

Optical Detector						
Attribute	Azatrax MRD1-V	Boulder Creek NS-352	Geoff Bunza's SMA23 DAPD	Iowa Scaled CKT-IRSENSE	Logic Rail OD-1-IR	Chinese eBay Sensor
Price	\$19.50	\$19.95	\$3.09	\$19.00	\$27.95	\$1.20
Supply voltage (min)	8 VDC/VAC	5 VDC	4.6 VDC	5 VDC	7 VAC / 9 VDC	5 VDC
Supply voltage (max)	16 VDC/VAC	16 VDC	30 VDC	24 VDC	9VAC / 12 VDC	5 VDC
Current draw (12VDC, detecting)	30 mA	40 mA	2 mA	9 mA	64 mA	42 mA @ 5V
Current draw (12VDC, not detecting)	7 mA	25 mA	2 mA	7 mA	62 mA	39 mA @ 5V
Technology	Modulated IR	Modulated IR	Ambient light	Modulated IR	Constant IR	Constant IR
Outputs (active when detecting)	1 SPST Relay	1 OC 1 OE w/pull-up	1 OC	1 OC	1 LED (25mA) 1 OC	1 OC w/pull-up
Outputs (active when not detecting)	None (*1)	None	None	1 OC	1 LED (25 mA)	None
Isolated Output	Yes	No	No	No	No	No
Detecting Output Max Voltage	28V	16V	36V	40V	12VDC	5 VDC
Detecting Output Max Current	3A	200mA	20mA	250mA	25mA / 150mA	15 mA
Non-Detecting Output Max Voltage	n/a (*1)	n/a	n/a	40V	12VDC	n/a
Non-Detecting Output Max Current	n/a (*1)	n/a	n/a	250mA	25mA	n/a
Onboard indicator light	Yes	Yes (*4)	No	Yes	No	Yes
Connection style	Term blocks	Wires	Holes / pin headers	Wires	Term blocks	Pin headers
Form factor	Board & sensor	Stick	Board & sensor	Stick	Board & sensor	Stick
Sensor mounting hole size	2x 3/16"	3/8"	2x 3/16"	3/8"	2x 11/64"	2x 1/4"
Detection distance (max - black-bottom car)	0.75"	2.75"	n/a (*3)	0.75"	0.5"	3.25"
Detection distance (max - white paper)	2.125"	7.375"	n/a (*3)	3.125"	1.5"	7.0"
Interference Distance (2x F32T8 fluorescent tubes)	no issue	no issue	n/a (*5)	no issue	<= 11"	<= 12"
Interference Distance (IR transmitter)	no issue	no issue	6" (*5)	no issue	<= 8"	<= 36"
Side detection (white card)	no issue	no issue	no issue	no issue	Intermittent detection card on sensor side	no issue
Adjustable "Drop Out" (turn off) Time	0.3s-14s	~0 or 2 sec Ordering option	No	0.1 - 23sec 0.1- 23min (*2)	2 or 4 sec	No
Sensitivity Adjustment	Not needed	Not needed	Not needed	Not needed	Not needed	Required
Open Source	No	No	Yes	Yes	No	No
Warranty	Unstated	1 year	n/a	Lifetime	1 year	Good luck with that

**Notes:**

\*1: The Azatrax can be installed across the track rather than reflecting. This can have the effect of inverting the outputs, depending on how it's wired.

\*2: Optional "long delay" version

\*3: Because the SMA23 is not sensing reflections, these tests aren't really applicable.

\*4: It's hidden under the shrink wrap on the bottom of the stem

\*5: Because the SMA23 requires light to work, the fluorescent light was essential, not interference. However, an IR transmitter would interfere if hitting the "ambient" sensor at 6"