

# **Z-Sensor**

Flexible, low-cost presence detection solutions with clear housings

**PHOTOELECTRIC SENSORS** 

**SICK**Sensor Intelligence.





#### Technical data overview

Dimensions (W x H x D)	13.6 mm x 34.8 mm x 23 mm 13.6 mm x 41.9 mm x 31.7 mm 13.6 mm x 41.9 mm x 21.9 mm 13.6 mm x 45.2 mm x 31.7 mm 13.6 mm x 34.8 mm x 21.9 mm 13.6 mm x 34.6 mm x 21.9 mm
Light source	LED
Type of light	Infrared light / visible red light (depending on type)
Enclosure rating	IP67 / IP65 (depending on type)
Housing material	Plastic
Adjustment	None

#### **Product description**

The Z photoelectric sensor is a low-cost sensor for standard applications in conveyor lines, packaging machines, bin controls and hands-free systems. The sensor's transparent housing provides 360° status indication and has a straight cable outlet for easy connection. The Z1 and Z2 are offered in many different sensing ranges and are available in three variants: retro-reflective, background suppression and energetic. The eyeball-shaped housing of the Z3 allows for infinite adjustability and the indicator LED to be seen from 360° around the device.

#### At a glance

- · Economical design with background suppression, retro-reflective or energetic variants available; non-adjustable
- Compact, transparent housing with 360° status indication
- M18 front mount and 24-25.4 mm slotted side through holes compatible with competitor devices
- Spherical eyeball-style housing with 24 mm ball mount allows for infinite adjustability (depending on type)
- Connection system: straight or angled cable outlet (60°) or M12 or M8 connector outlet
- IP 67 enclosure rating for harsh environments

### Your benefits

- · High performance at a low cost
- Clear housing provides highly visible 360° of status indication, which simplifies troubleshooting
- Simple and unique mounting options lower installation costs
- Small size fits applications with limited space
- · Customization options reduce material and labor costs
- · Compatibility with competitor products for easy integration into existing systems

## Ordering information

Other models and accessories → www.sick.com/Z-Sensor

• Functional principle: Photoelectric proximity sensor

• Functional principle detail: Energetic

Light source: LEDVoltage type: DC

Switching mode: Light switching
Type of light: Infrared light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
1 mm 100 mm	NPN	None	Cable with M12	ZT1-N4221	1045582
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N4221	1045427
			Cable with M8 male con-	ZT1-N4231	1045598
		None	nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N4231	1045443
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-N4215	1045566
				ZT2-N4215	1045411
			Male connector M12, 4-pin	ZT2-N4228	1045476
			Male connector M8, 4-pin	ZT2-N4238	1045492
	PNP	PNP None	Cable with M12	ZT1-P4221	1045583
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P4221	1045428
			Cable with M8 male con-	ZT1-P4231	1045599
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P4231	1045444
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-P4215	1045567
				ZT2-P4215	1045412
			Male connector M12, 4-pin	ZT2-P4228	1045477
			Male connector M8, 4-pin	ZT2-P4238	1045493
2 mm 150 mm 3 mm 100 mm	PNP	None	Cable, 3-wire, 2 m <sup>1)</sup>	ZT4-P5215S01	1044281

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
5 mm 155 mm	NPN	None	Cable with M12 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N5221	1045419
			Cable with M8 male con-	ZT1-N5231	1045590
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N5231	1045435
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-N5215	1045558
				ZT2-N5215	1045403
			Cable with connector RJ11, 6-pin, 0.5 m <sup>1)</sup>	ZT1-N5772	1048340
			Male connector M12, 4-pin	ZT2-N5228	1045468
			Male connector M8, 4-pin	ZT2-N5238	1045484
	PNP	None	Cable with M12	ZT1-P5221	1045575
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P5221	1045420
			Cable with M8 male con-	ZT1-P5231	1045591
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P5231	1045436
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-P5215	1045559
				ZT2-P5215	1045404
			Male connector M12, 4-pin	ZT2-P5228	1045469
			Male connector M8, 4-pin	ZT2-P5238	1045485

 $<sup>^{1)}</sup>$  Do not bend below 0 °C.

• Functional principle: Photoelectric proximity sensor

• Functional principle detail: Energetic

Light source: LEDVoltage type: DC

Switching mode: Dark switching
Type of light: Infrared light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
1 mm 100 mm	NPN	None	Cable with M12	ZT1-E4221	1045585
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E4221	1045430
			Cable with M8 male con-	ZT1-E4231	1045601
		None	nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E4231	1045463
			Cable, 3-wire, 2 m 1)	ZT1-E4215	1045569
	PNP			ZT2-E4215	1045414
			Male connector M12, 4-pin	ZT2-E4228	1045479
			Male connector M8, 4-pin	ZT2-E4238	1045495
		PNP None	Cable with M12	ZT1-F4221	1045584
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-F4221	1045429
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT1-F4231	1045600
				ZT2-F4231	1045445
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-F4215	1045568
				ZT2-F4215	1045413
			Male connector M12, 4-pin	ZT2-F4228	1045478
			Male connector M8, 4-pin	ZT2-F4238	1045494
2 mm 150 mm 3 mm 100 mm	PNP	None	Cable, 3-wire, 2 m <sup>1)</sup>	ZT4-F5215S02	1054290

 $<sup>^{1)}</sup>$  Do not bend below 0 °C.

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
5 mm 155 mm	NPN	None	Cable with M12	ZT1-E5221	1045577
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E5221	1045422
			Cable with M8 male con-	ZT1-E5231	1045593
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E5231	1045438
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-E5215	1045561
				ZT2-E5215	1045406
			Male connector M12, 4-pin	ZT2-E5228	1045471
			Male connector M8, 4-pin	ZT2-E5238	1045487
	PNP	None	Cable with M12	ZT1-F5221	1045576
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-F5221	1045421
			Cable with M8 male con-	ZT1-F5231	1045592
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-F5231	1045437
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-F5215	1045560
				ZT2-F5215	1045405
			Male connector M12, 4-pin	ZT2-F5228	1045470
			Male connector M8, 4-pin	ZT2-F5238	1045486

 $<sup>^{1)}</sup>$  Do not bend below 0 °C.

Functional principle: Photoelectric proximity sensor
 Functional principle detail: Background suppression

Light source: LEDVoltage type: DC

Switching mode: Light switching
Type of light: Infrared light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
0 mm 50 mm	NPN	None	Cable with M12	ZT1-N3221	1045578
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N3221	1045423
			Cable with M8 male connector, 4-pin, 150 mm $^{1)}$	ZT2-N3231	1045439
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-N3215	1045562
				ZT2-N3215	1045407
			Male connector M12, 4-pin	ZT2-N3228	1045472
			Male connector M8, 4-pin	ZT2-N3238	1045488
	PNP	None	Cable with M12 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT1-P3221	1045579
				ZT2-P3221	1045424
			Cable with M8 male con-	ZT1-P3231	1045595
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P3231	1045440
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-P3215	1045563
				ZT2-P3215	1045408
			Cable, 3-wire, 5 m <sup>1)</sup>	ZT2-P3210S01	1052607
			Male connector M12, 4-pin	ZT2-P3228	1045473
			Male connector M8, 4-pin	ZT2-P3238	1045489

 $<sup>^{1)}</sup>$  Do not bend below 0 °C.

## PHOTOELECTRIC SENSORS

• Functional principle: Photoelectric proximity sensor • Functional principle detail: Background suppression

Light source: LEDVoltage type: DC

Switching mode: Dark switchingType of light: Infrared light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
0 mm 50 mm	NPN	None	Cable with M12	ZT1-E3221	1045581
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E3221	1045426
			Cable with M8 male con-	ZT1-E3231	1045597
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E3231	1045442
			Cable, 3-wire, 2 m 1)	ZT1-E3215	1045565
				ZT2-E3215	1045410
			Male connector M12, 4-pin	ZT2-E3228	1045475
			Male connector M8, 4-pin	ZT2-E3238	1045491
	PNP	None	Cable with M12 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT1-F3221	1045580
				ZT2-F3221	1045425
			Cable with M8 male con-	ZT1-F3231	1045596
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-F3231	1045441
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-F3215	1045564
				ZT2-F3215	1045409
			Male connector M12, 4-pin	ZT2-F3228	1045474
			Male connector M8, 4-pin	ZT2-F3238	1045490

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

• Functional principle: Photoelectric proximity sensor

• Functional principle detail: Energetic

Light source: LEDVoltage type: DC

Switching mode: Dark switching
Type of light: visible red light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
5 mm 60 mm	NPN	None	Cable with M12	ZT1-E2221	1045573
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E2221	1045418
			Cable with M8 male con-	ZT1-E2231	1045589
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-E2231	1045434
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-E2215	1045557
				ZT2-E2215	1045402
			Male connector M12, 4-pin	ZT2-E2228	1045467
			Male connector M8, 4-pin	ZT2-E2238	1045483
	PNP	None	Cable with M12	ZT1-F2221	1045572
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-F2221	1045417
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT1-F2231	1045588
				ZT2-F2231	1045433
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-F2215	1045556
				ZT2-F2215	1045401
			Male connector M12, 4-pin	ZT2-F2228	1045466
			Male connector M8, 4-pin	ZT2-F2238	1045482

 $<sup>^{1)}</sup>$  Do not bend below 0 °C.

## PHOTOELECTRIC SENSORS

• Functional principle: Photoelectric proximity sensor

• Functional principle detail: Energetic

Light source: LEDVoltage type: DC

Switching mode: Light switchingType of light: visible red light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
5 mm 60 mm	NPN	None	Cable with M12	ZT1-N2221	1045570
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N2221	1045415
			Cable with M8 male con-	ZT1-N2231	1045586
			nector, 4-pin, 150 mm <sup>1)</sup>	ZT2-N2231	1045431
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-N2215	1045554
				ZT2-N2215	1045399
			Male connector M12, 4-pin	ZT2-N2228	1045464
			Male connector M8, 4-pin	ZT2-N2238	1045480
	PNP	None	Cable with M12	ZT1-P2221	1045571
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZT2-P2221	1045416
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZT1-P2231	1045587
				ZT2-P2231	1045432
			Cable, 3-wire, 2 m <sup>1)</sup>	ZT1-P2215	1045555
				ZT2-P2215	1045400
			Male connector M12, 4-pin	ZT2-P2228	1045465
			Male connector M8, 4-pin	ZT2-P2238	1045481

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

• Functional principle: Photoelectric retro-reflective sensor

• Functional principle detail: Dual lens

Light source: LEDVoltage type: DC

Switching mode: Dark switching
Type of light: visible red light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
0.1 m 4.8 m	NPN	None	Cable with M12	ZL1-E2421	1045503
		male connector, 4-pin, 150 mm <sup>1)</sup>	ZL2-E2421	1045394	
			ZL3-E2421	1045536	
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-E2431	1045507
				ZL2-E2431	1045398
				ZL3-E2431	1045540
			Cable, 3-wire, 2 m <sup>1)</sup>	ZL1-E2415	1045499
				ZL2-E2415	1045390

<sup>1)</sup> Do not bend below 0 °C.

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
				ZL3-E2415	1045532
			Cable with connector RJ11, 6-pin, 3 m <sup>1)</sup>	ZL1-E2277	1042621
			Male connector M12, 4-pin	ZL2-E2428	1045372
			Male connector M8, 4-pin	ZL2-E2438	1045386
	PNP	None	Cable with M12	ZL1-F2421	1045502
			male connector, 4-pin, 150 mm <sup>1)</sup>	ZL2-F2421	1045393
			, , ,	ZL3-F2421	1045535
			Cable with M12 male connector, 4-pin, 2 m <sup>1)</sup>	ZL3-F2425	1066618
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-F2431	1045506
				ZL2-F2431	1045397
				ZL3-F2431	1045539
			Cable with WAGO terminal 733-103, 0.5 m <sup>1)</sup>	ZL1-F2262	1042261
			Cable with WAGO terminal 733-103, 800 mm <sup>1)</sup>	ZL1-F2460S03P03	1044596
			Cable, 3-wire, 2 m <sup>1)</sup>	ZL1-F2415	1045498
				ZL2-F2415	1045389
				ZL3-F2415	1045531
			Cable, 3-wire, 3 m <sup>1)</sup>	ZL1-F2417	1048180
			Cable, 4-wire, 2 m <sup>1)</sup>	ZL1-F2715	1042929
			Male connec-	ZL2-F2428	1045371
			tor M12, 4-pin	ZL2-F2828	1043679
			Male connector M8, 4-pin	ZL2-F2438	1045385

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

• Functional principle: Photoelectric retro-reflective sensor

• Functional principle detail: Dual lens

Light source: LEDVoltage type: DC

Switching mode: Light switchingType of light: visible red light

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
0.05 m 2 m	PNP	None	Cable with connector M8, 3-pin, 500 mm <sup>1)</sup>	ZL7-P2400S01	1046191

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
0.1 m 4.8 m	NPN	None	Cable with M12 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-N2421	1045500
				ZL2-N2421	1045391
				ZL3-N2421	1045533
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-N2431	1045504
				ZL2-N2431	1045395
				ZL3-N2431	1045537
			Cable with Tyco connector, 2 m <sup>1)</sup>	ZL1-N2600S02	1044003
			Cable, 3-wire, 2 m <sup>1)</sup>	ZL1-N2415	1045496
				ZL2-N2415	1045387
				ZL3-N2415	1045529
			Cable, 4-wire, 2 m <sup>1)</sup>	ZL1-N2615	1045339
0.1 m 4.8 m	NPN	None	Cable with connector RJ11, 6-pin, 0.5 m <sup>1)</sup>	ZL1-N2272	1041365
				ZL1-N2272P01	2041590
			Cable with connector RJ11, 6-pin, 1.5 m <sup>1)</sup>	ZL1-N2274	1041367
				ZL1-N2274P01	2041592
			Cable with connector RJ11, 6-pin, 1 m <sup>1)</sup>	ZL1-N2273	1041366
				ZL1-N2273P01	2041591
				ZL2-N2873	1051430
			Cable with connector RJ11, 6-pin, 2.5 m <sup>1)</sup>	ZL1-N2276	1041369
			Cable with connector RJ11, 6-pin, 2 m <sup>1)</sup>	ZL1-N2275	1041368
				ZL1-N2275P01	2041593

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

Sensing range max.	Switching output	Adjustment	Connection type	Туре	Part no.
			Cable with connector RJ11, 6-pin, 3 m <sup>1)</sup>	ZL1-N2277	1041370
				ZL1-N2277P01	2041595
			Male connector M12, 4-pin	ZL2-N2428	1045369
			Male connector M8, 4-pin	ZL2-N2438	1045383
	PNP	None	Cable with M12 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-P2421	1045501
				ZL2-P2421	1045392
			, p , = 0 0	ZL3-P2421	1045534
			Cable with M12 male connector, 4-pin, 2 m <sup>1)</sup>	ZL2-P2425	1047766
			Cable with M8 male connector, 4-pin, 0.5 m <sup>1)</sup>	ZL1-P2432	1044514
				ZL3-P1232	1041941
			Cable with M8 male connector, 4-pin, 150 mm <sup>1)</sup>	ZL1-P2431	1045505
				ZL2-P2431	1045396
				ZL3-P2431	1045538
			Cable with M8 male connector, 4-pin, 500 mm <sup>1)</sup>	ZL3-P2432	1078731
			Cable, 3-wire, 0.5 m <sup>1)</sup>	ZL2-P2412	1048514
			Cable, 3-wire, 2 m <sup>1)</sup>	ZL1-P2415	1045497
				ZL2-P2415	1045388
				ZL3-P2415	1045530
			Cable, 3-wire, 3 m <sup>1)</sup>	ZL1-P2417	1047864
			Male connector M12, 4-pin	ZL2-P2428	1045370

 $<sup>^{1)}</sup>$  Do not bend below 0  $^{\circ}\text{C}.$ 

## SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in a wide range of industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

For us, that is "Sensor Intelligence."

## **WORLDWIDE PRESENCE:**

Contacts and other locations -www.sick.com

