

DURA-Vue™

MLV12 Series
Dura-Vue™ Sensors

- Rugged die-cast metal housing frame
- High-visibility, dual-position indicator LEDs
- Thru-hole or dovetail mounting
- Extreme low-temperature operation (-40°C/F) available

4 IN 1 FOUR OUTPUTS™ ONE SENSOR

4 output options from 1 sensor: NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed



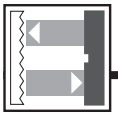
Diffused Mode with Background Suppression

See page 410

Features:
- Cost-effective electronic background suppression
- Cross-talk immunity

Sensing Range: 250mm

Outputs: PNP, 4-in-1



Retro-Reflective Mode

See pages 411-412

Features:
- Laser transmitter versions available
- Cross-talk immunity

Sensing Range: 450mm, 5m, 15m

Outputs: NPN, PNP, 4-in-1



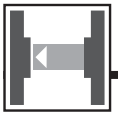
Retro-Reflective Mode for Clear Object Detection

See page 413

Features:
- Remote teach capability
- Cross-talk immunity

Sensing Range: 3m

Outputs: PNP, 4-in-1



Thru-Beam Mode

See page 414

Features:
- Remote teach capability
- Visible red LED in receiver as alignment aid

Sensing Range: 16m

Outputs: 4-in-1

See pages 415-418 for MLV12 Series specifications, wiring and dimensions.

Diffused Mode with Background Suppression

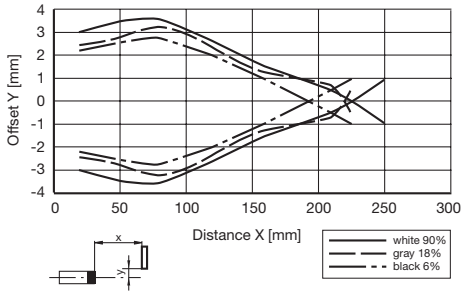
Specifications

SENSING RANGE		20-250mm	20-250mm
SENSITIVITY ADJUSTMENT		Yes (50-250mm)	Yes (50-250mm)
MODEL NUMBER(S)		—	MLV12-8-H-250-RT/47/65b/124
		MLV12-8-H-250-RT/65b/115/128	MLV12-8-H-250-RT/65b/124/128
		—	MLV12-8-H-250-IR/65b/124/128
OUTPUT	/47	—	2 PNP
	/128	4-in-1*	4-in-1*
LOAD CURRENT		200mA max.	200mA max.
SUPPLY VOLTAGE		10-30VDC	10-30VDC
CURRENT CONSUMPTION		≤55mA	≤55mA
RESPONSE TIME		0.5ms	0.5ms
SWITCHING FREQUENCY		1kHz	1kHz
LIGHT SPOT DIAMETER		≈8mm at a range of 250mm	≈8mm at a range of 250mm
LIGHT BEAM ANGLE		1.5°	1.5°
LIGHT SOURCE	-RT	Visible red LED 660nm	Visible red LED 660nm
	-IR	—	Infrared LED 880nm
AMBIENT LIGHT RESISTANCE		≤30,000 lux	≤30,000 lux
TEMPERATURE RANGE	WORKING	-40°F to +140°F	-40°F to +140°F
	STORAGE	-40°F to +167°F	-40°F to +167°F
ELECTRICAL CONNECTION		 2.5-meter cable, PVC covered 5-conductor, #24AWG	 Quick disconnect type V15
ADDITIONAL DATA		*See pages 415-418*	

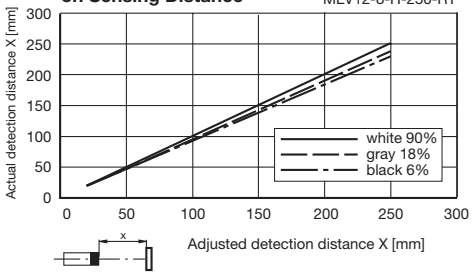
*NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed

Sensing Characteristics

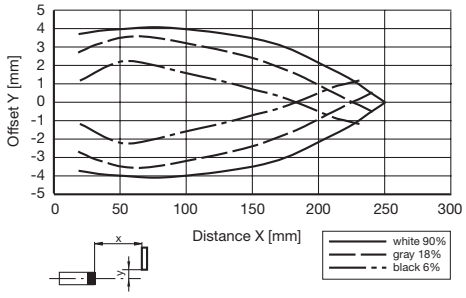
Movement Characteristics MLV12-8-H-250-RT



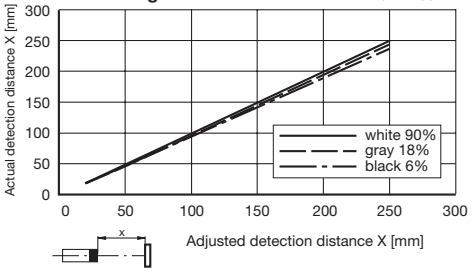
Effect of Target Color on Sensing Distance MLV12-8-H-250-RT



Movement Characteristics MLV12-8-H-250-IR



Effect of Target Color on Sensing Distance MLV12-8-H-250-IR



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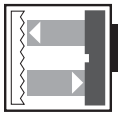


Retro-Reflective Mode

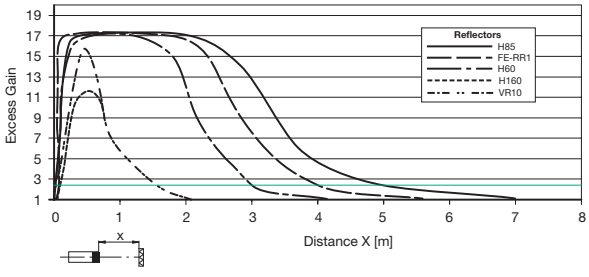
Specifications

SENSING RANGE		0-5m	0-5m
SENSITIVITY ADJUSTMENT		Yes	Yes
REFLECTOR DISTANCE		10mm-5m	10mm-5m
POLARIZED FILTER		Yes	Yes
MODEL NUMBER(S)		—	**MLV12-54/32/82b/124**
		—	**MLV12-54/49/124**
		MLV12-54/76b/115/128	**MLV12-54/76b/124/128**
OUTPUT	*/32*	—	1 PNP
	/49	—	1 NPN and 1 PNP
	/128	4-in-1*	4-in-1*
LOAD CURRENT		200mA max.	200mA max.
SUPPLY VOLTAGE		10-30VDC	10-30VDC
CURRENT CONSUMPTION		≤40mA	≤40mA
RESPONSE TIME		0.5ms	0.5ms
SWITCHING FREQUENCY		1kHz	1kHz
LIGHT SPOT DIAMETER		≈130mm at a range of 5m	≈130mm at a range of 5m
LIGHT BEAM ANGLE		1.5°	1.5°
LIGHT SOURCE		Visible red LED 660nm	Visible red LED 660nm
AMBIENT LIGHT RESISTANCE		≤50,000 lux	≤50,000 lux
TEMPERATURE RANGE	*WORKING*	-40°F to +140°F	-40°F to +140°F
	STORAGE	-40°F to +167°F	-40°F to +167°F
ELECTRICAL CONNECTION		 2.5-meter cable, PVC covered 5-conductor, #24AWG	 Quick disconnect type V15
ADDITIONAL DATA		***See pages 415-418***	

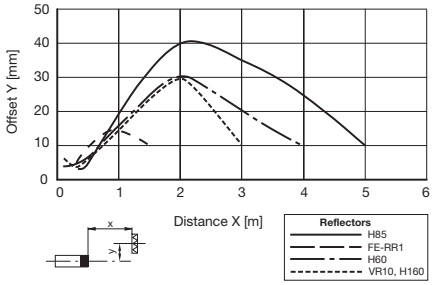
*NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed

Sensing Characteristics

Excess Gain vs. Sensing Range MLV12-54



Movement Characteristics MLV12-54



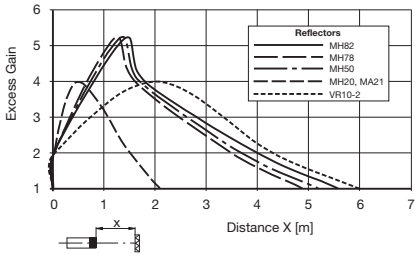
Retro-Reflective Mode

Specifications	Laser*		
SENSING RANGE	100-450mm (effective range)	0-15m	0-15m
SENSITIVITY ADJUSTMENT	Yes	Yes	Yes
REFLECTOR DISTANCE	20mm-4.3m	0-15m	0-15m
POLARIZED FILTER	Yes	Yes	Yes
MODEL NUMBER(S)	MLV12-54-LAS-300/76b/110/124	MLV12-54-LAS/76b/110/115	MLV12-54-LAS/76b/110/124
OUTPUT 4-IN-1 FOUR OUTPUTS ONE SENSOR /110	4-in-1†	4-in-1†	4-in-1†
	—	—	—
LOAD CURRENT	100mA max.	100mA max.	100mA max.
SUPPLY VOLTAGE	10-30VDC	10-30VDC	10-30VDC
CURRENT CONSUMPTION	≤40mA	≤40mA	≤40mA
RESPONSE TIME	0.2ms	0.2ms	0.2ms
SWITCHING FREQUENCY	2.5kHz	2.5kHz	2.5kHz
LIGHT SPOT DIAMETER	≈0.5mm at a range of 150-400mm (0.3mm min. target diameter)	≈5mm at a range of 15m	≈5mm at a range of 15m
LIGHT BEAM ANGLE	0.1°	0.02°	0.02°
LIGHT SOURCE	Visible red laser 650nm Class 2	Visible red laser 650nm Class 2	Visible red laser 650nm Class 2
AMBIENT LIGHT RESISTANCE	≤50,000 lux	≤50,000 lux	≤50,000 lux
TEMPERATURE RANGE *WORKING*	+14°F to +122°F	+14°F to +122°F	+14°F to +122°F
TEMPERATURE RANGE *STORAGE*	-4°F to +149°F	-4°F to +149°F	-4°F to +149°F
ELECTRICAL CONNECTION	Quick disconnect type V15	2.5-meter cable, PVR covered 5-conductor, #24AWG	Quick disconnect type V15
ADDITIONAL DATA	*See pages 415-418*		

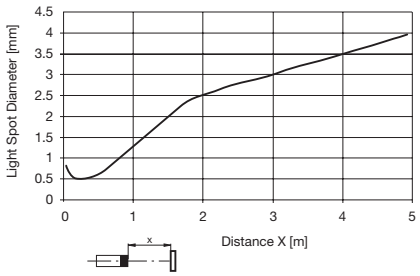
* Micro-structure corner-cube reflectors are recommended with laser retro-reflective mode sensors.
†NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed

Sensing Characteristics

Excess Gain vs. Sensing Range MLV12-54-LAS-300



Light Spot Diameter Over Entire Sensing Range MLV12-54-LAS-300



CAUTION

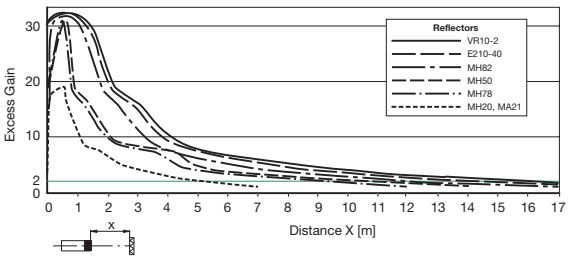
LASER RADIATION—
DO NOT STARE INTO BEAM

650nm LASER LIGHT
1mW PEAK POWER

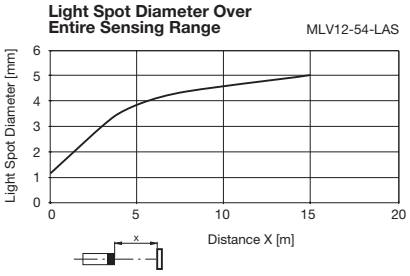
PRODUCT CONFORMS TO 21CFR1040
CLASS II LASER PRODUCT

AVOID EXPOSURE – Laser radiation is emitted from this aperture

Excess Gain vs. Sensing Range MLV12-54-LAS



Light Spot Diameter Over Entire Sensing Range MLV12-54-LAS



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Retro-Reflective Mode for Clear Object Detection

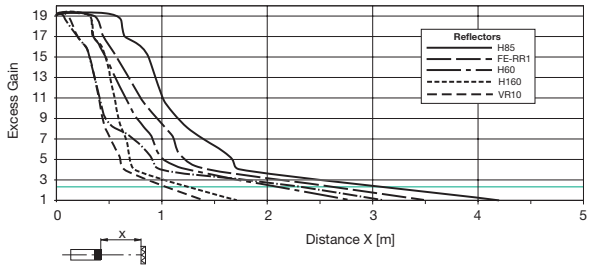
Specifications

SENSING RANGE		**0-3m**
SENSITIVITY ADJUSTMENT		Yes
REFLECTOR DISTANCE		0-3m
POLARIZED FILTER		Yes
MODEL NUMBER(S)		**MLV12-54-G/32/82g/124**
		MLV12-54-G/76b/124/128
OUTPUT	*/32*	1 PNP
	/128	4-in-1*
LOAD CURRENT		200mA max.
SUPPLY VOLTAGE		10-30VDC
CURRENT CONSUMPTION		≤55mA
RESPONSE TIME		0.5ms
SWITCHING FREQUENCY		1kHz
LIGHT SPOT DIAMETER		≈80mm at a range of 3m
LIGHT BEAM ANGLE		1.5°
LIGHT SOURCE		Visible red LED 660nm
AMBIENT LIGHT RESISTANCE		≤40,000 lux
TEMPERATURE RANGE	*WORKING*	-40°F to +140°F
	STORAGE	-40°F to +167°F
ELECTRICAL CONNECTION		 Quick disconnect type V15
ADDITIONAL DATA		***See pages 415-418***

*NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed

Sensing Characteristics

Excess Gain vs. Sensing Range MLV12-54-G



Thru-Beam Mode

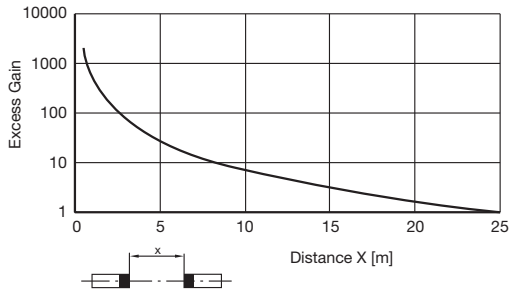
Specifications

SENSING RANGE		0-16m	0-16m
SENSITIVITY ADJUSTMENT		Yes	Yes
MODEL NUMBER(S)	Transmitter	M12-F1/76b/115	M12-F1/76b/124
	Receiver	MV12-F1/82b/115/128	MV12-F1/82b/124/128
OUTPUT (4 FOUR OUTPUTS IN 1 ONE SENSOR)	/128	4-in-1*	4-in-1*
		—	—
LOAD CURRENT		200mA max.	200mA max.
SUPPLY VOLTAGE		10-30VDC	10-30VDC
CURRENT CONSUMPTION		≤35mA transmitter ≤45mA receiver	≤35mA transmitter ≤45mA receiver
RESPONSE TIME		0.5ms	0.5ms
SWITCHING FREQUENCY		1kHz	1kHz
LIGHT SPOT DIAMETER		≈420mm at a range of 16m (12mm min. target diameter)	≈420mm at a range of 16m (12mm min. target diameter)
LIGHT BEAM ANGLE		1.5°	1.5°
LIGHT SOURCE		2 visible red LEDs 660nm	2 visible red LEDs 660nm
AMBIENT LIGHT RESISTANCE		≤40,000 lux	≤40,000 lux
TEMPERATURE RANGE	*WORKING*	-40°F to +140°F	-40°F to +140°F
	STORAGE	-40°F to +167°F	-40°F to +167°F
ELECTRICAL CONNECTION		 2.5-meter cable, PVC covered 5-conductor, #24AWG	 Quick disconnect type V15
ADDITIONAL DATA		*See pages 415-418*	

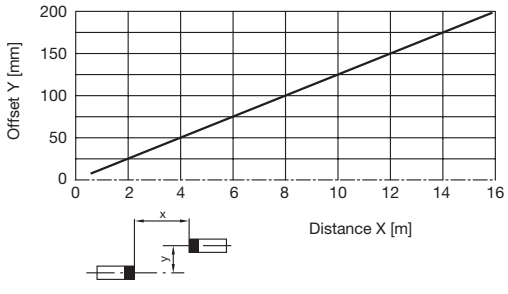
*NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed

Sensing Characteristics

Excess Gain vs. Sensing Range M12/MV12



Movement Characteristics M12/MV12



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Series Specifications

MLV12 Series Specifications

VOLTAGE DROP			≤2.5VDC
SHORT CIRCUIT AND OVERLOAD PROTECTION			Yes
REVERSE POLARITY PROTECTION			Yes
VOLTAGE RIPPLE			10%
LED(s)			Yes (2)*
OPERATING MODE			Light on/dark on
STANDARDS			EN 60947-5-2
PROTECTION (IEC)			IP67
HOUSING MATERIAL			Nickel-plated die-cast zinc and glass-fiber reinforced plastic PC
LENS			Plastic
WEIGHT			2.1oz (per housing)
APPROVALS	cULus LISTED	General Purpose	Yes
	CE		
	CSA CERTIFIED	General Purpose	Yes

*See *MLV12 Series Sensitivity Adjustment* for LED functions.

4-in-1 Output



The 4-in-1 output automatically detects the connected load, so the output either sources or sinks current depending on the load. The light on/dark on switch on the housing selects normally open or normally closed mode. A single sensor can operate as NPN normally open, NPN normally closed, PNP normally open, or PNP normally closed.

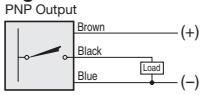
Wiring Diagrams

DC

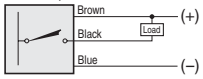


Cable Connection

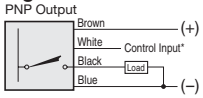
Light On/Dark On
PNP Output
/128



Light On/Dark On
NPN Output
/128

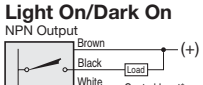


Light On/Dark On
PNP Output
/76b/128



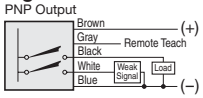
***Control Input:** Transmitter deactivated when connected to (–)

Light On/Dark On
NPN Output
/76b/128



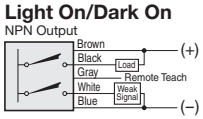
***Control Input:** Transmitter deactivated when connected to (–)

Light On/Dark On
PNP Output
/82b/128



Weak Signal Output: Output is on for adequate excess gain

Light On/Dark On
NPN Output
/82b/128



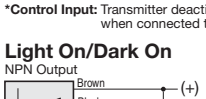
Weak Signal Output: Output is on for adequate excess gain

Light On/Dark On
PNP Output
/76b/110



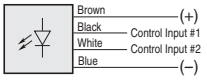
***Control Input:** Transmitter deactivated when connected to (–)

Light On/Dark On
NPN Output
/76b/110



***Control Input:** Transmitter deactivated when connected to (–)

Transmitter (thru-beam models)



Control Input #1: Transmitters deactivated when connected to (–)

Control Input #2: 1 of 2 transmitters deactivated when connected to (+) for reduced sensing range

Wiring diagrams continued on next page

Wiring Diagrams (cont.)

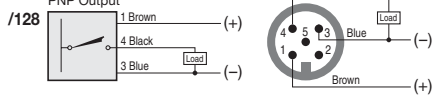
DC

Quick Disconnect

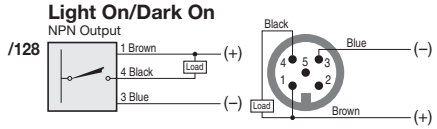
Note: Wiring diagrams show quick disconnect pin numbers.

V15 Type

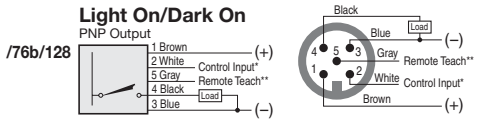
Light On/Dark On
PNP Output
/128



Light On/Dark On
NPN Output
/128

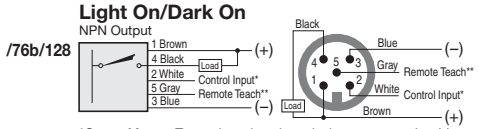


Light On/Dark On
PNP Output
/76b/128



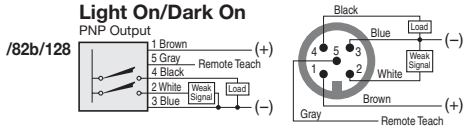
***Control Input:** Transmitter deactivated when connected to (–)
****Remote Teach** (for MLV12-54-G and M12/MV12 models only)

Light On/Dark On
NPN Output
/76b/128



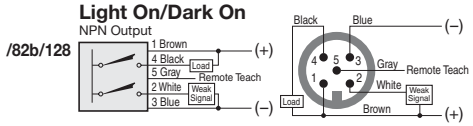
***Control Input:** Transmitter deactivated when connected to (–)
****Remote Teach** (for MLV12-54-G and M12/MV12 models only)

Light On/Dark On
PNP Output
/82b/128



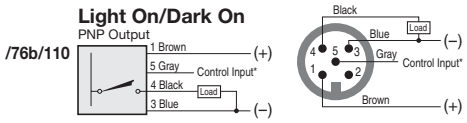
Weak Signal Output: Output is on for adequate excess gain

Light On/Dark On
NPN Output
/82b/128



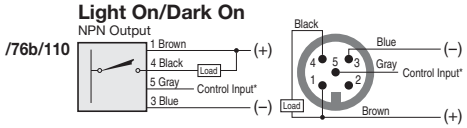
Weak Signal Output: Output is on for adequate excess gain

Light On/Dark On
PNP Output
/76b/110



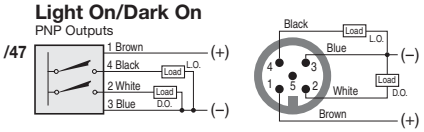
***Control Input:** Transmitter deactivated when connected to (–)

Light On/Dark On
NPN Output
/76b/110

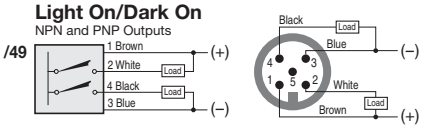


***Control Input:** Transmitter deactivated when connected to (–)

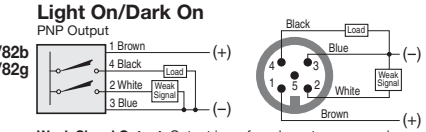
Light On/Dark On
PNP Outputs
/47



Light On/Dark On
NPN and PNP Outputs
/49

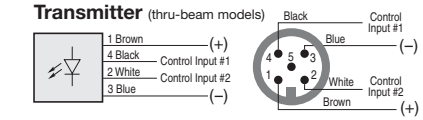


Light On/Dark On
PNP Output
/32/82b
/32/82g



Weak Signal Output: Output is on for adequate excess gain

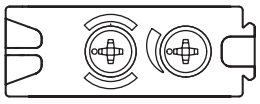
Transmitter (thru-beam models)



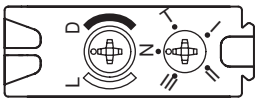
Control Input #1: Transmitters deactivated when connected to (–)
Control Input #2: 1 of 2 transmitters deactivated when connected to (+) for reduced sensing range

MLV12 Series Sensitivity Adjustment

Dura-Vue MLV12 photoelectric sensors are available with two different configurations for sensitivity adjustment. The first type is for the MLV12-8-H background suppression models and the MLV12-54 polarized retro-reflective models. The second is for the MLV12-54-G clear object sensing models and the M12/MV12 thru-beam models.



Configuration 1
(MLV12-8-H and MLV12-54)



Configuration 2
(MLV12-54-G and M12/MV12)

The adjustments for the MLV12-8-H and MLV12-54 models include two potentiometers. The one closest to the lens allows selection of light on or dark on operating mode. This potentiometer can be turned in either direction. The other potentiometer is the sensitivity adjustment and can be turned toward the larger end of the marked swirl to increase sensing range or toward the shorter end of the swirl to decrease sensing range.

The adjustments for the MLV12-54-G and M12/MV12 models also include two potentiometers. Both can be turned in either direction (clockwise or counter-clockwise). The one closest to the lens again allows selection of light on or dark on operating mode. The other potentiometer has 5 settings: N, T, I, II, and III.

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To program MLV12-54-G or M12/MV12:

1. Align the powered MLV12-54-G to its reflector or align the powered thru-beam pair M12/MV12.
2. Turn the potentiometer from N to T and wait approximately 1 second until the yellow LED flashes (1.5Hz).
3. (a.) If programming by potentiometer is desired, turn the potentiometer to either I, II, or III depending on the contrast desired. (Refer to “Modes Selected by Potentiometer” chart.)

   (b.) If programming by external teach is desired, apply a pulse (V+ of supply voltage) to the external teach input of the sensor. The pulse duration should correspond to the contrast desired. (Refer to “Modes Selected by External Teach Input” chart.)

After a successful teach, settings will be stored even if power to the sensor is disconnected. Detection of low-contrast transparent objects is affected by excessive lens contamination.

Models with weak signal (/82) outputs have an additional output to notify when the reflected light is barely adequate. This could be caused by poor alignment, contaminants on the lens, or excessive sensing range. This output will be ON for good conditions and will turn OFF for marginal excess gain.

LED Diagnostics

LED	LED status	Indicates
Green	ON solid	Power ON
Green	Flashing (4Hz)	Short-circuited output
Green	Flashing (0.8Hz)	Under-voltage
Yellow	OFF	No light is received
Yellow	ON solid	Light is received
Yellow	Flashing (1.5Hz)	Teach mode initiated
Yellow	Flashing (4Hz)	Marginal excess gain

Modes Selected by Potentiometer

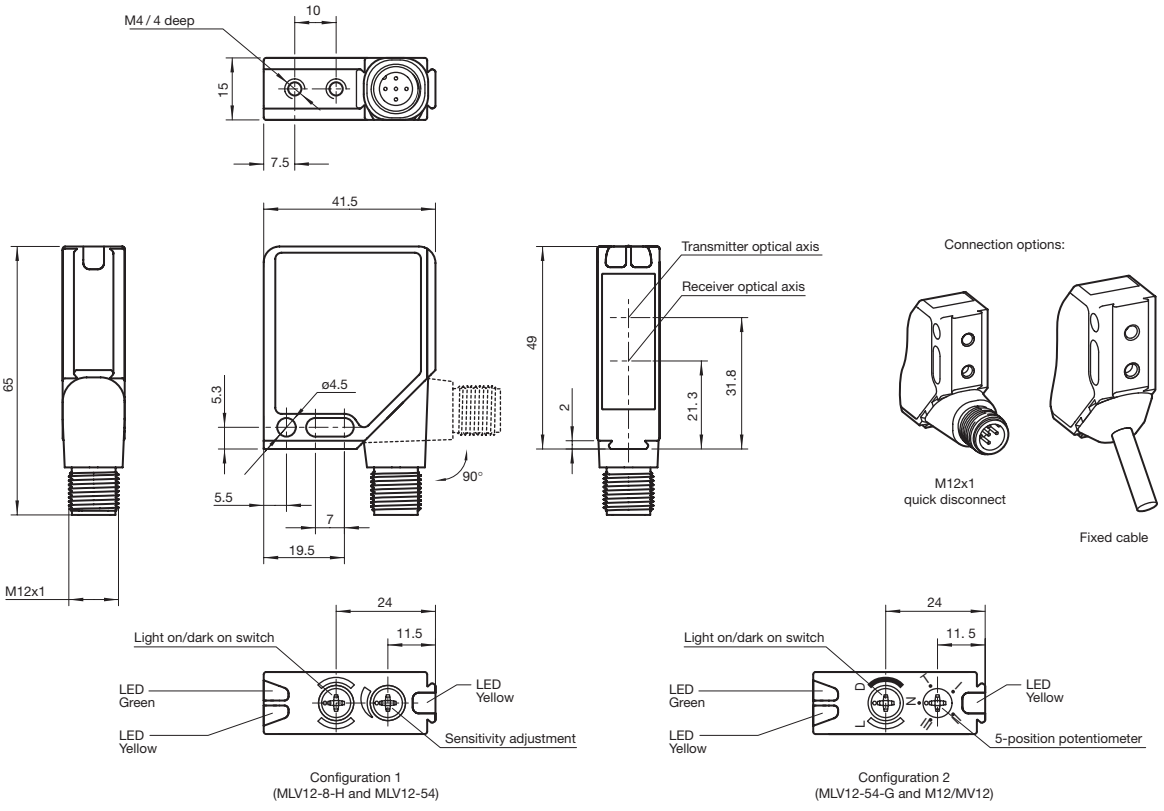
Position	Mode
N	Normal mode – for detection of opaque objects
T	Teach mode
I	15% contrast (most sensitive to transparent targets)
II	25% contrast
III	40% contrast

Modes Selected by External Teach Input

V+ Pulse Width (ms)	Mode
50 (30-100)	I (15% contrast)
150 (100-200)	II (25% contrast)
>200	III (40% contrast)

Dimensions (mm)

MLV12..., M12..., MV12...

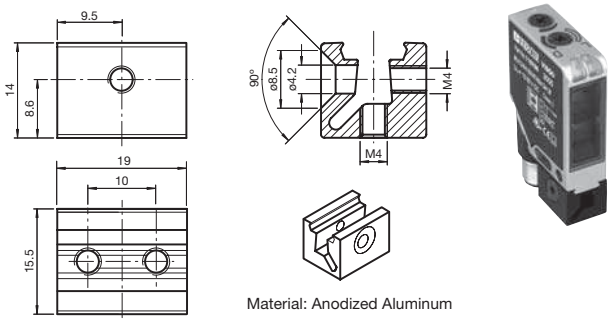


Accessories

(Dimensions in mm)

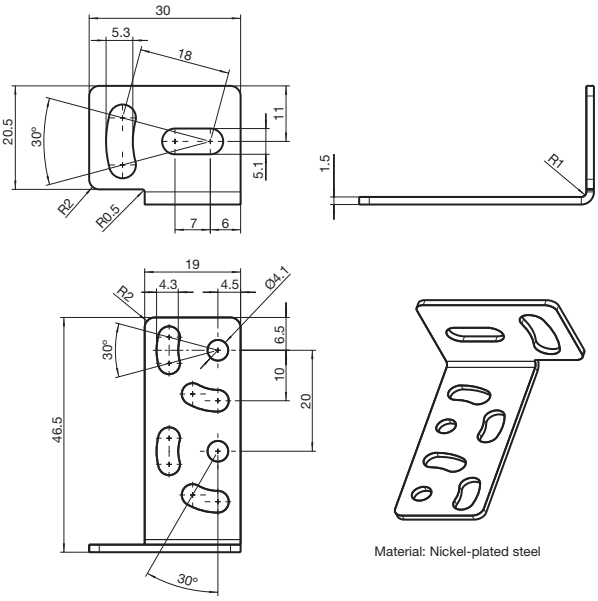
Dovetail Mounting Clamp Model OMH-K01

(Fits on back or bottom ridge of the sensor.)



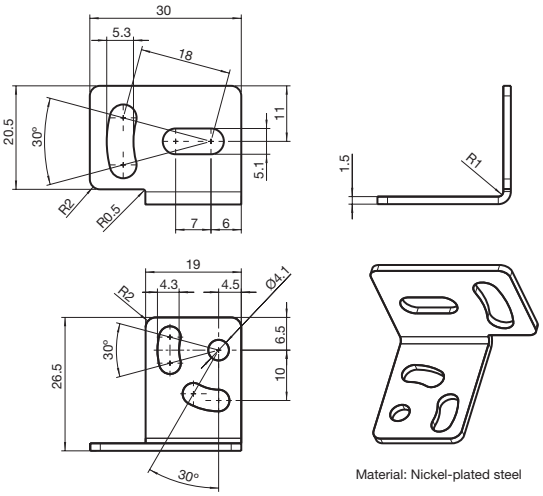
Material: Anodized Aluminum

Tall Mounting Bracket Model OMH-MLV12-HWG



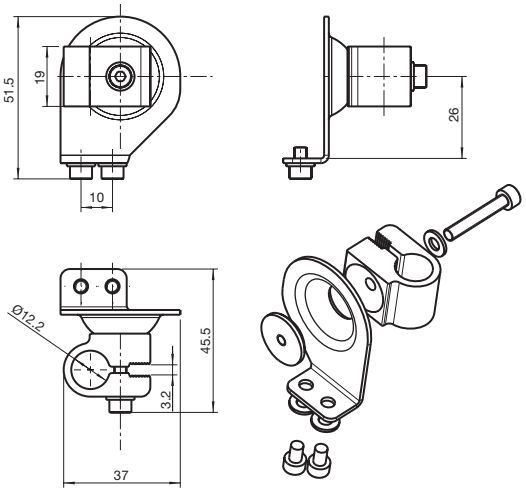
Material: Nickel-plated steel

Short Mounting Bracket Model OMH-MLV12-HWK



Material: Nickel-plated steel

Mounting Bracket Model OMH-06



Material: Zinc-plated aluminum





See pages 827-874 for cordsets



See pages 821-826 for reflectors

See pages 885-892 for additional accessories

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