



omega.com info@omega.com

## Servicing North America:

### U.S.A. Headquarters:

Omega Engineering, Inc.  
Toll-Free: 1-800-826-6342 (USA & Canada only)  
Customer Service: 1-800-622-2378 (USA & Canada only)  
Engineering Service: 1-800-872-9436 (USA & Canada only)  
Tel: (203) 359-1660 Fax: (203) 359-7700  
e-mail: info@omega.com

**For Other Locations Visit [omega.com/worldwide](http://omega.com/worldwide)**

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## WARRANTY/DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA's WARRANTY adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

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

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

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

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2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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MQS4432/1017

**1 YEAR**  
WARRANTY



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# **UWTC/UWRTD 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. "Device" refers to your connector/transmitter or receiver unit.

### 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:

### 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

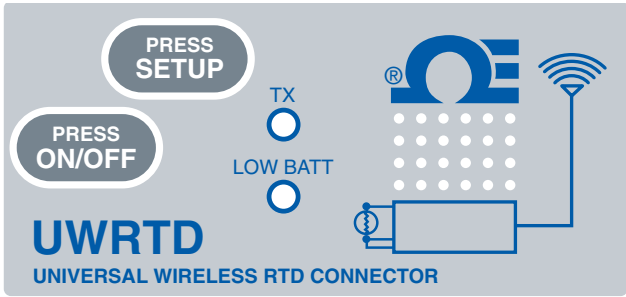
Caution, refer to accompanying documentation



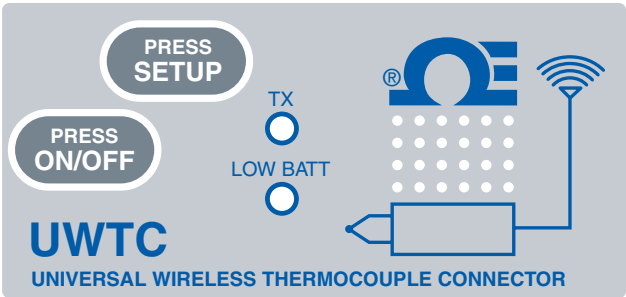
EU's Waste Electrical and Electronic Equipment Compliance

Section 2 - Product Labeling

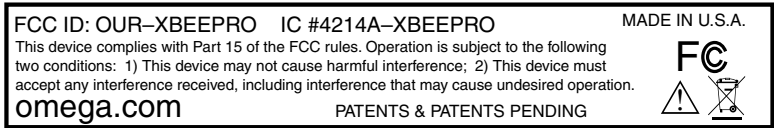
Connector Front Labels



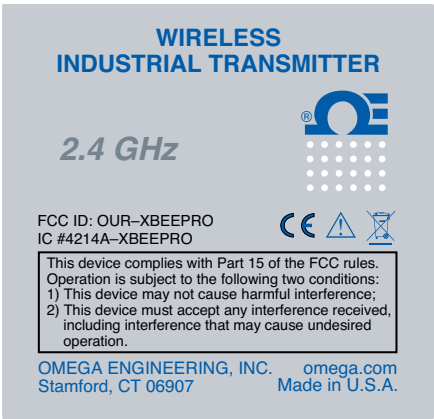
Connector Front Label,  
UWRTD-1, UWRTD-2,



Connector Front Label,  
UWTC-1, UWTC-2,

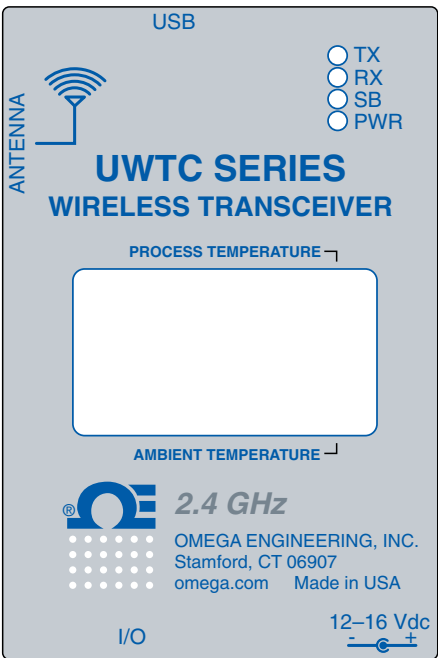


Connector Rear Label  
(UWTC-1, UWTC-2, UWRTD-1, UWRTD-2)

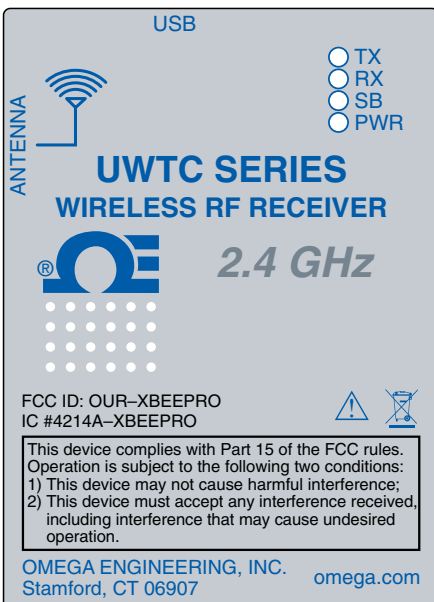


Transmitter Front Label (NEMA)  
UWTC-1, UWTC-2, UWRTD-1, UWRTD-2

Receiver Front Labels



Receiver Front Label  
UWTC-REC2-D



Receiver Front Label  
UWTC-REC1

## Section 3 – Setup Instructions

### UWTC/UWRTD Setup Procedure:

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

#### 1. Install Software

- a. Download and install the free software that's available for your UWTC Series receiver. Your system should begin the installation process automatically. The installer will guide you through the steps required to install TC Central on your computer

#### 2. Install USB Drivers

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

- a. Download the TC-Central User Software on your PC.
- b. 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".
- c. Your computer will then launch the Found New Hardware Wizard. Follow the instructions indicated on the Wizard boxes.
- d. 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.

#### 3. Configure Transmitter

Complete the following steps to configure your connector/transmitter:

- a. **Connect the USB cable** to your connector/transmitter unit and also to an available USB port on your computer.
- b. **Enter the "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.
- c. **Launch Setup Utility Program**  
To launch the UWTC connector/transmitter setup utility 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 UWTC Configuration Program
- d. **Program your settings into the connector/transmitter.**  
After starting the setup utility program the "Configuration Wizard" will open. Click next to proceed to continue setting up your connector/transmitter. Each screen will provide instruction details on how to proceed.

- e. Exit the "SETUP" mode

Once you have successfully programmed your connector/transmitter you can disconnect the USB cable and press "SETUP" button on the device once to exit the "SETUP" mode.

#### **4. Configure Receiver**

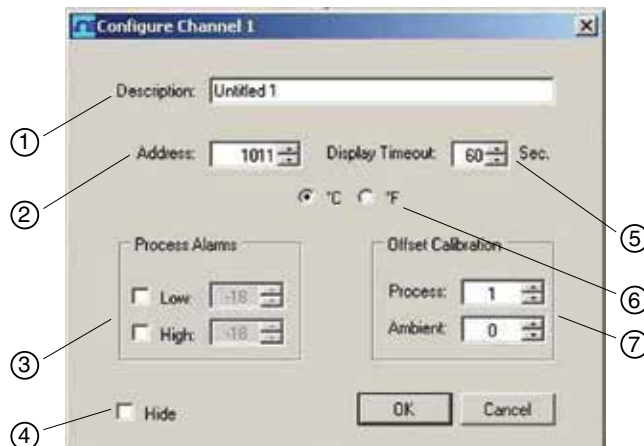
**UWTC-REC3 Users:** Refer to Manual M4620 for configuration of this UWTC receiver.

For other receivers, complete the following procedure. Your UWTC-REC receiver must be connected to a USB port on your PC.

- a. Launch the UWTC-REC setup utility program on your PC. You can access it through the "Programs" list under your "Start Menu". Scroll through the list to find the "UWTC Configuration" folder, and then select the UWTC-REC program.
- b. After starting the setup utility program, a configuration wizard will appear and guide you through steps to configure your UWTC-REC receiver.



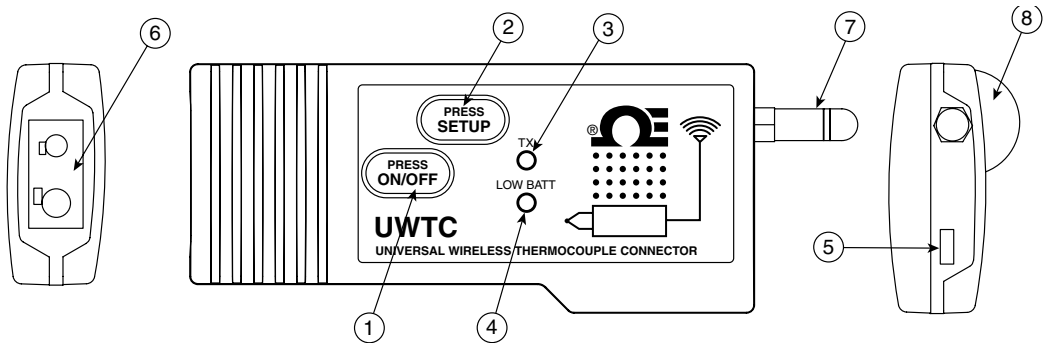
## Section 4 – Software



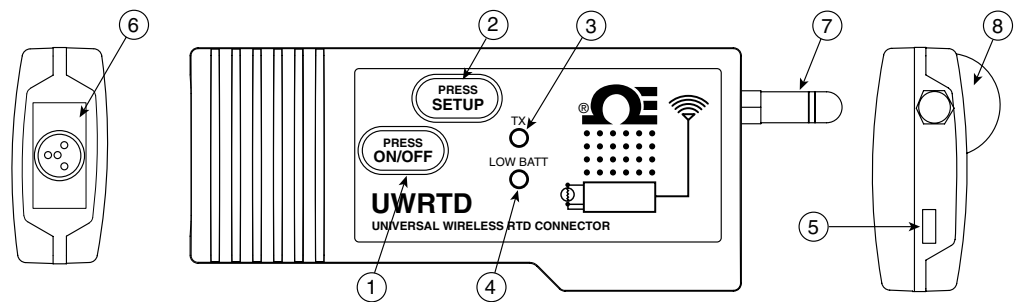
Channel Display Box Screen

- ① **Thermocouple 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 percentage bar graph indicates the amount of remaining usable available power the battery installed in the Connector/Transmitter has left to operate normally.

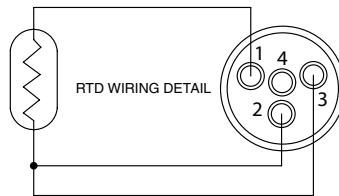
## Section 5 – Transmitter/Connector Operation



Thermocouple Connector (UWTC-1, UWTC-2)



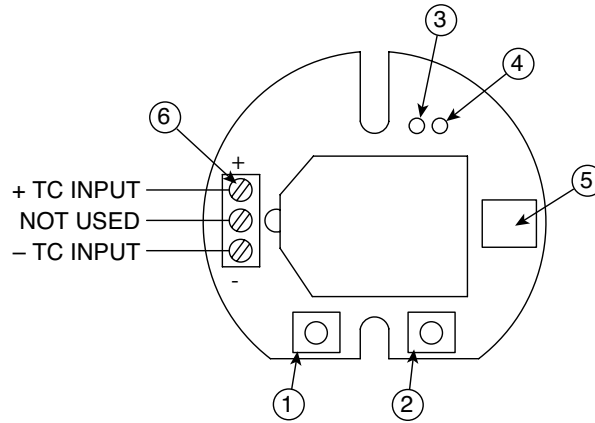
RTD Connector (UWRTD-1, UWRTD-2)



- (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

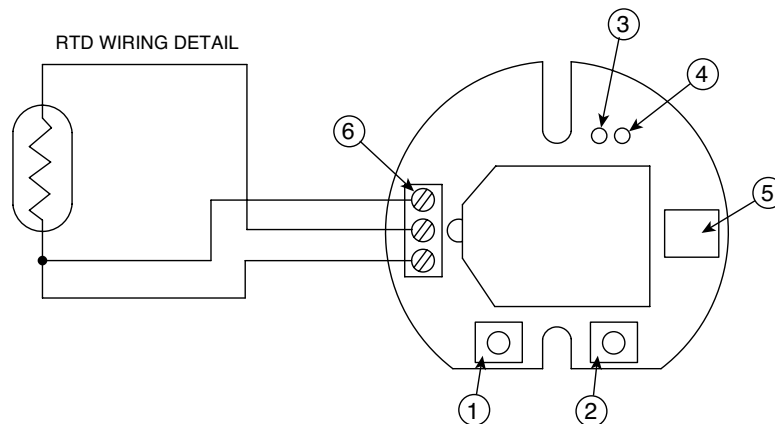
## Section 6 – Connector Operation

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



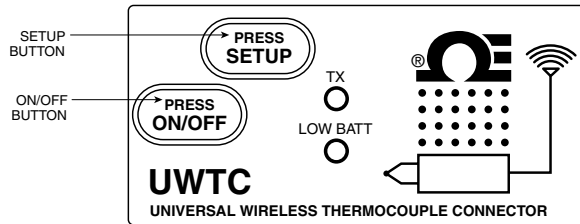
**Thermocouple Version**

**Industrial Probe (RTD Versions)**  
 UWRTD-NB9, UWRTD-NB9-NEMA, UWRTD-2-NEMA



**RTD Version**

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



Setup Mode

### 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.

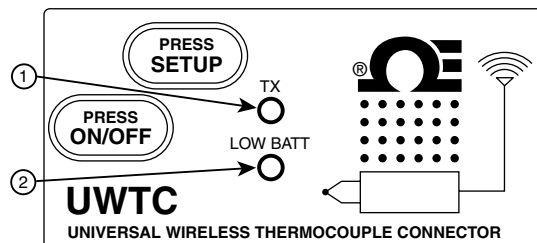
### Indicator Lights

#### (1) Transmit (TX) Green Indicator Light

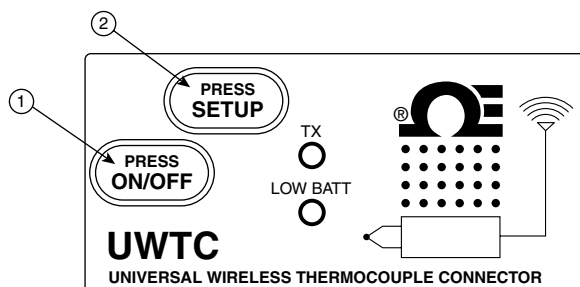
The green indicator light marked "TX" on the front of the connector/transmitter will blink every time the unit sends data to the receiving unit. Example; If you selected a 5 sec sample rate the green TX led will blink one time every 5 seconds.

#### (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.



Transmit and Low Battery Lights

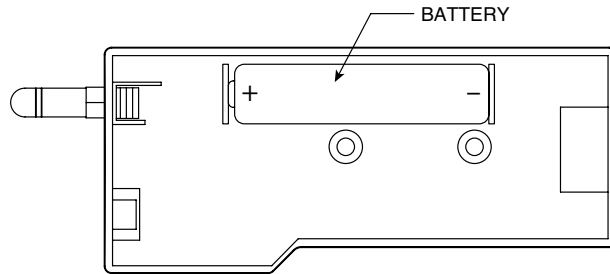


## Section 7 - Battery Installation

### Battery Installation or Replacement

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.

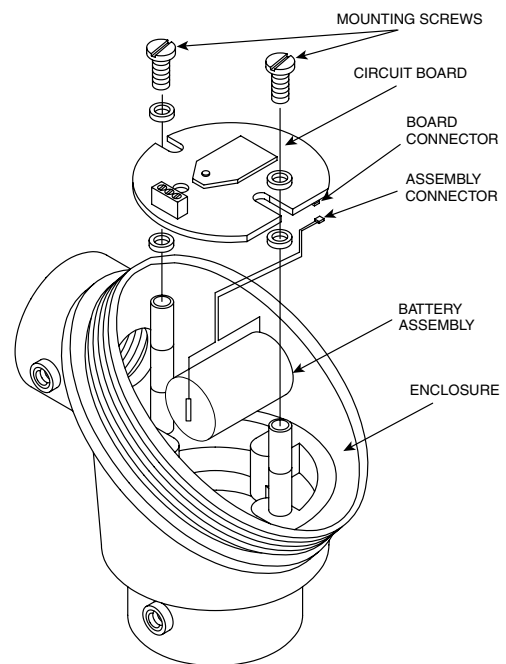


Battery Replacement UWTC-1, UWTC-2, UWRTD-1, UWRTD-2

### Battery Replacement

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

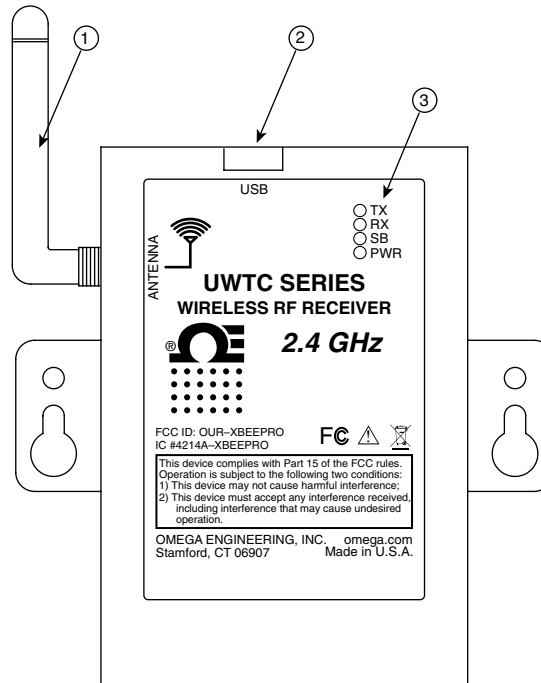
- A. Remove the two screws that secure the main circuit board from the probe head assembly.
- B. Tilt the front of the circuit board just high enough to allow you to unplug the connector that attaches the battery assembly to the bottom of the circuit board.
- C. Remove the old power cell.
- D. Install 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



Battery Replacement

## Section 8 - Receiver Operation

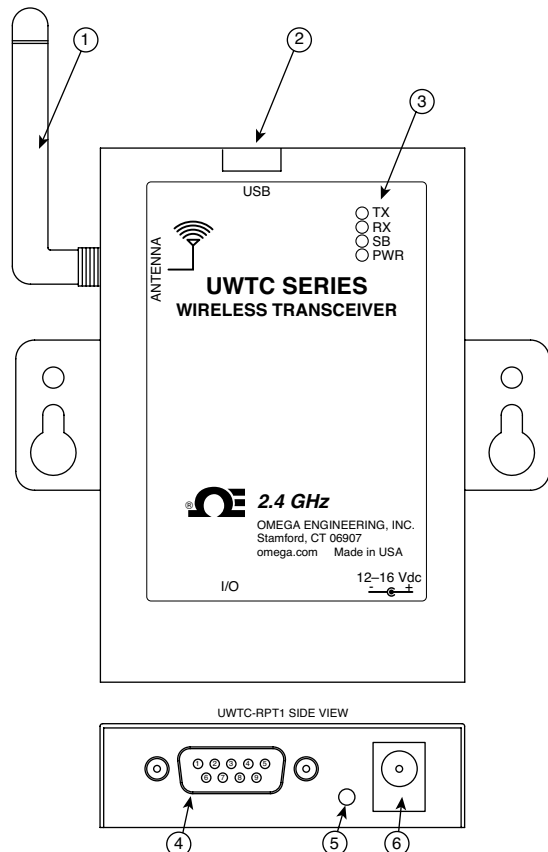
UWTC-REC1 (1) Antenna (2) USB Port (mini-B) (3) Indicator Lights



Receiver Operation - UWTC-REC1

UWTC-REC2

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

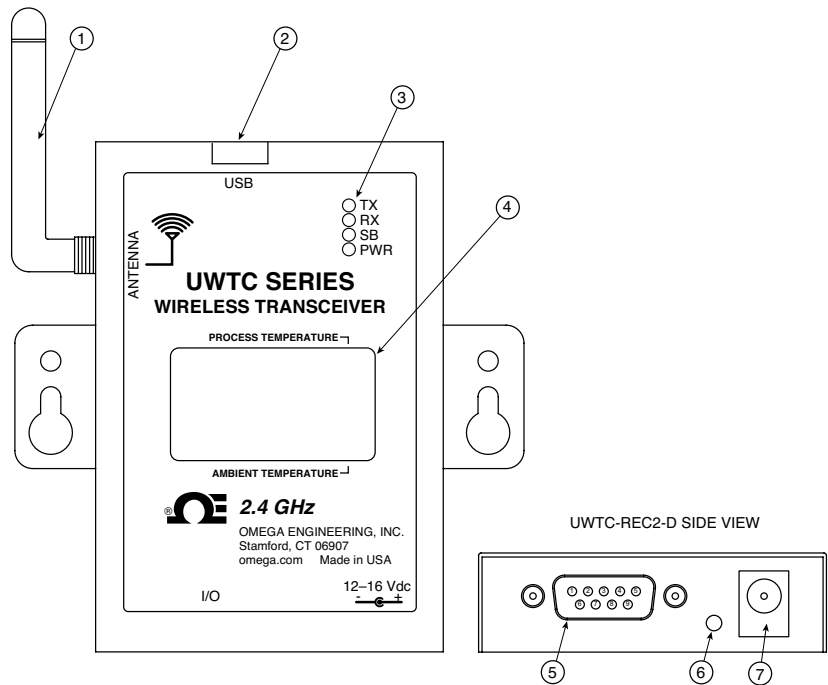


Receiver Operation - UWTC-REC2

## Section 8 - Receiver Operation Cont.

### UWTC-REC2-D

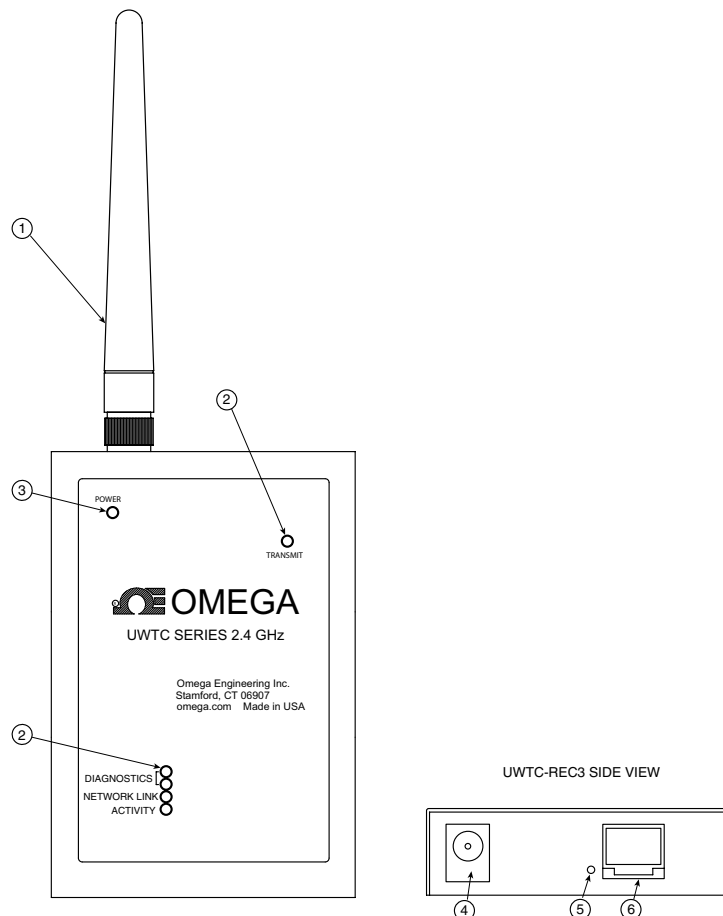
- (1) Antenna
- (2) USB Port (mini-B)
- (3) Indicator Lights
- (4) LCD Display
- (5) Output/Alarm Connection
  - Pin#1 - Analog Output (+)
  - Pin#2 - No Connection (Reserved)
  - Pin#3 - No Connection (Reserved)
  - Pin#4 - No Connection (Reserved)
  - Pin#5 - Alarm Ground
  - Pin#6 - No Connection (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)



Receiver Operation - UWTC-REC2-D

### UWTC-REC3

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

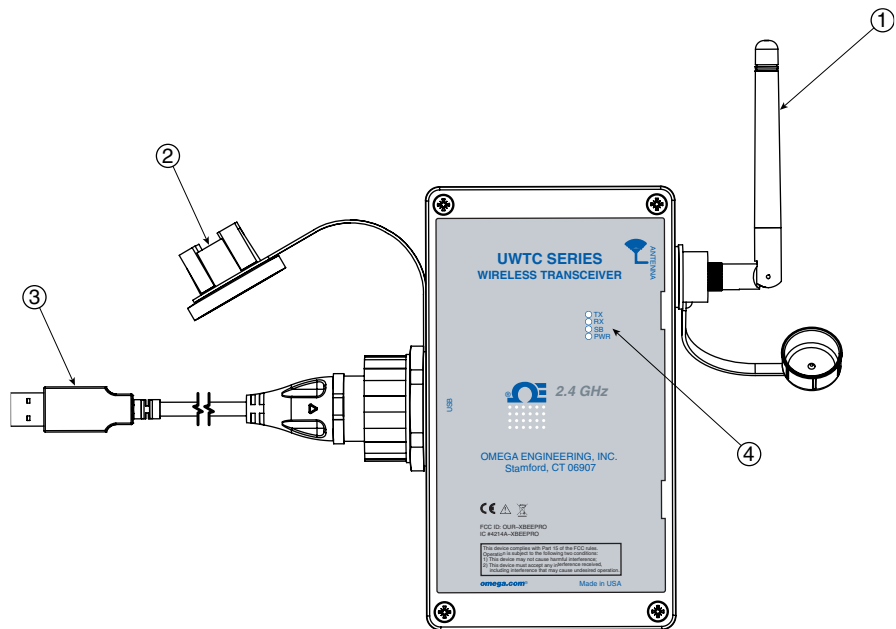


Receiver Operation - UWTC-REC3

## Section 8 - Receiver Operation Cont.

### UWTC-REC1-NEMA

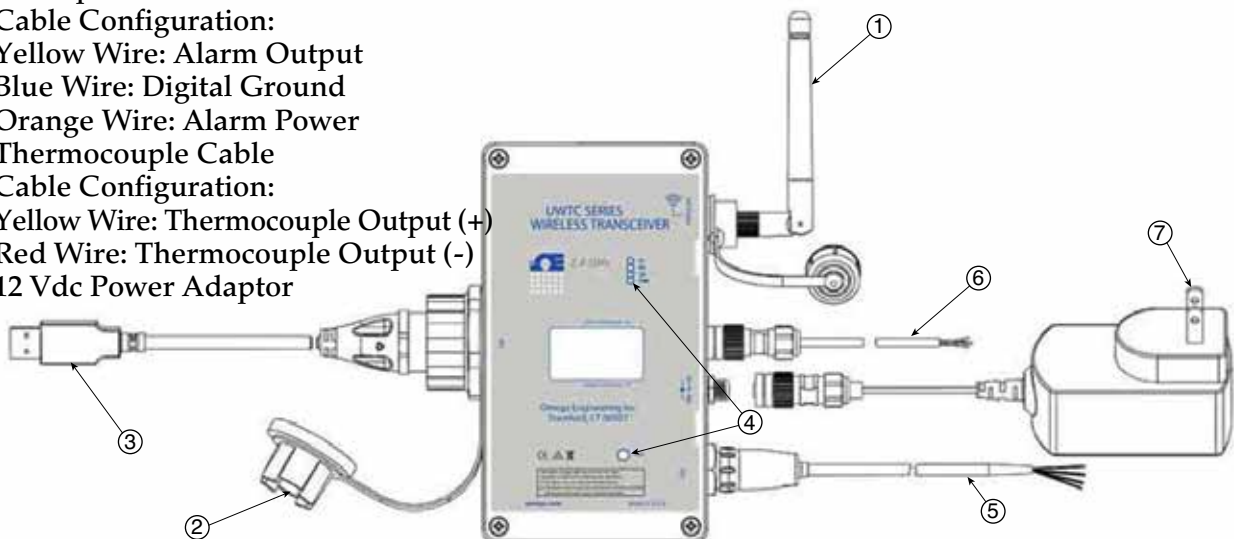
- (1) Antenna
- (2) USB NEMA 4X Connector Sealing Cap
- (3) USB NEMA 4X Connector Cable
- (4) Indicator Lights



### Receiver Operation - UWTC-REC1-NEMA, UWTC-REC1-915-NEMA

### 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
  - (6) Thermocouple Cable
  - (7) 12 Vdc Power Adaptor
- Cable Configuration:  
 Yellow Wire: Alarm Output  
 Blue Wire: Digital Ground  
 Orange Wire: Alarm Power
- Cable Configuration:  
 Yellow Wire: Thermocouple Output (+)  
 Red Wire: Thermocouple Output (-)



### Receiver Operation - UWTC-REC2-D-TC-NEMA



## Section 8 - Receiver Operation Cont.

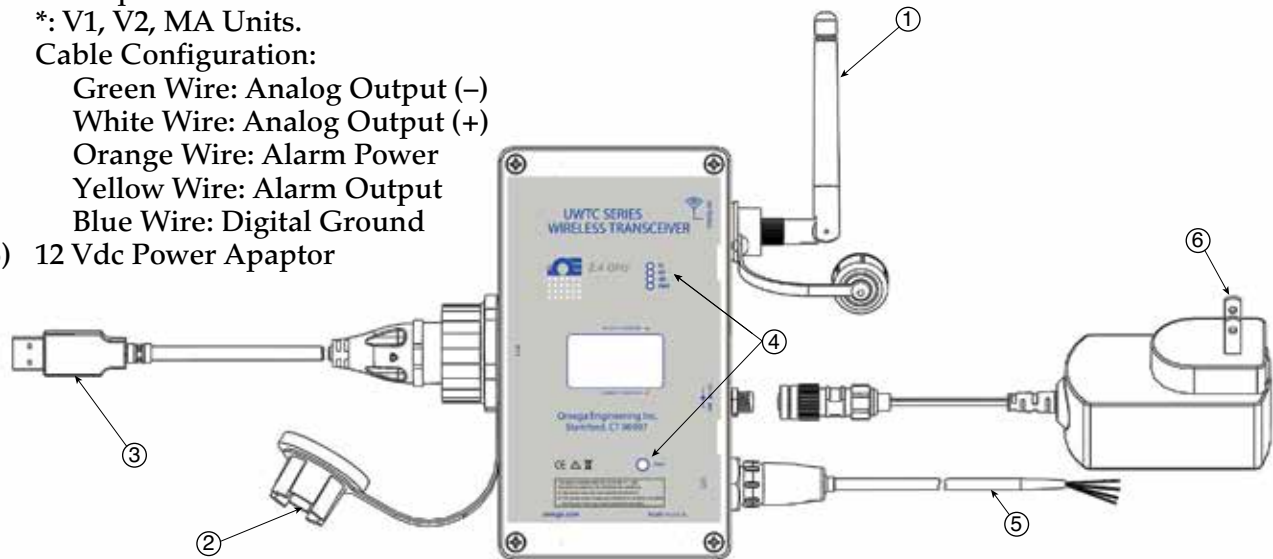
UWTC-REC2-D-\*-NEMA

- (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 Apaptor



Receiver Operation - UWTC-REC2-D-\*-NEMA

### 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.

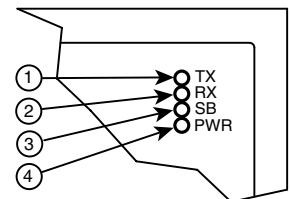
- (2) Receive (RX) Red Indicator Light

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

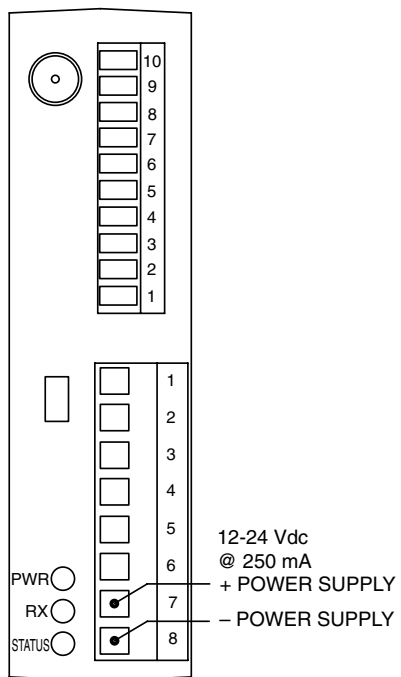
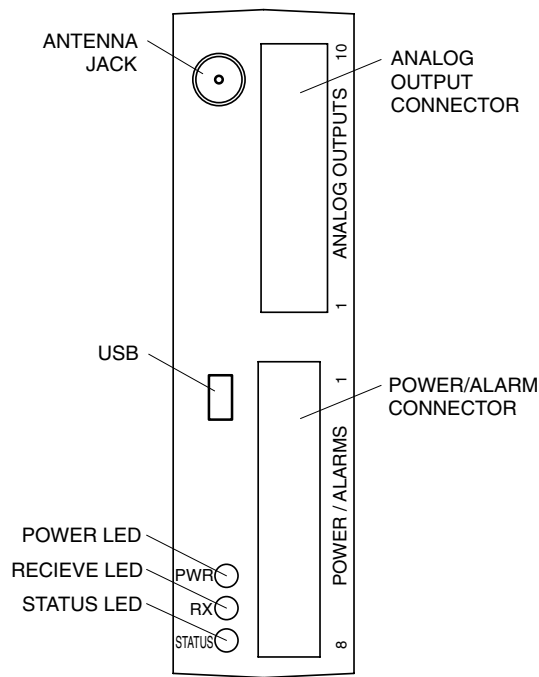
The yellow indicator light marked "SB" on the front of the receiver will blink continuously during normal operation. This indicates that the receiver is in the "Standby" mode and is waiting for incoming data from your connector/transmitter.

- (4) Power (PWR) Green Indicator Light



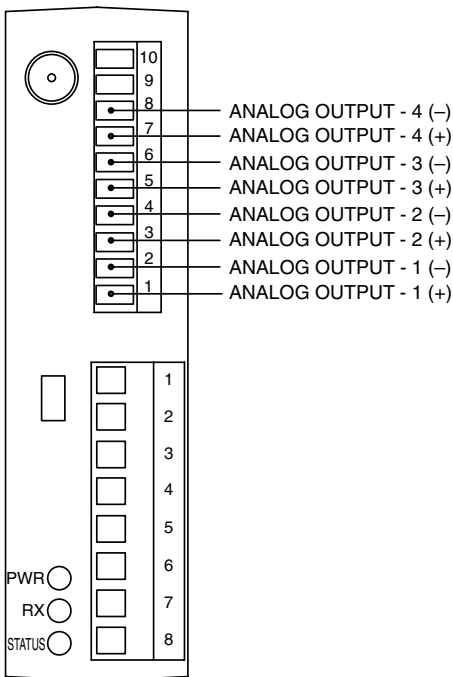
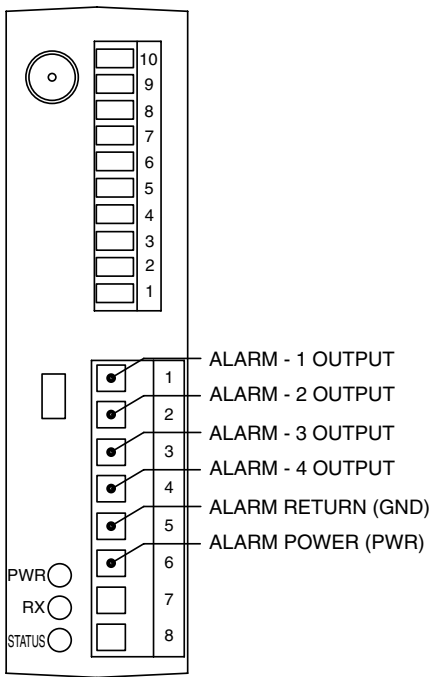
Indicator Lights

Section 9 - Receiver Connections



Receiver Operation - UWTC-REC4

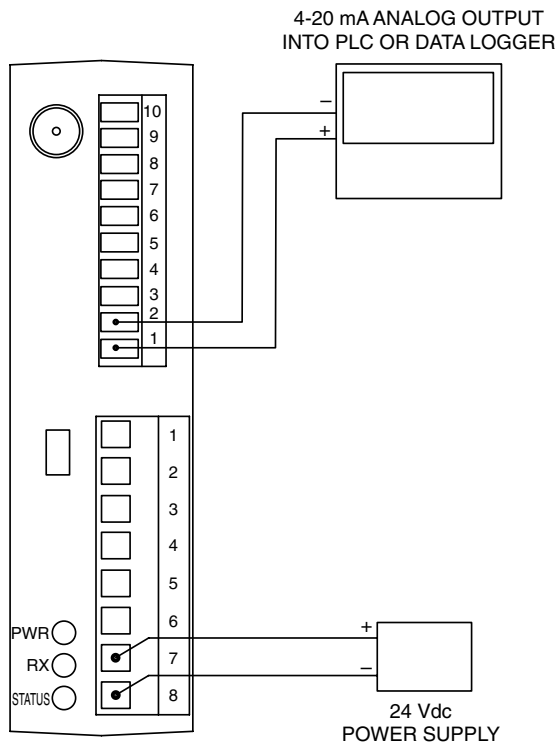
Power Supply Connection



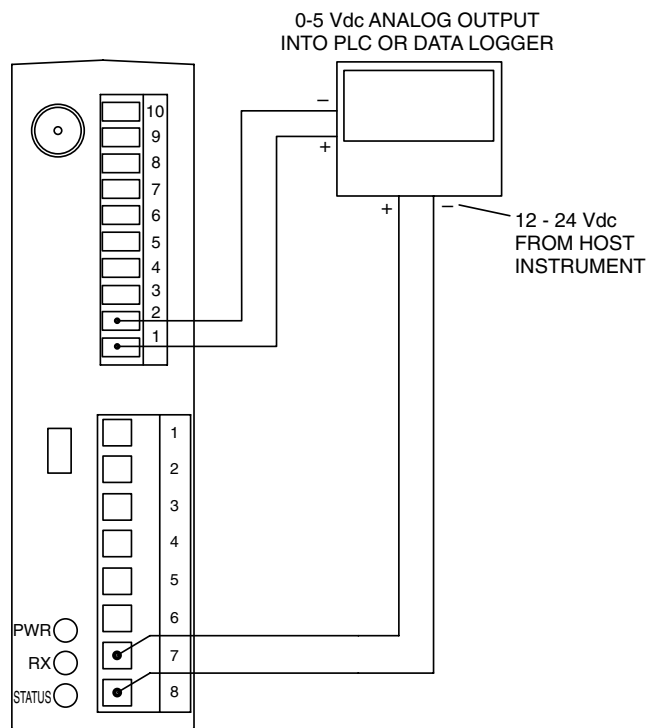
Alarm Output Connections

Analog Output Connections

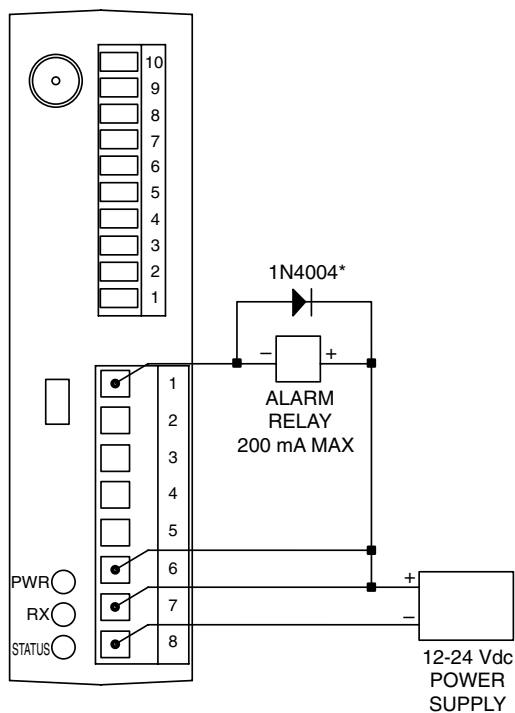
## Section 9 - Receiver Connection Cont.



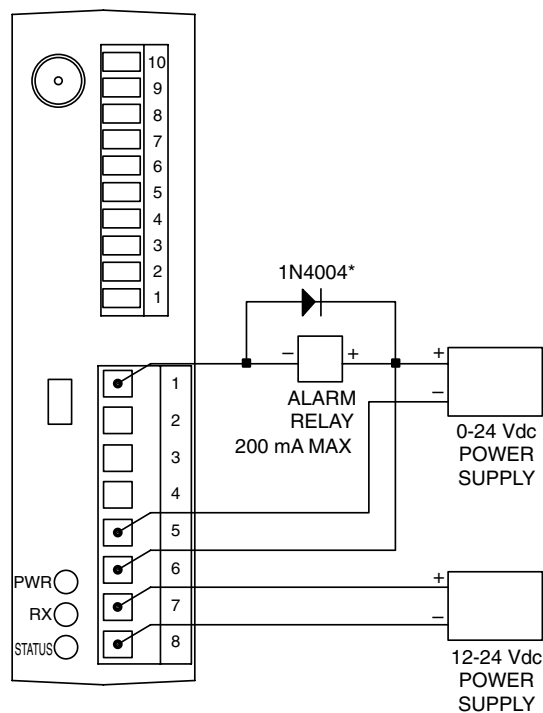
4-20 mA Output Example



Voltage Output Example



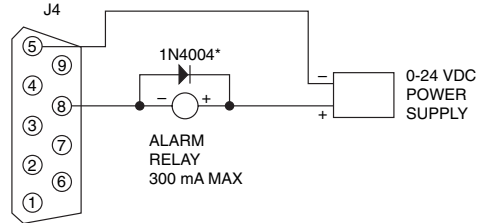
Alarm Example, System Powered



Alarm Example, External Power Supply

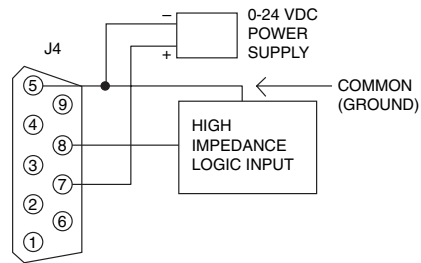
\*Required for magnetic relays. Not required for solid state relays.

## Section 9 - Receiver Connection Cont.

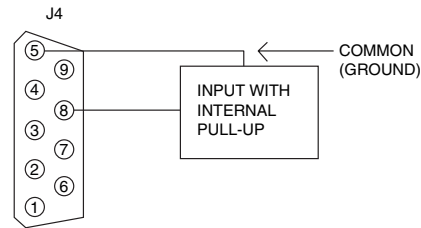


\*DIODE REQUIRED FOR MAGNETIC RELAYS.  
NOT REQUIRED FOR FOR SOLID STATE RELAYS,  
OR MAGNETIC RELAYS WITH INTERNAL DIODE.

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)

**UWTC-REC2 or UWTC-REC2-D, Alarm Example**