



**CA18/CA30CB capacitive sensors with LED bar**

**Sensors**

# CA18/30CB series

## IO-Link capacitive sensors with LED bar

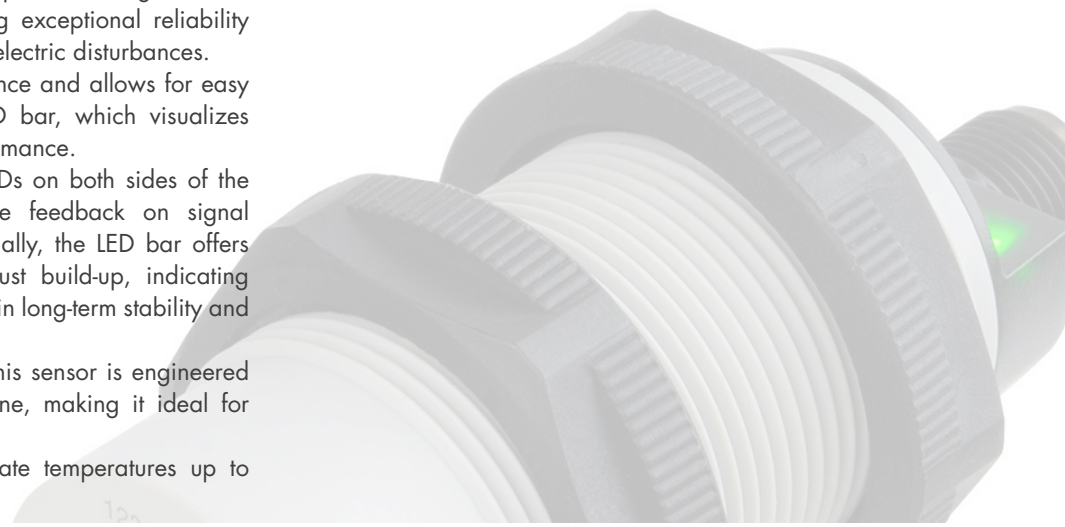
The CA18/30CB sensors are equipped with 4<sup>th</sup> generation **Tripleshield™** protection, ensuring exceptional reliability by shielding against magnetic and electric disturbances.

It delivers top-tier sensing performance and allows for easy adjustments with its integrated LED bar, which visualizes ON/OFF stability for optimal performance.

The balance of green ON/OFF LEDs on both sides of the switching LED provides immediate feedback on signal stability and dust reserve. Additionally, the LED bar offers real-time feedback on dirt and dust build-up, indicating when cleaning is required to maintain long-term stability and reliability.

Certified by ECOLAB and IP69K, this sensor is engineered for maximum durability and hygiene, making it ideal for challenging environments.

The sensors are designed to tolerate temperatures up to 120°C on the sensing face.



### Easy setup with the LED bar visualisation



The new CA18CB...IO and CA30CB...IO capacitive proximity sensors are equipped with an LED bar that assists the user in adjusting the sensor.

The LED bar provides a clear visual indication that the switch point is set with sufficient safety margins, ensuring reliable activation and deactivation according to the application's requirements.

The central yellow LED indicates the sensor's ON/OFF state, while the green LEDs reflect the stability of the signal. The farther a lit green LED is from the yellow LED, the more stable the signal. Ideally, both the OFF and ON states should display equal stability, represented by a symmetrical pattern of lit green LEDs.

## LED bar indications



### Full LED



Increased safe ON →



← Increased safe OFF

### Centered LED



Increased safe ON →



← Increased safe OFF

### Single LED



Increased safe ON →



← Increased safe OFF

## Advantages of the CA18/30CB

### Faster sensor/machine set-up time

The multi-LED bar offers real-time feedback on signal balance during manual setup, ensuring precise adjustments. IO-Link features offer a wide range of customizable options that are easy to set up. For example, the Quality of Teach value provides insight into the effectiveness of the teach procedure, indicating the margin between the actual setpoints and the influence of the environment on the sensor.

### Increased machine runtime

In stand-alone mode, the sensor offers real time feedback on sensing stability via the LED bar. If the green stability LEDs do not show a symmetrical pattern on either side of the yellow switching state LED, then the sensor needs to be cleaned or re-adjusted.

Scheduled maintenance is vastly preferable to unexpected machine break downs. The sensors' built-in diagnostic features such as temperature and dust alarms provide warnings when either parameter exceeds the set limits. This enables scheduled maintenance, preventing costly downtime. The temperature alarm can be configured to trigger if the temperature rises above or falls below preset values (Tmax or Tmin). Similarly, the dust alarm can be set to activate when the contamination level surpasses a chosen threshold. The Quality of Run value indicates the sensor's actual sensing performance relative to its set-points - the higher the

value, the better the detection quality.

The fourth generation Tripleshield technology ensures exceptional robustness, offering protection against electrical, magnetic and physical damage. For example, the sensor is designed to withstand electrostatic discharge from materials within a machine.

### Reduced stock

The CA18/30CB is a all-in-one sensor thanks to its IO-Link features. It is highly customizable via an IO-Link master or the SCTL55, allowing for the same sensor being used in multiple applications, ultimately reducing the stock costs.



**ECOLAB® IP69K**

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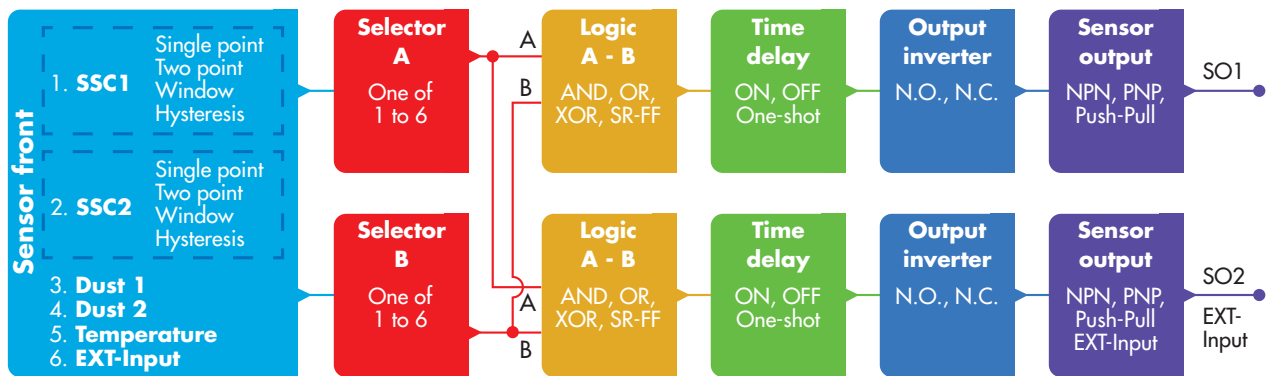
## IO-Link capacitive sensors with LED bar

### Smart functions - IO-Link selectable

#### Highly flexible sensors

They can operate in standard I/O mode (SIO), which is the default operation mode. When connected to an IO-Link master or the SCTL55 smart configurator, they automatically switch to IO-Link mode and can be operated and easily configured remotely.

Thanks to their IO-Link interface, these devices are much more intelligent and feature many additional configuration options, such as the settable sensing distance and hysteresis, also timer functions of the output. Advanced functionalities such as the Logic function block and the possibility to convert one output into an external input makes the sensor highly flexible in solving decentralized sensing tasks.



#### Selector

##### Channel A + B:

- Deactivated
- 1. SSC1 (Switching Signal Channel 1)
- 2. SSC2 (Switching Signal Channel 2)
- 3. Dust alarm 1
- 4. Dust alarm 2
- 5. Temperature alarm
- 6. External input

#### Time delay

##### For SO1 & SO2

- Disabled timer
- ON delay
- OFF delay
- ON delay and OFF delay
- One-shot leading edge
- One-shot trailing edge

#### Sensor output

- Disabled output
- PNP
- NPN
- Push-pull
- External Input, active high
- External Input, active low
- Teach-in

#### Logic

##### Channel A + B for SO1 & SO2

- Direct
- AND
- OR
- X-OR
- SetReset-FlipFlop

#### Output inverter

- N.O.
- N.C.



## Applications

### Plastic and rubber

The CA18CB and CA30CB sensors are ideal in level monitoring in hoppers containing plastic granules, as they are highly resistant to electrostatic discharges – an ongoing risk when moving plastic granules come into contact with grounded sensors.

Additionally, the sensors feature a high heat tolerance on the sensing face, withstanding temperatures up to 120°C, making them ideal for use in drying machines or near other heat sources.



### Agriculture

The new CA18CB and CA30CB sensors are excellent for level control of solid materials regardless of degree of humidity. Applications such as seed drills or fertilizer spreaders, ensuring that material levels are accurately monitored is critical to prevent running out of supply. Similarly, combine harvesters require reliable information on the filling level of their grain tanks to prevent overflow and grain damage.



### Pellet burner

In pellet burners, harsh environmental conditions represent a significant challenge to detection systems. The level measurements of the pellets must remain reliable despite dry and dusty conditions. Some pellet burners are equipped with automatic hopper filling systems, that refill the hopper from a secondary storage. These systems need precise measurements for optimum operation.

Alarm outputs ensure the safe and efficient operation: The dust alarm output alerts users when dust levels in the system reach a critical level, while the temperature alarm output triggers if the temperature exceeds a set threshold (e.g. 60°C). The temperature alarm is often used as a safety feature.



### Food and beverage

Thanks to their unique ability to detect content levels inside boxes and bottles, combined with dual outputs, these sensors function as two-in-one devices. One output may be configured to signal when the container is "Full," while the other signals "Fill level insufficient".

The CA18CB and CA30CB sensors are highly resistant to detergents and high-pressure washdowns, making them ideal for the food packaging industry. With IP69K and ECOLAB certification, they offer exceptional durability and hygiene compliance.



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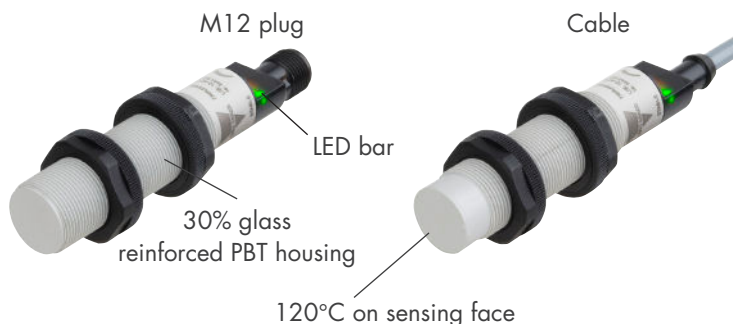
## IO-Link capacitive sensors with LED bar

### Features

#### CA18CBF.IO Flush

#### CA18CBN.IO Non-Flush

#### Back part of the sensor



All versions are available as Flush or Non-flush and cable or M12 plug versions.

#### CA30CBF.IO Flush

#### CA30CBN.IO Non-Flush

#### Back part of the sensor



All versions are available as Flush or Non-flush and cable or M12 plug versions.

### Easy installation with IO-Link

#### Simplified installation

An IO-Link system requires just standard, unshielded 3-wire cables, and a standardized uniform interface for sensors and actuators, which drastically reduces the complexity of the installation process. In addition, the automated parameter reassignment simplifies sensor replacement in case of defects and prevents incorrect settings. The IO-Link-enabled sensor acts as a standard sensor when installed in a non-IO-Link system, so the same sensor can

be stocked for both standard I/O (SIO) applications and IO-Link applications.

#### Simplified configuration with the handheld IO-Link SCTL55 smart configurator

Configuring your IO-Link sensor is effortless with the handheld SCTL55 smart configurator from Carlo Gavazzi. Once the SCTL55 smart configurator automatically downloads the sensor's IO-Link file you are ready to begin configuring.



## The Capacitive CA18CB/CA30CB IO-Link Family

M18/M30 DC IO-Link 4 <sup>TH</sup> Generation TRIPLESIELD™				
		M18		M30
Connection	Flush	Non-Flush	Flush	Non-Flush
Cable	CA18CBF08BPA2IO	CA18CBN12BPA2IO	CA30CBF16BPA2IO	CA30CBN25BPA2IO
Plug	CA18CBF08BPM1IO	CA18CBN12BPM1IO	CA30CBF16BPM1IO	CA30CBN25BPM1IO
Rated operating distance (S <sub>r</sub> )	8 mm	12 mm	16 mm	25 mm
Sensing range	2 - 10 mm	3 - 15 mm	2 - 20 mm	4 - 30 mm
IO-Link	Transmission type: COM2 (38.4 k Baud), Revision: 1.1, SDCI standard: IEC 61131-9, Profiles: Smart sensor (Process Data Variable; Device Identification), SIO mode: Yes, Required master part type: A, Min. process cycle time [ms]: 5			
Selectable function output 1	NPN, PNP or Push-Pull			
Selectable function output 2	NPN, PNP, Push-Pull, External input or External teach			
Diagnostic	Operating hours, Power cycles, Detection cycles, max. and min. Temperatures, Short-circuit, Maintenance, No of Parameter changes.			
Logic functions	AND, OR, X-OR, Gated SR-FF			
Timer functions	ON Delay, OFF delay, ON+OFF delay and One shot			
Sensitivity control	Trimmer input, Teach by wire or by IO-Link			
Operating voltage range (U <sub>p</sub> )	10 to 40 V DC (ripple included)			
No load supply current (I <sub>s</sub> )	≤ 20 mA			
Minimum operational current (I <sub>m</sub> )	≤ 0.5 mA			
Off-State current (I <sub>s</sub> )	≤ 100 µA			
Voltage drop (U <sub>d</sub> )	≤ 1.0 V DC @ 200 mA DC			
Capacitive load	100 nF			
Operating frequency	< 50 Hz			
Response time t <sub>ON</sub> / t <sub>OFF</sub>	< 10 ms			
Power on delay (t <sub>d</sub> )	≤ 300 ms			
Hysteresis (adjustable via IO-Link)	4%	15%	5%	10%
LED bar	9 LEDs		11 LEDs	
LED bar indications	Yellow LED steady: Switching state of the sensor ON/OFF. Green LED steady: Signal stability. Flashing all LEDs: Find-my-sensor			
LED bar settings	LED indication inactive. LED indication active, single LED. LED indication active, centered LEDs. LED indication active, all LEDs. Find-my-sensor			
Sensor protection	Shortcircuit, reverse polarity and transients			
Electrostatic discharge	Contact discharge: > 40 kV. Air discharge: > 40 kV (IEC 61000-4-2)			
Fast transients/burst	±4kV/5kHz (IEC 61000-4-4; EN 60947-1)			
Wire conducted disturbances	> 20 Vrms (IEC 61000-4-6)			
Magnetic field immunity	Continuous: > 60 A/m, 75.9 µ tesla. Short-time: > 600 A/m, 759 µ tesla (IEC 61000-4-8)			
Electromagnetic field immunity	> 20 V/m (IEC 61000-4-3)			
Vibration	10...150 Hz, 1.0 mm/15G in X,Y and Z direction (EN 60068-2-6)			
Shock	30 g <sub>x</sub> / 11 ms, 3 pos, 3 neg pr axis (EN IEC 60068-2-27)			
Drop test	2 x 1 m and 100 x 0.5 m (EN IEC 60068-2-31)			
Degree of protection	IP67, IP68/60 minutes (EN IEC 60529), IP69K (ISO 20653)			
NEMA type	1, 2, 4, 4X, 5, 6, 6P, 12 (NEMA 250)			
Ambient temperature	Operating: -30°C... +85°C (-22°F... +185°F). Storage: -40°C... +85°C (-40°F... +185°F)			
Max. temperature on sensing face	120°C (248°F)			
CE marking	According to EN 60947-5-2			
Approvals	cULus (UL508), ECOLAB			
Overvoltage category	III (IEC60664; EN 60947-1)			
Pollution degree	3 (IEC60664/60664A; EN 60947-1)			
MTTF <sub>2</sub>	97.1 years @ 40°C (104°F)		96.5 years @ 40°C (104°F)	
Material	Body: PBT grey, 30% glass reinforced. Trimmer shaft: Nylon, blue. Back part: PA12, transparent, black.			
Tightening torque	≤ 2.6 Nm		≤ 7.5 Nm	
Cable	2 m, 4 wire, 4 x 0.34 mm <sup>2</sup> , Ø5.2 mm Oil proof PVC, grey			
Connector	M12 x 1, 4 pin male connector			
Dimensions	Cable: M18 x 95.4 mm, Plug: M18 x 95.5 mm		Cable: M30 x 88.7 mm, Plug: M30 x 81.7 mm	
Weight incl. packaging	Cable version ≤ 143 g, Plug version ≤ 66 g		Cable version ≤ 187 g, Plug version ≤ 109 g	
Accessories, additional	Connectors: CONx14NF...W-series. Mounting brackets: AMB18-A... and AMB18-S...		Connectors: CONx14NF...W-series. Mounting brackets: AMB30-A... and AMB30-S...	
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