

## Quick Start Guide

*IP69K-rated radar sensors are designed for use in car washes and other harsh environments*

This guide is designed to help you set up and install the R-GAGE T30RW Sensor. For complete information on programming, performance, troubleshooting, dimensions, and accessories, please refer to the Instruction Manual at [www.bannerengineering.com](http://www.bannerengineering.com). Search for part number 232729 to view the Instruction Manual. Use of this document assumes familiarity with pertinent industry standards and practices.

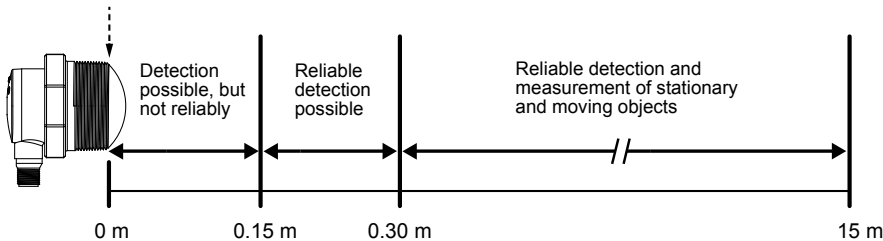


**WARNING:**

- **Do not use this device for personnel protection**
- Using this device for personnel protection could result in serious injury or death.
- This device does not include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A device failure or malfunction can cause either an energized (on) or de-energized (off) output condition.

## T30RW Overview

*Sensing Range*  
**Sensing Range**



Model	D0 (m)	D1 (m)	D2 (m)	D3 (m)
T30RW-1515 Models	0	0.15	0.20	15

## T30RW Features and Indicators

		LED	Color	Description
 T30RW Features	1	Power	Green	Power ON
	2	Signal Strength	Red	Flashes in proportion to the signal strength
	3	Output 1	Amber	Target is within the taught analog span or discrete output status
	4	Output 2	Amber	Discrete output status

## Radar Configuration Software



Use Banner's Radar Configuration Software to:

- Set up the sensor 3 easy steps: set the switch point distance, signal strength threshold, and response time
- Easily monitor device status via the software
- Visualize the application in real-time
- Make adjustments to sensor settings on the fly

For more information, visit [www.bannerengineering.com/us/en/products/sensors/software/radar-configuration.html](http://www.bannerengineering.com/us/en/products/sensors/software/radar-configuration.html).

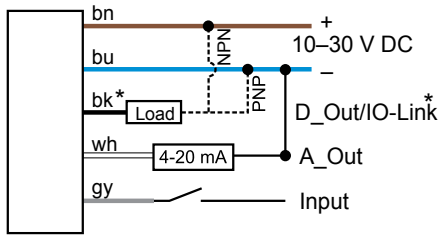


## Installation Instructions

### T30R Wiring

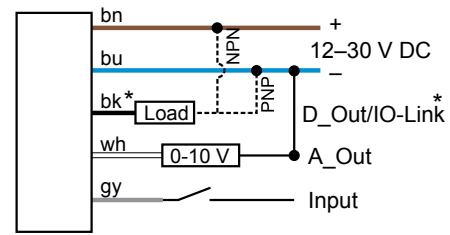
Quick disconnect wiring diagrams are functionally identical.

*Push-pull Output and Analog Current Output*



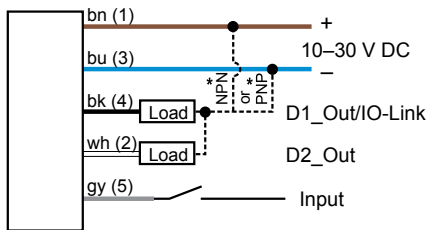
\* Push-Pull output. User-configurable PNP/NPN setting.

*Push-pull Output and Analog Voltage Output*



\* Push-Pull output. User-configurable PNP/NPN setting.

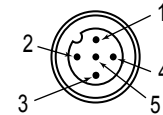
*Dual Discrete Output*



\* Push-Pull output.  
User-configurable PNP/NPN setting.

#### Key:

- 1 = Brown
- 2 = White
- 3 = Blue
- 4 = Black
- 5 = Gray (Connect for use with remote input or Banner Radar Configuration software)



## Mount the Device Using the Threaded Barrel

1. If your device came with a lock washer, place the lock washer on the barrel of the device.
2. Insert the barrel of the device through a hole or a bracket.
  - If desired and available, insert the device through an appropriately sized hole in the machine or equipment at the desired location.
  - If a bracket is needed, insert the device into the bracket.
3. Thread the mounting nut onto the barrel of the device, finger tight.
4. If using a bracket, mount the device and the bracket to the machine or equipment at the desired location. Do not tighten the mounting screws at this time.
5. Check the device alignment, aiming it near parallel to, or down towards, the ground.
 

If aiming at a target, alignment and signal strength can be checked via the red Signal Strength LED or the Banner Radar Configuration Software.
6. Tighten the nut.
7. If using a bracket, tighten the mounting screws to secure the device and the bracket in the aligned position.

## Getting Started

Power up the sensor, and verify that the power LED is ON green.

## Install the Software

#### Operating System

Microsoft® Windows® operating system version 10 or 11<sup>(1)</sup>

#### Hard Drive Space

500 MB

<sup>(1)</sup> Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.

#### Third-Party Software

.NET

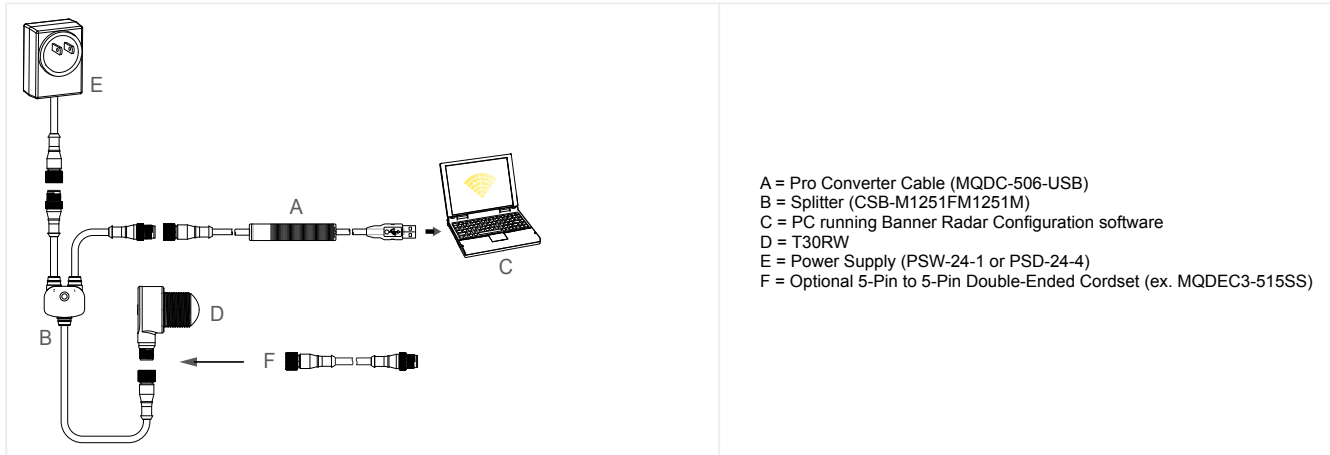
#### USB Port

Available USB port

**IMPORTANT:** Administrative rights are required to install the Banner Radar Configuration software.

1. Download the latest version of the software from [www.bannerengineering.com/us/en/products/sensors/software/radar-configuration.html](http://www.bannerengineering.com/us/en/products/sensors/software/radar-configuration.html).
2. Navigate to and open the downloaded file.
3. Click **Install** to begin the installation process.
4. Depending on your system settings, a popup window may appear prompting to allow Banner Radar Configuration to make changes to your computer. Click **Yes**.
5. Click **Close** to exit the installer.
6. See the Instruction Manual for instructions on using the Banner Radar Configuration software.

## Connect to the Sensor



1. Connect the sensor to the splitter cable from the PRO-KIT.
2. Connect the external power and Pro Converter cable to the splitter cable.
3. Connect the Pro Converter cable to the PC.
4. Open the Banner Radar Configuration Software.
5. Go to **Sensor > Connect** on the **Navigation** toolbar.  
The **Connection** screen displays.
6. Select the correct **Sensor Model** and **Com Port** for the sensor.
7. Click **Connect**.  
The **Connection** screen closes and the sensor data displays.

## T30RW Specifications

### Range

The sensor can detect an object at the following ranges, depending on the material of the target:

T30RW-1515 models:

Detection Range: 0.15 m to 15 m (0.5 ft to 49.2 ft)

Measurement Range: 0.2 m to 15 m (0.7 ft to 49.2 ft)

### Operating Principle

Frequency modulated continuous-wave (FMCW) radar

### Operating Frequency

122 GHz

### Frequency Range

T30RW-1515: 122 GHz to 123 GHz

### Supply Voltage (Vcc)

**Analog Voltage models:** 12 V DC to 30 V DC

**Analog Current and Dual Discrete models:** 10 V DC to 30 V DC

Use only with a suitable Class 2 power supply (UL) or Limited Power Supply (CE)

### Power and Current Consumption, exclusive of load

**Power consumption:** < 2.4 W

**Current consumption:** < 100 mA at 24 V DC

### Supply Protection Circuitry

Protected against reverse polarity and transient overvoltages

### Linearity<sup>(1)</sup>

T30RW-1515:

<± 20 mm at < 500 mm

<± 4 mm at > 500 mm

### Delay at Power-up

< 300 ms

### Maximum Torque

2.3 N·m (20 in-lbs)

### Repeatability<sup>(2)</sup>

< 1 mm

### Maximum Output Power

EIRP: 100 mW, 20 dBm

### Output Protection

Protected against output short-circuit

### Remote Input

Allowable Input Voltage Range: 0 to Vsupply

Active High (internal weak pull-down): High state > (Vsupply - 2.25 V) at 2 mA maximum

Active Low (internal weak pull-up): Low state < 2.25 V at 2 mA maximum

<sup>(1)</sup> Reference target with RCS = 1m².

<sup>(2)</sup> Repeatability < 10 mm at Excess Gain < 10×

**Response Time**

Analog update rate: 2 ms  
 Discrete output response: 6 ms  
 Speeds given for fast mode. See the Instruction Manual for additional details.

**Indicators**

**Power LED:** Green, power on

**Signal Strength LED:**

Red Flash: weak signal  
 Red Solid: 4× threshold

**Output LEDs:** Amber, target within taught analog span/  
 discrete output status

**Construction**

**Housing:** PBT

**Barrel Cover:** Polypropylene

**Output Configuration**

Analog Outputs:

**•Current models**

Discrete Output (Black Wire): IO-Link, push/pull output,  
 configurable PNP or NPN output  
 Analog output (White Wire): 4 mA to 20 mA

**•Voltage models**

Discrete Output (Black Wire): IO-Link, push/pull output,  
 configurable PNP or NPN output  
 Analog output (White Wire): Configurable 0 V to 10 V or  
 0.5 V to 4.5 V

**•Dual Discrete models**

Discrete Output 1 (Black Wire): IO-Link, push/pull output,  
 configurable PNP or NPN output  
 Discrete Output 2 (White Wire): Configurable PNP or NPN,  
 or Pulse Frequency Modulated (PFM) output

**Connections**

Integral M12 quick disconnect

Models with a quick disconnect require a mating cordset

**Vibration and Mechanical Shock**

All models meet MIL-STD-202F, Method 201A (Vibration: 10  
 Hz to 60 Hz maximum, 0.06 inch (1.52 mm) double amplitude,  
 10G acceleration) requirements. Method 213B conditions  
 H&I.Shock: 75G with device operating; 100G for non-  
 operation

**Operating Temperature**

−40 °C to +65 °C (−40 °F to +149 °F)

**Temperature Effect**

< ± 10 mm from −40 °C to +65 °C (−40 °F to +149 °F)

**Environmental Rating**

IP67 per IEC60529

IEC IP69K per BS/ISO 20653:2013

**Output Ratings**

Analog Outputs:

• **Current Output (T30R....-I.. models):** 1 kΩ maximum load  
 resistance at 24 V; maximum load resistance =  $[(V_{cc} - 4.5)/$   
 $0.02 \Omega]$

• **Voltage Output (T30R....-U.. models):** 2.5 kΩ minimum load  
 resistance

Discrete Outputs:

• **Current rating = 50 mA maximum each**

Black wire specifications per configuration		
<b>IO-Link Push/Pull</b>	Output High	≥ Vsupply - 2.5 V
	Output Low	≤ 2.5V
<b>PNP</b>	Output High	≥ Vsupply - 2.5 V
	Output Low	≤ 1V (loads ≤ 1 MegΩ)
<b>NPN</b>	Output High	≥ Vsupply - 2.5 V
	Output Low	≤ 2.5 V

White wire specifications per configuration		
<b>PNP</b>	Output High	≥ Vsupply - 2.5 V
	Output Low	≤ 2.5 V (loads ≤ 70 kΩ)
<b>NPN</b>	Output High	≥ Vsupply - 2.5 V
	Output Low	≤ 2.5 V

**Advanced Capabilities**

Available only in dual discrete models

**Certifications**

	 UL Environmental Rating: Type 1		
	<b>Banner Engineering BV</b> Park Lane, Culliganlaan 2F bus 3, 1831 Diegem, BELGIUM		
	<b>Turck Banner LTD</b> Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain		

ETSI EN 305 550-1 V.1.2.1

ETSI EN 305 550-2 V.1.2.1

FCC ID: UE3-T30R

IC: ID 7044A-T30R

for others, contact Banner Engineering

Country of Origin: USA

Operation of the T30RW sensor on board an aircraft or a satellite shall be prohibited.

## FCC Part 15 Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

## Industry Canada Statement for Intentional Radiators

This device contains licence-exempt transmitters(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

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1. L'appareil ne doit pas produire de brouillage.
2. L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

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