DATASENSOR

S40 SERIES
INSTRUCTION MANUAL

CONTROLS

OUTPUT LED
The yellow LED indicates the output status.

READY LED
The green LED ON indicates that the received signal has a safety margin compared to the output switching value.
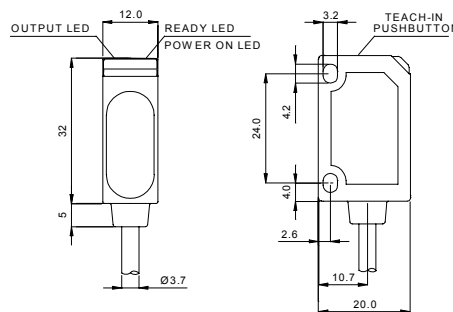See the "SETTING" paragraph for setup procedure indications.

POWER ON LED (S40-x-G)
The green LED indicates that the sensor is operating.

TEACH-IN PUSHBUTTON
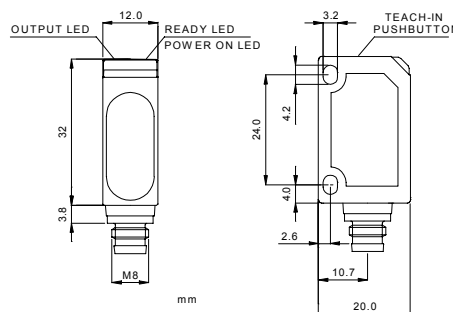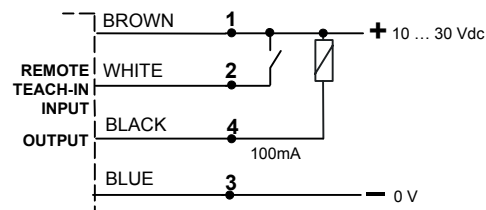The pushbutton activates the setup procedure.
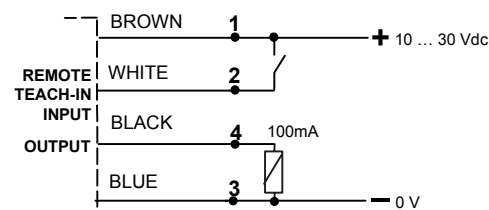
DIMENSIONS

CABLE VERSION

M8 CONNECTOR VERSION

CONNECTIONS

NPN OUTPUT

PNP OUTPUT

S40-x-G
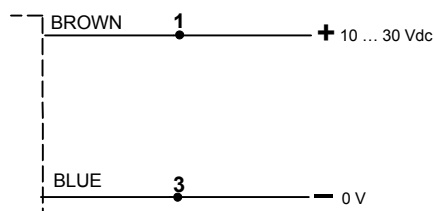
M8 CONNECTOR

TECHNICAL DATA

	S40-x-A	S40-x-B	S40-x-T	S40-x-C	S40-x-F/G	S40-x-M
Power supply:	10 … 30 Vdc; reverse polarity protected					
Ripple:	10% max					
Current consumption (output current excluded):	35 mA max.					
Output:	NPN or PNP, pull down/up resistance 22 kΩ (short-circuit protection)					
Output current:	100 mA max.					
Output saturation voltage:	2.4 V max.					
Response time:	0.5 ms max.					
Switching frequency:	1 kHz max.					
Data retention:	non-volatile EEPROM memory					
Indicators:	OUT LED (YELLOW) READY LED (GREEN) POWER ON LED (GREEN) mod. S40-x-G					
Setting:	TEACH-IN setting by pushbutton and REMOTE input					
Operating temperature:	-20 … +60 °C					
Storage temperature:	-20 … +80 °C					
Electrical shock protection:	Class 2					
Operating distance (minimum):	see TAB.1	0.1 … 0.7 m	0.5 … 30 cm	0.1 … 6 m		20…100 mm
Emission type:	RED (660nm)					RED (640nm)
Ambient light rejection:	according to EN 60947-5-2					
Vibration:	10 … 55 Hz, 1.5 mm amplitude in each X, Y, Z axis for 2 hours					
Shock resistance:	500 ms (approx. 50 G) 3 shock in each 3 axis					
LIGHT/DARK selection:	TEACH-IN procedure					
Housing:	ABS UL 94V-O					
Lenses:	PMMA plastic (TYPE 1 ENCLOSURE)					
Protection class:	IP67					
Connections:	2 m cable ⌀ 3.5 mm / M8 4-pole connector					
Weight:	40 g. max. cable versions / 10 g. connector versions					

The adhesive label supplied with the sensor briefly describes the setting procedure and may be applied on the sensor or close to it.

SETTING

A three-step setup procedure adjusts the sensor sensitivity or operating distance and sets the LIGHT/DARK mode.
The procedure given below describes a LIGHT mode setting for C and M models and a DARK mode setting for A, B, T, F and G models.
Connecting the REMOTE TEACH-IN input to the +Vdc supply is equivalent to pressing the pushbutton.

1) Alignment

Mod. A/B/T: position the sensor and reflector on opposite sides;
Mod. C/M: place the target opposite the sensor at the maximum distance required;
Mod. F/G: position the sensors on opposite sides;

press the TEACH-IN pushbutton and keep it pressed until the yellow and green LEDs flash synchronously. The flashing rate vares according is are operating conditions; high flashing rate indicates insufficient received signal level or excessive distance: improve alignment or reduce the distance to obtain a low flashing rate.

2) Output ON state acquisition

Mod. A/B/T: place the target between sensor and reflector;
Mod. C/M: place the target opposite the sensor at the maximum distance required;
Mod. F/G: place the target between the sensors;

press the TEACH-IN pushbutton and keep it pressed until the green LED flashes. Don't move the target during this phase.

3) output OFF state acquisition

Mod. A/B/T/F/G: place no target;
Mod. C: place no target;
Mod. M: remove or further the target;

press the TEACH-IN pushbutton and keep it pressed until the green LED lights permanently ON; this means a safe operation has been obtained.
If the yellow and green LEDs flash synchronously the setup procedure has failed due to insufficient contrast; repeat the procedure from the beginning.

To set the C and M models sensor in DARK mode and the A, B, T, F and G models in LIGHT mode invert the 2 and 3 steps.

TAB.1: S40-x-A/B max. operating distance table (meters)

	REFLECTOR					
	R1	R2	R3	R4	R5	R6
-A	1,8	3.0	2.4	3.6	3.1	4.2
-B	1.5	2.5	2.0	3.2	2.7	3.5

WARRANTY
DATASENSOR S.p.A. warrants its products to be free from defects.
DATASENSOR S.p.A. will repair or replace, free of charge, any product found to be defective during the warranty period of 36 months from the manufacturing date.
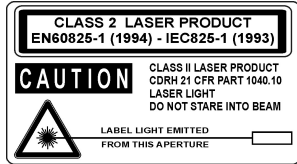This warranty does not cover damage or liability deriving from the improper application of DATASENSOR products.

DATASENSOR S.p.A. cares for the environment: 100% recycled paper.
DATASENSOR S.p.A. reserves the right to make modifications and improvements without prior notification.

826000463 Rev.C

DATASENSOR

S40-PH SERIES

CLASS 2 LASER PRODUCT
EN60825-1 (1994) - IEC825-1 (1993)

CAUTION
CLASS II LASER PRODUCT
CDRH 21 CFR PART 1040.10
LASER LIGHT
DO NOT STARE INTO BEAM

LABEL LIGHT EMITTED
FROM THIS APERTURE

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED
In the normal operating mode indicates the output status (the yellow LED ON indicates the output activation).
In the setting phase indicates the setting steps.
Please refer to the "SETTING" paragraph for procedure indications during detection or setting phases.

POWER ON LED
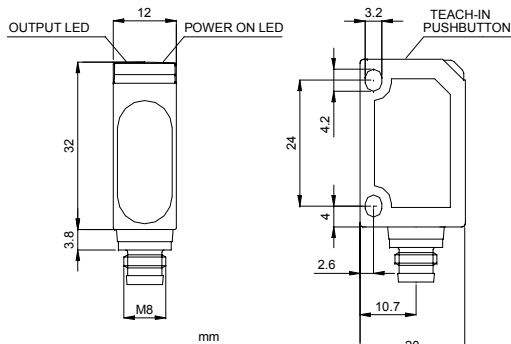The green LED signal indicates the sensor functioning. The LED blinks with the yellow LED if the detection is lacking.

SET PUSHBUTTON
A long pressure on the pushbutton activates the self-setting procedure.
The REMOTE input allows the external SET control.
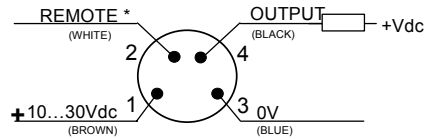
REMOTE FUNCTION

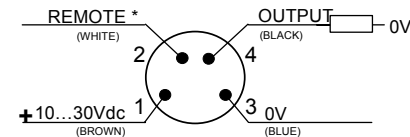The REMOTE wire connected to +Vdc is equal to pressing the SET pushbutton.

DIMENSIONS

CONNECTIONS

NPN OUTPUT

PNP OUTPUT

* Connect REMOTE wire to 0V if not used

TECHNICAL DATA

FUNCTION	Polarized retroreflex S40-PH-5-B03	Diffuse proximity S40-PH-5-C03	Background suppression S40-PH-5-M03
Power supply:	10 … 30 Vdc (reverse polarity protection)		
Ripple:	10% max		
Consumption (output current excluded):	35 mA max.		
Outputs:	NPN or PNP (short-circuit protection)		
Output current:	100 mA max.		
Output saturation voltage:	2.4 V max.		
Response time:	0.5 ms max.		
Switching frequency:	1 kHz		
Data retention:	EEPROM non volatile memory		
Indicators:	OUTPUT LED (YELLOW) POWER ON LED (GREEN)		
Setting:	TEACH-IN via pushbutton and wire		
Operating temperature:	-20 … +60 °C		
Storage temperature:	-20 … +80 °C		
Electrical protection:	Class 2		
Operating distance (minimum values):	6 m on R2 reflector 3 m on R7 reflector 1.5 m on R8 reflector	40…150 mm	20…60 mm
Emission type:	RED LASER: Class 2 EN 60825-1 Class II CDRH 21 CFR PART 1040.10 average power ≤ 1mW; Pulse = 3 us; λ = 630…680nm; Frequency =5kHz		
Ambient light rejection:	According to EN 60947-5-2		
Vibrations:	1.5 mm amplitude, 10 … 55 Hz frequency, 2 hours for each X, Y, Z axes		
Shock resistance:	500 ms (ca. 50 G) 3 shock per axis		
DARK/LIGHT selection:	automatic with fine detection setting mode		
Housing material:	ABS UL 94V-O (TYPE 1 ENCLOSURE)		
Lens material:	Methacrylic PMMA		
Mechanical protection:	IP67		
Connections:	M8 4-pole connector		
Weight:	10 g. max.		

SETTING

EASY TOUCH™
The sensor uses the patent-covered EASY TOUCH™ technology that allows a rapid and safe self-setting of the product.
Two different setting possibilities are available:
- *EASY TOUCH™;* press for 2 sec. of the SET pushbutton allows self-setting.
- *FINE DETECTION;* to be used only in particularly critical conditions. This setting procedure is used when the EASY TOUCH™ is not sufficient.

EASY TOUCH™ (standard detection)

B03 *mod.*: place sensor and reflector on opposite sides;
C03 *mod.*: place object to detect inside the operating distance;
M03 *mod.*: place the background or the object to be suppressed inside the operating range;
Press the SET pushbutton until the OUTPUT LED turns OFF, release the pushbutton: the sensor is now ready to detect all objects in the operating field.
The DARK mode is automatically selected for the B03 mod., the LIGHT mode for the C03/M03 mod.

FINE DETECTION

B03 *mod.*: insert object to detect between sensor and reflector;
C03/M03 *mod.*: place object to detect in front of the sensor at the desired distance;
Press the SET pushbutton and wait for the blinking of the OUTPUT LED, without moving the object. Release the pushbutton.
B03 *mod.*: remove object to detect;
C03 *mod.*: move away or remove the object to detect;
M03 *mod.*: place the background to be suppressed;
Press the SET pushbutton and wait for the blinking of the OUTPUT LED, without moving the object. Release the pushbutton.
The sensor selects the best operating conditions according to the acquired points and adjusts itself in the DARK mode condition for the B03 mod., or in the LIGHT mode for the C03/M03 mod.
The given acquisition sequence has to be inverted to select the opposite operating modes.
If the OUTPUT LED and the POWER ON LED blink contemporarily the detection has failed due to insufficient contrast and the procedure has to be repeated from the beginning.

826001660 Rev.00

DATASENSOR

S40-PR SERIES
INSTRUCTION MANUAL

CONTROLS

LED DI USCITA
The yellow LED the output status. (LED ON indicates the the output activation).

READY/ERROR LED
The green LED ON during functioning indicates that the received signal has a safety margin respect to the output switching value. Please refer to the "SETTING" paragraph for procedure indications during automatic setting.

POWER ON LED (S40-PR-x-G00)
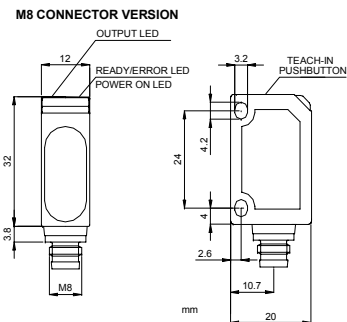The green LED signal indicates the sensor functioning.

SET PUSHBUTTON
A long pressure on the pushbutton activates the self-setting procedure. The REMOTE input allows the external SET control.
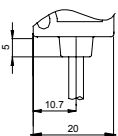
REMOTE FUNCTION

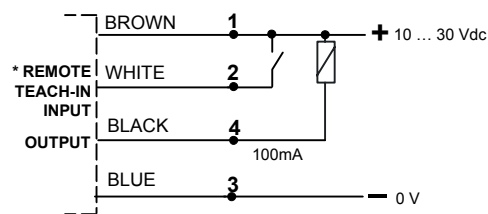The REMOTE wire connected to +Vdc is equal to pressing the SET pushbutton.
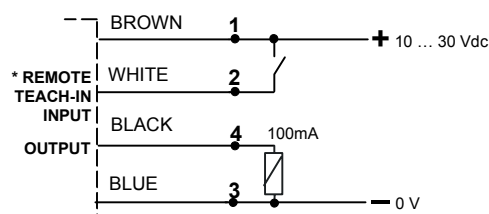
DIMENSIONS

M8 CONNECTOR VERSION

CABLE VERSION

CONNECTIONS

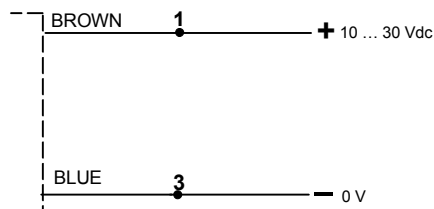### S40-PR-x-A03/B03/T03/C03/F03/M03

NPN OUTPUT
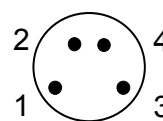

PNP OUTPUT

* Connect REMOTE wire to 0V if not used

S40-PR-x-G00

M8 CONNECTOR

TECHNICAL DATA

FUNCTION	Retroreflex S40-PR-x-A03	Polarized retroreflex S40-PR-x-B03	Retroreflex for trasparent S40-PR-x-T03	Diffuse proximity S40-PR-x-C03	Through beam S40-PR-x-FG3	Background suppression S40-PR-x-M03
Power supply:	10 … 30 Vdc (reverse polarity protection)					
Ripple:	10% max					
Consumption (output current excluded):	35 mA max.					
Outputs:	NPN or PNP, 22 KΩ pull down/up resistance (short-circuit protection)					
Output current:	100 mA max.					
Output saturation voltage:	2.4 V max.					
Response time:	0.5 ms max.					
Switching frequency:	1 kHz					
Data retention:	EEPROM non volatile memory					
Indicators:	OUTPUT LED (YELLOW) READY/ERROR LED (GREEN) POWER ON LED (GREEN) S40-x-G mod.					
Setting:	TEACH-IN via pushbutton and wire					
Operating temperature:	-20 … +60 °C					
Storage temperature:	-20 … +80 °C					
Electrical protection:	Class 2					
Operating distance (minimum values):	refer to TAB.1	0.1 … 0.7 m	0.5 … 30 cm	0.1 … 6 m		20…100 mm
Emission type:	RED (660nm)					RED (640nm)
Ambient light rejection:	According to EN 60947-5-2					
Vibrations:	1.5 mm amplitude, 10 … 55 Hz frequency, 2 hours for each X, Y, Z axes					
Shock resistance:	500 ms (about 50 G) 3 shock per axis					
DARK/LIGHT selection:	automatic with fine detection					
Housing material:	ABS UL 94V-O (TYPE 1 ENCLOSURE)					
Lens material:	Methacrylic PMMA					
Mechanical protection:	IP67					
Connections:	2 m ∅ 3.5 mm cable / M8 4-pole connector					
Weight:	40 g. max. max. cable vers. / 10 g. max. connector vers.					

SETTING

EASY TOUCH™
The sensor uses the patent-covered EASY TOUCH™ technology that allows a rapid and safe self-setting of the product.
Two different setting possibilities are available:
- *EASY TOUCH™;* press for 2 sec. of the SET pushbutton allows self-setting.
- *FINE DETECTION;* to be used only in particularly critical conditions. This setting procedure is used only when the EASY TOUCH™ is not sufficient.

EASY TOUCH™ (standard detection)
A03/B03/T03 *mod.*: place sensor and reflector on opposite sides;
C03 *mod.*: place object to detect inside the operating distance;
M03 *mod.*: place the background or the object to be suppressed inside the operating range;
FG3 *mod.*: place the sensors on opposite sides.
Press the SET pushbutton until the READY/ERROR LED turns OFF, release the pushbutton: the sensor is now ready to detect all objects in the operating field. The DARK mode is automatically selected for the A03/B03/T03/F03 mod., the LIGHT mode for the C03/M03 mod.

FINE DETECTION
A03/B03/T03 *mod.*: insert object to detect between sensor and reflector;
C03/M03 *mod.*: place object to detect in front of the sensor at the desired distance;
FG3 *mod.*: place the sensors on opposite sides, insert object to detect between sensors.
Press the SET pushbutton and wait for the blinking of the green LED, without moving the object. Release the pushbutton.
B03 *mod.*: remove the object to detect;
C03 *mod.*: move away or remove the object to detect;
M03 *mod.*: place the background to be suppressed;
FG3 *mod.*: remove object to detect
Press the SET pushbutton until the READY/ERROR LED turns OFF, release the pushbutton.
The sensor selects the best operating conditions according to the acquired points and adjusts itself in the DARK mode condition for the A03/B03/T03/F03 mod., or in the LIGHT mode for the C03/M03 mod.
The given acquisition sequence has to be inverted to select the opposite operating modes. If the OUTPUT LED and the READY/ERROR LED blink contemporarily the detection has failed due to insufficient contrast and the procedure has to be repeated from the beginning.

TAB.1: Max. operating distances for S40-PR-x-A03/B03 (meters)
REFLECTOR

	R1	R2	R3	R4	R5	R6
-A03	1.8	3.0	2.4	3.6	3.1	4.2
-B03	1.5	2.6	2.0	3.2	2.7	3.5

826001640 Rev.00