

# Photoelectric Sensors

## Photoelectric sensors with special properties

Certain applications require sensors with special properties.

Balluff's photoelectric sensors with special properties. For instance, color sensors reliably detect even the slightest color differences.

The first-class True Color Sensor is at home in quality control as well as sorting systems. Contrast sensors and luminescence sensors are perfectly suited for detection tasks, such as reading marks on packaging and sensing fill levels, determining contours, measuring thickness, etc.

Our broad selection of fork sensors with various widths and light types allow optimal adaptation to many detection tasks. Angle sensors or optical window sensors are available as another alternative, in addition to light grids for packaging larger objects involving longer distances.

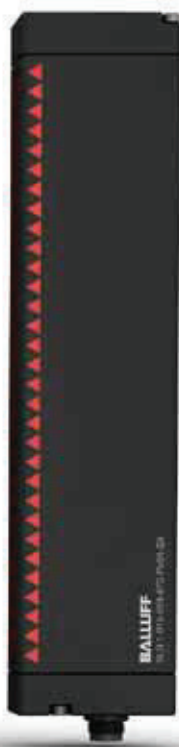
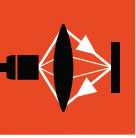
But even if it looks like there is no space for a photoelectric sensor, Balluff provides a solution: fiber optics in glass and plastic versions.



# Photoelectric Sensors with Special Properties

## Photoelectric Sensors with Special Properties

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Basic information  
and definitions  
can be found  
on page 934.

# Photoelectric Sensors with Special Properties

## Analog fork sensors BGL\_C

### In-process correction

Thanks to their lighting strip, analog fork sensors not only detect objects with absolute reliability, they also determine their positions with complete accuracy. That means that readjustments can easily be made during a process, process reliability and product quality are significantly increased, and more efficiency becomes a welcome "side effect".

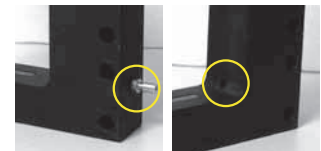
### Technical highlights

- Analog signal proportional to the skin depth of the object
- Constant value, even in the event of height variations
- High degree of soiling resistance and compensation
- Fieldbus connection with IO-Link
- Ideal for web edge control

# Analog Fork Sensors



Integral air rinsing nozzle to prevent dust from accumulating on the emitter and receiver optics. Simple connection via standard pneumatic system.



# Photoelectric Sensors with Special Properties

## Analog fork sensors BGL\_C

### Product overview



Photoelectric Sensors

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Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL\_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors

Type

■ Ordering code  
■ Part number

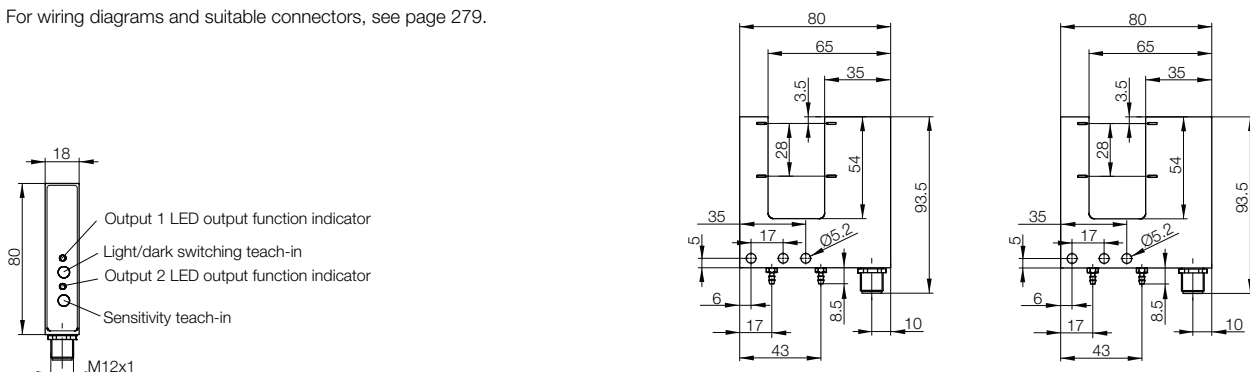
Type	Fork opening	Resolution	Light type		Output						Switching type		Switching frequency	U <sub>s</sub>	Con- nection	Page	
			Red light		0-10 V	4-20 mA	1 × PNP transistor	2 × PNP transistor	DSC (Dynamic Sensor Control)	IO-Link	Light switching	Dark switching					
<b>Fork sensors</b>																	
<b>BGL002Z</b>	BGL 30C-001-S4	30 mm	80 μm	■								■	■	500 Hz	■	■	276
<b>BGL0031</b>	BGL 30C-003-S4	30 mm	80 μm	■			■	■				■	■	500 Hz	■	■	276
<b>BGL0033</b>	BGL 30C-005-S4	30 mm	80 μm	■		■		■				■	■	500 Hz	■	■	277
<b>BGL0036</b>	BGL 30C-009-S4	30 mm	80 μm	■					■	■		■	■	500 Hz	■	■	276
<b>BGL0037</b>	BGL 50C-001-S4	50 mm	80 μm	■						■		■	■	500 Hz	■	■	277
<b>BGL0039</b>	BGL 50C-003-S4	50 mm	80 μm	■			■	■				■	■	500 Hz	■	■	277
<b>BGL003C</b>	BGL 50C-005-S4	50 mm	80 μm	■		■		■				■	■	500 Hz	■	■	277
<b>BGL003H</b>	BGL 50C-009-S4	50 mm	80 μm	■					■	■		■	■	500 Hz	■	■	277
<b>Fork sensors with IO-Link</b>																	
<b>BGL0035</b>	BGL 30C-007-S4	30 mm	80 μm	■							■				■	■	278
<b>BGL003F</b>	BGL 50C-007-S4	50 mm	80 μm	■							■				■	■	278

NPN on request



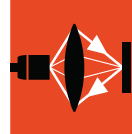
Series			<b>BGL analog</b>	<b>BGL analog</b>	
Fork opening			<b>30 mm</b>	<b>30 mm</b>	
Fork depth			<b>54 mm</b>	<b>54 mm</b>	
PNP 2 switching outputs	NC/NO	<b>Ordering code</b>	<b>BGL002Z</b>		
		Part number	BGL 30C-001-S4		
PNP 1 analog and 1 switching/ error output	NC/NO	<b>Ordering code</b>		<b>BGL0031</b>	
		Part number		BGL 30C-003-S4	
PNP 2 switching outputs with DSC	NC/NO	<b>Ordering code</b>	<b>BGL0036</b>		
		Part number	BGL 30C-009-S4		
Supply voltage $U_s$			18...30 V DC	18...30 V DC	
No-load supply current $I_0$ max.			$\leq 20$ mA	$\leq 20$ mA	
Output current			100 mA	100 mA	
Analog output				4...20 mA	
Switching type			Light/dark switching (selectable)	Light/dark switching (selectable)	
Polarity reversal/short-circuit protected			Yes/Yes	Yes/Yes	
Settings			Teach-in	Teach-in	
Emitter, light type			Red light	Red light	
Wavelength			633 Nm	633 Nm	
Resolution (smallest discernible part)			$\leq 80$ $\mu$ m	$\leq 80$ $\mu$ m	
Repeat accuracy			0.15 mm	0.15 mm	
Switching hysteresis			< 0.4 mm	< 0.4 mm	
Output function indicator			2x yellow LED	2x yellow LED	
Response time			2 ms	2 ms	
Switching frequency			500 Hz	500 Hz	
Measurement field length			28 mm	28 mm	
Degree of protection as per IEC 60529			IP 67	IP 67	
Ambient temperature $T_a$			-5...+55°C	-5...+55°C	
Ambient light limit according to			EN 60947-5-2	EN 60947-5-2	
Material	Housing		Anodized aluminum	Anodized aluminum	
	Optical surface		PMMA	PMMA	
Connection			M12 connector, 4-pin	M12 connector, 4-pin	

For wiring diagrams and suitable connectors, see page 279.



# Photoelectric Sensors with Special Properties

## Analog fork sensors BGL\_C



Photoelectric Sensors

Photoelectric Sensors

	<b>BGL analog</b> <b>30 mm</b> <b>54 mm</b>	<b>BGL analog</b> <b>50 mm</b> <b>54 mm</b> <b>BGL0037</b>	<b>BGL analog</b> <b>50 mm</b> <b>54 mm</b>	<b>BGL analog</b> <b>50 mm</b> <b>54 mm</b>
		BGL 50C-001-S4		
	<b>BGL0033</b> BGL 30C-005-S4		<b>BGL0039</b> BGL 50C-003-S4	<b>BGL003C</b> BGL 50C-005-S4
		<b>BGL003H</b> BGL 50C-009-S4		
	18...30 V DC ≤ 20 mA 100 mA 0...10 V DC Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2× yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2× yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA 4...20 mA Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2× yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin	18...30 V DC ≤ 20 mA 100 mA 0...10 V DC Light/dark switching (selectable) Yes/Yes Teach-in Red light 633 Nm ≤ 80 μm 0.15 mm < 0.4 mm 2× yellow LED 2 ms 500 Hz 28 mm IP 67 -5...+55°C EN 60947-5-2 Anodized aluminum PMMA M12 connector, 4-pin

Photoelectric Sensors with Special Properties

Analog Fork Sensors BGL\_C

Optical Window Sensors BOW

Light Grids BLG

Color Sensors BFS

Contrast Sensors BKT

Luminescence Sensors BLT

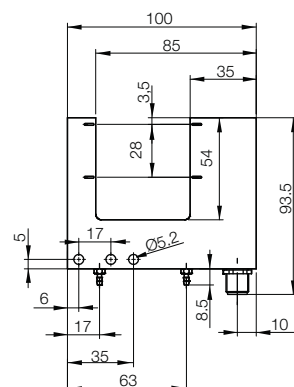
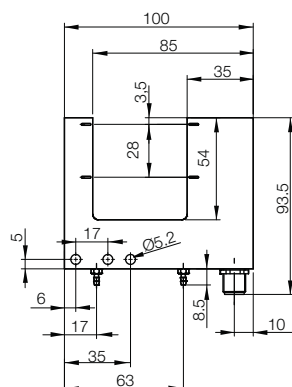
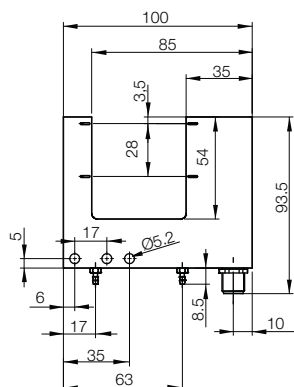
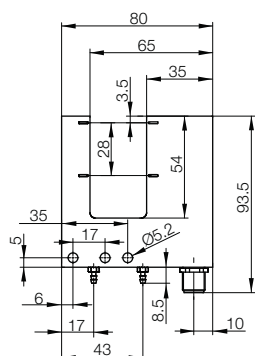
Optical Fiber Base Units BFB/ BOS

Plastic Fiber Optics BFO

Glass Fiber Optics BFO

Photoelectric Distance Sensors for Analog Distance Measurement

Accessories for Photoelectric Sensors



# Photoelectric Sensors with Special Properties

## Fork sensors BGL with IO-Link

# Analog Fork Sensors

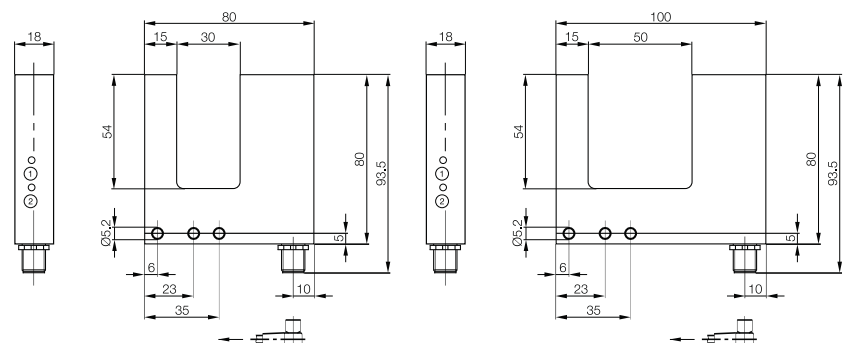
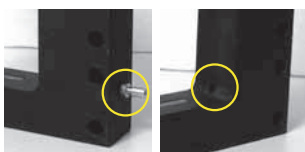


Series	<b>BGL analog, Series C Premium</b>		<b>BGL analog, Series C Premium</b>
Fork opening	<b>30 mm</b>		<b>50 mm</b>
Fork depth	<b>54 mm</b>		<b>54 mm</b>
PNP	With IO-Link	<b>Ordering code</b>	<b>BGL0035</b>
		Part number	BGL 30C-007-S4
			<b>BGL003F</b>
			BGL 50C-007-S4
Supply voltage $U_S$	18...30 V DC		18...30 V DC
No-load supply current $I_0$ max.	≤ 20 mA		≤ 20 mA
Output current	Max. 100 mA per output		Max. 100 mA per output
Analog output	4...20 mA		4...20 mA
Switching type	Light/dark switching (selectable)		Light/dark switching (selectable)
Polarity reversal/short-circuit protected	Yes/Yes		Yes/Yes
Response time	≤ 1 ms		≤ 1 ms
Settings	2× teach button		2× teach button
Emitter, light type	Red light		Red light
Wavelength	633 Nm		633 Nm
Resolution	0.1 mm		0.1 mm
Repeat accuracy	0.15 mm		0.15 mm
Switching hysteresis	< 0.4 mm		< 0.4 mm
Hysteresis	±0.8 %		±0.8 %
Output function indicator	2× yellow LED		2× yellow LED
Response time	2 ms		2 ms
Switching frequency	500 Hz		500 Hz
Measurement field length	28 mm		28 mm
Degree of protection as per IEC 60529	IP 67		IP 67
Ambient temperature $T_a$	-5...+55°C		-5...+55°C
Ambient light limit according to	EN 60947-5-2		EN 60947-5-2
Material	Housing	Anodized aluminum	Anodized aluminum
	Optical surface	PMMA	PMMA
Connection	M12 connector, 4-pin, A-coded		M12 connector, 4-pin, A-coded

### IO-Link

Mode	COM 2	COM 2
Transfer rate	38.4 kbaud	38.4 kbaud
IO-Link process data length	2 input bytes	2 input bytes
Value range	000 H...03FF H	000 H...03FF H
Diagnostics	Contamination	Contamination
Parameters	Switching points/switching range, button disable, NO/NC switch, analog value characteristics	Switching points/switching range, button disable, NO/NC switch, analog value characteristics

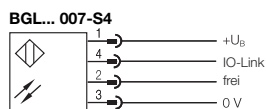
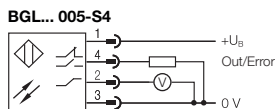
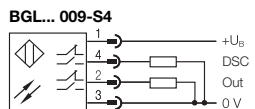
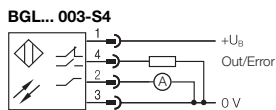
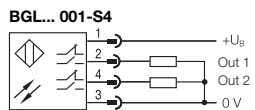
Integral air rinsing nozzle to prevent dust from accumulating on the emitter and receiver optics. Simple connection via standard pneumatic system.




# Photoelectric Sensors with Special Properties

## Fork sensors BGL Connection, accessories

### Wiring diagrams



 **Suitable connectors**  
(please order separately)



Size	Design	Cable material	Color	Length	Ordering code
M12, 4-pin	Straight	PUR	Black	2 m	<b>BCC032F</b>
M12, 4-pin	Straight	PVC	Gray	2 m	<b>BCC0367</b>
M12, 4-pin	Angled	PUR	Black	2 m	<b>BCC032Y</b>
M12, 4-pin	Angled	PVC	Gray	2 m	<b>BCC036N</b>

Connectors without LED are suitable for PNP and NPN sensors.

**More electrical accessories:** You can find a large selection of plug connectors and connector cables in a wide variety of cable materials, colors and lengths in our **Industrial Networking and Connectivity catalog**.



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