



## LASER distance sensor for precise measurement up to 20 m with a millimeter of resolution and repeatability through the Time of Flight technique

- Time of Flight technology
- Class 2 visible red LASER for an easy alignment with the target
- Measuring range up to 10m or 20m in the advanced model
- 1 mm resolution, 7 mm accuracy, 1 mm repeatability
- 4-20 mA or 0-10 V scalable analog output and 2 digital outputs
- RS485 serial interface in the advanced model
- Standard M12 connector
- IP67 Industrial metal housing



SENSORS

### APPLICATIONS

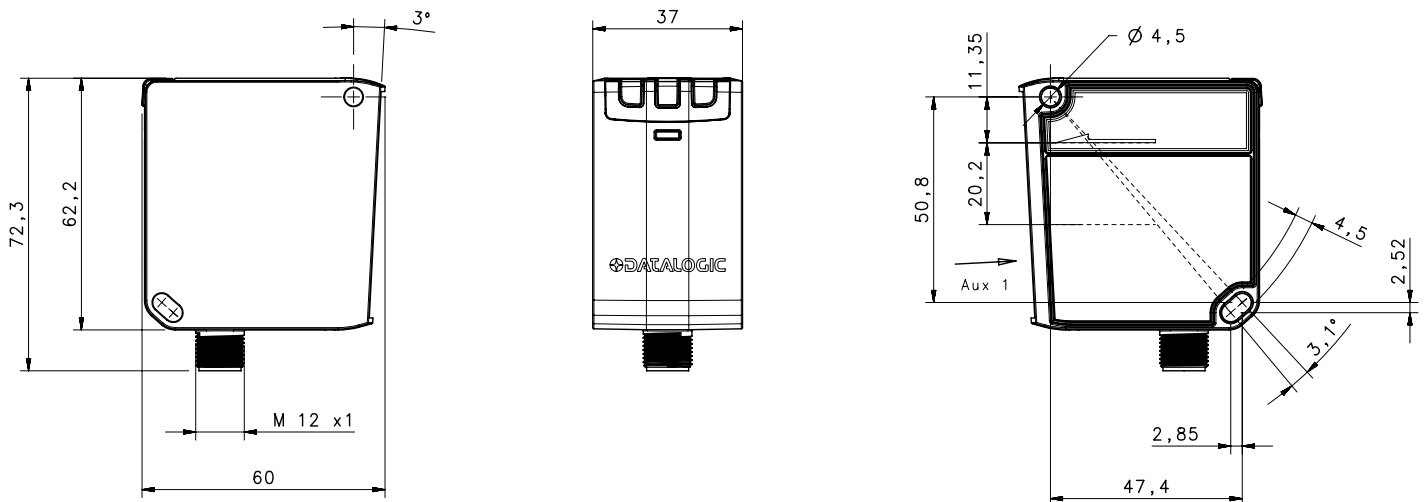
- Automated warehousing
- Processing and Packaging machinery
- Industrial vehicles
- Automotive



S85		
Distance sensor (90% White target)		0,2...20 m (S85-...-Y13) 0,2...10 m (S85-...-Y03)
Repeatability		1...2 mm
Accuracy		7...10 mm
Resolution		1 mm
Light emission		red LASER (class 2)
Response time		30 ms (S85-...-Y03) 15...30 ms (S85-...-Y13)
Serial interface		RS485 (S85-...-Y13)
Setting		Display (S85-...-Y13) push-buttons (S85-...-Y03)
Power supply	Vdc	24 V +/- 20%
	PNP	▪
Output	NPN	▪
	Push pull	selectable (S85-...-Y13)
	other	Analog output: 4...20 mA or 0...10 V
Connection	connector	M12 8-pole (S85-...-Y13)
		M12 5-pole (S85-...-Y03)
Approximate dimensions (mm)		60x62x37
Housing material		Zamak
Mechanical protection		IP65, IP67

GENERAL DATA	
Power supply	24 V $\pm$ 20%
Power consumption	< 3 W
Short circuit protection	Yes
Electric insulation	500 Vac, 1 min between electronic and metallic housing
Insulation resistance	> 20 MOhm, 500 Vcc between electronic and metallic housing
Laser class emission	2 according to IEC 60825-1 (2007)
Laser power emission	1 mW
Pulse duration	4 nsec
Wavelength	658 nm
Light immunity	according to EN 60947-5-2, >40 kLux DC ambient light
Warm up time	20 min typ
Working temperature	-15...50 °C
Storage temperature	-25...70 °C
Umidity	< 90% not cond.
Vibration resistance	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	ZINC ALLOY ZAMA 13
Lens material	PMMA
IP protection	IP65, IP67
Weight	250 g
Dimension	60 x 62,2 x 37 mm

## DIMENSIONS (mm)



	S85 Basic	
	S85-MH-5-Y03-00V	S85-MH-5-Y03-00I
Measurement range (90% white target)	0,2..10 m	
Measurement range (18% grey target)	0,2..5 m	
Measurement range (6% black target)	0,2..3 m	
Accuracy ( 1 sigma / 90% white target )	± 10 mm	
Repeatability ( 1 sigma / 90% white target )	1 mm @10 m	
Resolution	1 mm	
Analog output resolution	16 bit	
Spot diameter	15mm @ 8m typ (25 °C)	
Response time	30 ms typ (25 °C)	
Settings	Push-buttons	
Analog output	0-10 V	4-20 mA
Switching output / alarm	Push Pull / Q	
Histeresys	10mm	
Connector	M12 5-pole	

## SETTINGS

Without the procedure setting the sensor is configured to measure distances on a white target from a minimum value of 200 mm and a maximum of 10000 mm, with both switching point placed at 500 mm.

The parameters can be changed by push-buttons pointing the LASER on the target in the different interested points.

### INDICATORS

LED 1	Q1 (yellow)
LED 2	Q2 (yellow)
LED 3	POWER ON (green), OUT OF RANGE (red)

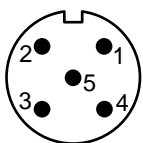


Push-buttons	Setting
MIN	Minimum distance value
MAX	Maximum distance value
Q1	First switching point
Q2	Second switching point
MIN+MAX	Reset distance range
MAX+Q1 (MIN+Q2)	Reset switching points

By using only one switching point the sensor can perform the background and foreground suppression function.

The suppression of the foreground is obtained by setting the minimum desired value of the measurement range with MAX push-button.

## CONNECTIONS



M12 5-pole connector

		S85-MH-5-Y03-00I	S85-MH-5-Y03-00V
1	brown	24 V ±20%	24 V ±20%
2	white	Q2	Q2
3	blue	0V	0V
4	black	Q1	Q1
5	grey	ANALOG OUTPUT 4...20 mA	ANALOG OUTPUT 0...10 V

	S85 Advanced	
	S85-MH-5-Y13-00IVY	S85-MH-5-Y13-00Y
Measurement range (90% white target)	0,2..20 m	
Measurement range (18% grey target)	0,2..8 m	
Measurement range (6 % black target)	0,2..5 m	
Accuracy	± 7 mm	
Repeatability (1 sigma/90% white target) (SLOW mode)	1 mm @10 m < 2 mm @20 m	
Resolution	1 mm	
Analog output resolution	16 bit	
Spot diameter	15mm @ 10m typ (25 °C)	
Response time	45 ms (SLOW mode); 30 ms (MEDIUM mode); 15 ms (FAST mode)	
Settings	Push-buttons and display	
Analog output	Voltage (0-10V) or Current (4-20 mA)	n/a
Serial interface	RS485	
Switching output/alarm	PNP, NPN, Push-pull, Q, Q*	
Histeresys	5..1000 mm (default: 10 mm)	
Remote input	Multifunction input	
Connector	M12 8-pole	

## SETTINGS

Without the procedure setting the sensor is configured to measure distances on a white target from a minimum value of 200 mm and a maximum of 20000 mm, with both switching point placed at 500 mm.

The parameters can be changed by the menu on the display pointing the LASER on the target in the different interested points.



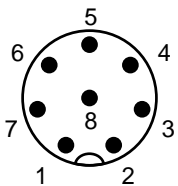
### INDICATORS

- LED 1 | Q1 (yellow)
- LED 2 | Q2 (yellow)
- LED 3 | POWER ON (green),  
OUT OF RANGE (red)

- DISPLAY
- Run/W.UP → Run mode or Warm-up mode
  - Q+Q → Digital Output setting → PNP/NPN/Push-Pull
  - I/V → Analog Output Setting → Ampere/Volt
  - Lock Symbol → Keylock or unlock
  - 5-digit display → Value corresponds to Distance in mm

Menu	Functions
OUT 1	Switching point1: Light/Dark; Switching point value; PNP, NPN, Push-pull; Alarm
OUT 2	Switching point 2: Light/Dark; Switching point value; PNP, NPN, Push-pull; Alarm
HYSTERESIS	Hysteresis level: 5...1000 mm
ANALOG OUT	Voltage (0...10 V); Current (4...20 mA)
MULTIFUNCTION IN	LASER OFF; Teach IN (Thresholds); RS485 Send Data
AVERAGE	Response time: SLOW; MEDIUM; FAST
RS485	Node N°; Enable; Termination; Output mode; Delay (0...254 ms)
SCALABLE OUT	Analog output range: Reset, MIN and MAX distance
FACTORY RESET	Factory default values
INFO	Software version

## CONNECTIONS



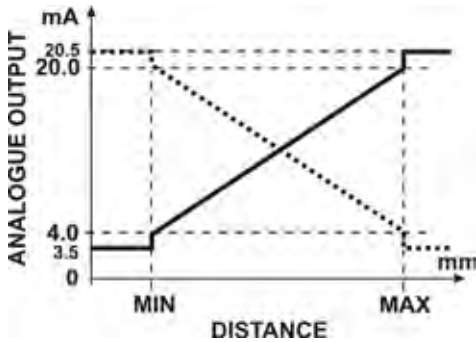
M12 8-pole connector

		S85-MH-5-Y13-00IVY	S85-MH-5-Y13-00Y
1	white	RS485 -	RS485 -
2	brown	24 V ±20%	24 V ±20%
3	green	ANALOG OUTPUT (Voltage or current)	Not used
4	yellow	Q1	Q1
5	grey	Q2	Q2
6	pink	RS485+	RS485+
7	blue	0V	0V
8	red	MULTIFUNCTION INPUT	MULTIFUNCTION INPUT

## S85 DIAGRAMS

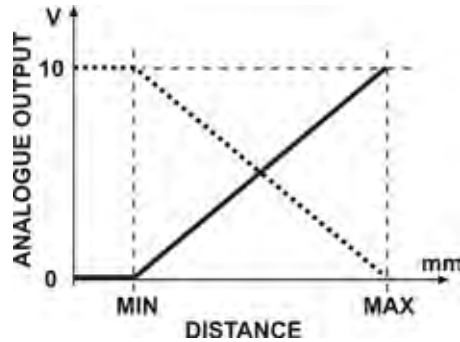
### CURRENT ANALOG OUTPUT

MEASUREMENT RANGE (4...20 mA)  
OUT OF RANGE (3,95...4 mA; 20...20,5 mA)



### VOLTAGE ANALOG OUTPUT

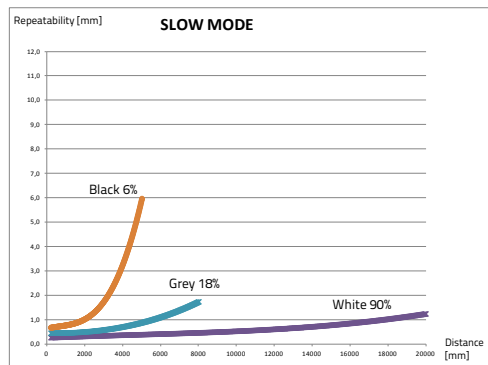
MEASUREMENT RANGE (0...10 V)



### S85-...-Y13 ADVANCED

#### REPEATABILITY (SLOW MODE)

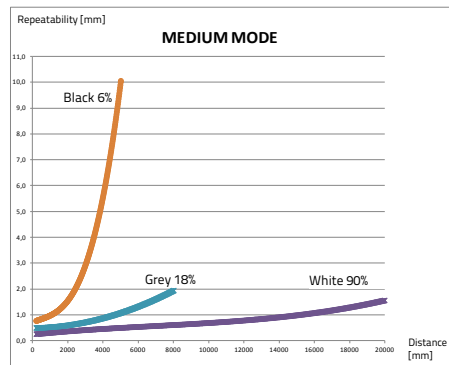
[WHITE 90%; GREY 18%; BLACK 6%]



### S85-...-Y13 ADVANCED

#### REPEATABILITY (MEDIUM MODE)

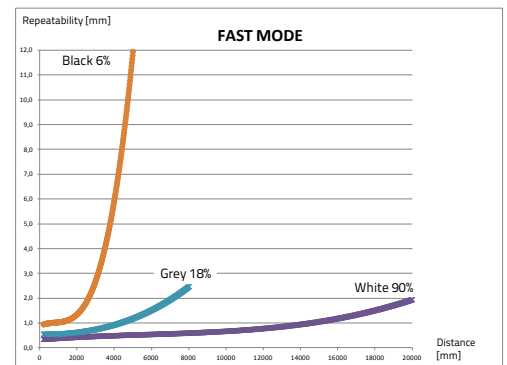
[WHITE 90%; GREY 18%; BLACK 6%]



### S85-...-Y13 ADVANCED

#### REPEATABILITY (FAST MODE)

[WHITE 90%; GREY 18%; BLACK 6%]



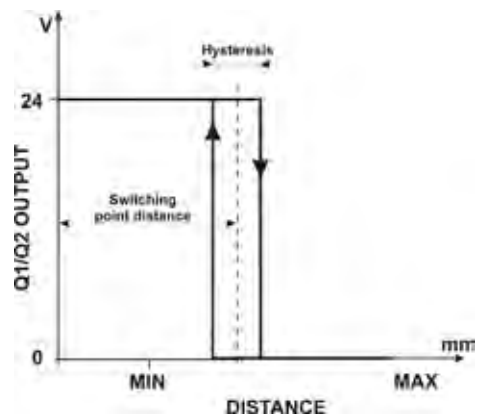
### S85-...-Y13 ADVANCED

#### REPEATABILITY/RESPONSE TIME

(90% WHITE TARGET @ 20 m)

Mode	Response time	Repeatability
Slow	45 ms	< 1,5 mm
Medium	30 ms	1,5 mm
Fast	15 ms	< 2 mm

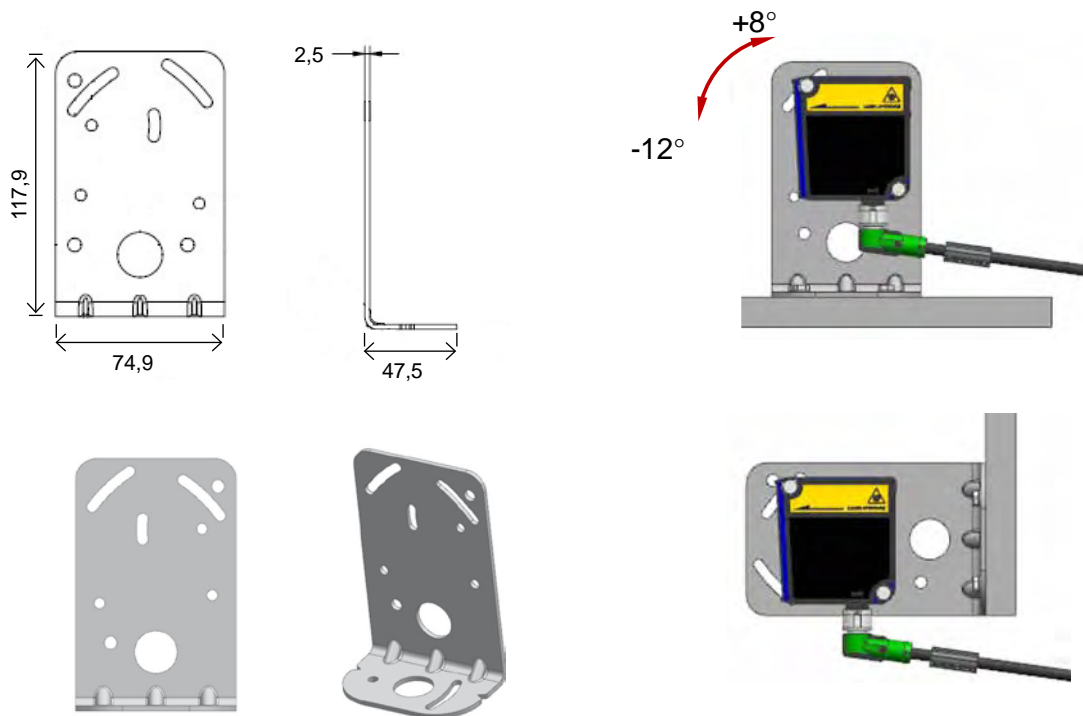
### HYSTERESIS



## MODEL SELECTION AND ORDER INFORMATION

OPTIC FUNCTION	OPERATING DISTANCE	CONNECTION	OUTPUT & INPUT	MODELS	ORDER No.
Distance sensor (Basic)	10 m	M12 5-pole connector	2 Digital outputs; Analog output: Voltage (0...10 V)	S85-MH-5-Y03-00V	951511010
			2 Digital outputs; Analog output: Current (4... 20mA)	S85-MH-5-Y03-00I	951511030
Distance sensor (Advanced)	20 m	M12 8-pole connector	2 Digital outputs; Analog output: Current (4... 20mA) or Voltage (0...10 V); RS485; Multifunction input	S85-MH-5-Y13-00IVY	951511020
			2 Digital outputs; RS485; Multifunction input	S85-MH-5-Y13-00Y	951511040

## ACCESSORIES



ST-S85-STD

DESCRIPTION	ORDER N°
ST-S85-STD S85 FIXING BRACKET	95ACC7840