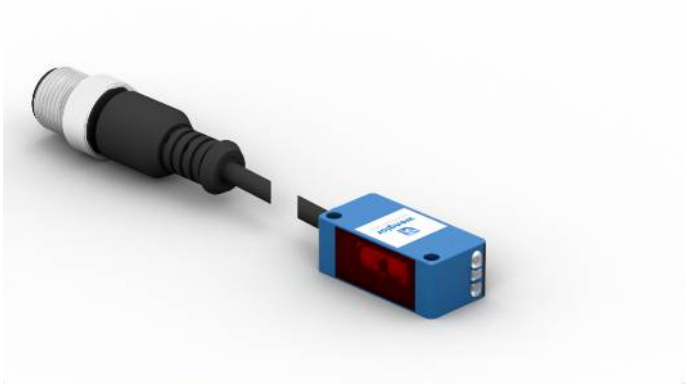
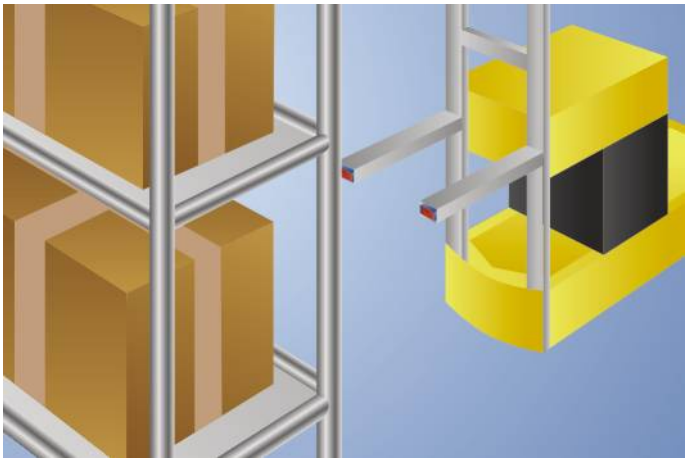
Laser Distance Sensor
Time of Flight

P1KY104 LASER
Part Number



- **2 mutually independent switching outputs**
- **IO-Link interface**
- **Large working range**
- **Miniature design**

The high-performance distance sensor with compact format accurately determines distance between the sensor and the object on the basis of transit time measurement. Two mutually independent switching outputs and the intelligent IO-Link interface permit multifunctional use for precisely ascertaining distance to an object, or for detecting the object at any two switching points. A large working range of 0 to 1500 mm ensures top performance with a miniature format and flexibility where range is concerned. Thanks to laser class 1, the sensor's laser beam is harmless for the human eye.



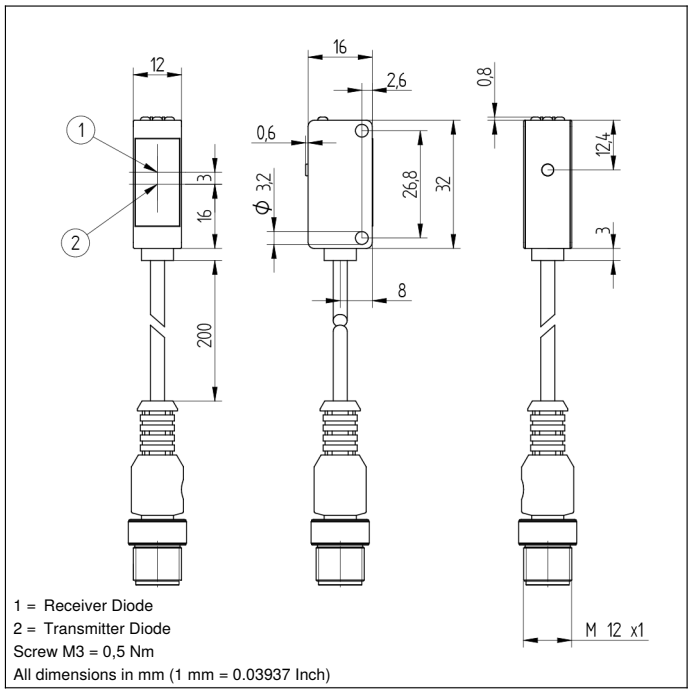
Technical Data

Optical Data	
Working Range	0...1500 mm
Setting Range	50...1500 mm
Switching Hysteresis	< 30 mm
Light Source	Laser (infrared)
Wavelength	940 nm
Service Life (T = +25 °C)	100000 h
Laser Class (EN 60825-1)	1
Max. Ambient Light	10000 Lux
Light Spot Diameter	see Table 1
Electrical Data	
Supply Voltage	10...30 V DC
Supply Voltage with IO-Link	18...30 V DC
Current Consumption (Ub = 24 V)	< 15 mA
Switching Frequency	10 Hz
Response Time	< 36 ms
Temperature Drift	< 2,5 %
Temperature Range	-40...60 °C
Number of Switching Outputs	2
Switching Output Voltage Drop	< 2,5 V
Switching Output/Switching Current	100 mA
Residual Current Switching Output	< 50 µA
Short Circuit Protection	yes
Reverse Polarity Protection	yes
Overload Protection	yes
Lockable	yes
Interface	IO-Link V1.1
Protection Class	III
FDA Accession Number	1720547-001
Mechanical Data	
Setting Method	Teach-In
Housing Material	Plastic
Optic Cover	PMMA
Degree of Protection	IP67/IP68
Connection	M12 × 1; 4-pin
Cable Length	200 mm
Safety-relevant Data	
MTTFd (EN ISO 13849-1)	2266,52 a
NPN NC, NPN NO	●
IO-Link	●
Connection Diagram No.	239
Control Panel No.	A23
Suitable Connection Equipment No.	2
Suitable Mounting Technology No.	400

NPN output function for O1 only

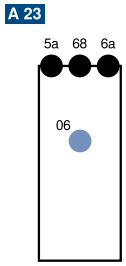
Complementary Products

IO-Link Master
Software

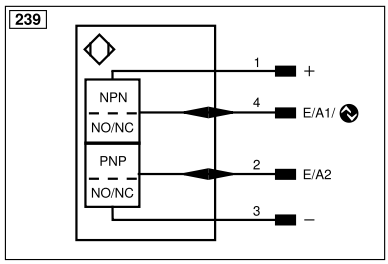


1 = Receiver Diode
2 = Transmitter Diode
Screw M3 = 0,5 Nm
All dimensions in mm (1 mm = 0.03937 Inch)

Ctrl. Panel



06 = Teach Button
5a = Switching Status Display, O1
68 = supply voltage indicator
6a = Switching Status Display, O2



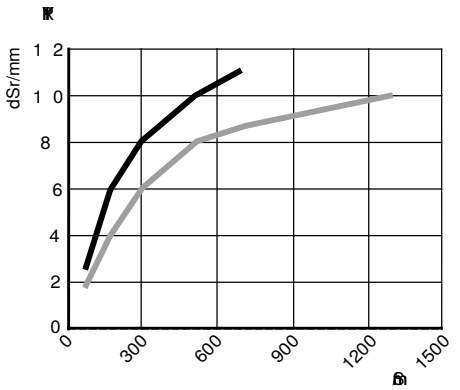
Legend					
+	Supply Voltage +	nc	Not connected	ENBRS422	Encoder B/B̄ (TTL)
–	Supply Voltage 0 V	U	Test Input	ENA	Encoder A
~	Supply Voltage (AC Voltage)	Ū	Test Input inverted	ENB	Encoder B
A	Switching Output (NO)	W	Trigger Input	AMIN	Digital output MIN
Ā	Switching Output (NC)	W–	Ground for the Trigger Input	AMAX	Digital output MAX
V	Contamination/Error Output (NO)	O	Analog Output	AOK	Digital output OK
V̄	Contamination/Error Output (NC)	O–	Ground for the Analog Output	SY In	Synchronization In
E	Input (analog or digital)	BZ	Block Discharge	SY OUT	Synchronization OUT
T	Teach Input	AMV	Valve Output	OLT	Brightness output
Z	Time Delay (activation)	a	Valve Control Output +	M	Maintenance
S	Shielding	b	Valve Control Output 0 V	rsv	Reserved
RxD	Interface Receive Path	SY	Synchronization	Wire Colors according to DIN IEC 60757	
TxD	Interface Send Path	SY–	Ground for the Synchronization	BK	Black
RDY	Ready	E+	Receiver-Line	BN	Brown
GND	Ground	S+	Emitter-Line	RD	Red
CL	Clock	⏚	Grounding	OG	Orange
E/A	Output/Input programmable	SnR	Switching Distance Reduction	YE	Yellow
	IO-Link	Rx+/–	Ethernet Receive Path	GN	Green
PoE	ower over Ethernet	Tx+/–	Ethernet Send Path	BU	Blue
IN	Safety Input	Bus	Interfaces-Bus A(+)/B(–)	VT	Violet
OSSD	Safety Output	La	Emitted Light disengageable	GY	Grey
Signal	Signal Output	Mag	Magnet activation	WH	White
BI_D+/–	Ethernet Gigabit bidirect. data line (A-D)	RES	Input confirmation	PK	Pink
EN0 RS422	Encoder 0-pulse 0/0̄ (TTL)	EDM	Contactor Monitoring	GNYE	Green/Yellow
PT	Platinum measuring resistor	ENARS422	Encoder A/Ā (TTL)		

Table 1

Working Distance	350 mm	700 mm	1500 mm
Light Spot Diameter	14 mm	25 mm	42 mm

Switching Distance Deviation

Typical characteristic curve based on white, 90 % remission



Sr = Switching Distance
dSr = Switching Distance Change

black 6 % remission
grey 18 % remission

Specifications are subject to change without notice V0-27.03.2023