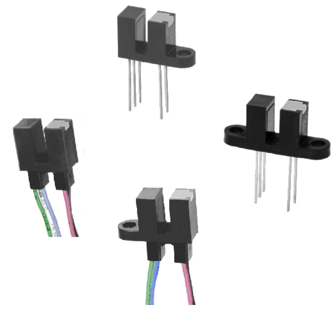
Photologic® Slotted Optical Switch

OPB460, OPB470, OPB480, OPB490 Series

TT Electronics



Features:

- Choice of pins or wires mounting configuration
- Choice of aperture
- Choice of output configuration
- Choice of opaque or IR transmissive shell material
- Data rates to 250 kBaud
- Low power consumption

Description:

The **OPB460**, **OPB470**, **OPB480** and **OPB490** series of Photologic® photo integrated circuit switches provide optimum flexibility for the design engineer. Building from a standard housing with a 0.125” (3.180 mm) wide slot, a user can specify the type and polarity of TTL output, discrete shell material, aperture width and choice of mounting configurations. **OPB460** through **OPB473** have 0.425” (10.795 mm) PCBoard leads with 0.320” (8.1 mm) spacing. **OPB480** through **OPB493** have 24” (609 mm) 26 AWG wires (UL approved wires).

All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

Applications:

- Mechanical switch replacement
- Speed indication (tachometer)
- Mechanical limit indication
- Edge sensing

Part Number Guide — OPB460, OPB470, OPB480, OPB490 Series

OPB 4 X X X 1 1 X

OPTEK Assembly

Photologic™ Sensor Family

Discrete Housing Material:
6 — Transmissive Shell, PCBoard Mountable
7 — Opaque Shell, PCBoard Mountable
8 — Transmissive Shell, Wire Termination

Electrical Specifications:
0 — Buffered 10 kΩ Output
1 — Buffered Open-Collector Output
2 — Inverted 10 kΩ Output

All PCBoard Versions RoHS Compliant:
Z = Wire Version RoHS Compliant

Sensor Aperture:
1 = 0.010” [0.25 mm]

Emitter Aperture:
1 = 0.010” [0.25 mm]

Mounting Configurations:
L — Emitter side mounting tab only
N — No mounting tabs
P — Sensor side mounting tab only
T — Two mounting tabs

Pb RoHS

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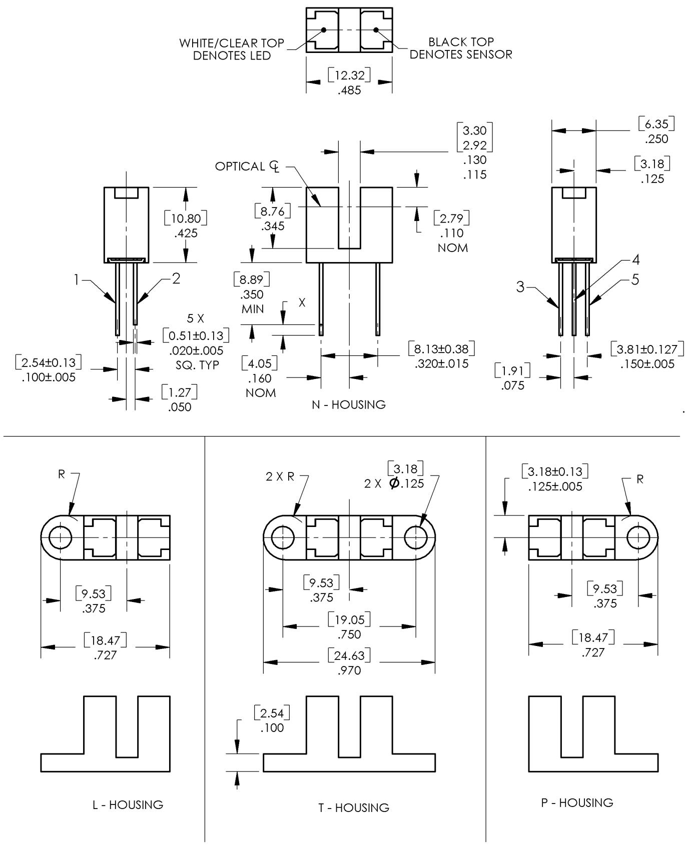
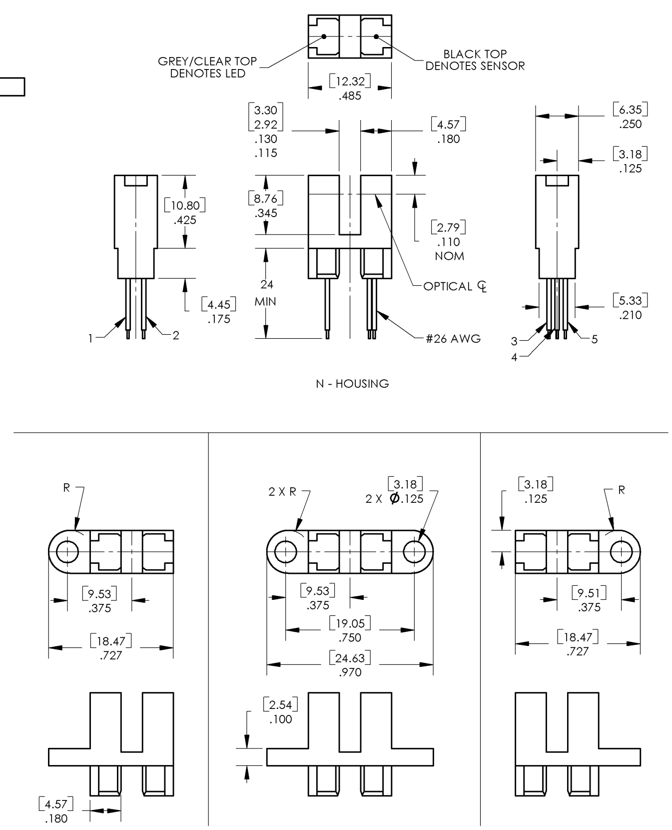


Color-Pin	Description
Red-1	Anode
Black-2	Cathode
White-3	Vcc
Blue-4	Output
Green-5	Ground

TOLERANCE DIMENSIONS ARE: ± .25mm [± .010"]



CONTAINS POLYSULFONE

To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK's molded plastics.

Applies to: OPB460, OPB470, OPB480, OPB490.

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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage & Operating Temperature Range	-40° C to +85° C
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron][(1)]	260°C
Input Infrared LED	
Supply Voltage, V_{CC} (not to exceed 3 seconds)	18 V
Diode Forward DC Current	40 mA
Diode Reverse DC Voltage	2 V
Input Diode Power Dissipation[(2)]	75 mW
Output Photologic®	
Voltage at Output Lead (Open Collector Output)	25 V
Output Photologic® Power Dissipation[(3)]	200 mW
Total Device Power Dissipation[(4)]	275 mW

Notes:
1. (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
2. (2) Derate linearly 1.67 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.82 mW/°C above 25° C (OPB480, OPB490).
3. (3) Derate linearly 1.50 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.64 mW/°C above 25° C(OPB480, OPB490).
4. (4) Derate linearly 3.17 mW/°C above 25° C (OPB460, OPB470) or derate linearly 3.45 mW/°C above 25° C (OPB480, OPB490).
5. (5) The OPB460/OPB470 series are terminated with 0.020" square leads designed for printed circuit board mounting.
6. (6) The OPB480/OPB490 series of switches are terminated with 24" (609.600 mm) of 7-strand 26 AWG, UL rated insulated wire on each terminal. Insulation colors and functions are: red (anode), black (cathode), white (V_{CC}), blue (output) and green (ground). Other wire lengths and/or colors in addition to customer selected connectors are available. Contact your local representative or call the factory.

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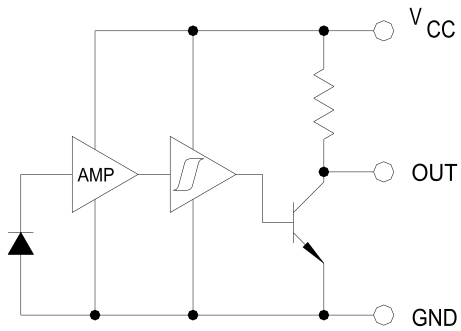
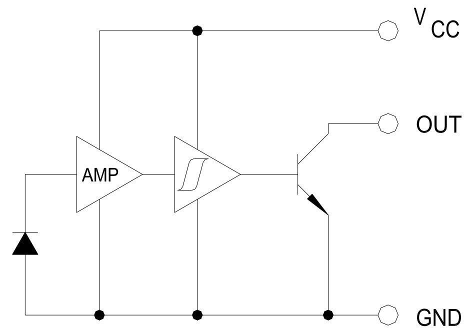
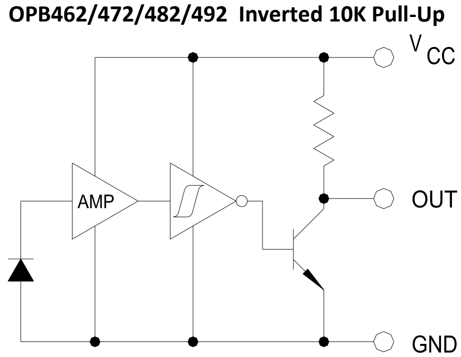
OPB460/470/480/490 Buffered 10K Pull-Up



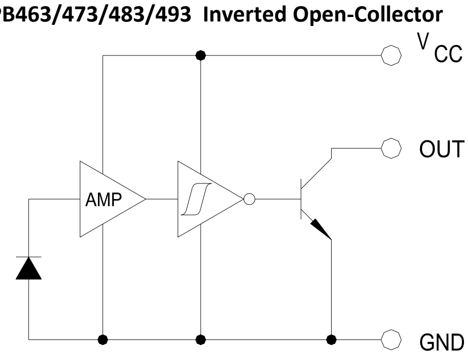
OPB461/471/481/491 Buffered Open-Collector



OPB462/472/482/492 Inverted 10K Pull-Up



OPB463/473/483/493 Inverted Open-Collector



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Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	-	-	1.7	V	I_F = 20 mA, T_A = 25° C
I_R	Reverse Current	-	-	100	µA	V_R = 2 V, T_A = 25° C
Output Photologic® Sensor						
V_{CC}	Operating DC Supply Voltage	4.5	-	16	V	
I_{CCL}	Low Level Supply Current: Buffered with 10k pull-up(1) Buffered Open-Collector Output	-	-	7.5	mA	V_{CC} = 16 V, I_F = 0 mA(1)
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7.5	mA	V_{CC} = 16 V, I_F = 12 mA
I_{CCH}	High Level Supply Current: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	7.5	mA	V_{CC} = 16 V, I_F = 12 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	7.5	mA	V_{CC} = 16 V, I_F = 0 mA(1)
V_{OL}	Low Level Output Voltage: Buffered with 10k pull-up Buffered Open-Collector Output	-	-	0.4	V	V_{CC} = 4.5 V, I_{OL} = 16 mA, I_F = 0 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output	-	-	0.4	V	V_{CC} = 4.5 V, I_F = 12 mA(1)
V_{OH}	High Level Output Voltage: Buffered with 10k pull-up	V_{CC} -1.5	-	-	V	V_{CC} = 4.5 V to 16 V, No Load, I_F = 12 mA
	Inverted with 10k pull-up: Inverted Open-Collector Output(1)	V_{CC} -1.5	-	-	V	V_{CC} = 4.5 V to 16 V, No Load, I_F = 0 mA
I_{OH}	High Level Output Voltage: Buffered Open-Collector Output	-	-	14	µA	V_{CC} = 16 V, I_F = 12 mA, V_{OH} = 25 V, T_A = 25° C
	Inverted with 10k pull-up: Inverted Open-Collector Output(1)	-	-	14	µA	V_{CC} = 16 V, I_F = 0 mA, V_{OH} = 25 V, T_A = 25° C
$I_{F(+)}$	LED Positive-Going Threshold Current	-	-	10	mA	V_{CC} = 5 V, T_A = 25° C
$I_{F(+)}/I_{F(-)}$	Hysteresis	-	1.4	-	-	V_{CC} = 5 V
$t_r t_f$	Rise Time, Fall Time	-	50	-	ns	V_{CC} = 5 V, T_A = 25° C, I_F = 0 or 12 mA
$t_{PLH} t_{PHL}$	Propagation Delay	-	3	-	µs	R_L = 300 Ω to 5 V, C_L = 50 pF

Notes:
(1) Normal application would be with light source blocked, simulated by I_F = 0 mA.
(2) All parameters tested using pulse technique.

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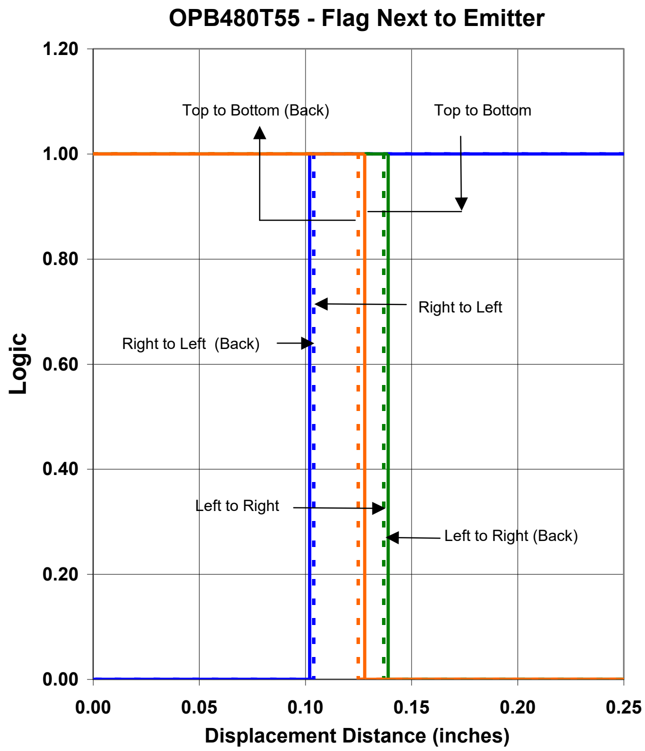
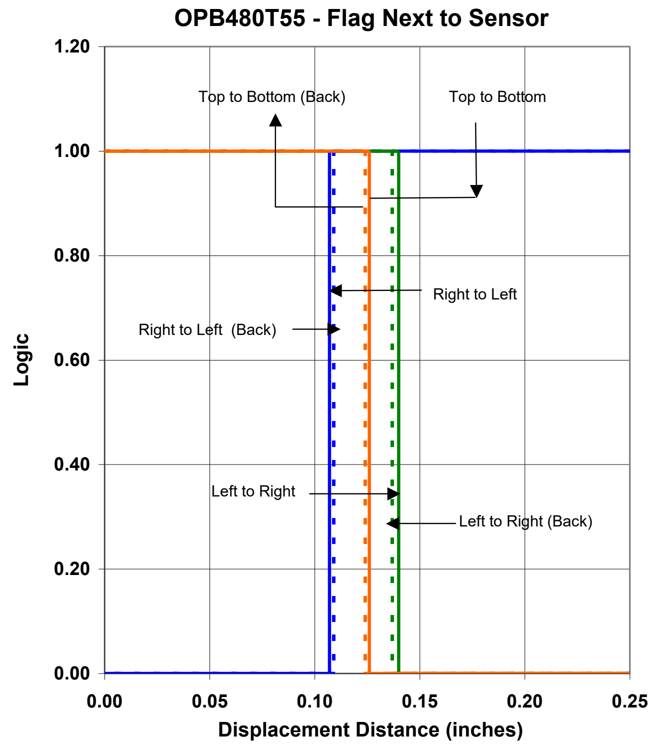
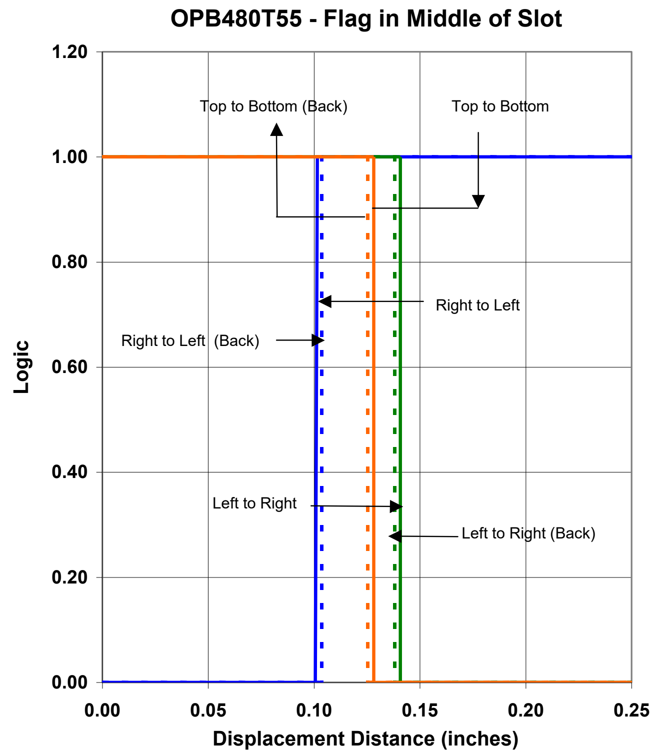
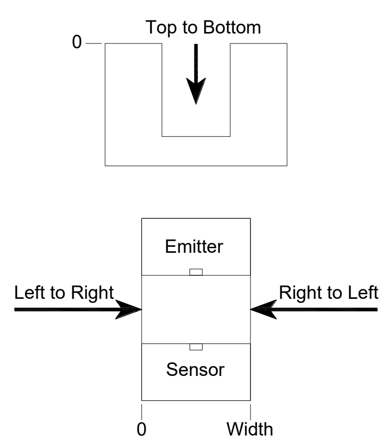
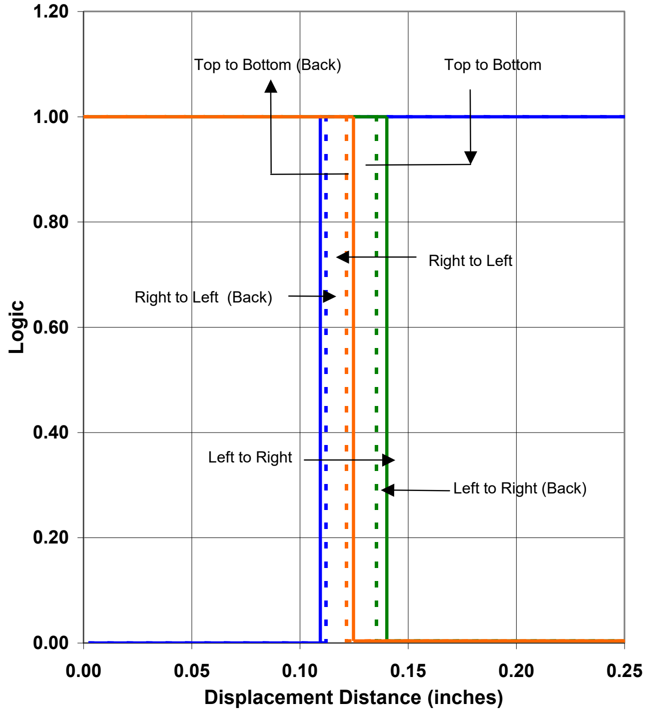

OPB480T55 - Flag Next to Emitter
Logic
Displacement Distance (inches)
Top to Bottom (Back)
Top to Bottom
Right to Left
Right to Left (Back)
Left to Right
Left to Right (Back)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.05
0.10
0.15
0.20
0.25


OPB480T55 - Flag Next to Sensor
Logic
Displacement Distance (inches)
Top to Bottom (Back)
Top to Bottom
Right to Left
Right to Left (Back)
Left to Right
Left to Right (Back)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.05
0.10
0.15
0.20
0.25

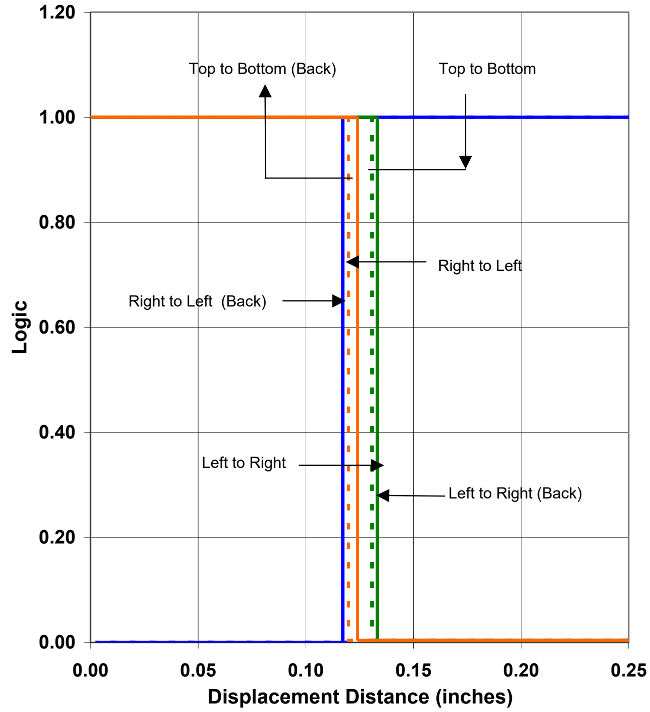

OPB480T55 - Flag in Middle of Slot
Logic
Displacement Distance (inches)
Top to Bottom (Back)
Top to Bottom
Right to Left
Right to Left (Back)
Left to Right
Left to Right (Back)
1.20
1.00
0.80
0.60
0.40
0.20
0.00
0.05
0.10
0.15
0.20
0.25


0
Top to Bottom
Emitter
Left to Right
Right to Left
Sensor
0
Width

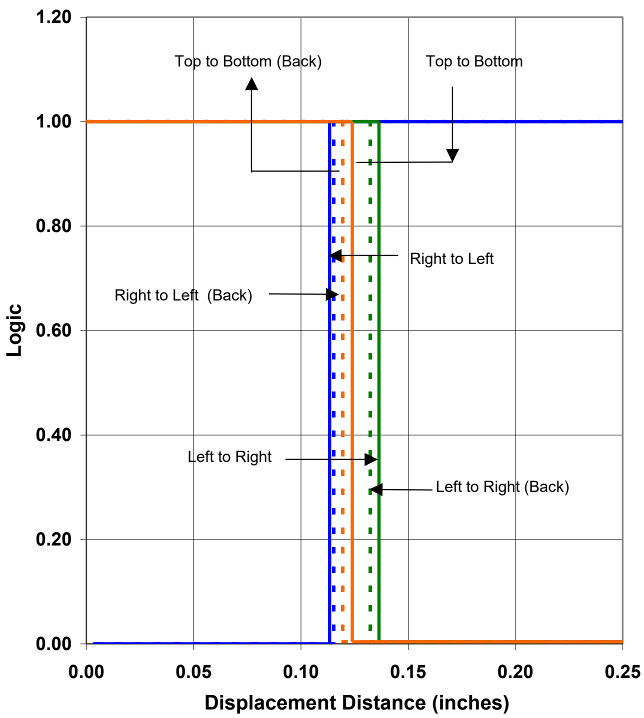
OPB481N51 - Flag Next to Emitter

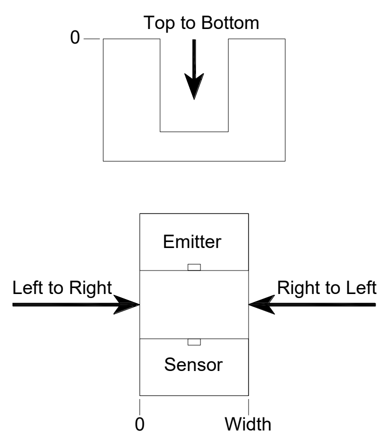


OPB481N51 - Flag Next to Sensor



OPB481N51 - Flag in Middle of Slot





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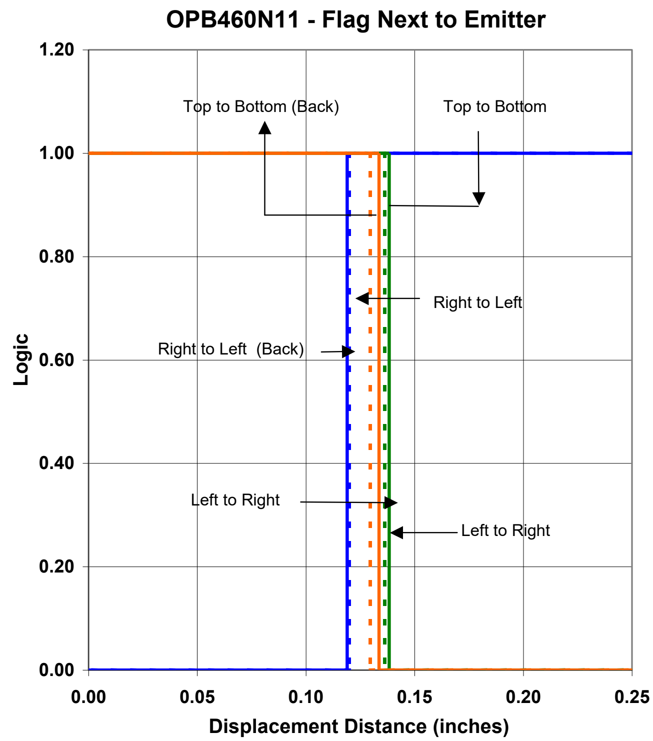

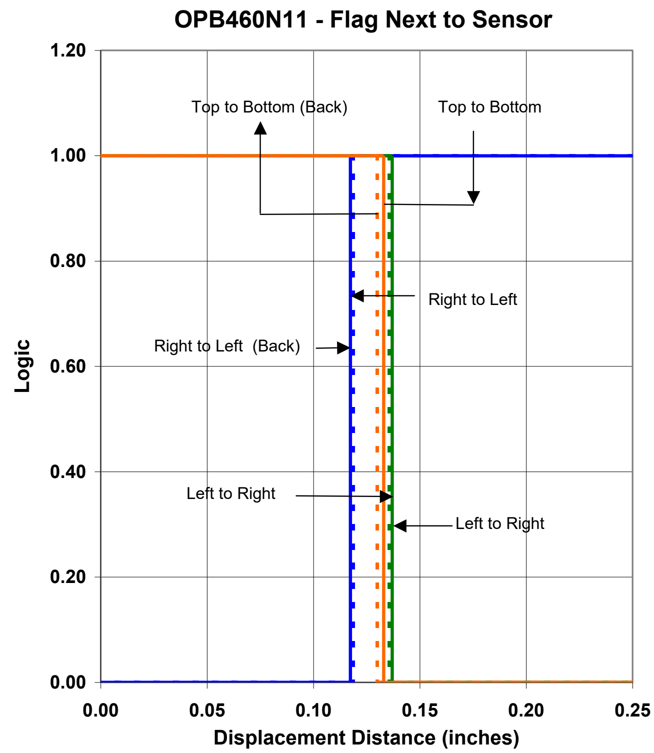

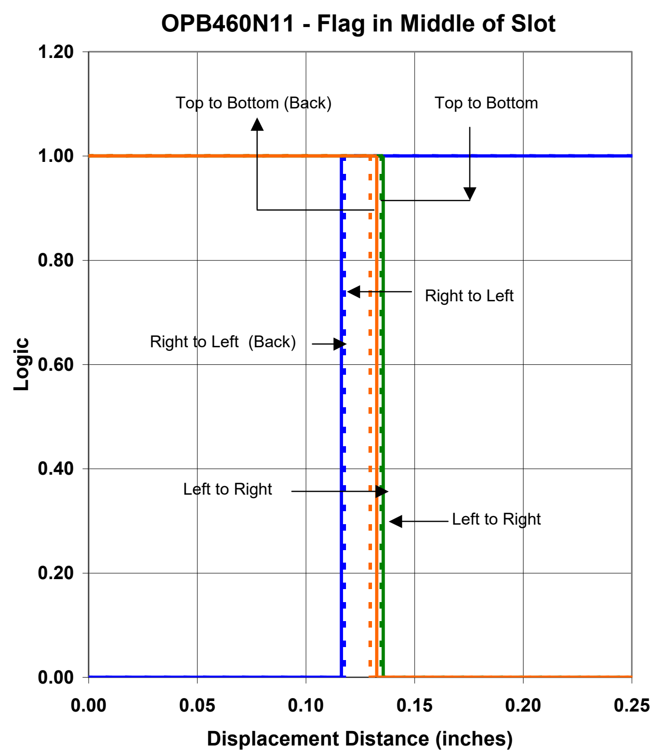

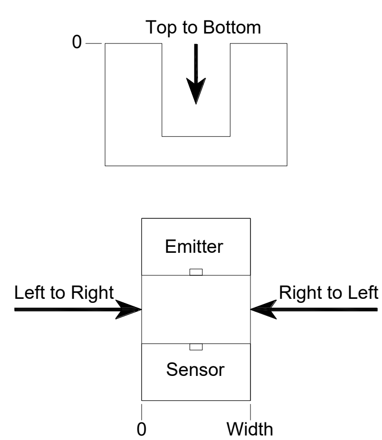

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