The object then reflects the R1 and R2 fields equally, resulting in no false triggering. A better solution, if possible, may be to reposition the object or the sensor.

Color Sensitivity

The effects of object reflectivity on cutoff distance, though small, may be important for some applications. It is expected that at any given cutoff setting, the actual cutoff distance for lower reflectance targets will be slightly shorter than for higher reflectance targets (see Figure-of-Merit information on page 5). This behavior is known as color sensitivity.

For example, an excess gain of 1 (see page 5) for an object that reflects 1/10 as much light as the 90% white card is represented by the horizontal graph line at excess gain = 10. An object of this reflectivity results in a far limit cutoff of approximately 20 mm (0.8"), for the 25 mm (1") cutoff model for example; thus 20 mm represents the cutoff for this sensor and target.

These excess gain curves were generated using a white test card of 90% reflectance. Objects with reflectivity of less than 90% reflect less light back to the sensor, and thus require proportionately more excess gain in order to be sensed with the same reliability as more reflective objects. When sensing an object of very low reflectivity, it may be especially important to sense it at or near the distance of maximum excess gain.

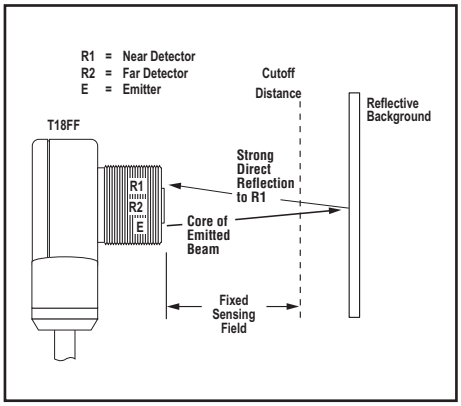

Figure 3. Reflective background – problem

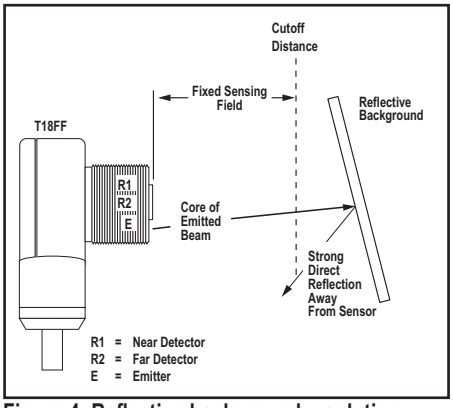

Figure 4. Reflective background – solution

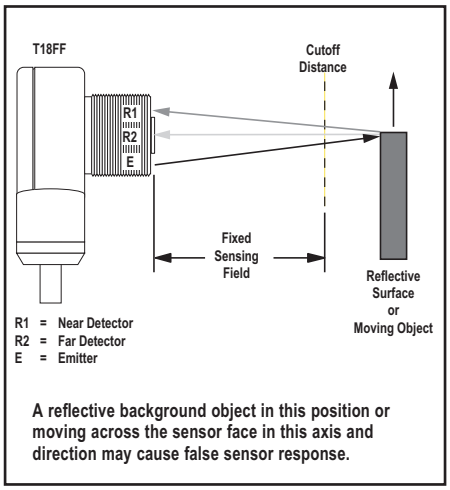

Figure 5. Object beyond cutoff – problem

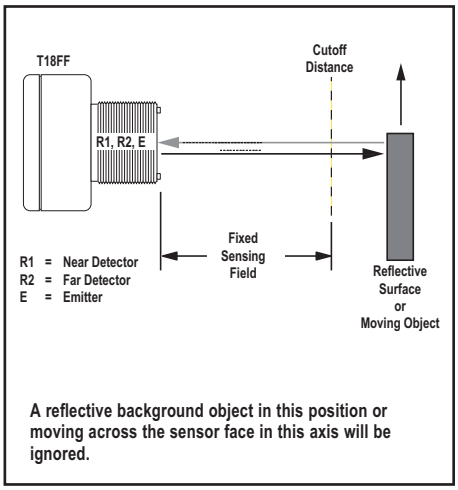

Figure 6. Object beyond cutoff – solution

Specifications

Supply Voltage and Current	10 to 30V dc (10% max. ripple); supply current (exclusive of load current): **Emitters, Non-Polarized Retro, Diffuse:** 25 mA **Receivers:** 20 mA **Polarized Retroreflective:** 30 mA **Fixed-Field:** 35 mA
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	SPDT solid-state dc switch; NPN (current sinking) or PNP (current sourcing), depending on model *Light Operate:* N.O. output conducts when sensor sees its own (or the emitter's) modulated light *Dark Operate:* N.C. output conducts when the sensor sees dark; the N.C. (normally closed) output may be wired as a normally open marginal signal alarm output, depending upon hookup to power supply
Output Rating	150 mA maximum (each) in standard hookup. When wired for alarm output, the total load may not exceed 150 mA. **OFF-state leakage current:** < 1 microamp @ 30V dc **ON-state saturation voltage:** < 1V @ 10 mA dc; < 1.5V @ 150 mA dc
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs
Output Response Time	**Opposed mode:** 3 ms ON, 1.5 ms OFF **Retro, Fixed-Field and Diffuse:** 3 ms ON and OFF NOTE: 100 ms delay on power-up; outputs do not conduct during this time.
Repeatability	**Opposed mode:** 375 µs **Retro, Fixed-Field and Diffuse:** 750 µs Repeatability and response are independent of signal strength.
Adjustments	Non-polarized retro and diffuse models (only) have a single-turn rear-panel Sensitivity control (turn clockwise to increase gain).
Indicators	Two LEDs (Green and Yellow) **Green ON steady:** power to sensor is ON **Green flashing:** output is overloaded **Yellow ON steady:** N.O. output is conducting **Yellow flashing:** excess gain marginal (1 to 1.5x) in light condition
Construction	PBT polyester housing; polycarbonate (opposed-mode) or acrylic lens
Environmental Rating	Leakproof design rated NEMA 6P, DIN 40050 (IP69K)
Connections	2 m (6.5') or 9 m (30') attached cable or 4-pin Euro-style quick-disconnect fitting
Operating Conditions	**Temperature:** −40° to +70° C (−40° to +158° F) **Maximum relative humidity:** 90% at 50° C (non-condensing)
Vibration and Mechanical Shock	All models meet Mil. Std. 202F requirements. Method 201A (Vibration; frequency 10 to 60 Hz, max., double amplitude 0.06" acceleration 10G). Method 213B conditions H&I (Shock: 75G with unit operating; 100G for non-operation)
Certifications	