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more sensors, more solutions

R58E Series *Expert* ™ Registration Mark Sensors

Registration Mark Sensor with Three-Color Light Source

Features

- Ultra-fast 10 kHz switching frequency

- Red, green, and blue LEDs evaluated during TEACH to optimize application contrast, with the best color automatically selected by the sensor; sensing beam colors also may be individually disabled

- Outstanding color contrast sensitivity; detects 16 levels of gray scale

- Smart gain-control algorithm to maximize performance in low-contrast or high-gloss applications

- Easy-to-set, automatic *Expert*-style configuration options include Static and Dynamic TEACH, plus Manual Adjust for fine tuning

- Easy-to-read 8-segment bargraph display indicator for TEACH and signal strength readout, plus indicators for continuous readout of output status and setup

- Fixed-convergent sensing at 10 mm ±3 mm (0.39" ±0.12")

- Rectangular 1.2 mm x 3.8 mm (0.05" x 0.15") sensing image at 10 mm (0.39") from the lens

- Parallel or perpendicular sensing image, depending on model (see below)

- Rugged zinc alloy die-cast housing with high-quality acrylic lens suitable for food processing applications; rated IP67, NEMA 6

- Easy selection of Light/Dark Operate (LO/DO), 30 ms pulse stretcher (OFF-delay), and 30 ms ON-delay, via push buttons or a remote input wire

Models

Models	Cable*	Focus	Supply Voltage	Output Type	Sensing Image Orientation
R58ECRGB1	5-wire 2 m (6.5')				**Parallel to sensor length**
R58ECRGB1Q8	5-pin Euro-style integral QD				
R58ECRGB1Q	5-pin Euro-style QD pigtail	10 mm (0.39")	10 to 30V dc	Bipolar NPN/PNP	
R58ECRGB2	5-wire 2 m (6.5')				**Perpendicular to sensor length**
R58ECRGB2Q8	5-pin Euro-style integral QD				
R58ECRGB2Q	5-pin Euro-style QD pigtail				

* 9 m cables are available by adding suffix "**W/30**" to the model number of any cabled sensor (e.g., **R58ECRGB1 W/30**).
 A model with a QD connector requires a mating cable; see page 10.

⚠ **WARNING . . . Not To Be Used for Personnel Protection**

Never use these products as sensing devices for personnel protection. Doing so could lead to serious injury or death.

These sensors do NOT include the self-checking redundant circuitry necessary to allow their use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

R58 *Expert*™ Registration Mark Sensors

Overview

R58 *Expert* (R58E) sensors offer maintenance-free solid-state reliability for typical color contrasts found in product and material registration applications. Fast 50-microsecond sensing response produces excellent registration repeatability, even in ultra-high-speed applications. This fast response, coupled with the small 1.2 x 3.8 mm (0.05" x 0.15") sensing image, allows the detection of even small and inconspicuous registration marks.

R58E sensors feature TEACH mode sensitivity adjustment by presenting two sensing conditions to the sensor. TEACH mode has two options: Static TEACH and Dynamic TEACH. Static TEACH is used to position the two sensing conditions individually. Dynamic TEACH provides a means for teaching a series of conditions on-the-fly; the R58E samples the sensing events and automatically sets the switchpoint between the lightest and darkest conditions. The sensor then determines which sensing condition is present for the shortest time and assigns the Output ON condition to that event (therefore, LO/DO selection is automatic). The LO/DO setting can then be reversed in SETUP mode.

The sensor uses a tri-color LED during either teach process and automatically selects a red, green, or blue sensing beam, based on the contrast between the registration mark and its background. For applications where the user wishes to select the sensing beam color, individual colors may be enabled/disabled in SETUP mode.

Sensitivity may be fine-tuned at any time by simply clicking the "+" or "-" buttons on the sensor. The eight-element bargraph display clearly displays the relative received signal strength.

The discrete bipolar (one NPN and one PNP) outputs may be configured in SETUP mode to include a 30-millisecond ON-delay and/or OFF-delay, if required.

TEACH and SETUP configuration may be accomplished either by using the push button on the sensor, or by supplying input pulses via the remote TEACH input. The push buttons may be diabled via the remote input.

The construction of the R58E is extremely robust, with a die-cast metal housing, plastic optics, and IP67 and NEMA 6 leakproof design for harsh sensing environments.
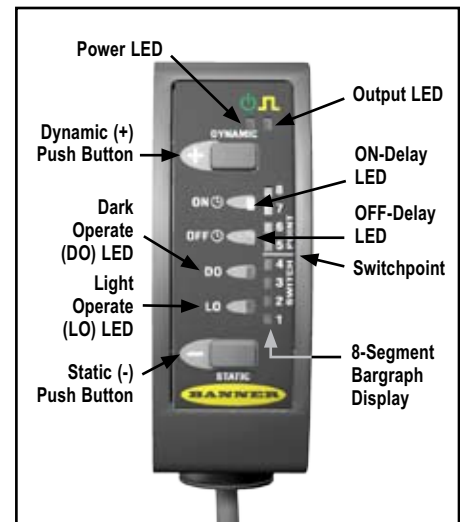

Figure 1. Sensor features

R58 *Expert*™ Registration Mark Sensors

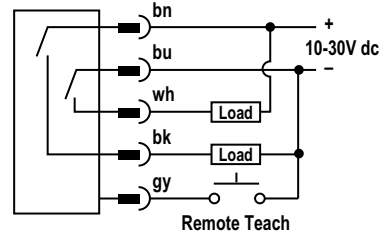| Specifications	
Supply Voltage and Current	10 to 30V dc (10% max. ripple); **Supply current** (exclusive of load current): 75 mA @ 10V dc 35 mA @ 30V dc
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	Outputs are bipolar: one current sourcing (PNP) and one current sinking (NPN) open-collector transistor
Output Rating	100 mA max. (each output) **OFF-state leakage current:** NPN < 200 microamps; PNP < 10 microamps **NPN saturation:** < 200 mV @ 10 mA and < 1V @ 100 mA **PNP saturation:** < 1.2V @ 10 mA and < 1.6V @ 100 mA
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short-circuit of outputs.
Output Response Time	50 microseconds NOTE: 1 second delay on power-up; outputs do not conduct during this time.
Repeatability	15 microseconds
Tri-Color LED Sensing Image	Rectangular: 1.2 mm x 3.8 mm (0.05" x 0.15") at 10 mm (0.39") from face of lens; image oriented either parallel or perpendicular to sensor length, depending on model (see page 1). **Red:** 636 nm **Green:** 525 nm **Blue:** 472 nm

Adjustments	**Using push buttons ("+" Dynamic and "-" Static):**
	    Manually adjust discrete output switchpoint using "+" or "-" buttons
	    Dynamic TEACH (teach on-the-fly) sensitivity adjustment
	    Static TEACH sensitivity adjustment
	    Light operate/Dark operate
	    OFF-delay/ON-delay
	    Sensing beam color enable/disable
	
	Using Remote TEACH input (gray wire):
	    Dynamic TEACH (teach on-the-fly) sensitivity adjustment
	    Static TEACH sensitivity adjustment
	    Light operate/Dark operate
	    OFF-delay/ON-delay
	    Sensing beam color enable/disable
	    Disable push buttons for security

Indicators	**8-segment Bargraph display:** Red signal strength indicator relative to taught signal level; higher segment number for higher sensing contrast **Light Operate:** Green **OFF-Delay:** Green **Dark Operate:** Green **ON-Delay:** Green **Outputs Conducting:** Yellow **Power/Run Mode:** Green
Construction	Zinc alloy die-cast and steel housing with black painted finish and o-ring sealed lens and lens port cap. **Lens:** Acrylic **Lens port cap and lens holder:** ABS **Push buttons:** Thermoplastic elastomer **Labels:** Polycarbonate
Environmental Rating	IEC IP67; NEMA 6
Connections	PVC-jacketed 5-conductor 2 m (6.5') or 9 m (30') attached cable with internal strain relief, integral 5-pin Euro-style QD fitting, or 150 mm (6") pigtail with 5-pin Euro-style QD fitting. Mating QD cordsets are purchased separately. See Quick-Disconnect cordsets on page 10.
Operating Conditions	**Temperature:** –10° to +55° C (+14° to 131° F) **Storage Temperature:** –20° to +80° C (–4° to +185° F) **Maximum Relative Humidity:** 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	All models meet IEC 68-2-6 and IEC 68-2-27 testing criteria.
Application Notes	• Do not mount the sensor directly perpendicular to shiny surfaces; position it at approximately a 15° angle in relation to the sensing target (see page 8). • Minimize web or product "flutter" whenever possible to maximize sensing reliability.

R58 *Expert*™ Registration Mark Sensors

Dimensions

Hookups

Cabled Models

bn
bu
wh
bk
gy

+
10-30V dc
−

Load
Load

Remote Teach
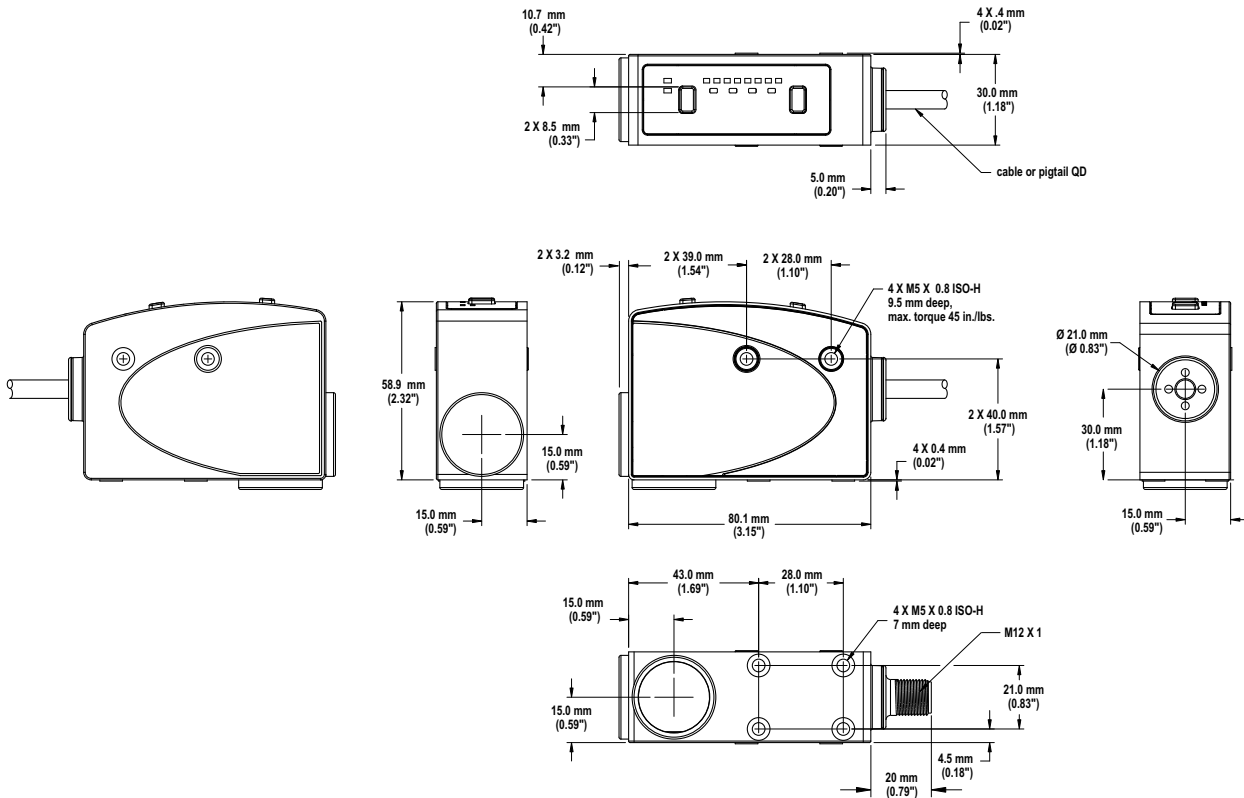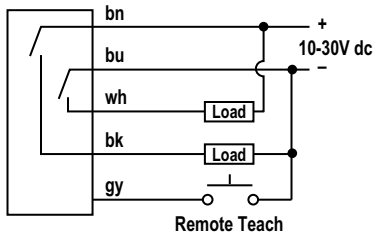
Quick-Disconnect Models

bn
bu
wh
bk
gy

+
10-30V dc
−

Load
Load

Remote Teach

Accessories

Quick-Disconnect Cordsets

Style	Model	Length	Dimensions	Pinout
5-pin Euro-style straight, with shield	**MQDEC2-506** **MQDEC2-515** **MQDEC2-530**	2 m (6.5') 5 m (15') 9 m (30')		