

Specifications

Supply Voltage

10 V dc to 30 V dc for ambient temperature $\leq 55\text{ }^{\circ}\text{C}$
 10 V dc to 24 V dc for ambient temperature $> 55\text{ }^{\circ}\text{C}$

Supply Current (Exclusive of Load Current)

All models except FF IR: $< 16\text{ mA}$
 FF IR models: $< 25\text{ mA}$

Output Protection Circuitry

Protected against false pulse on power-up and continuous short circuit of outputs. Short circuit protection at elevated temperature may require a power cycle to reset.

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Output Rating

$\leq 50\text{ mA}$ total current for ambient temperatures $> 55\text{ }^{\circ}\text{C}$
 $\leq 100\text{ mA}$ total current through both outputs $\leq 55\text{ }^{\circ}\text{C}$
 OFF-State Leakage Current: $< 50\text{ }\mu\text{A}$ at 30 V dc
 ON-State Saturation Voltage: $< 1.5\text{ V}$ at 10 mA; $< 3.0\text{ V}$ at 100 mA

Output Configuration

Complementary PNP or NPN by model number

Emitter LED

Visible Red on most models
 Infrared 850 nm on select fixed-field models to provide higher excess gain on blue and green targets

Indicators

Two LEDs (1 green, 1 amber)
 Green Solid: Indicates power applied and sensor ready
 Green flashing: Indicates marginal sensing signal
 Amber solid: Indicates Pin-4 (black wire) conducting

Vibration and Mechanical Shock

All models meet Mil. Std. 202G requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06 in acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)

Operating Conditions

$-40\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F}$ to $+158\text{ }^{\circ}\text{F}$)
 95% at $+50\text{ }^{\circ}\text{C}$ maximum relative humidity (non-condensing)

Environmental Rating

IEC IP67 per IEC60529
 IEC IP68 per IEC60529
 DIN IP69K

Certifications



Class 2 power
 UL Environmental Rating: Type 1



Chemical compatibility certified

ECOLAB is a registered trademark of Ecolab USA Inc. All rights reserved.

Output Response Time

Response is independent of signal strength
 Opposed models: 1.5 milliseconds ON, 1 millisecond OFF
 Polarized Retro, and Diffuse models: 1.5 milliseconds ON, 0.75 milliseconds OFF
 Fixed Field models: 2 milliseconds ON, 2 milliseconds OFF
 Delay on Power-up: 100 milliseconds; outputs do not conduct during this time

Repeatability

Repeatability is independent of signal strength
 Opposed models: 300 microseconds
 Retro, Polarized Retro, and Diffuse models: 100 microseconds
 Fixed Field models: 200 microseconds

Adjustments

Diffuse (DL, DS), Emitter (ES), Receiver (RS), Polarized Retroreflective (LPC) models: Single turn sensitivity (gain) adjustment potentiometer
 Emitter Beam Inhibit (EJ) models: Tie black wire to 10 to 30 V dc for beam inhibit

Construction

Housing, M12 QD, and cover: Black or Yellow PBT polyester
 Indicator light pipes: Translucent white PMMA (acrylic)
 Indicator cover and gain pot driver: PBT polyester
 Front window: PMMA

Required Overcurrent Protection



WARNING: Electrical connections must be made by qualified personnel in accordance with local and national electrical codes and regulations.

Overcurrent protection is required to be provided by end product application per the supplied table.
 Overcurrent protection may be provided with external fusing or via Current Limiting, Class 2 Power Supply.
 Supply wiring leads $< 24\text{ AWG}$ shall not be spliced.
 For additional product support, go to www.bannerengineering.com.

Supply Wiring (AWG)	Required Overcurrent Protection (Amps)
20	5.0
22	3.0
24	2.0
26	1.0
28	0.8
30	0.5

Performance Curves

