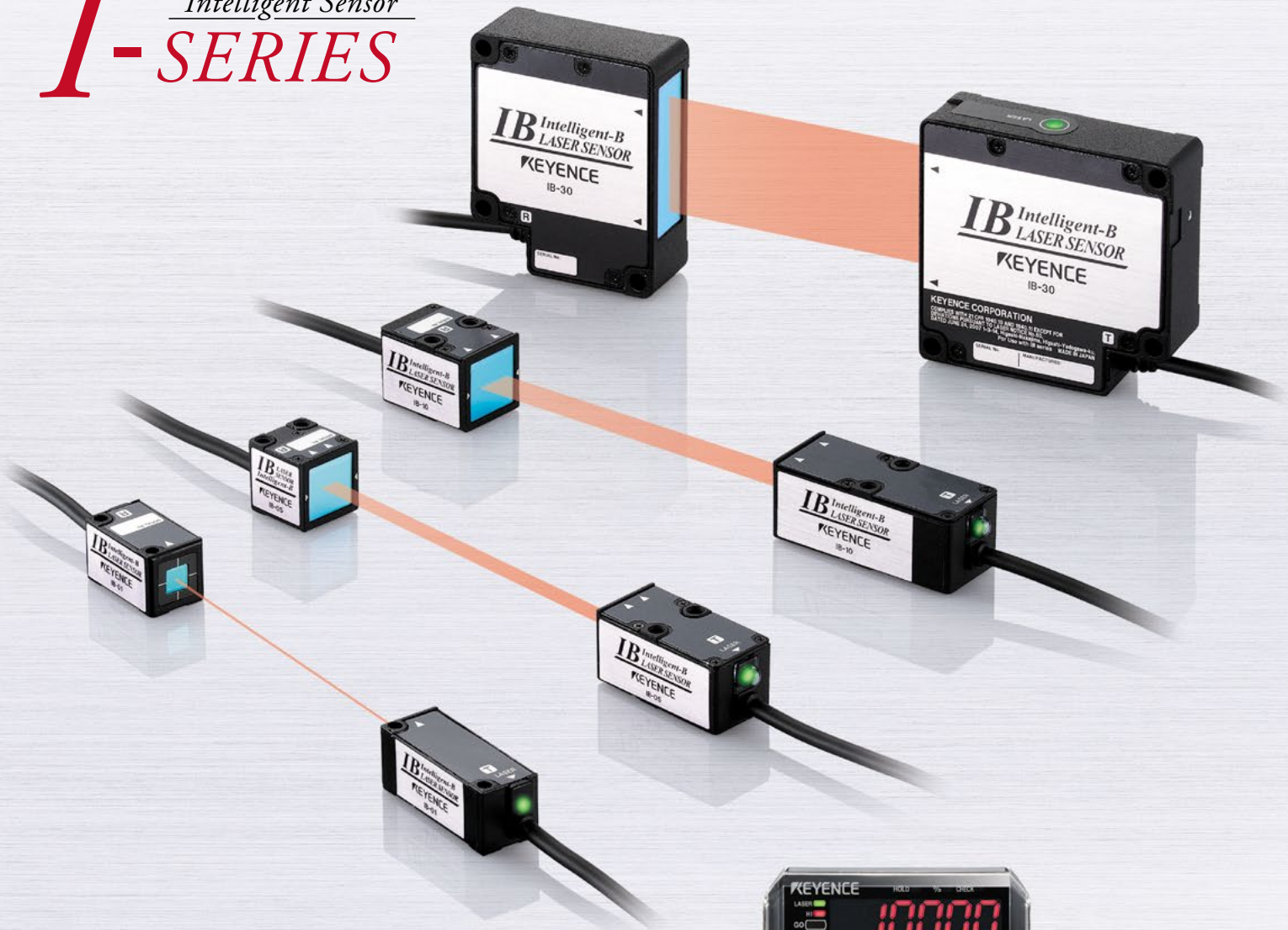


# I-*Intelligent Sensor* -SERIES



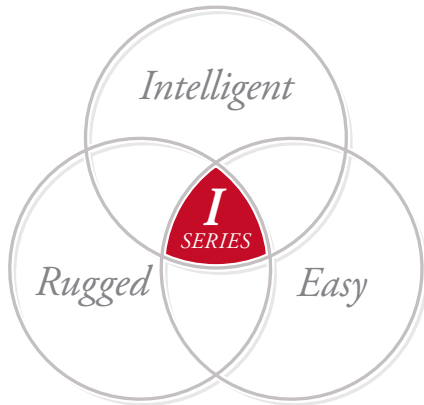
## *Make Sensing Easy:*

FROM SIMPLE DIFFERENTIATION TO HIGH SPEED,  
HIGHLY REPEATABLE DETECTION



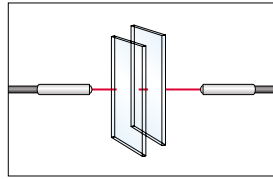
Low-cost  
High  
Performance

# A wide variety of applications are possible with the various sensor heads and the highly-functional amplifiers

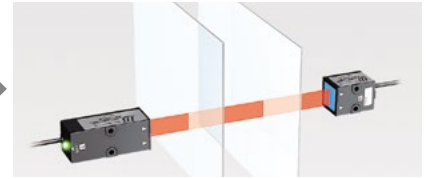


- High-speed sampling of 80  $\mu$ s
- High repeatability of 5  $\mu$ m
- New function: Auto adjustment included

## Highly repeatable detection even for transparent targets

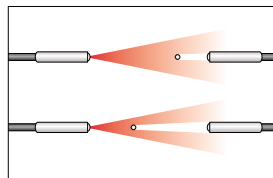


Not stable due to the subtle differences in received light volume

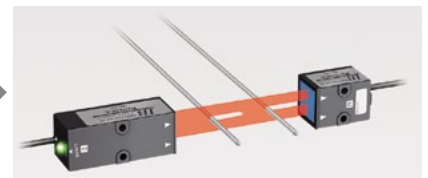


Definitive determination of even the most minute transmitted received light volume difference

## Not influenced by passage position



At the target gets closer to the transmitter or receiver, the received light volume changes.

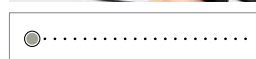


Regardless of position, the received light volume remains the same

## Simple positioning using to the alignment LED

### Easy to align the optical axis

As the optical axis of the laser aligns, the flash frequency of the laser transmitter indicator quickens. Even without looking at the amplifier unit, the optimum position can be achieved easily.



If the optical axis is not aligned the LED turns off



When the optical axis begins to align, the flashing frequency of the LED quickens

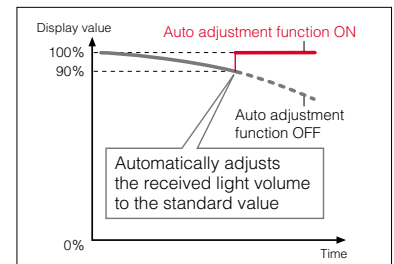


High-speed flashing when the optical axis is aligned

## Maintenance-saving with the Auto adjustment function

### Long-term, stable detection even in environments where the device becomes dirty easily

In the IB Series, should the received light volume decrease due to dirt on the front of the sensor head, by using the adjustment input, the new received light volume can be adjusted to compensate. In addition, when the Auto adjustment function recognizes no target in the beam path and the received light volume drops below 90%, the sensor compensates for the light loss automatically. Even when used in environments where the device becomes dirty easily, stable detection and a high degree of maintenance-saving has been made possible by the device automatically correcting itself.



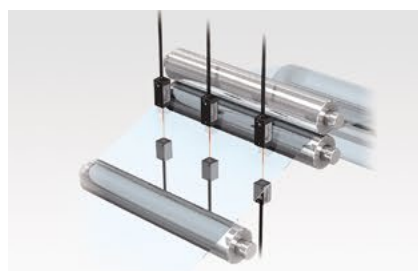
### Metal Industry

Differentiation of different metal shafts



### Plastics Industry

Differentiation of different films



### Factories

Turbidity detection of factory waste water



# Specifications



## Sensor head

Model	IB-01	IB-05	IB-10	IB-30
Appearance				
Light source	Visible semiconductor laser Wavelength: 660 nm Class 1 (IEC60825-1, FDA (CDRH) Part1040.10 <sup>1</sup> )			
Mounting distance	0 to 2000 mm 0 to 78.74*		0 to 300 mm 0 to 11.81*	
Measurement range	Ø1 mm 0.04* (Installation distance 0 to 300 mm 11.81*) Ø1 to 2.5 mm 0.04* to 0.10* (Installation distance 300 to 2000 mm 11.81* to 78.74*)	5 mm 0.20*	10 mm 0.39*	30 mm 1.18*
Sampling rate	12,500 times/sec. (80 µs)			
Minimum detectable object <sup>2</sup>	Ø8 µm (Installation distance 0 to 300 mm) Ø8 to 50 µm (Installation distance 300 to 2000 mm 11.81* to 78.74*)	Ø0.05 mm 0.002*	Ø0.1 mm 0.004*	Ø0.2 mm 0.008*
Repeatability <sup>3</sup>	5 µm (distance 0 to 300 mm 11.81*)	5 µm	5 µm	10 µm
Temperature characteristics <sup>4</sup>	±0.2% of F.S./°C	±0.1% of F.S./°C (±5 µm)	±0.1% of F.S./°C (±10 µm)	±0.1% of F.S./°C (±30 µm)
Operation indicator	Laser emission warning indicator: green LED			
Environmental resistance	Ambient luminance	Incandescent lamp: 5000 lux Solar light: 10000 lux	Incandescent lamp: 5000 lux Solar light: 5000 lux	Incandescent lamp: 10000 lux Solar light: 10000 lux
	Ambient temperature	0 to 50°C 0 to 122°F (no freezing)		
	Ambient humidity	35 to 85%RH (no condensation)		
	Vibration	10 to 55 Hz Double amplitude 1.5 mm 0.06* XYZ each axis: 2 hours		
Material	Case	PBT	Zinc die-cast	
	Lens cover	Glass		
	Cable	PVC		
Weight	Approx. 140 g	Approx. 180 g	Approx. 220 g	Approx. 510 g

- The classification for FDA (CDRH) is implemented based on IEC60825-1 in accordance with the requirements of Laser Notice No.50.
- Value when measuring the target (white diffuse object) at the middle of the transmitter and receiver position, and at the center of the measurement range.
- When distance between transmitter and receiver is set to 300 mm 11.81\*, and light is half-shielded at a position 150 mm 5.91\* from receiver. Deflection width (±2σ) when sampled for 30 seconds with an average number of times set to 64 times.
- When distance between transmitter and receiver is set to 100 mm 3.94\* and full light is received.

## Amplifier unit

Model	IB-1000	IB-1500	IB-1050	IB-1550	
Appearance					
Amplifier type	DIN rail mount	Panel mount	DIN rail mount	Panel mount	
Main unit/Expansion unit	Main unit		Expansion unit		
Head compatibility	Yes				
Display	Display resolution	0.01%, 0.1%, 1% (switchable)			
	Display range	-99.999 to 99.999, -99.99 to 99.99, -99.9 to 99.9, -99 to 99 (switchable)			
	Digital display method	Dual 7-segment display Upper level: 5 red digits Lower level: 5 green digits	Dual 7-segment display Upper level: 2-color (green/red) 5 digits Lower level: 5 green digits	Dual 7-segment display Upper level: 5 red digits Lower level: 5 green digits	Dual 7-segment display Upper level: 2-color (green/red) 5 digits Lower level: 5 green digits
	Operation indicator	Judgment indicator: 2-color (green/red) LED (HI, GO, LO), Bank indicator: Green LED x 4, Laser emission warning indicator: Green LED, Others: Green LED x 8, red LED x 3			
Analog voltage output <sup>1</sup>	±5 V, 1 to 5 V, 0 to 5 V Output impedance 100Ω		N/A		
Analog current output <sup>1</sup>	4 to 20 mA Maximum load resistance 350Ω		N/A		
Control input <sup>2</sup>	Bank switch input	Non-voltage input			
	Zero-shift input				
	Laser emission stop input				
	Timing input				
	Reset input				
	Adjust input				
Control output <sup>3</sup>	Judgment output	Open collector (NPN/PNP switchable, N.O./N.C. switchable)			
	Check output				
Power supply <sup>4</sup>	Power voltage	10 to 30 VDC, including ripple (P-P) 10% Class 2 or LPS	Supplied from main unit		
	Power consumption <sup>5</sup> (including analog current output)	2400 mW or less (at 30 V, 80 mA max.)	2550 mW or less (at 30 V, 85 mA max.)	2400 mW or less (at 30 V, 80 mA max.)	2550 mW or less (at 30 V, 85 mA max.)
Environmental resistance	Ambient temperature	-10 to +50°C 14 to 122°F (No freezing)			
	Ambient humidity	35 to 85% RH (No condensation)			
	Vibration	10 to 55 Hz Double amplitude 1.5 mm 0.06* XYZ each axis: 2 hours			
	Pollution degree	2			
Material	Case/Front panel: polycarbonate, keytop: polyacetal, cable: PVC				
Weight (including supplied items)	Approx. 150 g	Approx. 170 g	Approx. 140 g	Approx. 165 g	

- ±5 V, 1 to 5 V, 0 to 5 V, or 4 - 20 mA should be selected.
- The four external input wires are assigned with desired inputs.  
Rated no-voltage input: ON voltage 2 V or less, OFF current 0.05 mA or less  
Rated voltage input: Max. input rating 30 V or less, ON voltage 7.5 V or more, OFF current 0.05 mA or less
- Rated NPN open collector output: Max. 50 mA/ch (20 mA/ch when expansion units are connected), 30 V or less, residual voltage 1 V or less  
Rated PNP open collector output: Max. 50 mA/ch (20 mA/ch when expansion units are connected), 30 V or less, residual voltage 2 V or less
- Use with the over current protection device which is rated 30 V or more and not more than 1 A.
- Does not include the power consumption of the load. The power consumption with expansion units installed is the total of each amplifier unit's power consumption.  
Example: When using one main unit (IB-1000) with two expansion units (IB-1050)  
(2400 mW X 1) + (2400 mW X 2) = 7200 mW

