

S85



LASER DISTANCE SENSOR FOR PRECISE MEASUREMENT UP TO 20 M WITH MILLIMETRIC RESOLUTION AND REPEATABILITY THROUGH THE TIME OF FLIGHT TECHNOLOGY

- Direct 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



APPLICATIONS

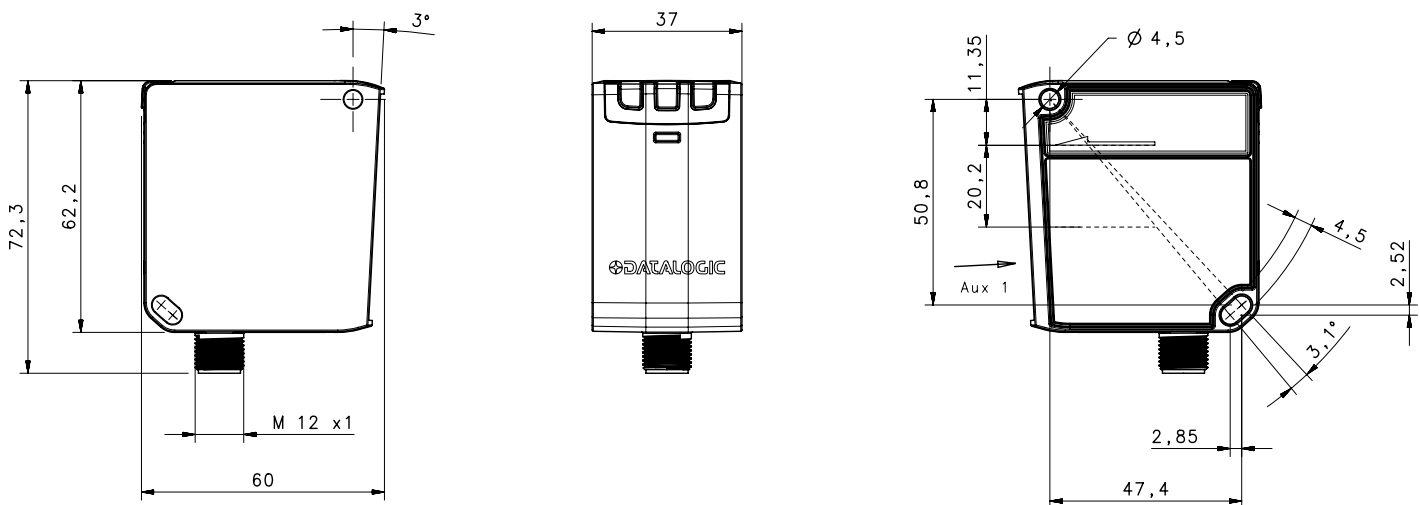
- Automated warehousing
- Processing and Packaging machinery
- Industrial vehicles
- Automotive

		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 Vdc +/- 20%
Output	PNP	•
	NPN	•
	Push pull	•
	other	Analog output: 4...20 mA or 0...10 V
Connection	connector	•
Approximate dimensions (mm)		60x72x37
Housing material		Zamak
Mechanical protection		IP67

TECHNICAL DATA

Power supply	24 Vdc \pm 20%
Consumption (output current excluded)	2,8 W max. (mod. S85...Y03) 3 W max. (mod. S85...Y13)
Light emission	red Laser 658 nm
Setting	push-buttons (mod. S85...Y03) push-buttons and display (mod. S85...Y13)
Operating distance	90% white target 0,2...10 m (mod. S85...Y03), 0,2...20 m (mod. S85...Y13) 18% grey target 0,2...5 m (mod. S85...Y03), 0,2...8 m (mod. S85...Y13) 6% black target 0,2...3 m (mod. S85...Y03), 0,2...5 m (mod. S85...Y13)
Indicators	yellow Q1 LED, Q2 LED green/red POWER/OUT OF RANGE LED 5-digit multi display (mod. S85...Y13)
Output	push pull/Q (mod. S85...Y03) PNP, NPN, push pull, Q, Qneg (mod. S85...Y13)
Analog output	0-10 V (mod. S85...Y03-OOV) 4-20 mA (mod. S85...Y03-OOI) 0-10 V/4-20 mA (mod. S85...Y13-OOIVY)
Response time	slow 45 ms (mod. S85...Y13) medium 30 ms fast 15 ms (mod. S85...Y13)
Connection	M12 5-pole connector (mod. S85...Y03), M12 8-pole connector (mod. S85...Y13)
Dielectric strength	500 Vac, 1 min between electronics and housing
Insulating resistance	>20 M Ω , 500 Vdc between electronics and housing
Mechanical protection	IP67
Ambient light rejection	according to EN 60947-5-2, >40 Klux DC ambient light
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	ZINC ALLOY ZAMA 13 EN-1774/PC LEXAN 121R display
Lens material	PMMA
Operating temperature	-15 ... 50 °C
Storage temperature	-25 ... 70 °C
Weight	250 g max.

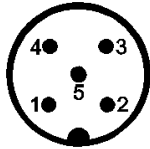
DIMENSIONS



CONNECTIONS

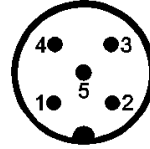
M12 CONNECTOR - STANDARD

S85-Y03-00V
Voltage version



- 1 (BROWN): +24 V ± 20 %
- 2 (WHITE): Q2 100mA max.
- 3 (BLUE): 0 V
- 4 (BLACK): Q1 100mA max.
- 5 (GREY): ANALOG. OUT 0-10V

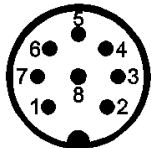
S85-Y03-00I
Current version



- 1 (BROWN): +24 V ± 20 %
- 2 (WHITE): Q2 100mA max.
- 3 (BLUE): 0 V
- 4 (BLACK): Q1 100mA max.
- 5 (GREY): ANALOG. OUT 4-20mA

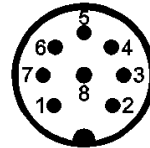
M12 CONNECTOR - ADVANCED

S85-Y13-00IVY
Analog version



- 1 (WHITE): RS485 -
- 2 (BROWN): +24 V ± 20 %
- 3 (GREEN): ANALOGUE OUT
- 4 (YELLOW): Q1 100mA max.
- 5 (GREY): Q2 100mA max.
- 6 (PINK): RS485 +
- 7 (BLUE): 0 V
- 8 (RED): MULTIFUNC.INPUT

S85-Y13-00Y



- 1 (WHITE): RS485 -
- 2 (BROWN): +24 V ± 20 %
- 3 (GREEN): RESERVED
- 4 (YELLOW): Q1 100mA max.
- 5 (GREY): Q2 100mA max.
- 6 (PINK): RS485 +
- 7 (BLUE): 0 V
- 8 (RED): MULTIFUNC.INPUT

INDICATORS AND 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)



1 2 3

DISPLAY

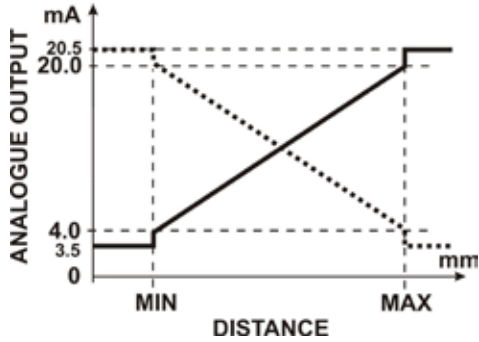
- Run/W.UP → Run mode or Warm-up mode
- Q+Q → Digital Output setting → PNP/NPN/Push-Pull
- I/V → Analog Output Setting → Ampere/Volt
- Lock Symbol → Keylock or unlock
- 5-digit display → Value corresponds to Distance in mm

MENU	FUNCTIONS
OUT 1	Switching point 1: 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

DETECTION DIAGRAMS

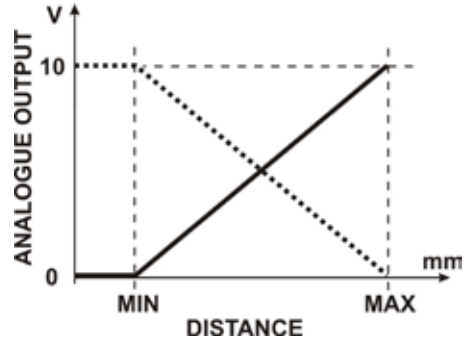
CURRENT ANALOG OUTPUT

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



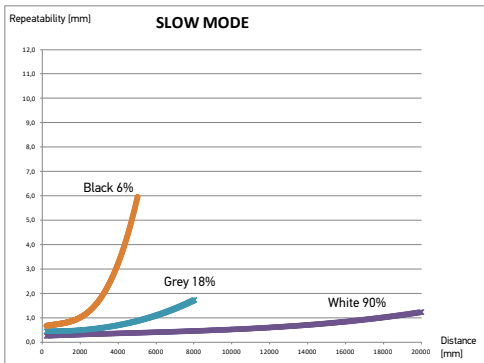
VOLTAGE ANALOG OUTPUT

MEASUREMENT RANGE (0...10 V)



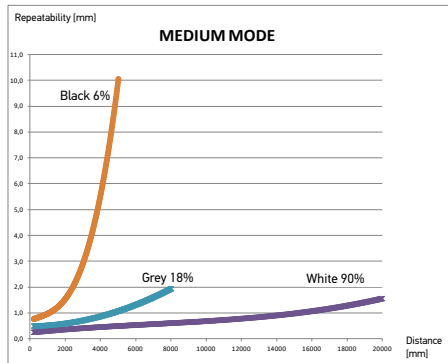
S85-...-Y13 ADVANCED REPEATABILITY (SLOW MODE)

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



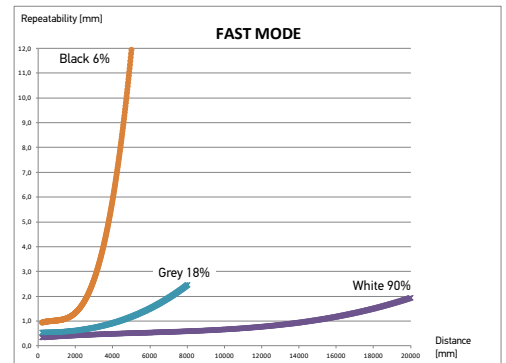
S85-...-Y13 ADVANCED REPEATABILITY (MEDIUM MODE)

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



S85-...-Y13 ADVANCED REPEATABILITY (FAST MODE)

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

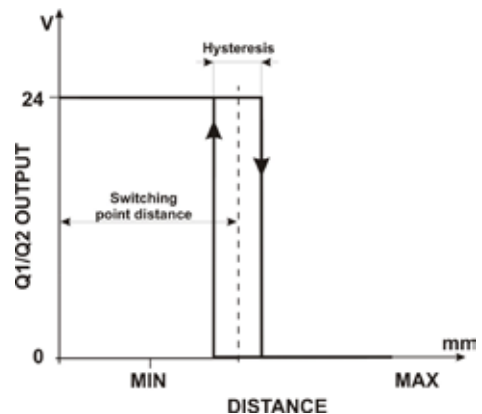


S85-...-Y13 ADVANCED REPEATABILITY/RESPONSE TIME

(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

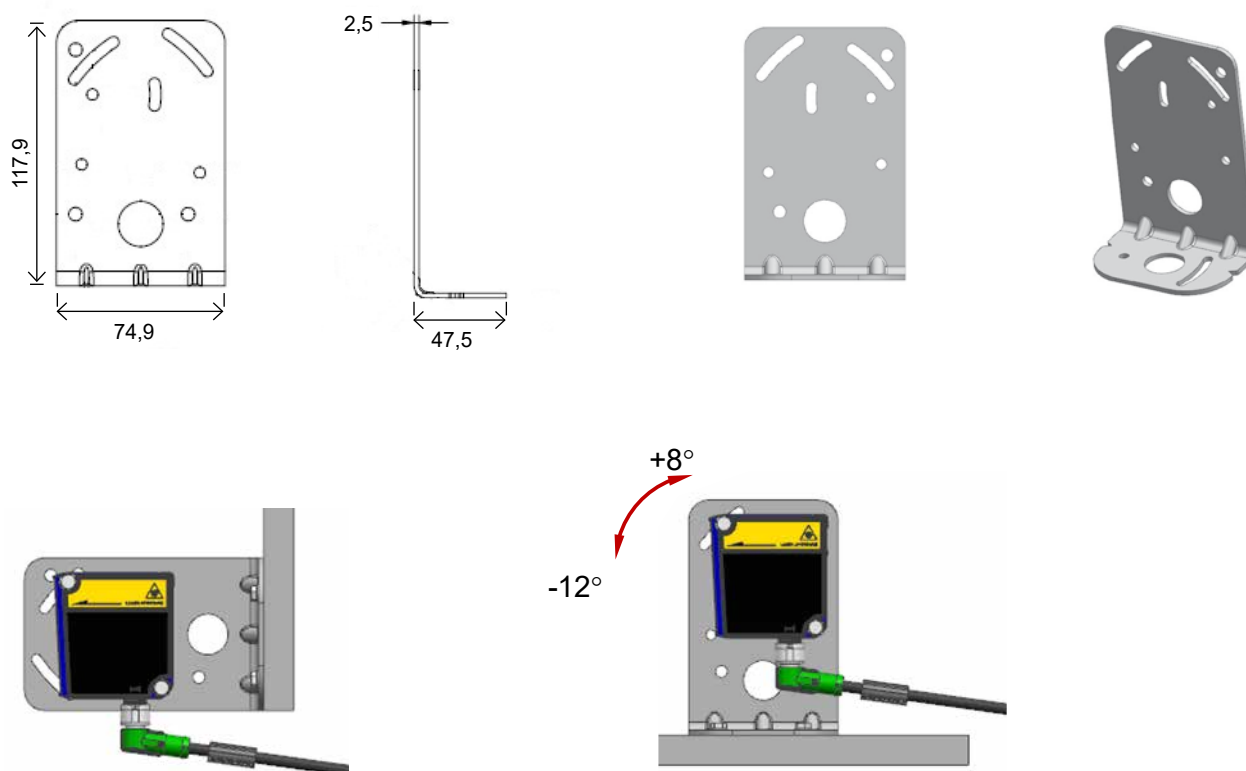


MODEL SELECTION AND ORDER INFORMATION

OPTIC FUNCTION	OPERATING DISTANCE	CONNECTION	OUTPUT & INPUT	MODELS	ORDER No.
Distance sensor (Standard)	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



MODEL	DESCRIPTION	ORDER No.
ST-S85-STD	mounting bracket	95ACC7840

CABLES

TYPE	DESCRIPTION	LENGTH	MODEL	ORDER No.
Axial M12 connector	5-pole, grey, P.V.C.	3 m	CS-A1-03-G-03	95ACC2110
		5 m	CS-A1-03-G-05	95ACC2120
		10 m	CS-A1-03-G-10	95ACC2140
	5-pole, U.L., black, P.V.C	3 m	CS-A1-03-U-03	95ASE1170
		5 m	CS-A1-03-U-05	95ASE1180
		10 m	CS-A1-03-U-10	95ASE1190
		15 m	CS-A1-03-U-15	95ASE1200
		25 m	CS-A1-03-U-25	95ASE1210
Axial M12 Connector	8-pole, black, P.V.C.	3 m	CS-A1-06-B-03	95ACC2230
		5 m	CS-A1-06-B-05	95ACC2240
		10 m	CS-A1-06-B-10	95ACC2250
Radial M12 Connector	8-pole, shielded, black, P.V.C.	3 m	CV-A2-26-B-03	95ACC1600
		5 m	CV-A2-26-B-05	95ACC1610
		10 m	CV-A2-26-B-10	95ACC1620
Axial M12 Connector	8-pole, shielded, black, P.V.C.	3 m	CV-A1-26-B-03	95ACC1510
		5 m	CV-A1-26-B-05	95ACC1520
		10 m	CV-A1-26-B-10	95ACC1530
		15 m	CV-A1-26-B-15	95ACC2080
		25 m	CV-A1-26-B-25	95ACC2100
		50 m	CV-A1-26-B-50	95ACC2110
	8-pole, U.L., black, P.V.C.	3 m	CS-A1-06-U-03	95ASE1220
		5 m	CS-A1-06-U-05	95ASE1230
		10 m	CS-A1-06-U-10	95ASE1240
		15 m	CS-A1-06-U-15	95ASE1250
		25 m	CS-A1-06-U-25	95ASE1260
	50 m	CS-A1-06-U-50	95A252710	
	8-pole, black	Connector-not cabled	CS-A1-06-B-NC	95ACC2550

DATALOGIC PRODUCT OFFERING



Sensors



Hand Held scanners



Mobile Computers



Laser Marking Systems



Safety Laser Scanner



Vision Systems



Stationary Industrial Scanners



Safety Light Curtains



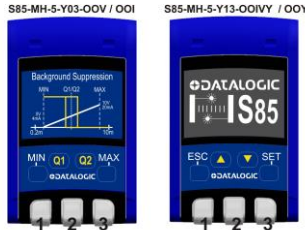
S85-MH-5-Y

Distance sensor with laser emission and time of flight measurement

INSTRUCTION MANUAL

CLASS 2 EN 60825-1
(2014)
LASER PRODUCT

CONTROLS



OUTPUT LED (yellow)
Yellow led's 1 and 2 lit, show digital outputs Q1 and Q2 enabled.

OUT OF RANGE / POWER ON LED (red/green)
LED 3 lit RED shows an out of range measurement.
LED 3 lit GREEN shows the sensor power on and the laser emission activated

INSTALLATION

The installation of the sensor can be carried out thanks to the two fixing holes on the body, by means of screws (eg M4x45 UNI5739) with nuts and washers. To install the product *only* and *always* refer to the reference surface (A) shown in Fig.1. Adjustable fixing brackets are available in order to facilitate the sensor positioning (see Accessories catalog).

With direct fixing the unit has an angular adjustment range of the laser emission of $\pm 1.5^\circ$. The measurement refers to the front surface of the sensor as in Fig.2.

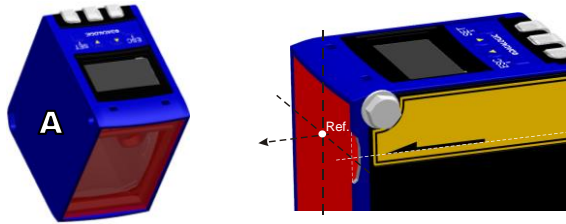


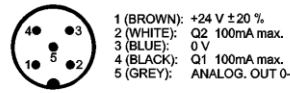
Fig.1

Fig.2

- 1) Connect and secure the M12 connector with unit power off.
- 2) Connect the cable to the power supply and/or I/O as indicated for each model.
- 3) Fix the sensor to a suitable support, taking care to align the laser spot on the center of target before fixing.
- 4) Measurement will be available within a few seconds from power on.
- 5) Allow the unit to warm up before starting normal operation.
- 6) Configure device unlocking by simultaneously pushing the Δ ∇ buttons for S85-MH-5-Y13 (the unit automatically locks the settings at the end of configuration)

CONNECTIONS

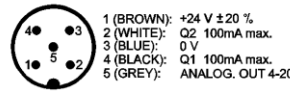
S85-Y03-OOV



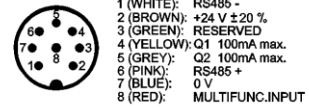
S85-Y13-OOIV



S85-Y03-OOI



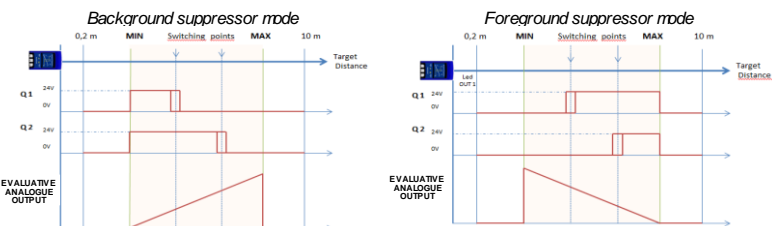
S85-Y13-OOY



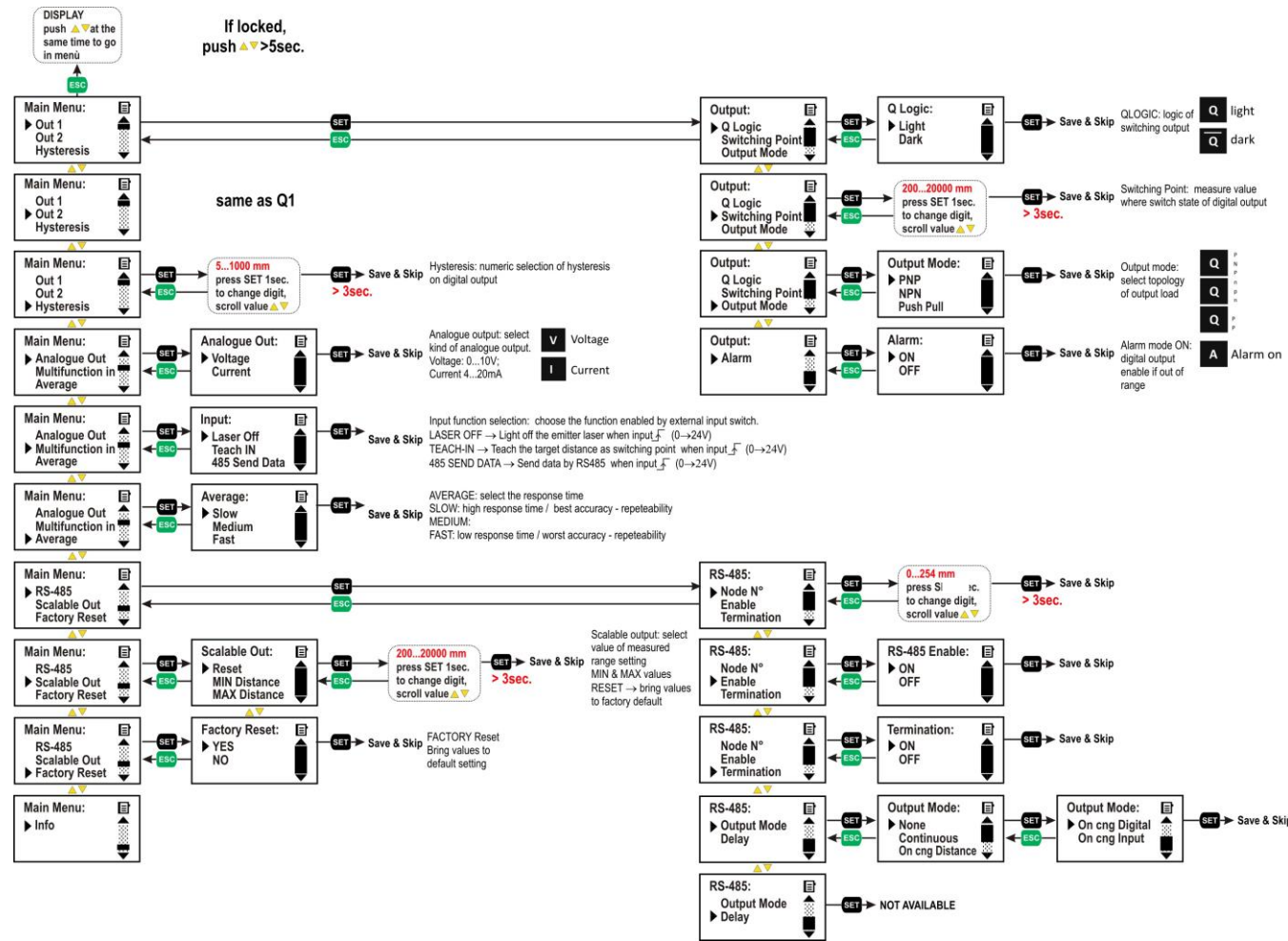
N.B.: Color of wires are referred to European standard.

CONFIGURATION SETTINGS FOR S85-MH-5-Y03

Push buttons for at least 3secs and release when the appropriate LED flashes
Push **MIN** until LED yellow 1 flashes to read "min" value.
Push **MAX** until LED yellow 2 flashes to read "max" value.
Push **Q1** until LED yellow 1 flashes to read switching point 1.
Push **Q2** until LED yellow 2 flashes to read switching point 2.
Push **MIN + MAX** until LED green 3 flashes to restore range default values.
Push **MAX + Q1 / MIN + Q2** until LED green 3 flashes to restore default switching point 1/2 (= 500 mm).



CONFIGURATION SETTING FOR S85-MH-5-Y13



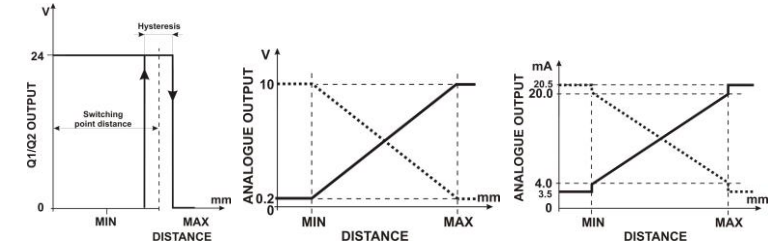
TECHNICAL DATA

	S85-MH-5-Y03-OOV	S85-MH-5-Y03-OOI	S85-MH-5-Y13-OOIV	S85-MH-5-Y13-OOY												
Power supply:	24 VDC $\pm 20\%$															
Consumption:	< 2.8 W		< 3 W													
Measurement range:	0.2..10 m (90% white) / 0.2..5 m (18% grey) / 0.2..3 m (6% black)		0.2..20 m (90% white) / 0.2..8 m (18% grey) / 0.2..5 m (6% black)													
Accuracy (1 sigma / 90% white Xrite target):	10 mm		7 mm (slow response time)													
Repeatability (1 sigma / 90% white Xrite target):	1 mm		1 mm up to 10 m / < 2 mm up to 20 m (slow response time)													
Resolution:			1 mm / 16 bit													
Hysteresis:	10mm		configurable (5 ... 1000 mm)													
Analogue output: (Linearity error $\pm 0.03\%$ FS, $\pm 0.02\%$ FS)	0.2-10 V scalable (1200 Ω min) short-circuit protection	4-20 mA scalable (100 Ω max.) short-circuit protection	Configurable (0.2-10V / 4-20 mA / scalable) short-circuit protection	Not available												
Response time SLOW:	45 msec (typ)															
Response time MEDIUM:	30 msec (typ)															
Response time FAST:	15 msec (typ)															
RS 485	Not available		<table border="1"> <thead> <tr> <th>RS-485 Cmd</th> <th>1" byte</th> <th>2" byte</th> <th>3" byte</th> <th>4" byte</th> <th>5" byte</th> </tr> </thead> <tbody> <tr> <td>Get Measure</td> <td>"0x40" hex</td> <td>"0x43" hex</td> <td>"Node N" hex</td> <td>"0x00" hex</td> <td>"0x01" hex</td> </tr> </tbody> </table>		RS-485 Cmd	1" byte	2" byte	3" byte	4" byte	5" byte	Get Measure	"0x40" hex	"0x43" hex	"Node N" hex	"0x00" hex	"0x01" hex
RS-485 Cmd	1" byte	2" byte	3" byte	4" byte	5" byte											
Get Measure	"0x40" hex	"0x43" hex	"Node N" hex	"0x00" hex	"0x01" hex											
Switching output / Alarm:	Push Pull / Q		Configurable (PNP NPN Push Pull Q Qneg)													
Multifunction input:	not available		See par. "Default Configuration"													
Warm up time:	20 min typ															
Indicators:	Q1 (YELLOW) / Q2 (YELLOW) / POWER ON (GREEN) - OUT OF RANGE (RED) 5-digit / multi display (only for S85-MH-5-Y13-OOIV / OOY)															
Operating temperature:	-15 ... 50 °C (with powered devices) - reduce the min temp. to -5°C in case of cold power on															
Storage temperature:	-25 ... 70 °C															
Dielectric strength:	500 VAC, 1 min between electronics and housing															
Insulating resistance:	> 20 M Ω , 500 VDC between electronics and housing															
Typical spot dimension (T = 25°C)	Initial diameter: 2mm Diameter @ 8m: 15mm, divergence theta: 0.001625 rad		Initial diameter: 2mm Diameter @ 10m: 15mm, divergence theta: 0.0013 rad													
Laser power emission / Pulse duration:	Pp=100mW, PFR=1MHz, pulse duration 4ns															
Wavelength:	658 nm															
Laser class emission:	CLASS 2 According to IEC 60825-1 (2014)															
Ambient light rejection:	According to EN 60947-5-2, >40 Klux DC ambient light															
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)															
Humidity:	< 90% not condensed															
Housing material:	ZINC ALLOY ZAMA 13 EN-1774 / Display: PC LEXAN 121R															
Lens material:	PMMA															
Mechanical protection:	IP67															
Connections:	M12 - 5 poles		M12 - 8 poles													
Dimension (max shape):	58 x 61 x 37 mm															
Peso	250 gr. max.															
UL requirements:	Class 2 power supply according to UL 508 - Type 1 Enclosure minimum distance between the "Proximity Switch Metal Enclosure" and any "External uninsulated live part" shall be at least 12.7 mm															
CDRH requirements:	Complies with 21 CFR 1040.10 and 1040.11															

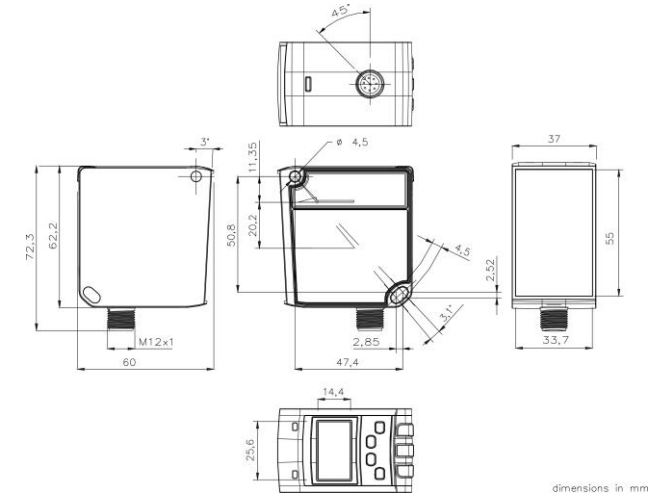
DEFAULT CONFIGURATION

	S85-MH-5-Y03-OOV	S85-MH-5-Y03-OOI	S85-MH-5-Y13-OOIV	S85-MH-5-Y13-OOY
Average:	30 msec	30 msec	45 msec (Slow)	45 msec (Slow)
Analogue out:	0.2..10 V	4..20 mA	4..20 mA	4..20 mA
RS485 output mode:			None	None
RS485 termination:			Off	Off
Input function:			Teach in	Teach in
OUT1 logic:	Light	Light	Light	Light
OUT2 logic:	Light	Light	Light	Light
OUT1 mode:	Push Pull	Push Pull	Push Pull	Push Pull
OUT2 mode:	Push Pull	Push Pull	Push Pull	Push Pull
Switching point 1 (mm):	500	500	500	500
Switching point 2 (mm):	500	500	500	500
Hysteresis (mm):	10	10	10	10
Scalable range min (mm):	200	200	200	200
Scalable range max (mm):	10000	10000	20000	20000

DETECTION DIAGRAMS



DIMENSIONS



SAFETY WARNINGS

All the safety electrical and mechanical regulations and laws have to be respected during sensor functioning. The sensor has to be protected against mechanical damages.
Do not look directly into the laser beam!
Do not point the laser beam towards people!
Eye irradiation for over 0.25 seconds is dangerous; refer to class 2 standard (EN60825-1). This product is intended for indoor use only.
Use of controls or adjustments or performance or procedures other than those specified herein may result in hazardous radiation exposure.



CAUTION LASER RADIATION
DO NOT STARE INTO BEAM
CLASS 2 LASER PRODUCT
Pp = 100mW
PFR = 1MHz
ton = 4ns
λ = 658nm
IEC 60825-1 (2014)

MAINTENANCE

Device do not need for particular maintenance. Anycase, take care to clean optic surface with compliant cleanser in order to avoid decay of performance.
Use protection for plastic parts in case of hazardous environment.

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.



For information about the disposal of Waste Electrical and Electronic Equipment (WEEE), please refer to the website at www.datalogic.com.

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