S62…B

Polarised retroreflex

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the following output status: N.O. closed and N.C. open.

STABILITY LED (green)
The green LED permantely ON indicates a stable operating condition, where the signal received has a safety margin higher than 30% respect to the output switching value. The sensor is ready to function correctly.

SENSITIVITY TRIMMER (ADJ.)
A mono-turn trimmer adjusts the sensitivity and the sensor operating distance.
See the “SETTING” paragraph for the functioning mode.

NOTE: *the maximum trimmer mechanical rotating range is equal to 240°. Do not force over the maximum e minimum positions.*

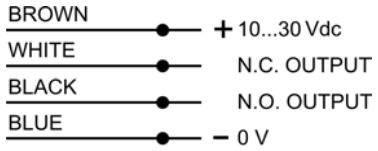
INSTALLATION

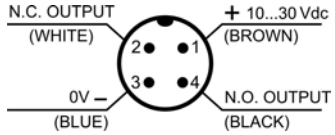
The sensor can be positioned by means of the three housing’s holes using two screws (M4x25 or longer, 1.5 Nm maximum tightening torque) with washers.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the accessories listed in the catalogue).
The operating distance is measured from the front surface of the sensor optics.
The M12 connector can be oriented at two different positions using the specific fastening spring and rotating the block of 180°.

TECHNICAL DATA

Power supply:	10 … 30 Vdc (limit values)
Ripple:	2 Vpp max.
Current consumption (output current excluded):	< 30 mA
Outputs:	PNP or NPN N.O. / N.C.; 30 Vdc max. (short-circuit protection)
Output current:	100 mA max (overload and overvoltage protection)
Output saturation voltage:	≤ 2 V
Response time:	500 µs max.
Switching frequency:	1 kHz
Indicators:	OUTPUT LED (YELLOW) / STABILITY LED (GREEN)
Setting:	mono-turn sensitivity adjustment trimmer
Operating temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	500 Vac / 1 min. between electronic parts and housing
Insulation resistance:	>20 MΩ / 500 Vdc, between electronic parts and housing
Operating distance (typical values):	0.1…8 m su R2 (EG = 2)
Emission type:	RED (640 nm)
Ambient light rejection:	according to EN 60947-5-2
Vibrations:	0.5 mm amplitude, 10 … 55 Hz frequency, for each axis (EN60068-2-6)
Shock resistance:	11 ms (30 G) 6 shocks for each axis (EN60068-2-27)
Housing material:	ABS
Lens material:	window in PMMA, lenses in polycarbonate
Mechanical protection:	IP67
Connections:	2 m ∅ 4 mm cable / M12 4-pole connector
Weight:	90 g. max. (cable version) / 40 g. max. (connector version)

CONNECTIONS



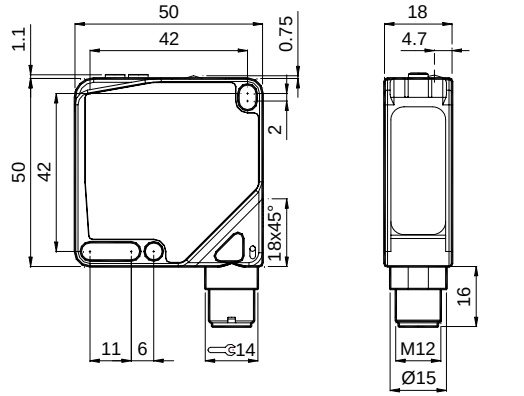


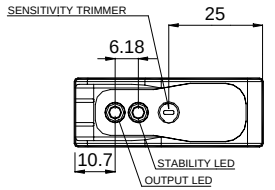
SETTING

Alignement:
- Align sensor and reflector on opposite sides at the necessary distance.
- Rotate in the clockwise direction the sensitivity adjustment trimmer (ADJ.) to maximum level.
- Moving the sensor vertically and horizontally, establish the powering and turning off of the yellow LED (OUT) and fix the sensor at in the middle. The best alignment is obtained in the following condition: yellow LED permanently OFF and green LED permanently ON.

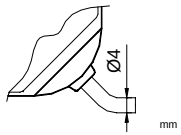
Control:
- Place the target between the sensor and the reflector. Control that the yellow LED turns ON.
- Remove the target and control that the yellow LED turns OFF again.

DIMENSIONS





CABLE VERSION



EX-II-3D T6

Temperature class:	T6 (<85°C)
Max. Power consumpti	540 mW at 30 Vdc
Max. Internal capacitar	100 nF
Internal inductance:	negligible

DECLARATION OF CONFORMITY
We DATASENSOR S.p.A. declare under our sole responsibility that these products are conform to the 2004/108 CEE, 73/23 CEE Directives and successive amendments.

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.

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826003020 Rev.00

S62…M

Background suppression

INSTRUCTION MANUAL

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates that the N.O. output is closed and the N.C. output is open.

STABILITY LED (green)
When permanently ON, the green LED indicates a normal operating condition where the received signal has a safety margin superior to 30% respect to the output switching value. The sensor is ready to function correctly (stability condition).

DISTANCE ADJUSTMENT TRIMMER (ADJ.)
A 6-turn trimmer allows the background suppression distance adjustment through a mechanical variation of the optic triangulation angle.
The operating distance increases, rotating the screws in a clockwise direction.
Please refer to the “SETTING” paragraph for acquisition or setup procedure indications.

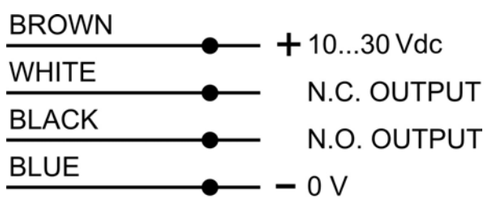
POSITION INDICATOR
This indicator presents a scale numbered from 1 to 6 that allows a precise adjustment of the suppression distance in the entire operating range.
Please refer to the “SETTING” paragraph for use indications.

TIMER ADJUSTMENT TRIMMER (only. M05/M15/M25/M35 vers.)
This control allows to vary the output delay deactivation from 0 to 1 sec.
Please refer to “TIMER FUNCTIONS” paragraph for use indications.

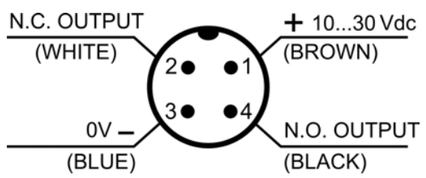
INSTALLATION

The sensor can be positioned by means of the three housing’s holes using two screws (M4x25 or longer, 1.5Nm max. tightening torque) with washers.
Various orientable fixing brackets to ease the sensor positioning are available (please refer to the general catalogue).
The operating distance is measured from the front surface of the sensor optics.
The M12 connector can be oriented at two different positions using the specific fastening spring and rotating the block of 180°.

CONNECTIONS



M12 connector



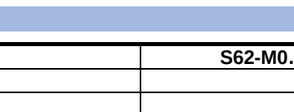
TECHNICAL DATA

	S62-M0…	S62-M1…	S62-M2…	S62-M3…
Power supply:	10 … 30 VDC			
Ripple:	2 Vpp max.			
Consumption (output current excluded):	40 mA max.			
Outputs:	PNP or NPN N.O./N.C.; 30 Vdc max. (short-circuit protection)			
Output current:	100 mA (overload and overvoltage protection)			
Output saturation voltage:	≤ 2 V			
Response time:	500 µs		1 ms	1,5 ms
Switching frequency:	1 kHz		500 Hz	330 Hz
Emission type:	RED (660 nm)	INFRARED (880 nm)		
Spot dimension:	6x6 mm (at 200 mm)	15x15 mm (at 400 mm)		200x200 mm (at 2000 mm)
Operating distance (typical values):	30…300 mm	60…600 mm	60…1200 mm	200…2000 mm *(recommended target 400x400mm)*
Adjustment:	Multiturn distance adjustment trimmer / Timer adjustment trimmer (only M05/M15/M25/M35 vers.)			
Difference (90% white / 4% black):	< 8 %	< 12 %	< 25 %	< 30 %
Hysteresis (90% white):	< 5 %			< 20 %
Indicators:	OUTPUT LED (YELLOW) / STABILITY LED (GREEN)			
Operating temperature:	-10 … 55 °C			
Storage temperature:	-20 … 70 °C			
Dielectric strength:	500 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 each axis (EN60068-2-6)			
Shock resistance:	11 ms (30 G) 6 shock for each axis (EN60068-2-27)			
Housing material:	ABS			
Lens material:	PMMA window; PC lens			
Mechanical protection:	IP67			
Connections:	2 m cable ∅ 4 mm / M12 4-pole connector			
Weight:	90 g. max. cable vers. / 40 g. max. connector vers.			

SETTING

Suppression distance setting

1. *Object detection*
Position object to detect in front of the sensor at the distance required.
Turn distance adjustment trimmer (ADJ) to minimum: yellow LED OFF and green LED ON.



Rotate trimmer in a clockwise direction until the yellow LED and green LED turn ON. *Object detection condition* (A status of position indicator)

A

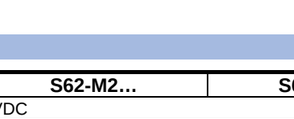
2. *Background suppression*
Remove object and ensure that the background is in front of the sensor: yellow LED OFF and green LED ON.

Rotate trimmer in a clockwise direction until the yellow LED and green LED turn ON: *background detection condition* (B status of position indicator).

B

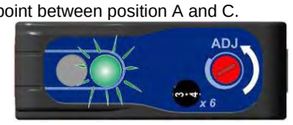
The trimmer reaches maximum level with yellow LED OFF if the background is outside the operating range.

Rotate trimmer in an anticlockwise direction until yellow LED turns OFF and green LED ON: *condition where background is outside operating range* (C status of position indicator).



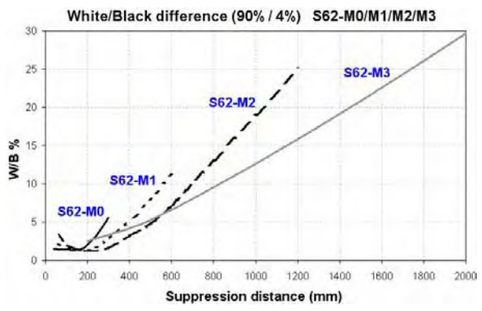
C

3. *Setting and control*
Rotate trimmer in an anticlockwise direction until the indicator reaches an intermediate point between position A and C.

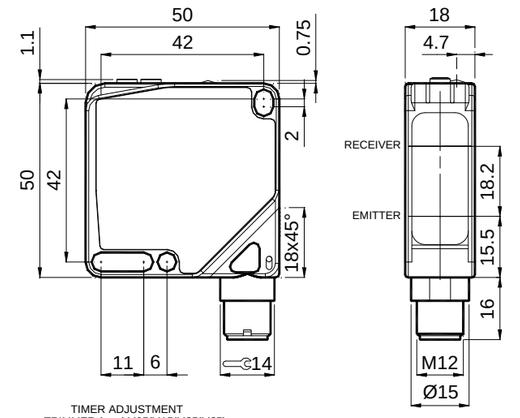


If position A and C are close to each other, leave trimmer on position C.
The sensor is now ready to function correctly and in stable conditions:

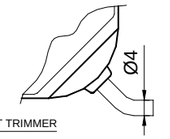
DIAGRAMMA DI RILEVAZIONE



DIMENSIONS

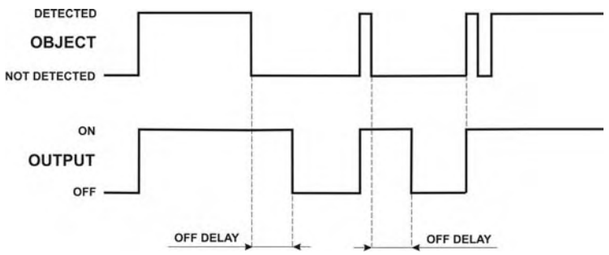


CABLE VERSION



TIMER FUNCTION (S62…M05/M15/M25)

The timer function allows to adjust the output deactivation delay when the object is outside the detection area. The delay extends the output activation allowing the slower interface systems to detect shorter pulses.



The delay adjustment is carried-out manually using the Timer adjustment trimmer. Clockwise rotation increase the delay from 0 to a max. 1 sec. value.

	EX-II-3-D T6	
	Temperature class:	T6 (<85°C)
	Max. Power consumption:	1260 mW at 30 Vdc
	Max. Internal capacitance:	130 nF
	Internal inductance:	negligible

DECLARATION OF CONFORMITY
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WARRANTY
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826002872 Rev.D

S62-PL…B Laser

Polarised retroreflex

INSTRUCTION MANUAL

CLASS 2 EN 60825-1 (1994)
LASER PRODUCT

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the following output status: N.O. closed and N.C. open.

POWER ON LED (green)
The green LED ON indicates the sensor powering status and laser emission presence.

SENSITIVITY TRIMMER (ADJ.)
Monoturn trimmer that adjusts the sensitivity and thus the sensor operating distance.
Please refer to "SETTING" paragraph for the correct use procedure.

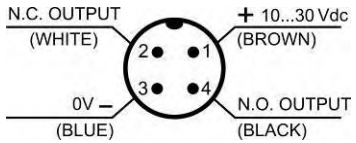
WARNING: *the maximum mechanical trimmer rotation is equal to 240°. Do not apply excessive torque over the maximum and minimum positions.*

INSTALLATION

The sensor can be positioned by means of the three housing's holes using two screws (M4x25 or longer, 1.5 Nm maximum tightening torque) with washers.
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.
The M12 connector can be oriented at two different positions using the specific fastening spring and rotating the block to 180°.

CONNESSIONS

M12 connector

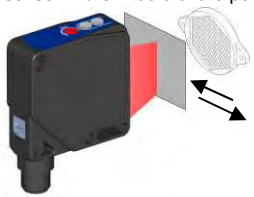


TECHNICAL DATA

Power supply:	10 … 30 Vcc
Ripple:	2 Vpp max.
Consumption (output current excluded):	30 mA max
Outputs:	PNP or NPN N.O. / N.C.; 30 Vdc max. (short-circuit protection)
Output current:	100 mA max (overload and overvoltage protection)
Output saturation voltage:	≤ 2 V
Response time:	200 µs
Switching frequency:	2.5 kHz
Emission type:	RED LASER (λ = 645…665 nm): Class 2 EN 60825-1 (1994), Class II CDRH 21 CFR PART 1040.10 Pulsed emission: pot. max ≤ 5 mW; pulse duration = 5 µs; frequency max = 32 KHz
Operating distance (typical values):	refer to TAB.1
Min. detectable object dimension:	0.5 mm at 0.5m (minimum spot)
Indicators:	OUTPUT LED (YELLOW) / POWER ON LED (GREEN)
Setting:	Monoturn sensitivity adjustment trimmer
Functioning temperature:	-10 … 55 °C
Storage temperature:	-20 … 70 °C
Dielectric strength:	500 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:	ABS
Lens material:	PMMA window, polycarbonate lenses
Mechanical protection:	IP67
Connections:	M12 4-pole connector
Weight:	40 g. max.

SETTING

Alignment:
- Position the sensor and reflector aligned on opposite sides at the desired distance.
- Turn to maximum the sensitivity adjustment trimmer (ADJ.) (clockwise).
- Determine the powering on and powering off points of the yellow LED (OUT) by moving vertically and horizontally the sensor and mount the sensor in the middle of the points found.



Control:
- Enter laterally the object inside the operating field and control that the yellow LED turns on.
- Remove the object and check that the yellow LED turns off immediately

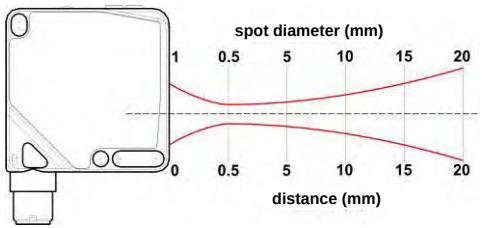
PERFORMANCES

TAB.1: Operating distances (m)

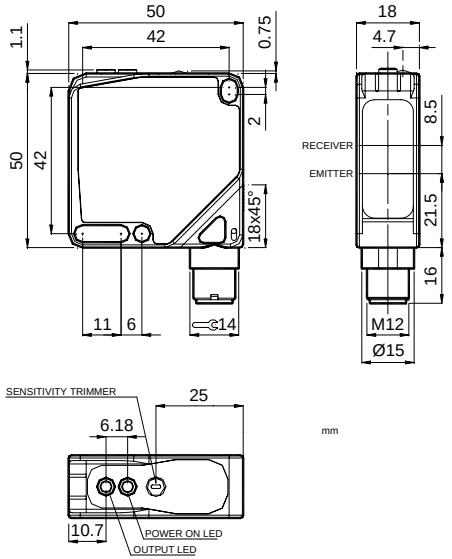
REFLECTOR

R1	R2	R6	R7 /R20	R8
0.3 … 16	0.3 … 20	0.4 … 22	0.3 … 22	0.2 … 2

Note: The use of the RT 3970 reflecting tape is not suggested.



DIMENSIONS



SAFETY PRECAUTIONS

All the electric and mechanical safety regulations have to be respected during sensor functioning.
The sensor has to be protected against mechanical damage.
Apply the labels supplied in a visible position near the laser emission beam.
Do not stare directly into the laser beam!
Do not point the laser beam towards people!
Eye irradiation superior to 0.25 seconds is dangerous.
Please refer to the Class 2 Standard (EN60825-1).
These sensors can not be used for safety applications!

EX-II-3D T6

Temperature class:	T6 (<85°C)
Max. Power consumption:	800 mW at 30 Vdc
Max. Internal capacitance:	100 nF
Internal inductance:	negligible

DECLARATION OF CONFORMITY
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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.
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826003251 Rev.B

S62-PL…M Laser

Background suppression

INSTRUCTION MANUAL

CLASS 2 EN 60825-1 (1994)
LASER PRODUCT

CONTROLS

OUTPUT LED (yellow)
The yellow LED ON indicates the output status: N.O. closed and N.C. open.

POWER ON LED (green)
The green LED ON indicates the sensor powering status and laser emission presence.

DISTANCE ADJUSTMENT TRIMMER (ADJ.)
The multiturn trimmer with clutch (6 turn) adjusts the suppression distance through the mechanical variation of the optic triangulation angle.
The operating distance increases rotation the trimmer shaft in a clockwise direction.
Please refer to “SETTING” paragraph for the correct use procedure.

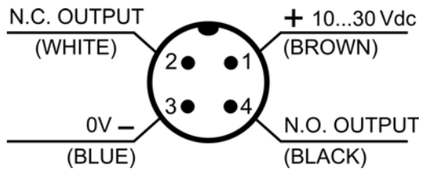
POSITION INDICATOR
This indicator has a scale numbered from 1 to 6 that allows the precise adjustment of the suppression distance on the entire operating range.
Please refer to “SETTING” paragraph for the correct use procedure.

INSTALLATION

The sensor can be positioned by means of the three housing’s holes using two screws (M4x25 or longer, 1.5 Nm maximum tightening torque) with washers.
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.
The M12 connector can be oriented at two different positions using the specific fastening spring and rotating the block to 180°.

CONNECTIONS

M12 connector



TECHNICAL DATA

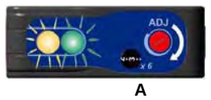
	S62-PL-M01…	S62-PL-M11…
Power supply:	10 … 30 VDC	
Ripple:	2 Vpp max.	
Consumption (output current excluded):	30 mA max	
Outputs:	PNP or NPN N.O. / N.C.; 30 VDC max. (short-circuit protection)	
Output current:	100 mA (overload and overvoltage protection)	
Output saturation voltage:	≤ 2 V	
Response time:	140 µs	200 µs
Switching frequency:	3.5 kHz	2.5 kHz
Emission type:	RED LASER (λ = 645…665nm): Class 2 EN 60825-1 (1994), Class II CDRH 21 CFR PART 1040.10 Pulsed emission: pot. max ≤ 5mW; pulse duration = 5µs; frequency = 14KHz (mod. M01) / 10KHz (mod. M11)	
Focalisation point :	60 mm	150 mm
Spot dimension:	< 0.2 mm (at 60 mm)	< 0.4 mm (at 150 mm)
Operating distance (typical values):	30…150 mm	50…350 mm
Adjustment:	4-turn distance adjustment trimmer	6-turn distance adjustment trimmer
Difference (90% white/ 4% black):	< 4 % (see DETECTION DIAGRAM)	
Hysteresis (90% white):	< 1 %	
Indicators:	OUTPUT LED (YELLOW) / POWER ON LED (GREEN)	
Functioning temperature:	-10 … 55 °C	
Storage temperature:	-20 … 70 °C	
Dielectric strength:	500 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 each axis (EN60068-2-6)	
Shock resistance:	11 ms (30 G) 6 shock for each axis (EN60068-2-27)	
Housing material:	ABS	
Lens material:	PMMA window; PC lens	
Mechanical protection:	IP67	
Connections:	M12 4-pole connector	
Weight:	40 g. max.	

SETTING

Suppression distance setting

1. *Object detection*
Position object to detect in front of the sensor at the distance required.
Turn distance adjustment trimmer (ADJ) to minimum: yellow LED OFF and green LED ON.

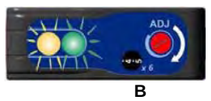
Rotate trimmer in a clockwise direction until the yellow LED and green LED turn ON. *Object detection condition* (A status of position indicator).



A

2. *Background suppression*
Remove object and ensure that the background is in front of the sensor: yellow LED OFF and green LED ON.

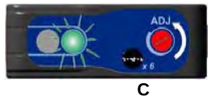
Rotate trimmer in a clockwise direction until the yellow LED and green LED turn ON: *background detection condition* (B status of position indicator).



B

The trimmer reaches maximum level with yellow LED OFF if the background is outside the operating range.

Rotate trimmer in an anticlockwise direction until yellow LED turns OFF and green LED ON: *condition where background is outside operating range* (C status of position indicator).

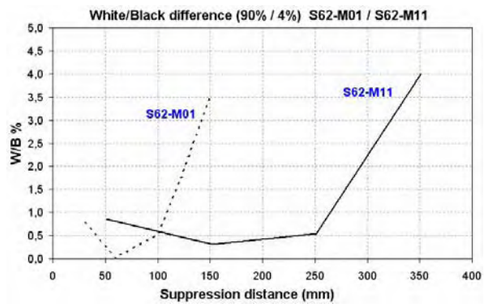


C

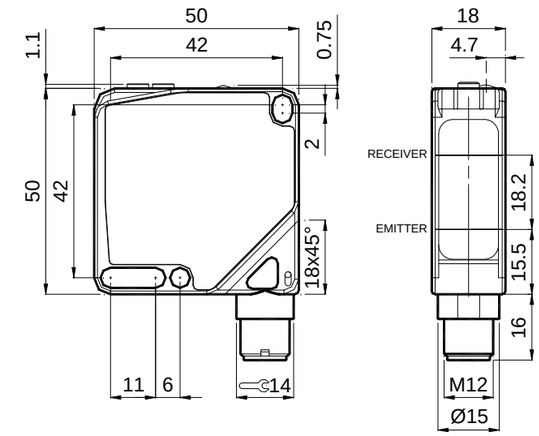
3. *Setting and control*
Rotate trimmer in an anticlockwise direction until the indicator reaches an intermediate point between position A and C.

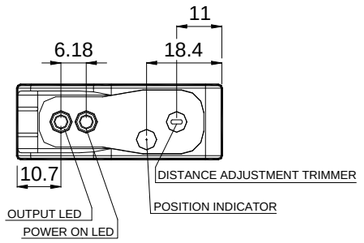
If position A and C are close to each other, leave trimmer on position C.
The sensor is now ready to function correctly and in stable conditions.

DETECTION DIAGRAM



DIMENSIONS





mm

SAFETY PRECAUTIONS

All the electric and mechanical safety regulations have to be respected during sensor functioning.
The sensor has to be protected against mechanical damage.
Apply the labels supplied in a visible position near the laser emission beam.

Do not stare directly into the laser beam!
Do not point the laser beam towards people!
Eye irradiation superior to 0.25 seconds is dangerous. Please refer to the Class 2 Standard (EN60825-1).
These sensors can not be used for safety applications!

EX-II-3-D T6	
Temperature class:	T6 (<85°C)
Max. Power consumption:	800 mW at 30 Vdc
Max. Internal capacitance:	100 pF
Internal inductance:	negligible

DECLARATION OF CONFORMITY
We DATASENSOR S.p.A. declare under our sole responsibility that these products are conform to the 2004/108/CE, 2006/95/CE Directives and successive amendments.

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.

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http://www.datasensor.com e-mail: info@datasensor.com

826003241 Rev.B

S62…Y

Micrometric Distance Meter

INSTRUCTION MANUAL

DECLARATION OF CONFORMITY

We

DATASENSOR S.p.A.
Via Lavino, 265
40050 Monte San Pietro
Bologna - Italy

declare under our sole responsibility that the product(s)

S62-PX-X-XXX-XX, PHOTOELECTRIC SENSOR AND ALL ITS MODELS

To which this declaration relates in conformity with the following standard(s) or other normative document(s)

EN 60947-5-2, OCTOBER 1998:
LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR. PART 5: CONTROL CIRCUIT DEVICES AND SWITCHING. SECTION 2: PROXIMITY SWITCHES

CEI EN 60947-5-2/A1, JUNE 2000
CEI EN 60947-5-2/A2, JULY 2005

IEC 61000-6-2, JANUARY 1999:
ELECTROMAGNETIC COMPATIBILITY (EMC).
PART 6-2: GENERIC STANDARDS – IMMUNITY FOR INDUSTRIAL EVIRONMENTS

EN 55011, MAY 1998:
INDUSTRIAL, SCIENTIFIC AND MEDICAL (ISM) RADIO-FREQUENCY EQUIPMENT
RADIO DISTURBANCE CHARACTERISTICS
LIMITS AND METHODS OF MEASUREMENT

Following the provision of the Directive(s):

2004/108 CEE (EMC), 73/23 CEE (LV) AND SUCCESSIVE AMENDMENTS, 93/68 CEE.

Monte San Pietro 24/11/2006

Giuseppe De Maria

Quality Assurance

UNI EN ISO 9001 UNI EN ISO 14001

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1. General description

S62Y is a red laser light emitting optic sensor for contactless distance measurement.
It is equipped with analogue outputs (0..10 V voltage outputs or 4..20 mA current outputs, depending on the model), one digital output, one alarm output and a half-duplex RS485 interface.
Two S62…Y sensors may be combined to achieve differential direct detection, for such applications as thickness determination.

The RS485 interface supports up to eight S62…Y sensors connected to a single half-duplex RS485, which may be controlled like common addressable peripherals.

1.2. Key features

- Operating range: 40…120 mm
- Two digital outputs (Output and Alarm)
- 4..20 mA analogue output for S62-PL-5-Y03-PIZ version
- 0..10 V voltage output for S62-PL-5-Y03-PVZ version
- User interface with two buttons and three LEDs
- Overall dimensions 50x50x18 mm
- Resolution lower than 50 µm throughout the measurement range
- Half-duplex RS485 interface capable of managing several bus sensors (max. 8)
- Programmable serial transmission baud rate and time delays

1.3. Operating principle

The S62…Y sensor uses optical triangulation to determine the position of the target object: when the laser beam is reflected from the object to the receiver, spot position is digitally processed to calculate object position.

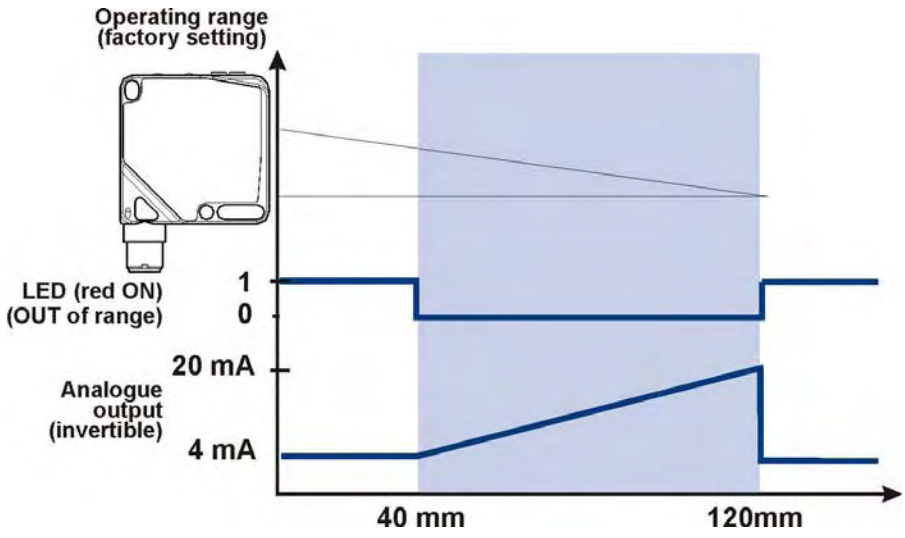
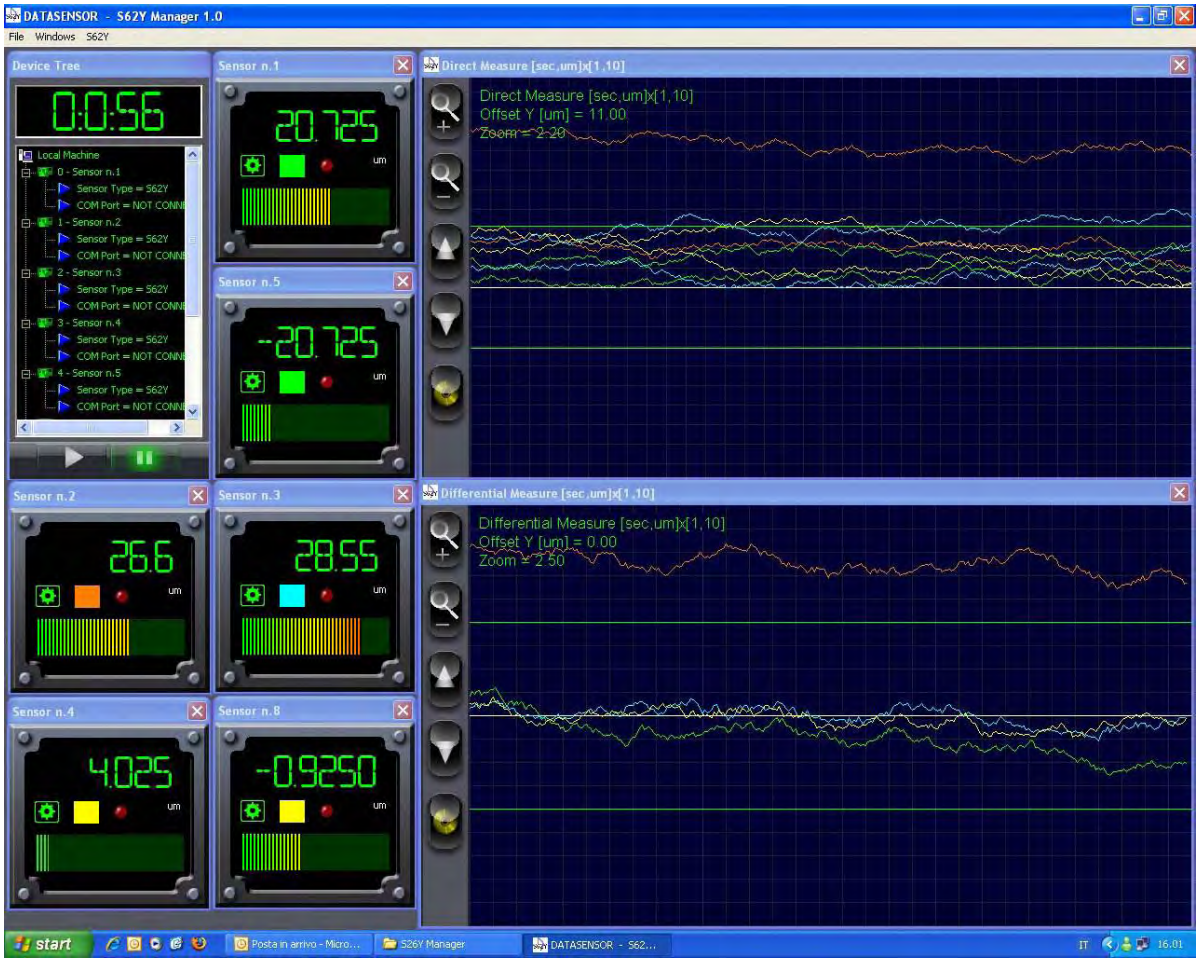


Fig. 1

1.4. S62Y Manager

Developed alongside the product to ensure intuitive, fast operation, the **S62…Y Manager** control interface enables even less expert users to set up complex applications using one or more S62…Y sensors, making use of the advanced features available through the serial interface.



The software is available on the CD-ROM enclosed with the product and includes exhaustive on-line help.
It operates in the Windows 2000/XP/Vista environment.

Special features:

- Manages several sensors at the same time
- Measurement indicator with figures and graphic display
- Differential detection/reading comparison between pairs of sensors
- Data plotting to time vs. distance XY graph
  (graph display may be turned on/off by user)
- Graph windows may be saved in image format
- Acquired data may be saved in ASCII format
- Data may be saved to a binary meta-format file
- Event management and ASCII LOG file (alarms)
- The graphic structure makes the software easy to control through a touch-screen display.

2. DIRECTIONS FOR INSTALLATION

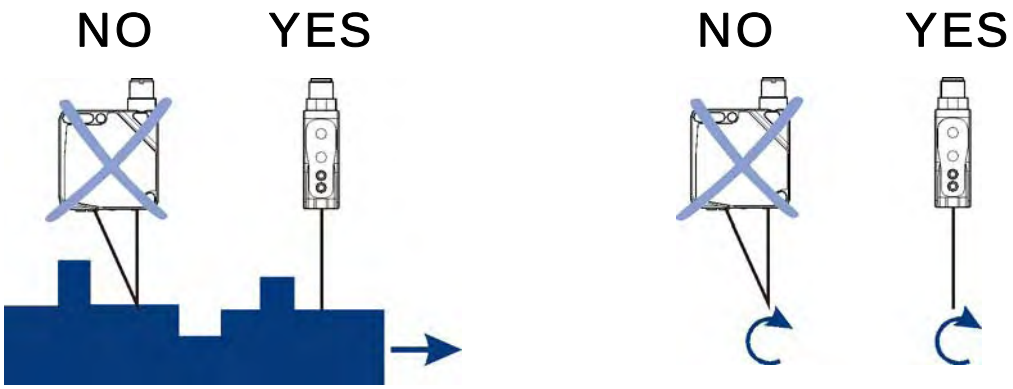
The S62…Y sensor must be installed using suitable anti-vibration mounts to ensure the greatest possible measurement accuracy.

2.1. Set-up and alignment

Rotate the mobile connector into the ideal position for installation; the cable should be free and not stretched taut. Use the suitable brackets (see paragraph 8 “Accessories”) to fix the sensor. The angles specified in the following paragraph must be observed.
Use the pre-drilled mounting holes only

2.2. Positioning the sensor with respect to the target object

The (actual or tangent) measurement plane of the object must always be kept the most perpendicular possible to the optical axis of sensor S62…Y as shown in Fig.2:



Linear movement *Rotary movement*

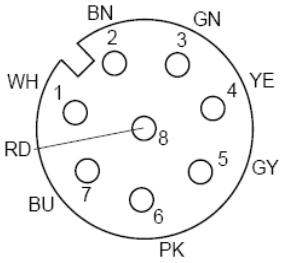
Fig. 2

Sensor S62…Y is now ready to operate.

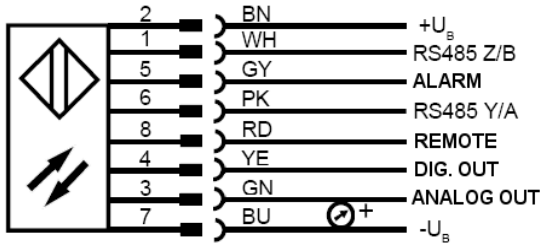
3. DIRECTIONS FOR ELECTRICAL INSTALLATION

Warning: Pins 1 and 6 are not short-circuit protected, do not connect them to power supply.

Sensor S62Y is equipped with an 8-pole M12 connector: Plug in the female connector making sure to match the key and then tighten the ring nut firmly.



Illustr. 9 Pin assignment



Illustr. 10 Connection diagram

Description of connections (for colours, please refer to the DATASENSOR cable).

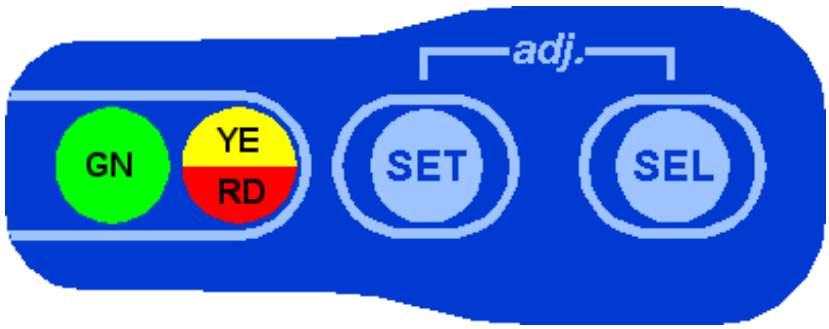
Connection	Colour	Purpose	Notes
1	White	RS485 (TXB/-)	Not protected
2	Brown	+VDC	18..30VDC
3	Green	Analogue out	0..10V (PVZ) 4..20mA (PIZ)
4	Yellow	Digital output	Short-circuit protected
5	Grey	Alarm	Short-circuit protected
6	Pink	RS485 (TXA/+)	Not protected
7	Blue	GND	-
8	Red	Remote	Input, 0..30VDC

Once powered, the sensor runs a set-up routine that takes about one second and then starts taking measurements.

The 4..20 mA current analogue output meets industry-standard load requirements and is rated for 0 to 500 Ω loads. For the 0..10V voltage analogue output, we recommend using high-impedance load (e.g. 470 kΩ).

4. USER INTERFACE

4.1. General meaning of LED status during operation



The following table provides an overview of the meanings of the different LEDs during normal sensor operations, that is when not in programming mode.

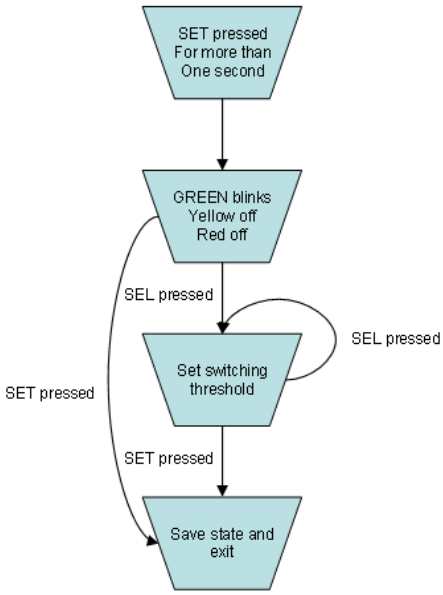
LED	ON	OFF
Red	Target outside range	Good target
Yellow	Digital output ON	Digital output OFF
Green	Emission ON	Emission OFF

The meaning of the LEDs during programming is discussed at the following paragraphs.

This is a Class 2 laser system and eye protection is normally ensured by the body's protective responses, including the blink reflex. However, never stare into the laser beam.

4.1.1. SET

Allows the selection of the switching threshold for the digital output.



1. Press the *SET* push-button for more than one second. The sensor enters in the switching threshold setting mode; this is indicated by the green LED flashing (laser emission stops).

2. Make sure the target is at the desired distance and press the *SEL* push-button. The sensor takes carries-out a set of measurements to determine the switching threshold.

3. To set a new switching threshold without saving the last acquisition, simply repeat step 2.

4. To save the last acquisition, press SET until the green LED remains steady. At that point, the sensor will return to normal operation.

4.1.2. SEL

Allows the selection of the master or slave mode.
It functions as a general system reset. Once setting the slave mode, using the push-buttons, the device acquires a “000” address and waits for commands from RS485 (it exits from the continuous transmission mode on RS485).

1. Press *SEL* for more than one second. The sensor enters in the master/slave selection mode, indicated by the yellow blinking LED.
   The Slave mode is selected and the green LED turns off.

2. The master mode is accessed by pressing the *SEL* push-button, and it is signalled by the powering of the green LED.

3. To change modes without saving, simply repeat step 2.

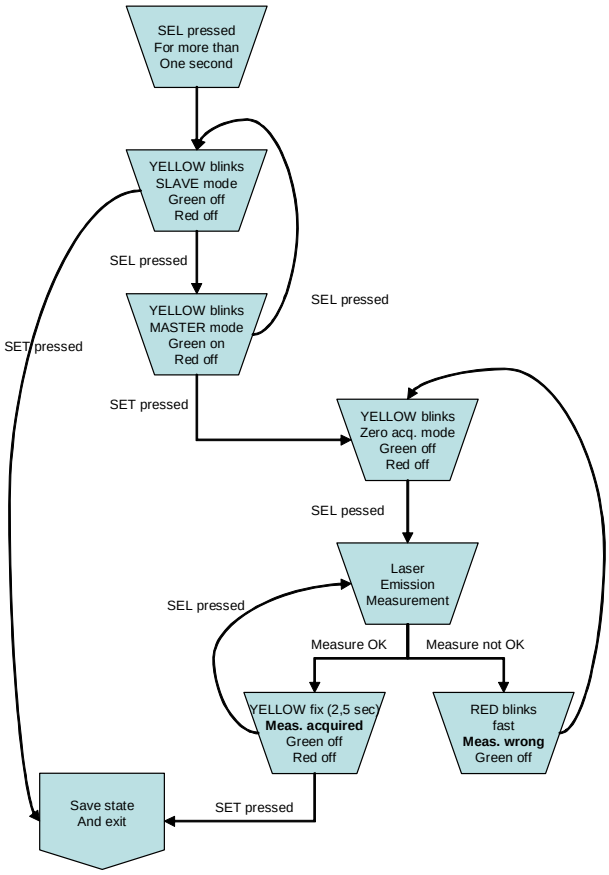
4. Pressing *SET* when the device in the slave mode (green LED off) the status is saved and the sensor returns to normal functioning. Whereas, pressing *SET* while the sensor is in the master mode the sensor acquires the zero level (yellow LED blinking).

5. Pressing *SEL* the master sensor acquires the zero level after performing different measurements and interrogating the slave sensor. If the measurement procedure has been successful, the yellow LED will turn on for 2.5 seconds. In case of measurement errors (missing communication, out of range, etc.) the red LED will blink very quickly.

6. If the measurement fails, the device can carry-out the previous step again. If successful the measurement can be acquired again or the save the status by pressing *SET*.

7. Press *SET* to save the status and the zero level and the sensor begins to function in the master/ slave mode.

When you enter the master/slave mode selection menu, the sensor enters in the slave mode. Some the information previously set (device address, continuous transmission mode, M/S differential operation) may be lost.



4.1.3. SET+ SEL (adj.)

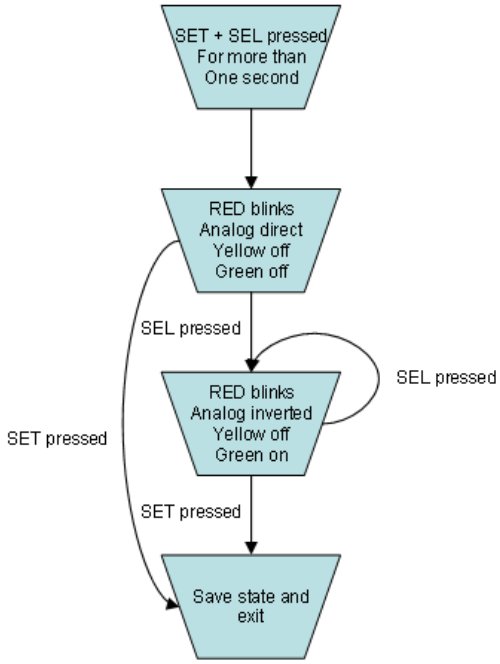
Allows to select the measurement analogue output ratio (analogue output reversal).

1. Press the *SEL* and *SET* push-buttons for more than one second. The sensor enters in the measurement analogue output ratio selection mode. This is indicated by the red LED blinking. The status of the yellow LED indicates the current ratio: Off indicates a positive gradient, On indicates a negative (inverted) gradient.

2. The ratio may be changed by pressing the *SEL* push-button to toggle between positive and negative gradients. Current selection is indicated by the yellow LED.

3. To change modes without saving, simply repeat step 2.

4. The last setting can be saved by pressing SET until the green LED stays remains steadily ON. At that point, the sensor resumes operation in the selected mode.



It is important to provide stable power supply while programming the sensor. A power failure during automatic saving of the settings could damage the sensor.

5. STAND-ALONE MASTER/SLAVE FUNCTIONING

Two S62Y sensors are connected together in this mode and the analogue output of one (master) supplies the thickness variation (differential measurement) of the objects that move between the sensors respect to a zero condition.

The sensors can be installed even with overlapping measurement fields. The object must have the necessary thickness to guarantee that both sides are included in the measurement field of both sensors (refer to Fig. 3).

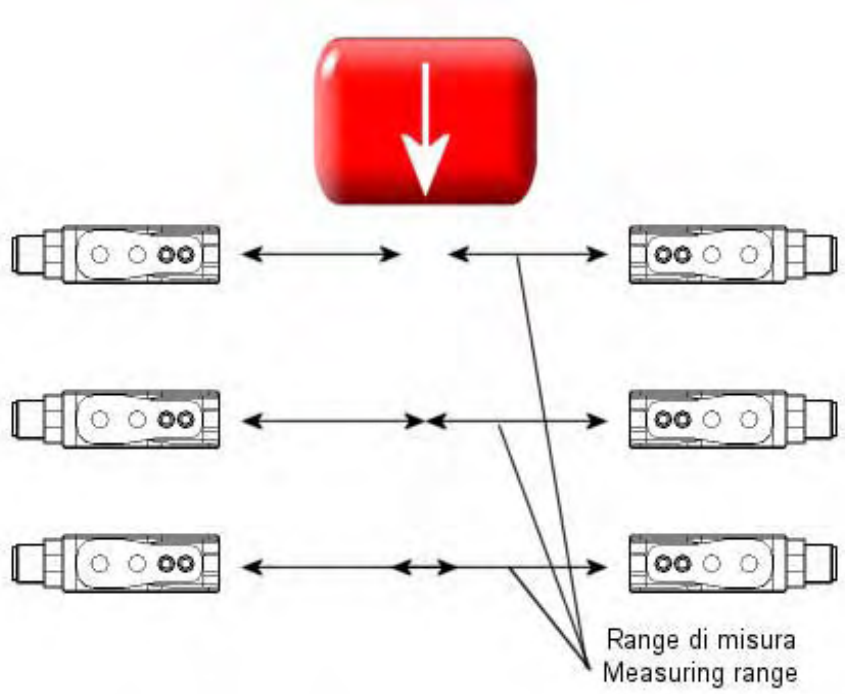


Fig. 3

The best performances are obtained when the object to measure is in the middle of the two measurement range.

5.1. Installation

Mount the two S62Y sensors as explained in Charter 2 and connect as shown in Fig. 4. Set one of the two sensors in the master mode as explained in paragraph 4.1.2.

The master sensor's analogue output represents the differential measurement of the thickness of the moving object. In the reference condition, i.e. when an object, with a thickness equal to the one detected during the set-up procedure, the analogue output of the master sensor reaches the middle value of the range (about 5V in the PVZ version and about 12 mA in the PIZ version).

The analogue output variations follow the thickness variation of the objects that pass respect to the reference condition.

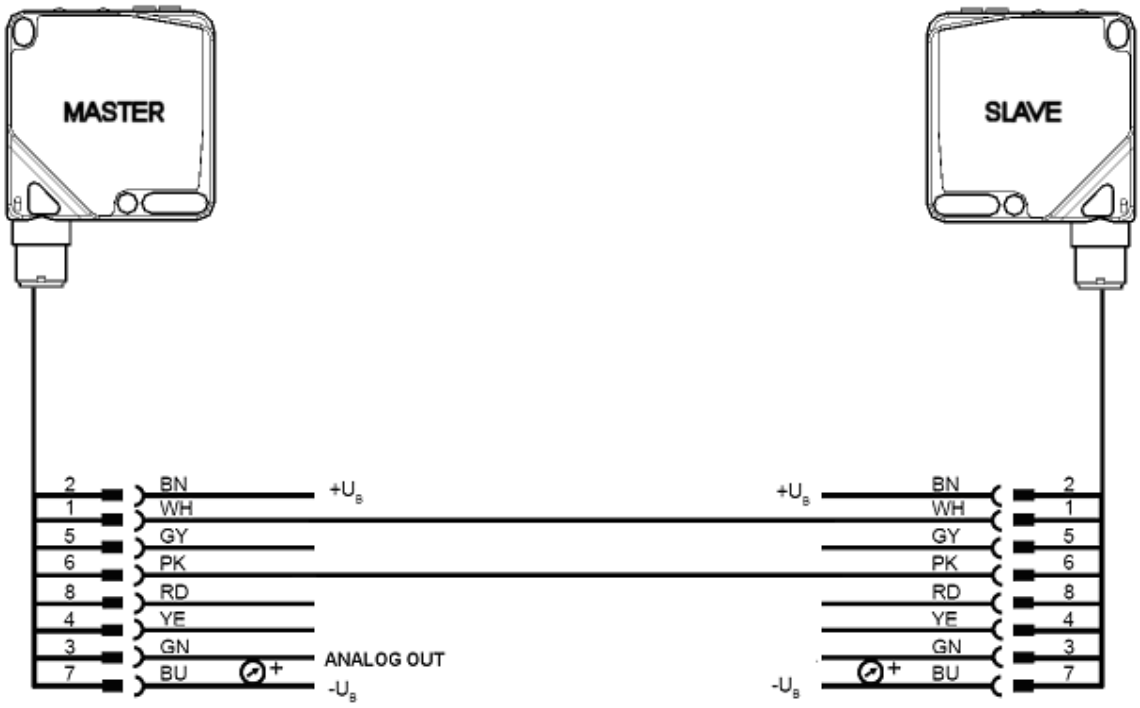


Fig. 4

5.2. Notes

The master/SLAVE functioning requires a continuous query of the SLAVE sensor through the RS485 serial interface. Environmental disturbances can jeopardize electrically the communication bus and the communication between the two sensors can be disturbed.

The master sensor can detect disturbances on the serial communication, signalling the condition with a red LED blinking during normal functioning. If the blinking is continuous, we suggest to power off the sensors, control the connections and re-power the system.

6. FUNCTIONS ACCESSIBLE VIA RS485

Sensor S62…Y features an industry-standard EIA/TIA-485 serial interface, also known as RS485. Half-duplex communication permits several sensors (up to 8) to be connected to the same bus at the same time.
Besides permitting several reading modes for measured data, the serial interface gives access to programming mode and many other auxiliary sensor functions, as outlined in the following paragraphs.

6.1. Protocol definition

As can be seen from the table below, each packet transmitted and received by the sensor is made up of four bytes:

A **HEADER** byte that contains information on command type, packet sender and sender or receiver address
Two (**HIGH** and **LOW**) bytes that may contain different information depending on the type of payload (measurement, programming parameter, etc.)
A **CRC** byte enables both sensor and host to check for packet integrity. This CRC has been defined as follows (XOR of column bits):

$CR_n = HDR_n \oplus H_n \oplus L_n$

1	C_2	C_1	C_0	M/S	AD_2	AD_1	AD_0	**HDR**
0	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7	**H**
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0	**L**
0	CR_6	CR_5	CR_4	CR_3	CR_2	CR_1	CR_0	**CRC**

Each sensor on the RS485 bus is identified by an address. The default, factory-set address for all sensors is “000” and it is the user's responsibility to set a specific address for each sensor.
Depending on whether the M/S bit identifies the transmission as coming from a master element (command) or a slave element (command response), the address denotes packet receiver and source, respectively.

When implementing the bus connection as shown in the figure below, we recommend keeping the RS485 connection between individual sensors and main bus as short as possible.
For main line termination issues, please refer to the EIA/TIA-485 standard.

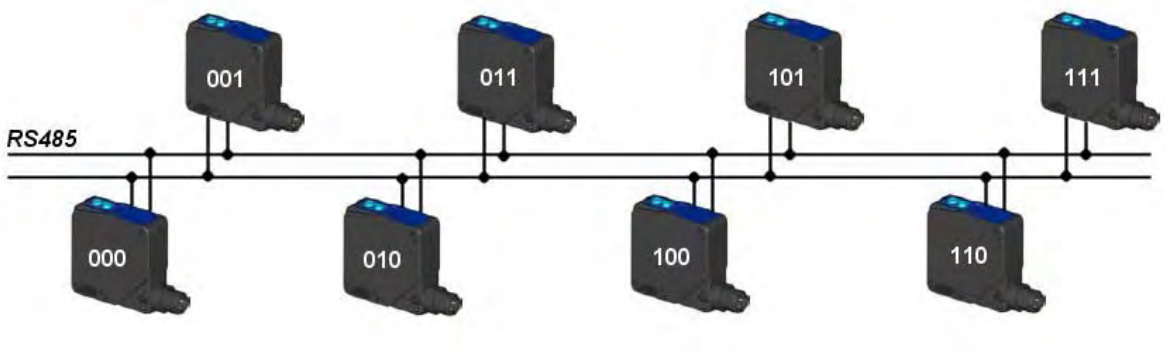


Fig. 3

6.2. Commands

The commands available via serial connection are outlined below. Please note that the CRC byte of each command is not specified, but it must be calculated and included in each packet sent and received.

6.2.1. On-demand measurement reading

This command submits an asynchronous query to the sensor and transmits the last measurement taken before the query to RS485. Command structure is as follows:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	0	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	X	X	X	X	X

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device

Note: The devices returns a 14-bit value that represents the last measurement taken before answering the query.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	0	0	0	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0

$A_{2..0}$: current address of device
$D_{13..0}$: result in tens of µm (14-bit), ranging from 0 to 8000

The 14 bits of the returned value represent measured distance from the target; the unit of measurement is 10 µm, the measurement is expressed in absolute value using working range offset (40 mm) as zero point. If the target is outside the measurement range (i.e. at a distance greater than 120 mm or lower than 40 mm with respect to sensor front plane), the sensor provides a measurement value of 0 (as shown in the figure below).

This is the recommended mode of operation when two or more sensors are connected to the bus.

6.2.2. Changing device address

As mentioned above, all devices are assigned the default “000” address at the factory. When using more sensors on the same bus, the address of each device must be modified by individually connecting each device to a PC via the RS485 interface and using the command outlined below.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	0	1	1	OA_2	OA_1	OA_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	X	X	A_2	A_1	A_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$OA_{2..0}$: current address of device
$A_{2..0}$: new address of device

Note: The device responds sending back the new address according to the following diagram.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	0	1	0	A_2	A_1	A_0

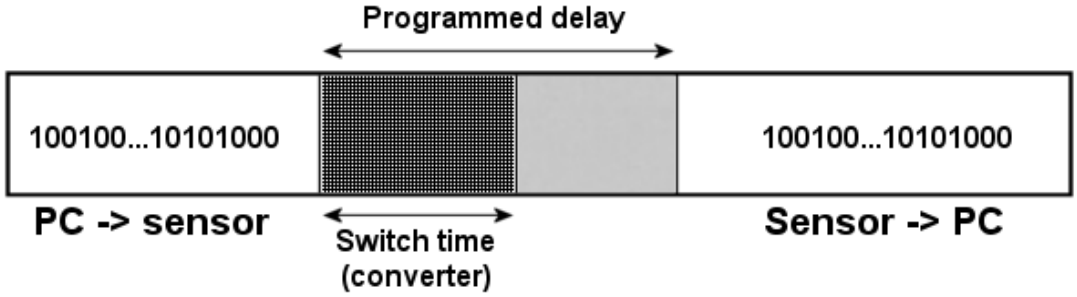
-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	X	X	A_2	A_1	A_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: new address of device

6.2.3. Changing device transmission delay

The S62Y sensor has been tested and is capable of operating when connected to a PC using a range of different interface converters (RS232/RS485, RS232/USB).
These converters feature automatic switching, which may introduce a dead time. This dead time must be observed, otherwise transmission from sensor to PC may fail. To avoid this problem, a time delay may be set for sensor transmission according to the diagram below.
This way, the sensor will start transmitting when the wait time (after the received command) determined by the set delay expires.



Time delay is set using the following command:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	1	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device
$D_{6..0}$: transmission delay unit (0…127 * 100 us)

Example:

D = 50 means that the device will wait 50 * 100 us, i.e. 5 ms before sending a response.

The device responds sending back its new delay.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	1	0	0	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0

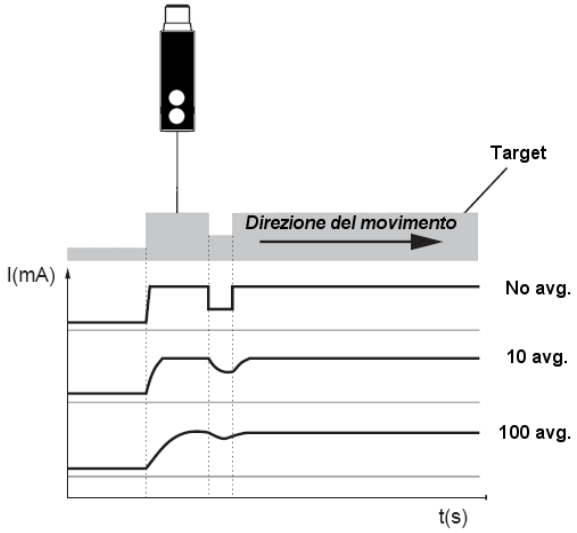
-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device
$D_{6..0}$: transmission delay unit (0…127 * 100 us)

Note: Adding one or more converters will normally affect only communications from sensor to PC, not the other way around. Setting the time delay is a trial-and-error process; start with a certain value and increase it gradually until achieving correct communications in both directions.

6.2.4. Output smoothing (averaging)

Where the target surface is very irregular and the specific application does not require sensor response times to be kept to a minimum, smoothing of the measured value may be implemented: the sensor takes *n* measurements, stores them in the internal memory and returns the average of these *n* measurements.
Figure xxx shows how smoothing operates.
The *n* number of samples to be averaged is user-selectable: setting range is from 0 (smoothing off) to 127.
Command syntax is outlined in the table below.



-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	1	1	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device
$D_{6..0}$: number of averages for transmission (0…127)

Note: Transmission frequency will decrease by 1/D consequently.

Example:

D = 64 means that each output value is the average of the 64 previous measurements.

The device responds sending back the set smoothing value.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	0	1	1	0	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	D_6	D_5	D_4	D_3	D_2	D_1	D_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device
$D_{6..0}$: number of averages for transmission (0…127)

6.2.5. Continuous transmission mode on RS485

When an application does require several S62Y sensors on a single bus and you wish to use the full band on the serial channel as well, you may set continuous measurement transmission on RS485.
This way, the sensor will transmit the measurement result via the serial interface after each measurement.
In this mode, the sensor will keep the RS485 continually busy and transmission to the device is not possible.
This mode is especially convenient, for instance, when a sensor is connected to a PLC to read measurements over the serial line at full speed, so as to take advantage of the benefits associated with the latest high-performance PLC systems.

Command syntax is as follows:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	1	0	0	0	0

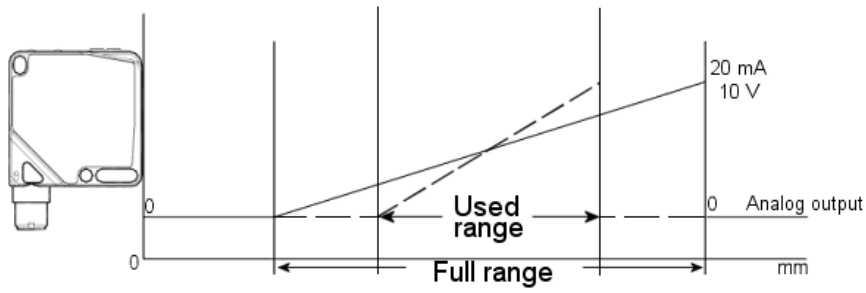
-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device

This command simply enables the relevant service.
To disable this mode, you will need to reset the sensor and set it to slave mode from the user interface with the push-buttons mentioned above.

6.2.6. Changing analogue output gradient

Some applications use only part of the sensor's working range; when this is the case, it may be convenient to set the maximum and minimum limits of the analogue output range so as to match the working range actually required.



Command syntax is as follows:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	0	0	0	0	1

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device

The device will now go into threshold setting mode to acquire the thresholds of the newly set range. The green LED will be flashing. Place the target at maximum distance (upper limit of newly set range) and press the SET push-button to start threshold acquisition (the green LED will stay on steady during the acquisition process). Place the target at minimum distance (lower limit of newly set range) and press the SET push-button to start threshold acquisition (the green LED will stay on steady during the acquisition process).
The sensor now saves the new range and resumes normal operation.

Thresholds must be set in this order: if the upper threshold should somehow turn out to be closer to the device than the lower threshold, the sensor will detect the error. When this is the case, the red LED starts to flash and the sensor exits the procedure without saving changes.

The characteristic curve of the analogue output may be restored to default setting, with the original sensor working range. Command syntax is as follows:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	1	A_2	A_1	A_0

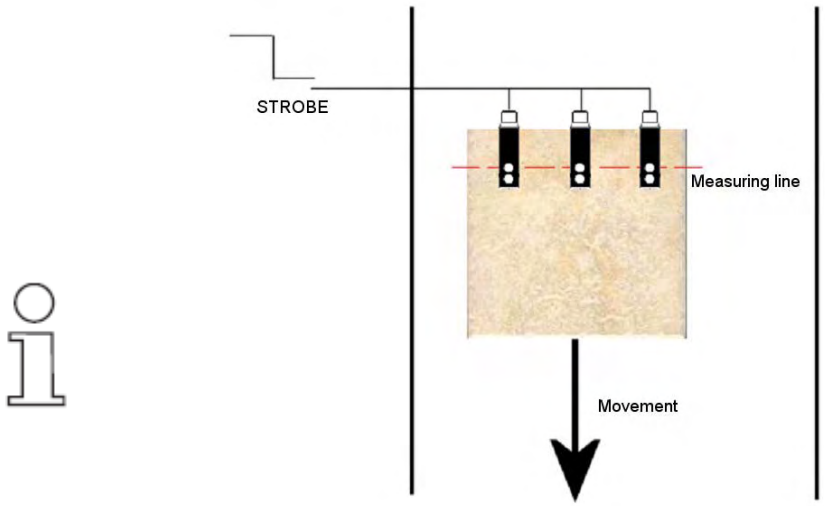
-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	0	0	0	1	0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

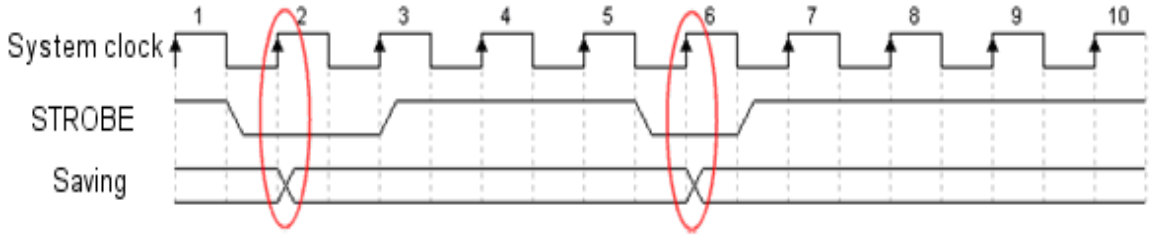
$A_{2..0}$: current address of device

6.2.7. Management of internal buffer memory

The S62Y sensor uses an internal buffer memory to save measurement result whenever an external trigger event takes place (pulse on STORE pin).
This function is especially useful in applications that require measurement synchronisation amongst different sensors (for instance, line measurements with several devices positioned side by side as shown in the figure).
The size of the measurement storage buffer is 32 elements: This means 32 different measurements can be stored without losing data. The buffer operates on the FIFO principle. Once the 32 locations are occupied, the device will overwrite the oldest data. The buffer may be accessed or queried for valid data via the RS485 interface.



The sensor stores measurements on STROBE pulse edge, rather than on the level.
This will avoid time constraints for the user and prevent unwanted measurements from filling storage capacity too fast.



a) Reading N measurements from the buffer

This command lets you read N values from the buffer memory.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	0	0	0	1	1

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	D_5	D_4	D_3	D_2	D_1	D_0

$A_{2..0}$: current address of device
$D_{5..0}$: N number of elements requested

The device responds sending N times according to the standard measurement reading syntax as mentioned above. Although it is up to the user to avoid requesting more data than the buffer contains, the device incorporates a consistency check. If valid data is less than the N number of readings requested, the sensor responds sending the 0x3FFF reading after the last valid information, which means END OF CONTENT.

b) Querying for the number of valid data in the buffer

This command submits a query to the device to determine how many valid data are contained in the buffer.

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	1	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	X	X	0	0	1	0	0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device

The device responds using this syntax:

-	C_3	C_2	C_1	M/S	A_2	A_1	A_0
1	1	0	0	0	A_2	A_1	A_0

-	D_{13}	D_{12}	D_{11}	D_{10}	D_9	D_8	D_7
0	0	D_5	D_4	D_3	D_2	D_1	D_0

-	D_6	D_5	D_4	D_3	D_2	D_1	D_0
0	X	X	X	X	X	X	X

$A_{2..0}$: current address of device
$D_{5..0}$: N number of valid elements in the buffer

7. TROUBLESHOOTING

PROBLEM	DESCRIPTION	REMEDY
1. Sensor does not switch on	After several seconds, the sensor still provides no emission and the green LED does not light up.	**The polarity of the power supply connections could be inverted**. Check for correct polarity and rectify as required. **Power supply could be outside the accepted range**. Make sure power supply conforms to specified range. **Poor contact in connector**. Check sensor current draw using a multimeter; if there is not current draw, check the connector for any false contacts.
2. Sensor switched on, but red LED stays on steady.	Sensor emission is correct (visible spot), green LED is on, but red LED stays on steady. Analogue outputs stuck at zero, query via RS485 returns zero value.	**There may be an object in the sensor beam, darkening the sensor**. Make sure the return beam is not interrupted (wrong installation). **The target may be outside the sensor working range**. Make sure the target is within the working range. **The sensor protection glass may be dirty, preventing light from passing through**. Make sure the sensor protection glass is clean. **The target is a very dark object (e.g. std. 4% black target) and the surface angle is such that received luminous flux is too low**. Try and set target surface at a smaller angle.
3. The digital output exhibits a pulsing behaviour, in spite of the yellow LED being steady on/off.	A pulsing behaviour of the digital output is typically associated with a steady behaviour over time when the target is stable or anyway in such a range as will not cause the output to change state.	**Apparent output load is such to overload the sensor, which operates in a limited mode**. Check the digital output connection and the load connected to it.

PROBLEM	DESCRIPTION	REMEDY
4. Communication with sensor via RS485 is impossible.	Communication with sensor via RS485 is impossible. When the supplied suite is used, sensor will not respond. *The following indications are valid when the proper operation of any converters and interfaces used has been established with certainty (look at the indicator LEDs on the interfaces to determine their operating state).*	**The polarity of the two RS485 (TX+ and TX-) connections has been inverted**. Make sure to observe the indications of the manufacturer of the RS485 interface used (board, converter, etc.); try inverting the polarity of the connection on the interface if needed. **Poor contact in connector**. Check the connector for any false contacts. **Another device could be disturbing the transmission**. Make sure there is no other device on the RS485 line is used and try again. **Different baud rate settings in PC/PLC and in sensor**. Using the suitable instruments, try establishing communication again at the allowed baud rate (please refer to relevant section of this manual). **Sensor may have been assigned a different address from the default factory-set address**. Query the sensor using each of the eight possible addresses or perform the reset procedure from the user interface (please refer to relevant section of this manual). **The addition of an interface converter (or a chain of converters) may introduce a critical delay in communication switching**. If you are using one or more interface converters (for instance, RS485/RS232, RS232/USB), automatic switching may have introduced dead times leading to transmission filtering. To solve this problem, implement a delay for sensor communication following the procedure described in this manual.
5. Stand-alone MASTER/SLAVE reading mode can not be activated	MASTER/SLAVE functioning mode can not be activated.	**The polarity of the two RS485 (TX+ and TX-) connections has been inverted**. Make sure that the two RS485 bus wires have been connected combining them correctly according to their colour. **Another device could be disturbing the transmission**. Make sure there is no other device on the RS485 line is used and try again. . **One or both sensor during set-up are outside the range respect to the sample target.** Make sure that the system is set in such a manner that the sample target falls inside the measurement range of both sensors.

8. OVERVIEW OF PRODUCT FEATURES

8.1. Optic specifications

Operating range:	40 … 120 mm
Measurement range:	80 mm
Minimum resolution[1:]	50 µm
Linearity:	< 0.25% max. operating range
Type of emission:	Pulsed red Laser, 658 nm, MTBF > 10^5h
Spot dimension:	0.5 x 0.7 mm @ 100 mm
Pulse max duration:	< 150 µs
Laser protection class:	2 (EN 60825-1)

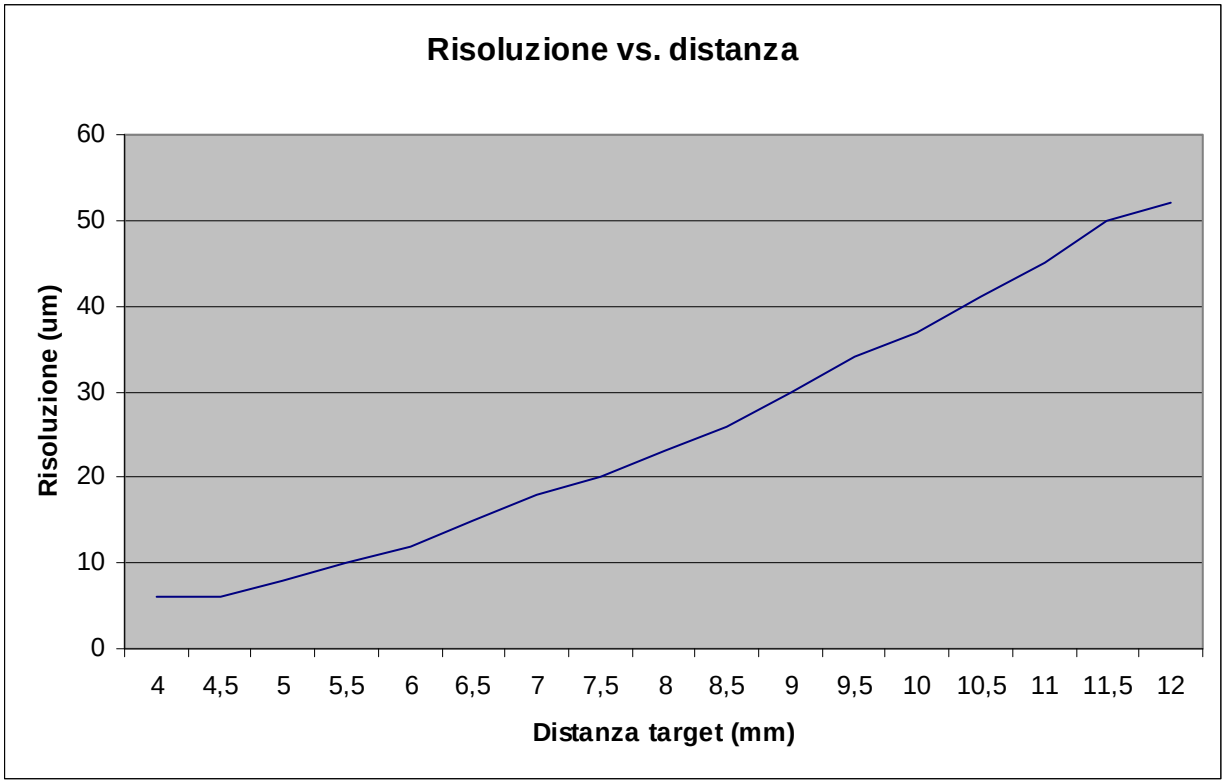
8.2. Electrical specifications

Operating voltage:	18…30 Vdc
Maximum current draw (without loads):	< 70 mA @ 24 Vdc
Digital outputs:	PNP, N.O.
Measurement frequency:	< 750 Hz
Response time:	666 µs
Maximum capacitive load allowed for digital outputs:	< 330 nF
Analogue output (PIZ version):	4…20 mA
Analogue output (PVZ version):	0…10 V
Maximum load allowed (apparent ohmic resistance) (PIZ version):	≤ 500 Ω
Maximum load allowed (apparent ohmic resistance) (PVZ version):	> 100 kΩ
Serial interface:	EIA/TIA-485, half-duplex
Maximum number of S62Y sensors connected to one bus:	8 (with different addresses)
Temperature drift:	< 10 µm / °C
Protection circuits:	Power supply inversion, short-circuit protection on all outputs (except RS485), overload protection (only digital outputs)
Stand-by time:	< 1 s

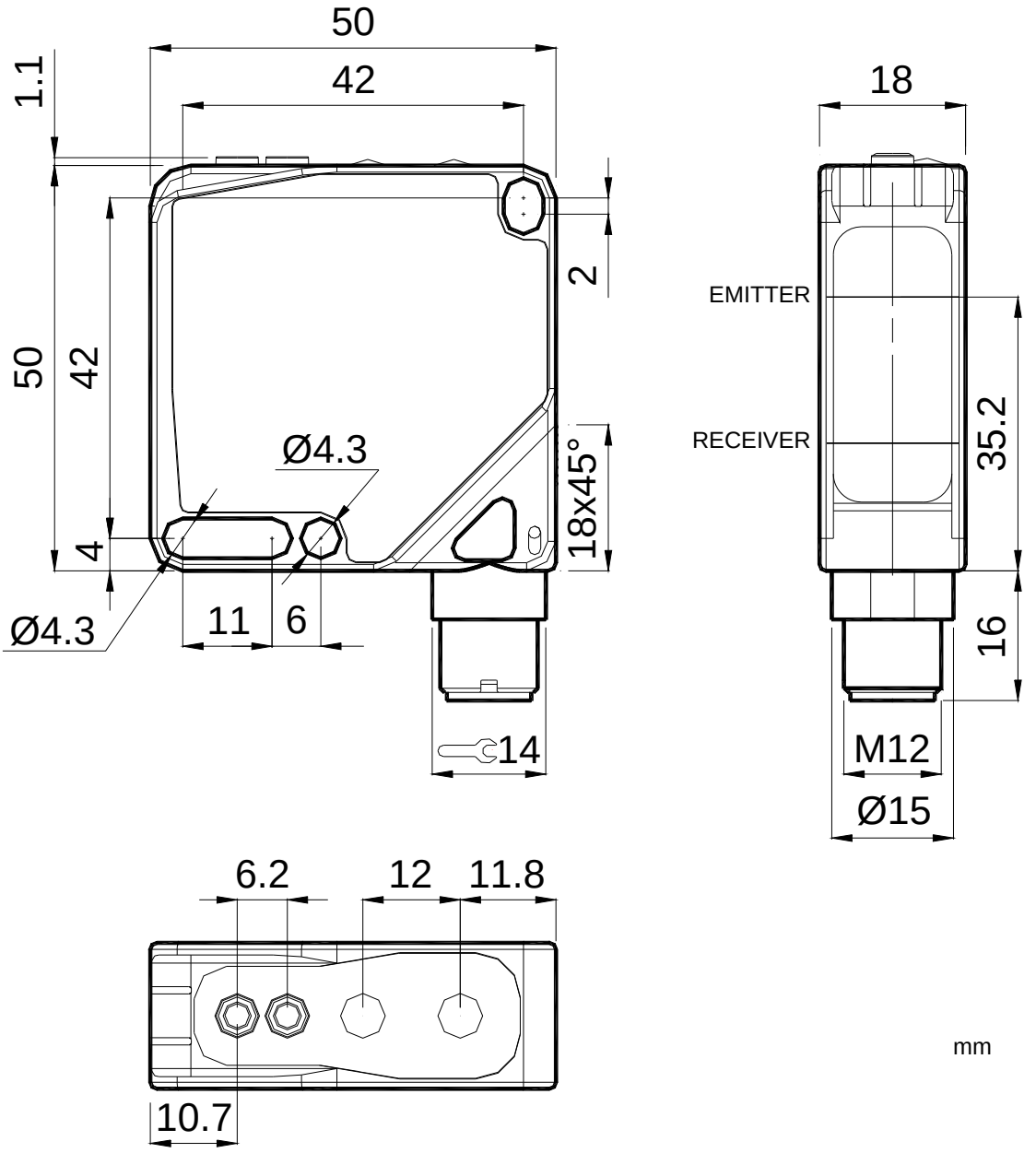
8.3. Mechanical specifications

Housing material:	ABS, shock-resistant
Protection class:	IP67
Operating temperature:	0…+55 °C
Storage temperature:	-20…+70 °C
Type of connection:	8-pole M12 connector
Weight:	40 g.

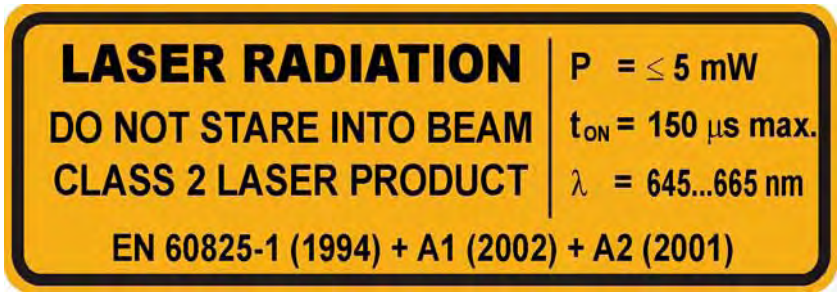
8.4. Risoluzione del sistema



8.5. Overall dimensions



9. SAFETY PRECAUTIONS



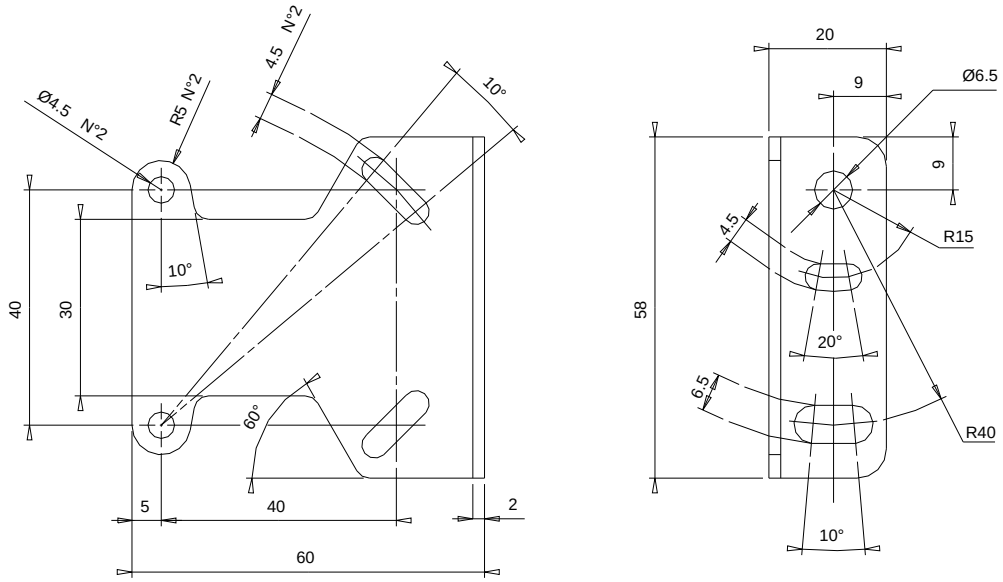
All the electric and mechanical safety regulations have to be respected during sensor functioning.
The sensor has to be protected against mechanical damage.
Apply the labels supplied in a visible position near the laser emission beam.
Do not stare directly into the laser beam!
Do not point the laser beam towards people!
Eye irradiation superior to 0.25 seconds is dangerous.
Please refer to the Class 2 Standard (EN60825-1).
These sensors can not be used for safety applications!

10. ACCESSORIES

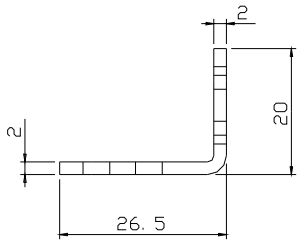
Mounting brackets *(dimensions in mm)*

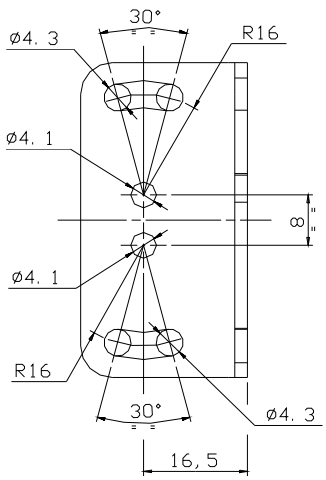
MODEL	DESCRIPTION	ITEM NO.
ST-504	Mounting bracket	95ACC1320
ST-5020	Mounting bracket	95ACC5330
ST-5021	Mounting bracket	95ACC5340
ST-5053	Protective mounting bracket	95ACC2410
ST-5054	Protective mounting bracket	95ACC2420
JOINT-S62	Protective bracket with swivel joint	95ACC2430

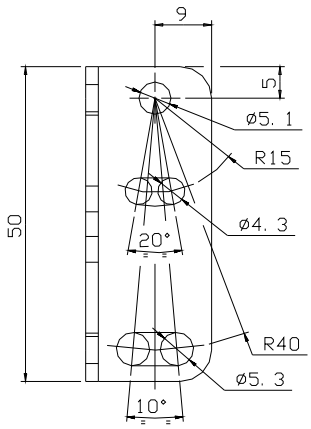
ST-504



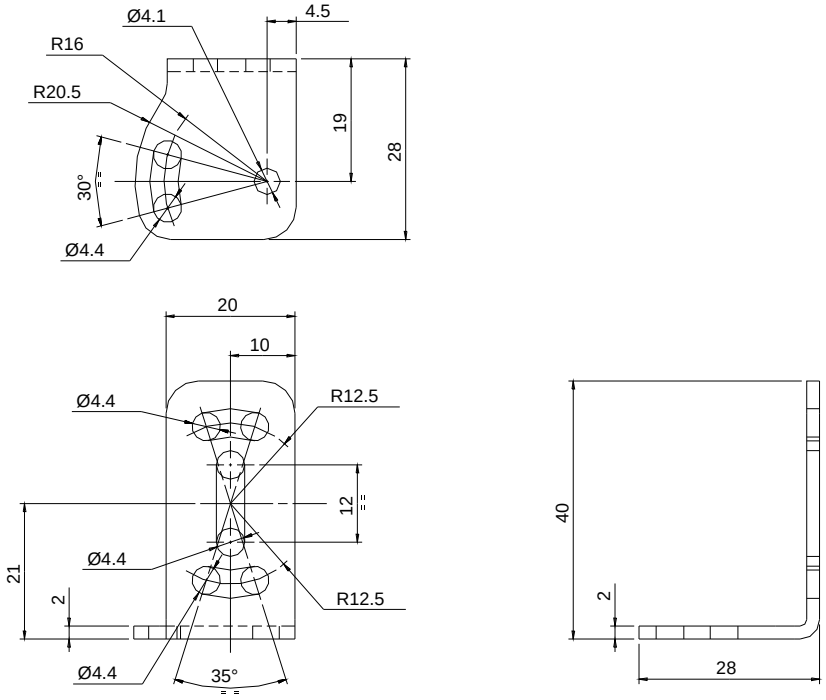
ST-5020



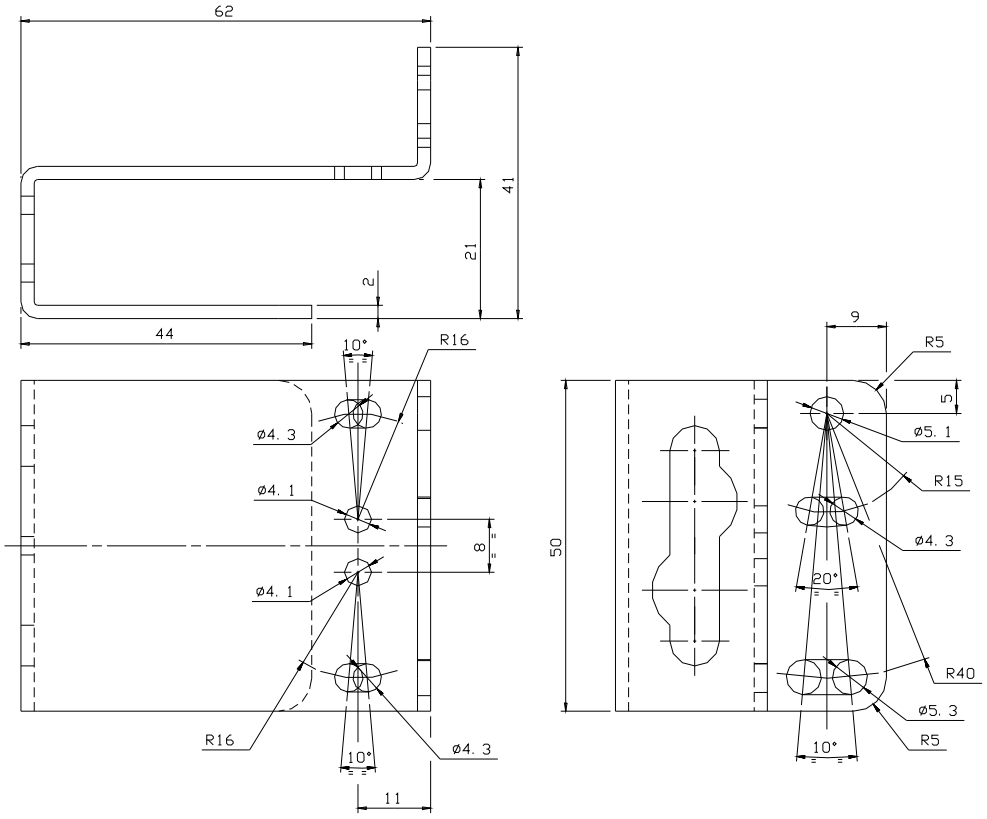




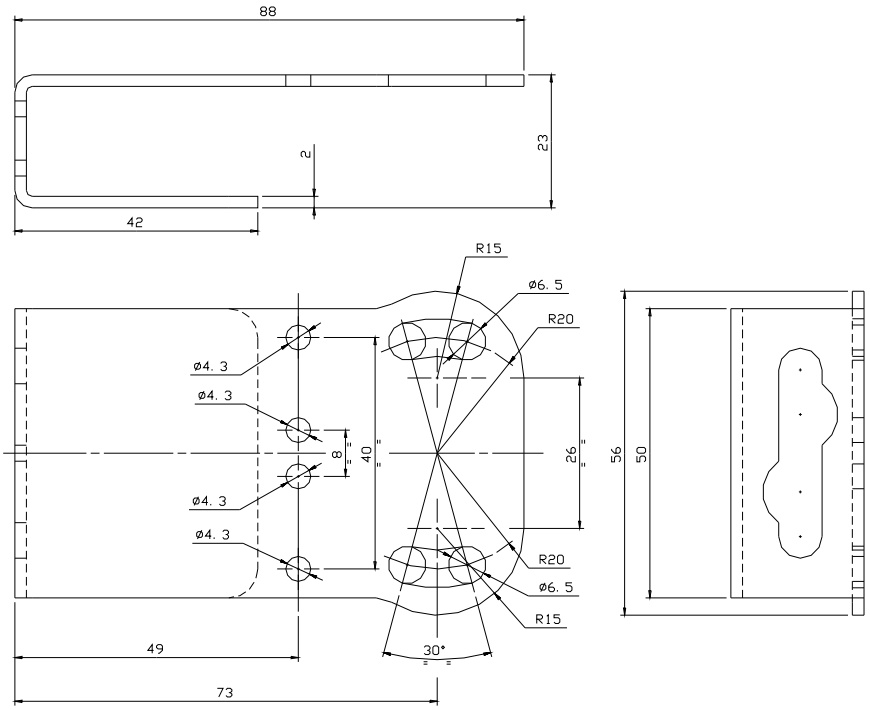
ST-5021



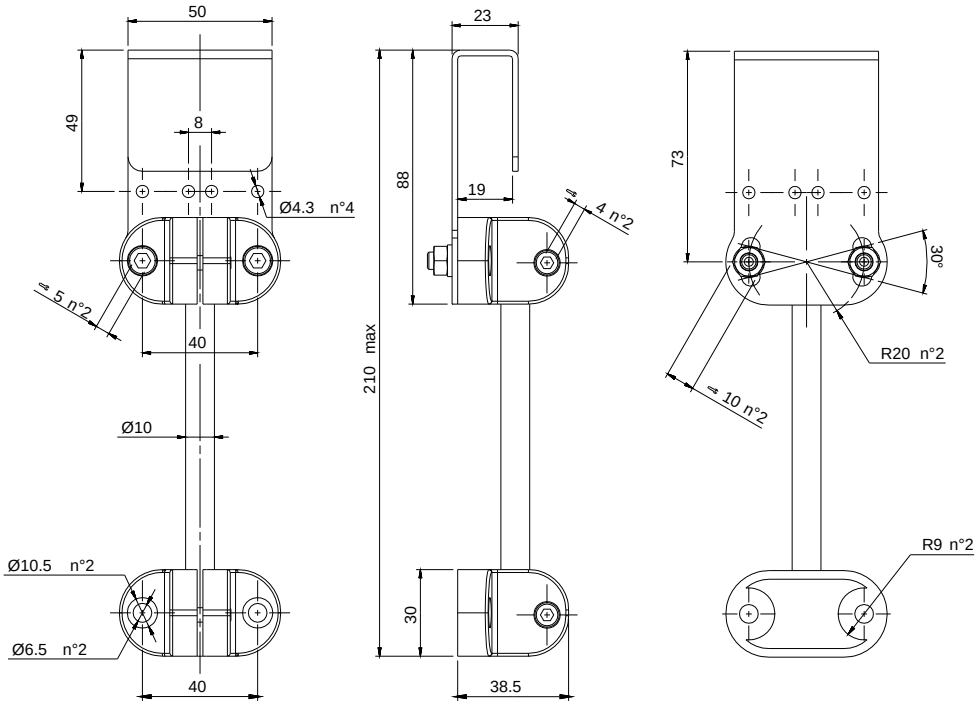
ST-5053



ST-5054



JOINT-S62



Connection cables

MODEL	MODEL	ITEM NO.
CV-A1-26-B-03	Shielded cable, 8 pins, M12, straight, 3m	95ACC1510