

Parallel Beam Line Sensor

# Z4LC

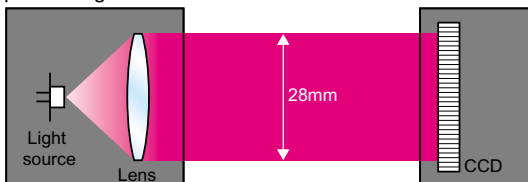
*Wide range of decision functions, including positioning based on outer diameter decision and pitch inspection.*



## Features

### Equipped with the CCD line sensor in a small body.

The CCD line sensor was carried and outer diameter distinction and positioning were attained.

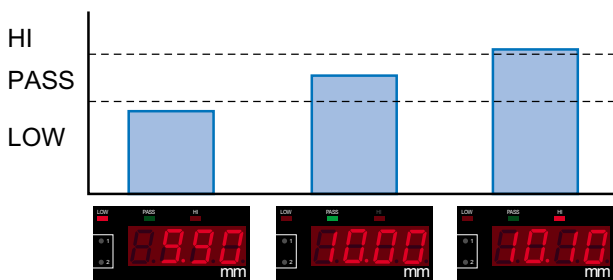


### The visible light semiconductor laser beam is adopted which can be used in easily.

Since it is the visible light laser equivalent to the class 1 of JIS C6802 "the radiation safe standard of a laser product", it can be used in easily.

### Equipped with distinction function

Quality distinction and bound distinction are possible.

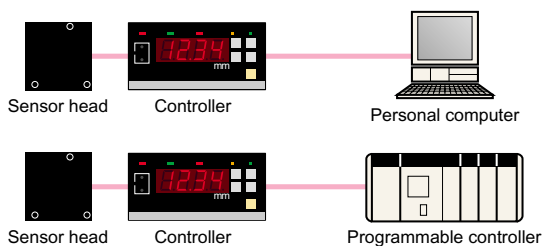


### Various output forms which extend a use.

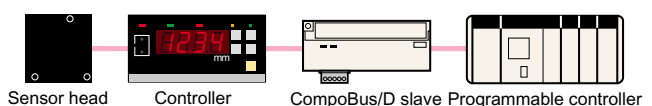
4 to 20-mA analog output, 12-bit parallel output, and RS-232C output are standard equipment. Moreover, it is connectable also with CompoBus/D using a slave station.



#### •RS-232C, 12-bit parallel output, and analog output



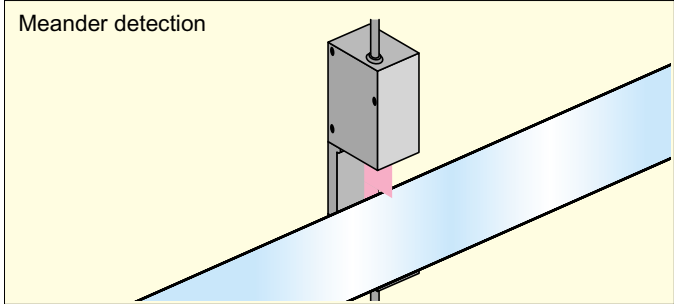
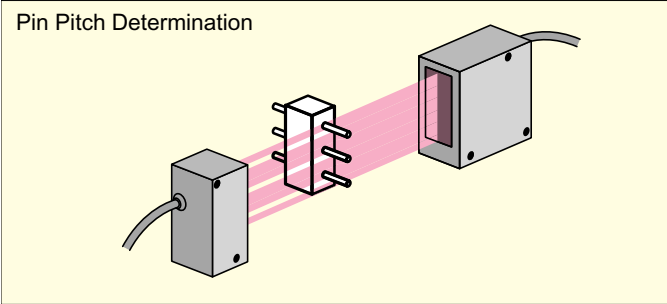
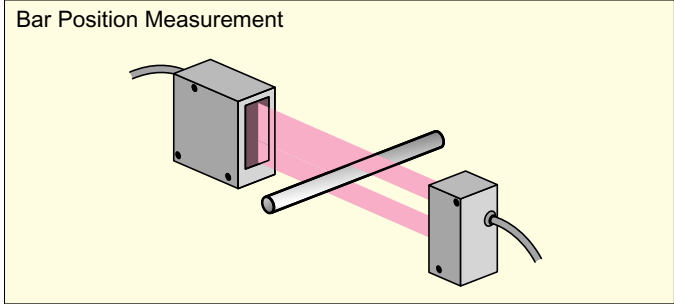
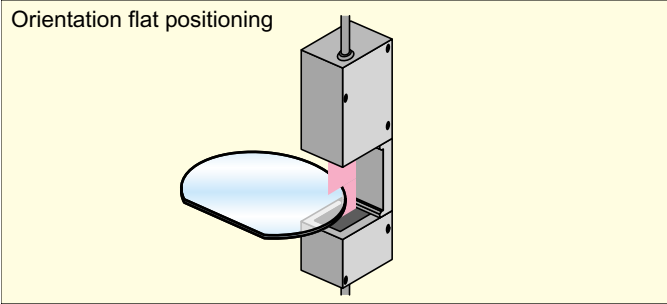
#### •CompoBus



### The edge of a transparent glass board is detectable.

The edge position of a transparent glass board is detectable with transparent object detection mode.

**Application**



**Ordering Information**

Accessories (Order Separately)

Extension cable

Laser beam (red)

Type	Sensing distance	Measurement width	Model
Integrated type	40 mm	28 mm	<b>Z4LC-S2840</b>
Separated type	0 to 300 mm		<b>Z4LC-S28</b>

Controller

Model
<b>Z4LC-C28</b>

Sensors

Sensors

Name	Model	Cable length
Cable for connecting sensor and controller	<b>Z49-C6</b>	2 m
		8 m

Note: Projector/receiver set. When ordering, please specify the cable length as well as the model. (Example: Z49-C6, 2 m)

## Rating/performance

### Sensors

Item	Model	Z4LC-S2840	Z4LC-S28
Light source (wave length)		Visible-light semiconductor laser (wavelength 670 nm, Class 1)	
Measurement width		28 mm	
Sensing distance		40 mm	0 to 300 mm
Min. sensing object		0.2 mm dia.	0.5 mm dia.
Linearity*1		±0.1% F.S.	±0.1%F.S.*2
Temperature drift		0.01%F.S./°C max.	
Ambient temperature		Operating: 0°C to 40°C, Storage: -15°C to 50°C (with no icing or condensation)	
Ambient humidity		Operating/Storage: 35% to 85%RH (with no condensation)	
Ambient illuminance		Incandescent lamp 1,000 lux max. Sun light 3,000 lux max.	
Vibration resistance		10 to 150 Hz, the lesser of a half amplitude of 0.75 mm or an acceleration speed of 100 m/s <sup>2</sup>	
Protective structure		IEC Standard IP40	
Connection method		Cable pull-out type with connector (projector/receiver: standard cable length 2 m)	
Material	Case	Diecast aluminum	
Weight (Packed state)		Approximately 580 g (unit: approximately 520 g (including 2-m cable))	Approx. 550 g ( Unit projector: approximately 250 g, unit receiver: approximately 250 g (including 2-m cable) )
Accessories		Class 2 warning label (JIS C6802-1991), CLASS 2 warning label (EN 68025:1991), FDA CLASS II warning label, FDA certification label, FDA laser emission outlet label	

\*1. The values given are typical values for one-side interruption mode 1 with the distance between an emitter and a receiver set to 40 mm and the sensing object placed 20 mm from the receiver.

\*2. Linearity: The value deviated from the ideal straight line of measurement value outputs in one-side interruption mode 1 when the distance between an emitter and a receiver is set to 40 mm and the sensing object placed 20 mm from the receiver.

Controller

Item	Model	Z4LC-C28	
Display		7-segment LED, 4 digits	
Minimum reading		10 $\mu$ m	
Repeatability *1,*2		20 $\mu$ m (at average count of 16 times)	
Measurement value output	Analog	Output form	4 to 20 mA, load impedance: 300 $\Omega$ max.
		Response time	3.3 ms (at average count of once)
	Digital	Output form	12-bit binary outputNPN open collector output: 30 VDC, 20 mA max.Residual voltage: 2 V max.
		1 digit*3	10 $\mu$ m
	Response time	3.3 ms (at average count of once)	
Output signals	Decision output (HI, PASS, LOW)	NPN open collector output 30 VDC, 20 mA max. Residual voltage: 2 V max.	
Input signal	Enable input LD OFF input Bank selection input Forced-zero input External reset input	Photo coupler input, input voltage: 12 to 24 V DC $\pm$ 10%, ON voltage: 10.2 V DC or higher, OFF voltage: 3.0 V DC or lower, input current: 10 mA (typical)	
Communications		RS-232C	
Temperature drift		0.005% F.S./ $^{\circ}$ C	
Power supply voltage		20.4 to 26.4 VDC, ripple (p-p) : 10 % max.	
Current consumption		0.4 A max.	
Main functions		Measurement value display function, measurement mode switching function, decision setting switching function, measured value average count switching function, zero function, banking switching function, linear output range setting function, enable mode measurement function	
Ambient temperature		Operating: 0 $^{\circ}$ C to 50 $^{\circ}$ C, Storage: -15 $^{\circ}$ C to 60 $^{\circ}$ C (with no icing or condensation)	
Ambient humidity		Operating/Storage: 35% to 85%RH (with no condensation)	
Vibration resistance		10 to 150 Hz, the lesser of a half amplitude of 0.15 mm or an acceleration speed of 20 m/s <sup>2</sup>	
Protective structure		IEC Standard IP20	
Connection method		Input/output side: 28-pin connector, D-sub 9-pin connector; power supply side: terminal block type	
Material		ABS/PC	
Weight (Packed state)		Approximately 580 g (unit: approximately 290 g)	
Accessories		Operation manual, connector (DX40-28P), connector cover (DX-28-CV), resistor 250 $\Omega$ , 1/2 W	

\*1. The values given are typical values for one-side interruption mode 1 with the distance between an emitter and a receiver set to 40 mm and the sensing object placed 20 mm from the receiver.

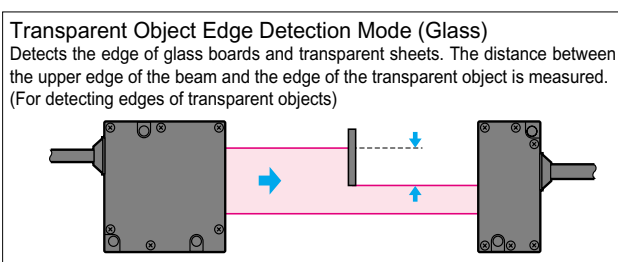
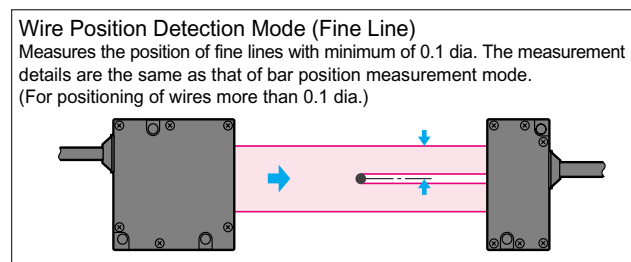
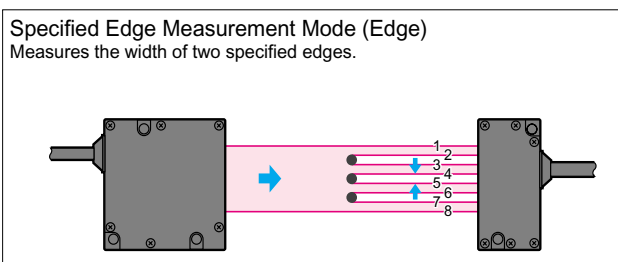
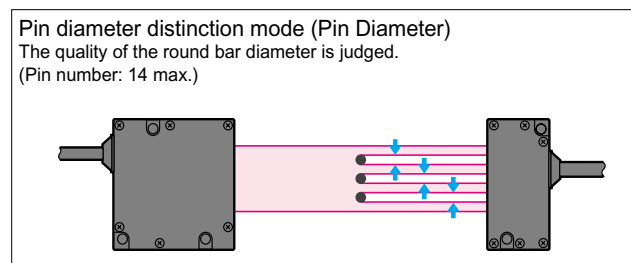
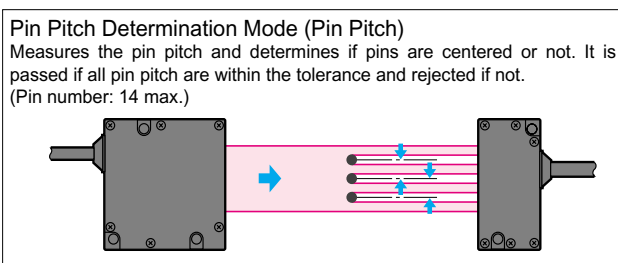
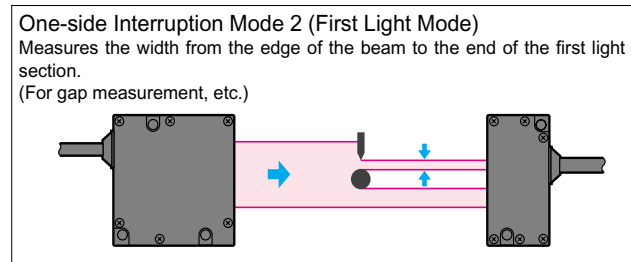
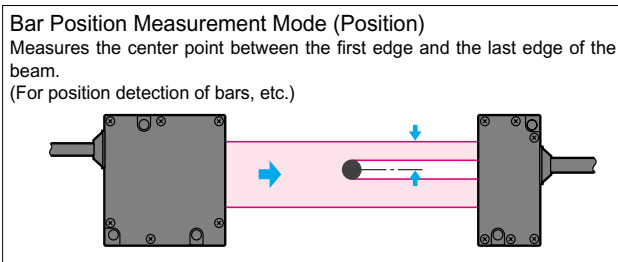
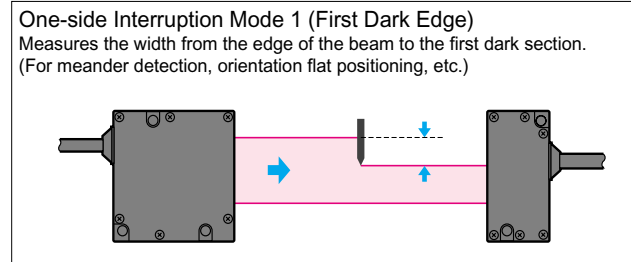
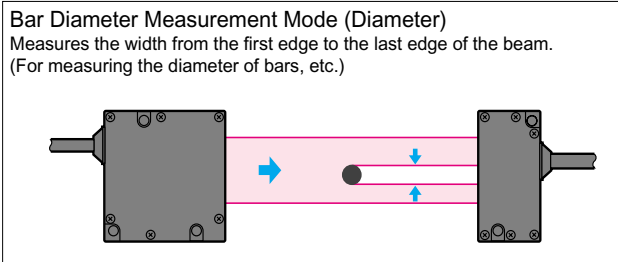
\*2. The repeatability is the variation in the display and digital output when the sensing object is stationary. Performance specifications may not be satisfied depending on the environment such as strong magnetic field.

\*3. The value converted to a distance corresponding to the 1LSB of the digital output.

## Functions

### Measurement Modes

Select one of the following measurement modes according to the measurement conditions.



### Zero function

The displayed value can be set to zero by the ZERO/ENT Key on the front panel or external input.

Suitable for the discrimination of standard workpieces.

### Analog output range setting function


The range of analog output can be set within the measurement width 28 mm.

### Enable mode setting function

The processing item (i.e. maximum, minimum, maximum minus minimum, or average) can be set. The set item is calculated and output while the enable mode signal is input.

Suitable for the measurement of bar movement.

Precautions

 Warning

**Be careful not to expose your eyes to the laser beam directly or to the light reflected by a mirror-smooth object.**

**The laser beam emitted from the laser has high power density and its entry to your eyes may cause blindness.**



Laser safety

Safety measures are required for laser devices both in Japan and abroad.

Brief explanations follow of requirements for use in Japan and requirements for export to other countries after assembly in Japan.

User's Requirements

Item	Class 1	Class 2	Class 3A	Class 3B		Class 4
				3B*	3B	
Remote interlock	Not required			Connect the remote interlock of the laser beam to the emergency main interlock, the interlock of the room, or the interlock of the door.		
Key control	Not required			Do not keep the key in the lock when the laser beam is not used.		
Beam shield or attenuator	Not required			Used to protect people from accidental radiation by the laser beam.		
Warning sign	Not required			Post a proper warning sign on the door to the room where laser beam equipment is installed.		
Beam path	Not required	The laser beam must be terminated and, as a rule, must be enclosed. If the laser beam is exposed, the vertical height of the beam must not be the same as that of the eyes.				
Mirror reflection	Not required			Appropriate optical elements must be securely attached and you must be able to control the optical elements during laser radiation.		
Eye protect	Not required			Use eye protectors except in special, specified locations.		
Protection clothes	Not required		Wear protection clothes if exposure of the skin to the laser beam may exceed the MPE of the skin.			
Training	Not required		The laser system must be operated by only properly trained people.			

\* 5 mW or less in the visible range

(1) Japan

JIS C6802 sets forth safety measures that users must implement based on the class of laser product. (A summary is shown in the above table.)

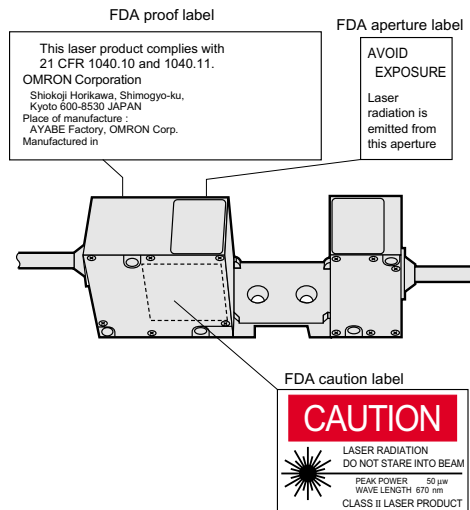
**Classification of Z4LC** — **Class 1**

Labels related to laser

An explanatory label is attached to the side of the sensor.

Handing Instructions

This sensor is equipped with a laser emission indicator lamp and a laser-off input circuit. An interlock function can be configured using an external circuit



**Classification of Z4LC** — **Class 2**

Note: Note that the FDA classifies this as a Class 2 device.

(3) Countries other than the U.S.A.

For countries other than Japan or the U.S.A., replace the warning label with the included English label.

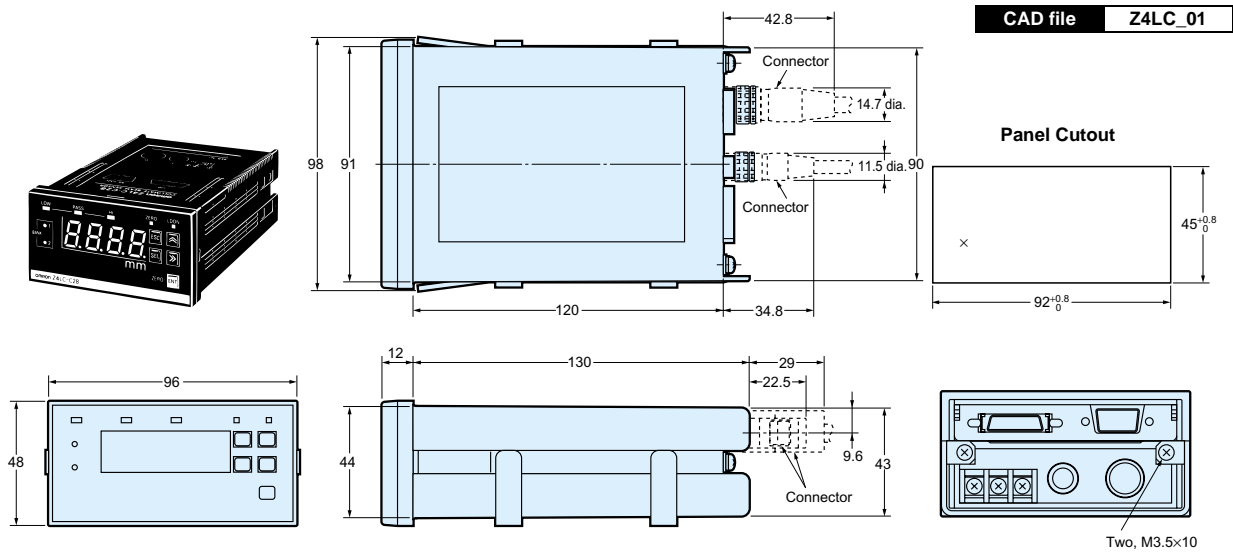


With respect to exports to Europe, a different standard exists, Europe EN60825.

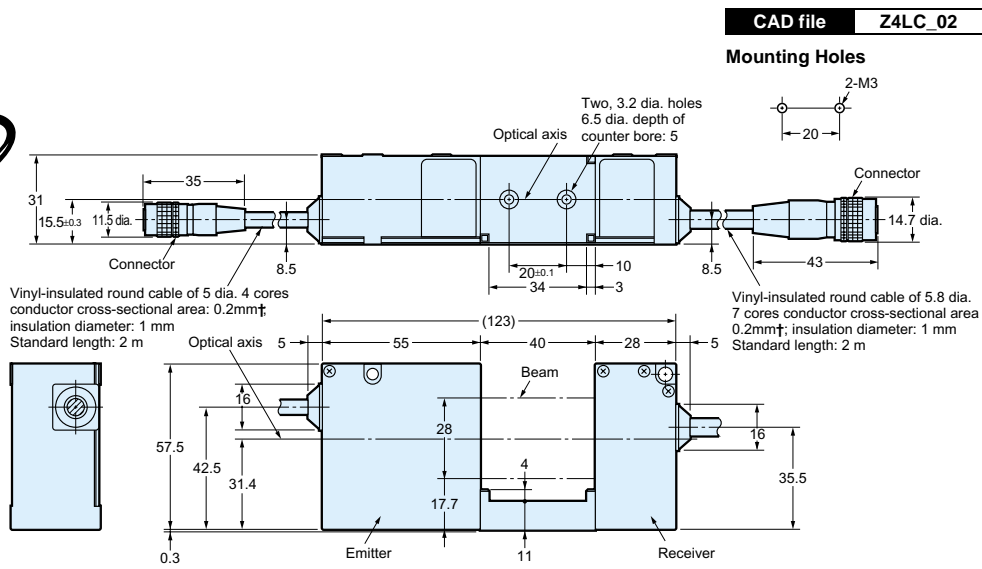
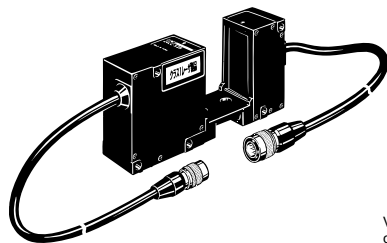
\* U.S. Federal Law: 21CFR1040.10 and 1040.11: Technical standards for laser products and "laser products for special uses"

Dimensions (Unit: mm)

Controller  
Z4LC-C28



Sensors  
Z4LC-S2840



Sensor (separated type)  
Z4LC-S28

