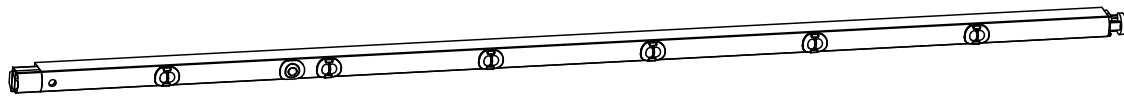


Through the Roller Sensor Family

Datasheet



- 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



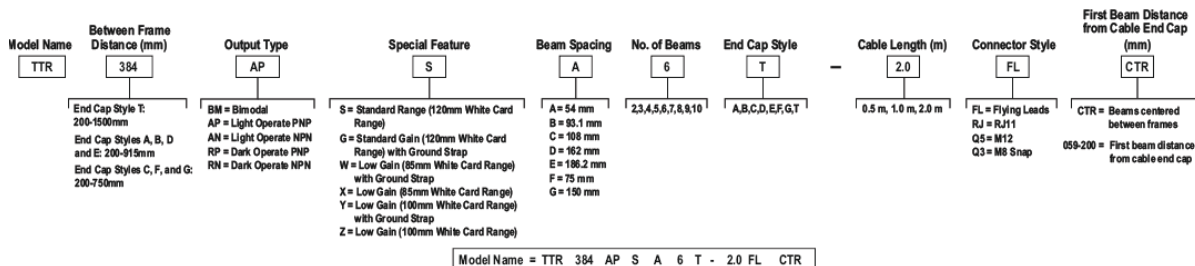
WARNING

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



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 [Specifications for the TTR on page 5](#).

Configurations

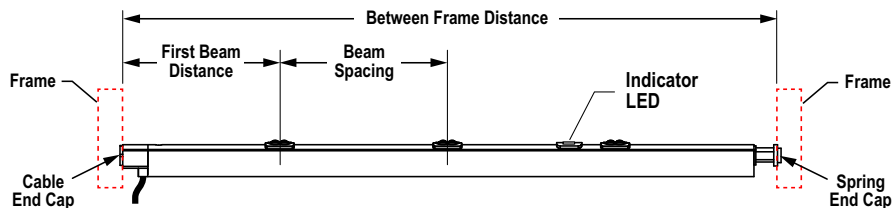


Figure 1: Spring End Cap Configuration

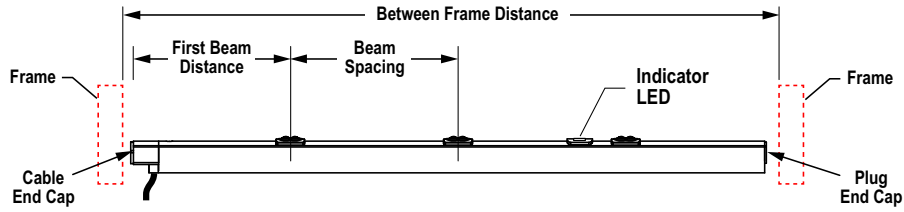


Figure 2: T-Slot Configuration

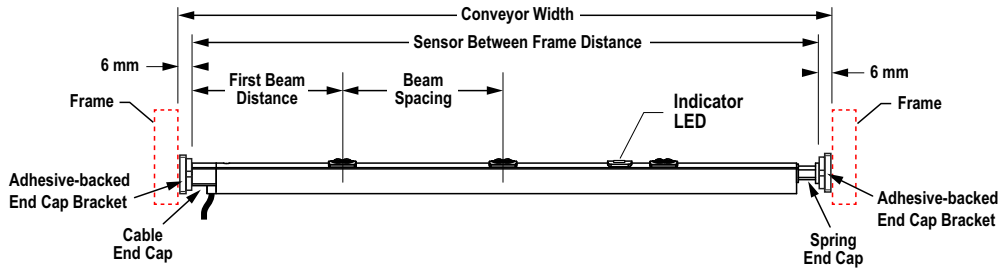
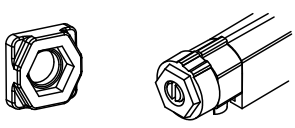
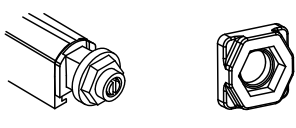
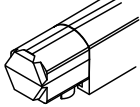
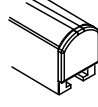


Figure 3: Adhesive End Cap Configuration

Table 1: End Cap Styles (Sheet 1 of 2)

End Cap Style		End 1		End 2
A	11 mm Hex, flat side up		Spring 11 mm hex / 8 mm round	
B	11 mm Hex, point up		Spring 11 mm hex / 8 mm round	
C	Adjustable 11 mm Hex, can be positioned in 10 degree increments		Spring 11 mm hex / 8 mm round	
D	11 mm Hex, flat side up		Spring 8 mm round	
E	11 mm Hex, point up		Spring 8 mm round	
F	Adjustable 11 mm Hex, can be positioned in 10 degree increments		Spring 8 mm round	

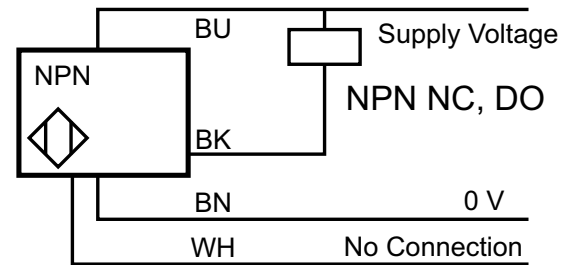
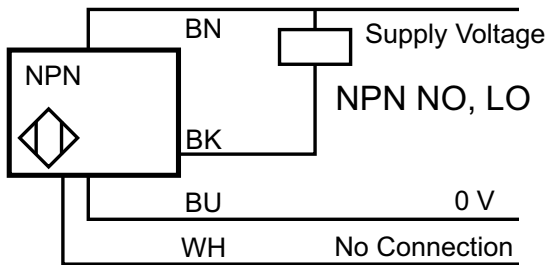
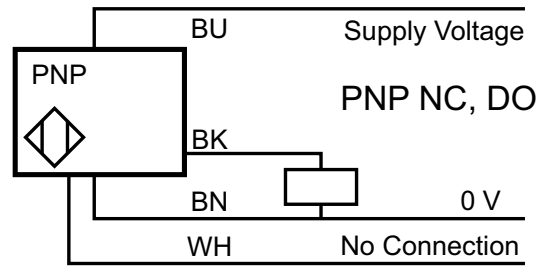
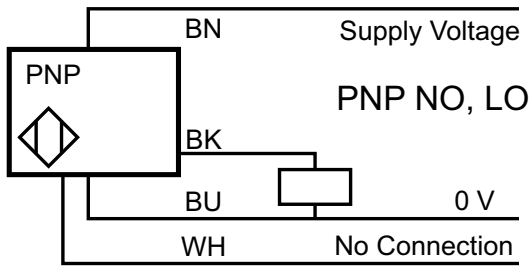
Table 1: End Cap Styles (Continued) (Sheet 2 of 2)

End Cap Style	End 1		End 2	
G	Adjustable 11 mm Hex, can be positioned in 10 degree increments / adhesive backed bracket		Spring 11 mm hex / 8 mm round / adhesive backed bracket	
T	11 mm Hex, flat side up		Plug	

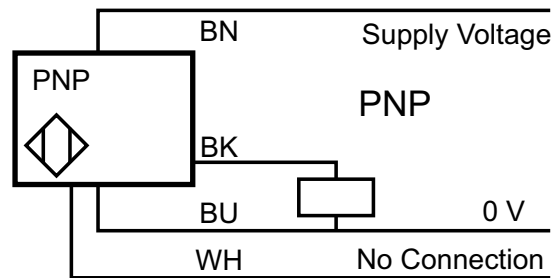
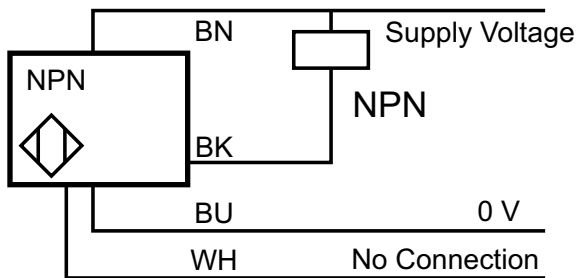
NOTE: T-Slot mounted sensors with the T End Cap Style are 6 mm shorter than the specified Between Frame Distance.

Wiring

Bimodal Output Wiring Diagrams

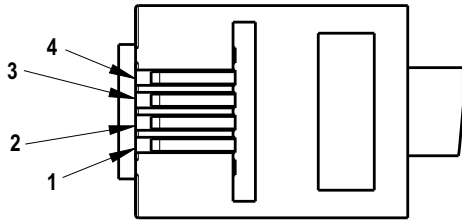


Fixed NPN and PNP Output Wiring Diagrams: Light and Dark Operate by Model Number



RJ-11 Pinout

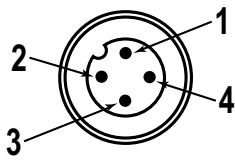
RJ-11 Key



- 1) Brown
- 2) Black
- 3) White
- 4) Blue

M12 Pinout

M12 Key



- 1) Brown
- 2) White
- 3) Blue
- 4) Black

M8 Snap Connector Pinout

M8 Key

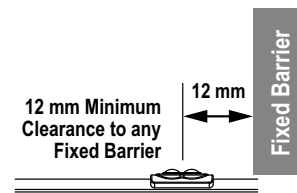
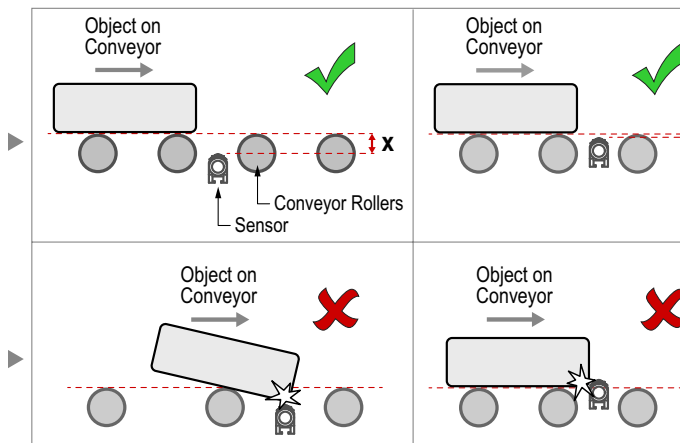


- 1) Brown
- 2) White
- 3) Blue
- 4) Black

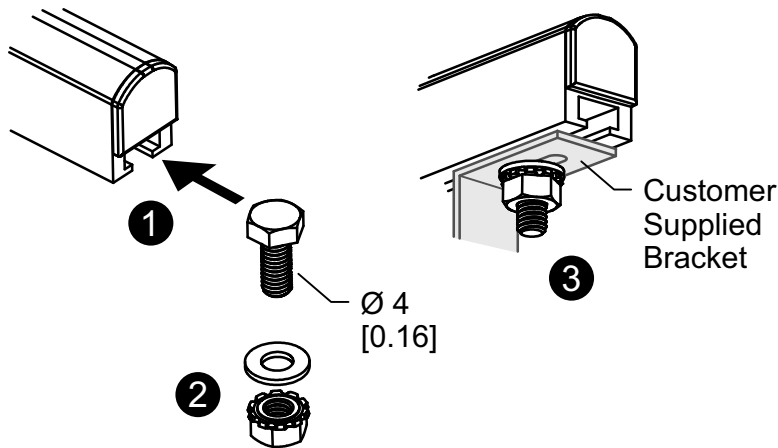
Installation

Mounting Considerations

Conveyor Side View



T-Slot Installation



Specifications for the TTR

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

Output Configuration
Rating: 100 mA max output at 25 °C
Output Voltage High: Greater than Vsupply – 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

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

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

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 ≥ 120 mm	0 to ≥ 50 mm	≤ 3 to ≥ 30 mm
Y and Z	0 to ≥ 100 mm	0 to ≥ 40 mm	≤ 4 to ≥ 25 mm
W and X	0 to ≥ 85 mm	0 to ≥ 35 mm	≤ 6 to ≥ 20 mm

Certifications



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

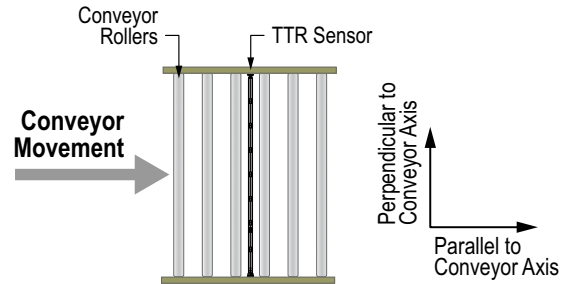
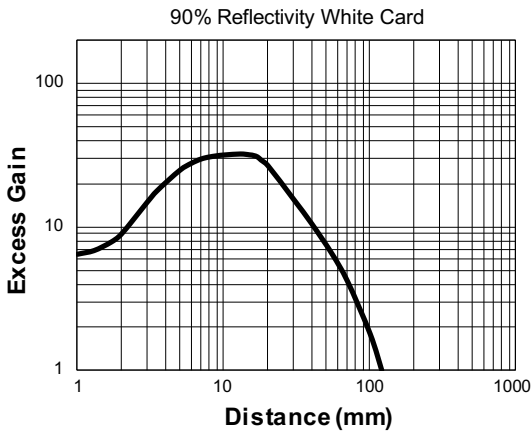
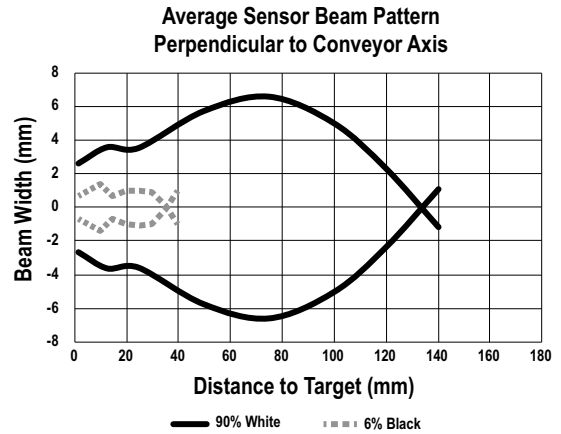
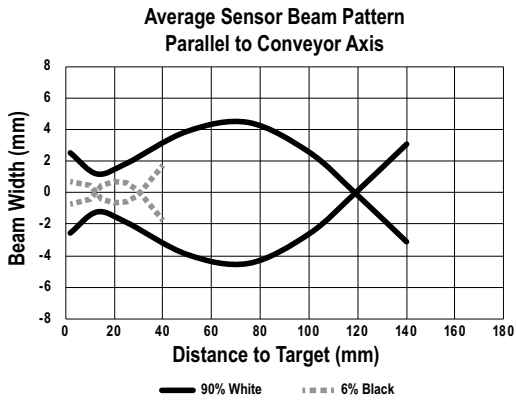


Turck Banner LTD Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain



Performance Curves

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



Dimensions

All measurements are listed in millimeters, unless noted otherwise.

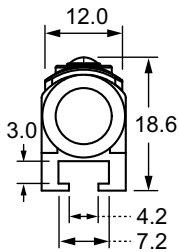


Figure 4: End view

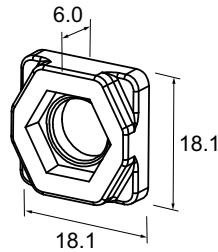


Figure 5: Adhesive end cap

Accessories for the TTR Family

TTR-HK1

- Hardware packet for T-style End-Cap TTRs
- (2) M4 screws
- (2) Hex nuts
- (2) Lock washers

TTR-HK20

- Hardware packet for G-style End-Cap TTRs
- (20) Adhesive-backed mounting brackets

TTR-HK2

- Hardware packet for G-style End-Cap TTRs
- (2) Adhesive-backed mounting brackets

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.

Banner Engineering Corp Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

THIS LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES WHETHER EXPRESS OR IMPLIED (INCLUDING, WITHOUT LIMITATION, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE), AND WHETHER ARISING UNDER COURSE OF PERFORMANCE, COURSE OF DEALING OR TRADE USAGE.

This Warranty is exclusive and limited to repair or, at the discretion of Banner Engineering Corp., replacement. **IN NO EVENT SHALL BANNER ENGINEERING CORP. BE LIABLE TO BUYER OR ANY OTHER PERSON OR ENTITY FOR ANY EXTRA COSTS, EXPENSES, LOSSES, LOSS OF PROFITS, OR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES RESULTING FROM ANY PRODUCT DEFECT OR FROM THE USE OR INABILITY TO USE THE PRODUCT, WHETHER ARISING IN CONTRACT OR WARRANTY, STATUTE, TORT, STRICT LIABILITY, NEGLIGENCE, OR OTHERWISE.**

Banner Engineering Corp. reserves the right to change, modify or improve the design of the product without assuming any obligations or liabilities relating to any product previously manufactured by Banner Engineering Corp. Any misuse, abuse, or improper application or installation of this product or use of the product for personal protection applications when the product is identified as not intended for such purposes will void the product warranty. Any modifications to this product without prior express approval by Banner Engineering Corp will void the product warranties. All specifications published in this document are subject to change; Banner reserves the right to modify product specifications or update documentation at any time. Specifications and product information in English supersede that which is provided in any other language. For the most recent version of any documentation, refer to: www.bannerengineering.com.

For patent information, see www.bannerengineering.com/patents.

Document title: Through the Roller (TTR) Sensor Family Datasheet
Part number: 216696
Revision: E
Original Instructions
© Banner Engineering Corp. All rights reserved.

