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

SECTION   **PAGE**

LIST OF FIGURES

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
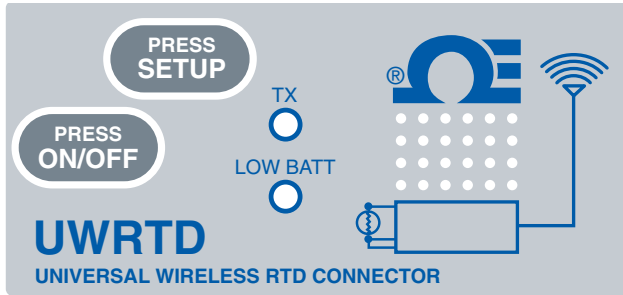
IEC symbols   **Description**

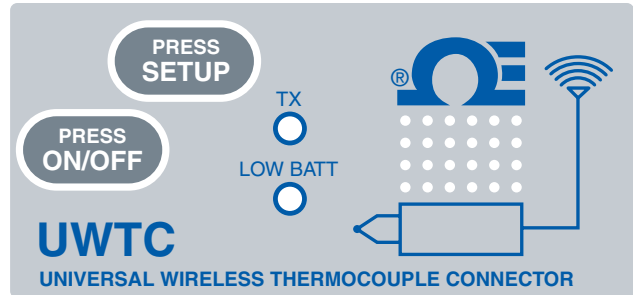Caution, refer to accompanying documentation

EU's Waste Electrical and Electronic Equipment Compliance

Section 2 - Product Labeling
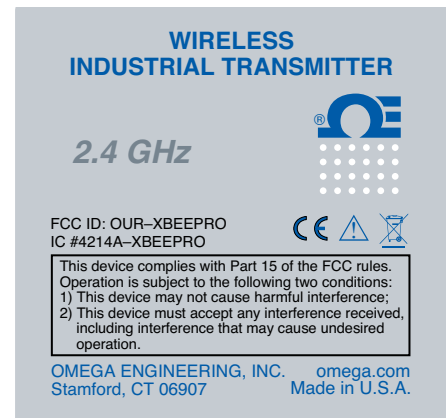
Connector Front Labels

PRESS SETUP

PRESS ON/OFF

TX

LOW BATT

UWRTD

UNIVERSAL WIRELESS RTD CONNECTOR

PRESS SETUP

PRESS ON/OFF

TX

LOW BATT

UWTC

UNIVERSAL WIRELESS THERMOCOUPLE CONNECTOR

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

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

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.

omega.com   PATENTS & PATENTS PENDING

MADE IN U.S.A.

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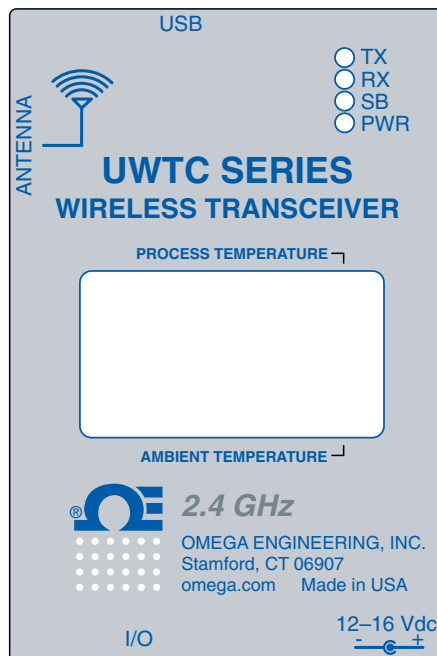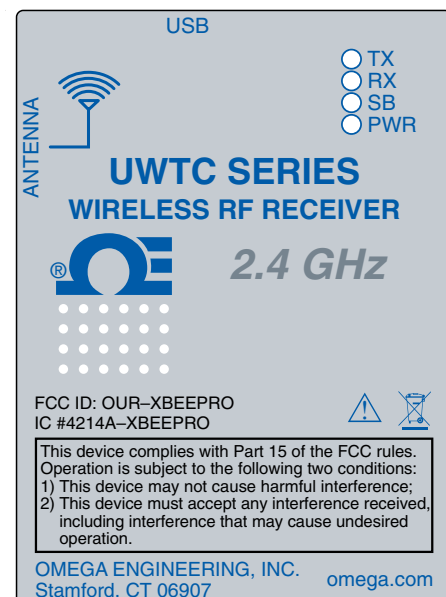(UWTC-1, UWTC-2, UWRTD-1, UWRTD-2)**

**WIRELESS
INDUSTRIAL TRANSMITTER**

2.4 GHz

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

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Stamford, CT 06907   Made in U.S.A.

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

Receiver Front Labels

USB

ANTENNA

TX
RX
SB
PWR

UWTC SERIES
WIRELESS TRANSCEIVER

PROCESS TEMPERATURE

AMBIENT TEMPERATURE

2.4 GHz

OMEGA ENGINEERING, INC.
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I/O   12–16 Vdc

**Receiver Front Label
UWTC-REC2-D**

USB

ANTENNA

TX
RX
SB
PWR

UWTC SERIES
WIRELESS RF RECEIVER

2.4 GHz

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.

OMEGA ENGINEERING, INC.
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**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
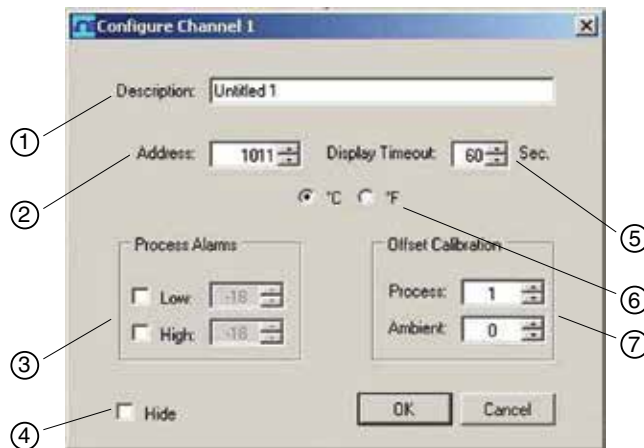
Channel Display Box Screen

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.
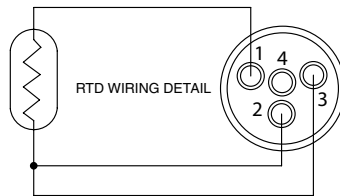
Section 5 – Transmitter/Connector Operation
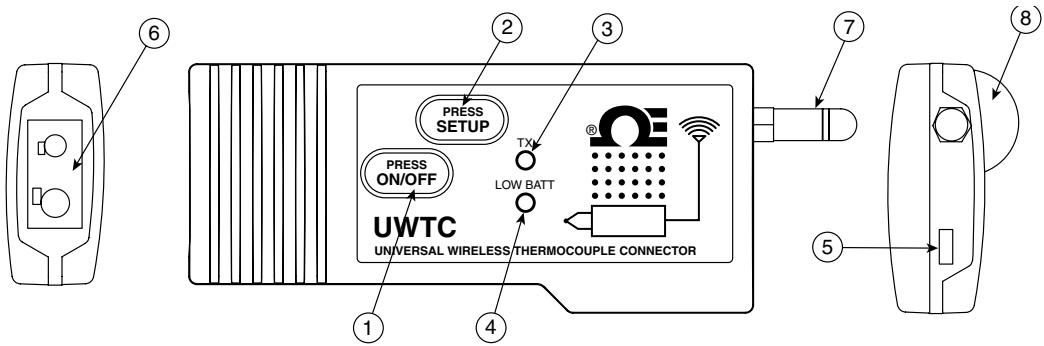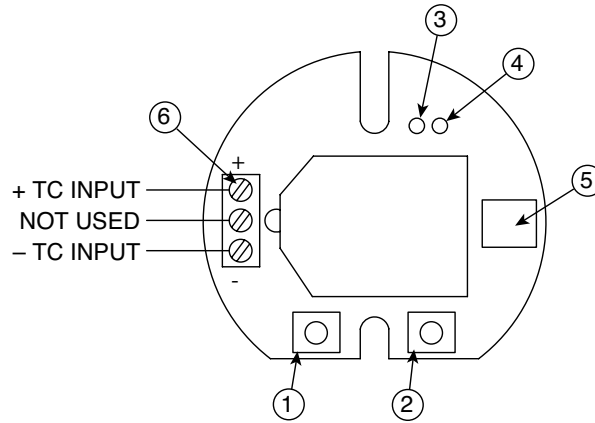

Thermocouple Connector (UWTC-1, UWTC-2)
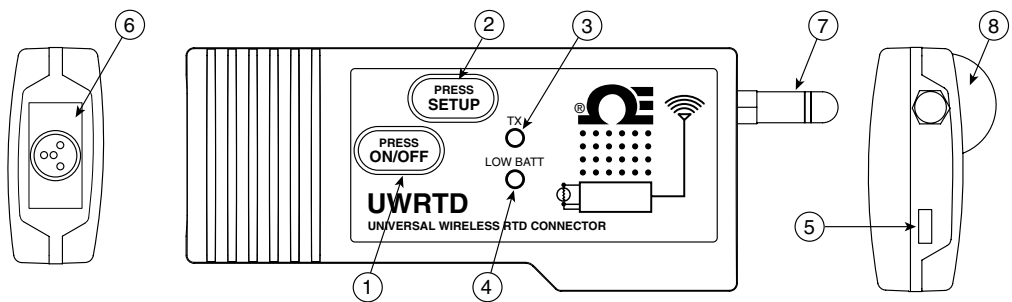
RTD Connector (UWRTD-1, UWRTD-2)

(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

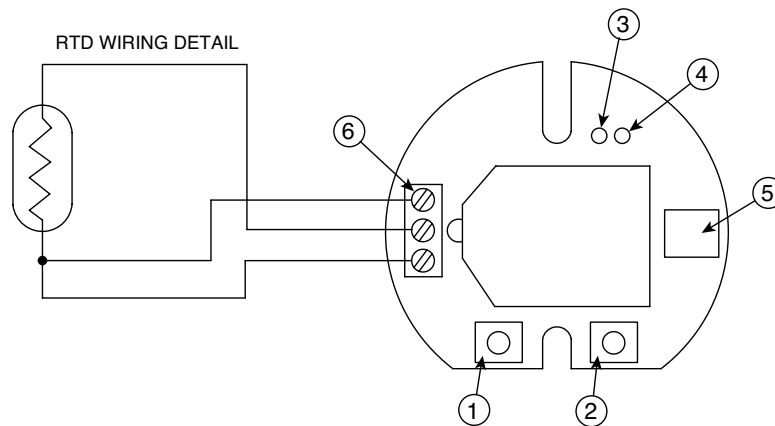# Section 6 – Connector Operation

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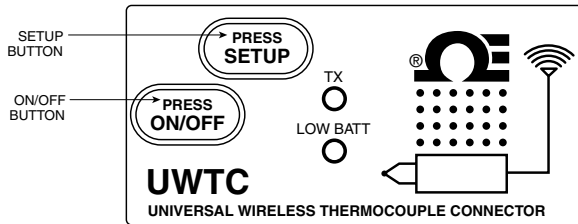**UWTC-NB9, UWTC-NB9-NEMA, UWTC-2-NEMA**

+ TC INPUT
NOT USED
– TC INPUT

Thermocouple Version

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

RTD WIRING DETAIL

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.
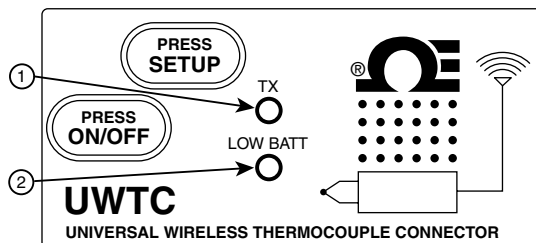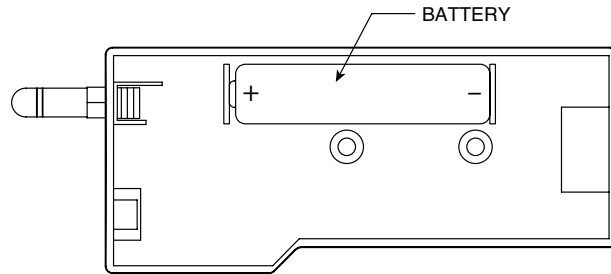
Transmit and Low Battery Lights

Connector/Transmitter Operation
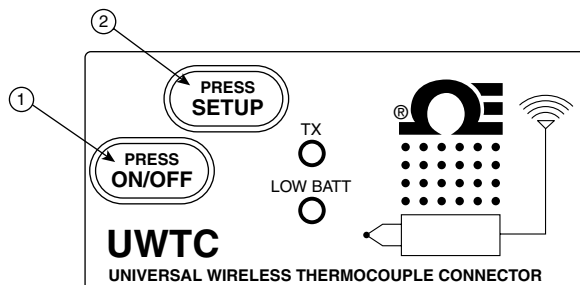
Section 7 - Battery Installation

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
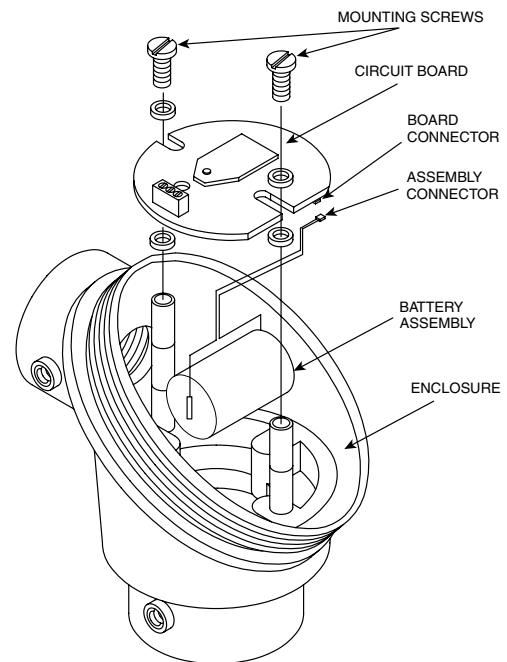
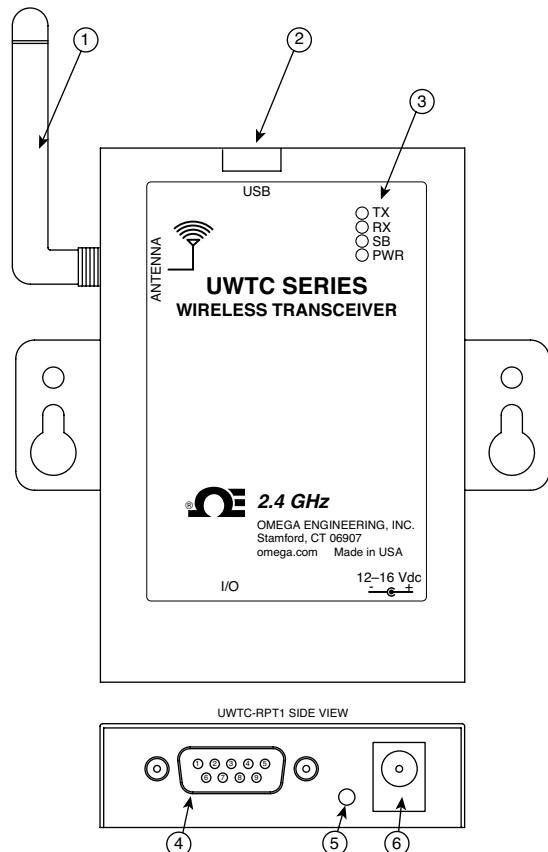**Battery Replacement**

Section 8 - Receiver Operation

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

ANTENNA

USB

○ TX
○ RX
○ SB
○ PWR

UWTC SERIES
WIRELESS RF RECEIVER

® Ω𝐄 *2.4 GHz*

FCC ID: OUR–XBEEPRO
IC #4214A–XBEEPRO

FC ⚠ 🗑

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   including interference that may cause undesired
   operation.

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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)

ANTENNA

USB

○ TX
○ RX
○ SB
○ PWR

UWTC SERIES
WIRELESS TRANSCEIVER

® Ω𝐄 *2.4 GHz*
OMEGA ENGINEERING, INC.
Stamford, CT 06907
omega.com   Made in USA

I/O   12–16 Vdc

UWTC-RPT1 SIDE VIEW

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)
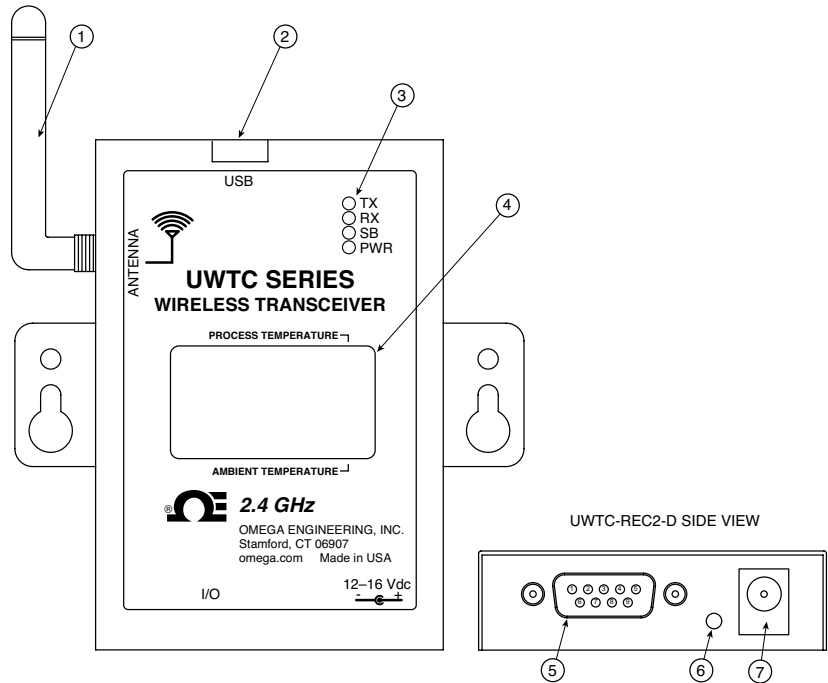
Receiver Operation - UWTC-REC2-D

UWTC-REC3
(1) Antenna
(2) Indicator Lights
(3) Power LED
(4) DC Power Jack
(5) Reset
(6) Ethernet Connection (RJ45)
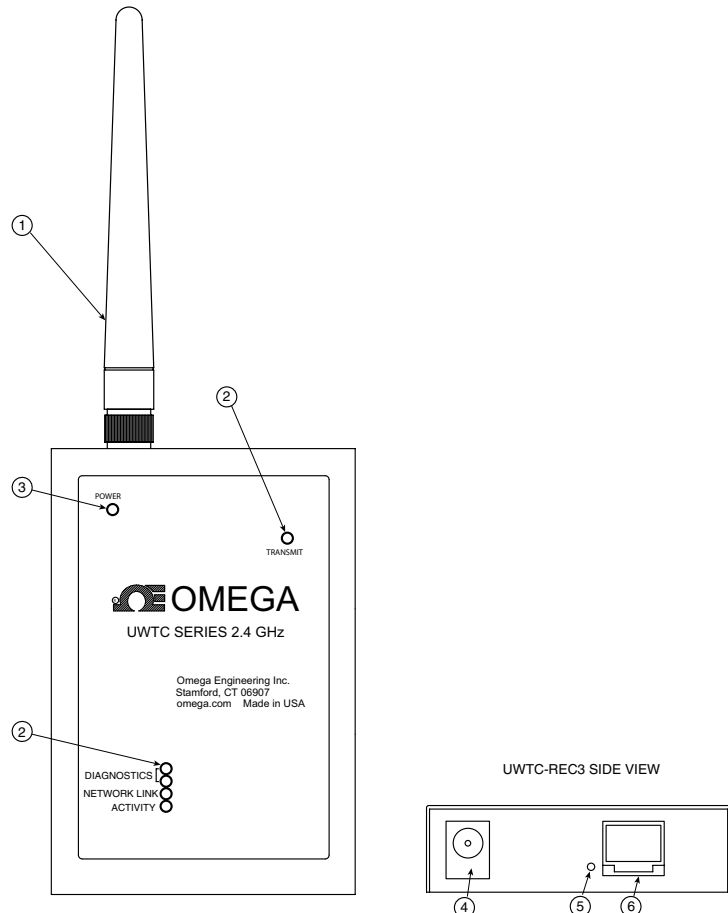
Receiver Operation - UWTC-REC3

Section 8 - Receiver Operation Cont.

UWTC-REC1-NEMA
(1) Antenna
(2) USB NEMA 4X Connector
    Sealing Cap

(3) USB NEMA 4X
    Connector Cable
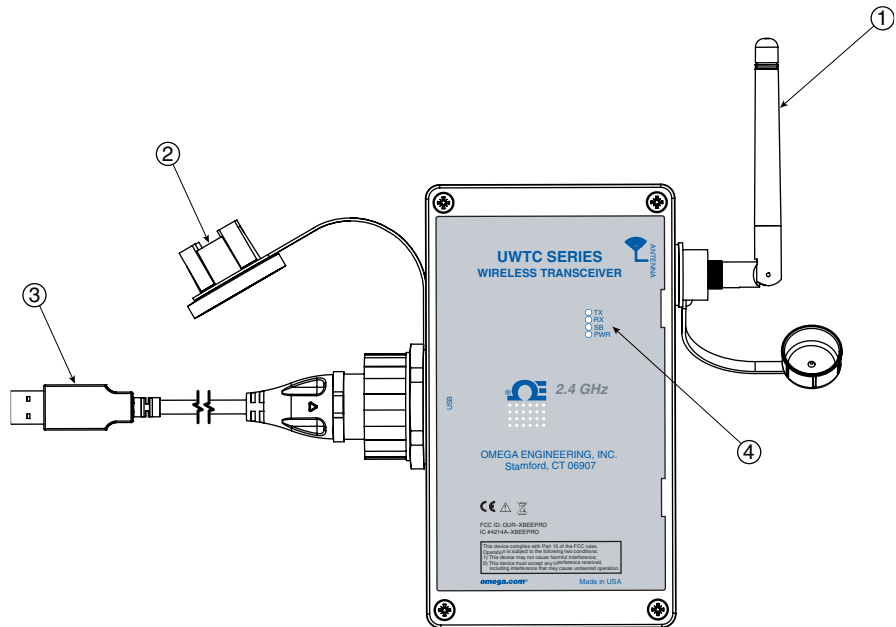
(4) Indicator Lights

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
    Cable Configuration:
    Yellow Wire: Alarm Output
    Blue Wire: Digital Ground
    Orange Wire: Alarm Power
(6) Thermocouple Cable
    Cable Configuration:
    Yellow Wire: Thermocouple Output (+)
    Red Wire: Thermocouple Output (-)
(7) 12 Vdc Power Adaptor
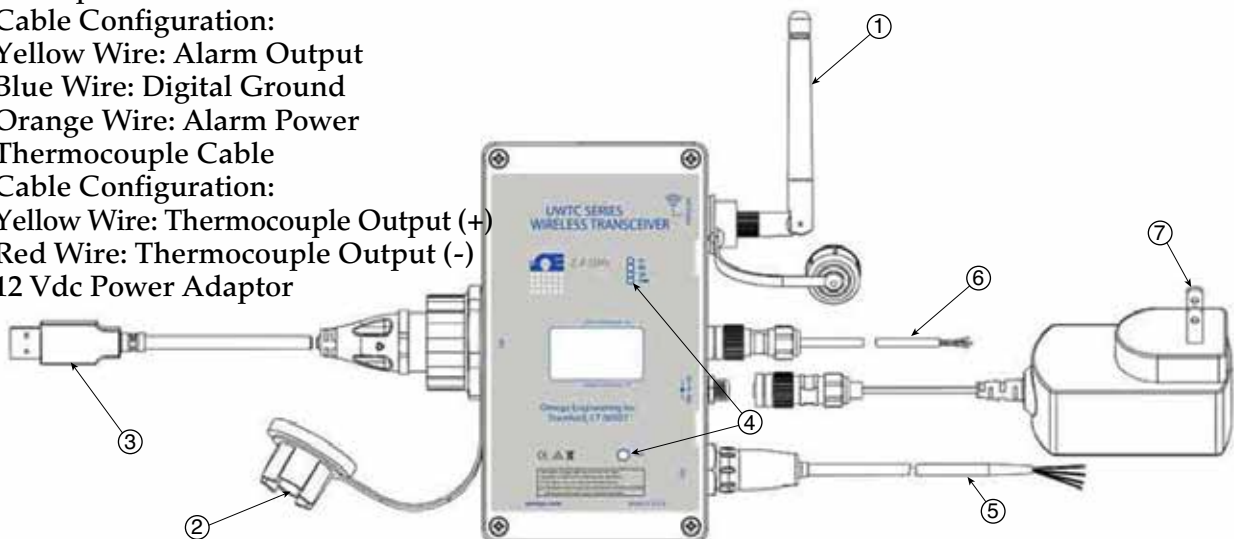
Receiver Operation - UWTC-REC2-D-TC-NEMA

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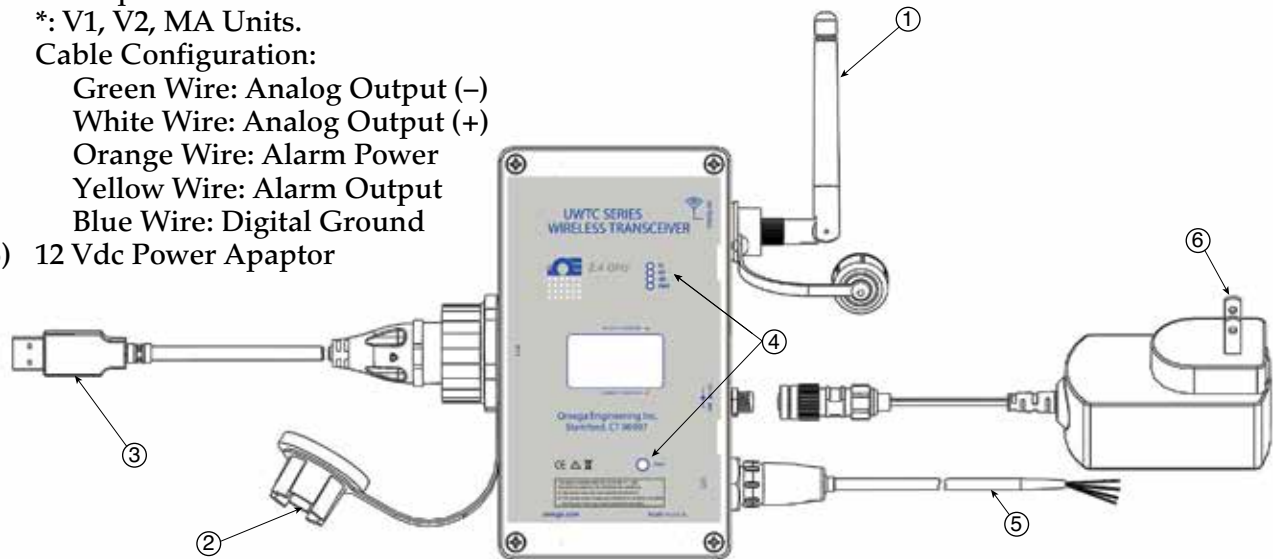
Receiver Operation - UWTC-REC2-D-*-NEMA

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.
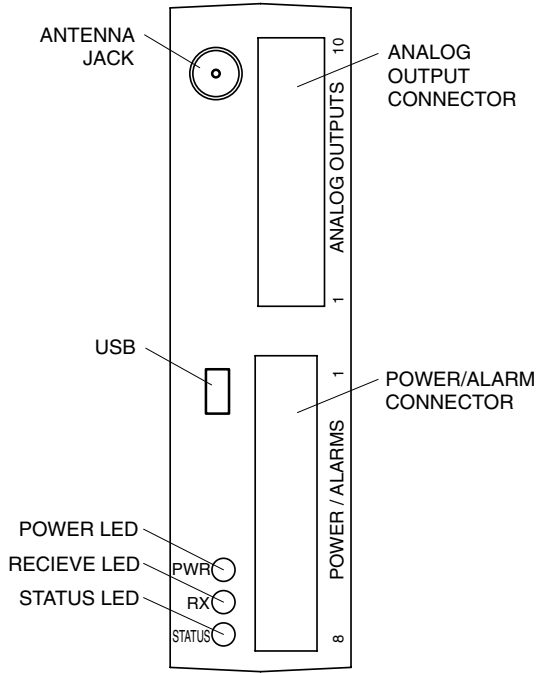
(3) Standby (SB) Yellow Indicator Light

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.
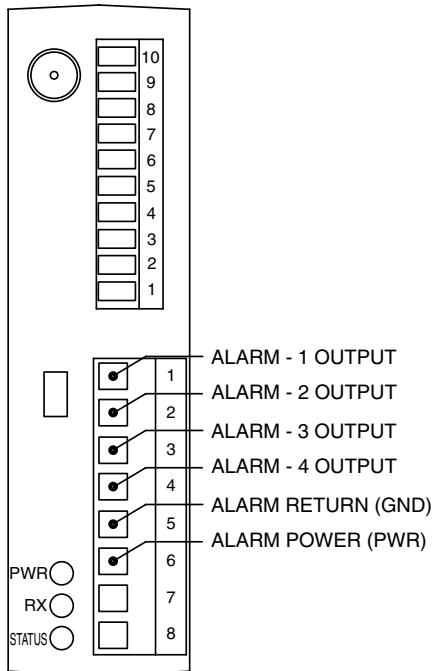
(4) Power (PWR) Green Indicator Light
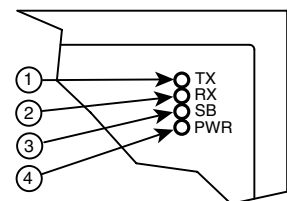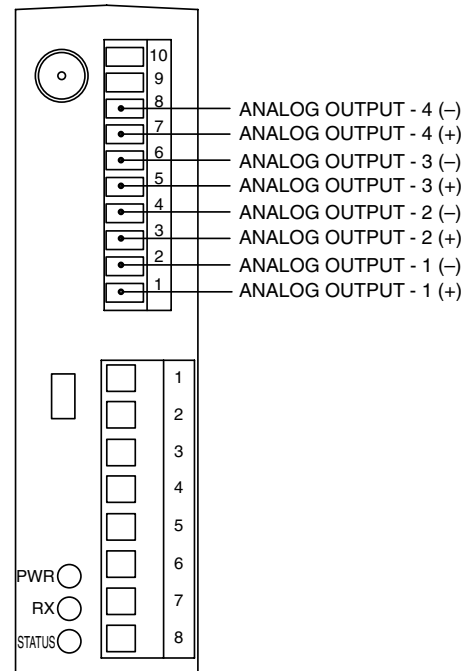

Indicator Lights

Section 9 - Receiver Connections
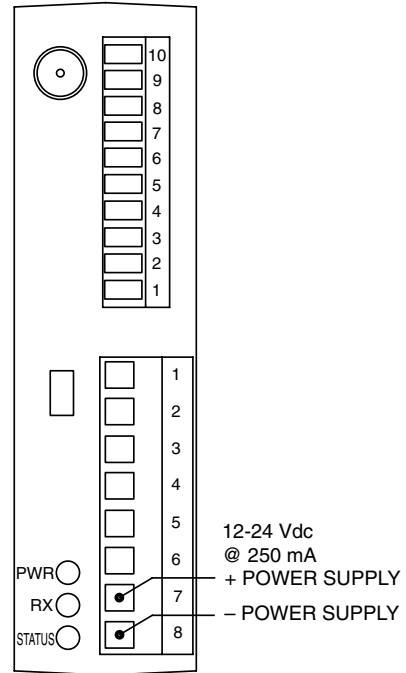
Receiver Operation - UWTC-REC4
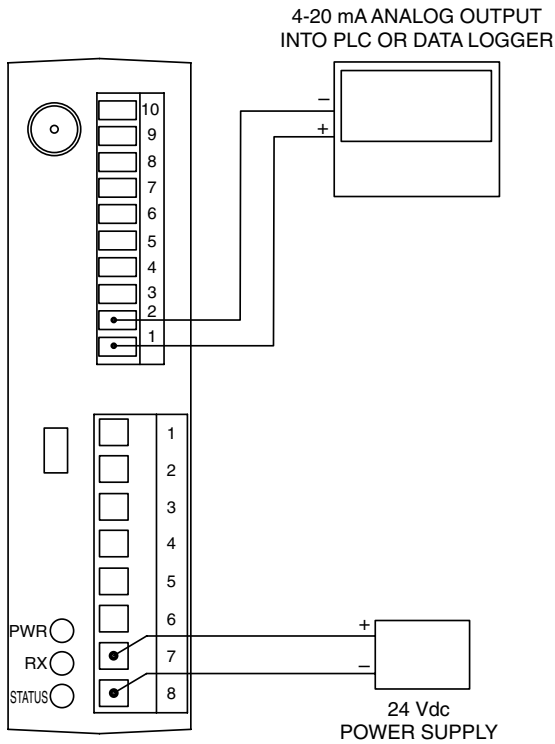

Power Supply Connection
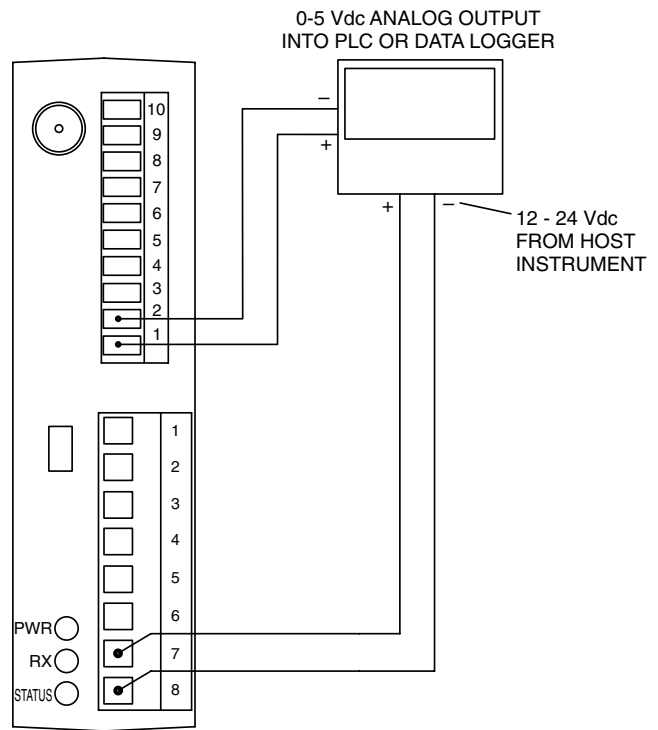

Alarm Output Connections
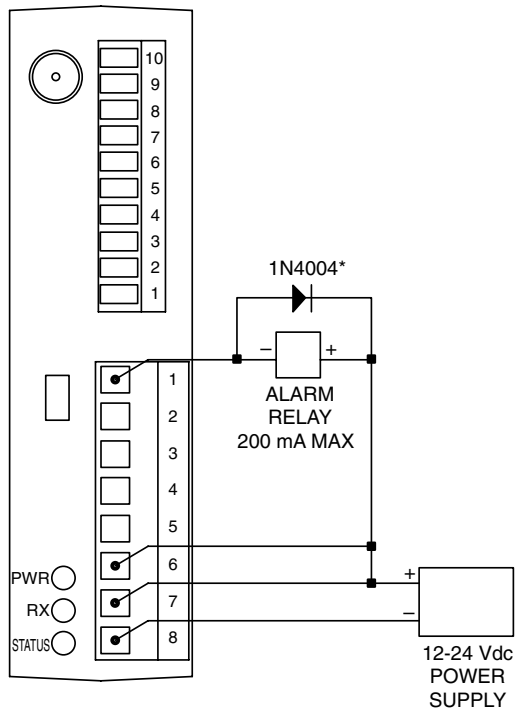

Analog Output Connections

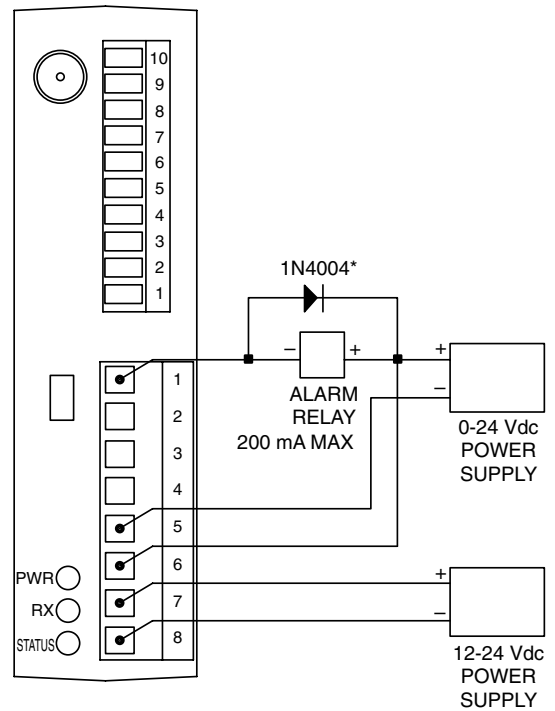# Section 9 - Receiver Connection Cont.

4-20 mA Output Example

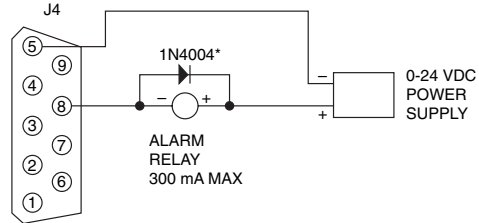**Voltage Output Example**

Alarm Example, System Powered

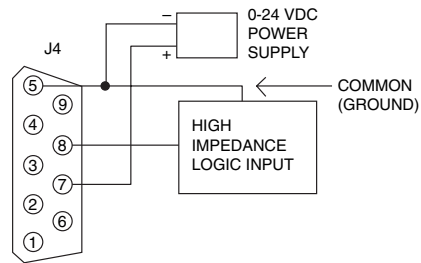**Alarm Example, External Power Supply**

*Required for magnetic relays. Not required for solid state relays.
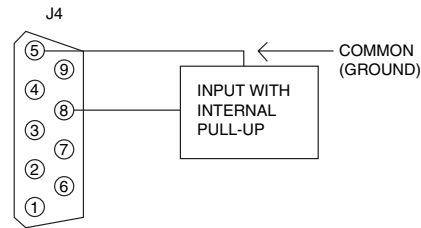
Section 9 - Receiver Connection Cont.

*DIODE REQUIRED FOR MAGNETIC RELAYS.
NOT REQIRED 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