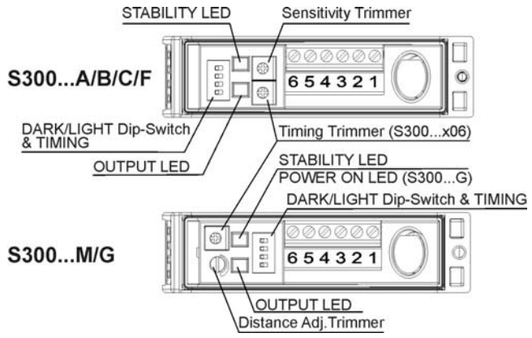
S300-PA SERIES
INSTRUCTION MANUAL

CONTROLS



OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

STABILITY LED (green)
The green LED ON indicates that the sensor has working with a enough safety margin.

POWER ON LED (green) (S300…G)
The green LED indicates that the sensor is operating.

SENSITIVITY TRIMMER (S300…A/B/C/F)
A mono-turn trimmer adjusts the sensitivity and the sensor operating distance.
The operating distance increases, rotating the screws in a clockwise direction.
Do not apple more than 0.3Nm tightening torque on the trimmer screw.

DISTANCE ADJUSTMENT TRIMMER (S300…M)
The multi-turn trimmer has mechanical stop in clockwise turn and clutch control in anti-clockwise turn, adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
Please refer to "SETTINGS" paragraph for procedure indications.

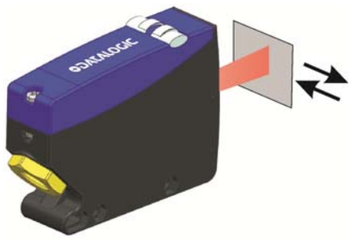
TIMING TRIMMER (S300…x06 exclude S300…G)
Mono-turn trimmers to setting output activation and disactivation delay time.
Please refer to "TIMING FUNCTIONS" paragraph for for procedure indications.
Do not apple more than 0.3Nm tightening torque on the trimmer screw.

DARK/LIGHT DIP-SWITCH & TIMING (S300…x06 exclude S300…G)
A mono-turn trimmer to select dark/light mode (for all models) and timing (only timing versions).

WARNING: *the maximum mechanical rotation range of the trimmer is 240°.*
Do not force over of the maximum and minimum positions.

INSTALLATION

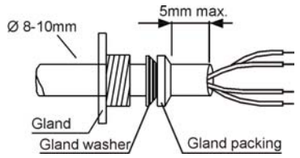
The sensor can be positioned by means of the two housing holes using two screws (M4x35 or longer, 1.2Nm maximum tightening torque).
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.
For a correct use, the sensor must be installed orthogonal respect the direction of the object to detect like show in the figure.



Tighten all screws surely to maintain the water-proof characteristics for IP67 (IEC/EN60529).
Excessive tightening causes damage. Tighten the screws within the tightening torque range shown in the table.

TIGHTENING TORQUE (Nm)	
Terminal screws	0.5 max
Covers screws	0.5…0.8

CABLE CONNECTION

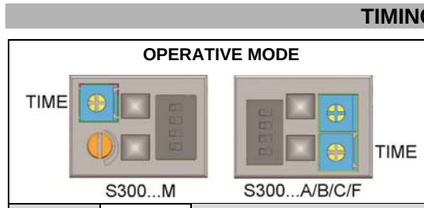


Use a cable of 8 … 10 mm in diameter to ensure water- and dust-proof characteristics.
Two gland packings are supplied; for cables of 8 … 9 mm and 9 … 10 mm in diameter.
Use a proper gland packing and a gland washer, and tighten the gland firmly (torque 10 at 15 Kgf-cm).
Keep the cable insulation within 5 mm from the gland packing as shown above.
Make sure the gland washer is placed in the gland packing correctly.
The wires section must be in the range of 16 up to 26AWG.
The stripped length must be 6mm.
Make sure that the sensor is not supplied when making connections.
Make correct connection to avoid product damage.
When connection are made tighten the cable lock nut.
Close the cover using the screw lock.

TECHNICAL DATA

	S300…1-x01 / S300…1-x06	S300…2-x01 / S300…2-x06
Power supply:	24…240 VAC / 24…60 VDC	12…30 VDC Class 2 (UL508)
Ripple:	10% max.	10% max.
Current consumption (output current excluded):	< 3VA	< 35 mA
Outputs:	Electromechanical SPDT 250 Vca / 30 Vcc	PNP / NPN open collector
Output current:	3 A max. (resistive load)	100 mA (resistive load)
Output saturation voltage:	-	< 2.4 V max
Diagnostic function:	-	TEST+ input (S300…G)
Response time:	25 ms	1 ms (S300…A/B/C/M); 2 ms (S300…F/G)
Switching frequency:	20Hz max	500 Hz (S300…A/B/C/M) 250 Hz (S300…F/G)
Weight:	130 g.	120 G.
Emission type:	RED (660nm) S300…B ; INFRARED (940nm) S300…C INFRARED (880 nm) S300…A/G/M	
Operating distance (typical values):	**S300…A**: 0.1...15 m on R5 reflector (EG 2) / **S300...B**: 0.1 ...10 m on R5 reflector (EG 2) **S300...C**: 5 … 200 cm on 90% White target (EG 2) / **S300...M**: 20 … 200 cm on 90% White target **S300…F/G**: 0 … 50 m (EG 2)	
Indicators	OUTPUT LED (YELLOW) / STABILITY LED (GREEN) POWER ON LED (GREEN) S300…G	
Adjustment:	Sensitivity trimmer (S300…A/B/C/F), DARK/LIGHT dip-switch (S300…A/B/C/F/M) 7-turns distance adjustment trimmer (S300…M) Dip-switch mode ON delay / OFF delay / ON-OFF delay / Single pulse (ONE-SHOT) (S300…x06) Timig Trimmer (S300…x06 esclude S300...G)	
Time Delay Range (timing vers.):	0.6…16 s (adjustment by Trimmer)	
Operating temperature:	-25 … 55 °C	
Storage temperature:	-25 … 70 °C	
Dielectric strength:	⧈: 1500 VAC, 1 min between electronics and housing	
Insulating resistance:	> 20 MΩ, ⧈500 VDC between electronics and housing	
Ambient light rejection:	according to EN 60947-5-2	
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)	
Housing material:	PBT 30% Glass fiber-reiforced	
Lens material:	frontal window and lens in PC	
Mechanical protection:	IP67 (IEC / EN60529)	
UL requirements:	TYPE 1 ENCLOSURE. Use 60 or 75°C copper (CU) conductor and wire size No. 24-20 AWG, stranded or solid. Output Terminal tightening torque of 0.5 Nm. VDC models: they are intended to be connected to a Class 2 transformer or class 2 power supply. VAC models: these devices shall be connected to a power-supply or system,including filters or air-gaps, of overvoltage category II ("load level – secondary circuit of a protected utility transformer"), suitable to control over-voltages at the maximum "rated impulse withstand voltage peak of 1.2KV and with a short-circuit power limit at max 500VA.	
Connections:	see the "CONNECTIONS" paragraph	
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C	

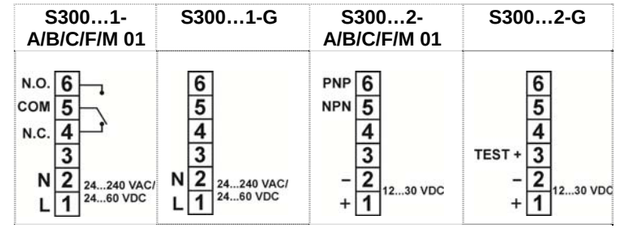
TIMING FUNCTIONS / TIMING DIAGRAM (S300…x06)



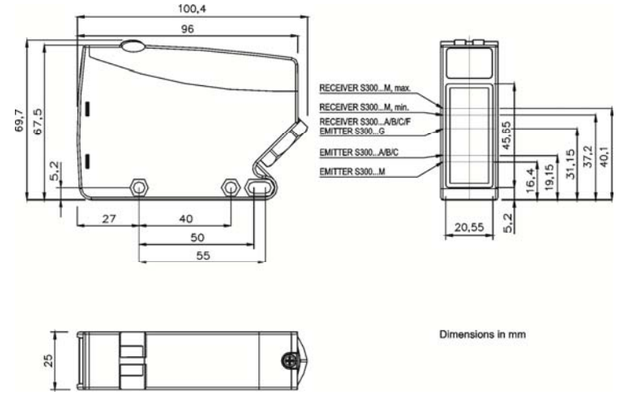
			1	2	3	4
LIGHT		Normal	ON	OFF	OFF	OFF
	TIME	ON delay	ON	ON	OFF	OFF
		Single pulse (one-shot)	ON	OFF	ON	OFF
		OFF delay	ON	OFF	OFF	ON
		ON/OFF delay	ON	ON	OFF	ON
DARK		Normal	OFF	OFF	OFF	OFF
	TIME	ON delay	OFF	ON	OFF	OFF
		Single pulse (one-shot)	OFF	OFF	ON	OFF
		OFF delay	OFF	OFF	OFF	ON
		ON/OFF delay	OFF	ON	OFF	ON

NOTE: The timing functions are selected by dip-switches.
The sensors without timing functions have only the LIGHT/DARK dip-switch and normal operative mode.
The yellow LED in lighted with output ON and dark with output OFF.
The delay variation is not linear with trimmer rotation in order to be more sensitive with shorter delay time.
The variation is more sensitive up to half rotation (short delay), from half rotation up to end rotation the variation is faster.

CONNECTIONS



DIMENSIONS



SETTINGS

S300…A and S300…B setting
Position the sensor and reflector on opposite sides. Turn the sensitivity trimmer to maximum.
Find the points where the yellow LED (OUT) in both vertical and horizontal positions and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON.
If necessary, reduce sensitivity using the trimmer, in order to detect very small targets.
In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.

S300...C setting
Position the sensor and turn the sensitivity trimmer at minimum: the yellow LED is OFF (litgh mode). Place the target opposite the sensor. Turn the sensitivity trimmer clockwise until the yellow LED turns ON (Target detected state, pos.A). Remove the target, the yellow LED turns OFF. Turn the trimmer clockwise until the yellow LED turns ON (Background detected state, pos.B). The trimmer reaches maximum if the background is not detected. Turn the trimmer in intermediate position C, between the two positions A and B. The green LED must be ON.

S300…F/G setting
Position the sensors on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) is switched ON and OFF in both vertical and horizontal positions, and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON.
If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.

S300…M setting
Suppression distance setting
a) Position object to detect in front of the sensor at the distance required. Turn distance adjustment screw (ADJ) to minimum: yellow LED OFF. Rotate trimmer in a clockwise direction until the yellow LED turns ON. *Object detection condition* (pos.A).
b) Remove object and ensure that the background is in front of the sensor: yellow LED OFF. Rotate screw in a clockwise direction until the yellow LED turns ON: *background detection condition* (pos.B).
c) Rotate screw in an anti-clockwise direction until the trimmer reaches an intermediate point between position A and C. The sensor is now ready to function correctly in stable conditions.

DIAGNOSTIC FUNCTIONS

TEST+ input (only S300-PA-2-G)
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating.
The TEST function is activated if the TEST+ input is connected to a voltage between 10…30V, whereas if the TEST+ input is connected to GND or it is not connected the function is disactivated.
Activating the TEST the output switches from ON to OFF (in light mode), testing the total operation.

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: **Contact Us, Terms and Conditions, Support**.

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

826000351 Rev.C

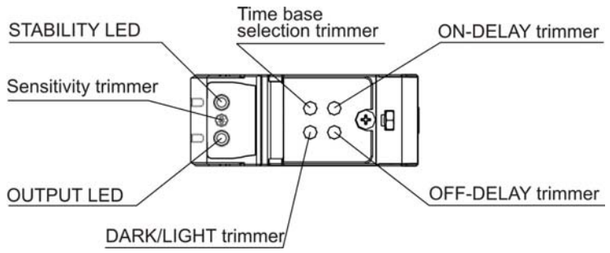
DATALOGIC

S300-PR…B
Polarised retroreflex

S300-PR…C
Diffuse proximity

INSTRUCTION MANUAL

CONTROLS



OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

STABILITY LED (green)
The green LED ON indicates that the sensor has working with a enough safety margin.

SENSITIVITY TRIMMER
A mono-turn trimmer adjusts the sensitivity and the sensor operating distance.
The operating distance increases, rotating the screws in a clockwise direction.

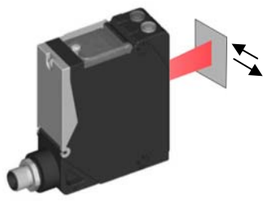
DARK/LIGHT TRIMMER
A mono-turn trimmer to select dark/light mode.

ON-DELAY AND OFF-DELAY TRIMMER *(only versions with timing functions)*
Mono-turn trimmers to setting output activation and disactivation delay time. Please refer to “TIMING FUNCTIONS” paragraph for for procedure indications.

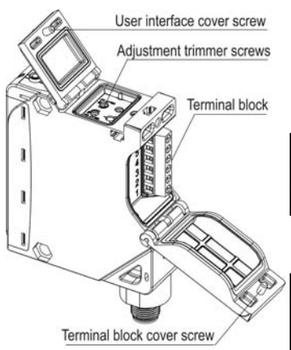
TIME BASE SELECTION AND ONE-SHOT TRIMMER (*only versions with timing functions*)
A mono-turn trimmer with three operation position: it allows to select two different delay time base (SHORT BASE and LONG BASE) or ONE SHOT. Please refer to “TIMING FUNCTIONS” paragraph for procedure indications.

***WARNING:** the maximum mechanical rotation range of the trimmer is 240°.* Do not force over of the maximum and minimum positions.

INSTALLATION



The sensor can be positioned by means of the two housing holes using two screws (M5x35 or longer, 1.2Nm maximum tightening torque).
The sensor bottom surface has been provided of two mechanical threaded insert M5x5,5. These metal insert are commercial components.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.
For a correct use, the sensor must be installed orthogonal respect the direction of the object to detect like show in the figure.



Tighten all screws surely to maintain the water-proof characteristics for IP67 (IEC/EN60529).
Excessive tightening causes damage. Tighten the screws within the tightening torque range shown in the table.

TIGHTENING TORQUE (Nm)	
Terminal screws(6pc)	0.5 max
Covers screws	0.5…0.8

The cable gland assure mechanical retention compliant with EN50262.

CABLE DIAMETER	LOAD (N)
4,5..8mm	30
8..10mm	42

TECHNICAL DATA

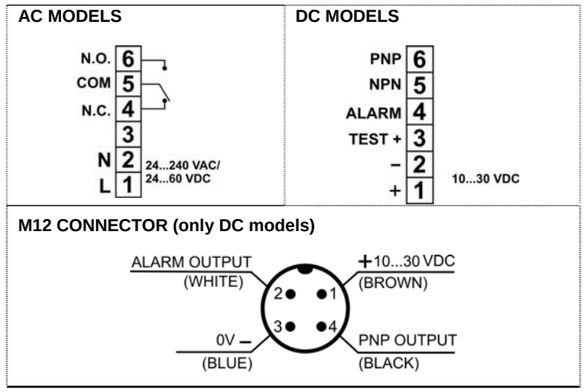
AC MODELS	S300-PR-1-B/C
Power supply:	24…240 VAC / 24…60 VDC
Ripple:	10 % max
Current consumption (output current excluded):	< 3 VA
Outputs:	Electromechanical SPDT: 250 VAC, 30 VDC
Output current:	Max 3 A (resistive load)
Response time:	20 ms
Switching frequency:	25 Hz
Weight:	150 g
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

DC MODELS	S300-PR-2/5-B/C
Power supply:	10…30 VDC Class 2 (UL508)
Ripple:	10 % max
Current consumption (output current excluded):	< 30 mA
Outputs:	PNP / NPN open collector R_pull-up/down = 47KΩ
Output current:	100 mA (resistive load)
Output saturation voltage:	2.4 V max
Diagnostic functions	PNP ALARM output / Test+ iput
Response time:	1 ms
Switching frequency:	500 Hz
Weight:	140 g
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

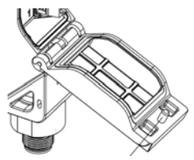
Common data

	S300 B	S300 C
Emission type:	RED LED (660nm)	INFRARED LED (880nm)
Operating distance (typical value):	20m (EG2), 22m (EG1) on R5 reflector	3,5m on 90% white target (EG2), 5M (EG1)
Indicators:	OUTPUT LED (YELLOW), STABILITY LED (GREEN)	
Adjustment:	Sensitivity trimmer / DARK/LIGHT trimmer *Versions with timing functions*: time base selection and one shot trimmer / ON DELAY trimmer / OFF DELAY trimmer	
Time base (*Versions with timing functions*):	SHORT BASE: 0…2 sec, LONG BASE: 0…10 sec	
Operating temperature:	-40…55 °C	
Storage temperature:	-40…70 °C	
Dielectric strength:	□: 1500 VAC, 1 min between electronics and housing	
Insulating resistance:	> 20 MΩ, □500 VDC between electronics and housing	
Ambient light rejection:	EN 60947-5-2	
Vibration:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)	
Housing:	PBT 30% Glass fiber-reiforced	
Lenses:	frontal window and lens in PC	
Protection class:	IP67 (IEC / EN60529) / cable gland EN50262	
UL requirements:	60-70°C copper conductor 24-20 AWG; TYPE 1 ENCLOSURE	
Connections:	see the “CONNECTIONS” paragraph	

CONNECTIONS



Terminal block versions (S300-PR-1/2)
Use a cable of 4,5 to 10 mm in diameter to ensure water- and dust-proof characteristics. The trasversal section of the cable must be between 16 and 26AWG. The length of conductor peel must be 6mm and the cable peel must be 100mm.



To favour the cable connection it is possible remove (and then replace) the terminal block cover when it is in the maximum opening position (like showned in the figure).
Turn off the power supply before wiring. Connect correctly to prevent damage. At the end of the connections, screw the cable gland decisively to lock the cable.
Close the terminal block cover with the screw.

M12 connector versions (S300-PR-5)
The connector wires are just connected like show in the previous figure. It is possible change the wiring and use other functionality (NPN output, TEST+ input).

SETTING

Sensitivity setting (S300..B)
Position the sensor and reflector on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) is switched ON and OFF in both vertical and horizontal positions, and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON. If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.

Sensitivity setting (S300..C)
Position the sensor and turn the sensitivity trimmer at minimum: the yellow LED is OFF (litgh mode). Place the target opposite the sensor. Turn the sensitivity trimmer clockwise until the yellow LED turns ON (Target detected state, pos.A). Remove the target, the yellow LED turns OFF. Turn the trimmer clockwise until the yellow LED turns ON (Background detected state, pos.B). The trimmer reaches maximum if the background is not detected. Turn the trimmer in intermediate position C, between the two positions A and B. The green LED must be ON.

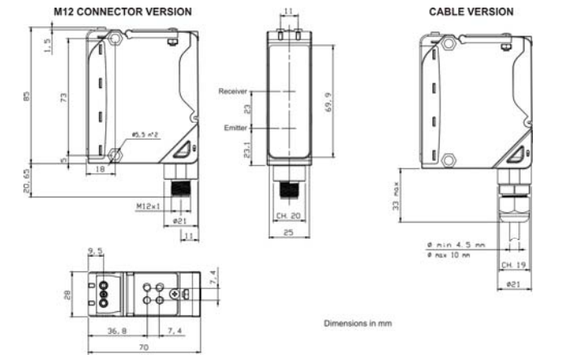
DIAGNOSTIC FUNCTIONS

S300 has the following diagnostic functions to verify the correct operation on application.

TEST+ input (only S300-PR-2/5)
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating. The TEST function is activated if the TEST+ input is connected to a voltage between 10…30V, whereas if the TEST+ input is connected to GND or it is not connected the function is disactivated.
Activating the TEST while an object (C)/reflector (B) is in front of the sensor (output ON in light mode), the output switches from ON to OFF, testing the total operation. Activating the TEST whithout an object (C) in front of the sensor (output OFF in light mode), the outpt switches from OFF to ON, testing only the output operation.

ALARM output (only S300-PR-2/5)
The alarm output switches ON whenever the received signals remains without a safety margin (greater than 30% compared to the output switching level).
In C model the ALARM output is activated when the sensor detects an object in instability conditions (stability LED OFF, OUT LED ON) for 10 times consecutively. If the commutations number is lower, the count down is reset and restart only in instability condition. The ALARM output remain ON until there is a commutation in stability condition.
In B model the ALARM output is activated when the received signal remains without a safety margin for more than 3 seconds.

DIMENSIONS



TIMING FUNCTIONS

Vers.with timing functions

Vers.without timing functions

The TIME BASE SELECTION trimmer allows to select the time base or the ONE SHOT function.

Short Base 0..2sec
0..10sec
0..2s One shot 0..2sec

Long base 0..10sec
0..10sec
0..2s One shot 0..2sec

One shot 0..2sec
0..10sec
0..2s One shot 0..2sec

Selecting the short base the time setting of ON delay and OFF delay trimmer is in the range 0..2sec, selecting long base is in the range 0..10sec.
To allow a better setting of little delay, the variation of ON and OFF delay are not linear with mechanical regulation of the trimmer: until half rotation the regulation is thiner, whereas from half to full scale the regulation is faster.
The follow figure indicates the values of initial, middle and full scale delay of ON and OFF delay trimmer in the two different selectable time base:

ON / OFF DELAY (short base)
0.5sec
0sec 2sec

ON / OFF DELAY (long base)
2sec
0sec 10sec

The TIME BASE SELECTION trimmer has a third position to select ONE SHOT mode. The ONE SHOT duration is selectable by ON DELAY trimmer with short time base (0…2 sec). In this mode the OFF delay trimmer is disabled.

TIMING DIAGRAM (S300-x-xxxT)

OPERATION MODE	*OUTPUT*
Normal (timing disable)	
ONE SHOT *(only with short time base 0…2 sec.)*	Ton, Ton, Ton
ON/OFF delay	Ton, Toff, Ton
ON delay	Ton, Ton
OFF delay	Toff, Toff

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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Helpful links at www.datalogic.com: **Contact Us, Terms and Conditions, Support**.

The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

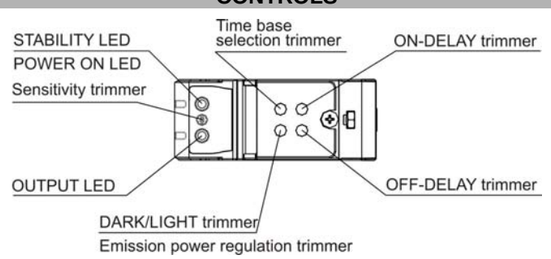
826004704 Rev.D

S300…F
Receiver

S300…G
Emitter

INSTRUCTION MANUAL

CONTROLS



OUTPUT LED (yellow) (S300…F)
The yellow LED ON indicates the output status.

STABILITY LED (green) (S300…F)
The green LED ON indicates that the sensor has working with a enough safety margin.

POWER ON LED (S300…G)
The green LED indicates that the sensor is operating.

SENSITIVITY TRIMMER (S300…F)
A mono-turn trimmer adjusts the sensitivity and the sensor operating distance. The operating distance increases, rotating the screws in a clockwise direction.

DARK/LIGHT TRIMMER (S300…F)
A mono-turn trimmer to select dark/light mode.

EMISSION POWER REGULATION TRIMMER (S300…G)
A mono-turn trimmer to select the emission power.

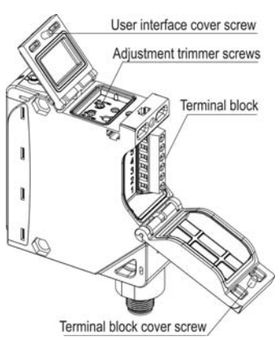
ON-DELAY AND OFF-DELAY TRIMMER (S300…F06)
Mono-turn trimmers to setting output activation and disactivation delay time. Please refer to “TIMING FUNCTIONS” paragraph for for procedure indications.

TIME BASE SELECTION AND ONE-SHOT TRIMMER (S300…F06)
A mono-turn trimmer with three operation position: it allows to select two different delay time base (SHORT BASE and LONG BASE) or ONE SHOT. Please refer to “TIMING FUNCTIONS” paragraph for procedure indications.

WARNING: *the maximum mechanical rotation range of the trimmer is 240°.* Do not force over of the maximum and minimum positions.

INSTALLATION

The sensor can be positioned by means of the two housing holes using two screws (M5x35 or longer, 1.2Nm maximum tightening torque).
The sensor bottom surface has been provided of two mechanical threaded insert M5x5,5. These metal insert are commercial components.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.



Tighten all screws surely to maintain the water-proof characteristics for IP67 (IEC/EN60529).
Excessive tightening causes damage. Tighten the screws within the tightening torque range shown in the table.

TIGHTENING TORQUE (Nm)	
Terminal screws(6pc)	0.5 max
Covers screws	0.5…0.8

The cable gland assure mechanical retention compliant with EN50262.

CABLE DIAMETER	LOAD (N)
4,5..8mm	30
8..10mm	42

TECHNICAL DATA

AC MODELS	S300…1-G/F
Power supply:	24…240 VAC / 24…60 VDC
Ripple:	10 % max
Current consumption (output current excluded):	< 3 VA
Outputs:	Electromechanical SPDT: 250 VAC, 30 VDC
Output current:	Max 3 A (resistive load)
Response time:	20 ms
Switching frequency:	25 Hz
Weight:	150 g

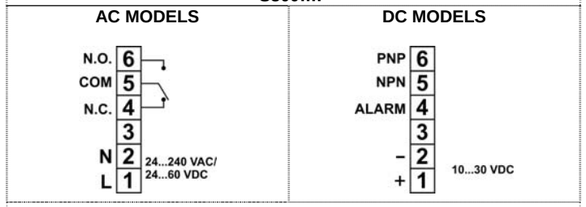
DC MODELS	S300…2/5-G/F
Power supply:	10…30 VDC Class 2 (UL508)
Ripple:	10 % max
Current consumption (output current excluded):	F: <25mA / G: < 20 mA
Outputs:	PNP / NPN open collector R_pull-up/down = 47KΩ
Output current:	100 mA (resistive load)
Output saturation voltage:	2.4 V max
Diagnostic functions	PNP ALARM output / Test+ iput
Response time:	1 ms
Switching frequency:	500 Hz
Weight:	140 g

Common data

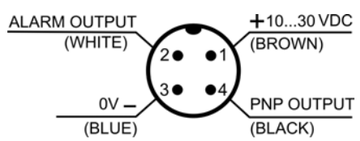
	S300…G	S300…F
Emission type:	INFRARED LED (880nm)	-
Operating distance (typical value):	0..60m	
Indicators:	POWER ON LED (GREEN)	OUTPUT LED (YELLOW), STABILITY LED (GREEN)
Adjustment:	Emission power regulation trimmer	Sensitivity trimmer / DARK/LIGHT trimmer *Timing versions S300…F06*: time base selection and one shot trimmer / ON DELAY trimmer / OFF DELAY trimmer
Time base (*Timing vers. S300…F06*):	SHORT BASE: 0...2 sec, LONG BASE: 0…10 sec	
Operating temperature:	-40…55 °C	
Storage temperature:	-40…70 °C	
Dielectric strength:	□: 1500 VAC, 1 min between electronics and housing	
Insulating resistance:	> 20 MΩ, □500 VDC between electronics and housing	
Ambient light rejection:	EN 60947-5-2	
Vibration:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)	
Housing:	PBT 30% Glass fiber-reiforced	
Lenses:	frontal window and lens in PC	
Protection class:	IP67 (IEC / EN60529) / cable gland EN50262	
UL requirements:	60-70°C copper conductor 24-20 AWG; TYPE 1 ENCLOSURE	
Connections:	see the “CONNECTIONS” paragraph	

CONNECTIONS

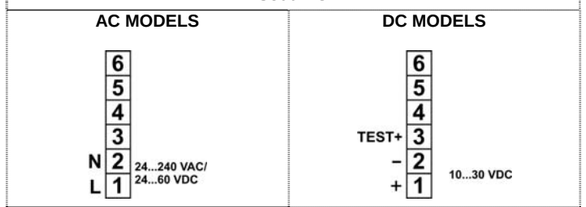
S300…F



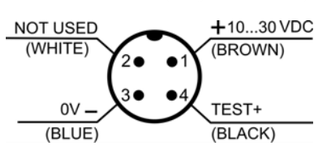
M12 CONNECTOR (only DC models)



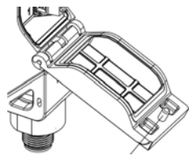
S300…G



M12 CONNECTOR (only DC models)



Terminal block versions (S300…1/2)
Use a cable of 4,5 to 10 mm in diameter to ensure water- and dust-proof characteristics. The trasversal section of the cable must be between 16 and 26AWG. The length of conductor peel must be 6mm and the cable peel must be 100mm.



To favour the cable connection it is possible remove (and then replace) the terminal block cover when it is in the maximum opening position (like showned in the figure).
Turn off the power supply before wiring. Connect correctly to prevent damage. At the end of the connections, screw the cable gland decisively to lock the cable.
Close the terminal block cover with the screw.

M12 connector versions (S300…5)
The connector wires are just connected like show in the previous figure. It is possible change the wiring and use other functionality (NPN output, TEST+ input).

SETTING

Sensitivity setting (S300..F and S300…G)
Position the sensors on opposite sides. Turn the sensitivity trimmer to maximum. Find the points where the yellow LED (OUT) is switched ON and OFF in both vertical and horizontal positions, and fix the sensor in the centre between these points. Optimum operation is obtained when both LEDs switch ON. If necessary, reduce sensitivity using the trimmer, in order to detect very small targets. In order to improve alignment, repeat the procedure detailed above whilst progressively reducing the sensitivity.

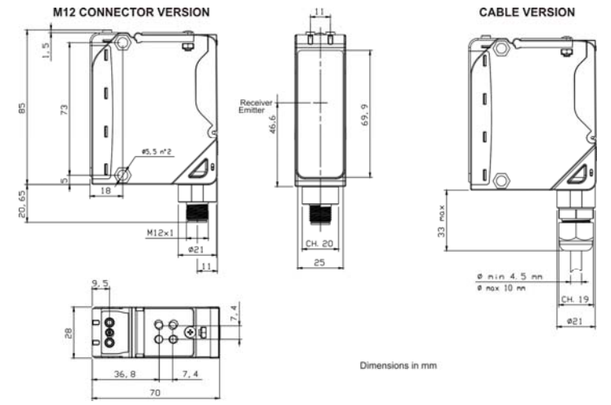
DIAGNOSTIC FUNCTIONS

S300 has the following diagnostic functions to verify the correct operation on application.

TEST+ input (only S300…2/5-G)
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating. The TEST function is activated if the TEST+ input is connected to a voltage between 10…30V, whereas if the TEST+ input is connected to GND or it is not connected the function is disactivated.
Activating the TEST the output switches from ON to OFF (in light mode), testing the total operation.

ALARM output (only S300…2/5-F)
The alarm output switches ON whenever the received signals remains without a safety margin (greater than 30% compared to the output switching level).
The ALARM output is activated (ON) when the received signal remains without a safety margin for more than 3 seconds.

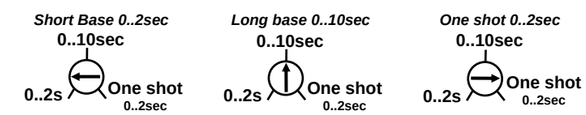
DIMENSIONS



TIMING FUNCTIONS

Vers.with timing functions *Vers.without timing functions*

The TIME BASE SELECTION trimmer allows to select the time base or the ONE SHOT function.



Selecting the short base the time setting of ON delay and OFF delay trimmer is in the range 0..2sec, selecting long base is in the range 0..10sec.
To allow a better setting of little delay, the variation of ON and OFF delay are not linear with mechanical regulation of the trimmer: until half rotation the regulation is thiner, whereas from half to full scale the regulation is faster.
The follow figure indicates the values of initial, middle and full scale delay of ON and OFF delay trimmer in the two different selectable time base:

The TIME BASE SELECTION trimmer has a third position to select ONE SHOT mode. The ONE SHOT duration is selectable by ON DELAY trimmer with short time base (0…2 sec). In this mode the OFF delay trimmer is disabled.

TIMING DIAGRAM (S300…F06)

OPERATION MODE	*OUTPUT*
Normal (timing disable)	
ONE SHOT *(only with short time base 0…2 sec.)*	Ton, Ton, Ton
ON/OFF delay	Ton, Toff, Ton
ON delay	Ton, Ton
OFF delay	Toff, Toff

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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The warranty period for this product is 36 months. See General Terms and Conditions of Sales for further details.

Under current Italian and European laws, Datalogic is not obliged to take care of product disposal at the end of its life. Datalogic recommends disposing of the product in compliance with local laws or contacting authorised waste collection centres.

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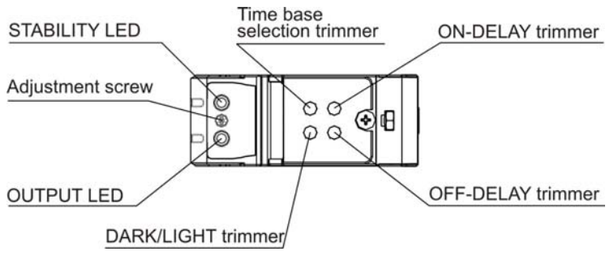
DATALOGIC

S300-PR…M

Background suppression

INSTRUCTION MANUAL

CONTROLS



OUTPUT LED (yellow)
The yellow LED ON indicates the output status.

STABILITY LED (green)
The green LED ON indicates that the sensor has working with a enough safety margin.

ADJUSTMENT TRIMMER (ADJ.)
The multiturn trimmer with clutch adjusts the suppression distance through the mechanical variation of the optic triangulation angle. Please refer to “SETTING” paragraph for for procedure indications.

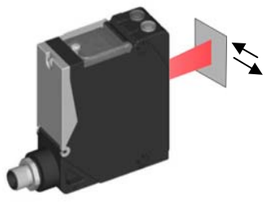
DARK/LIGHT TRIMMER
A mono-turn trimmer to select dark/light mode.

ON-DELAY AND OFF-DELAY TRIMMER *(only versions with timing functions)*
Mono-turn trimmers to setting output activation and disactivation delay time. Please refer to “TIMING FUNCTIONS” paragraph for for procedure indications.

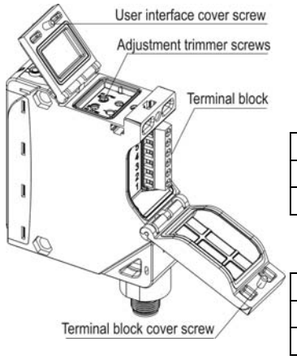
TIME BASE SELECTION AND ONE-SHOT TRIMMER (*only versions with timing functions*)
A mono-turn trimmer with three operation position: it allows to select two different delay time base (SHORT BASE and LONG BASE) or ONE SHOT. Please refer to “TIMING FUNCTIONS” paragraph for procedure indications.

***WARNING:** the maximum mechanical rotation range of the trimmer is 240°.* Do not force over of the maximum and minimum positions.

INSTALLATION



The sensor can be positioned by means of the two housing holes using two screws (M5x35 or longer, 1.2Nm maximum tightening torque). The sensor bottom surface has been provided of two mechanical threaded insert M5x5,5. These metal insert are commercial components.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the general catalogue).
The operating distance is measured from the front surface of the sensor optics.
For a correct use, the sensor must be installed orthogonal respect the direction of the object to detect like show in the figure.



Tighten all screws surely to maintain the water-proof characteristics for IP67 (IEC/EN60529).
Excessive tightening causes damage. Tighten the screws within the tightening torque range shown in the table.

TIGHTENING TORQUE (Nm)	
Terminal screws(6pc)	0.5 max
Covers screws	0.5…0.8

The cable gland assure mechanical retention compliant with EN50262.

CABLE DIAMETER	LOAD (N)
4,5..8mm	30
8..10mm	42

TECHNICAL DATA

AC MODELS	S300-PR-1-M
Power supply:	24…240 VAC / 24…60 VDC
Ripple:	10 % max
Current consumption (output current excluded):	< 3 VA
Outputs:	Electromechanical SPDT: 250 VAC, 30 VDC
Output current:	Max 3 A (resistive load)
Response time:	20 ms
Switching frequency:	25 Hz
Weight:	150 g
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

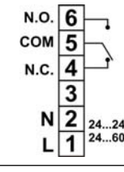
DC MODELS	S300-PR-2/5-M
Power supply:	10…30 VDC Class 2 (UL508)
Ripple:	10 % max
Current consumption (output current excluded):	< 35 mA
Outputs:	PNP / NPN open collector R_pull-up/down = 47KΩ
Output current:	100 mA (resistive load)
Output saturation voltage:	2.4 V max
Diagnostic functions	PNP ALARM output / Test+ iput
Response time:	2 ms
Switching frequency:	250 Hz
Weight:	140 g
AtEx 2014/34/EU:	II 3G EX nA II T6 ; II 3D EX tD A22 IP67 T85°C

Common data

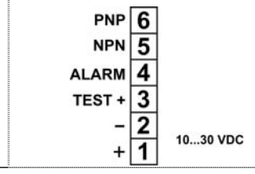
Emission type:	INFRARED LED (880nm)
Operating distance (typical value):	400..2500mm
Difference (90% white / 4% black):	< 15 % at the max distance
Hysteresis (90% white):	< 10 %
Indicators:	OUTPUT LED (YELLOW), STABILITY LED (GREEN)
Adjustment:	15 turns adiustment screw / DARK/LIGHT trimmer *Versions with timing functions*: time base selection and one shot trimmer / ON DELAY trimmer / OFF DELAY trimmer
Time base (*Versions with timing functions*):	SHORT BASE: 0...2 sec, LONG BASE: 0…10 sec
Operating temperature:	-40…55 °C
Storage temperature:	-40…70 °C
Dielectric strength:	⧈: 1500 VAC, 1 min between electronics and housing
Insulating resistance:	> 20 MΩ, ⧈500 VDC between electronics and housing
Ambient light rejection:	EN 60947-5-2
Vibration:	0.5 mm amplitude, 10 … 55 Hz frequency, for every axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shock for every axis (EN60068-2-27)
Housing:	PBT 30% Glass fiber-reiforced
Lenses:	frontal window and lens in PC
Protection class:	IP67 (IEC / EN60529) / gland EN50262
UL requirements:	60-70°C copper conductor 24-20 AWG; TYPE 1 ENCLOSURE
Connections:	see the “CONNECTIONS” paragraph

CONNECTIONS

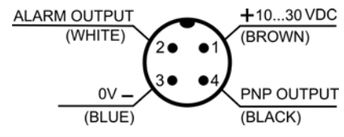
AC MODELS



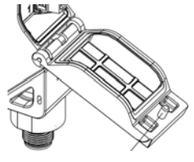
DC MODELS



M12 CONNECTOR (only DC models)



Terminal block versions (S300-PR-1/2)
Use a cable of 4,5 to 10 mm in diameter to ensure water- and dust-proof characteristics. The trasversal section of the cable must be between 16 and 26AWG. The length of conductor peel must be 6mm and the cable peel must be 100mm.



To favour the cable connection it is possible remove (and then replace) the terminal block cover when it is in the maximum opening position (like showned in the figure).
Turn off the power supply before wiring. Connect correctly to prevent damage. At the end of the connections, screw the cable gland decisively to lock the cable.
Close the terminal block cover with the screw.

M12 connector versions (S300-PR-5)
The connector wires are just connected like show in the previous figure. It is possible change the wiring and use other functionality (NPN output, TEST+ input).

SETTING

Suppression distance setting

a) Position object to detect in front of the sensor at the distance required. Turn distance adjustment screw (ADJ) to minimum: yellow LED OFF. Rotate trimmer in a clockwise direction until the yellow LED turns ON. *Object detection condition* (pos.A).
b) Remove object and ensure that the background is in front of the sensor: yellow LED OFF. Rotate screw in a clockwise direction until the yellow LED turns ON: *background detection condition* (pos.B).
c) Rotate screw in an anti-clockwise direction until the trimmer reaches an intermediate point between position A and C. The sensor is now ready to function correctly in stable conditions.

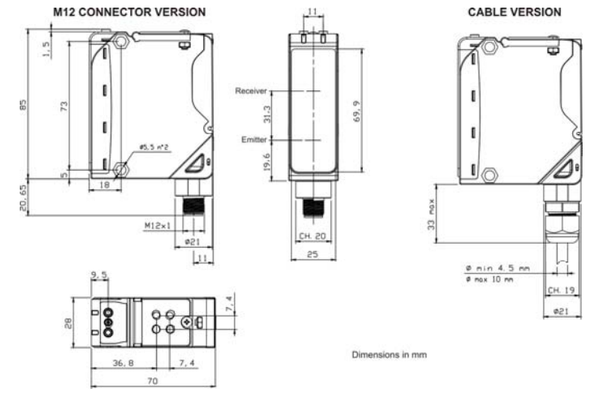
DIAGNOSTIC FUNCTIONS

S300 has the following diagnostic functions to verify the correct operation on application.

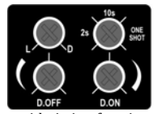
TEST+ input (only S300-PR-2/5)
The TEST+ input can be used to inhibit the emitter and verify that the system is correctly operating. The TEST function is activated if the TEST+ input is connected to a voltage between 12…30V, whereas if the TEST+ input is connected to GND or it is not connected the function is disactivated.
Activating the TEST while an object is in front of the sensor (output ON in light mode), the output switches from ON to OFF, testing the total operation. Activating the TEST whithout an object in front of the sensor (output OFF in light mode), the outpt switches from OFF to ON, testing only the output operation.

ALARM output (only S300-PR-2/5)
The alarm output switches ON whenever the received signals remains without a safety margin (greater than 30% compared to the output switching level).
The ALARM output is activated when the sensor detects an object in instability conditions (stability LED OFF, OUT LED ON) for 10 times consecutively. If the commutations number is lower, the count down is reset and restart only in instability condition.
The ALARM output remain ON until there is a commutation in stability condition.

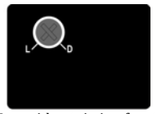
DIMENSIONS



TIMING FUNCTIONS



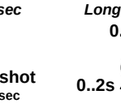
Vers.with timing functions



Vers.without timing functions

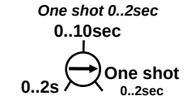
The TIME BASE SELECTION trimmer allows to select the time base or the ONE SHOT function.

Short Base 0..2sec



Long base 0..10sec

One shot 0..2sec



Selecting the short base the time setting of ON delay and OFF delay trimmer is in the range 0..2sec, selecting long base is in the range 0..10sec.
To allow a better setting of little delay, the variation of ON and OFF delay are not linear with mechanical regulation of the trimmer: until half rotation the regulation is thiner, whereas from half to full scale the regulation is faster.
The follow figure indicates the values of initial, middle and full scale delay of ON and OFF delay trimmer in the two different selectable time base:

ON / OFF DELAY (short base)

ON / OFF DELAY (long base)

The TIME BASE SELECTION trimmer has a third position to select ONE SHOT mode. The ONE SHOT duration is selectable by ON DELAY trimmer with short time base (0…2 sec). In this mode the OFF delay trimmer is disabled.

TIMING DIAGRAM (S300-x-xxxT)

OPERATION MODE	*OUTPUT*
Normal (timing disable)	
ONE SHOT *(only with short time base 0…2 sec.)*	Ton, Ton, Ton
ON/OFF delay	Ton, Toff, Ton
ON delay	Ton, Ton
OFF delay	Toff, Toff

The sensors are NOT safety devices, and so MUST NOT be used in the safety control of the machines where installed.

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