



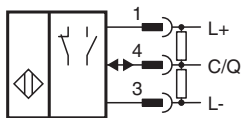
## Technical Data

General specifications			
Detection range			7 ... 300 mm
Detection range min.			7 ... 25 mm
Detection range max.			7 ... 300 mm
Adjustment range			25 ... 300 mm
Reference target			standard white, 100 mm x 100 mm
Light source			laser diode
Light type			modulated visible red light
Laser nominal ratings			
Note			LASER LIGHT , DO NOT STARE INTO BEAM
Laser class			1
Wave length			680 nm
Beam divergence			> 5 mrad d63 < 1 mm in the range of 150 mm ... 250 mm
Pulse length			3 µs
Repetition rate			approx. 13 kHz
max. pulse energy			10.4 nJ
Black-white difference (6 %/90 %)			< 5 % at 150 mm
Diameter of the light spot			approx. 1 mm at a distance of 200 mm
Opening angle			approx. 0.3 °
Ambient light limit			EN 60947-5-2 : 40000 Lux
Functional safety related parameters			
MTTF <sub>d</sub>			560 a
Mission Time (T <sub>M</sub> )			20 a
Diagnostic Coverage (DC)			0 %
Indicators/operating means			
Operation indicator			LED green: constantly on - power on flashing (4Hz) - short circuit flashing with short break (1 Hz) - IO-Link mode
Function indicator			LED yellow: constantly on - object detected constantly off - object not detected
Control elements			Light-on/dark-on changeover switch
Control elements			Sensing range adjuster
Electrical specifications			
Operating voltage	U <sub>B</sub>		10 ... 30 V DC
Ripple			max. 10 %
No-load supply current	I <sub>0</sub>		< 20 mA at 24 V supply voltage
Protection class			III
Interface			
Interface type			IO-Link ( via C/Q = pin 4 )
IO-Link revision			1.1
Device profile			Smart Sensor
Device ID			0x110602 (1115650)
Transfer rate			COM2 (38.4 kBit/s)
Min. cycle time			2.3 ms
Process data width			Process data input 1 Bit Process data output 2 Bit
SIO mode support			yes
Compatible master port type			A
Output			
Switching type			The switching type of the sensor is adjustable. The default setting is: C/Q - Pin4: NPN normally open / light-on, PNP normally closed / dark-on, IO-Link
Signal output			1 push-pull (4 in 1) output, short-circuit protected, reverse polarity protected, overvoltage protected

## Technical Data

Switching voltage		max. 30 V DC
Switching current		max. 100 mA , resistive load
Usage category		DC-12 and DC-13
Voltage drop	$U_d$	$\leq 1.5$ V DC
Switching frequency	$f$	1650 Hz
Response time		300 $\mu$ s
<b>Conformity</b>		
Communication interface		IEC 61131-9
Product standard		EN 60947-5-2
Laser safety		EN 60825-1:2014
<b>Approvals and certificates</b>		
UL approval		E87056 , cULus Listed , class 2 power supply , type rating 1
FDA approval		IEC 60825-1:2007 Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007
<b>Ambient conditions</b>		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F) , fixed cable -25 ... 60 °C (-13 ... 140 °F) , movable cable not appropriate for conveyor chains
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>		
Housing width		13.9 mm
Housing height		33.8 mm
Housing depth		18.3 mm
Degree of protection		IP67 / IP69 / IP69K
Connection		300 mm fixed cable with M8 x 1, 3-pin connector
Material		
Housing		PC (Polycarbonate)
Optical face		PMMA
Mass		approx. 17 g

## Connection



## Connection Assignment

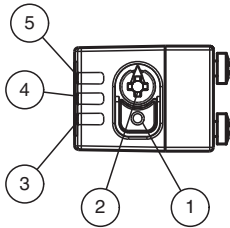


## Connection Assignment

Wire colors in accordance with EN 60947-5-2

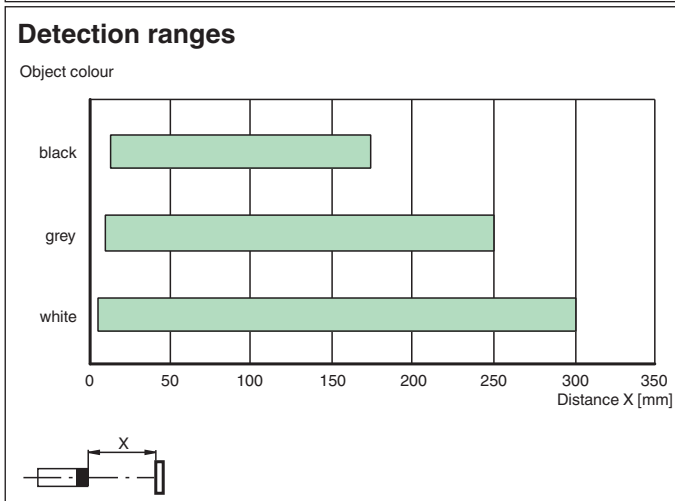
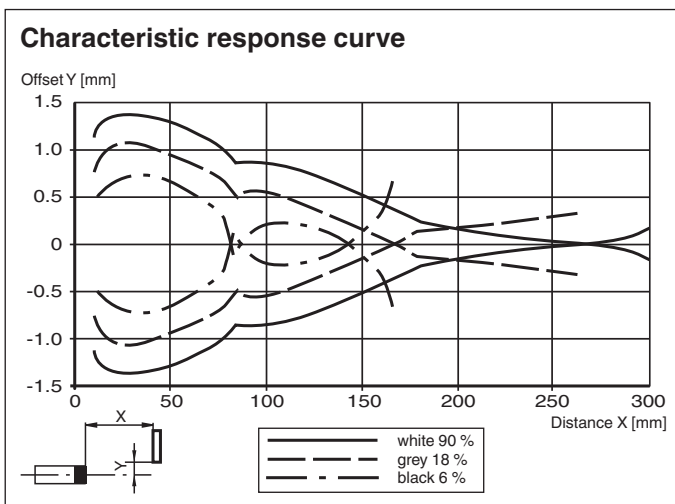
1	BN	(brown)
3	BU	(blue)
4	BK	(black)

## Assembly



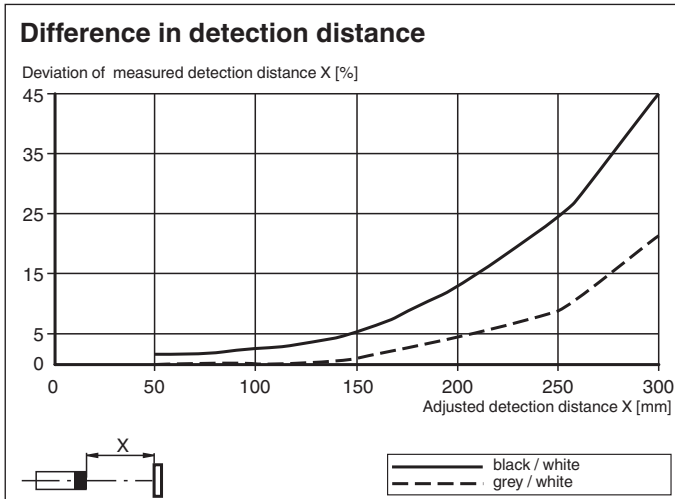
1	Light-on/dark-on changeover switch
2	Sensing range adjuster
3	Operating indicator / dark on
4	Signal indicator
5	Operating indicator / light on

## Characteristic Curve

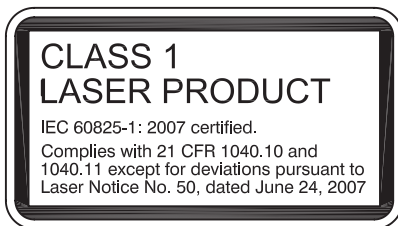


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## Characteristic Curve







## Safety Information











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## Accessories

	<b>V31-GM-2M-PUR</b>	Female cordset single-ended M8 straight A-coded, 4-pin, PUR cable grey
	<b>V31-WM-2M-PUR</b>	Female cordset single-ended M8 angled A-coded, 4-pin, PUR cable grey
	<b>V3-WM-2M-PUR</b>	Female cordset single-ended M8 angled A-coded, 3-pin, PUR cable grey
	<b>ICE2-8IOL-G65L-V1D</b>	EtherNet/IP IO-Link master with 8 inputs/outputs

## Accessories

	<b>ICE3-8IOL-G65L-V1D</b>	PROFINET IO IO-Link master with 8 inputs/outputs
	<b>ICE1-8IOL-G30L-V1D</b>	Ethernet IO-Link module with 8 inputs/outputs
	<b>ICE1-8IOL-G60L-V1D</b>	Ethernet IO-Link module with 8 inputs/outputs
	<b>ICE2-8IOL-K45P-RJ45</b>	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, push-in connectors
	<b>ICE2-8IOL-K45S-RJ45</b>	EtherNet/IP IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	<b>ICE3-8IOL-K45P-RJ45</b>	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, push-in terminals
	<b>ICE3-8IOL-K45S-RJ45</b>	PROFINET IO IO-Link master with 8 inputs/outputs, DIN rail, screw terminal
	<b>IO-Link-Master02-USB</b>	IO-Link master, supply via USB port or separate power supply, LED indicators, M12 plug for sensor connection

## Configuration



- 1 - Light on / dark on changeover switch
- 2 - Sensing range / sensitivity adjuster
- 3 - Operating indicator / dark on
- 4 - Signal indicator
- 5 - Operating indicator / light on

To unlock the adjustment functions turn the sensing range adjuster for more than 180 degrees.

### Sensing Range / Sensitivity

Turn sensing range / sensitivity adjuster clockwise to increase sensing range / sensitivity.

Turn sensing range /sensitivity adjuster counterclockwise to decrease sensing range / sensitivity.

If the end of the adjustment range is reached, the signal indicator starts flashing with 8 Hz.

### Light on / Dark on Configuration

Press the light on / dark on changeover switch for more than 1 second (less than 4 seconds). The light on / dark on mode changes and the operating indicators are activated accordingly.

If you press the light on / dark on changeover switch for more than 4 seconds, the light on / dark on mode changes back to the original setting. On release of the light on / dark on changeover switch the current state is activated.

### Restore Factory Settings

Press the light on / dark on changeover switch for more than 10 seconds (less than 30 seconds) until all LEDs turn off. On release of the light on / dark on changeover switch the signal indicator turns on. After 5 seconds the sensor resumes operation with factory settings.

After 5 minutes of inactivity the sensing range / sensitivity adjustment is locked. In order to reactivate the sensing range / sensitivity adjustment, turn the sensing range / sensitivity adjuster for more than 180 degrees.