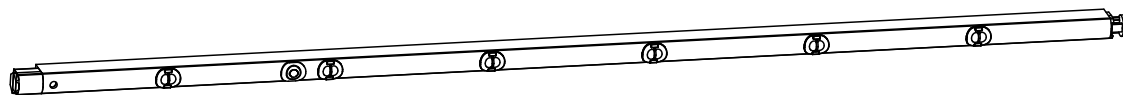


## TTR Features



- Reliable leading-edge detection of letters, thin packages, poly bags, totes, boxes or other products on roller conveyors
- Mounts between conveyor roller gap to standard hex or round side rail holes with no extra hardware required or on the T-Slot with customer-supplied bracket and hardware
- Spring-loaded end caps reduce installation and alignment time for reduced labor costs
- Built to order with specified length and beam spacing: 200 mm to up to 1500 mm (8 in to up to 59 in) depending on mounting configuration, with 2 to 10 sensors for maximum flexibility
- Robust aluminum housing, ambient light and ESD resistance for enhanced durability

### 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.

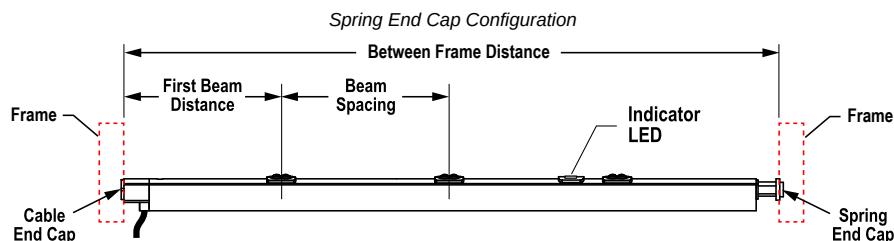
## Models

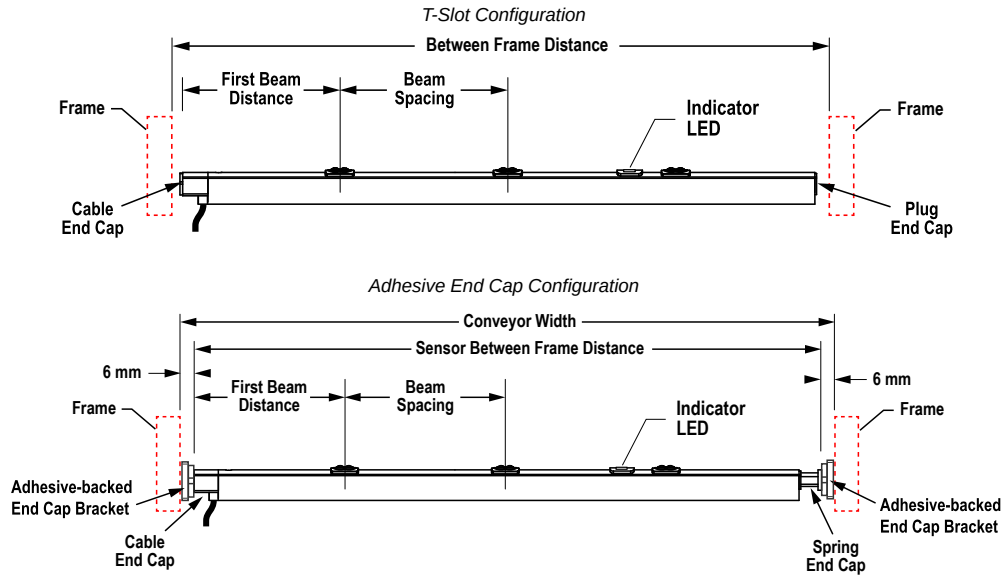
| Model Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Between Frame Distance (mm) | Output Type | Special Feature | Beam Spacing | No. of Beams | End Cap Style | Cable Length (m) | Connector Style | First Beam Distance from Cable End Cap (mm) |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------|-----------------|--------------|--------------|---------------|------------------|-----------------|---------------------------------------------|
| TTR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 384                         | AP          | S               | A            | 6            | T             | 2.0              | FL              | CTR                                         |
| End Cap Style T: 200-1500mm<br>End Cap Styles A, B, D and E: 200-915mm<br>End Cap Styles C, F, and G: 200-750mm<br>BM = Bimodal<br>AP = Light Operate PNP<br>AN = Light Operate NPN<br>RP = Dark Operate PNP<br>RN = Dark Operate NPN<br>S = Standard Range (120mm White Card Range)<br>G = Standard Gain (120mm White Card Range) with Ground Strap<br>W = Low Gain (85mm White Card Range) with Ground Strap<br>X = Low Gain (85mm White Card Range)<br>Y = Low Gain (100mm White Card Range) with Ground Strap<br>Z = Low Gain (100mm White Card Range)<br>A = 54 mm<br>B = 93.1 mm<br>C = 108 mm<br>D = 162 mm<br>E = 186.2 mm<br>F = 75 mm<br>G = 150 mm<br>2,3,4,5,6,7,8,9,10<br>A,B,C,D,E,F,G,T<br>0.5 m, 1.0 m, 2.0 m<br>FL = Flying Leads<br>RJ = RJ11<br>Q5 = M12<br>Q3 = M8 Snap<br>CTR = Beams centered between frames<br>059-200 = First beam distance from cable end cap |                             |             |                 |              |              |               |                  |                 |                                             |
| Model Name = TTR 384 AP S A 6 T 2.0 FL CTR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                             |             |                 |              |              |               |                  |                 |                                             |

**NOTE:** For definition of the End Cap Styles, see "[Configurations](#)" on page 1.

**NOTE:** Sensors with more than 7 beams have higher minimum supply voltage requirements, see "[TTR Specifications](#)" on page 5.

## Configurations



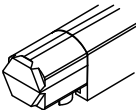
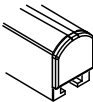


#### End Cap Styles

| End Cap Style | End 1                                                                                     |  | End 2                                                   |  |
|---------------|-------------------------------------------------------------------------------------------|--|---------------------------------------------------------|--|
| <b>A</b>      | 11 mm Hex, flat side up                                                                   |  | Spring 11 mm hex / 8 mm round                           |  |
| <b>B</b>      | 11 mm Hex, point up                                                                       |  | Spring 11 mm hex / 8 mm round                           |  |
| <b>C</b>      | Adjustable 11 mm Hex, can be positioned in 10 degree increments                           |  | Spring 11 mm hex / 8 mm round                           |  |
| <b>D</b>      | 11 mm Hex, flat side up                                                                   |  | Spring 8 mm round                                       |  |
| <b>E</b>      | 11 mm Hex, point up                                                                       |  | Spring 8 mm round                                       |  |
| <b>F</b>      | Adjustable 11 mm Hex, can be positioned in 10 degree increments                           |  | Spring 8 mm round                                       |  |
| <b>G</b>      | Adjustable 11 mm Hex, can be positioned in 10 degree increments / adhesive backed bracket |  | Spring 11 mm hex / 8 mm round / adhesive backed bracket |  |

Continued on page 3

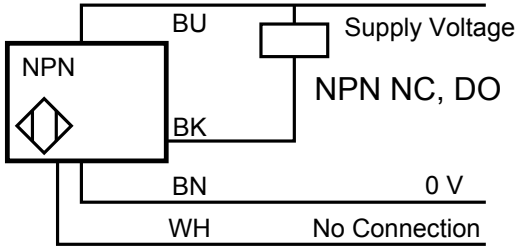
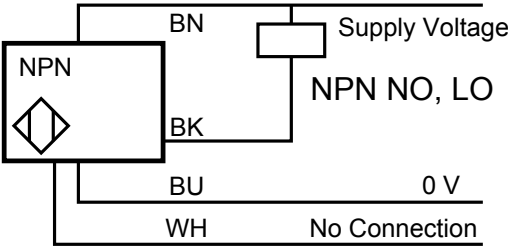
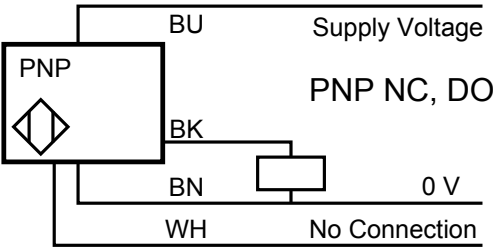
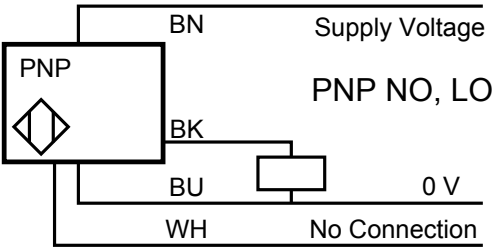
Continued from page 2

| End Cap Style | End 1                   |                                                                                   | End 2 |                                                                                     |
|---------------|-------------------------|-----------------------------------------------------------------------------------|-------|-------------------------------------------------------------------------------------|
| T             | 11 mm Hex, flat side up |  | Plug  |  |

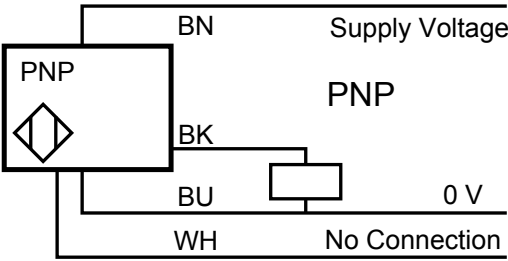
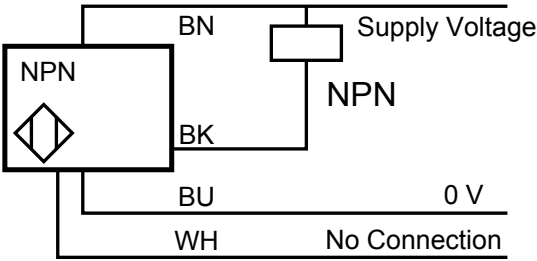
**NOTE:** T-Slot mounted sensors with the T End Cap Style are 6 mm shorter than the specified Between Frame Distance.

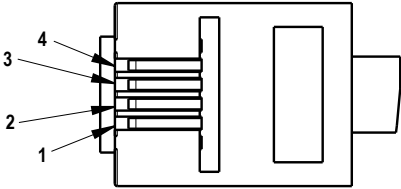
TTR Wiring

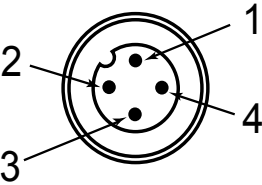
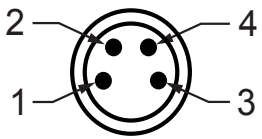
Bimodal output wiring diagrams



Fixed NPN and PNP output wiring diagrams: light and dark operate by model number

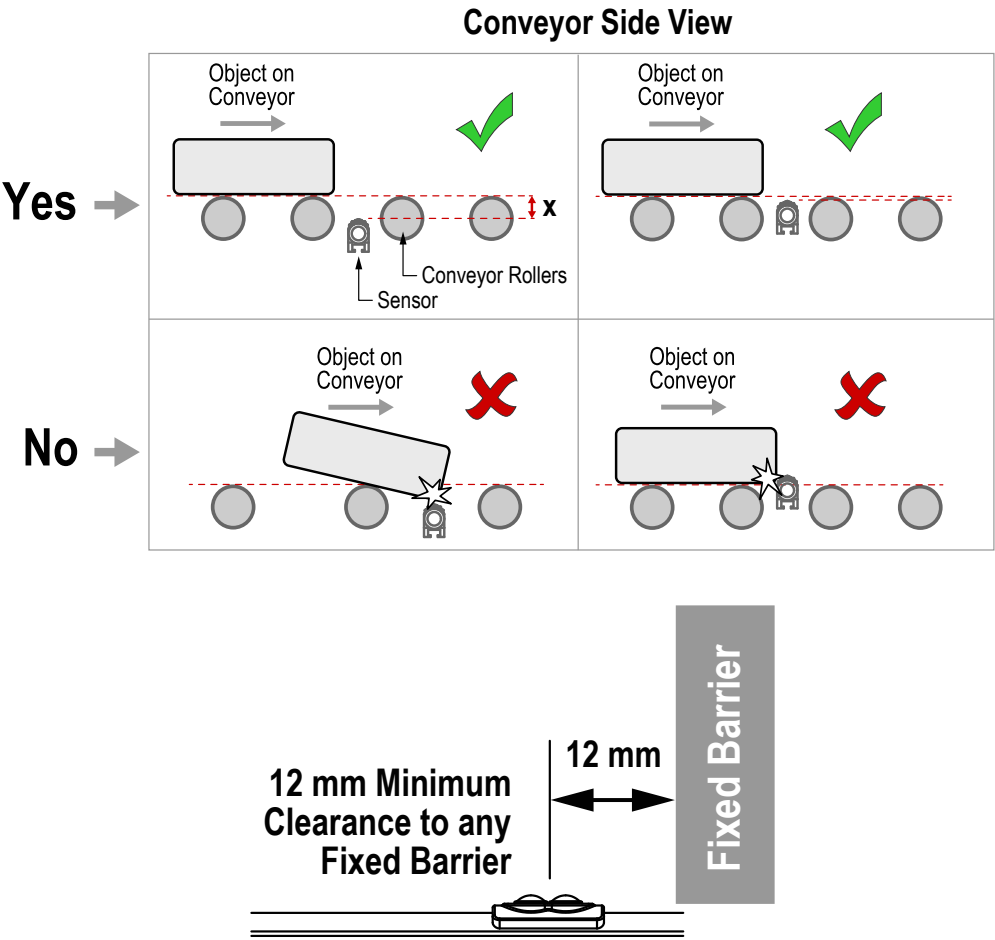


| RJ-11 Pinout                                                                        | RJ-11 Key                                                                                                  |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>1. Brown</li><li>2. Black</li><li>3. White</li><li>4. Blue</li></ul> |

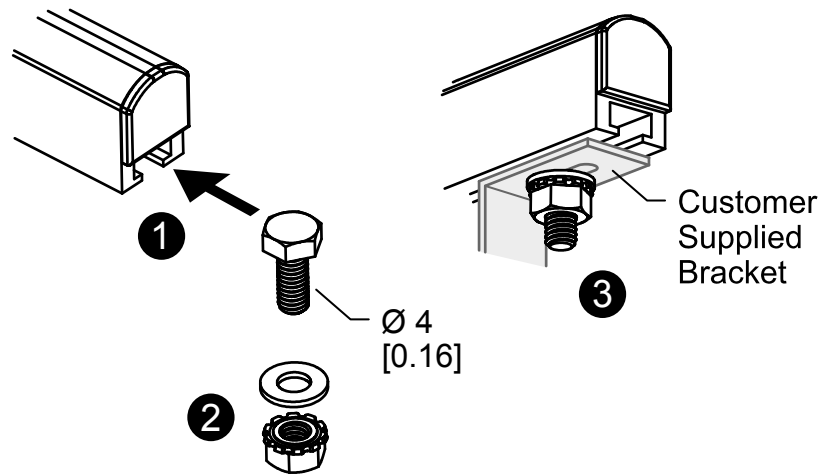
| M12 Pinout (Male)                                                                 | M12 Key                                                                                                    |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none"><li>1. Brown</li><li>2. White</li><li>3. Blue</li><li>4. Black</li></ul> |
| M8 Snap Connector Pinout (Male)                                                   | M8 Key                                                                                                     |
|  | <ul style="list-style-type: none"><li>1. Brown</li><li>2. White</li><li>3. Blue</li><li>4. Black</li></ul> |

Installation

TTR Mounting Considerations



TTR T-Slot Installation



## TTR Specifications

### Supply Current

45 mA

### Supply Protection Circuitry

Protected against reverse polarity and transient voltages

### Wavelength

Infrared LED, 940 nm

### Output Response

1 ms on/off

### Indicators

Amber on: Light sensed

### Sensing Mode

Diffuse, Infrared, 940 nm

### Operating Conditions

-10 °C to +55 °C (+14 °F to +131 °F)

### Environmental Rating

IP50

### Output Configuration

Rating: 100 mA max output at 25 °C

Output Voltage High: Greater than  $V_{supply} - 2.5 V$

Output Voltage Low: Less than 2.5 V

For loads less than 1 Meg Ohm

Protected against false pulse on power-up and continuous overload or short-circuit of output

### Vibration and Mechanical Shock

All models meet IEC 60068-2-6, IEC 60947-5-2, UL491 Section 40, MIL-STD-202F, Method 201A (Vibration: 10 Hz to 60 Hz, 0.5 mm peak-to-peak)

Shock: 30G 11 ms duration, half sine wave per IEC 60068-2-27

### Certifications



Banner Engineering BV  
Park Lane, Culliganlaan 2F bus 3  
1831 Diegem, BELGIUM

### Cable

Minimum static bend radius: 20 mm

Flex life > 10,000 cycles at flexing bend radius > 40 mm

### Supply Voltage

| Number of Sensing Beams | Supply Voltage with 10% Maximum Ripple |
|-------------------------|----------------------------------------|
| 2, 3, 4, 5, 6, 7        | 18 V DC to 30 V DC                     |
| 8                       | 22 V DC to 30 V DC                     |
| 9                       | 24 V DC to 30 V DC                     |
| 10                      | 26 V DC to 30 V DC                     |

Use only with a suitable Class 2 power supply (UL) or SELV power supply (CE)

### Range

| Special Feature Type | Range              |                   |                          |
|----------------------|--------------------|-------------------|--------------------------|
|                      | 90% White Card     | 18% Gray Card     | 6% Black Card            |
| S and G              | 0 to $\geq 120$ mm | 0 to $\geq 50$ mm | $\leq 3$ to $\geq 30$ mm |
| Y and Z              | 0 to $\geq 100$ mm | 0 to $\geq 40$ mm | $\leq 4$ to $\geq 25$ mm |
| W and X              | 0 to $\geq 85$ mm  | 0 to $\geq 35$ mm | $\leq 6$ to $\geq 20$ mm |



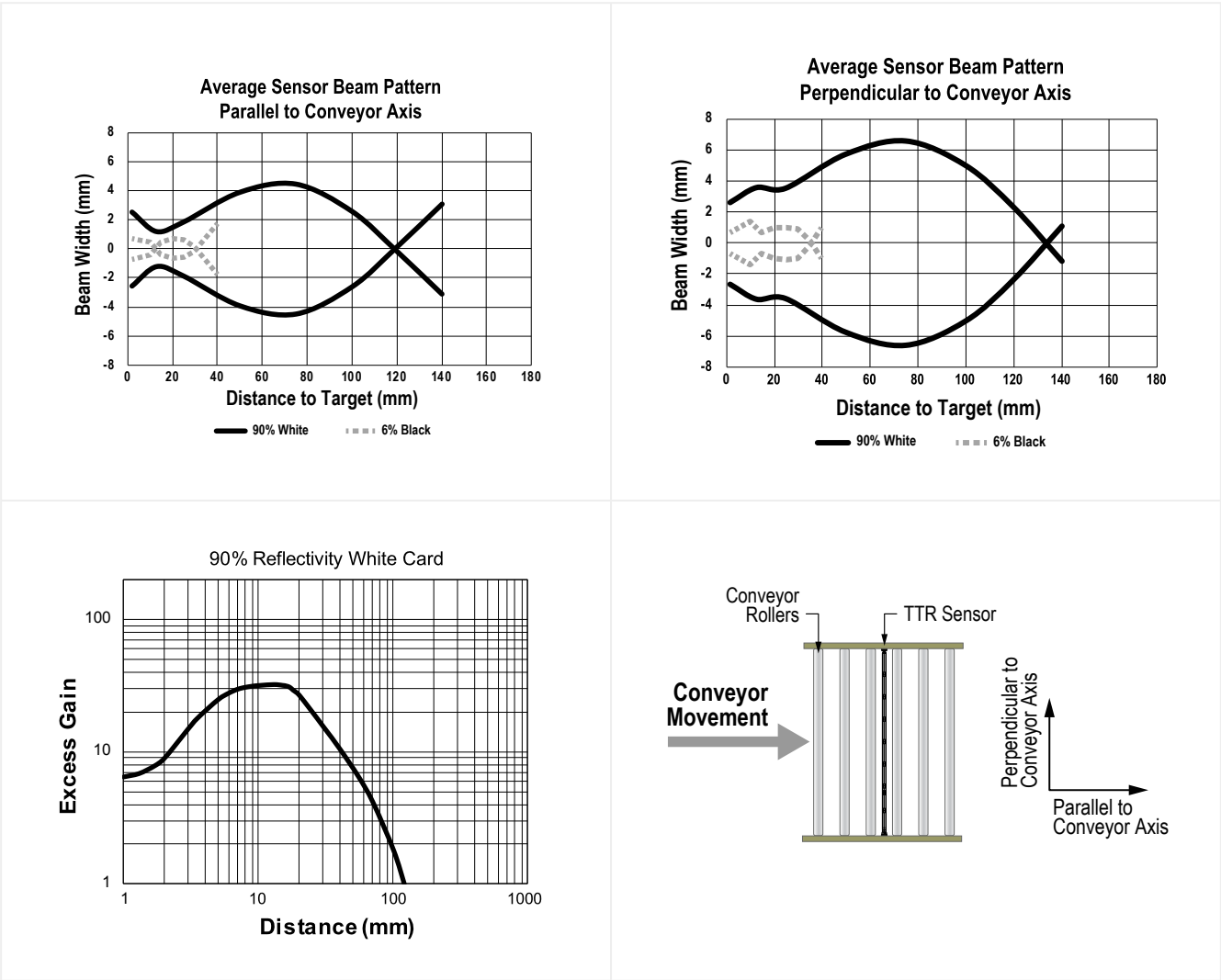
Turck Banner LTD Blenheim House  
Blenheim Court  
Wickford, Essex SS11 8YT  
GREAT BRITAIN



IND. CONT. EQ.  
E224071

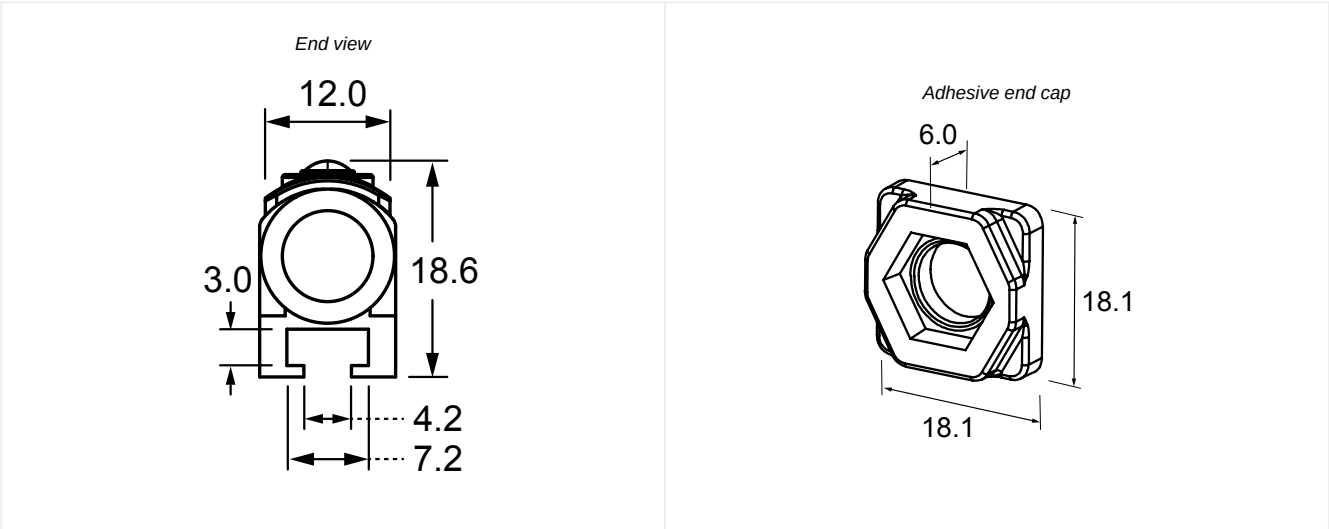
## TTR Performance Curves

**NOTE:** The Beam Pattern and Excess Gain performance curve diagrams represent the Standard Gain (Special Feature S and G) models.



TTR Dimensions

All measurements are listed in millimeters, unless noted otherwise.



## Accessories for the TTR Family

|                                                                                                                                                                                          |                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>TTR-HK1</b> <ul style="list-style-type: none"> <li>• Hardware packet for T-style End-Cap TTRs</li> <li>• (2) M4 screws</li> <li>• (2) Hex nuts</li> <li>• (2) Lock washers</li> </ul> | <b>TTR-HK2</b> <ul style="list-style-type: none"> <li>• Hardware packet for G-style End-Cap TTRs</li> <li>• (2) Adhesive-backed mounting brackets</li> </ul>        |
| <b>TTR-HK20</b> <ul style="list-style-type: none"> <li>• Hardware packet for G-style End-Cap TTRs</li> <li>• (20) Adhesive-backed mounting brackets</li> </ul>                           | Two adhesive-backed mounting brackets are included with each G-style sensor. Adhesive-backed mounting brackets are also compatible with A-, B-, or C-style sensors. |

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For patent information, see [www.bannerengineering.com/patents](http://www.bannerengineering.com/patents).

Document title: Through the Roller (TTR) Sensor Family Datasheet

Part number: 216696

Revision: E

Original Instructions

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CTR-M8 TTR533APSC4D-2.0RJ-CTR TTR610APSB5D-2.0RJ-CTR