

1 YEAR
WARRANTY



**UWTC-1/UWRD-1 have been obsoleted.
Please use the UWTC-2/UWRD-2 for the substitute.**

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UWTC/UWRD SERIES **The Smart Connector™** **Wireless Thermocouple/RTD** **Connector/Transmitter & Receiver**



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Section 1 - Introduction

Please read this manual completely before installing and operating your wireless connector/transmitter and receiver system. It's important to read and follow all notes, cautions, warnings and safety precautions before operating this device. "End Device" refers to your connector/transmitter or receiver 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 or listed on product labels.
- 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 connector/transmitter and can transmit simultaneously with your UWTC unit.
- Never install UWTC connector/transmitters within 20 cm or less from each other.
- Never install and/or operate your UWTC connector/transmitter closer than 20 cm to nearby persons.
- Never use your UWTC connector/transmitter 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

1.3 Product Labeling

1.3.1 Connector Front Labels

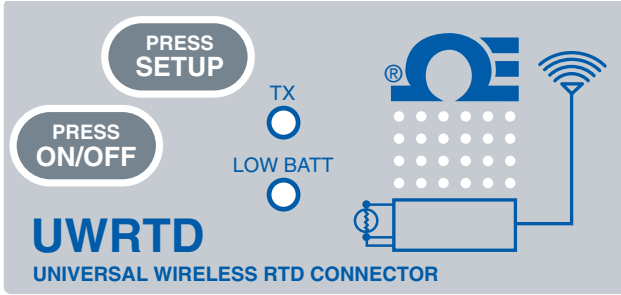


Figure 1-2A. UWRTD-1, UWRTD-2, Connector Front Label

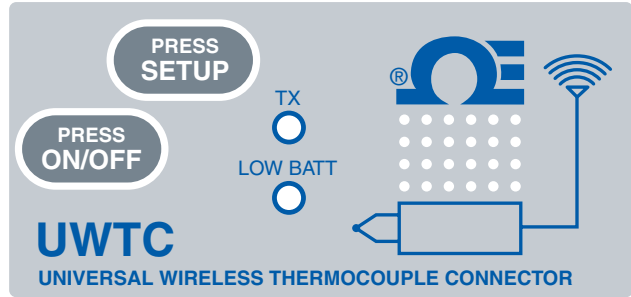


Figure 1-2B. UWTC-1, UWTC-2, Connector Front Label

1.3.2 Connector Rear Label

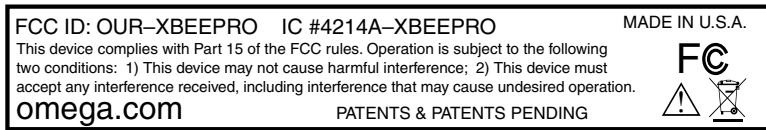


Figure 1-3. Connector Rear Label (UWTC-1, UWTC-2, UWRTD-1, UWRTD-2)

1.3.3 Receiver Front Labels

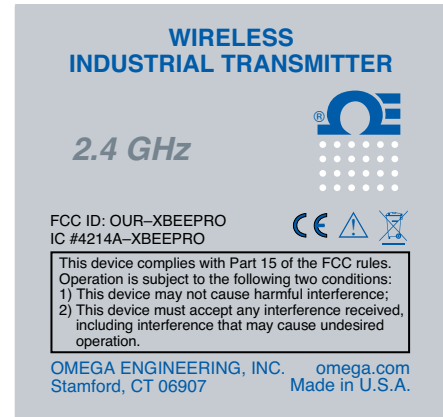


Figure 1-4. Transmitter Front Label (NEMA) UWTC-1, UWTC-2, UWRTD-1, UWRTD-2

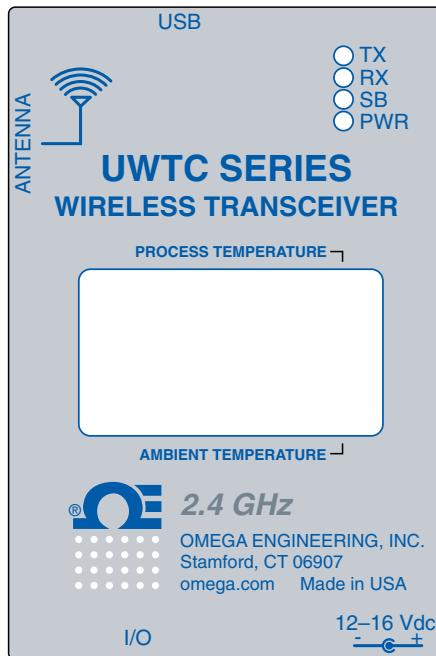


Figure 1-5A. Receiver Front Label UWTC-REC2-D

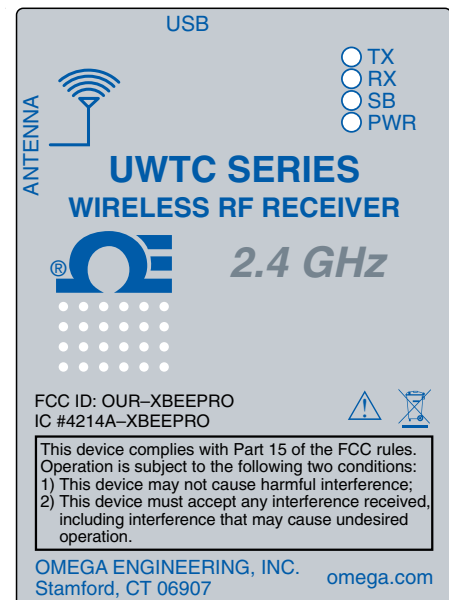


Figure 1-5B. Receiver Front Label UWTC-REC1

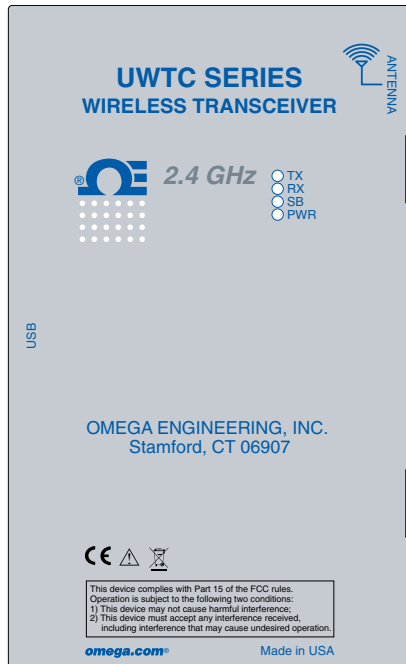


Figure 1-6A. Receiver Front Label
UWTC-REC1-NEMA

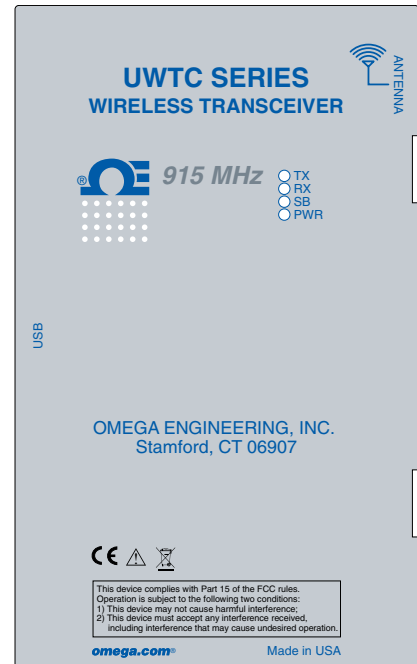


Figure 1-6B. Receiver Front Label
UWTC-REC1-915-NEMA

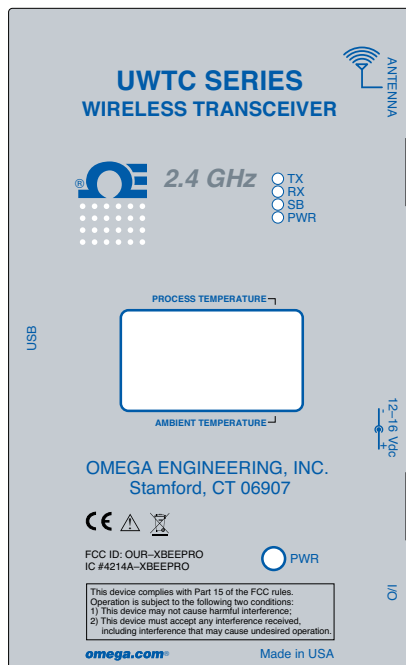


Figure 1-6C. Receiver Front Label
UWTC-REC2-D-*-NEMA

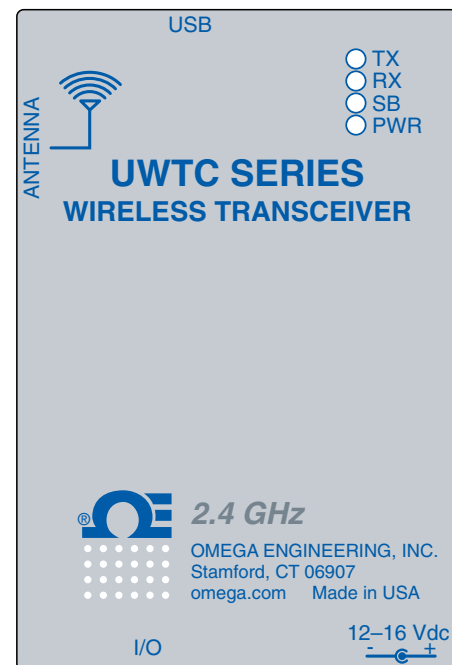


Figure 1-6D. Receiver Front Label
UWTC-REC2

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. For additional information see Section 10 - Approvals & Regulatory Compliance.

1.5 General Description and System Components

1.5.1 General Description

Your Wireless Thermocouple/RTD Connector Series features stand-alone, compact, battery powered wireless connectors that transmit their readings back to a host receiver up to 120 m (400') away. Each thermocouple unit can be programmed in the field to work as a type J, K, T, E, R, S, B, N or C calibration connector. Each RTD connector can be programmed for a 100 ohm, 2 or 3 wire configuration with a 0.00385 or 0.00392 curve. When activated the connector will transmit readings continuously at a pre-set time interval that was programmed by the user during the initial setup. Each unit measures and transmits: Process Input Reading, Connector Ambient Temperature, RF Signal Strength and Battery Condition to the host and is displayed on the PC screen in real-time using the downloadable software. When used with host receiver UWTC-REC1 data from up to 48 wireless connectors can be received and displayed. Each unit includes free downloadable software that converts your PC into a strip chart recorder or data logger so readings can be saved and later printed or exported to a spread sheet file.

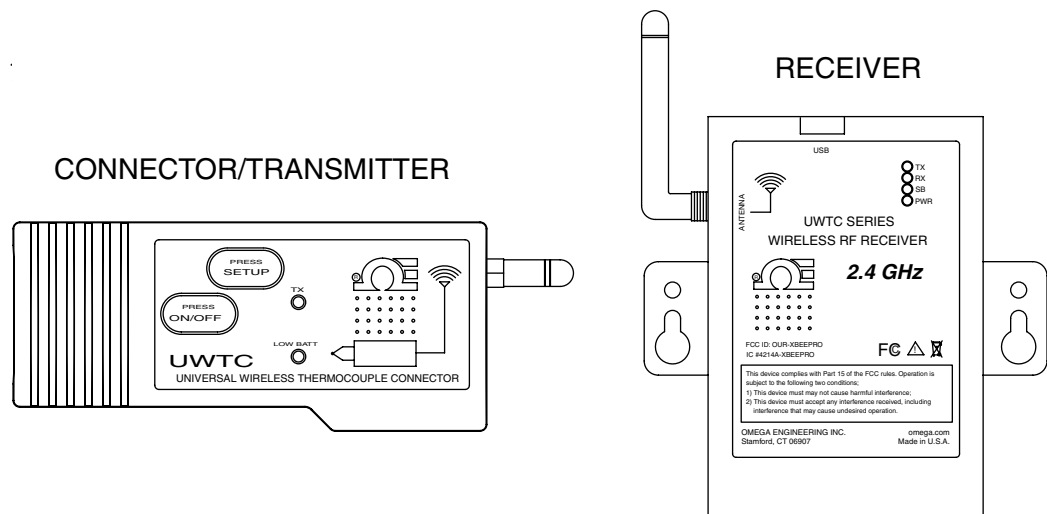


Figure 1-7. System Components

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 contact our Customer Service Department. We can be reached on the Internet and via e-mail. 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 box.

With UWTC-1, UWTC-2, UWTC-2-NEMA, UWRTD-1, UWRTD-2, or UWRTD-2-NEMA Connector/Transmitter:

- 1 Connector/Transmitter w/Antenna
- 1 UWTC Series Quick Start Guide (MQS4432)
- 1 Type-K Thermocouple Sensor (Omega No. SC-GG-K-30-36-PP) (UWTC-1 and UWTC-2 only)
- 1 Standard (AA) 3.6V Lithium Battery, (Omega No. UWTC-BATT) (for UWTC-1 & UWRTD-1) or 1 Standard (AA) 3.6V High pulse Lithium Battery (for UWTC-2 & UWRTD-2) or 1 standard (C) 3.6V Lithium Battery Assembly (Installed) Omega No. UWTC-BATT-C (for -NB9 or -NEMA versions).
- 1 Mounting Bracket Kit
- 1 TA4F Mating Connector (UWRTD-1 and UWRTD-2 only)

With UWTC-REC1, UWTC-REC2, UMTC-REC2-D, UWTC-REC4, UWTC-REC1-NEMA, UWTC-REC1-915-NEMA, UWTC-REC2-D-*-NEMA Receivers:

- 1 Receiver Device
- 1 Antenna
- 1 UWTC Series Quick Start Manual (MQS4432)
- 1 USB Interface Cable (For NEMA versions, 1 USB NEMA 4X Connector Cable)
- 4 Rubber Enclosure Feet (Only for UWTC-REC1, UWTC-REC2, UWTC-REC2-D, versions)
- I/O Cable (Only for UWTC-REC2-D-*-NEMA)

Section 3 – Software

3.1 Getting Started

The following program files are included on the UWTC User Software that can be downloaded from Omega's website.

- Universal Wireless End Device Configuration Wizard
- TC-Central Measurement and Data Logging Program

3.2 Software Installation

3.2.1 System Requirements

Your PC should meet the following minimum requirements:

- Pentium Class processor
- Hard Drive Space: 210 meg
- Ram: 256 meg or higher
- 1 Available USB Port
- 1 CD-ROM Drive
- Windows 2000, XP, Vista or Windows 7 Operating System
- Adobe Acrobat Reader

3.2.2 Software Installation

Download and install the free software that's available for your UWTC Series receiver. Your system should begin the installation process automatically. If the software installation does not start automatically please see the “Troubleshooting” Section 7.



Figure 3-1.
Welcome Screen

This welcome screen should be visible on your computer screen. To continue with installing the program click the “Next >” button.

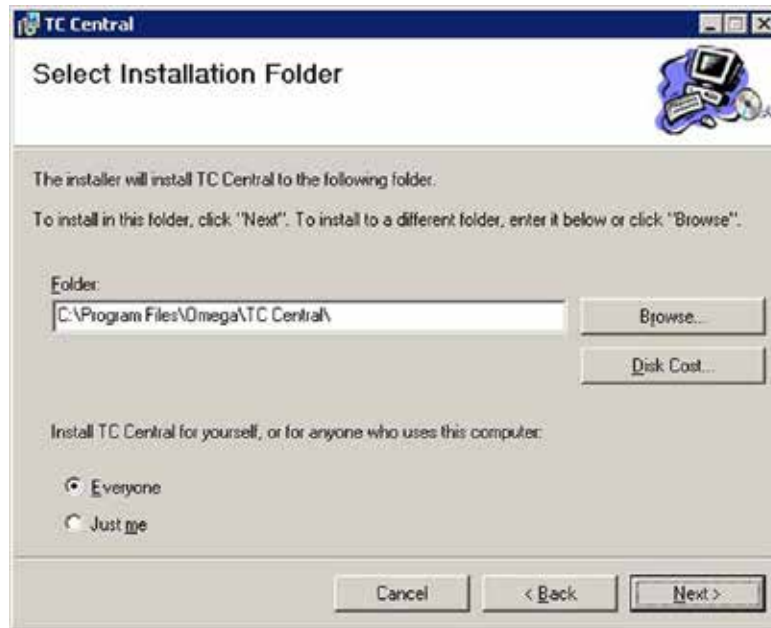


Figure 3-2.
Select Install Screen

From this screen you select the folder where you want the program files installed on your PC. The default setting will install the software under your "Program" folders in a new folder named "Omega". To continue with installing the program click the "Next >" button.



Figure 3-3.
Confirm Installation
Screen

The setup wizard now has all the information to complete the installation of the software on your PC. To continue with installing the program click the "Next >" button.



Figure 3-4.
License Agreement
Screen

From this screen you must select "Agree" to continue installing your program. After making your selection click the "Next >" button. The setup wizard will now install the software.

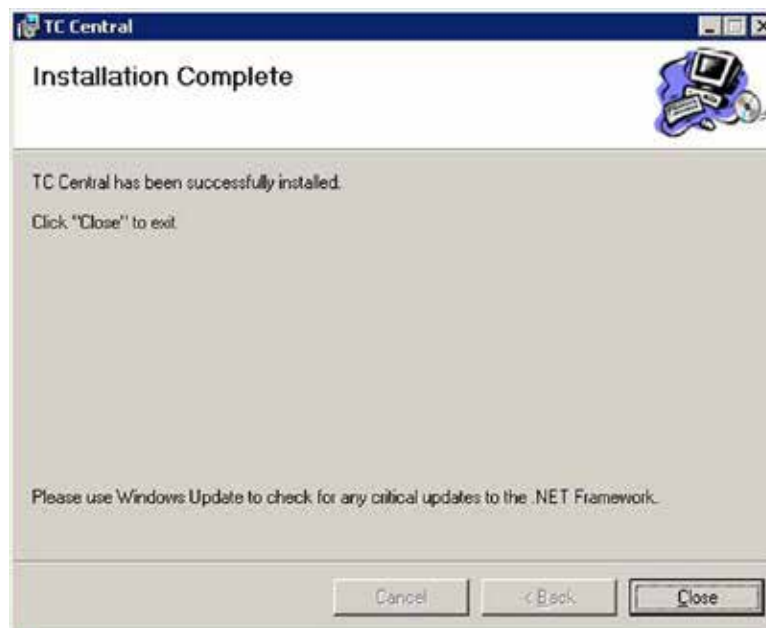


Figure 3-5.
Installation
Complete
Screen

Congratulations! You have just successfully installed the TC-Central Program on your PC. To end installing the program and close the setup wizard click the "Close" Button.

3.3 USB Driver Installation

To install the USB software drivers that are required for your UWTC system components to operate correctly follow these procedures.

NOTE:

You need to have the TC-Central User Software that was supplied with your receiver downloaded on your PC.

1. Connect your UWTC receiver to your computer with the USB cable provided in the box with your device. You should get a notice box that indicates that your computer “Has Found New Hardware”
2. Your computer will then launch the Found New Hardware Wizard. Follow the instructions indicated on the Wizard boxes and the additional instructions noted in this manual with each box.

NOTE:

After completing the Found New Hardware Wizard your system will ask that you repeat this process. This is normal. You should repeat the steps outlined here twice. After the second driver is installed you should then get the “New Hardware Ready For Use” notice.



Figure 3-6. Welcome To The Found New Hardware Wizard Screen

From this box you should check the “No, not at this time” button. Then click the “Next >” button to continue with the driver installation process.



Figure 3-7. Install Software Automatically Wizard Screen

Next, check the “Install the software automatically” button. Then click the “Next>” button to continue.



Figure 3-8. Completing The Found New Hardware Wizard Screen

This screen will be displayed to indicate that the software drivers have been installed. You should click the “Finish” button to complete the process.

3.4 UWTC Universal Wireless End Device Configuration Wizard

This utility is used to program your connector/transmitter for the following operating parameters: Thermocouple Type, Channel Number and Sample Rate. For complete instructions on using this program please see Section 4.

3.5 TC-Central Measurement and Recording Program

To launch the TC-Central program on your PC begin by accessing the “Programs” list under your “Start Menu” Next, scroll through the list of program folders to find the “TC-Central” folder. Inside the “TC-Central” folder click on the “TC-Central” program link. This will start the software running.

3.5.1 Channels TAB

When TC-Central starts up, the “Channels” tab is displayed. This view allows you to see temperatures and properties for up to 48 connector/transmitter at one time by using the scroll bar to the right of the screen.

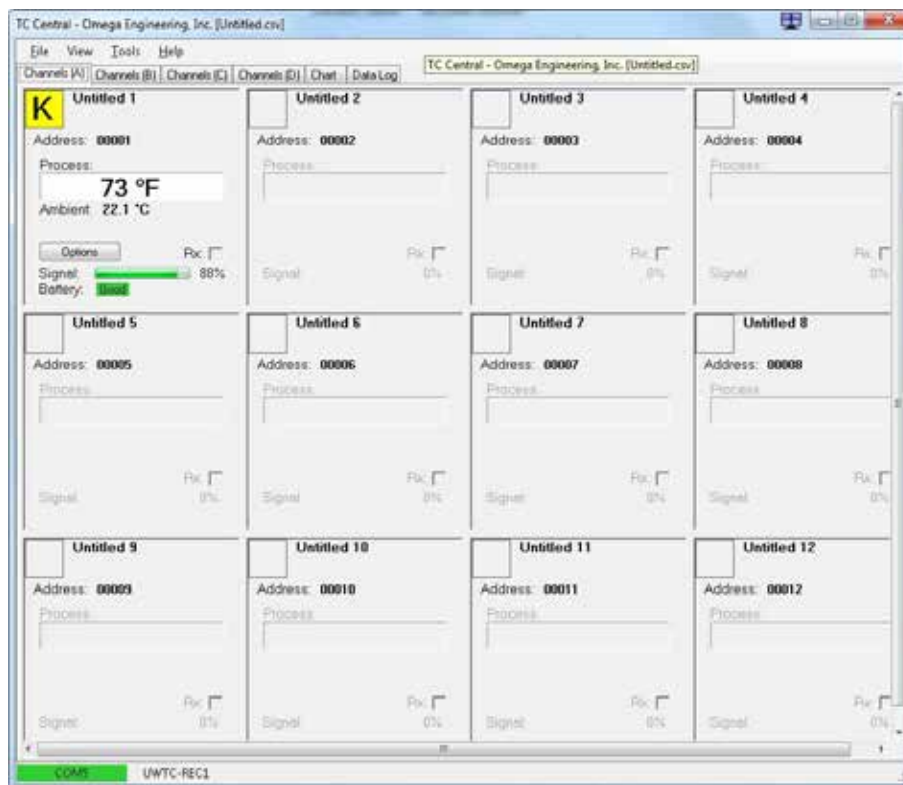


Figure 3-9. TC-Central Program Screen

This is a view of the TC-Central Program in operation. You will not have any blocks receiving data until you have programmed and placed into operation your connector/transmitters.

3.5.2 Setting up the TC-Central Program

Before you can make wireless measurements with your connector/transmitter the TC-Central software must be configured properly. The following steps outline how to setup your program.

3.5.3 Channel Configuration

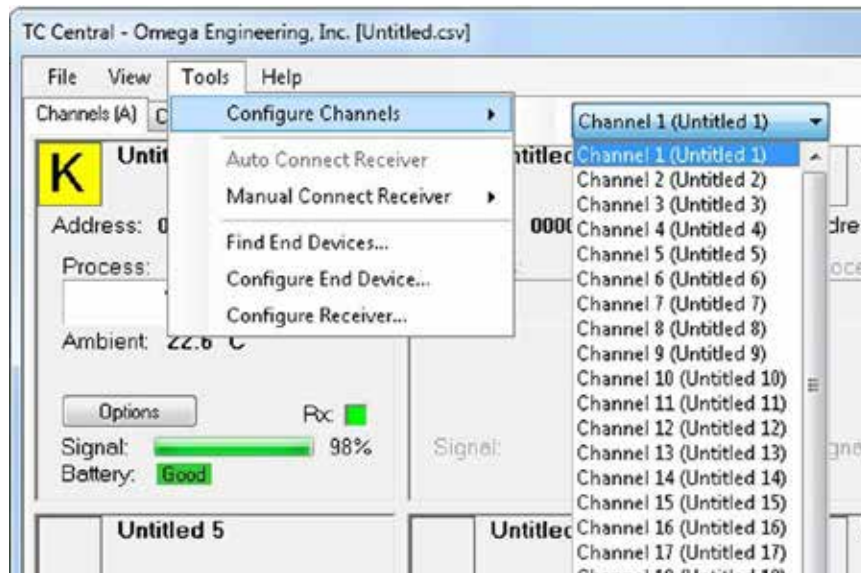


Figure 3-10. Channel Configuration Screen

From the “Tools” pull-down menu select “Configure”...“Channel 1” or click the “Options” button in the channel box you wish to configure. This will open the program settings table where you can make selections on how you want your system to operate.

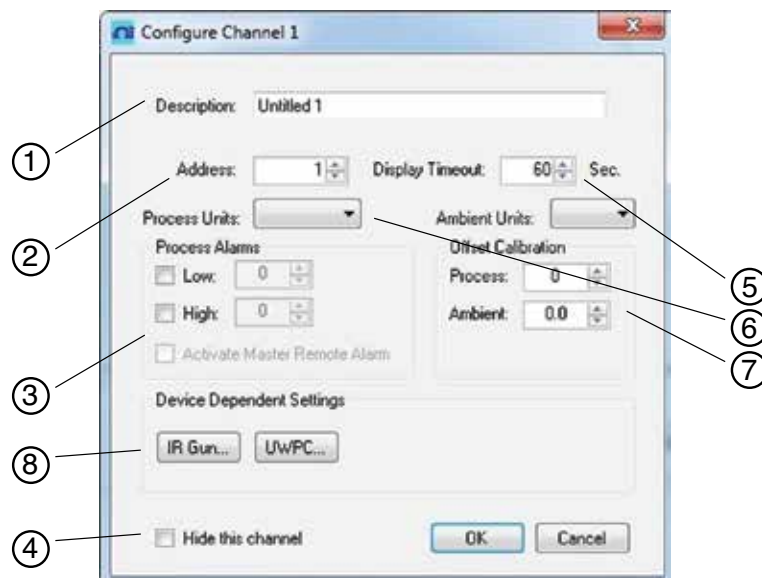


Figure 3-11. Configuration Channel 1 Screen

① Description Field

In the Description Field you can type a reference name that is associated with the location or process being measured by the connector/transmitter for address. Example: “Test Chamber 1”

② Address Field

Here you must set an address number into this box that corresponds to a matching Connector/Transmitter unit that you are using in your system. For the system to work correctly each Connector/Transmitter must have a number programmed that is different than other units in your system. Click with your mouse on the “Up” and “Down” buttons to advance to a higher or lower address number.

③ Low Alarm/High Alarm

When the “High” or “Low” Alarm box is checked the alarm feature becomes active. Click with your mouse on the “Up” and “Down” buttons to advance to a higher or lower setting. The displayed temperature reading will change to RED digits and begin blinking to indicate that the process temperature has gone below the low alarm or exceeded the high alarm value.

④ Hide

When the “Hide” box is checked the particular box that you are configuring will become inactive and will not show up on the screen when running the TC-Central program. This is used to remove unused boxes when less than 12 Connector/Transmitter units are being used.

⑤ Display Timeout

The Display Timeout setting is used to set how long you want the unit to continue showing the last reading data when communication between the Connector/Transmitter and receiver has been lost. Make sure not to set this value to a time less than the current sample rate programmed into the Connector/Transmitter or you will never receive and or display any readings.

⑥ Process Units

This drop down allows selection of the engineering units displayed for the process input. A similar drop down is available for the ambient units.

⑦ Offset

Offset Calibration

⑧ Device Dependent Settings

These buttons allow the user to perform additional configuration for specific end device types.

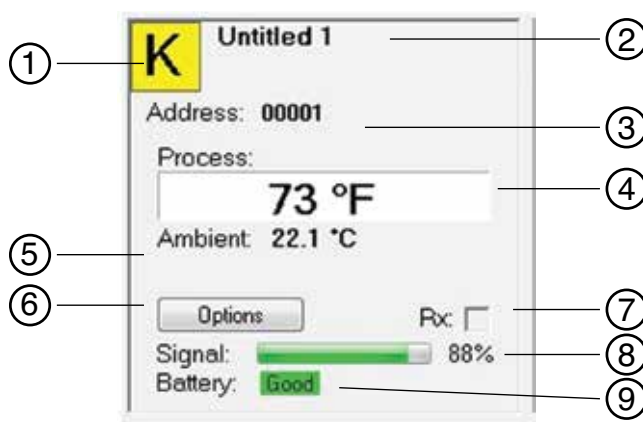


Figure 3-12. Channel Display Box Screen

① Thermocouple Sensor Type

This box indicates the type of thermocouple sensor that your connector/-transmitter has been programmed to operate with. As a default the thermocouple color codes have been set to the ANSI color codes. You can change these to IEC color codes, see section 3.5.2

② Reference

This location will display the reference name you typed into the "Description" field when this box was configured. This can be changed at any time.

③ Address

The number displayed here is the address number you specified when this display box was configured. This number must match the corresponding Connector/Transmitter that has the same number specified or your system will not receive the correct data readings.

④ Process

This is the actual process temperature reading that is being measured by your thermocouple or RTD sensor.

⑤ Ambient

This is the actual ambient temperature connector inside the body of your Connector/Transmitter. If the unit is exposed to temperatures outside the limits specified in this manual the reading will begin to blink and the digits will turn red to provide a visual warning.

⑥ Options

The Options button provides quick access to the channel configuration menu.

⑦ RX

The "RX" indicator box will display a green light that blinks each time the receiver acquires data from the corresponding connector transmitter.

⑧ Signal

This percentage bar graph indicates the radio signal strength being received by the receiver. This should be used as guidance when installing your system to help determine the best location and positioning of your equipment.

⑨ Battery

This label indicates the status of the battery. It will change from showing "Good" in green color to "Low" in red color when the battery is near the end of its useful life.

3.6 Chart Tab

The “Chart” tab allows you to start, stop and view real-time data from the transmitters in a screen plot that you can save and print.

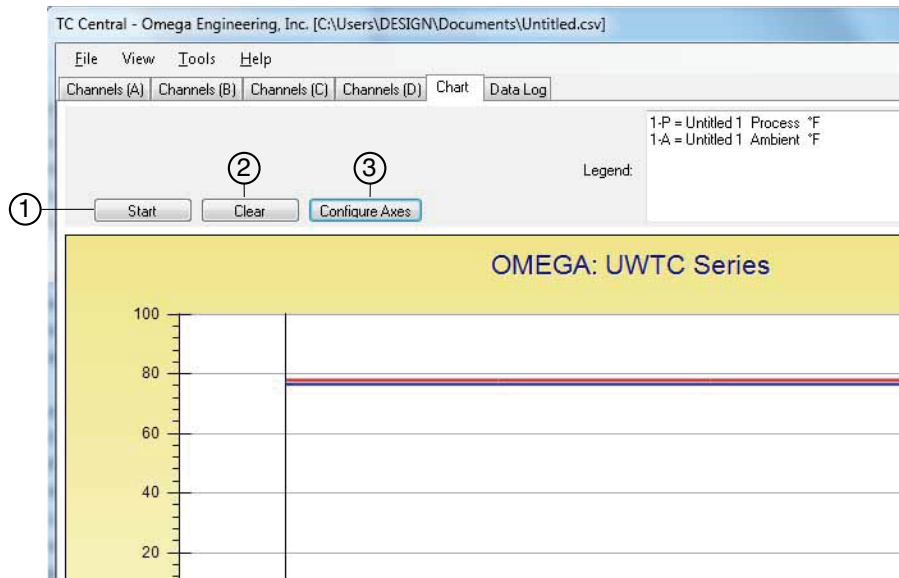


Figure 3-13. Charting Screen

① Start Button

The “Start” button will open the dialog box shown below. This dialog allows you to set all parameters related to logging and plotting data. Click the checkbox next to the channel(s) number you want to include in your plot.

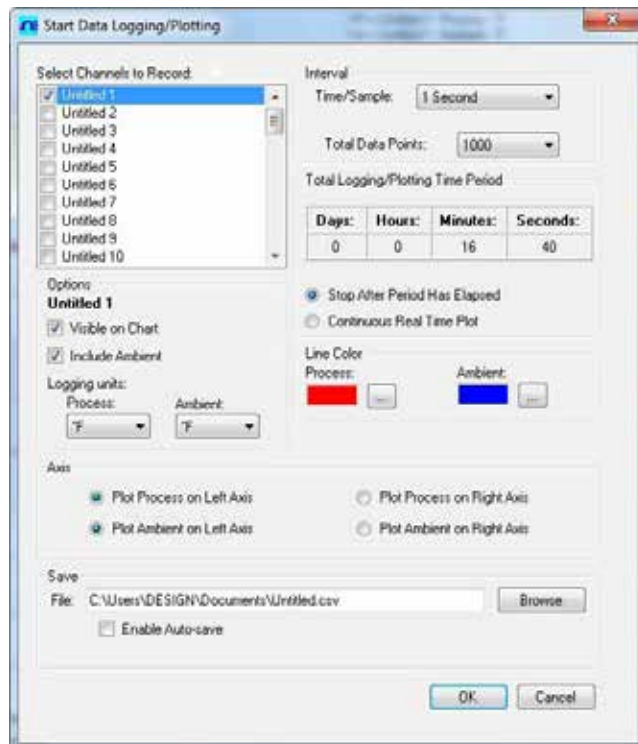


Figure 3-14. Start Data Logging/Plotting Screen

Line Color

You can change the color specified for each channel's line. Click the "Change" button to select a new color for the Channel selected.

Interval

The total logging time is displayed for the interval setting selected. In general, the interval should normally be set to a value equal to or greater than the same sample time you programmed into the corresponding connector/transmitter for that channel.

If you click the OK button, the data logging session will start, and "Recording Data" will flash in the status bar. The "Start" button above the chart will change to "Stop", indicating that if you click it again, the logging session will be terminated.

You can choose to have the data logging/chart recording session end after 1000 data points, or have the session run continuously. After 1000 data points have been collected in the continuous mode, the oldest data point is shifted out on the left, and the newest data point is added to the right. Data will continue to be collected and displayed until you click on the "Stop" button above the chart.

Logging Units

Two drop down selections are provided to set the units used in logging and plotting. One is for the process input and one for the ambient temperature of the end device.

② Clear Button

The "Clear" button will delete all data from the chart and the data log.

③ Configure Axis Button

The Configure Axis button opens the dialog box shown below. This dialog allows you to adjustments to both the X and Y axis of the chart.

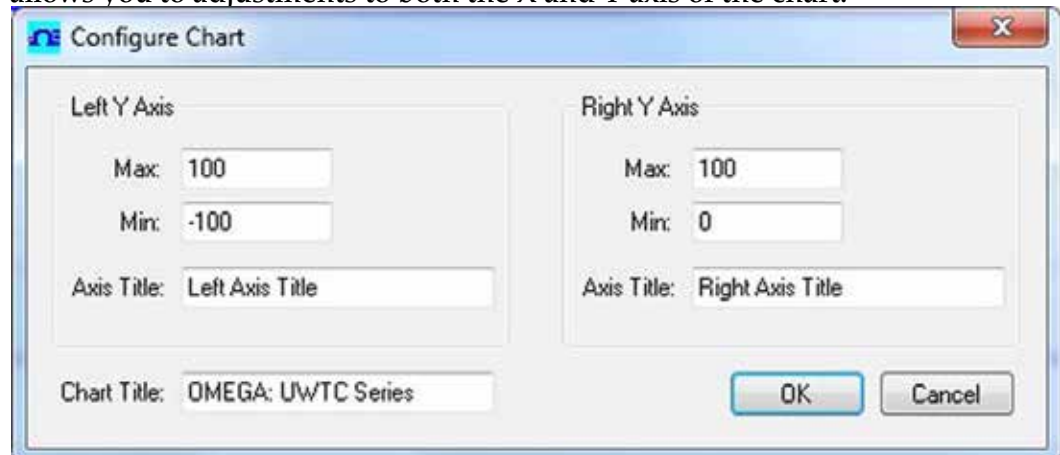


Figure 3-15. Configuration Chart Screen

3.7 Charting Options

You can access all of the charting options that are available by opening the chart option menu found under the “View” Tab. Alternatively, you can simply right click anywhere on the chart itself to bring up this menu.

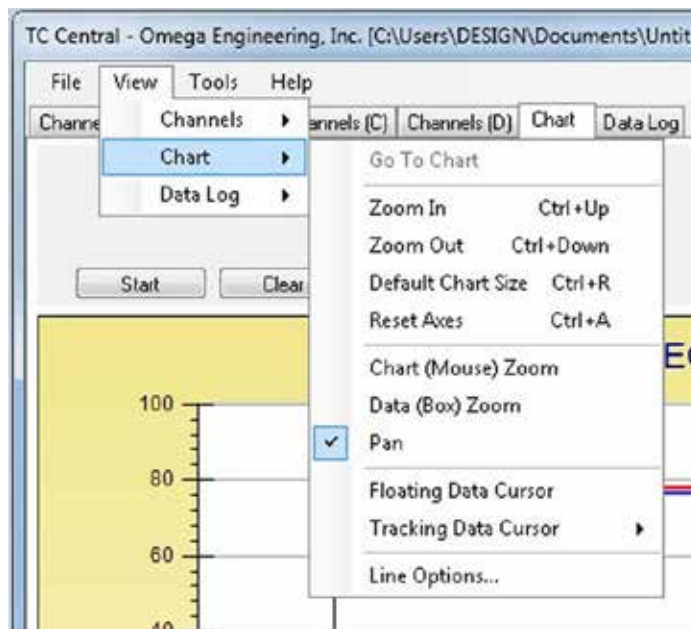


Figure 3-16. Charting Options Screen

Zoom In/Zoom Out

Allow you to change the size of the chart on the screen. You can also use the Control-Up Arrow and Control-Down Arrow keys as well.

Default Chart Size

Returns the chart to its normal size (after zooming or panning), and places the title and legend in their normal positions.

Reset Axes

Reset Axes will effectively cancel the results of a Data Zoom and return the axes back to their original dimensions, but will not change the size of the chart.

Chart (Mouse) Zoom

Perform the same function as mentioned above, by moving the mouse up or down, or rolling the mouse wheel.

Data (Box) Zoom

When checked, you can use the mouse to click and drag a rectangle around a line of data to magnify that portion of the chart. The chart size will remain the same, but the axes will be expanded as well and the data line(s) to allow viewing more detail. You can close either of the axis scroll bars by clicking on the Red button of each scroll bar.

Pan

Allows you to move the chart as well as the title and legend around on the screen. If the Pan item is checked, you can still use the mouse wheel to zoom in and out, while holding the left button down to move the chart as desired.

Reset Axes will effectively cancel the results of a Data Zoom and return the axes back to their original dimensions, but will not change the size of the chart.

Floating Cursor

When checked, will display a crosshair type cursor that you can move with the mouse. You can use the Floating Cursor to pinpoint a particular temperature and time. The status bar displays the data point number, the time, and the temperature, where the crosshairs meet. If the horizontal cursor line is touching a data plot line, the corresponding channel number is also displayed in the status bar.

Tracking Cursor

When checked, will perform similarly to the Floating Cursor, except that you can specify a channel for the horizontal cursor line to lock on to. This channel is also displayed in the status bar. With this option enabled, you can move the mouse left and right without regard to up and down, and the horizontal cursor will remain pointing to the line (channel) you specify. Assuming you have more than one channel plotted on the chart, you can switch tracking to another channel by moving the mouse over the data line of that channel until the mouse cursor becomes a hand with a pointing finger. If you left-click at this point, the Tracking Cursor will track that line. You can also change the channel of the Tracking Cursor from the chart's context menu, Tracking Cursor menu item combo box. The same option is also available in the View Chart menu in the main menu bar

Line Options

Allows you to select which channel(s) you want to display, and/or change the color of each channel data line. This allows you to limit your view to either a single channel, or a selected two or more channels for comparison, instead of having all twelve channels displayed at once.

3.8 Data Log Tab

The “Data Log” tab allows you to view received data from a connector/transmitter in a table format as it is being recorded. This data can be saved and printed.

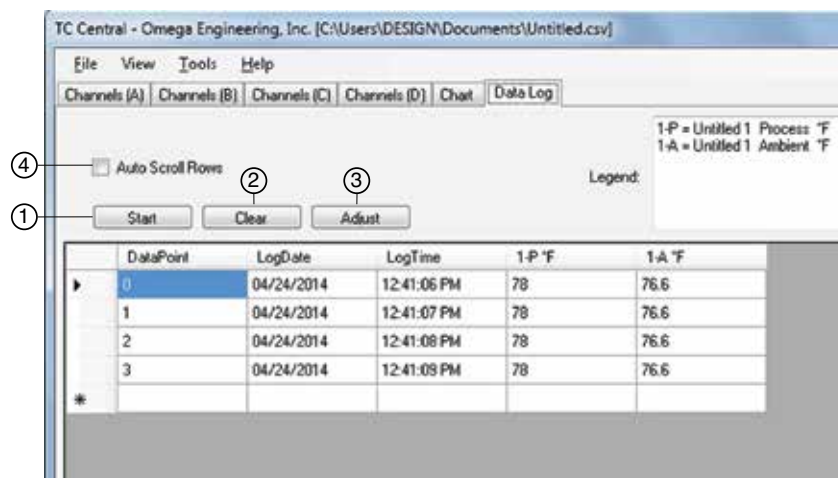


Figure 3-17. Data Logging Screen

① Start Button

The Start button opens the dialog box shown in figure 3-14 and described in section 3.6.

② Clear Button

The “Clear” button will delete all data from the data log.

③ Adjust Button

Resizes the columns to the smallest size necessary to fit all the data in the columns.

④ Auto Scroll Rows

The Auto Scroll Rows check box causes the data to be scrolled up one line each time a new row of data is added to the grid.

3.9 Menu Tabs

3.9.1 File Menu

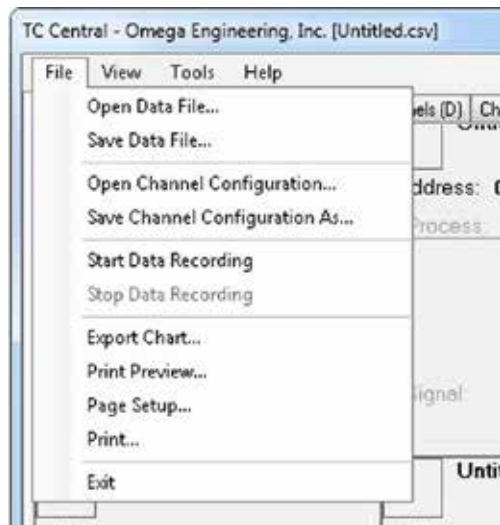


Figure 3-18.
File Menu Screen

Open Data File...

Displays a dialog box which allows you to choose a data file to open and display on the chart and in the data log. This file must be a file that was saved by the Save menu item in TC Central. If the file has been modified externally, you may not be able to open it.

Save Data File...

Displays a dialog box which allows you to save the data currently displayed on the chart and in the data log. The file format is either tab separated (*.txt) or (*.csv) (comma separated values), which can be opened by Microsoft Excel for further analysis and charting. It is strongly recommended that you do not modify this file, or you may not be able to open it again in TC Central. Use Excel's "Save As" option to save it as a Microsoft Excel Workbook (*.xls), which you can then modify.

Start Data Recording...

Performs the same function as the Start button on the Chart and Data Log Tabs.

A dialog box is displayed allowing you to select one or more channels to be plotted and logged by checking the checkbox next to the channel number. You can also change the color of each channel's line.

The interval should be set as desired for your particular needs. The total logging time is displayed for the interval setting selected. In general, the interval should normally be set to a value equal to or greater than the "Seconds per Sample" you configured into the transmitter using the UWTC Configuration Wizard.

You can choose to have the data logging/chart recording session end after 1000 data points, or have the session run continuously. After 1000 data points have been collected in the continuous mode, the oldest data point is shifted out on the left, and the newest data point is added to the right. Data will continue

If you click the OK button, the data logging session will start, and “Recording Data” will flash in the status bar. The “Start” button above the chart and data log will change to “Stop”, indicating that if you click it again, the logging session will be terminated.

Stop Data Recording...

Performs the same function as the “Stop” buttons on the Chart and Data Log Tabs, by terminating any data logging/plotting session in progress.

Export Chart...

Displays a dialog box that allows you to either save an image of the current chart on the Chart Tab, or copy it to the clipboard.

Print Preview...

Displays a standard Windows Print Preview dialog, allowing you to view the item(s) as they would be printed on a printer. You can also print from this dialog by clicking the printer icon in the upper left corner. If the Channels Tab is displayed before choosing this option, a screen snapshot of the Channels Tab will be previewed. If the Chart Tab is displayed before choosing this option, the current chart image will be previewed. If the Data Log Tab is displayed, the data table in grid style format will be previewed.

Page Setup...

Displays a standard page setup dialog box which allows you to change the page orientation, margins, paper size, etc. You can then select the Print Preview menu to view your changes without printing.

Print...

Displays a standard print dialog box. This allows you to select printers, printer preferences, page ranges, number of copies, etc. If you click the “Print” button, the specified page(s) will be sent to the printer. If you click the “Apply” button, you can then select the Print Preview menu to view your changes without printing.

Exit...

Will exit and close the TC-Central program.

3.9.2 View Menu



Figure 3-19. View Menu Screen

Channels

Performs the same functions as the Channels context menu, except for the Configure menu item. See Channels TAB Menu (Section 3.5) for an explanation of this menu.

Additionally selection of channel tabs and thermocouple color codes can be made here. By default the setting for thermocouple color code is the American National Standards Institute (ANSI) standard. You can change the default setting to the International Electrotechnical Commission (IEC) standard or the Japanese standard.

Chart

Performs the same functions as the Chart context menu. See Chart Tab Menu (Section 3.6) for an explanation of this menu.

Data Log

Performs the same functions as the “Auto Scroll Rows” checkbox and the “Adjust” button on the data log. See Data Log Menu (Section 3.8) for an explanation of these functions.

Changing Thermocouple Color Codes.

By default the setting for thermocouple color code is the American National Standards Institute (ANSI) standard. You can change the default setting to the International Electrotechnical Commission (IEC) standard or the Japanese standard here under this menu in the CT-Central software.

3.9.3 Tools Menu

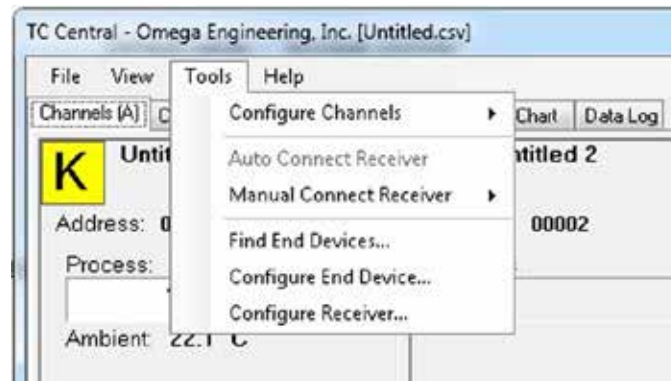


Figure 3-20. Tools Menu Tab Screen Configuration

Displays the same dialog box as the Channels context menu, Configure menu item, after you select a channel to configure. See Channels Tab above for an explanation of this dialog box.

Auto Connect Receiver

Normally disabled, if you have established communications with a receiver connected to your PC. If for some reason such as the receiver being replaced with a different one, this menu item will be available. When selected, TC Central will send “+++” to each and every available COM port in an attempt to identify a port with a receiver connected to it. If TC Central finds a receiver, it will perform the necessary configuration of the receiver and display the COM port number in Green in the status bar. Even though your receiver is connected via a USB Cable, the USB drivers installed create a “virtual” COM port, usually a port number greater than COM4. Once connected, TC Central saves (remembers) the port number you are using, and will automatically connect to it the next time TC Central is started.

Manual Connect Receiver

Is available if you do not want TC Central to send “+++” to all of your serial ports. If you know the COM port number used by your receiver, you can connect to it from this menu without disturbing other COM ports. You can also use this menu to connect to a second receiver connected to the PC on a different COM port.

Find End Devices...

This will display a list of all end devices that have been detected by the receiver as shown in the figure below.

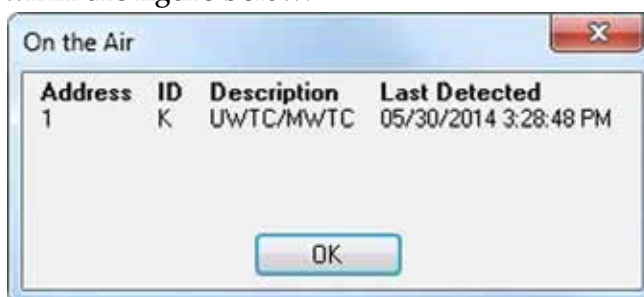


Figure 3-21. End Device Screen

Configure End Devices

Launches the Universal End Device Configuration Wizard. When you follow the steps in the wizard, you will be able to configure each transmitter (one at a time) for the thermocouple type, the transmitter address, and the sample rate.

Configure Receiver

Launches the dialog for configuring the receiver. See Section 5.1.2 for additional information.

Section 4 – Transmitter/Connector Operation

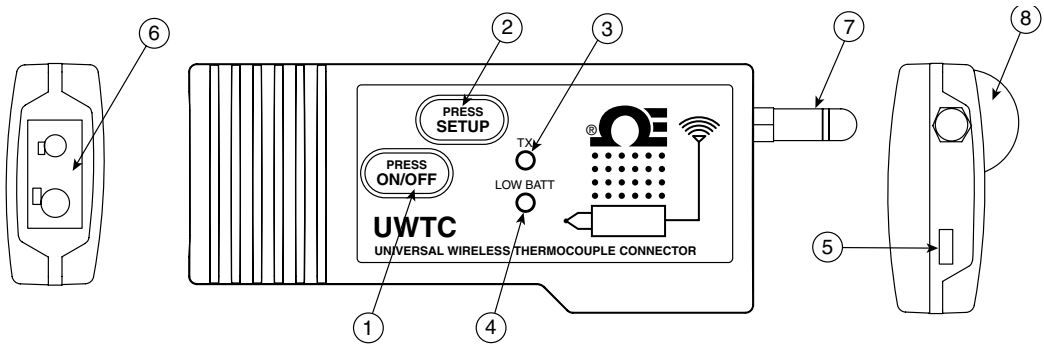
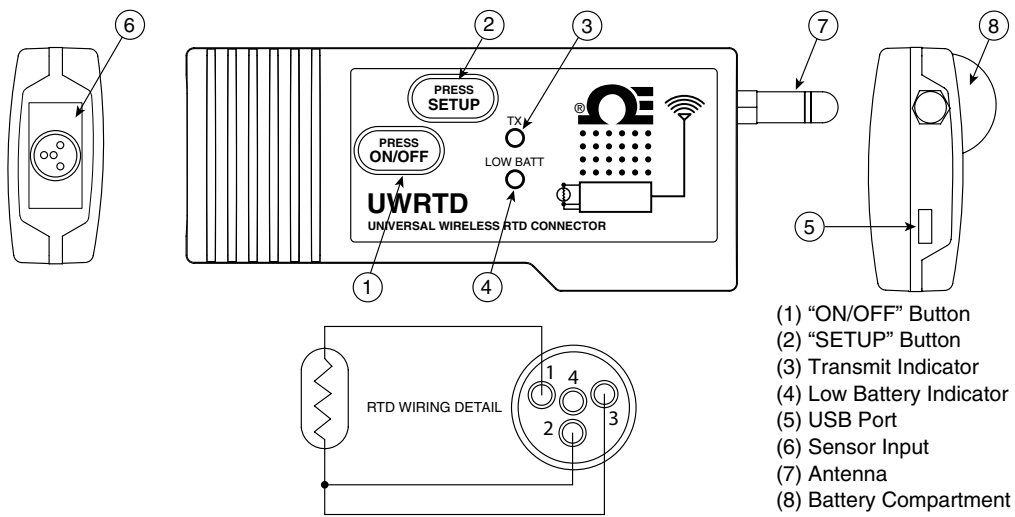
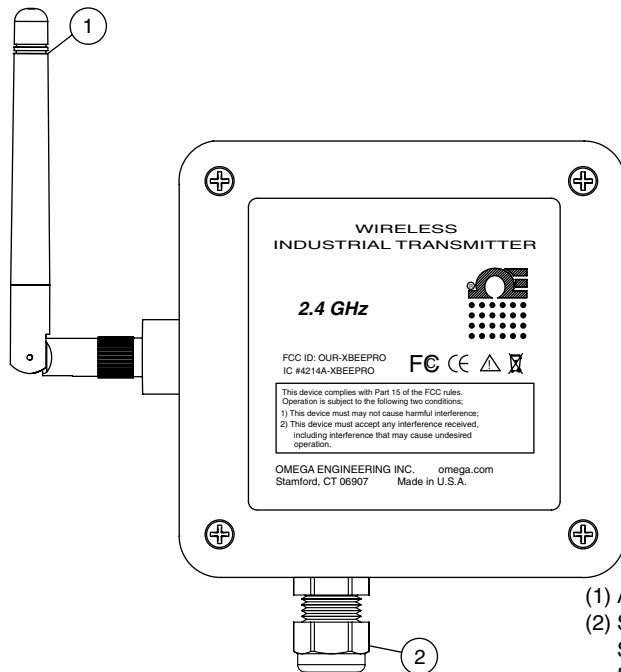


Figure 4-1A. Thermocouple Connector (UWTC-1, UWTC-2)



- (1) "ON/OFF" Button
- (2) "SETUP" Button
- (3) Transmit Indicator
- (4) Low Battery Indicator
- (5) USB Port
- (6) Sensor Input
- (7) Antenna
- (8) Battery Compartment

Figure 4-1B. RTD Connector (UWRTD-1, UWRTD-2)



- (1) Antenna
- (2) Sensor Cable
See Fig. 4-2A & 4-2B
for more info.

Figure 4-1B. Thermocouple/RTD Connector (UWTC-2-NEMA, UWRTD-2-NEMA)

Industrial Probe (Thermocouple Versions)
 UWTC-NB9, UWTC-NB9-NEMA, UWTC-2-NEMA

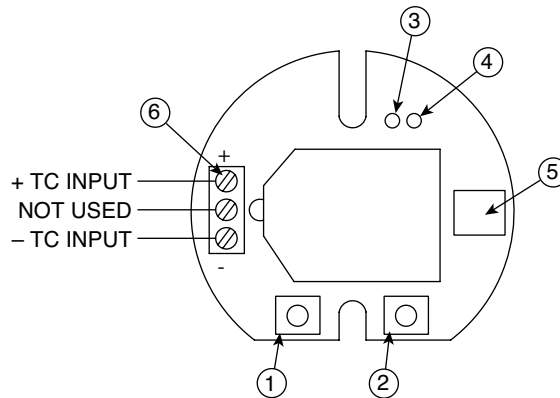
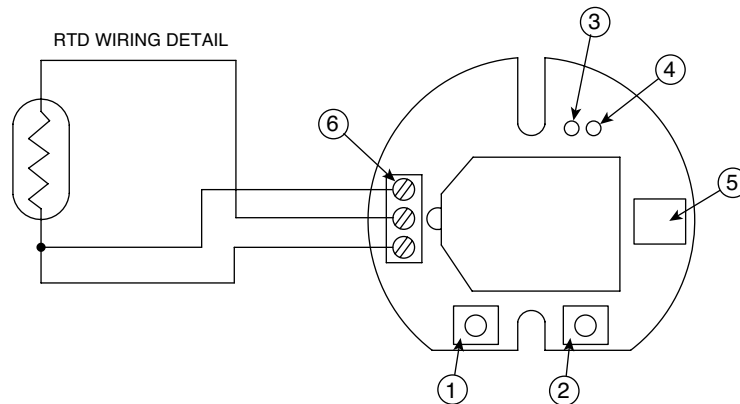


Figure 4-2A. Thermocouple Version

Industrial Probe (RTD Versions)



UWRTD-NB9, UWRTD-NB9-NEMA, UWRTD-2-NEMA

Figure 4-2B. RTD Version

- (1) "SETUP" Button (2) "ON/OFF" Button (3) Transmit Indicator
 (4) Battery Indicator (5) USB Port (6) Sensor Input

4.1 Setup and Configuration

4.1.1 Connecting your device

Connect the USB cable to your connector/transmitter unit and also to an available USB port on your computer. See figure below. This cable was



4.1.2 Configure Your Connector/Transmitter

Now that you have connected your USB cable to your PC and connector/transmitter you will complete the following steps to configure your connector/transmitter before placing the unit into operation. You will be using the configuration software utility that you installed onto your PC in Section 3.2.

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 connector/transmitter.

Connector Options:

For UWTC - Thermocouple Type:

This will program your device to provide the correct temperature readings to your receiver for the type of thermocouple you will be using. Available types are J, K, T, E, R, S, N, B.

For UWRTD - RTD Type:

This will program your device to provide the correct temperature readings to your receiver for the type of RTD you will be using.

NOTE:

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

For the first receiver:

Set the addresses on your connector/transmitters to 101, 102, 103, 104, etc. Then set the addresses in your TC-Central user software to match.

For the second receiver:

Set the addresses on your connector/transmitters to 201, 202, 203, 204, etc. Then set the addresses in your TC-Central user software to match.

This numbering scheme can be expanded to match the number of receivers you are using.

Transmitter Address:

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

Sample Rate:

This will program your 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 effect on the life of the battery in your connector/transmitter. It is recommended that you set the longest sample time that your application can live with to extend time between battery replacement. See Section 6 for more information on battery life.

RF Channel:

Sets the channel number used for transmitting data to the receiver. Can be set in the for any value from 12 to 23.

Network ID:

Sets the ID of the network for the corresponding receiver.

Receiver Address:

Sets the address of the corresponding receiver.

STEP 1. Enter the "SETUP" mode.

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

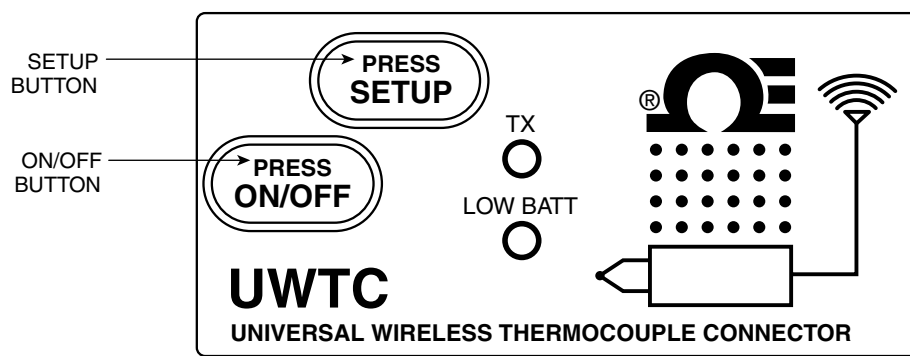


Figure 4-3. Setup Mode

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 connector/transmitter is ready to run the configuration utility software.

STEP 2. Launch Setup Utility Program.

To launch the End Device Configuration Wizard. program on your PC begin by accessing the "Programs" list under your "Start Menu".

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

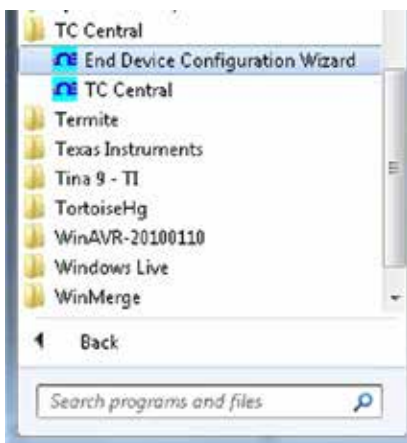


Figure 4-4.
Launch Setup Utility Program

STEP 3. Programing your settings into a connector/transmitter.

Figure 4-5.
Welcome To
End Device
Configuration
Wizard
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 connector/transmitter. Each screen will provide instruction details on how to proceed.



Figure 4-6.
Connect The
End Device
Screen

If you have not already connected your connector/transmitter 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 connector/transmitter.



Figure 4-7. Setup The End Device Screen

If you have not already placed your connector/transmitter 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 connector/transmitter.



Figure 4-8. 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 this confirmation of proper communication you should click the “Back” button to try connecting again. If you still do not obtain a good connection visit the “Troubleshooting” Section of this users guide for additional help.



Figure 4-9.
Read
Settings
Screen

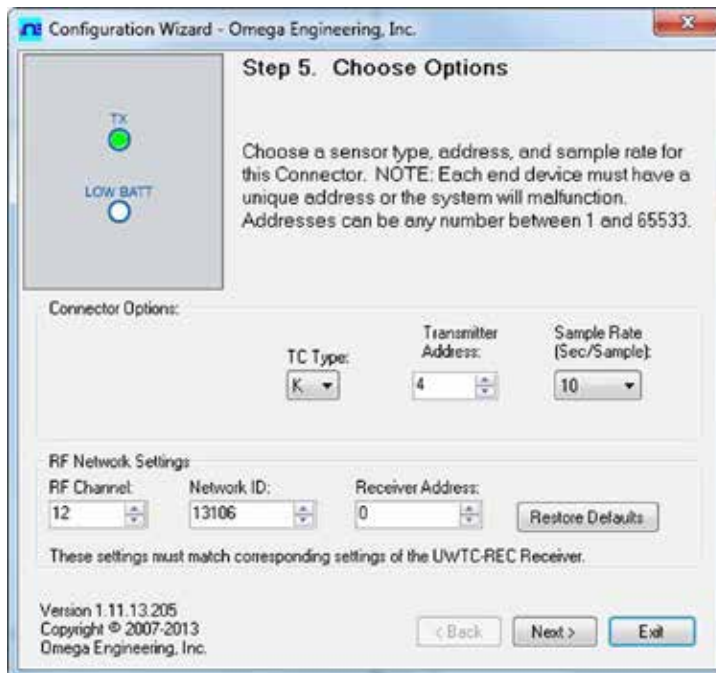


Figure 4-10.
Choose
Options
Screen

From this screen you will select the main operating settings for your connector/transmitter. Start by selecting the type of Thermocouple you will be using. Then select the address setting for this unit.

NOTE:

Each connector/transmitter must have a different address number than other units in your system for proper operation).

Then select the sample rate that your unit will transmit data to the receiver. After making your selections click the “Next >” button to proceed and program your settings into connector/transmitter.

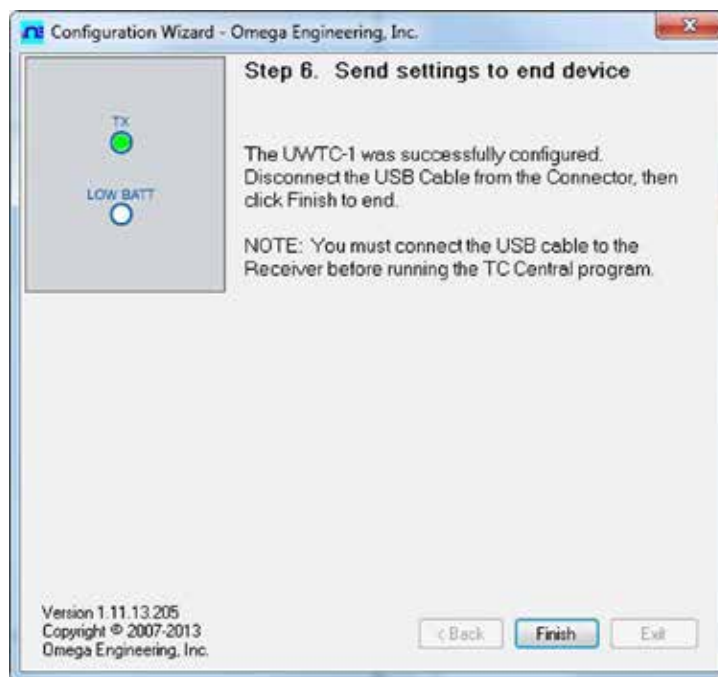


Figure 4-11.
Send Settings
To End Device
Screen

Congratulations! You have successfully programmed your connector transmitter. After your unit has been programmed click the “Finish” button to close the utility program or click the “Start” button to begin setting up a second unit. You can now disconnect your connector transmitter from the programming cable. Press the “Setup” button on the connector/transmitter one time to exit the “Setup” mode.

4.2 Mounting, Installation and Antenna Connection

4.2.1 Mounting & Installation

A mounting bracket kit has been supplied with your connector/transmitter. The diagram below shows dimensions and how to install your mounting bracket.

Your UWTC-2-NEMA and UWRTD-2-NEMA connectors come with built-in mounting holes. See Fig. 4-12B above for mounting dimensions.

NOTE:

TIP: Use the plate as a template to mark the location of the mounting holes you need to drill before installing the mounting kit onto the connector transmitter.

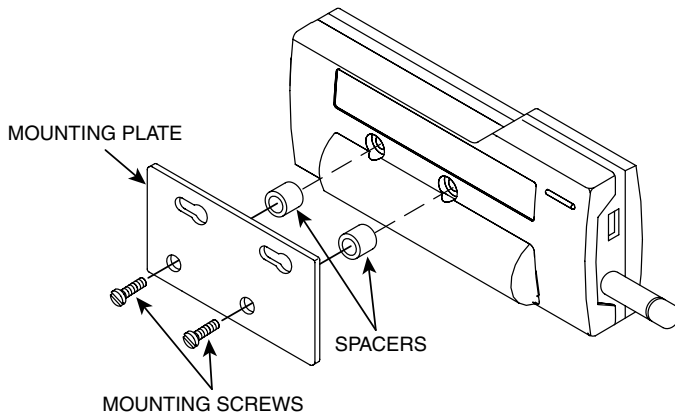


Figure 4-12A. Mounting Bracket Installation
UWTC-1, UWTC-2, UWRTD-1, UWRTD-2
4.2.2 Mounting

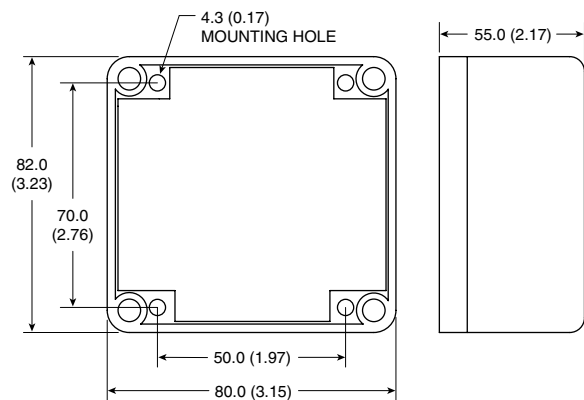


Figure 4-12B. Mounting Dimensions
UWTC-2-NEMA, UWRTD-2-NEMA

When mounting your connector/transmitter, care should be taken to make sure it is as far away from any metal objects. If nearby metal gets too close to your connector/transmitter, 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.

4.2.3 Installation

When installing your connector/transmitter 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 connector/transmitter and your receiver.

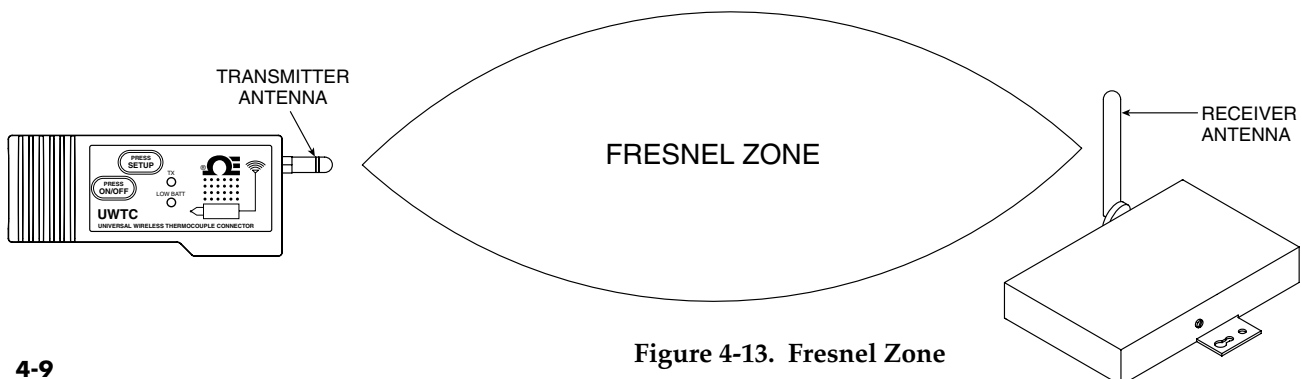


Figure 4-13. Fresnel Zone

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 connector/transmitter 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 connector/transmitter 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 it's antenna is located within 20 cm of your connector/transmitter and can transmit simultaneously with your UWTC unit.

NOTE:

Never install UWTC connector/transmitters within 20 cm or less from each other.

NOTE:

Never use your UWTC connector/transmitter as a portable device. Your unit has been designed to be operated in a permanent installation only.

4.2.4 Antenna Connection

Your device has been shipped to you a standard antenna already attached. You may remove and install Omega No. UWTC-ANT-LR high gain antenna to improve range and signal strength if needed. This antenna is sold as an accessory.

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.

NOTE:

Use of any other antenna than what's supplied with your device will void all FCC and CE regulatory compliance.

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

4.3 - Thermocouple Connections

Your connector/transmitter has been design with a patented universal input that will interface with most industry thermocouple connectors. Omega's Miniature (SMP) Series and Standard (OST) Series of connectors will plug directly into the side of your unit. Omega's line of thermocouple probes with connectors attached will also plug directly into your unit.



Patented Universal
Input OST Series



Miniature Connector



Standard Connector

Figure 4-14. Thermocouple Connection

4.3.1 Thermocouple Operating Environment and Placement

4.3.2 Ambient Temperature Concerns

Your Connector/Transmitter is rated for use in ambient temperatures between -10°C (14°F) to 70°C (158°F). Exposure to temperatures below or above these stated temperatures can cause your device to malfunction and produce incorrect operation. When installing your thermocouple probe care should be taken to make sure your connector/transmitter will not be operated in an environment outside the specifications outlined in Section 9.

4.3.3 Recommended Placement

For applications where the ambient temperature around the thermocouple probe has the possibility of exceeding the operating conditions outlined in Section 9 of this manual, the connector/transmitter should be mounted away from the thermocouple probe in an area within the normal operating conditions of -10°C (14°F) to 70°C (158°F). See Below.

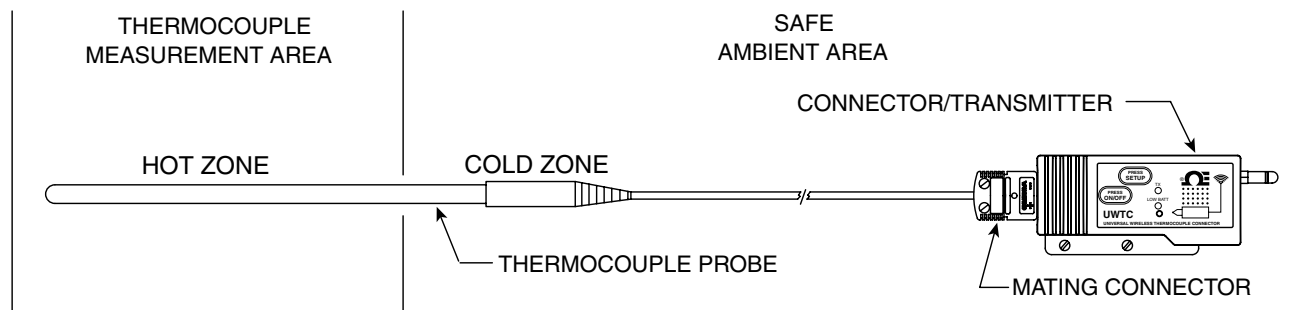


Figure 4-15. Recommended Thermocouple Placement

CAUTION:

Installing your connector/transmitter in an application where the device 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.

4.4 RTD Connection

Your connector/transmitter has been designed with a RTD input that will interface with Omega's TA4F connector. This connector will plug directly into the side of your unit as shown below. A mating connector was provided in the box with your unit (UWRTD-1, UWRTD-2 only).



RTD Receptacle



RTD Connector

Figure 4-16. RTD Connection

4.4.1 RTD Operating Environment and Placement

4.4.2 Ambient Temperature Concerns

Your Connector/Transmitter is rated for use in ambient temperatures between -10°C (14°F) to 70°C (158°F). Exposure to temperatures below or above these stated temperatures can cause your device to malfunction and produce incorrect operation. When installing your RTD probe care should be taken to make sure your connector/transmitter will not be operated in an environment outside the specifications outlined in Section 9.

4.4.3 Recommended Placement

For applications where the ambient temperature around the RTD probe has the possibility of exceeding the operating conditions outlined in Section 9 of this manual, the connector/transmitter should be mounted away from the thermocouple probe in an area within the normal operating conditions of -10°C (14°F) to 70°C (158°F). See Below.

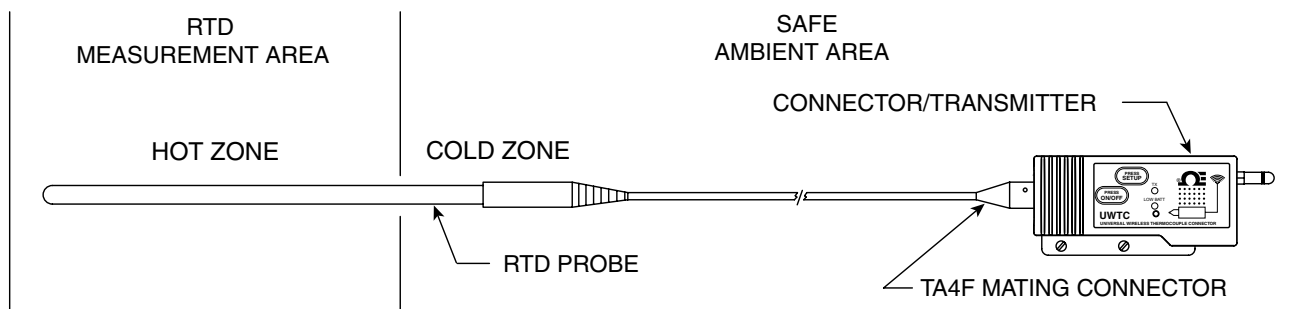


Figure 4-17. Recommended RTD Placement

4.5 Battery Installation or Replacement

4.5.1 UWTC-1, UWTC-2, UWRTD-1, UWRTD-2

To install or replace the battery in your Connector/Transmitter you must first remove the two screws located on the back side of your device. This will allow you to access the battery compartment.

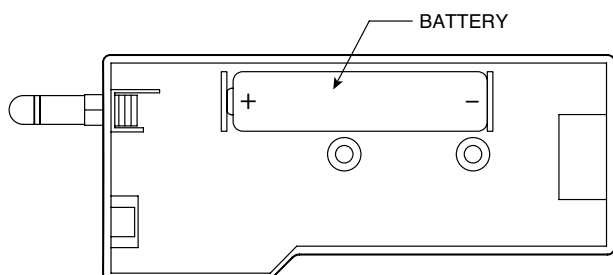


Figure 4-18A. Battery Replacement UWTC-1, UWTC-2, UWRTD-1, UWRTD-2

4.5.2 UWTC-2-NEMA & UWRTD-2-NEMA

To install or replace the battery in your End Device you must first remove the four screws located on the Lid of the enclosure. This will allow you to access the battery compartment.

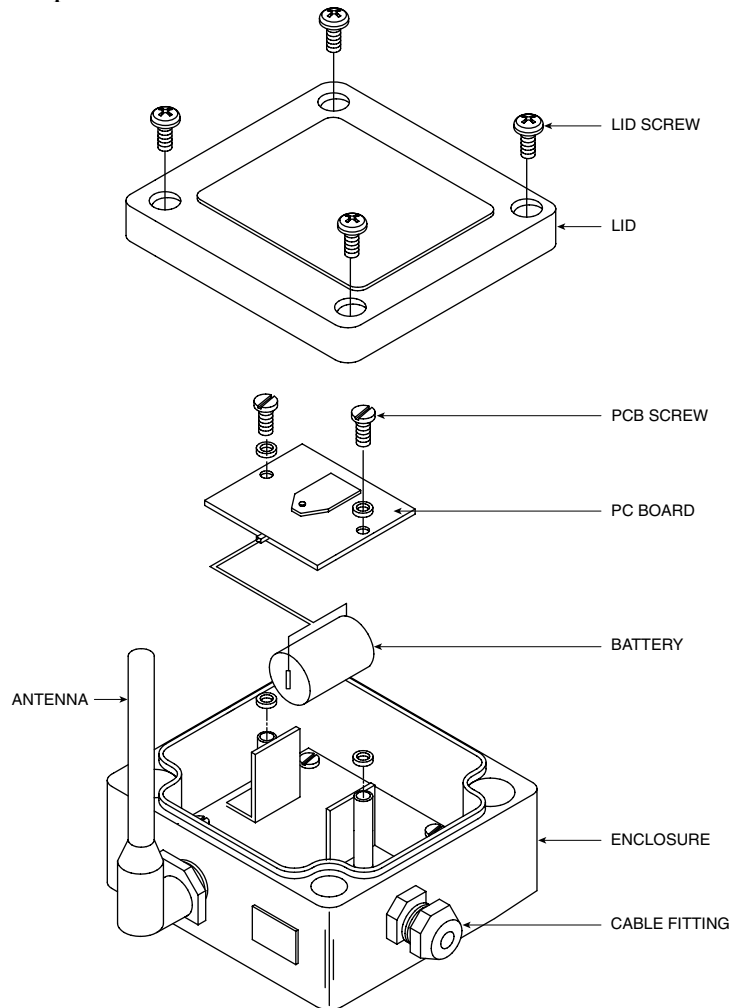


Figure 4-18B. Battery Placement UWTC-2-NEMA, UWRTD-2-NEMA

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

- A. Remove the two screws that secure the main circuit board assembly.
- B. Lift the circuit board just high enough to allow you to unplug the connector that attaches the battery assembly to the bottom of the circuit board.
- C. Remove the old power cell.
- D. Install your new battery assembly into the housing in the same position as the old battery was located.
- E. Connect the battery assembly connector to the mating connector on the bottom of the circuit board.
- F. Install the circuit board back into the housing and secure with the two screws you removed in step one.
- G. Installation complete.

WARNING:

Lithium batteries may get hot, explode or ignite and cause serious injury if exposed to abusive conditions. Be sure to follow the safety warnings listed below:

Your transmitter operates with one 3.6V Lithium Battery. Omega Replacement Part Number UWTC-BAT-C. Never operate your transmitter with a different battery than what is specified in this manual or on the product data sheet.

Do not discharge the battery using any device except your Transmitter unit. When the battery is used in devices other than the specified device, it may damage the battery or reduce its life expectancy. If the device causes an abnormal current to flow, it may cause the battery to become hot, explode or ignite and cause serious injury.

Refer to the Omega technical data sheet or this manual for the temperature ranges over which the battery can be operated. Use of the battery outside this temperature range may damage the Transmitter or reduce the performance and life of the battery.

- Do not place the battery in fire or heat the battery.
- Do not store batteries with other hazardous or combustible materials.
- Do not install the battery backwards so the polarity is reversed.
- Do not connect the positive terminal and negative terminal of the battery to each other with any metal object (such as wire).
- Do not carry or store the battery together with metal objects.
- Do not pierce the battery with nails, strike the battery with a hammer, step on the battery or otherwise subject it to strong impacts or shocks.
- Do not solder directly onto the battery.
- Do not expose battery to water or salt water, or allow the battery to get wet.
- Do not disassemble or modify the battery.
- When the battery is discharged, insulate the terminals with adhesive tape or similar materials before disposal.
- Immediately discontinue use of the battery if, while using or storing the battery, the battery emits an unusual smell, feels hot, changes color or shape, leaks or appears abnormal in any other way. Contact Omega if any of these problems are observed.
- Do not place the battery in microwave ovens.

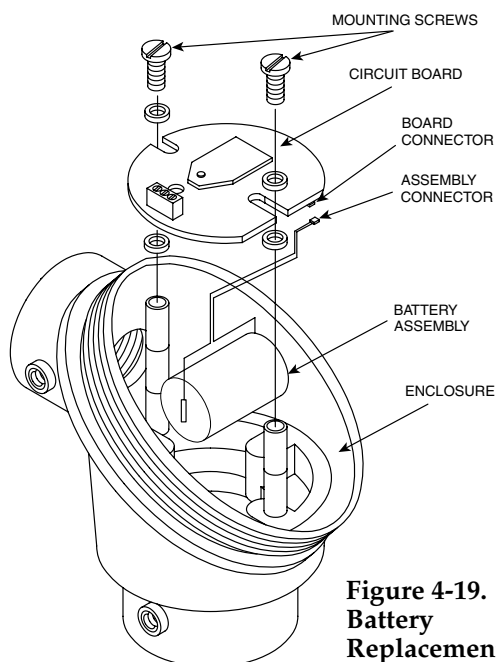


Figure 4-19.
Battery
Replacement

4.5.3 UWTC-NB9 and UWRTD-NB9

Your NB9 is equipped with a “C” size lithium power cell assembly. Omega Part Number: UWTC-BATT-C. To install a fresh replacement battery assembly follow steps outlined here.

- A. Remove the two screws that secure the main circuit board from the probe head assembly.
- B. Tilt the front of the circuit board just high enough to allow you to unplug the connector that attaches the battery assembly to the bottom of the circuit board.
- C. Remove the old power cell.
- D. Install your new battery assembly into the housing in the same position as the old battery was located.
- E. Connect the battery assembly connector to the mating connector on the bottom of the circuit board.
- F. Install the circuit board back into the housing and secure with the two screws you removed in step one.
- G. Installation complete

Section 5 - Receiver Operation

UWTC-REC1 (1) Antenna (2) USB Port (mini-B) (3) Indicator Lights

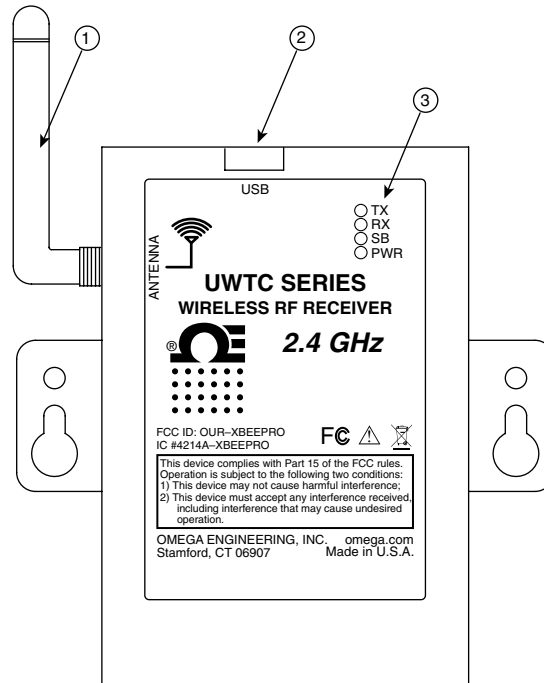


Figure 5-1. Receiver Operation - UWTC-REC1

UWTC-REC2

- (1) Antenna
- (2) USB Port (mini-B)
- (3) Indicator Lights
- (4) Output/Alarm Connection
 - Pin#1 - Analog Output (+)
 - Pin#2 - No Connection (Reserved)
 - Pin#3 - No Connection (Reserved)
 - Pin#4 - No Connection (Reserved)
 - Pin#5 - Alarm Ground
 - Pin#6 - No Connection (Reserved)
 - Pin#7 - Alarm Power (0 to 24 Vdc)
 - Pin#8 - Alarm Output (Open Drain to Pin#8, 10K pull-up to Pin#7, 200 mA Max)
- Pin#9 - Analog Output (-)
- (5) Power LED
- (6) DC Power Jack (12 to 16 Vdc @ 300 mA)

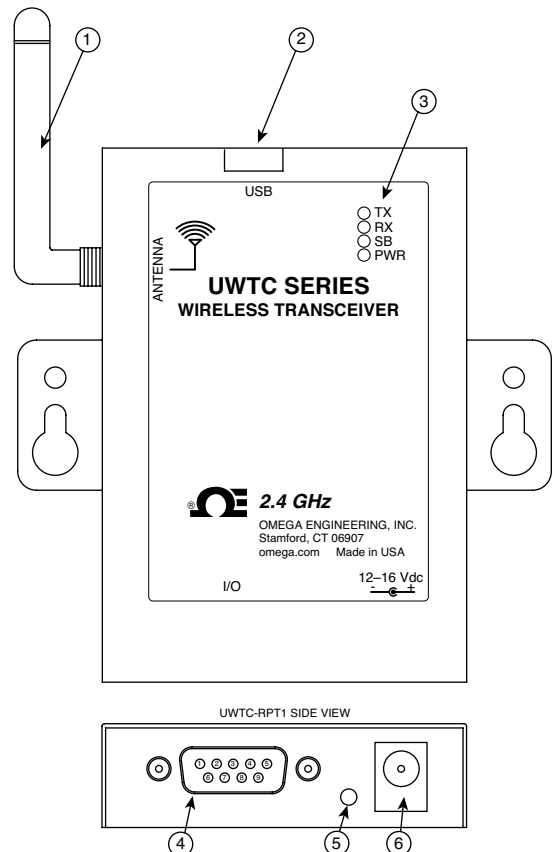


Figure 5-2. Receiver Operation - UWTC-REC2

Section 5 - Receiver Operation Cont.

UWTC-REC2-D

- (1) Antenna
- (2) USB Port (mini-B)
- (3) Indicator Lights
- (4) LCD Display
- (5) Output/Alarm Connection

- Pin#1 - Analog Output (+)
- Pin#2 - No Connection (Reserved)
- Pin#3 - No Connection (Reserved)
- Pin#4 - No Connection (Reserved)
- Pin#5 - Alarm Ground
- Pin#6 - No Connection (Reserved)
- Pin#7 - Alarm Power (0 to 24 Vdc)
- Pin#8 - Alarm Output (Open Drain to Pin#8, 10K pull-up to Pin#7, 200 mA Max)
- Pin#9 - Analog Output (-)
- (6) Power LED
- (7) DC Power Jack (12 to 16 Vdc @ 300 mA)

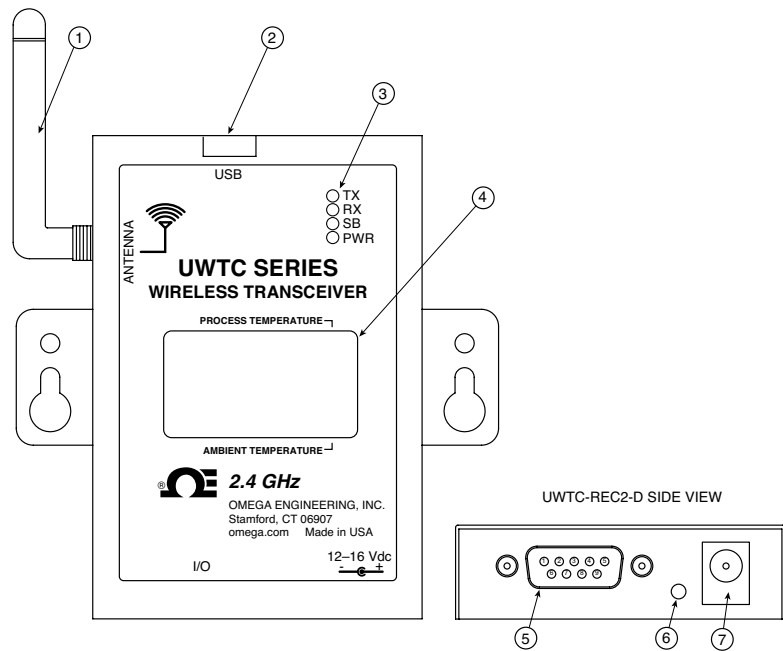
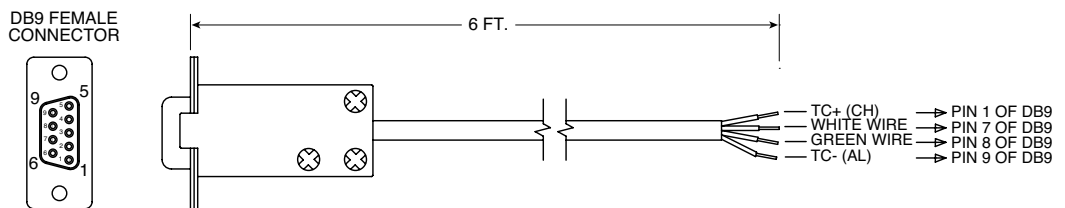
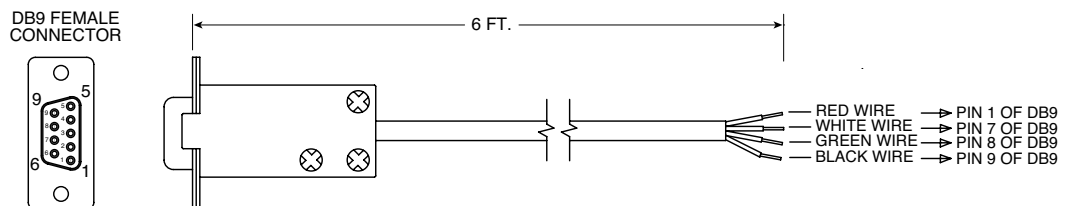


Figure 5-3. Receiver Operation - UWTC-REC2-D



Supplied with thermocouple output versions.



Supplied with voltage and current output versions

Figure 5-4. UWTC-REC2 DB9 Output Cables

Section 5 - Receiver Operation Cont.

UWTC-REC3

- (1) Antenna
- (2) Indicator Lights
- (3) Power LED
- (4) DC Power Jack
- (5) Reset
- (6) Ethernet Connection (RJ45)

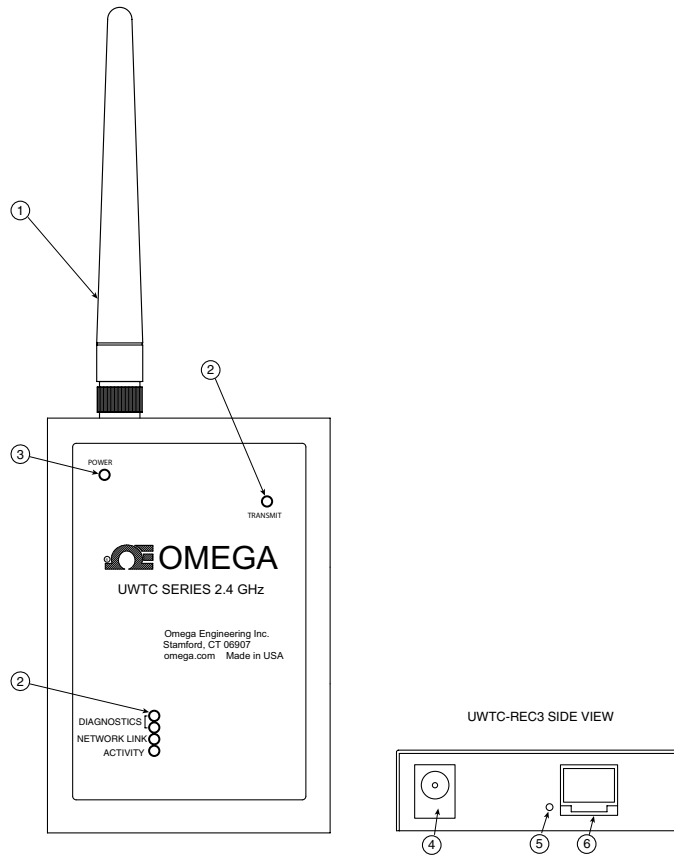


Figure 5-5. Receiver Operation - UWTC-REC3

UWTC-REC1-NEMA

- (1) Antenna
- (2) USB NEMA 4X Connector Sealing Cap
- (3) USB NEMA 4X Connector Cable
- (4) Indicator Lights

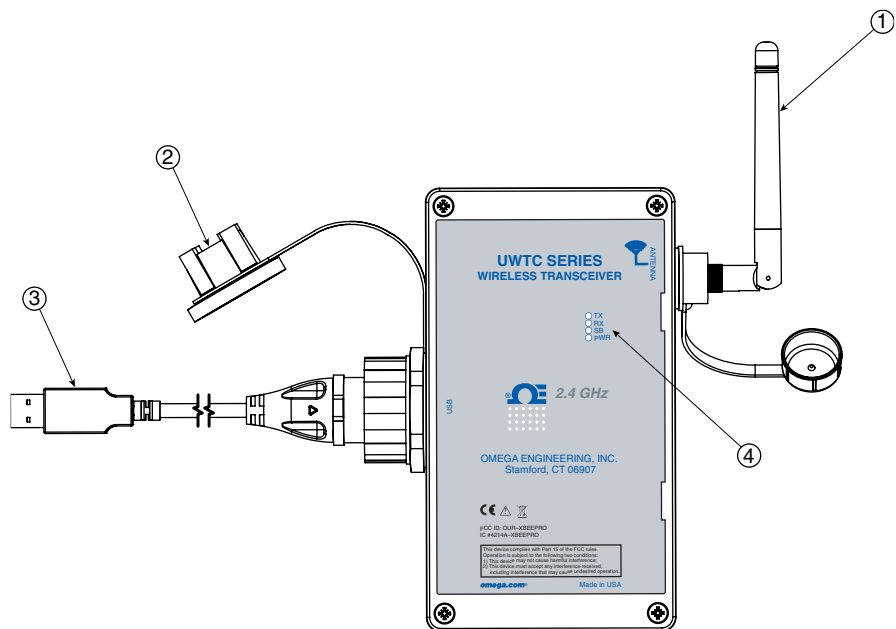


Figure 5-5A. Receiver Operation - UWTC-REC1-NEMA, UWTC-REC1-915-NEMA

Section 5 - Receiver Operation Cont.

UWTC-REC2--D-TC-NEMA

- (1) Antenna
- (2) USB NEMA 4X Connector Sealing Cap
- (3) USB NEMA 4X Connector Cable
- (4) Indicator Lights
- (5) 8 Pin Analog I/O

Waterproof Cable

Cable Configuration:

Orange Wire: Alarm Power

Yellow Wire: Alarm Output

Blue Wire: Digital Ground

- (6) Thermocouple Cable
- Cable Configuration:
- Yellow Wire: Thermocouple Output (+)
- Red Wire: Thermocouple Output (-)
- (7) 12 Vdc Power Adaptor

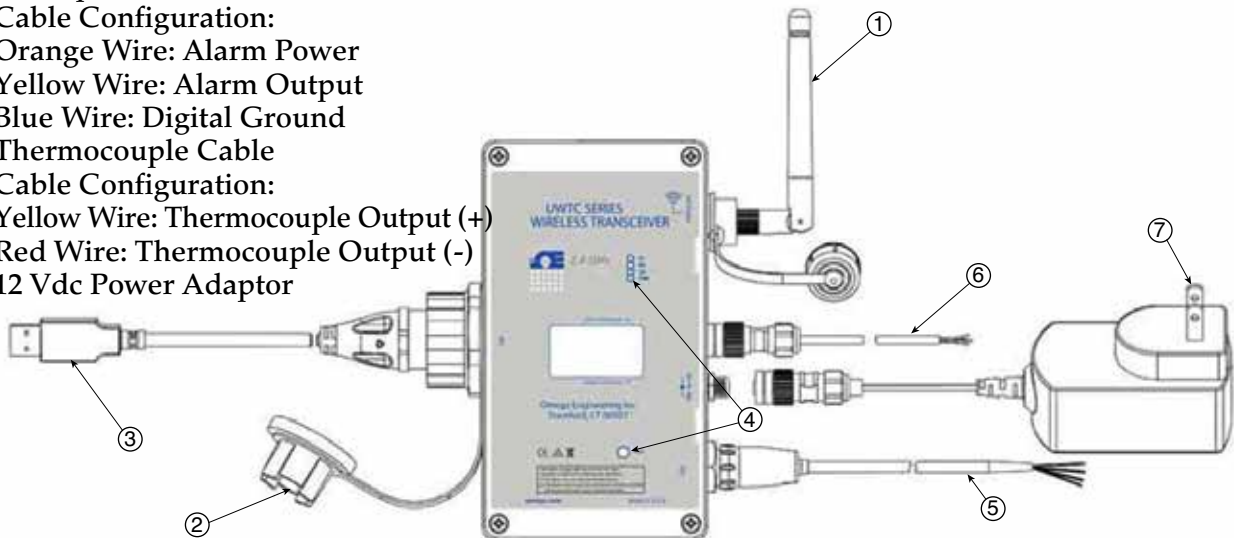


Figure 5-5B. Receiver Operation - UWTC-REC2-D-TC-NEMA

UWTC-REC2-D-*-NEMA

- (1) Antenna
- (2) USB NEMA 4X Connector Sealing Cap
- (3) USB NEMA 4X Connector Cable
- (4) Indicator Lights
- (5) 8 Pin Analog I/O

Waterproof Cable

*: V1, V2, MA Units.

Cable Configuration:

Green Wire: Analog Output (-)

White Wire: Analog Output (+)

Orange Wire: Alarm Power

Yellow Wire: Alarm Output

Blue Wire: Digital Ground

- (6) 12 Vdc Power Adaptor

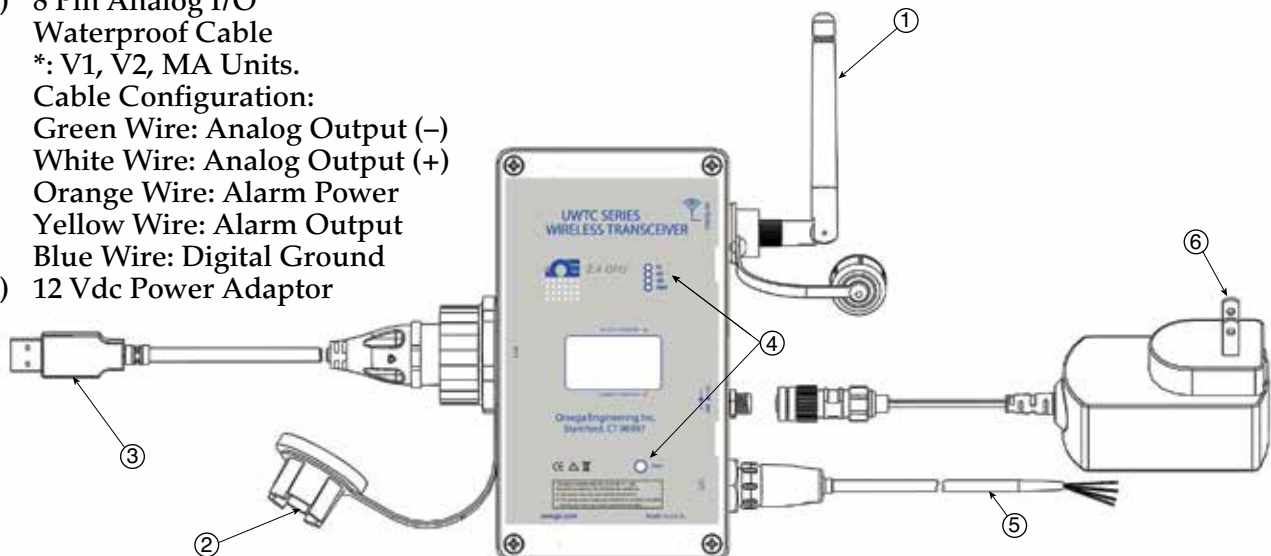


Figure 5-5C. Receiver Operation - UWTC-REC2-D-*-NEMA

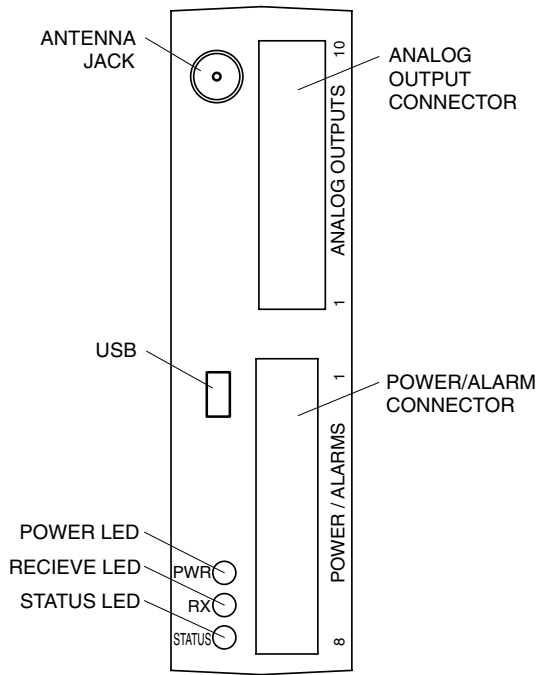


Figure 5-6. Receiver Operation - UWTC-REC4

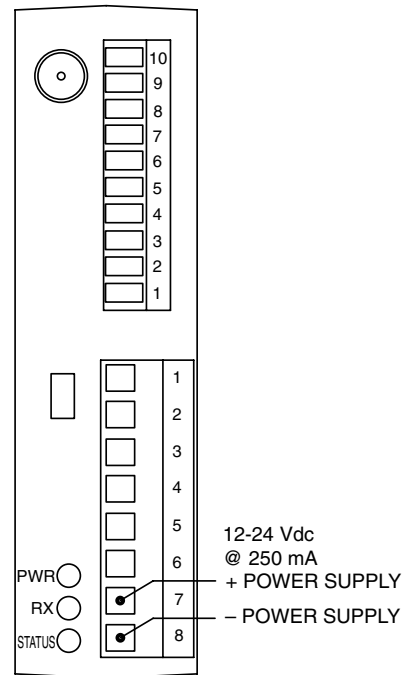


Figure 5-7. Power Supply Connection

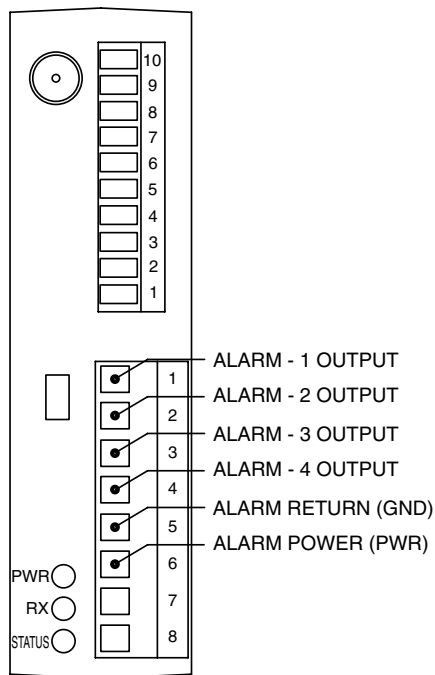


Figure 5-8. Alarm Output Connections

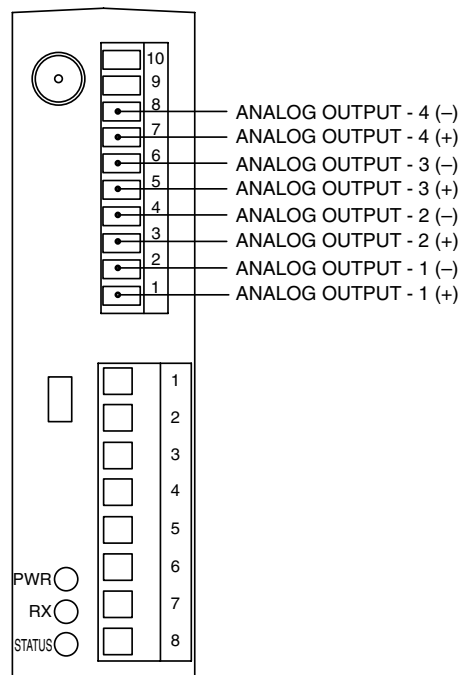


Figure 5-9. Analog Output Connections

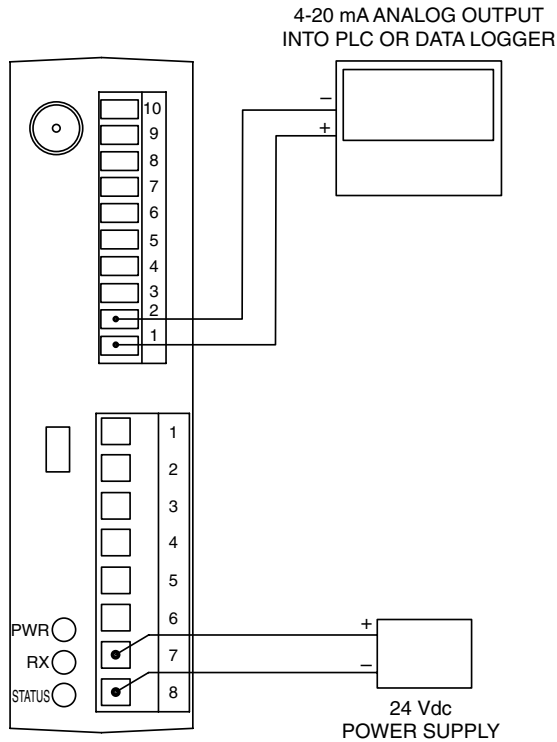


Figure 5-10. 4-20 mA Output Example

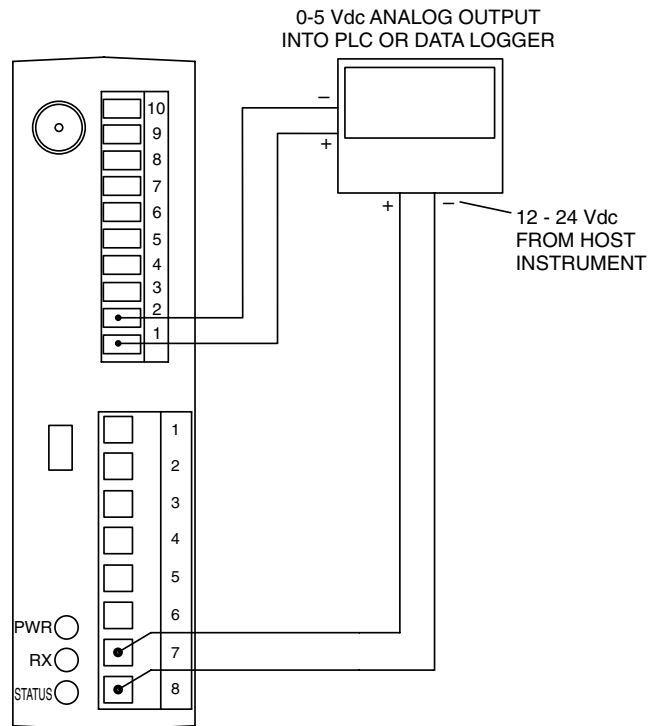


Figure 5-11. Voltage Output Example

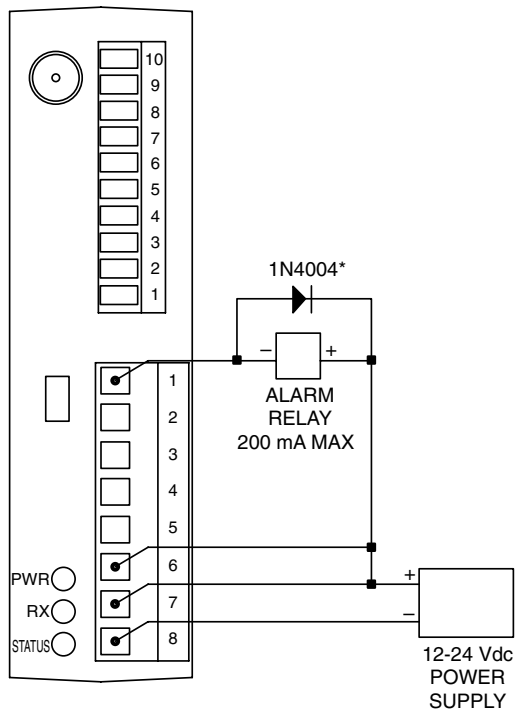


Figure 5-12. Alarm Example, System Powered

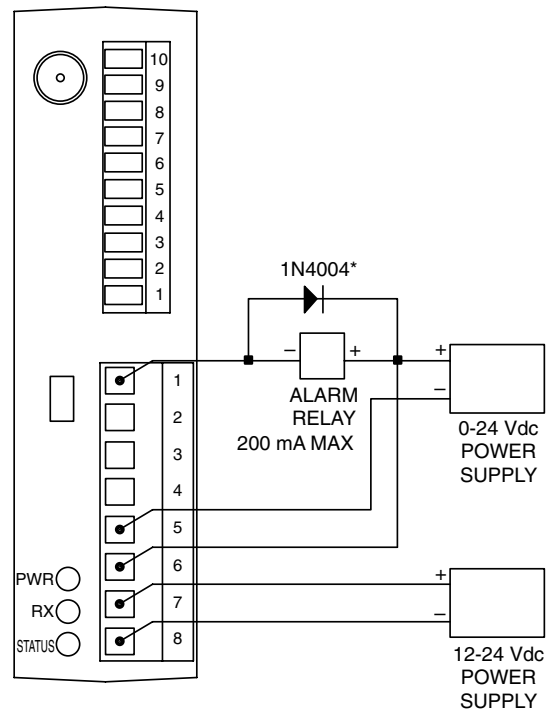
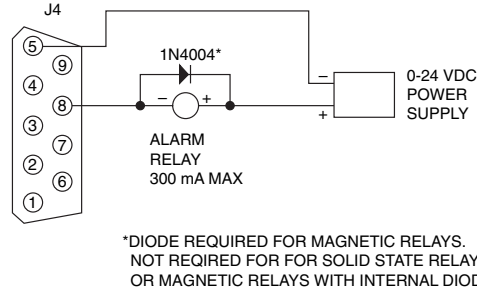
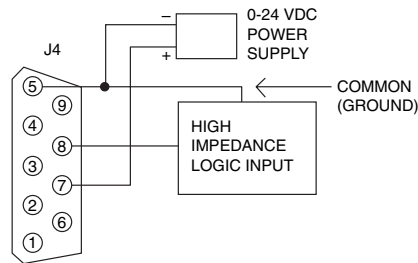


Figure 5-13A . Alarm Example, External Power Supply

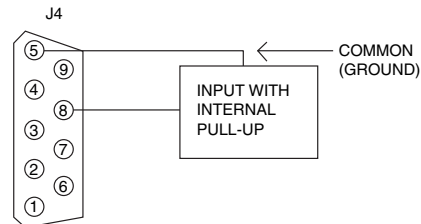
*Required for magnetic relays. Not required for solid state relays.



DRIVING A RELAY OR LOW IMPEDANCE INPUT (OPEN DRAIN)



DRIVING A HIGH IMPEDANCE INPUT (PULL HIGH/DRIVE LOW)



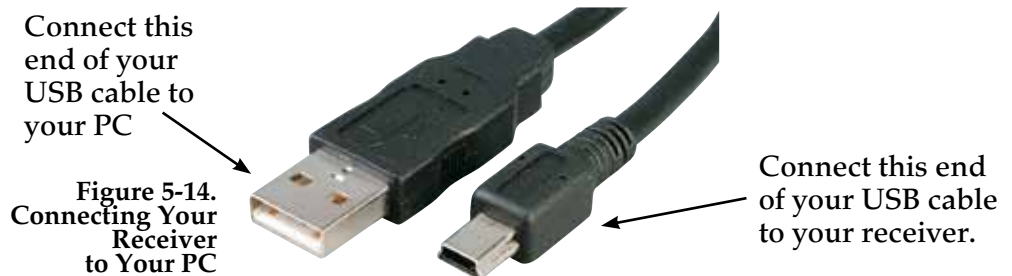
DRIVING TTL OR INPUT WITH INTERNAL PULL-UP (OPEN DRAIN)

Figure 5-13B. UWTC-REC2 or UWTC-REC2-D, Alarm Example

5.1 Connecting Your Receiver To Your PC

USB Versions (UWTC-REC1, UWTC-REC2, UWTC-REC2-D, UWTC-REC4),
UWTC-REC1-NEMA, UWTC-REC2-D-*-NEMA

Connect the USB cable to your receiver unit and also to an available USB port on your PC. See figure below. This cable was provided in the box with your receiver unit. This the same cable you used to program your connector/transmitter

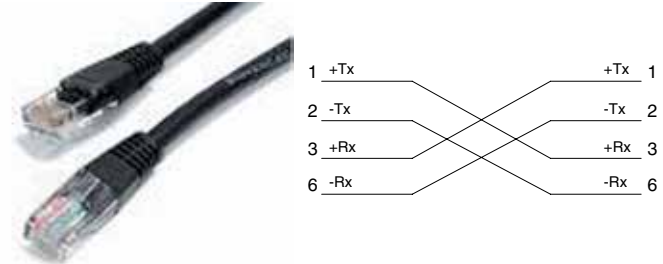


Ethernet Version (UWTC-REC3)

The 10BASE-T Ethernet network (RJ-45) system is used in the UWTC-REC3 receiver for network connectivity. The 10 Mbps twisted-pair Ethernet system operates over two pairs of wires. One pair is used for receiving data signals. This means that four pins of the eight-pin connector are used.

Figure 5-15A. RJ45 Connector

When connecting the UWTC-REC3 directly to the computer, the transmit data pins of the computer should be wired to the receiver data pins of the UWTC-REC3, and vice versa. The 10Base-T crossover cable with pin connection assignments are shown above.



NOTE:

Refer to the UWTC-REC3 Manual (M4620) for more details.

5.1.1 Configure Analog and Alarm Outputs (Versions UWTC-REC2, UWTC-REC2-D, UWTC-REC4, UWTC-REC2-D-*-NEMA Only)

To complete this procedure your UWTC-REC transceiver must be connected to a USB port on your PC, and power must be supplied so that the green PWR LED is illuminated. During this procedure you will be setting the following parameters of your UWTC-REC2 or UWTC-REC4.

UWTC-REC2:

RF NETWORK SETTINGS:

The RF Network Settings are used to create a unique RF network.

RF Channel:

Sets the channel number used for receiving data. Can be set in to any value from 12 to 23.

Network ID:

Sets the ID of the network.

Receiver Address:

Sets the address of the receiver.

OPTIONS:

These options are used to define which connector/transmitter will have its data applied to the analog and alarm output.

Transmitter Address:

Enter the transmitter address that you had previously specified when configuring your sensor using the End Device Configuration Wizard, as described in Section 4.1.2 Configure Your Connector/Transmitter.

The voltage on the Analog Output pin on the REC2 will correspond to the value of this sensor.

Timeout:

This setting is to indicate the number of seconds you want the REC2 to wait before displaying a NO SIGNAL message on the display.

Process Units:

Choose the units which will be used to set the limits of the analog output scaling.

Custom Units:

A custom unit type can be entered here.

Alarm Activation Mode:

This will set the alarm to activate on the rising or falling temperature when your setpoint is reached.

Alarm Setpoint:

Set the setpoint (in degrees F) that you want the alarm to activate at.

Alarm Deadband:

The number of units away from the Alarm Setpoint before the alarm will be activated again.

Decimal Places:

Number of decimal places in the Alarm Setpoint and Alarm Deadband values.

SCALING:

Enter one value, in Process Units, that will set the analog output to its minimum value (such as 0 V) and another value, in Process Units, that will set the analog output to its maximum value (such as 10 V).

UWTC-REC4:

The configuration window for the UWTC-REC4 features a tabbed interface that allows the user to configure all of the relevant settings described for the UWTC-REC2 for each of the four analog output channels.

5.1.2 Setting Values:

To set these values, launch TC Central (Start | Programs | TC Central) and then select Configure Receiver from the Tools menu. The following figures show what the configuration screen will look like, based on the version of your receiver:

REC2

Configure Receiver

Properties
 Model Number: **UWTC-REC2** Analog Output: **0 10V**
 Firmware Version: **110607** Has Alarm Output: **Yes**
 Hardware Revision: **B** Remote Alarm Activation: **Yes**

RF Network Settings
 RF Channel: **13** Network ID: **3415** Receiver Address: **0**

Settings of selected end devices to be received by this receiver must match these settings:

Options
 Transmitter Address: **7** Timeout: **15** Process Units: **F** Custom Units: Alarm Activation Mode: **Disabled** Setpoint: **500** Deadband: **5**
 Ambient Units: °C °F Decimal Places: **0** Decimal Places: **0**

Scaling
 0V = **0** °F Transfer Functions:
 10V = **100** °F $F = 10.0000 * V + 0.0000$
 Decimal Places: **0** $V = 0.1000 * F + 0.0000$
 Format: Standard Scientific
 Decimal Places: **4**

Calculator
 0 V = **0.0000** °F 0 °F = **0.0000** V

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Copy to Clipboard OK Cancel

Figure 5-15B. UWTC-REC2 Setup Screen

REC4

Configure Receiver

Properties
 Model Number: **UWTC-REC4** Analog Output: **4 20mA**
 Firmware Version: **110607** Has Alarm Output: **Yes**
 Hardware Revision: **A** Remote Alarm Activation: **Yes**

RF Network Settings
 RF Channel: **12** Network ID: **13106** Receiver Address: **0**

Settings of selected end devices to be received by this receiver must match these settings:

Analog Channel 1 | Analog Channel 2 | Analog Channel 3 | Analog Channel 4

Options
 Transmitter Address: **1** Timeout: **1** Output Units: **°C** Custom Units: Alarm Activation Mode: **Disabled** Setpoint: **500** Deadband: **10**
 Output: **Amperes** Activate as Master Alarm Decimal Places: **0**
 Decimal Places: **0** Decimal Places: **0**

Scaling
 4 mA = **0** °C Transfer Functions:
 20 mA = **700** °C $°C = 43.7500 * mA - 175.0000$
 Decimal Places: **0** $mA = 0.0229 * °C + 4.5000$
 Format: Standard Scientific
 Decimal Places: **4**

Calculator
 0 mA = **-175.0000** °C 0 °C = **4.0000** mA

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Copy to Clipboard OK Cancel

Figure 5-15C. UWTC-REC4 Setup Screen

5.2 Mounting, Installation and Antenna Connection

5.2.1 Mounting

For UWTC-REC1, UWTC-REC2-D, UWTC-REC2, UWTC-REC3

Mounting ears or brackets are built-in to your receiver enclosure. The diagram below shows dimensions and mounting hole location. Rubber bumpers have also been supplied with your receiver should you wish to use the device on a desk or a work bench next to your PC.

NOTE:

TIP: Mounting your receiver on a wall away from your PC will provide better signal strength and help to maximize system range.

When mounting your receiver, care should be taken to make sure it is as far away from any metal objects. If nearby metal gets too close to your receiver's antenna, it has the potential to interfere with the way the unit receives data and may cause signal loss or possibly even the inability to communicate at all with your connector/transmitter.

NOTE:

For UWTC-REC3 mounting information, refer to the UWTC-REC3 Manual (M4620).

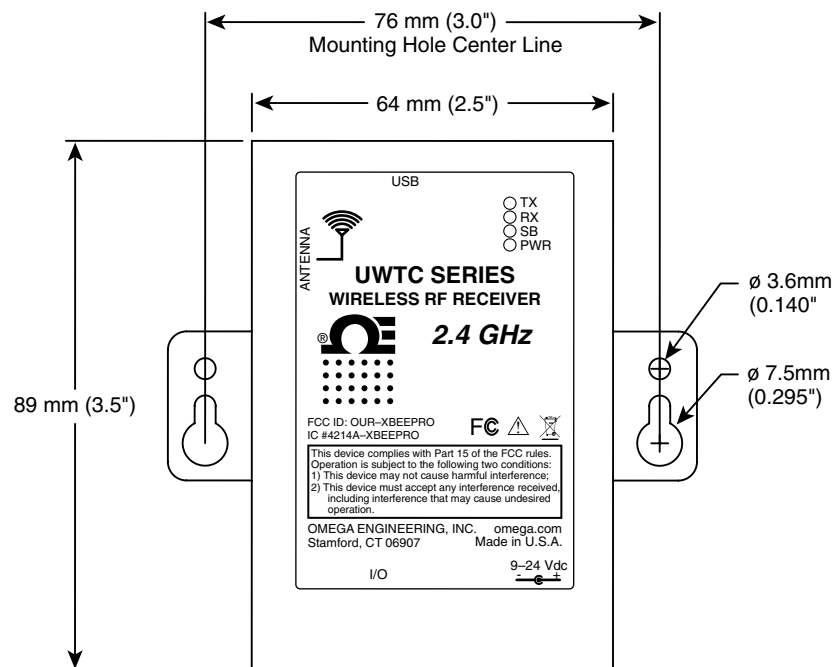


Figure 5-16. Mounting

For UWTC-REC1-NEMA, UWTC-REC2-D-*-NEMA

Mounting ears are built-in to your receiver enclosure. The diagram below shows dimensions and mounting hole location. Rubber bumpers have also been supplied with your receiver should you wish to use the device on a desk or a work bench next to your PC.

NOTE:

TIP: Mounting your receiver on a wall away from your PC will provide better signal strength and help to maximize system range.

When mounting your receiver, care should be taken to make sure it is as far away from any metal objects. If nearby metal gets too close to your receiver's antenna, it has the potential to interfere with the way the unit receives data and may cause signal loss or possibly even the inability to communicate at all with your connector/transmitter.

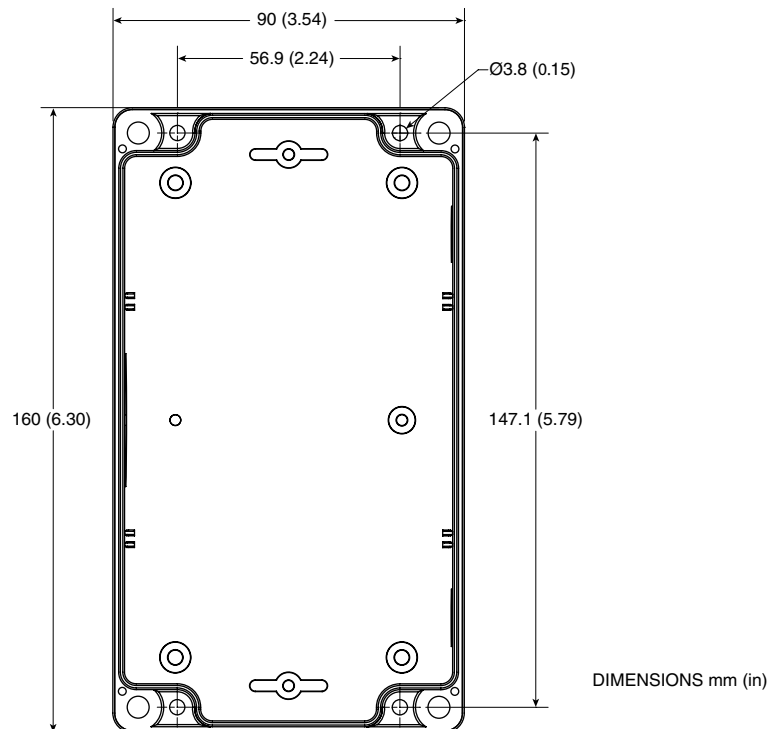


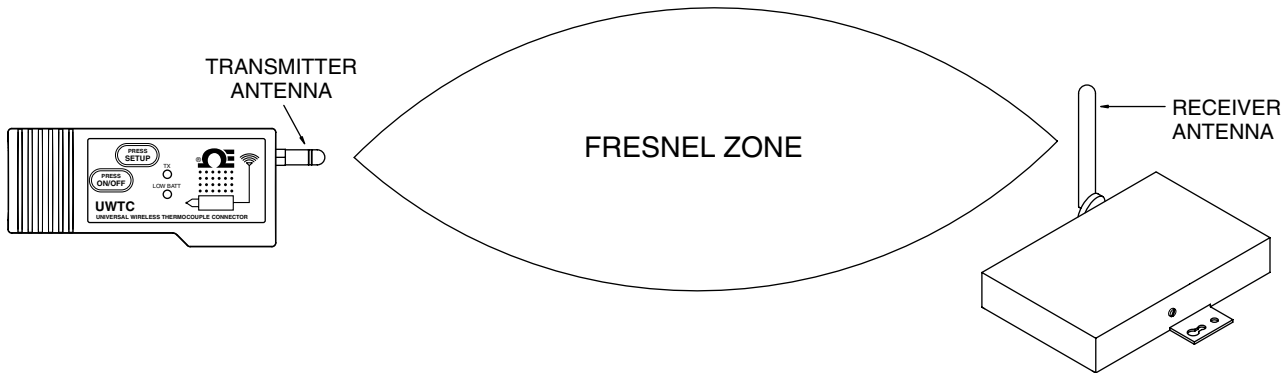
Figure 5-17. UWTC-NEMA Mounting

5.2.2 Installation

When installing your receiver 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 connector/transmitter and your receiver.

Figure 5-18. Installation



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 connector/transmitter 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 connector/transmitter and receiver, the devices can be raised on one end or on both ends to hopefully clear the Fresnel Zone of obstructions.

5.2.3 Antenna Connection

Your receiver has been shipped to you with a high gain antenna already attached.

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.

NOTE:

Use of any other antenna than what's supplied with your device will void all FCC and CE regulatory compliance.

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

NOTES:

Section 6 - System Operation

6.1 Introduction

Compared to wired thermocouple systems, wireless thermocouple systems provide 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 UWTC Series system.

6.2 RF Communication Basics

The UWTC-1 (Standard Distance) or UWTC-2 (Long Distance) wireless Thermocouple Connector/Transmitter sends wireless transmissions to the UWTC-REC1 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.

6.3 Basic System Overview

The UWTC wireless thermocouple system is comprised of only two main components; a Thermocouple Connector with a built-in battery powered 2.4 GHz radio transmitter, and a USB powered 2.4 GHz radio receiver.

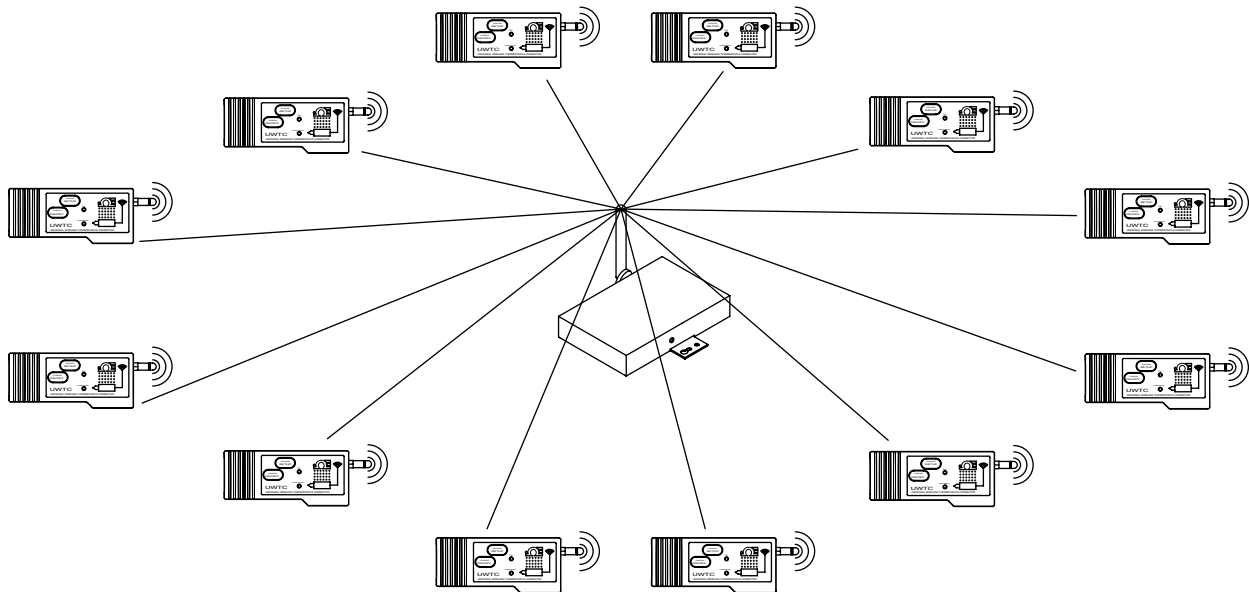


Figure 6-1. Basic System Overview

Up to 48 each of UWTC-1 or UWTC-2 connector/transmitters can be used with one UWTC-REC1 receiver.

6.4 Connector/Transmitter Operation

6.4.1 Button Operation

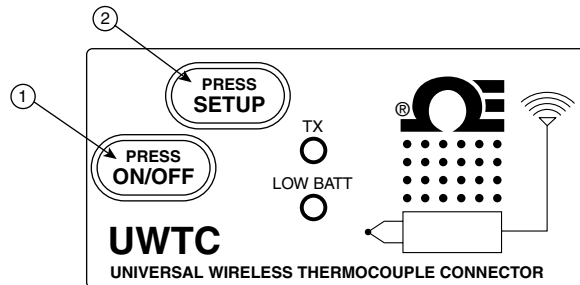
(1.) “PRESS ON/OFF”

The “PRESS ON/OFF” button on the front of your connector/transmitter is used to turn your unit “ON” or “OFF”

(2.) “PRESS SETUP”

The “PRESS SETUP” button on the front of your connector/transmitter is only used during the setup and configuration of your unit. See Section 4.1.2 for more information.

Figure 6-2. Connector/Transmitter Button Operation



6.4.2 Ambient Temperature Readings

The ambient temperature reading displayed on your screen when running the TC-Central program, is the actual ambient temperature that your connector/transmitter is being exposed to. This reading is only provided as reference and to aid you in proper installation of your unit. The ambient temperature reading will blink and change to RED digits to alert you that you have exceeded the maximum recommended safe operating conditions for your connector/transmitter. You should not rely on this feature as sole protection. Additional protection should be taken by you “the user” to protect your unit from extreme conditions.

NOTE:

Operating your connector/transmitter outside the specified ambient conditions listed in Section 9 of this manual may cause your unit to malfunction and stop working correctly.

6.4.3 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 Batt) Red Indicator Light

The red indicator light marked “Low Batt” on the front of the connector/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 procedures on how to change your battery see Section 4.5. For information on battery life see Section 6.11.

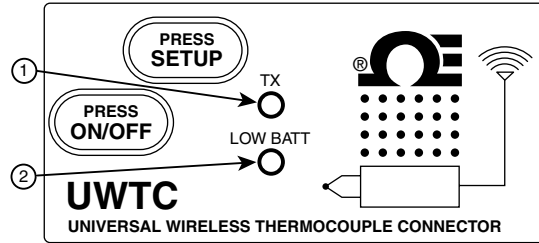


Figure 6-3. Transmit and Low Battery Lights

6.5 Receiver Operation

6.5.1 Indicator Lights

(1) Transmit (TX) Green Indicator Light

The top green indicator light marked “TX” on the front of the receiver will only blink when the receiver is connected to your PC and you initialize your measurement software. After the receiver establishes communication with the program the light will no longer blink. Note: this may happen very fast and will not be noticeable.

(2) Receive (RX) Red Indicator Light

The red indicator light marked “RX” on the front of the receiver will blink each time the receiver receives incoming data from one of your connector transmitters.

(3) Standby (SB) Yellow Indicator Light

The yellow indicator light marked “SB” on the front of the receiver will blink continuously during normal operation. This indicates that the receiver is in the “Standby” mode and is waiting for incoming data from your connector/transmitter.

(4) Power (PWR) Green Indicator Light

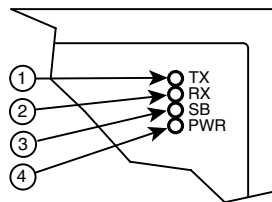


Figure 6-4. Indicator Lights

6.6 Environment/Operating Conditions

6.6.1 Environment

Omega's UWTC or UWRTD series connector/transmitter and receiver unit has 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.

6.6.2 Operating Conditions

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

- Never operate your wireless device outside the recommended environmental limits specified in this manual.
- Never operate your wireless device in flammable or explosive environments.
- Never use your wireless device in medical, nuclear or other dangerous applications where failure can cause damage or harm.
- Never operate your transmitter/connector 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 connector/transmitter and can transmit simultaneously with your UWTC unit.
- Never install a connector/transmitters within 20 cm or less from each other.
- Never use your connector/transmitter as a portable device. Your unit has been designed to be operated in a permanent installation.
- Never install and/or operate your connector transmitter closer than 20 cm to nearby persons.
- Never operate your connector transmitter with any other antenna than what is supplied or listed here in this manual for approved use.

6.7 Determining and Maximizing Range

NOTE:

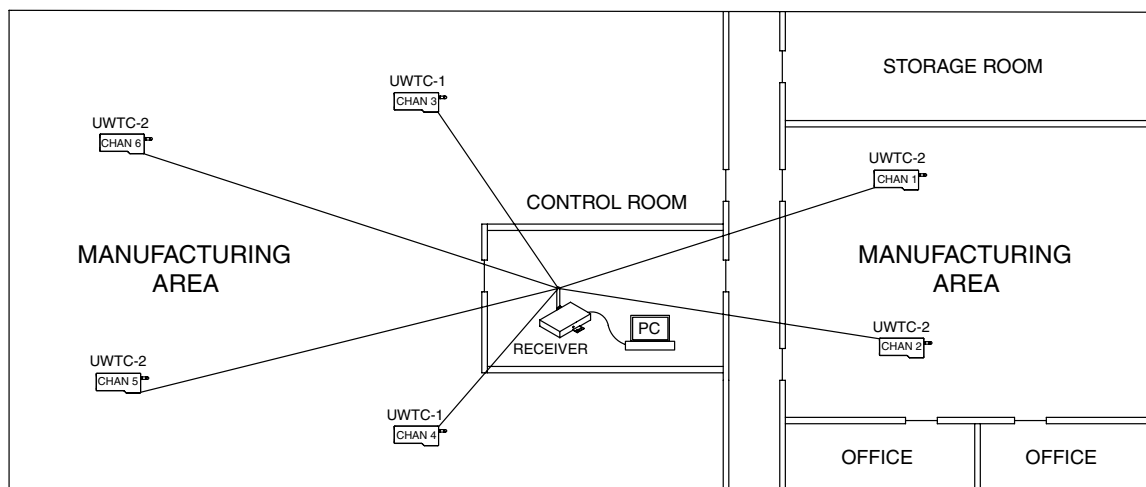
The available maximum range specified for the wireless Series system in this manual is only achievable under optimum installation conditions. Mounting height, obstructions in your "Fresnel Zone" and ambient conditions can cause a decrease in signal strength resulting in a shorter range between your transmitter/connector 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 connector/transmitters are in operation, position your receiver unit in a central space if possible in equal distance to each connector transmitter.

Figure 6-5. Determining Maximum Range



Test your system before permanent mounting

Before permanently mounting your connector/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 connector/transmitter and receiver unit are to the floor and exterior walls, 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 connector/transmitter and receiver unit will produce greatly improved signal strength over a system where the antennas 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.

6.7.1 Operation in Buildings

Your Connector/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.

6.7.3 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%

Figure 6-6. Operation In Buildings

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

6.7.2. 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 connector/transmitter should be transmitted as directly as possible.

6.8 Antenna Basics

6.8.1 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 thermocouple connector system have been tuned to operate in the 2.4 GHz band.

NOTE:

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.

6.9 Antenna Placement

Proper antenna installation is important and will allow you to achieve maximum performance and range between your connector/transmitter and receiver unit.

NOTE:

Your connector/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 connector/transmitter installed on the opposite or connecting wall to the receiver.

6.9.1 Horizontal Antenna Placement

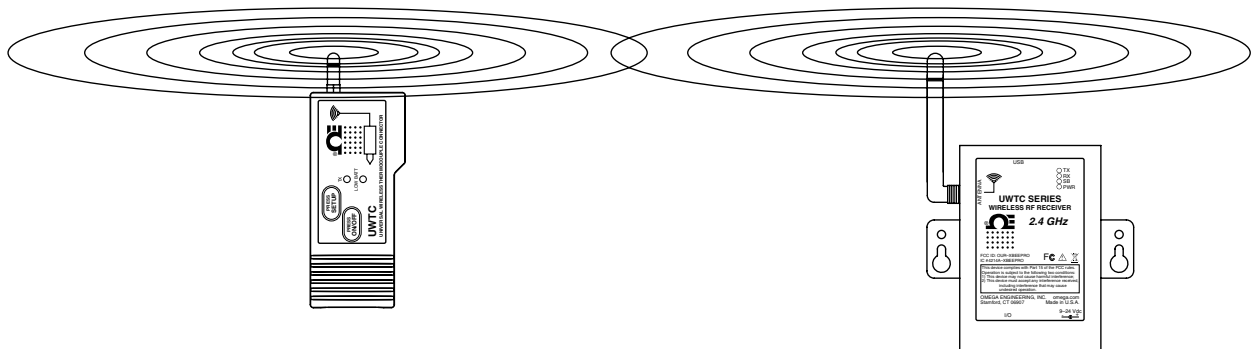


Figure 6-7. Horizontal Antenna Placement

If your Connector/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.

6.9.2 Vertical Antenna Placement

If your Connector/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 6-8.

6.10 Factory Preset Values

Your Connector/Transmitter has been factory programmed for the following default operation; Channel Number: 1, Thermocouple Type: K, Transmit Rate: 1 sample/5 sec

6.11 Transmit Rate vs. Battery Life

Many factors such as ambient temperature conditions and transmitting rate can have a big effect on the life of the battery used in your connector/transmitter. Transmitting data places a big demand of the battery in your connector/transmitter. The transmit rate is the single most contributing factor in the life of your battery. The slower 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 vs. the transmit rate you selected when you setup your connector/transmitters and under normal operating conditions.

For Version UWTC-1 or UWRTD-1

Transmit Time	Estimated Battery Life
1 Sample/2 Seconds	12 days
1 Sample/3 Seconds	18 days
1 Sample/5 Seconds	30 days
1 Sample/10 Seconds	60 days
1 Sample/15 Seconds	90 days
1 Sample/30 Seconds	180 days
1 Sample/45 Seconds	270 days
1 Sample/60 Seconds	365 days

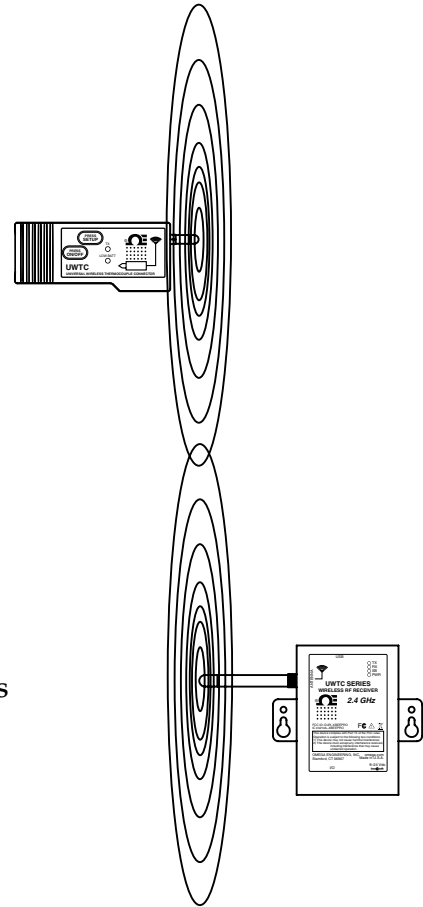


Figure 6-8. Vertical Antenna Placement

For UWTC-2, UWRTD-2, UWRH-2

Transmit Time	Estimated Battery Life
1 Sample/2 Seconds	6 days
1 Sample/3 Seconds	9 days
1 Sample/5 Seconds	15 days
1 Sample/10 Seconds	30 days
1 Sample/15 Seconds	45 days
1 Sample/30 Seconds	90 days
1 Sample/45 Seconds	135 days
1 Sample/60 Seconds	180 days

For UWTC-NB9, UWRTD-NB9

Transmit Time	Estimated Battery Life
1 Sample/2 Seconds	134 days
1 Sample/3 Seconds	195 days
1 Sample/5 Seconds	305 days
1 Sample/10 Seconds	528 days
1 Sample/15 Seconds	699 days
1 Sample/30 Seconds	1031 days
1 Sample/45 Seconds	1226 days
1 Sample/60 Seconds	1353 days

Section 7 - 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.

7.1 Connector/Transmitter Troubleshooting

Problem	Solution
1. Unit will not enter “Setup” mode	<ul style="list-style-type: none"> a. Check USB cable connection b. Contact Customer Service
2. Configuration Utility will not connect	<ul style="list-style-type: none"> a. Check USB cable connection to device being programmed b. Confirm you are in the “SETUP” mode. See Section 3 c. Contact Customer Service

7.2 Receiver Troubleshooting

Problem	Solution
1. Unit will not turn on	<ul style="list-style-type: none"> a. Check power cord connections b. Unit requires service, contact Customer Service
2. Analog output stays at maximum value (5.05V, 10.10V, 20.20mA)	<ul style="list-style-type: none"> a. Verify that none of the following conditions exist: <ul style="list-style-type: none"> 1. The end device selected for this analog channel has a defective or open sensor. 2. The end device is measuring a process that has a value greater than the upper limit of the input range of the end device. 3. The end device is measuring a process that has a value greater than the upper scale value set for the analog output of the receiver. 4. The receiver is not receiving a signal from the end device having the end device address selected for this analog channel.
3. Analog output	<p>The end device is measuring a process that has a value stays at zero equal to or less than the input range of the end device, (for voltage output): or the lower scale value that is set for the analog output of the receiver.</p>
4. Analog output stays at 3.8mA	<p>The end device is measuring a process value that is less than the input range of the end device, or the (for mA output): lower scale value that is set for the analog output of the receiver.</p>

Problem	Solution
If the problem persists after checking and correcting one or more of the above conditions, do the following before contacting Customer Service:	<ol style="list-style-type: none">Run the “End Device Configuration Wizard” (TC Central) with the device connected.When at the screen where all the settings appear, click the “Copy to Clipboard” button.Paste to a text file.Next, select “Configure Receiver ...” from the “Tools” menu (in TC Central).When at the screen where all the settings appear, click the “Copy to Clipboard” button.In the same file as in step c above, paste this information.Call Customer Service. When speaking to your Customer Service Representative, ask for an email address to send the information you just copied and pasted.

Section 8 – Service & Calibration

Your UWTC and UWRTD Series components have been built and factory calibrated to meet or exceed the specifications listed here in this manual. The following section provides information on how to have your device serviced and also on how to re-calibrate your unit in the field.

8.1 Service & Calibration

If any of your wireless system components require service or calibration, please call our Customer Service Department. They will assist you in arranging the return and service of your device. We can also be reached on the Internet and via email. Check our website for contact information.

Section 9 – Specifications

9.1 Connector/Transmitter Specifications (Thermocouple Versions)

Thermocouple (TC) Input UWTC-1, UWTC-2, UWTC-2-NEMA:	J, K, T, E, R, S, B, C or N (User Field Selectable)
UWTC-NB9:	J, K, T, E, R, S, B, C or N (Factory set for integral probe)
Thermocouple Measurement Range:	J: -100 to 760°C (-148 to 1400°F) K: -100 to 1260°C (-148 to 2300°F) T: -200 to 400°C (-328 to 752°F) E: -200 to 1000°C (-328 to 1832°F) R: 260 to 1760°C (500 to 3200°F) S: 260 to 1760°C (500 to 3200°F) B: 870 to 1820°C (1598 to 3308°F) C: 0 to 2315°C (32 to 4200°F) N: -100 to 1260°C (-148 to 2300°F)
TC Measurement Accuracy UWTC-1, UWTC-2, UWTC-2-NEMA:	Types J and K: $\pm 0.5\%$ rdg or $\pm 1.0^\circ\text{C}$ (1.8°F), whichever is greater Types T, E, and N: $\pm 0.5\%$ rdg or $\pm 2.0^\circ\text{C}$ (3.6°F), whichever is greater Types R, S, B and C: $\pm 0.5\%$ of Full Scale
UWTC-NB9:	Type J, K, T, E and N: $\pm 0.5\%$ of Reading or $\pm 2.0^\circ\text{C}$ (3.6°F), whichever is greater Type R, S, B and C: $\pm 0.5\%$ of Full Scale
TC Measurement Resolution:	1°C/1°F
Cold Junction Compensation (Automatic):	-10 to 70°C
Thermocouple Connection UWTC-1, UWTC-2:	Patented universal female accepts both standard male (OSTW Series) or miniature Male (SMPW Series) Mating Connector
UWTC-2-NEMA, UWTC-NB9:	Integral Terminal Block
Ambient Operating Conditions:	-10 to 70°C, 0-95% Relative Humidity (Non-condensing)
Ambient Temperature Reading Accuracy:	$\pm 2.0^\circ\text{C}$ (3.6°F)
Computer Interface:	USB
Transmit Sample Rate UWTC-1, UWTC-2:	Programmable from 120 seconds/sample to 2 seconds/sample
UWTC-2-NEMA, UWTC-NB9:	Programmable from 120 seconds/sample to 2 seconds/sample

Radio Frequency (RF):	ISM 2.4 GHz, direct sequence spread
Transceiver Carrier:	Spectrum, license free worldwide (2.450 to 2.490 GHz -12 channels)
RF Output Power	
UWTC-1:	0dBm (1 mW)
UWTC-2, UWTC-2-NEMA, UWTC-NB9:	10dBm (10 mW)
Range of RF Link:	UWTC-1: Up to 60 m (200') outdoor line of sight. Up to 20 m (65') indoor/urban.
UWTC-1:	
UWTC-2, UWTC-2-NEMA, UWTC-NB9:	Up to 120 m (400') outdoor line of sight. Up to 40 m (130') indoor/urban.
RF Data Packet Standard:	IEEE 802.15.4, open communication architecture
Software (Free Download):	Requires Windows, 2000, XP, Vista or Windows 7 operating system
Battery Power	
UWTC-1:	One Standard 3.6 V lithium Battery , 2.4 Ah capacity (AA). Omega No: UWTC-BATT
UWTC-2:	One Standard 3.6 V lithium Battery , 2.4 Ah capacity (AA). Omega No: UWTC-BATT or One High Pulse 3.6 V lithium Battery, 1.2 Ah capacity (AA). Omega No: UWTC-BATT-HP
UWTC-2-NEMA, UWTC-NB9:	One Standard 3.6 V lithium Battery, 7.2 Ah capacity (C). Omega No: UWTC-BATT-C
Battery Life:	See Section 6 of this manual
Data Transmitted to Host:	Thermocouple Temperature, Ambient Temperature, RF Signal Strength and percent of Battery Life remaining
Dimensions	
UWTC-1, UWTC-2:	103 L x 47 W x 28 mm H (without antenna)
UWTC-2-NEMA:	80 L x 82 W x 55 mm H (without antenna)
UWTC-NB9:	95 L x 98 W x 83 mm H (without antenna and integral probe)
Weight	
UWTC-1, UWTC-2:	70 grams (0.19 lbs)
UWTC-2-NEMA:	218 grams (0.58 lbs)
UWTC-NB9:	174 grams (0.47 lbs)
Enclosure/Housing	
UWTC-1, UWTC-2:	ABS Plastic
UWTC-2-NEMA:	Polycarbonate (NEMA 4X)
UWTC-NB9:	Bakelite Glass Fiber (IP65)

9.2 RTD Connector/Transmitter Specifications

Available Types:	100 Ω (standard), 500 Ω , 1000 Ω (special order)
UWRTD-1, UWRTD-2, UWRTD-2-NEMA:	PT100 - 0.00385 or 0.00392 (User Field Selectable)
UWTC-NB9:	PT100 - 0.00385 or 0.00392 (Factory set for integral probe)
RTD Measurement Range:	0.00385: -200 to 600°C (-328 to 1112°F) 0.00392: -100 to 457°C (-148 to 854°F)
RTD Measurement Accuracy:	$\pm 1^\circ\text{C}$ from 0 to 400°C (32 to 752°F), $\pm 2.5^\circ\text{C}$ below 0°C or above 400°C (752°F)
RTD Measurement Resolution:	1°C/1°F
Operating Environment:	-10 to 70°C (14 to 158°F)
RTD Connection	
UWRTD-1, UWRTD-2:	Omega Series "T" receptacle. Use Omega Version TA4F mating connector (one included)
UWRTD-2-NEMA, UWRTD-NB9:	Integral Terminal Block
Computer Interface:	USB (one interface cable included with receiver)
Transmit Sample Rate:	Programmable from 120 seconds/sample to 2 seconds/sample
Radio Frequency (RF)	
Transceiver Carrier:	ISM 2.4 GHz, direct sequence spread spectrum, license free worldwide (2.450 to 2.490 GHz -12 channels)
RF Output Power	
UWRTD-1:	0dBm (1 mW)
UWRTD-2, UWRTD-2-NEMA, UWTC-NB9:	10dBm (10 mW)
Range of RF Link	
UWRTD-1:	Up to 60 m (200') outdoor line of sight. Up to 20 m (65') indoor/urban.)
UWRTD-2, UWRTD-2-NEMA, UWRTD-NB9:	Up to 120 m (400') outdoor line of sight. Up to 40 m (130') indoor/urban. RF Data Packet Standard: IEEE 802.15.4, open communication architecture
Software (Free Download):	Requires Windows 2000, XP, Vista, Windows 7 operating system
Battery Power	
UWRTD-1:	One Standard 3.6 V lithium Battery, 2.4 Ah capacity (AA). Omega No: UWTC-BATT
UWRTD-2:	One Standard 3.6 V lithium Battery, 2.4 Ah capacity (AA). Omega No: UWTC-BATT or One High Pulse 3.6 V lithium Battery, 1.2 Ah capacity (AA). Omega No: UWTC-BATT-HP

UWRTD-2-NEMA, UWRTD-NB9:	One Standard 3.6 V lithium Battery, 7.2 Ah capacity (C). Omega No: UWTC-BATT-C Battery Life: See Section 6 of this manual
Data Transmitted to Host:	RTD reading, connector ambient reading, RF transmit strength and battery condition
Dimensions	
UWRTD-1, UWRTD-2:	103 L x 47 W x 28 mm H (without antenna)
UWRTD-2-NEMA:	80 L x 82 W x 55 mm H (without antenna)
UWRTD-NB9:	95 L x 98 W x 83 mm H (without antenna and integral probe)
Weight	
UWRTD-1, UWRTD-2:	70 grams (0.19 lbs) with antenna
UWRTD-2-NEMA:	218 grams (0.58 lbs) with antenna
UWRTD-NB9:	174 grams (0.47 lbs) with antenna
Enclosure/Housing	
UWRTD-1, UWRTD-2:	ABS Plastic
UWRTD-2-NEMA:	Polycarbonate (NEMA 4X)
UWRTD-NB9:	Bakelite Glass Fiber (IP65)

9.3 UWTC-REC1/UWTC-REC2 Receiver Specifications

Power	
UWTC-REC1, UWTC-REC1-NEMA, UWTC-REC1-915-NEMA:	USB bus +5V powered, 300 mA consumption max.
UWTC-REC2, UWTC-REC2-D, (supplied UWTC-REC2-D-*-NEMA:	12-16 Vdc, 300 mA, AC Wall Adapter with unit)
USB Compatibility:	USB 1.1, USB 2.0
LED Indicators:	TX (transmit) RX (receive) SB (Standby) PWR (USB Power)
Radio Frequency (RF):	
UWTC-REC1, UWTC-REC1-NEMA, UWTC-REC2, UWTC-REC2-D, UWTC-REC2-D-NEMA:	ISM 2.4 GHz, direct sequence spread
UWTC-REC1-915-NEMA:	ISM 915 MHz, direct sequence spread
Protocol:	IEEE 802.15.4
Cable Type:	USB 4P(A) Male to USB Mini 5P(B) Male
Ambient Operating Conditions:	-10 to 70°C, 0-95% Relative Humidity (Non-condensing)
Analog Output:	
UWTC-REC2, UWTC-REC2-D-*-NEMA:	-V1: 0-5 Vdc, -V2: 0-10 Vdc, -TC: Type-K Thermocouple -MA: 4-20 mA

Output Scaling - Analog Output Accuracy:

Mode	Accuracy	Resolution	Range	Scalable
MA	±0.1% FS	8 μ A	4 to 20.2 mA	-1000 to +100000 Process
Units				
V1	±0.2% FS	1 mV	0 to 5.05V	-1000 to +100000 Process
Units				
V2	±0.1% FS	1 mV	0 to 10.1V	-1000 to +100000 Process
Units				
TC	±2.0°C	1°C/1°F	-75°C (-103°F) to 1370°C (2498°F)	Not Scalable

Dimensions

UWTC-REC1, UWTC-REC2:	91 L x 62 W x 22 mm H (without antenna)
UWTC-REC1-NEMA, UWTC-REC1-915-NEMA, UWTC-REC2-D-*-NEMA:	160 L x 90 W x 47 mm H

Weight:

UWTC-REC1, UWTC-REC2:	935 grams; (2.1 lbs) with antenna
UWTC-REC1-NEMA, UWTC-REC2-D-*-NEMA:	UWTC-REC1-915-NEMA, Approx. 635 grams (1.4 lbs)

Enclosure/Housing:

UWTC-REC1, UWTC-REC2:	Painted Steel
UWTC-REC1-NEMA, UWTC-REC2-D-*-NEMA:	UWTC-REC1-915-NEMA, NEMA 4x ABS plastic

9.4 UWTC-REC4 Specifications

Power: 12 to 24 Vdc @ 250 mA

Analog Output: 4 independent, non isolated, retransmission
0 to 5 Vdc, 0 to 10 Vdc or 4 to 20 mA

Output Scaling - Analog Output Accuracy

Mode	Accuracy	Resolution	Range	Scalable
MA	±0.1% FS	8 μ A	4 to 20.2 mA	-1000 to +100000 Process
Units				
V1	±0.2% FS	1 mV	0 to 5.05V	-1000 to +100000 Process
Units				
V2	±0.1% FS	1 mV	0 to 10.1V	-1000 to +100000 Process
Units				
TC	±2.0°C	1°C/1°F	-75°C (-103°F) to 1370°C (2498°F)	Not Scalable

Alarms (Programmable): One per channel, rising/falling activation

Alarm Type: 10K pull-up to Alarm Power (Terminal 6),
200 mA Max

Power, Output, Alarm Connection: Screw terminals

Operating Ambient: 0 to 55°C (32 to 131°F),
90% RH non-condensing

Radio Frequency (RF)

Transceiver Carrier: ISM 2.4 GHz, direct sequence spread spectrum

Section 10 – Approvals, Regulatory Compliance & Patent Notice

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.

10.1 FCC (Domestic Use: USA & Canada)

(USA) FCC ID: OUR-XBEEPRO (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.

10.2 International Usage & CE Marking (Pending)

The UWTC and UWRTD Series system components are CE marked and certified for use in several European countries. Please contact OMEGA for information on International Regulatory Compliance for each country.

The single exception to this conformity is with the UWTC-REC2-TC receiver. In this case, if the unit is exposed to RF radiation at a nominal level (3 V/m) between the frequencies of 80 MHz to 1000 MHz, the accuracy of the unit may be degraded by as much as 6°C - 7°C, which is outside the normal performance specification of the unit. Under all other circumstances the product performs to specification.

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 or national regulations and laws.

Transmitting Power

Your UWTC and UWRTD Series System Components have been designed and manufactured so that the transmitting power will not exceed 2 dBm (10 mW).

10.3 Declaration of Conformity (DOC)

Contact OMEGA for status on CE marking and DOC availability.

10.4 Patent Notice

UWTC PATENT NOTICE

(Product is covered by patents for Super MCJ, Uniconnector and pending wireless connector)

PATENT NOTICE: U.S. PAT. NO. 6,074,089 / Canada 2,228,333 / UK GB 2,321,712 / Israel 123052
Other U.S. and international patents pending.