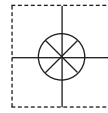


1 YEAR
WARRANTY

MADE IN
USA



Ω OMEGA® **User's Guide**



*Shop online at
omega.com®*

*e-mail: info@omega.com
For latest product manuals:
www.omegamanual.info*

UWXL-24-RH-RP1 **Long Distance Industrial** **Wireless Humidity/Temperature** **Transmitters with Remote Probe**



omega.com info@omega.com

Servicing North America:

U.S.A.:

Omega Engineering, Inc., One Omega Drive, P.O. Box 4047
Stamford, CT 06907-0047 USA

Toll-Free: 1-800-826-6342 (USA & Canada only)

Customer Service: 1-800-622-2378 (USA & Canada only)

Engineering Service: 1-800-872-9436 (USA & Canada only)

Tel: (203) 359-1660

Fax: (203) 359-7700

e-mail: info@omega.com

For Other Locations Visit omega.com/worldwide



Table of Contents

Section	Page
Section 1 - Introduction	1-1
1.1 Precautions	1-1
1.2 Safety Warnings and IEC Symbols	1-1
1.3 Product Labeling	1-2
1.4 Statement on FCC and CE Marking.....	1-3
1.4.1 FCC Marking	1-3
1.4.2 CE Marking	1-3
1.5 General Description & System Components	1-3
1.5.1 General Description	1-3
Section 2 - Hardware	2-1
2.1 Package Inspection	2-1
2.2 Included Items	2-1
2.3 UWXL-24-RH-RP1 Accessories	2-1
Section 3 - Transmitter Setup and Installation	3-1
3.1 Setup and Configuration	3-1
3.1.1 Connecting Your Device	3-1
3.1.2 Configure Your End Device	3-1
3.2 Mounting, Installation and Antenna Connection	3-7
3.2.1 Mounting	3-7
3.2.2 Installation	3-7
3.2.3 Antenna Connection	3-8
3.3 IR Sensor Connection	3-9
3.4 Battery Replacement	3-9
Section 4 - System Operation	4-1
4.1 Introduction	4-1
4.2 RF Communication Basics	4-1
4.3 Basic System Overview	4-1
4.4 Connector/Transmitter Operation	4-2
4.4.1 Button Operation	4-2
4.4.2 Indicator Lights	4-2
4.5 Environment/Operating Conditions	4-3
4.5.1 Environmental	4-3
4.5.2 Ambient Temperature Readings	4-3
4.5.3 Operating Conditions	4-3
4.6 Determining and Maximizing Range	4-4
4.6.1 Operating in Buildings	4-5
4.6.2 Penetration Angle of Radio Waves Through Walls	4-5
4.6.3 Building Materials	4-5
4.7 Antenna Basics	4-6



Table of Contents continued

Section 4 - System Operation Continued	
4.8 Antenna Placement	4-6
4.8.1 Horizontal Antenna Placement	4-6
4.8.2 Vertical Antenna Placement	4-7
4.9 Factory Preset Values	4-7
4.10 Transmit Rate vs. Battery Life	4-8
Section 5 - Troubleshooting	5-1
5.1 Transmitter Troubleshooting	5-1
5.2 Receiver Troubleshooting	5-1
Section 6 - Service and Calibration	6-1
6.1 Service and Calibration	6-1
Section 7 - Specifications	7-1
7.1 Specifications	7-1
Section 8 - Approvals & Regulatory Compliance	9-1
8.1 FCC (Domestic Use: USA & Canada)	9-1
8.2 International Usage & CE Marking (Pending)	9-1
8.3 CE Declaration of Conformity (DOC)	9-1



Table of Figures

Figure	Description	Page
Section 1 - Introduction		
1-1	IEC Symbols	1-1
1-2	Transmitter Rear Label	1-2
1-3	Transmitter Top Labels	1-2
Section 3 - Transmitter Setup and Installation		
3-1	Connecting Your Device	3-1
3-2	Setup Mode	3-2
3-3	Select End Device	3-3
3-4	Welcome Screen	3-3
3-5	Connect To The Transmitter Screen	3-4
3-6	Setup The End Device Screen	3-4
3-7	Establish A Link Screen	3-5
3-8	Choose Options Screen	3-5
3-9	Send Settings To Transmitter Screen	3-6
3-10	Mounting Dimensions	3-7
3-11	Fresnel Zone	3-7
3-12	Battery Placement	3-9
Section 4 - System Operation		
4-1	Basic System Overview	4-1
4-2	Transmitter Button Operation	4-2
4-3	Determining Maximum Range	4-4
4-4	Horizontal Antenna Placement	4-6
4-5	Vertical Antenna Placement	4-7
Section 7 - Specifications		
7-1	RH Accuracy Chart	7-2
7-2	Temperature Accuracy Chart	7-3



UWXL-24-RH-RP1 - Long Distance Industrial Wireless Humidity/Temperature Transmitters With Remote Probe

NOTES:

Section 1 - Introduction

Please read this manual completely before installing and operating your wireless End Device and receiver system. It's important read and follow all notes, cautions, warnings and safety precautions before operating this End Device. "End Device" refers to your transmitter unit.

1.1 Precautions

- This device is not designed for use in any medical or nuclear applications.
- Do not operate this device in flammable or explosive environments.
- Never operate with a power source other than the one recommended in this manual.
- This device has been designed for dry, moisture free indoor applications only.
- Do not operate this device outside of the recommended use outlined in this manual.
- No co-location with other radio transmitters is allowed. By definition, co-location is when another radio device or it's antenna is located within 20 cm of your End Device and can transmit simultaneously with your End Device.
- Never install wireless End Devices within 20 cm or less from each other.
- Never install and/or operate your End Device closer than 20 cm to nearby persons.
- Never use your End Device as a portable device. Your unit has been designed to be operated in a permanent installation only.

NOTE:

There are no user serviceable parts inside your device. Attempting to repair or service your unit may void your warranty:

1.2 Safety Warnings and IEC Symbols

This device is marked with international safety and hazard symbols in accordance with IEC standards. It is important to read and follow all precautions and instructions in this manual before operating or commissioning this device as it contains important information relating to safety and EMC. Failure to follow all safety precautions may result in injury and or damage to your device. Use of this device in a manner not specified will void your warranty




IEC symbols	Description
	Caution, refer to accompanying documentation
	EU's Waste Electrical and Electronic Equipment Compliance
	Laser Symbol

Figure 1-1. IEC Symbols

1.3 Product Labeling

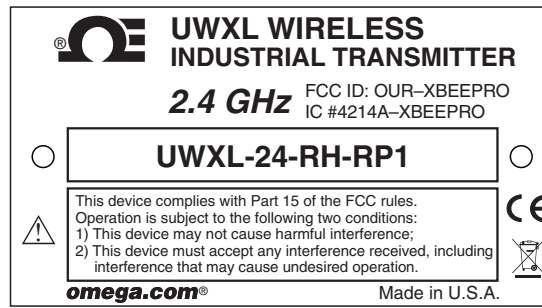


Figure 1-2. Transmitter Rear Label

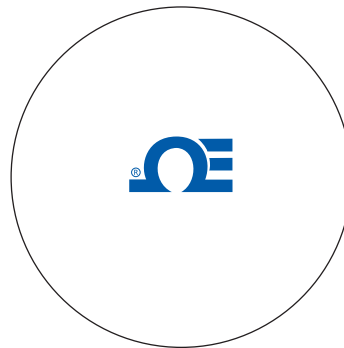


Figure 1-3. Transmitter Top Label

1.4 Statement on FCC and CE Marking

1.4.1 FCC Marking

FCC ID: OUR-XBEEPRO IC #4214A-XBEEPRO

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. 2.) This device must accept any interference received, including interference that may cause undesired operation.

1.4.2 CE Marking

It is the policy of OMEGA to comply with all worldwide safety and EMI/EMC regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

1.5 General Description & System Components

1.5.1 General Description

The UWXL Series Long Distance Industrial Wireless Transmitters are stand-alone, rugged, battery powered, wireless transmitters that send their measurements to a host receiver up to 450 m (1500') line of sight (LOS) away. The UWXL transmitters are designed for a variety of applications, including temperature (RTD or thermocouple), infrared temperature, relative humidity, process transducers with standard voltage or current outputs, flow (pulsed frequency) as well as pH measurement. When activated, the transmitter will send readings continuously at a pre-set time interval programmed by the user during initial setup.

Each unit measures and transmits: Process value, Ambient Temperature, RF Signal Strength and Battery Condition to the host. This information is then displayed on the host PC screen in real time using the provided software. When used with host receiver model UWXL-REC1, data from up to 48 wireless end devices can be received and displayed simultaneously. Each receiver includes free software that converts your PC into a strip chart recorder or data logger allowing readings to be saved and later printed or exported to a spread sheet file.

The UWXL-24-RH-RP1 is a long distance wireless relative humidity / temperature transmitter. In addition to the standard UWXL features listed above, this model includes a detachable industrial humidity / temperature sensor that can be remotely mounted.

Section 2 – Hardware

It is important that you read this manual completely and follow all safety precautions before operating this instrument.

2.1 Package Inspection

Remove the packing list and verify that you have received all your equipment. If you have any questions about the shipment, please call our Customer Service Department at **1-800-622-2378** or **203-359-1660**. We can also be reached on the Internet at **omega.com**, e-mail: **cservice@omega.com**. When you receive the shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE:

The carrier will not honor any damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

2.2 Included Items

The following items are supplied in the UWXL-24-RH-RP1 box:

- 1 UWXL Series Transmitter
- 1 Remote Probe With Cable - 3 m (10')
- 1 User's Guide
- 1 Battery

2.3 UWXL-24-RH-RP1 Accessories

The UWXL-24-RH-RP1 is offered with three different accessories. In the case that you would like to protect your probe, there are two types of probe caps. Also, if you need to replace your probe, a factory-calibrated replacement probe is offered.

IP-PC	Polyethylene Probe Cap, for wet environments
IP-SC	Porous Stainless Steel Probe Cap: 5um porosity, for dusty and pressurized (< 35 psi) environments
iTHP-5-M12-CAL-3-HU	Replacement Industrial Probe, cable 3 m (10') with M12 connector and NIST traceable calibration certificate.

More information can be found at omega.com.

NOTES:

Section 3 – Transmitter Setup & Installation

3.1 Setup and Configuration

3.1.1 Connecting Your Device

Connect the USB cable to your transmitter unit and also to an available USB port on your computer. See figure below. The USB cable is provided in the box with your receiver unit. The same cable is used for programming your transmitter and for connecting your receiver.

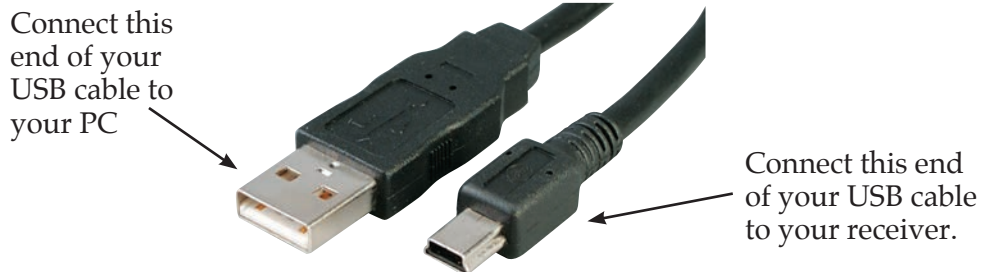


Figure 3-1. Connecting Your Device

3.1.2 Configure Your End Device

Now that you have connected your USB cable to your PC and transmitter you will complete the following steps to configure your End Device before placing the unit into operation. You will be using the configuration software utility that you installed onto your PC when you set up your receiver. If you have not installed the configuration software utility you should do so now. During this procedure you will be setting the following parameters in your transmitter.

Transmitter Options:

Connector Address

This sets a unique address number into your transmitter. Later, when you set up your measurement software you will again set channel numbers to receive readings from the corresponding unit(s). Each end device must be given a different address for your system to operate correctly.

NOTE:

If you will be using more than one receiver unit in your area it is important to set the transmitter address numbers to be a corresponding number in your TC-Central software.

Example

For the first receiver: Set the addresses on your transmitters to 101, 102, 103, 104, etc. Then set the channels in your TC-Central user software to match.
For the second receiver: Set the addresses on your transmitters to 201, 202, 203, 204, etc. Then set the channels in your TC-Central user software to match. This numbering scheme can be expanded to match the number of receivers you are using.

Sample Rate

This will program your End Device to transmit 1 data reading to your receiver at a specified time interval. Available settings are 2, 3, 5, 15, 30, 45, 60, 75 or 90 seconds

NOTE:

The sample rate you set will have the most direct affect on the life of the battery in your End Device. It is recommended that you set the longest sample time that your application can live with to extend time between battery replacements. See Section 6 for more information on battery life.

RF Network Settings:**RF Channel**

This setting determines the operating channel on which RF connections are made between the transmitter and receiver. The transmitter must be set to the same channel as the receiver in order for them to communicate.

Network ID

This sets the ID of the Network that the transmitter will be joining. It must match the setting of the receiver in order for them to communicate.

Receiver Address

This sets the destination address for RF packets sent by the transmitter. It must match the address of the receiver in order for them to communicate.

NOTE:

It is possible to have multiple RF networks operating in the same vicinity. Each network must have at least one unique RF Network Setting in order to differentiate the networks.

STEP 1. Enter the "SETUP" mode.

To place your transmitter into the SETUP mode for programming follow this procedure.

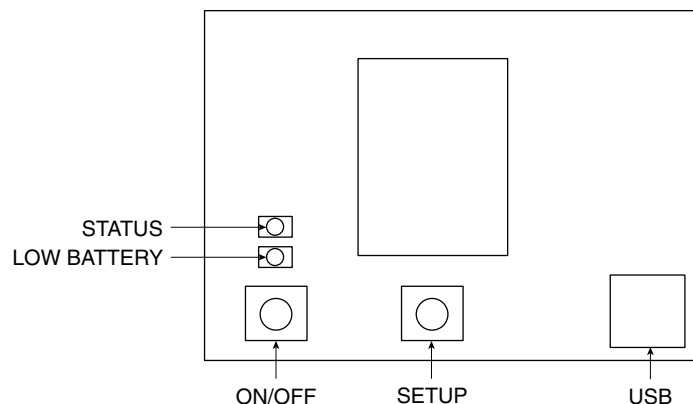


Figure 3-2. Setup Mode

Press and hold the ON/OFF button. While the ON/OFF button is being held, press the SETUP button one time and then release the ON/OFF button. The green (TX) indicator on the front of your device should be blinking at a steady rate. This indicates your End Device is ready to run the configuration utility software.

STEP 2. Launch Setup Utility Program.

To launch the End Device setup utility program on your PC begin by accessing the “Programs” list under your “Start Menu”.

Scroll through the list of to find the Omega TC-Central folder, then select the End Device Configuration Program.

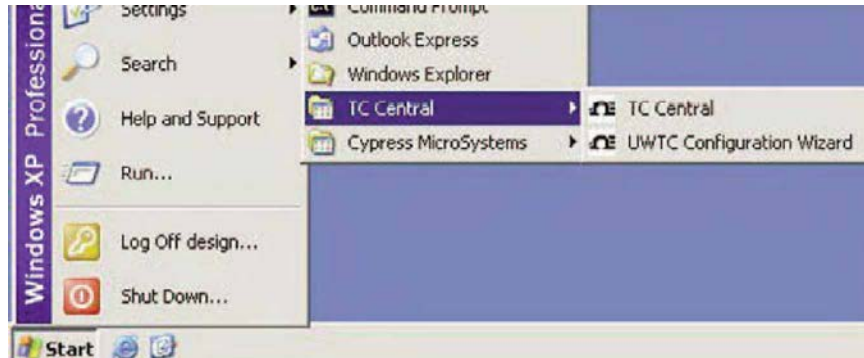


Figure 3-3. Select End Device Screen

STEP 3. Programming your settings into your End Device



Figure 3-4. Welcome Screen

After starting the setup utility program this will be the first screen you will see. Click the “Next >” button to proceed and continue setting up your End Device. Each screen will provide instruction details on how to proceed.



Figure 3-5. Connect To The Transmitter Screen

If you have not already connected your End Device to a USB port on your PC you must do this now before continuing. After your unit has been connected, click the Next > button to proceed and continue setting up your unit.

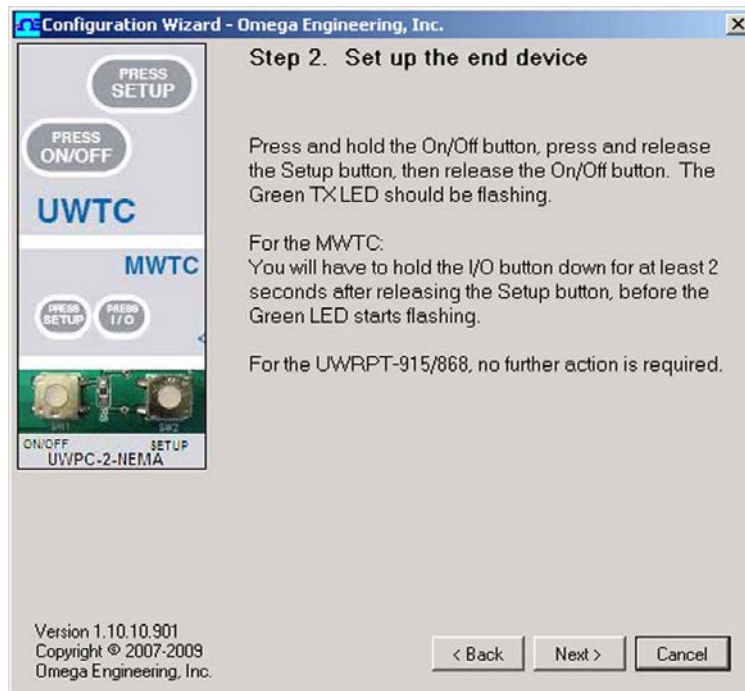


Figure 3-6. Setup The End Device Screen

If you have not already placed your End Device into the SETUP mode you should do this now before continuing. After your unit has been placed into the SETUP mode, click the Next > button to proceed and continue setting up your unit.

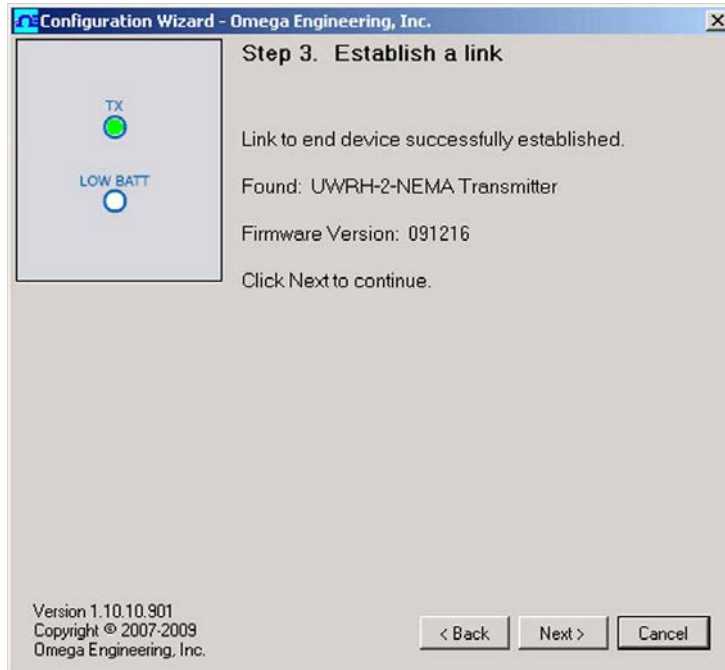


Figure 3-7. Establish A Link Screen

After successful communication between your connector/transmitter has been established you can click the Next > button to proceed and continue setting up your connector/transmitter. If you did not receive a confirmation of proper communication you should click the <Back button to try connecting again.

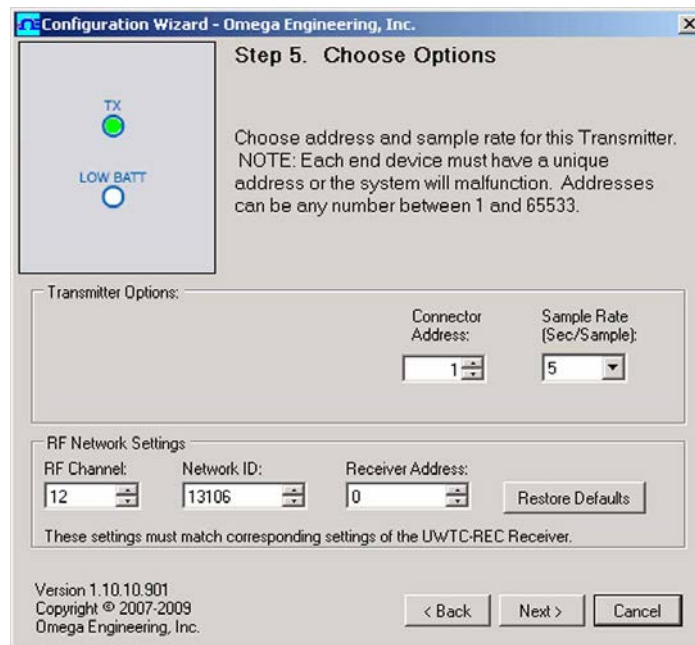


Figure 3-8. Choose Options Screen

From this screen you will select the main operating settings for your end device.

NOTE:

Each end device must have a different address number for proper operation).

After making your selections click the Next > button to proceed and program your settings into your unit.

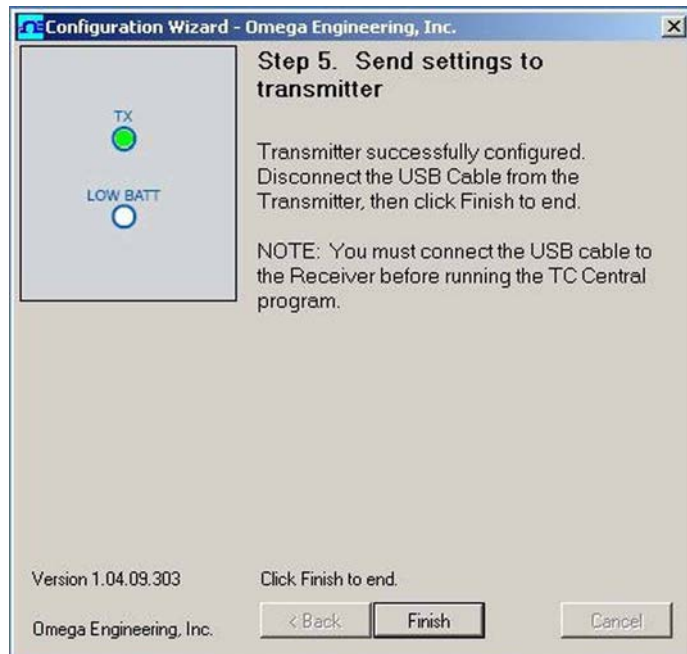


Figure 3-9. Send Settings To Transmitter

Congratulations! You have successfully programmed your end device. After your unit has been programmed click the Finish button to close the utility program.

3.2 Mounting, Installation and Antenna Connection

3.2.1 Mounting

The diagram below shows dimensions of the transmitter housing for mounting.

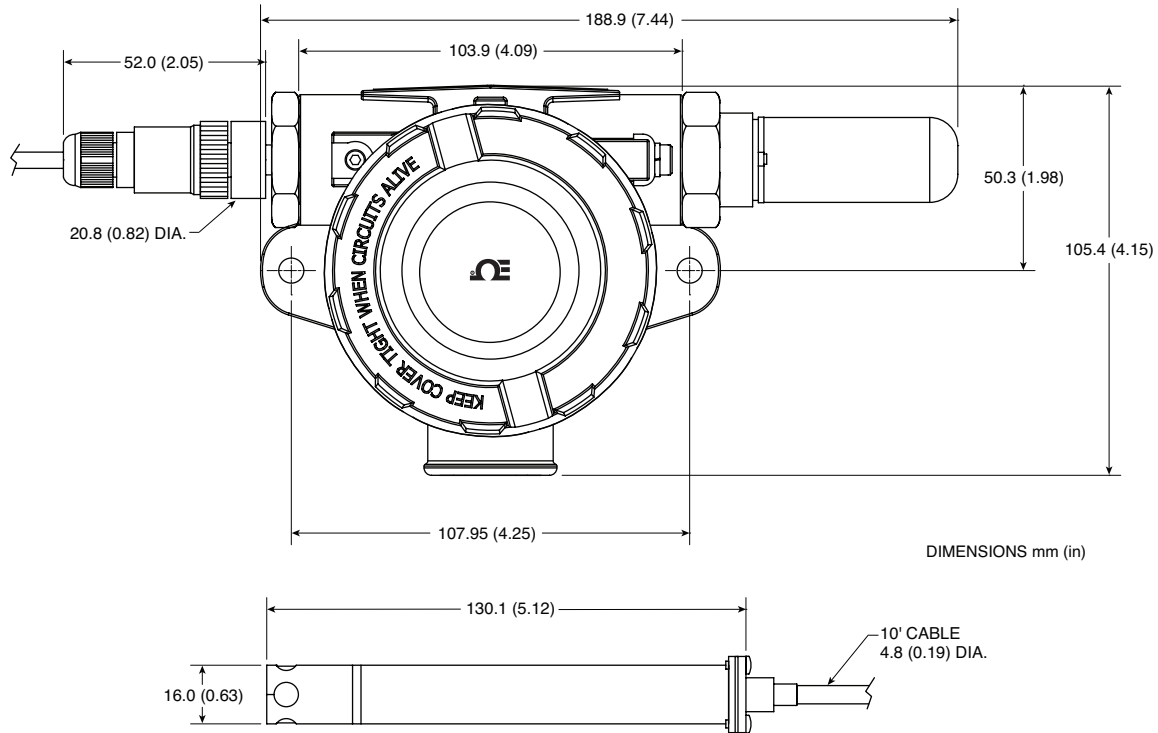


Figure 3-10. Mounting Dimensions

When mounting your end device, care should be taken to make sure it is as far away from any metal objects as possible. If nearby metal gets too close to your unit, it has the potential to interfere with the way the unit radiates and may cause signal loss or possibly even the inability to communicate at all with your receiver.

3.2.2 Installation

When installing your End Device it is important to position your device in such a way as to optimize the antenna location within what's known as the "Fresnel Zone".

The Fresnel Zone can be thought of as a football-shaped invisible tunnel between two locations that provides a path for RF signals between your End Device and your receiver.

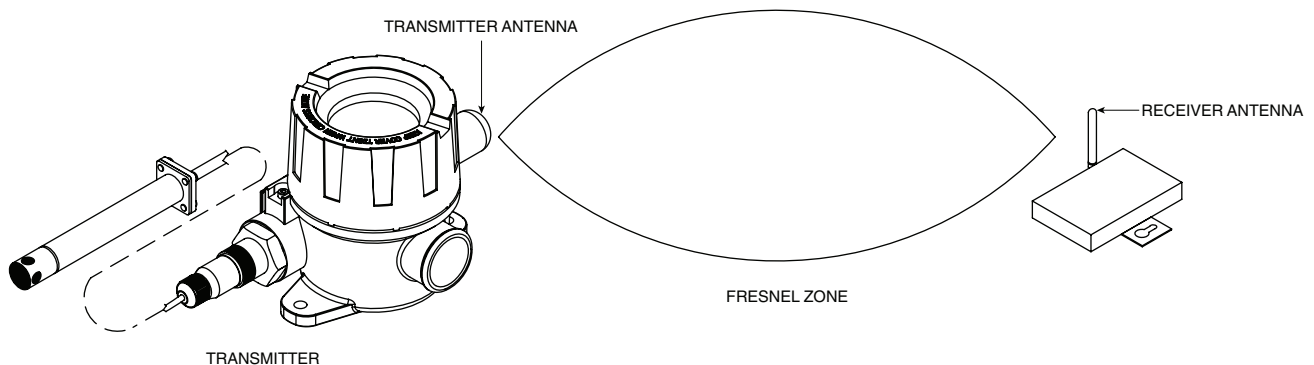


Figure 3-11. Fresnel Zone

In order to achieve maximum range, the football-shaped path in which radio waves travel must be free of all obstructions. Obstacles in the path (especially metal) will decrease the communication range between your End Device and receiver. Also, If the antennas are mounted just barely off the ground, over half of the Fresnel zone ends up being obstructed by the earth resulting in significant reduction in range. To avoid this problem, the antennas should be mounted high enough off of the ground so that the earth does not interfere with the central diameter of the Fresnel zone.

NOTE:

It is important to understand that the environment may change over time due to new equipment or machinery being installed, building construction, etc. If new obstacles exist between your End Device and receiver, the devices can be raised on one end or on both ends to hopefully clear the Fresnel Zone of obstructions.

NOTE:

No co-location with other radio transmitters is allowed. By definition, co-location is when another radio device or the device's antenna is located within 20 cm of your connector/transmitter and can transmit simultaneously with your unit.

NOTE:

Never install multiple End Devices within 20 cm or less from each other.

NOTE:

Never use your UWXL End Device as a portable device. Your unit has been designed to be operated in a permanent installation only.

3.2.3 Antenna Connection

Your End Device has been shipped to you with a standard antenna already attached. In some cases the user may wish to install a remote antenna to maximize transmission range to the receiver. In these instance the UWXL-RAK antenna kit can be used. The kit includes a direction antenna, 8" extension cable and a mounting bracket.

NOTE:

Use of any other antenna then what's supplied with your End Device will void all FCC, IC and CE regulatory compliance.

Additional information on installation and system operation can be found in Section 6.

3.3 RH Probe Connection

Your transmitter features a 5-pin M12 receptacle providing a reliable connection to the Relative Humidity Probe.

3.4 Battery Replacement

To install or replace the battery in your End Device you must first remove the lid of the enclosure. This will allow you to access the battery compartment.

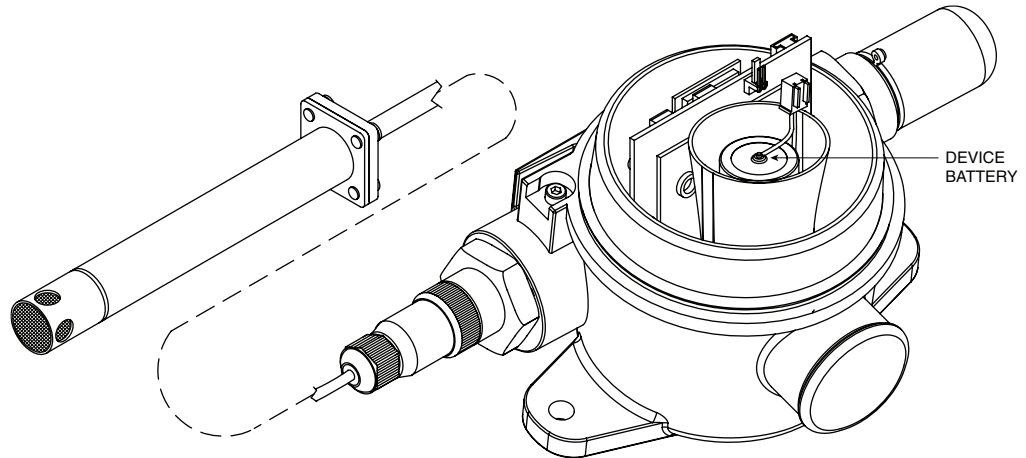


Figure 3-12. Battery Placement

Your End Device is equipped with a “C” size lithium power cell assembly. Omega Part Number: UWTC-BATT-C. To install a replacement battery assembly follow steps outlined here.

- A. Disconnect the battery from the main circuit board.
- B. Remove the battery assembly from the housing.
- C. Install your new battery assembly into the housing in the same position as the old battery was located.
- D. Connect the battery assembly connector to the mating connector on the top of the main circuit board.
- E. Installation complete.

CAUTION:

Installing your end device in an application where the unit will be exposed to ambient temperatures above or below the operating limits specified in this manual will damage your unit and cause the unit to malfunction and produce incorrect operation.

Section 4 – System Operation

4.1 Introduction

Compared to wired systems, a wireless system provides much simpler installation. Based on the physical principle of the propagation of radio waves, certain basic conditions should be observed. The following simple recommendations are provided to insure proper installation and correct operation of your wireless system.

4.2 RF Communication Basics

The Model UWXL-24-RH-RP1 sends wireless transmissions to a receiver. The receiver checks the incoming data for accuracy and processes this data for use by the measurement software on your PC. Radio signals are electromagnetic waves, hence the signal becomes weaker the further it travels. While radio waves can penetrate some solid materials like a wall, they are dampened more than when a direct line-of-sight between the transmitting and receiving antenna exist.

4.3 Basic System Overview

The UWXL wireless RH system is comprised of only two main components; a signal conditioner with a built-in battery powered 2.4GHz radio transmitter, and a USB powered 2.4GHz radio receiver.

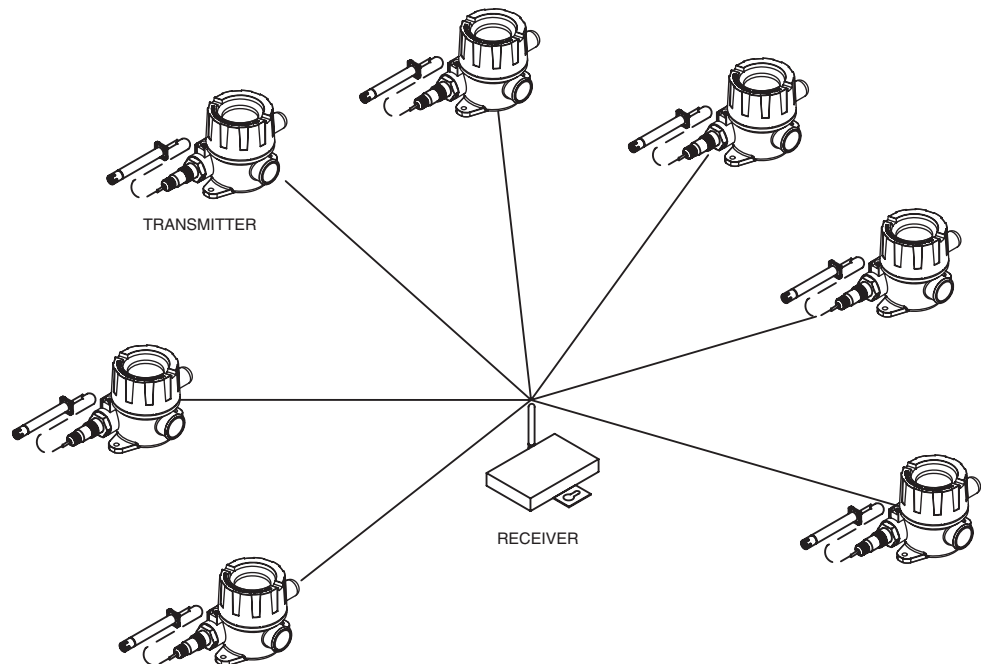


Figure 4-1. System Components

NOTE:

Up to 48 end devices can be used with one receiver.

4.4 Connector/Transmitter Operation

4.4.1 Button Operation

(1.) ON/OFF

The ON/OFF button on the main circuit board of your transmitter is used to turn your unit on or off.

(2.) SETUP

The SETUP button on the main circuit board of your transmitter is only used during

the setup and configuration of your unit. See Section 3.1.2 for more information.

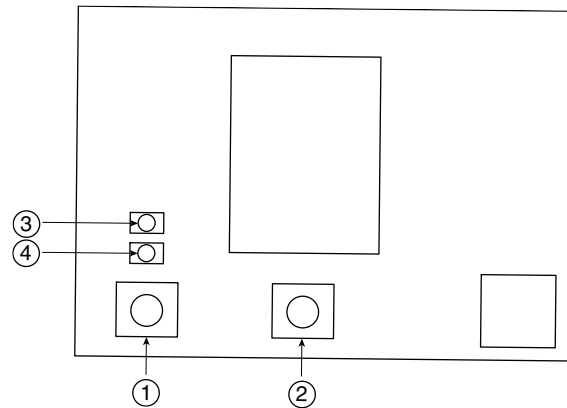


Figure 4-2. Transmitter Button Operation

- (1) "ON/OFF" Button
- (2) "SETUP" Button
- (3) Transmit Indicator
- (4) Battery Indicator

4.4.2 Indicator Lights

1) Transmit (TX) Green Indicator Light

The green indicator light marked "TX" on the front of the connector/transmitter will blink every time the unit sends data to the receiving unit. Example; If you selected a 5 sec sample rate the green TX led will blink one time every 5 seconds.

2) Low Battery (Low Bat) Red Indicator Light

The red indicator light marked "Low Bat" on the front of the transmitter will turn on when the battery reaches a level at or below the power level required for normal operation. When this indicator turns on it's time to install a fresh battery in your unit. For information on battery life see Section 6.11.

4.5 Environment/Operating Conditions

4.5.1 Environment

Omega's wireless end devices and receiver units have been designed to be fixed mounted and operated in a clean and dry indoor environment. Care should be taken to prevent the components of your wireless system from being exposed to moisture, toxic chemicals and extreme cold or hot temperature that are outside the specifications listed in this manual.

4.5.2 Ambient Temperature Readings

Measuring Relative Humidity/Temperature

Before starting to measure relative humidity / temperature, make sure that the probe is connected to the main unit.

4.5.3 Operating Conditions

The RH sensor works stable within recommended normal range – see Figure 4-3.

Long term exposures to conditions outside normal range, especially at humidity >80%RH, may temporarily offset the RH signal (+3 %RH after 60h). After return to normal range it will slowly return towards calibration state by itself.

See Section 6, Service and Calibration to accelerate eliminating the offset.

Prolonged exposure to extreme conditions may accelerate ageing.

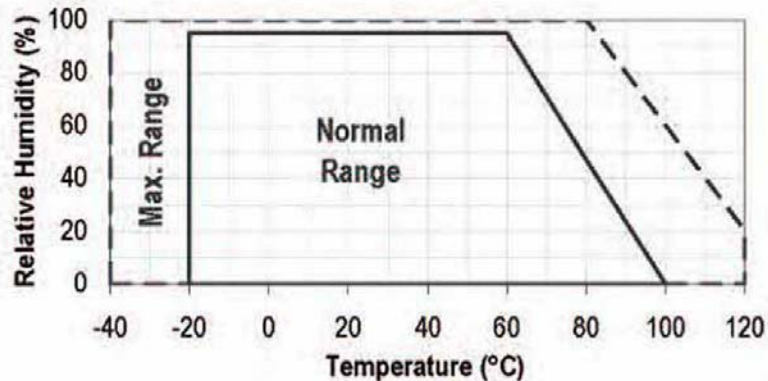


Figure 4-3. Normal Range

The following is a list of basic good practice you should apply when operating your wireless system.

- Never operate your wireless device or receiver outside the recommended environmental limits specified in this manual.
- Never operate your wireless end device or receiver in flammable or explosive environments.
- Never use your wireless end device or receiver in medical, nuclear or other dangerous applications where an interruption of readings can cause damage or harm.
- Never operate your end device or receiver with any other battery or power source than what's specified in this manual or on the battery compartment label.

- No co-location with other radio transmitters is allowed. By definition, co-location is when another radio device or its antenna is located within 20 cm of your end device and can transmit simultaneously with your end device.
- Never install end devices within 20 cm or less from each other.
- Never use your end device as a portable device. Your unit has been designed to be operated in a permanent installation.
- Never install and/or operate your end device closer than 20 cm to nearby persons.
- Never operate your end device with any other antenna than what is supplied or listed here in this manual for approved use.

4.6 Determining and Maximizing Range

The available maximum range specified for the wireless Series system in this manual is only achievable under optimum installation conditions. Mounting height, obstructions in your “Fresnel Zone” and ambient conditions can cause a decrease in signal strength resulting in a shorter range between your transmitter and receiver unit. The following recommendations will help to improve the range of your wireless system.

Position your receiver in a central location

When multiple transmitters are in operation, position your receiver unit in a central space if possible in equal distance to each connector transmitter.

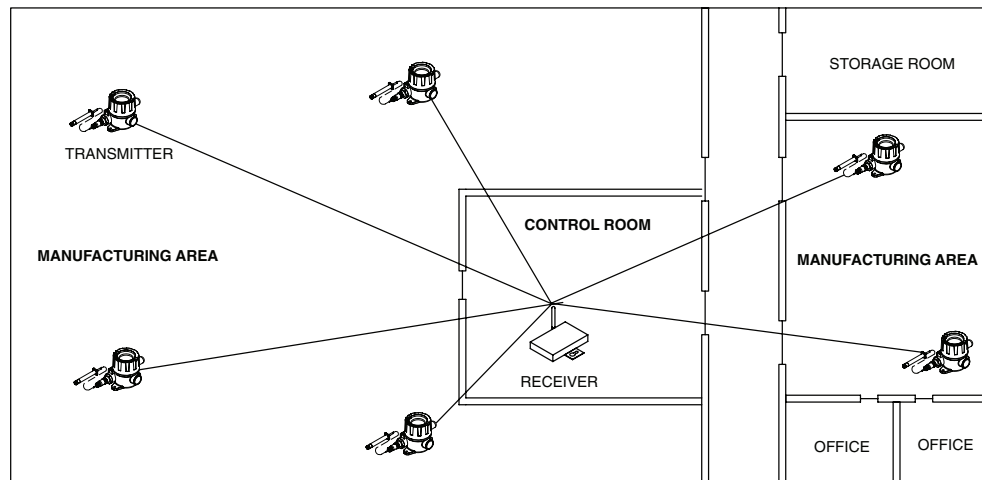


Figure 4-3. Determining Maximum Range

Test your system before permanent mounting

Before permanently mounting your transmitters in your application try moving the devices to different locations and mounting angles to determine what installation achieves the best signal strength.

Move your system components higher off the floor and away from exterior walls

Avoid installing your system components too close to the floor or near your building's exterior walls. The closer your transmitter and receiver unit are to the greater the interference and loss of signal strength will be.

Maintain a line of sight (LOS) between antennas

Maintaining a line of sight between your transmitter and receiver unit will produce greatly improved signal strength over a system where the antenna's in your system have obstacles blocking them.

Maintain a constant ambient temperature environment

Maintaining a constant ambient temperature environment is important to achieving maximum signal strength. Exposing your system components to extreme hot or cold temperatures, or sudden changes in ambient conditions will have an effect on the performance of your system.

4.6.1 Operation in Buildings

Your transmitter sends wireless data transmissions to a receiver connected to your PC. Radio signals are electromagnetic waves. A radio signal becomes weaker the further it travels. Range is decreased by different types of materials found in the direction of the signals propagation. Radio waves can penetrate most types of wall materials, but they are dampened more than they would be by a direct line-of-sight installation.

Avoid dampening materials by repositioning the transmitting and/or receiver.

4.6.2 Penetration Angle of Radio Waves Through Walls

The angle at which the transmitted radio signal hits a wall is very important and also has a big effect on maximizing range. Signals between your transmitter should be transmitted as directly as possible.

4.6.3 Building Materials

Examples of how different types of wall material may reduce your signal:

Material Type	Possible Signal Reduction
Wood, Plaster, Sheetrock, Uncoated Glass w/o Metal, Fiberglass	0 to 10%
Brick, Pressboard	5 to 35%
Reinforced Concrete	10 to 90%
Metal Walls, Metal Doors, Elevators, Metal Stair Cases, Metal Piping, Metal Mesh, Metal Screening	90 to 100%

Avoid dampening materials by repositioning the transmitting and/or receiver.

4.7 Antenna Basics

By definition, an antenna is a device used to transform an RF signal, traveling on a conductor, into an electromagnetic wave in free space. Antennas demonstrate a property known as reciprocity, this means that an antenna will always maintain the same characteristics regardless if it is used to transmit or receive. Most antennas are resonant devices, which means they operate efficiently over a relatively very narrow frequency band. An antenna must be tuned to the same frequency band of the radio system to which it is connected, otherwise the reception and the transmission will be impaired. The antennas in your wireless transmitter system have been tuned to operate in the 2.4 GHz band. In some cases, a short RF cable may be used to connect an antenna to your device. Please note that RF extension cables will always add some loss to the transmitting signal strength. The longer the cable the more signal will be lost over that cable. Because of this the length of the cable should be kept as short as possible.

4.8 Antenna Placement

Proper antenna installation is important and will allow you to achieve maximum performance and range between your transmitter and receiver unit. Your transmitter should not be installed on the same side of the wall as the receiver. If mounted close to each other on the same wall, the radio waves are likely to be subject to interfering dispersions or reflections. The best positioning is to have the transmitter installed on the opposite or connecting wall to the receiver.

4.8.1 Horizontal Antenna Placement

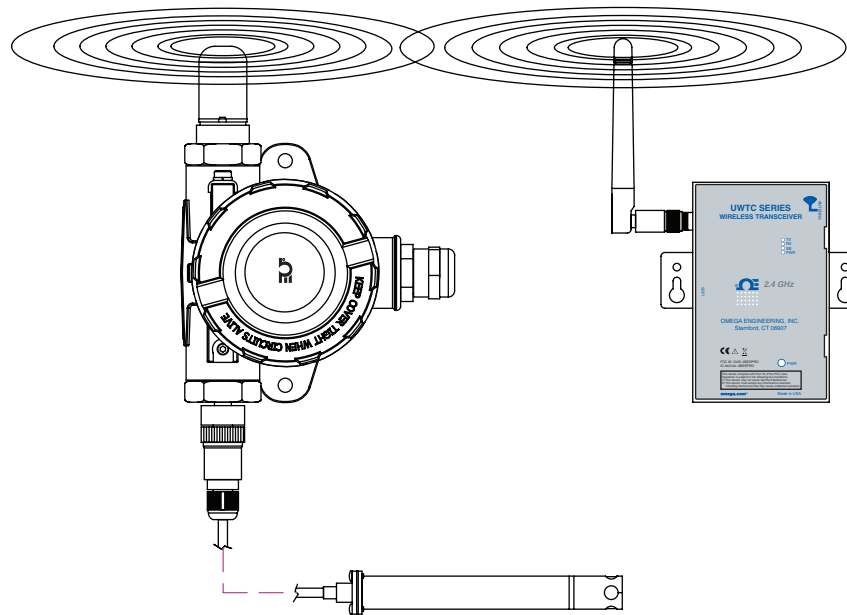


Figure 4-4. Horizontal Antenna Placement

If your transmitter is mounted in a horizontal position in your application you should mount your receiving so that the same polarization is achieved with the receiving antenna. As shown in the “Horizontal” example above.

4.8.2 Vertical Antenna Placement

If your transmitter is mounted in a vertical position in your application you should mount your receiving so that the same polarization is achieved with the receiving antenna. As shown in the “Vertical” example Fig 4-5.

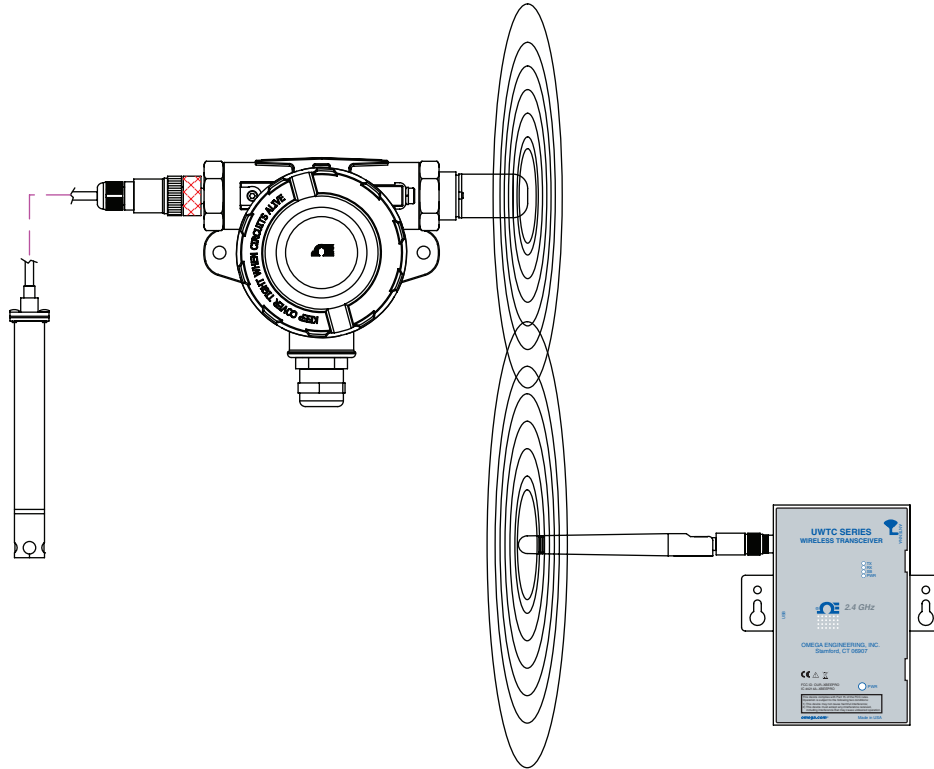


Figure 4.5. Vertical Antenna Placement

4.9 Factory Preset Values

Your transmitter has been factory programmed for the following default operation; Channel Number: 1, Transmit Rate: 1 sample/5 sec

4.10 Transmit Rate vs. Battery Life

Many factors such as ambient temperature and transmission rate can have a major affect on the life of the battery used in your transmitter. The transmit rate is the biggest factor in the life of your battery. The longer the transmit rate you set, the longer the battery in your device will last. The table below give some estimates on how long the battery should last for the transmit rate you selected when you setup your transmitters if used under normal operating conditions.

For Model UWXL-24-RH-RP1

Transmit Time	Estimated Battery Life
1 Sample/2 Seconds	30 days
1 Sample/3 Seconds	45 days
1 Sample/5 Seconds	75 days
1 Sample/10 Seconds	150 days
1 Sample/15 Seconds	225 days
1 Sample/30 Seconds	450 days
1 Sample/45 Seconds	675 days
1 Sample/60 Seconds	912 days

Section 5 – Troubleshooting

The information provided in this section should solve most of the common problems you may experience when installing or operating your wireless System. If the problems and solutions outlined here do not solve your problem, please contact Omega’s customer service department. Contact information can be found in Section 2 of this manual or by visiting omega.com.

5.1 Transmitter Troubleshooting

Problem

Solution

1. Unit will not enter “Setup” mode

- a. Check USB cable connection
- b. Contact Customer Service

2. Configuration Utility will not connect

- a. Check USB cable connection to device being programmed
- b. Confirm you are in the “SETUP” mode. See Section 3
- c. Contact Customer Service

5.2 Receiver Troubleshooting

Problem

Solution

1. Unit will not turn on

- a. Check power cord connections
- b. Unit requires service, contact Customer Service

Section 6 – Service and Calibration

Your UWXL-24-RH-RP1 Temperature Transmitter has been built and factory calibrated to meet or exceed the specifications listed here in this manual. Information is provided below on how to have your unit service.

6.1 Service and Calibration

If any of your wireless system components require service or re-calibration, please call our Customer Service Department at 1-800-622-2378 or 203-359-1660. They will assist you in arranging the return of your device. We can also be reached on the Internet at www.omega.com, e-mail: cservice@omega.com

6.2 Reconditioning Procedure

As stated in Section 4, extreme conditions or exposure to solvent vapors may offset the sensor. The following reconditioning procedure may bring the sensor back to calibration state:

Baking: 100 - 105°C at < 5%RH for 10h

Re-Hydration: 20 - 30°C at ~ 75%RH for 12h.

(75%RH can conveniently be generated with saturated NaCl solution. 100 – 105°C correspond to 212 - 221°F, 20 - 30°C correspond to 68 - 86°F)

Section 7 – Specifications

7.1 Specifications

TRANSMITTER HOUSING SPECIFICATIONS

Computer Interface:	USB
Transmit Sample Rate:	Programmable from 2 sec to 120 sec
Radio Frequency (RF) Transceiver Carrier:	ISM 2.4 GHz, direct sequence spread Spectrum, (2.450 to 2.490 GHz - 12 RF channels)
RF Output Power:	18 dBm (63 mW)
Range of RF Link:	Up to 450 m (1500') outdoor line of sight; up to 90 m (300') indoor/urban
RF Data Packet Standard:	IEEE 802.15.4, open communication architecture
Power:	One 3.6V, Lithium C Cell (included)
Battery Life (Typical):	3 years; at 1 sample/minute reading rate @ 25°C

Sensor Specifications

Relative Humidity (RH)

Accuracy/Range:	±2% for 10 to 90%; ±3% for 5 to 10% and 90 to 95% ±4% for 0 to 5% and 95 to 100% *Refer to Figure 7-1
Hysteresis:	±1% RH
Non-linearity:	±3%
Response Time:	8 seconds, tau 63% (time for reaching 63% of a step function, valid at 25C and 1m/s airflow)
Repeatability:	±0.1%
Resolution:	0.1%, 12bit
Temperature (T) Accuracy/Range*:	±0.5°C for 5° to 45°C (±1°F for 41 to 113°F); ±0.5° to ±1.5°C for -40° to 5°C and 45° to 124°C (±1° to ±2.7°F for -40° to 41°F and 113° to 255°F) *Refer to Figure 7-2
Response Time:	5 to 30 seconds, tau 63% (response time depends on heat capacity of and thermal resistance to sensor substrate)
Repeatability:	±0.1°C
Resolution:	0.1°C, 14 bit

Probe Specifications

Dimensions: 137 x 16 mm diameter (5 x 0.63")

Cable with M12 Connector: 3m (10')

Cable Operating Temperature: -40 to 125°C (-40 to 257°F)

Accuracy: Figure 7-1 RH Accuracy Chart
Figure 7-2 Temperature Accuracy Chart

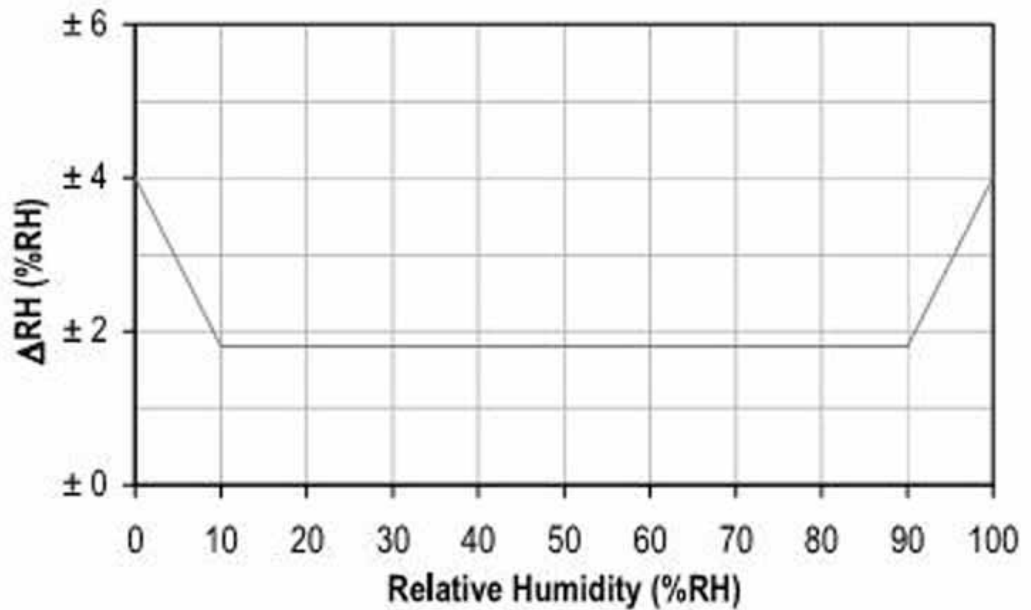


Figure 7-1. RH Accuracy Chart

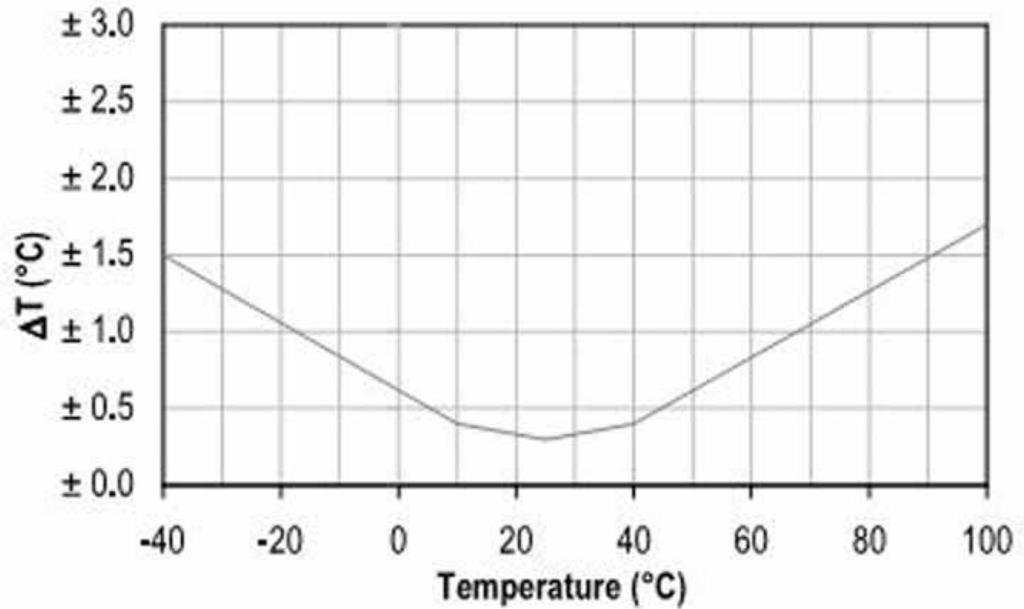


Figure 7-2. Temperature Accuracy Chart

Accuracies are tested at Manufacturer's Outgoing Quality Control at 25°C (77°F) and 3.3V. Values exclude hysteresis and non-linearity, and are only applicable to noncondensing environments.

NOTE: Reconditioning of the probe may be necessary if the probe is stored for a period of time in a harsh environment (temperatures below 0°C or above 70°C or exposure to chemical vapors, condensation, etc).

To recondition the probe refer to Section 6.

Section 8 – Approvals, Regulatory Compliance

NOTE:

All approvals outlined in this manual are based on testing that was done with antennas that are supplied with your Wireless Series System Components. Removing and or installing a different antenna will void the product compliance demonstrated in these documents.

8.1 FCC (Domestic Use)

For United States: FCC ID: OUR-XBEEPRO

For Canada: IC #4214A-XBEEPRO

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. 2.) This device must accept any interference received, including interference that may cause undesired operation.

WARNING:

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

8.2 International Usage & CE Marking

NOTE:

It is your (the user's) responsibility to insure that these products are operated within the guidelines here in this manual and in conformance with all local, state, federal or national regulations and laws of the country they are being operated in.

NOTE:

Transmitting Power - Your Wireless Series System Components have been designed, manufactured and tested so that the transmitting power of your connector transmitter will not exceed 18 dBm (63mW).

8.3 Declaration of Conformity (DOC)

Contact OMEGA for status on CE marking and DOC availability.



WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

OMEGA is a registered trademark of OMEGA ENGINEERING, INC.

© Copyright 2013 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.

Where Do I Find Everything I Need for Process Measurement and Control? **OMEGA...Of Course!** *Shop online at omega.comSM*

TEMPERATURE

- ☑ Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- ☑ Wire: Thermocouple, RTD & Thermistor
- ☑ Calibrators & Ice Point References
- ☑ Recorders, Controllers & Process Monitors
- ☑ Infrared Pyrometers

PRESSURE, STRAIN AND FORCE

- ☑ Transducers & Strain Gages
- ☑ Load Cells & Pressure Gages
- ☑ Displacement Transducers
- ☑ Instrumentation & Accessories

FLOW/LEVEL

- ☑ Rotameters, Gas Mass Flowmeters & Flow Computers
- ☑ Air Velocity Indicators
- ☑ Turbine/Paddlewheel Systems
- ☑ Totalizers & Batch Controllers

pH/CONDUCTIVITY

- ☑ pH Electrodes, Testers & Accessories
- ☑ Benchtop/Laboratory Meters
- ☑ Controllers, Calibrators, Simulators & Pumps
- ☑ Industrial pH & Conductivity Equipment

DATA ACQUISITION

- ☑ Data Acquisition & Engineering Software
- ☑ Communications-Based Acquisition Systems
- ☑ Plug-in Cards for Apple, IBM & Compatibles
- ☑ Data Logging Systems
- ☑ Recorders, Printers & Plotters

HEATERS

- ☑ Heating Cable
- ☑ Cartridge & Strip Heaters
- ☑ Immersion & Band Heaters
- ☑ Flexible Heaters
- ☑ Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL

- ☑ Metering & Control Instrumentation
- ☑ Refractometers
- ☑ Pumps & Tubing
- ☑ Air, Soil & Water Monitors
- ☑ Industrial Water & Wastewater Treatment
- ☑ pH, Conductivity & Dissolved Oxygen Instruments