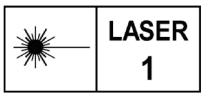
LD33CEBI10xx

Photoelectric Background suppression laser sensors with Time Of Flight

Benefits

- **Long range Background suppression** TOF (Time of Flight) sensor with adjustable distance of 50 to 1.000 mm by Teach-in.
- **Infrared laser class 1** assure a reliable detection.
- 

Description

The LD33CEBI10xx sensor family comes in a compact 12 x 33.1 x 20 mm PC+PBT housing.
They are designed for use in applications where high-accuracy detection as well as small size is required.
Compact housing and high power LED for excellent performance-size ratio.
The compact sensor design is ideally suited to confined spaces.

Applications

- The detection distance is very independent of the colour of the objects to be detected.

References

Product selection key

LD33CEBI10 ☐☐☐

Enter the code option instead of ☐

Code	Option	Description
L	-	Sensing principle: Photoelectric sensor
D	-	Rectangular housing
33	-	Length of housing
C	-	Plastic housing
E	-	Teach-button
B	-	Diffuse reflective, Background suppression
I	-	infrared light
10	-	Sensing distance: 1000 mm
☐	N	NPN
	P	PNP
☐	O	N.O.
	C	N.C.
☐	A2	Cable, 2 m
	M5	Connector M8, 4-pin

Type selection

Connection	Output	Swithing mode	Code
Cable	NPN	N.O.	**LD33CEBI10NOA2**
	PNP	N.O.	**LD33CEBI10POA2**
	NPN	N.C.	**LD33CEBI10NCA2**
	PNP	N.C.	**LD33CEBI10PCA2**
M8 connector, 4-pin	NPN	N.O.	**LD33CEBI10NOM5**
	PNP	N.O.	**LD33CEBI10POM5**
	NPN	N.C.	**LD33CEBI10NCM5**
	PNP	N.C.	**LD33CEBI10PCM5**

Structure

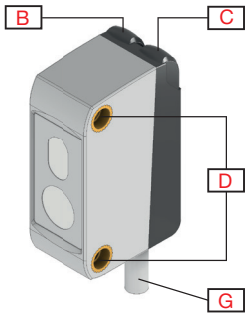


Fig. 1 *Cable*

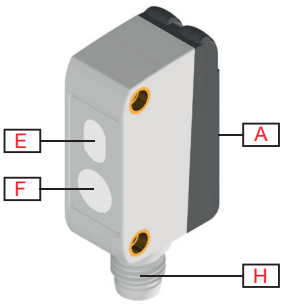


Fig. 2 *Plug*

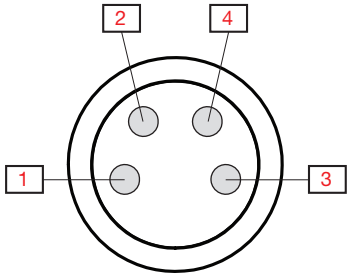


Fig. 3 *"M8-plug" Pin numbers*

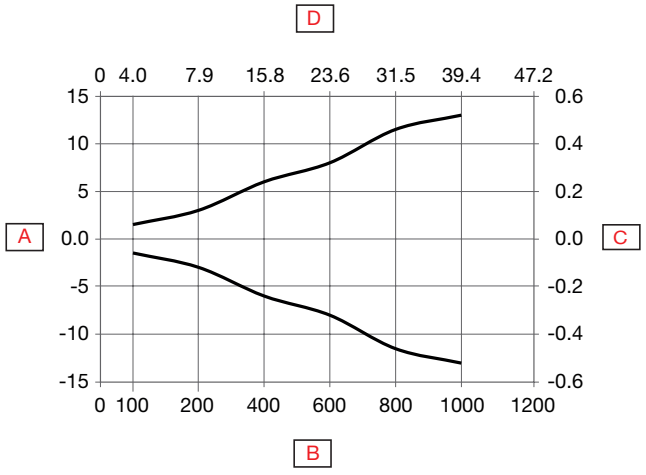
A	Teach-button (back)	**G**	2 m, 4 wire PVC Ø 3.3 mm cable
B	Yellow LED	**H**	M8, 4-pin male connector
C	Green LED	**1**	Brown
D	M3 Fixing holes for sensor mounting	**2**	White
E	Receiver/Emitter	**3**	Blue
F	Indicator light	**4**	Black

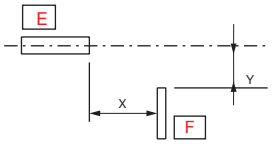
Sensing

Detection

Rated operating distance (S_n)	1000 mm	Reference target, white paper with 90 % reflectivity, Size 200x200 mm
Maximum detection distance	< 1000 mm	White object 90% reflection
	< 1000 mm	Grey object 18% reflection
	< 1000 mm	Black object 6% reflection
Sensitivity control	Adjustable by Teach-in	
Sensitivity adjustment	50 mm ... 1000 mm	Teach-in
Blind zone	< 50 mm	White object 90% reflection
	< 50 mm	Grey object 18% reflection
	< 50 mm	Black object 6% reflection
Light source	940 nm	Infrared V csel laser
Light type	Laser modulated	
Laser class	1	
Indicating light for alignment	Red light beam	
Detection angle	± 0.8°	@1000 mm
Light spot size	Ø 12 mm / Ø 24 mm / Ø 35 mm	@200 mm / 600 mm / 1000 mm
Emitter beam angle	± 1.1°	@500 mm
Hysteresis (H)	1.5% @ max. distance	

Detection diagram





A	Detection width (mm)	**D**	Sensing range (inches)
B	Sensing range (mm)	**E**	Sensor
C	Detection width (inches)	**F**	Object 25 x 25 mm, White 90%

Accuracy

Temperature drift	< 0.1%/°C

Attenuation

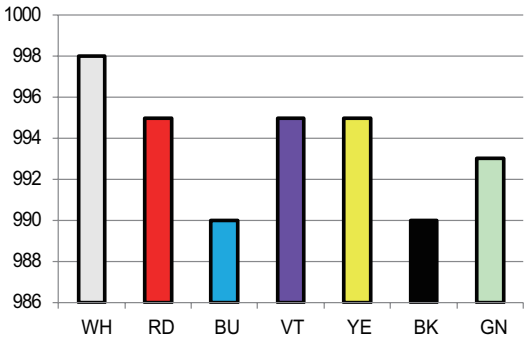


Fig. 4 *Unit in mm*

Features

Power Supply

Rated operational voltage (U_B)	10 ... 30 VDC (ripple included)
Ripple (U_{rpp})	≤ 10%
No load supply current (I_o)	≤ 25 mA @ 24 V
Power-ON delay (t_v)	≤ 1 sec.

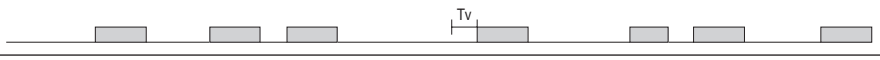
Outputs

Rated operational current (I_e)	≤ 100 mA	
OFF-state current (I_r)	≤ 200 µA	
Minimum operational current (I_m)	> 1 mA	
Voltage drop (U_d)	≤ 2.0 VDC @ 100 mA DC	
Protection	Short circuit, reverse polarity, overload protection	

Operation diagram

For default factory sensor

Tv = Power-ON delay

Power supply	ON	
Target (Object)	Present	
Break output (N.C.)	ON	
Make output (N.O.)	ON	

Response times

Operating frequency (f)	≤ 10 Hz	
Response times	OFF - ON	≤ 45 ms
	ON - OFF	≤ 30 ms

Indication

Yellow LED	Output indicator
Green LED	Steady state indicator

Environmental

Ambient temperature	-20°... +60°C (-4°... +140°F)	Operating [1]
	-40° ... +70°C (-40° ... +158°F)	Storage [1]
Ambient light	≤ 5 000 lux @ <5°	@ 3000 … 3200 °K
Vibration	10 ...55 Hz, 0.5 mm/7.5 g	EN 60068-2-6
Shock	50 g_n / 11 ms, 3 pos, 3 neg per axis	EN60068-2-27
Drop test	2 x 1 m	EN 60068-2-31
Rated insulation voltage (U_i)	50 VDC	
Dielectric insulation voltage	≥ 650 VAC rms	50/60 Hz for 1 min.
Rated impulse withstand voltage	1 kV	1.2/50 µs
Pollution degree	3	EN60947-1
Overvoltage category	III	IEC60664; EN60947-1
Degree of protection	IP67	IEC60539; EN60947-1
Ambient humidity range	35% ... 95% [2]	Operating [2]
	35% ... 95% [2]	Storage [2]

[1] *Do not bend the cable in temperatures below -10°C*
[2] *With no icing or condensation*

EMC

Electrostatic discharge immunity test	± 8 kV @ air discharge or ± 4 kV @ contact discharge	IEC 61000-4-2
Radiated radio-frequency electromagnetic field immunity test (80 MHz ... 1 GHz and 1.4 GHz ... 6 GHz)	10 V/m @ 80 MHz ... 1 GHz 3 V/m @ 1.4 GHz ... 6 GHz	IEC 61000-4-3
Electrical fast transient/Burst immunity test	±2 kV / 5 kHz using the capacitive coupling clamp	IEC 61000-4-4
Conducted disturbances induced by radio-frequency fields immunity test (150 kHz ... 80 MHz)	10 Vrms	IEC 61000-4-6

Mechanics/electronics

Connection

Cable	2 m, 3-wire 3 x 0.14 mm², Ø = 3.5 mm, PVC, Black
Plug	M8, 4-pin, male

Wiring

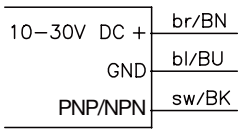


Fig. 5 *Cable NPN or PNP, NO or NC*

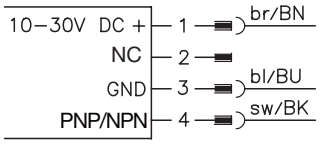


Fig. 6 *4-wire plug NPN or PNP, NO or NC*

BN	WH	BK	BU
Brown	White	Black	Blue

Housing

Body	PBT + 20% glass fibers	
Backpart	PC, transparent	
Front glass	PMMA, Red	
Teach-button	PC	
Dimensions	12 x 33.1 x 20 mm	
Weight	≤ 44 g	Cable version
	≤ 9.5 g	Plug version

Dimensions mm (inches)

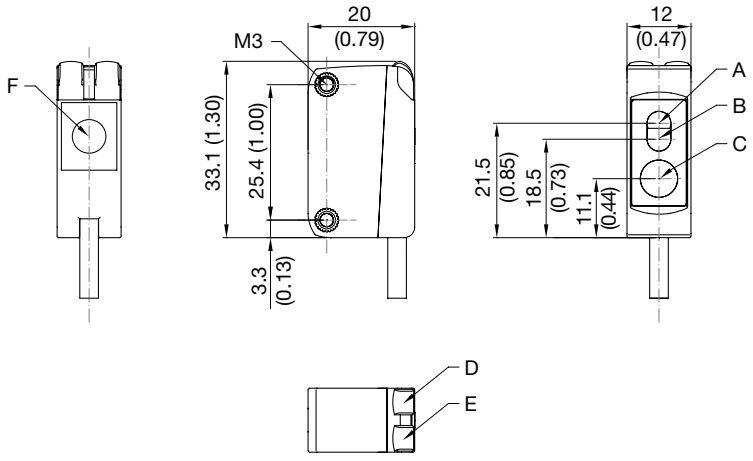


Fig. 7 *Cable*

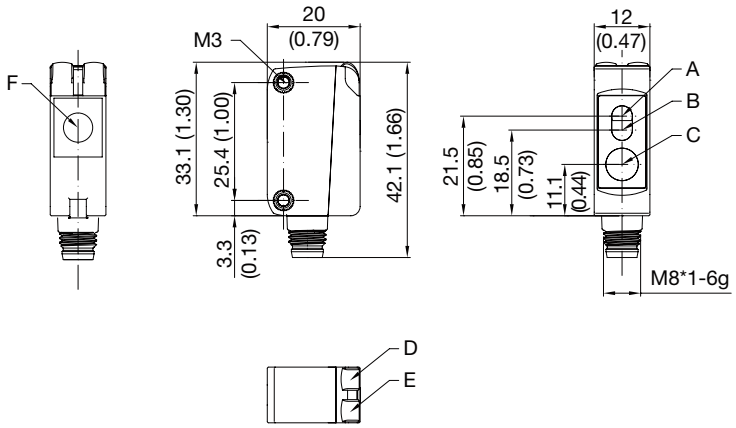
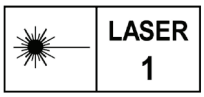


Fig. 8 *Plug*

A	Receiver	**D**	Output indicator
B	Emitter	**E**	Steady state indicator
C	Indicator light	**F**	Teach button

Compatibility and conformity

Approvals and markings

General reference	Sensor designed according to EN60947-5-2	
MTTF$_d$	516 years @ 40°C (+104°F)	ISO 13849-1, SN 29500
CE-marking	CE	
Other Approvals		Class 1 laser according to IEC 60825-1:2014

Delivery contents and accessories

Delivery contents

- Photoelectric switch: LD33CEBI10xx
- Packaging: Plastic bag

Accessories

- Mounting bracket: APD30-MB1, APD30-MB2 to be purchased separately
- Connector type: CON.54NF.. series to be purchased separately

Further information

Information	Where to find it	QR
Manual		
Mounting brackets		
Connectors		