Eco Water Monitor
User Manual

Contents

1. Product Information

1.1 Definitions/Glossary

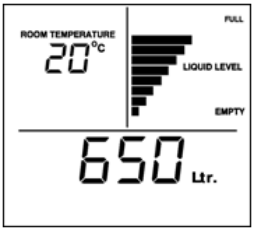
Ullage	The distance from the sensor to the surface of the liquid in the tank.
Outlet	The connection point from which water is drawn from your tank. It is typically located 8cm/3ins. above the bottom of your tank in one of the sidewalls. Water below the outlet level is not usable.
Offset	The height at which the Eco-Water sensor is located or fixed above the top surface of the tank
Vent	A small chimney-like feature on the top of your tank. It allows the air within the tank to be released when the tank is being filled.
Brim-full Tank Capacity	The maximum amount of liquid that can fit in the tank.
Usable capacity	The nominal capacity of the tank minus the amount of water that is below the outlet or discharge point. If the water level falls to the level of the outlet, your tank is effectively empty.
Matching	The process of uniquely matching the sensor and the monitor.
RF	Radio Frequency - the tank level measurements are conveyed wirelessly to the monitor from the sensor using RF transmissions.
SETUP mode	SETUP mode is used to configure the monitor for your water tank.
LEARN mode	LEARN mode is used to match the sensor with the monitor.
NORMAL mode	NORMAL mode is for day-to-day use of your monitor - this mode displays tank level as a remaining liquid volume, a % of tank capacity or as the liquid height in the tank.

1.2 Introduction

Thank you for selecting the **Tekelek Eco-Water**. This water tank level monitoring system allows today's environmentally conscious consumer to monitor their water tank level in real time, informing about the remaining volume of water in the tank, so further usage can be planned

The **Tekelek Eco-Water** product from Tekelek Europe Ltd consists of the **Tekelek Eco-Water Sensor** and the **Tekelek Eco-Water Monitor**. The Tekelek Eco-Water Sensor is easily installed on your water storage tank to measure the level of water. It transmits the water level information wirelessly to the Tekelek Eco-Water Monitor which may be located in a convenient location inside your home.

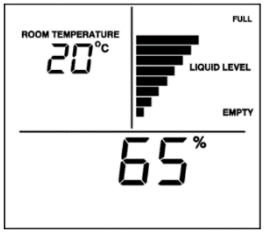
The Tekelek Eco-Water Sensor uses ultrasonic technology to measure the distance from the Sensor on top of the tank to the surface of the liquid in your water tank. As the amount of water in your tank decreases, the distance measured increases accordingly. The distance information or 'ullage' is transmitted wirelessly to the Tekelek Eco-Water Monitor.



Volume and %

Once programmed with information about your water tank's shape and size, and the mounting location of the **Tekelek Eco-Water Monitor** above the tank, the Tekelek Eco-Water Monitor calculates and displays the amount of water remaining in your tank in litres or Metric or US units gallons* as a percentage of the tank capacity.

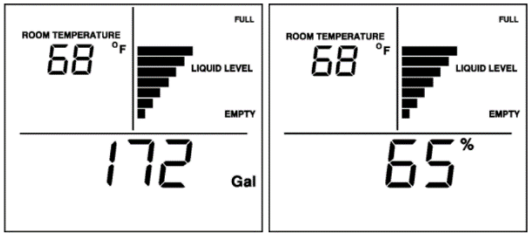
**Tank capacity and remaining water volume are displayed in Gallons in the USA, and in Litres else-where.*



Water Height

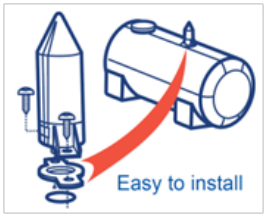
As the Tekelek Eco-Water Sensor continuously measures and transmits the water level, the Tekelek Eco-Water Monitor conveniently presents the height of the water level in your tank in cm or inches**.

*** Tank dimensions and water level height are displayed in inches in the USA, and in cm elsewhere.*



Installation

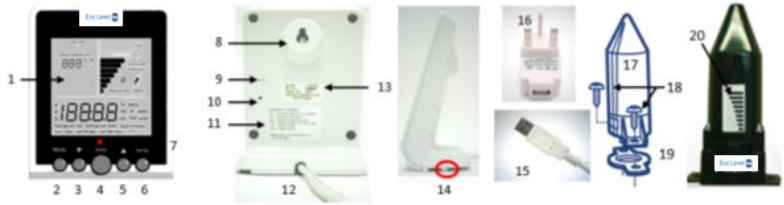
The Tekelek Eco-Water Sensor fits into 32mm hole found on many water storage tanks and is suitable for use with almost any plastic or metal tank up to 3m tall, it may also be easily installed on tanks with pre-threaded holes by using the supplied multi-thread mounting adaptor which has threads compatible with 2", 1.5", and 1.25" NPT/BSP threaded apertures. If desired it may also be mounted on a fixture above the storage tank.



2. Features and Functions

2.1 Features

1	LCD Display	11	Error code information
2	MODE key	12	Power/data cable
3	DOWN key	13	Manufacturing information
4	ENTER key	14	Location feature (See Installation Guide)
5	UP key	15	USB connector
6	SETUP key	16	Mains power plug
7	Alarm Red LED	17	Tekelek Eco Water Sensor
8	Screw mount hanger	18	Self-tapping screws x 2
9	Beeper aperture	19	Weather seal (Gasket)
10	RESET button access	20	Tekelek Eco Water Sensor Water level display



2.2 Functions

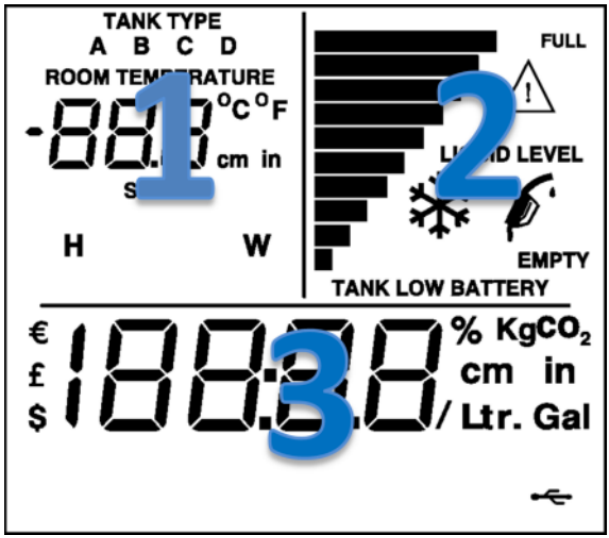
MODE	When in NORMAL mode press **MODE** to move between the current and the historical information screens.
△	Press **UP** to move between screens when in NORMAL mode. Use it to increase a setting when in SETUP mode.
ENTER	The **ENTER** key is used only in SETUP mode. It is used to save the settings shown on the display and then move automatically to the next SETUP number.
▽	Press **DOWN** to move between screens when in NORMAL mode. Use it to decrease a setting when in SETUP mode.
SETUP	Press **SETUP** for 3 seconds to enter SETUP. When in **SETUP**, press SETUP to exit from SETUP mode.
▽+△	When in NORMAL mode, by pressing together **UP** and **DOWN** and releasing, the screen will flash the current tank configuration for 20 seconds. Press any key to return to NORMAL mode.

2.3 LED

The red light above the ENTER key flashes when there is an Alarm condition (see 3. Alarms) and on receiving data from the Tekelek Sensor**.**

2.4 Display – Symbols & Indicators

The Tekelek Eco Water Monitor contains a display that conveys a variety of information during normal use and during its initial setup and configuration for use with your water tank. The display contains three sections (1, 2, & 3) as indicated in the diagram.



1 - Used for SETUP and displays SETUP number, and in normal use displays room temperature.
2 - Tank information including a visual bar-graph of the water level in the tank.
3 - Information about the remaining usable water in litres/Gals or as a %, the 'Days to Empty', and the average and cumulative use of water in litres/Gals. Time is also displayed here.

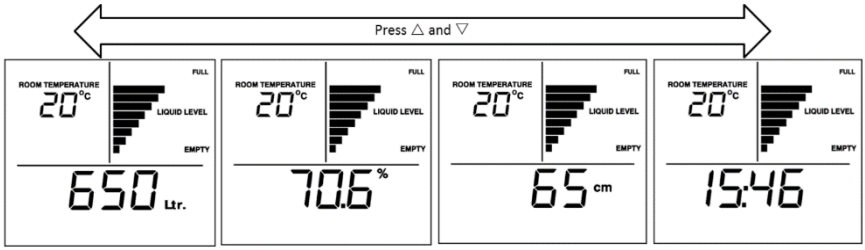
Tekelek Eco Water Monitor and Sensor Display Symbol reference		
1	**TANK TYPE**	Indicates the tank type being selected.
	A,B,C	A, B, C are types of tank shapes. (See Installation Guide)
	ROOM TEMPERATURE	The value displayed is the room temperature.
	20	Numeric display - shows the room temperature in normal mode e.g. 20.
	3	Shows the SETUP mode number when in SETUP mode, e.g. SETUP mode 3
	˚C & ˚F	The value displayed is temperature in degrees Celsius/Fahrenheit.
	cm\inch	The value displayed is in centimetres/inches.
	SETUP	SETUP mode is active.

2	**H**	The value displayed is the tank height.
	W	The value displayed is the tank width.
		Monitor Display: Bar graph indicator of liquid level - each bar represents 10% of tank height. .
		Tekelek Eco Water Sensor Display (If equipped with a display): Tanks 1m/3.3ft. in height or greater - each bar represents 1/10th of the top 1m/3.3ft of the tank. Tanks less than 1m/3.3ft. in height - each bar represents 1/10th of 1m/3.3ft
	Full	Indicates the 'Full' level of the bar graph indicator.
	Liquid Level	Indicates the bar graph is showing the liquid level.
	EMPTY	Indicates the 'Empty' level of the bar graph indicator.
	BUND ALARM	When flashing, there has been a leak into the 'Bund' (double skinned tanks). The 10 bars and the RED LED will also be flashing at the same time.
	TANK LOW BATTERY	The sensor battery needs to be changed.
		Flashing "near empty" symbol in the monitor – The remaining liquid level in the tank is at 6cm/2.36inches or below of the tank outlet height. Flashing "near empty" symbol in the sensor – The remaining liquid level in the tank is at 10% or below the tank height.
		Flashing – There is a problem with the RF signal from the sensor. Refer to "Troubleshooting" for more details. Static – Attempt to change the monitor system of measurement (SETUP mode 3) with the risk of losing saved data.
		The temperature of the sensor is measured at –8°C or below — the information accuracy may be affected.
3	**%**	The value displayed is the % of usable water remaining in the tank.
	cm\inches	The value displayed is in centimetres/inches
	Ltr\Gal	The value displayed is in litres/gallons.
		USB data activity.
	675	Numeric display – used to show numeric values and the time.

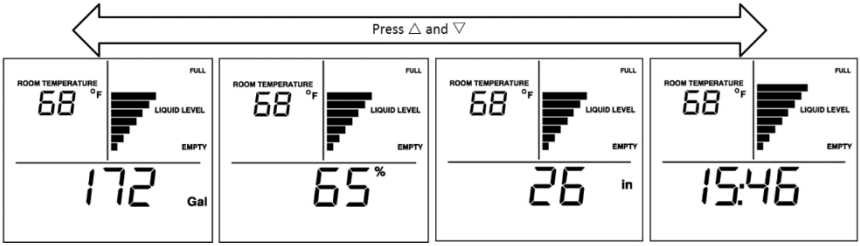
2.5 Display Screens

Information screens: Change between 'Ltr or Gal' (depending on units setting), %, Liquid height and Clock display screens using the r and s keys.

Units in EU (Metric):



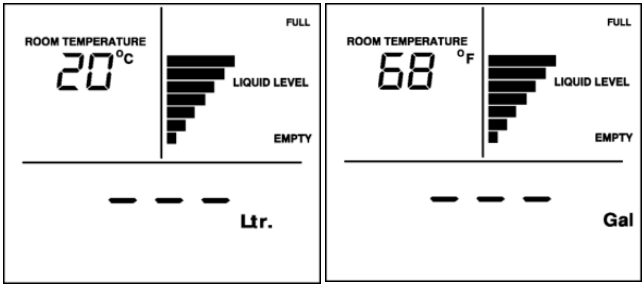
Units in USA (United States Customary System):



Eco-Water Monitor display

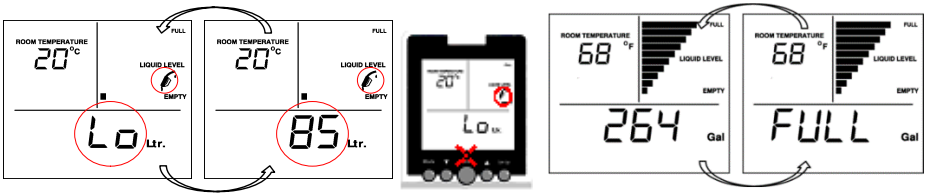
During use the Tekelek Eco Water sensor takes a level measurement twice a minute and sends measurement information to the Eco Water monitor every 30 minutes. At the Eco Water monitor the level information is presented as the remaining volume or as a % of the tank capacity or as the height of the liquid in the tank. The Eco Water sensor continuously checks each new measurement against previous measurements and if it detects a significant step change in the level measurement it will increase the rate at which it sends new measurements to the Eco Water monitor to faster than once a second.

The Eco Water monitor checks that each measurement it receives is lower than tank height plus the offset and higher than the sensor blind zone, in order to help ensure that the measurements presented are valid. If this requirement is not met, it may temporarily display '---' to indicate that is uncertain about the validity of the measurement information.



3. Alarms

Low Level Indication – When the tank level falls to <6cm/2.36inches of the bottom of the tank the 'near-empty' symbol will flash (see diagram above). When the tank level is such that there is below 10% of the usable volume of liquid left in the tank, the screen alternates between showing the remaining volume in Ltr. / Gal. (or % or liquid height) and 'Lo'.
High Level Indication – When the tank rises to within 12cm/4.7 inches OR when the tank level is such that there is above 90% of the usable volume of the liquid in the tank, the screen alternates between showing the volume in Ltr/Gal (or % of liquid height) and 'Full'. The Red LED will also flash under these conditions.
Alarm Indication – If the Alarm indication is set to ON in Setup mode 10 (the default is OFF) then an audible alarm indication is provided when the 'High Level Indication' conditions describe above are fulfilled by the monitor beeping 5 times per hour at the 'top of the hour', repeating every hour, i.e. 10:00,11:00,12:00,13:00,14:00...



4. Technical Specifications

4.1 Tank Size

Min. Depth: 0.5m / 20 inch
Max. Depth: 3m / 118 inch
Max. Tank Volume: 19999Litres / 5,200Gallons

4.2 Displays

Multi-function LCD display including:
· 10 bar-graph level indication on both Tekelek Eco-Water Monitor and Sensor*
(Note: The graph displayed on the sensor only represents the top 1M of the tank contents)
· Display control with five control buttons
· Red LED for high tank level indication

4.3 Audible Alarm

· Audible alarm sounds when the tank is >90% full or the level is within 12cm / 4.7" of the top of the tank.

4.4 Max communication distance

Typically, up to 500m/1640feet in normal 'line of sight' conditions

4.5 Wireless Communications

915MHz FM transmission (FCC part 15)
433MHz FM transmission (EN300-220)

4.6 Dimensions (Sensor)

140mm x 70mm x 40mm / 5.51'' x 2.75'' x 1.57''

4.7 Dimensions (Monitor)

120mm x 90mm x 50mm / 4.72'' x 3.54'' x 1.96''

4.8 Power Supply

- Tekelek Eco-Water Sensor—3V LiMn cell, CR2450 or CR2430 (Depending on sensor)
- Tekelek Eco-Water Monitor:
    - Receiver: 5V DC (40mA)
    - Backup battery: 3V LiMn cell, CR2450 or CR2430

4.9 Mains Power Supply (incl.) for Tekelek Eco-Water Monitor

North America: 110V +/- 10% 60Hz, meets UL60950-1
Other: 150V-240V, 50-60 Hz, meets EN60950-1

4.10 Battery Life

Tekelek Eco-Water Sensor: 5 years (estimated life)
Tekelek Eco-Water Monitor – Receiver memory back-up battery: 3yr if device is not plugged in**

4.11 Max and Min Operation (Sensor)

Operating temperature range: -20°C/-4°F to +60°C/140°F
Operating Humidity: 15 - 95% non-condensing

4.12 Max and Min Operation (Monitor)

Operating temperature range: 0°C/32°F to +50°C/122°F
Operating Humidity: 0 - 95% non-condensing

4.13 Hole size for fitting sensor:

32mm/1.25inch diameter

** The Tekelek Eco Level Sensor and Tekelek Eco-Water Monitor bar-graph displays may differ (see Display symbol reference table).*
*** This device contains a small battery to keep time during power cuts. If the device is left unpowered for an extended period, then the battery will deplete.*

5. Tekelek sensor battery change

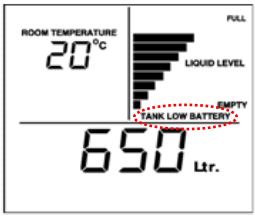
If the battery in the Tekelek Sensor needs to be changed the display will provide advance warning by showing the 'TANK LOW BATTERY' text below the bar-graph.

- Remove the Tekelek Sensor from the tank and move to a safe location
- The battery can be accessed by removing the 4 self-tapping screws from the base of the unit.
- Remove the old battery noting the orientation ('+' mark facing outwards) and replace it with a new battery, 3V.
- Re-assemble, ensuring the O-ring is undamaged and secured in position.
- Re-locate the sensor on the tank.

There is no need to re-synchronise the sensor with the monitor when the sensor battery is changed.

Disposal

The crossed-out dustbin on the packaging indicates that this product and its battery shall not be treated as household waste. Proper disposal will help prevent potentially negative consequences for the environment and human health. For more detailed information about recycling of this product or battery, please contact your local recycling centre or the shop where you purchased the product.

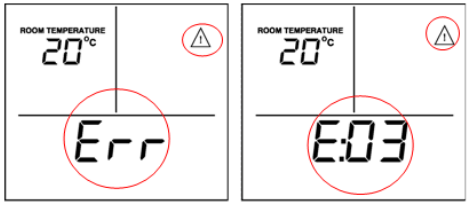


6. General Product safety, care and user guide lines

- To ensure that you use your product correctly and safely, please read the warnings, safety precautions and notes below regarding use of and caring for your Tekelek Eco-Water Monitor and Sensor.
- Do not use this product where the use of radio frequency products can cause malfunction in the control devices of other equipment i.e. hospitals, aircraft, etc.
- Do not subject the product to excessive force, shock, dust, temperature or humidity.
- The LCD panel behind the display lens is made of glass, and may break if the unit is dropped, impacted or subjected to shock.
- Take special care when handling a damaged display, as the liquid crystals can be harmful to your health.
- Keep the product away from heat sources i.e. radiators, stoves, heaters, etc.
- Do not use the Tekelek Eco-Water Monitor in or near water or in high moisture areas i.e. Bathroom
- Do not tamper with the Tekelek Eco-Water Monitor's internal components. This will invalidate the warranty.
- Do not attempt to repair the product yourself. Contact the retailer or our Customer Service Department.
- Do not dispose of old batteries as unsorted municipal waste, do so in accordance with your local waste disposal regulations.
- When disposing of this product do so in accordance with your local waste disposal regulations
- Do not scratch hard objects against the Tekelek Eco-Water display as this may cause damage
- Do not replace batteries in a potentially explosive atmosphere.

7. Troubleshooting

If the Tekelek Eco-Water Monitor does not receive or cannot understand the RF signal from the Tekelek Eco-Water Sensor, an error message will be displayed on the Tekelek Eco-Water Monitor**.** The error message appears as an alternating screen showing 'Err' and 'E:0?' where? is a number.
Error codes are listed on a label on the rear of your Tekelek Eco-Water Monitor.



Error	Description	To Rectify
E01	Received reading is inconsistent	- Check that the sensor is vertical on the tank. - Check positioning of the sensor (ensure that the sensor is not too close to the tank sides or internal obstructions. - Ensure that the sensor is not tightly attached to the tank. It should be attached such that it is snig against the supplied gasket. - Ensure that the tank is not overfilled and that the bottom of the sensor is clean.
E02	Reading not received after 6 hours	- Check that the sensor is within range of the monitor. Try and relocate the monitor to a position that is nearer a window. Remember that the sensor communicates with the monitor using an FM signal and moving the monitor plug from possible metal obstructions can improve the signal. - Ensure the monitor is not too close to, or obstructed by, other electrical appliances.
E03	Reading received but void	- Check positioning of the sensor (ensure that the sensor is not too close to the tank sides or internal obstructions). - Ensure that the sensor is not too tightly attached to the tank. - Ensure that the tank is not overfilled i.e. there is a minimum of 120mm/4.7inches free space between the sensor and liquid level. - Ensure that the bottom of sensor is clean. - If a bunded or double skinned tank, ensure that the sensor is located on the inner tank.
E04	Received reading greater than tank height	- Check the tank height and ensure that this information is correct on the monitor, press the r and s keys together to view your tank configuration. If height is incorrect, enter the SETUP mode by pressing SETUP for 3 secs, press ENTER until you reach screen 5 and adjust the height using r and s keys. Press ENTER to save. Press SETUP to exit Setup mode. Wait 3 hours for updated readings. - Check the sensor is vertical and the positioning of the sensor (ensure the sensor is not too close to the tank sides or internal obstructions.
E05	Contact Vendor	- This is a potential hardware fault and requires contact with the vendor.
E06	Contact Vendor	- This is a potential hardware fault and requires contact with the vendor.

8. Notes

- Please retain this product manual and the installation guide. It contains practical instructions, technical specifications and safety precaution warnings you should know about.
- The maximum ***displayed*** value for all measurements and computed values is 19999. If a measurement exceeds this value, the display will flash. This does not affect data calculations or alarm functions.
- When used according to recommendations, the Tekelek Eco-Water monitors the water level in your tank and calculates and presents figures relating to the remaining water and the historical usage. The Tekelek Eco-Water must not be used as verification of a 'Weights and Measures' certified dispensing meter.
- Patents pending or covered by one of the following patents: S2003/0882, EP2131164 (A1), US2006261966 (A1), US7277020 (B2), IE20030882 (A2), S2008/0466, US2009/0303059 A1
- The Tekelek Eco-Water Monitor is intended to be connected to a power source continuously. It contains a small battery to keep time during power cuts. If the Tekelek Eco-Water Monitor is left unpowered for an extended period, then the battery will deplete, and information may be lost. When you are not using water system, you may unplug the Tekelek Eco-Water and store it until you wish to use your water system again. Its back-up battery and internal clock keep track of the settings previously entered.
- When the Tekelek Eco-Water has been unplugged and is plugged in again, it will start up in 'Lrn' mode. Simply press any key to exit.
- When you are receiving a water fill, the Tekelek Eco-Water Sensor cannot receive a reliable echo due to turbulence within the tank and may cause the Tekelek Eco-Water Monitor to temporarily display some error messages. Should the tank be filled above the recommended 95% this will obstruct the sensor signal until the water level drops below 120mm\4.7inchs from the sensor. The sensor will be unable to send accurate readings during this period.
- The Tekelek Eco-Water Monitor displays the volume of liquid available above the outlet height. The default value of the outlet height configured in the monitor is 0cm/0". If the tank has an outlet that is above the bottom of the tank the full amount of the displayed volume will not be available for use.
- Not suitable for pressurised containers. Only use on tanks vented to the atmosphere.
- Only access the Reset Switch if instructed by customer service.
- Changes in temperature can result in contraction and expansion of the tank and hence can affect the tank capacity. Such changes may affect your readings.

9. Warranty

This product carries a 24-month warranty from date of original purchase from Tekelek against any deficiency or fault in manufacture. This does not affect your statutory rights, or any warranty offered by the seller if different to Tekelek.
This warranty does not cover normal wear and tear, damage cause by negligence, accident, improper use or incorrect installation. Any change or modification made by the purchaser or user to the appliance will invalidate the warranty, as would any attempted repair.
The warranty applies only when the appliance has been operated in accordance with the instructions and connected to an electricity supply which matches that shown in the manual.
The warranty will be rendered invalid if the product is resold by the end user. The product must be used solely for domestic purposes.
Tekelek Europe Ltd's obligations are limited to the repair, or at its sole discretion, replacement of the unit. The unit should only be returned to Tekelek upon receiving confirmation from Tekelek that the return will be accepted. Tekelek distributors should get in touch in this regard with their normal sales contact at Tekelek. Other parties should only return the product for warranty assessment via the point of original purchase.
Tekelek Europe Ltd. and its distributors shall not be liable for indirect or consequential loss or damage resulting from the use of this product.

10. FCC ID: S6T603

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

WARNING: Changes or modifications not expressively approved by the party responsible for compliance could void the user's authority to operate the equipment.