconds and will no longer be flashing.
- The unit will not immediately try to connect to the server and then revert to the listen mode.

Also consult the online video:



## 6 Fitting the Sensor

**For tanks with pre-drilled 32mm holes:**

- Remove cap from pre-drilled hole and insert transmitter, ensuring the weather seal is securely in place and that the sensor sits vertically.
- Tighten onto the tank with the supplied 2 stainless steel self-tapping screws provided. **Do not use longer screws or over tighten.**

**For tanks with a 2", 1½" or 1¼" BSP/NPT gauge aperture (60mm/48mm/42mm):**

- Unscrew any caps from hole; fit adapter provided by screwing into gauge socket.
- Fit Sensor to adapter on the tank; ensure weather seal is in place.
- Tighten on the tank using the screws supplied. **Do not over tighten.**  
**NOTE: Mounting Adapter supplied must only be used.**

## 7 Interacting with the Modem via a Browser

Once the TEK-608A Broadband modem has been connected to the power supply and to the networks router, the System Dashboard page can be viewed in a web-browser.

In order to connect to the modem use the following URL:

[HTTP://TEK608-XXXX](http://TEK608-XXXX)

The XXXX must be replaced with the last 4 digits of the modems serial number.

The sample to the right would need [HTTP://TEK608-1897](http://TEK608-1897) as hostname to be typed into the browser.



Please note that the hostname address can only be used with a Windows-based PC or a MAC PC. Android or Apple Tablets/Smartphones do not have a native way of dynamically discovering the hostname. In these cases the IP-address must be discovered from the router.

### System Dashboard

System Overview

System Dashboard

Setup Wizard

<b>Modem Status:</b>	<span style="color: green;">●</span>	OK
<b>Sensor 1:</b>	<span style="color: red;">●</span>	No Sensor Connected
<b>Sensor 2:</b>	<span style="color: red;">●</span>	No Sensor Connected
<b>Sensor 3:</b>	<span style="color: red;">●</span>	No Sensor Connected
<b>Sensor 4:</b>	<span style="color: red;">●</span>	No Sensor Connected
<b>System RTC:</b>		1/1/15 12:02
<b>Serial Num:</b>		0000000049
<b>Firmware:</b>		1.0

Welcome to the TEK608A Broadband gateway

The dashboard shows the status of the connection to the internet server, as well as which sensors that are connected. Each sensor that was matched in the previous process shows up named "Sensor 1" to "Sensor 4" automatically.

### Setup Wizard

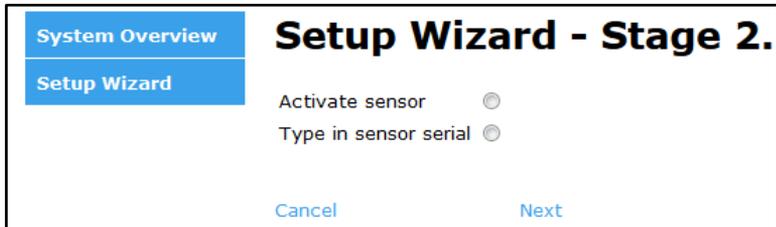


The screenshot shows the 'Setup Wizard - Stage 1' interface. On the left, there are two blue navigation buttons: 'System Overview' and 'Setup Wizard'. The main heading is 'Setup Wizard - Stage'. Below the heading, a text prompt says 'Please select the sensor and click "Next"'. A table with three columns: 'Sensor', 'Nickname', and 'Select' is displayed. The 'Sensor' column contains numbers 1 through 4. The 'Nickname' column contains 'Sensor 1' through 'Sensor 4'. The 'Select' column contains radio buttons, with the first one (for Sensor 1) being selected. At the bottom, there are 'Cancel' and 'Next' buttons.

Sensor	Nickname	Select
1	Sensor 1	<input checked="" type="radio"/>
2	Sensor 2	<input type="radio"/>
3	Sensor 3	<input type="radio"/>
4	Sensor 4	<input type="radio"/>

On the Setup Wizard Page, the name of the sensor transmitter can be renamed and a new more descriptive name can be provided. The name is stored once the "Next" button is at the bottom of the page is selected.

### Setup Wizard Stage 2



The screenshot shows the 'Setup Wizard - Stage 2' interface. On the left, there are two blue navigation buttons: 'System Overview' and 'Setup Wizard'. The main heading is 'Setup Wizard - Stage 2.'. Below the heading, there are two options: 'Activate sensor' and 'Type in sensor serial', each with an unselected radio button. At the bottom, there are 'Cancel' and 'Next' buttons.

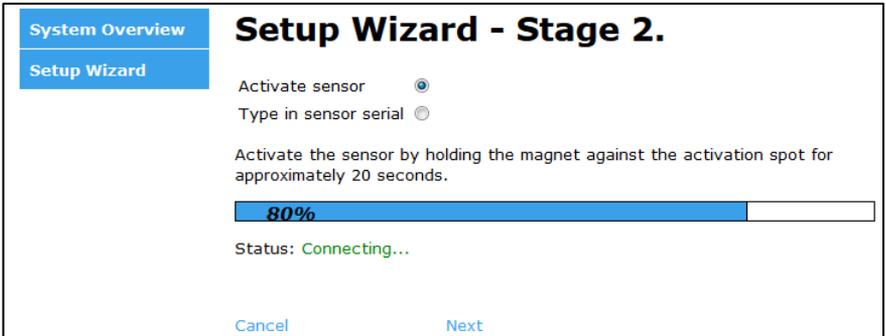
If the transmitter sensor serial number is already known and is already active, the number may be typed in using the “Type in sensor serial” option.

It is however more typical to use the “Activate Sensor” option.

When the “Activate Sensor” option is selected and the “Next” button is clicked, the Broadband modem is set to the “Learn Mode” and the screen below is shown.

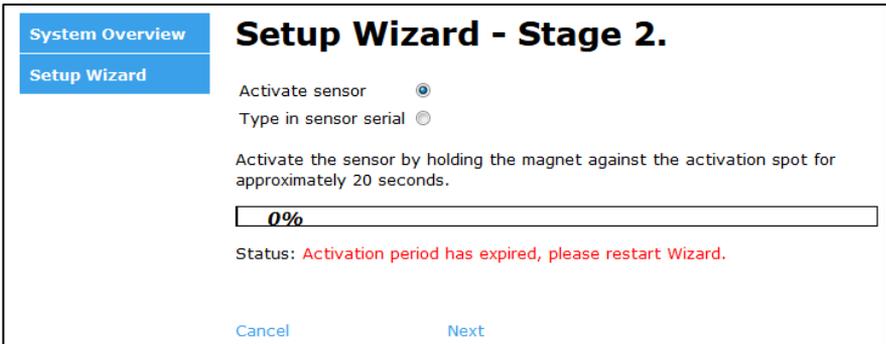
A magnet needs to be held to the Transmitter Sensor (at the black dot), or the sensor is held to the black dot of the Broadband Modem.

Follow the instructions on the screen and hold the sensor next to the broadband modem.



The screenshot shows the 'Setup Wizard - Stage 2' interface. On the left, there are two menu items: 'System Overview' and 'Setup Wizard', with 'Setup Wizard' selected. The main content area has two radio buttons: 'Activate sensor' (selected) and 'Type in sensor serial'. Below the buttons, there is a text instruction: 'Activate the sensor by holding the magnet against the activation spot for approximately 20 seconds.' A progress bar is shown with '80%' in the center. Below the bar, the status is 'Connecting...'. At the bottom, there are 'Cancel' and 'Next' buttons.

If the process is not started within 2 minutes, the activation period will expire and the process must be restarted.



The screenshot shows the 'Setup Wizard - Stage 2' interface. On the left, there are two menu items: 'System Overview' and 'Setup Wizard', with 'Setup Wizard' selected. The main content area has two radio buttons: 'Activate sensor' (selected) and 'Type in sensor serial'. Below the buttons, there is a text instruction: 'Activate the sensor by holding the magnet against the activation spot for approximately 20 seconds.' A progress bar is shown with '0%' in the center. Below the bar, the status is 'Activation period has expired, please restart Wizard.' At the bottom, there are 'Cancel' and 'Next' buttons.

Once successfully paired the page will show a registration form for the details of the tank. The name of the sensor and the serial number will be pre-filled.

<b>System Overview</b>	Please enter your details here and press Save.
<b>Setup Wizard</b>	
<b>FirstName:</b>	<input type="text"/>
<b>LastName:</b>	<input type="text"/>
<b>Address 1:</b>	<input type="text"/>
<b>Address 2:</b>	<input type="text"/>
<b>City:</b>	<input type="text"/>
<b>County:</b>	<input type="text"/>
<b>Modem Serial:</b>	<input type="text" value="0000000049"/>
<b>Select Sensor</b>	<input type="text" value="Sensor 1"/>
<b>Tank Shape:</b>	<input checked="" type="radio"/> Rectangle <input type="radio"/> Horizontal Oval/Cylindrical <input type="radio"/> Horizontal Vertical
<b>Tank Height:</b>	<input type="text" value="100"/> cm
<b>Tank Width:</b>	<input type="text" value="100"/> cm
<b>Tank Length:</b>	<input type="text" value="100"/> cm
<b>Outlet Height:</b>	<input type="text" value="8"/> cm
<b>Safe Capacity:</b>	<input type="text" value="95"/> % <input type="button" value="Save Settings"/>

The transmitter sensor is now matched with the Broadband modem. The screen will not be showing that data is being received from the newly matched sensor:

<b>System Overview</b>	<h2>System Dashboard</h2>
<b>Setup Wizard</b>	
<b>Modem Status:</b>	<span style="color: green;">●</span> OK
<b>Sensor 1:</b>	<span style="color: green;">●</span> OK
<b>Sensor 2:</b>	<span style="color: red;">●</span> No Sensor Connected
<b>Sensor 3:</b>	<span style="color: red;">●</span> No Sensor Connected
<b>Sensor 4:</b>	<span style="color: red;">●</span> No Sensor Connected
<b>System RTC:</b>	1/1/15 12:12
<b>Serial Num:</b>	0000000049
<b>Firmware:</b>	1.0
Welcome to the TEK608A Broadband gateway	

Once the transmitters are matched the data is received and forwarded on to the online monitoring. Further setup is done at the online monitoring website.

## 9 Online Setup

Once the system is up and running the tanks must be registered with the online monitoring service. Please contact your seller about the different options on how to activate the system for your use.

## 10 Troubleshooting

Problems typically only arise with the modem and the connectivity of the sensors, or the connectivity to the server.

The red LED indicator on the Broadband modem provides the error code, by the flashing sequence. By observing the red LED light, please note that there is a longer break. From this point forward the amount of flashes should be counted until a longer break is observed again. The number counted, represents the error code of the issue described below:

### 1: No RF reading received for 6 hours

The Broadband modem does not receive any signal from the sensor transmitter. This is usually when there is no direct line of sight, an unusual obstacle, or the sensor transmitter was not properly matched.

Please refer to the matching sequence above in order to match the sensor again and observe the Dashboard to verify the Sensor Transmitter sending data.

The sensor transmitter might also have reached the end of its battery life. Please refer to the section below on how to exchange the battery in the sensor transmitter.

### 2: MAC Address/IP link failed

The system could not receive an IP Address, or there is a conflict with the MAC Address of the Broadband modem. Check with your Router settings and verify the DHCP settings and DHCP Client on the network.

### 3: No valid IP

The broadband modem did not receive a valid IP Address through the DHCP service, or the hardcoded IP Address is invalid. Please check with your network router what the network address should be, or if the device is blocked.

#### 4: Unable to connect to Server

The system cannot connect to the server. The Broadband modem might be blocked from external Internet access or the Router is down and cannot receive any outside addresses.

The routers DHCP service might not be up to date. Try to restart the router, check internet access via a browser and restart the broadband modem.

#### 5: Server did not respond correctly

This message should not occur in normal operation. There might be however a network issue preventing the remote servers reply to make it back to the Broadband modem. Please contact customer service in this case.

#### 6: File download failed

This error message can only occur when the system is remotely updated. This requires maintenance access which is not done by the end-user.

#### 7: RF self-test failed

When this error occurs customer service needs to check the unit, as this indicates a hardware issue.

#### Low Battery (indicated in online application)

1. Remove transmitter from the tank and take it into a clean, dry environment.

2. The battery can be accessed by removing 4 self-tapping screws from the base of the unit.

3. Remove the old battery noting the orientation (+ mark facing upwards) and replace with a new battery (3V-CR2450)

4. Re-assemble, ensuring the O-Ring is undamaged and secured in position.

5. Place the transmitter on the tank.

No need to re-match the sensors.



## 11 Specifications

<b>Tank depth measurement:</b>	Depth: 4ins./0.1m – 10 ft. (Use on tanks vented to the atmosphere)
<b>Battery / battery life:</b>	3-volt CR2450 lithium cell / up to 10 years.
<b>Dimensions (modem): Indoor use only</b>	120 x 25 x 72 mm 4.7 x 1 x 2.8 inch
<b>Max and min operating temp. (transmitter):</b>	Operating temperature range: +14°F to +140°F Operating humidity: 0-100% Sealed airtight unit made from PP3317 UV stabilized
<b>Hole size for tank fitting:</b>	2 ins. Use adapters for tanks with pre-drilled 2", 1½" or 1¼" BSP/NPT gauge aperture.

## 11 Warning

It is the user's responsibility to avoid exposing the product to aggressive substances e.g. liquids or gases that may attack metals, or solvents that may affect polymeric materials.

- The broadband modem is for indoor use only (the sensor is OK for outdoor use).
- The broadband modem is a sealed unit; do not attempt to open it.

- Periodically check that the unit is intact and securely fastened to the tank.
- Do not attempt to repair the product.
- Clean only with a damp cloth.
- Do not replace batteries in a potentially explosive atmosphere.
- Do not discard batteries in a pressurized container.



## Warranty Registration

Please register your product for warranty at:

<https://www.tankmonitoring.net/warranty-registration.html>



## Support

### **Timitoo Tank Monitoring Solutions**

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