

**Description**

- Operation mode and max sensing range:  
Thru-beam: 1-70 m
- IO-Link communication interface
- PC software for parameter configuration and diagnostics with optional USB-IO-Link Master 02
- M12 plug connection
- Transmitting power adjustment
- Power and output indicators
- High tolerance to hostile environments
- 10-30 V dc supply voltage
- 5 pin, IO-Link / push-pull and NPN or PNP output
- Test input
- High excess gain
- Optical cross talk elimination of 4 independent sensor channels selectable via IO-Link



The SM 9000-IO series consists of a high-power self-contained transmitter SMT, and receiver SMR, which are to be used in thru-beam mode. The complete series is available in stainless steel or plastic housing with either cable or plug connection.

The complete series is available with a 10-30 V dc supply voltage. All sensors offer a combined IO-Link and push-pull output, together with a supplementary NPN or PNP output.

The SM 9000-IO is equipped with an IO-Link communication interface which allows a variety of process parameter and setting to be configured and monitored, which includes: transmitter power, channel selection, light or dark selection, on/off time delay, one-shot timer, signal alarm.

The control input in the SMT may be used for either disabling or enabling the transmitting power temporarily for test purpose, multiplexing applications or as gradual regulation of the transmitting power level.

The series features cross talk elimination which enables up to 4 individual sensor pairs to operate independently, configurable via IO-Link in the SMT and SMR, ensuring that optical cross talk interference between the channels is prevented.

Both the transmitter and receiver are protected against reverse polarity of power supplies, control input and output signals. The output is also protected against short circuit and inductive loads.

Technical Data				
	SMT		SMR	
	9020C	9070C	9x20	9x70
Supply voltage	10-30 V dc			
Voltage ripple	Max. 15 %			
Reverse polarity protected	Yes			
Short circuit protected	-		Yes	
Current consumption	Max. 40 mA			
Maximum output load	-		100 mA	
Maximum residual voltage	-		2,5 V	
IO-Link communication	Yes			
Maximum operation frequency	-		20 Hz	
Response time $t_{ON}$ / $t_{OFF}$	-		25 ms / 25 ms	
Power on indicator	Green LED		-	
Output indicator	-		Yellow LED	
Hysteresis	-		Approx. 20 %	
Light source	Infrared (880 nm)		-	
Opening angle	-		+/- 7°	+/- 3°
Emission angle	+/- 7°	+/- 4°	-	
Housing material	Sensor housing	Stainless Steel (AISI 316 / 1.4401) or Polycarbonate		
	Front lens	Polycarbonate		
Cable, PVC Ø 4,9 mm	5 x 0,14 mm <sup>2</sup>			

**Environmental Data**

	SMT	SMR	
		9x20	9x70
Vibration	10-55 Hz, 0,5 mm		
Shock	30 g		
Light immunity, @ 5° incidence	-	10 000 lux	20 000 lux
Temperature, operation	-20 to +60 °C		
Temperature, storage	-40 to +80 °C		
Sealing class	IP 69K		
Approvals	CE UK CA		

**Note:** Sensors are IP 69K rated if the cable is protected from high-pressure spray.

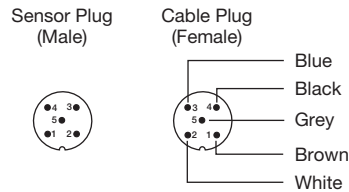
**Available Types**

	Type	Control Feature	Output	Connection		0,1 m cable with 5 pin, M12 plug Order Reference	Range
				Housing Material	Housing Type		
<b>Transmitter</b>	<b>9020C</b>	Adjustable range and test input	-	Polycarbonate	M18 x 1	<b>SMT 9020C-IO TP 0.1-J5</b>	1-20 m
				Stainless Steel		<b>SMT 9020C-IO TS 0.1-J5</b>	
<b>Receiver</b>	<b>9420</b>	-	NPN	Polycarbonate	M18 x 1	<b>SMR 9420-IO TP 0.1-J5</b>	20 m
				Stainless Steel		<b>SMR 9420-IO TS 0.1-J5</b>	
	PNP		Polycarbonate	<b>SMR 9520-IO TP 0.1-J5</b>			
			Stainless Steel	<b>SMR 9520-IO TS 0.1-J5</b>			
<b>Transmitter</b>	<b>9070C</b>	Adjustable range and test input	-	Polycarbonate	M18 x 1	<b>SMT 9070C-IO TP 0.1-J5</b>	1-70 m
				Stainless Steel		<b>SMT 9070C-IO TS 0.1-J5</b>	
<b>Receiver</b>	<b>9470</b>	-	NPN	Polycarbonate	M18 x 1	<b>SMR 9470-IO TP 0.1-J5</b>	70 m
				Stainless Steel		<b>SMR 9470-IO TS 0.1-J5</b>	
	PNP		Polycarbonate	<b>SMR 9570-IO TP 0.1-J5</b>			
			Stainless Steel	<b>SMR 9570-IO TS 0.1-J5</b>			

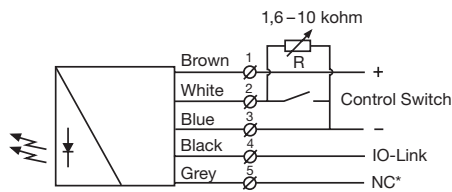
**Connections**

	M12 Plug / Cable
Supply +	Pin 1 / Brown
Supply -	Pin 3 / Blue
Control Input / Output	Pin 2 / White
IO-Link	Pin 4 / Black
Not Connected	Pin 5 / Grey

**5 pin, M12**



**Wiring Diagrams**



\*Do not connect grey wire

**SMT 90xxC**

Variable range and ON/OFF switch for transmitting power



\*Do not connect grey wire

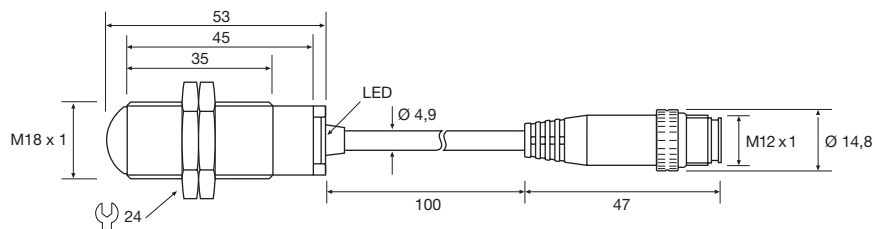
**SMR 94xx**



\*Do not connect grey wire

**SMR 95xx**

**Dimensions and Descriptions**

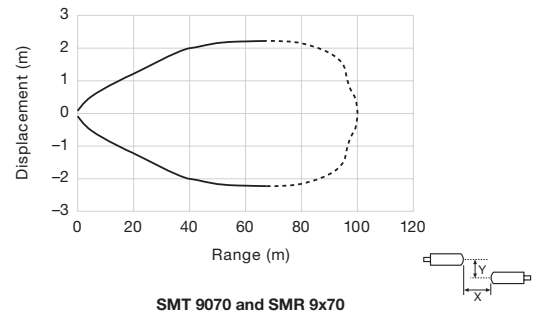
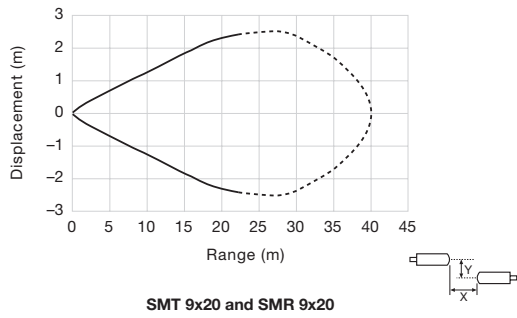


**TP/TS 0.1-J5**

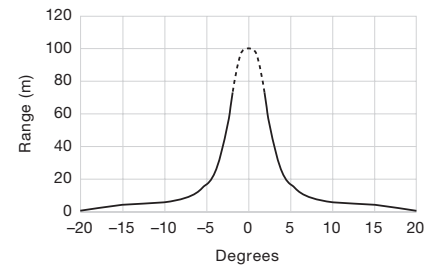
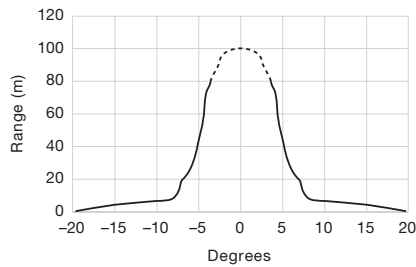
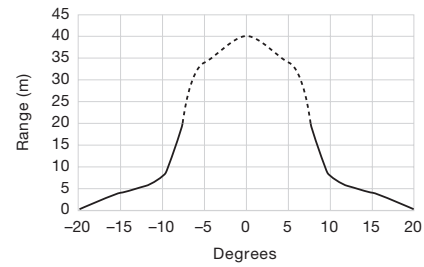
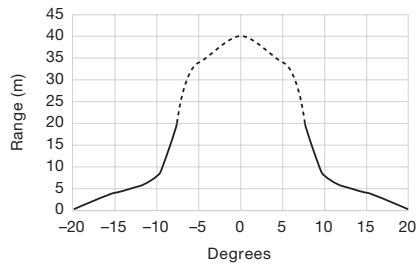
(Units in mm)

Sensing Characteristics

Parallel Displacement



Angular Displacement



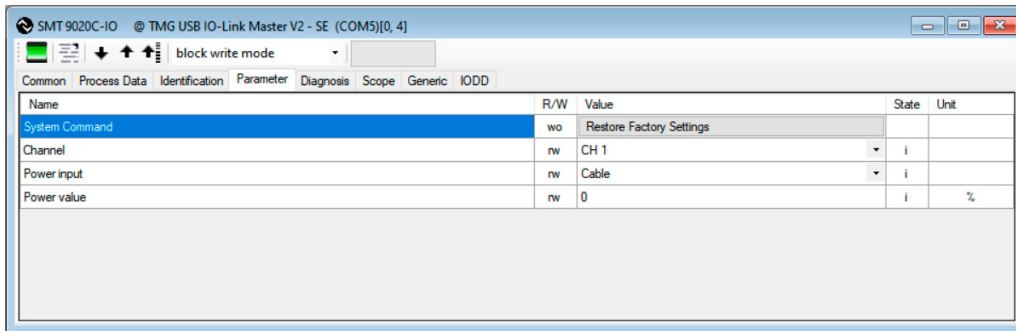
**PC Programming and Monitoring**

**General Setup**

**Transmitter**

	Settings	Function	Parameters
1	System Command – Restore Factory Settings	Restores all user settings to default values	N/A
2	Channel	Select channel. Same channel selected for matching SMT and SMR pair	CH 1 / CH 2 / CH 3 / CH 4
3	Power Input	Select power input mode	Cable / IO-Link
4	Power Value	Adjust the transmitter power of the transmitter	0-100 %

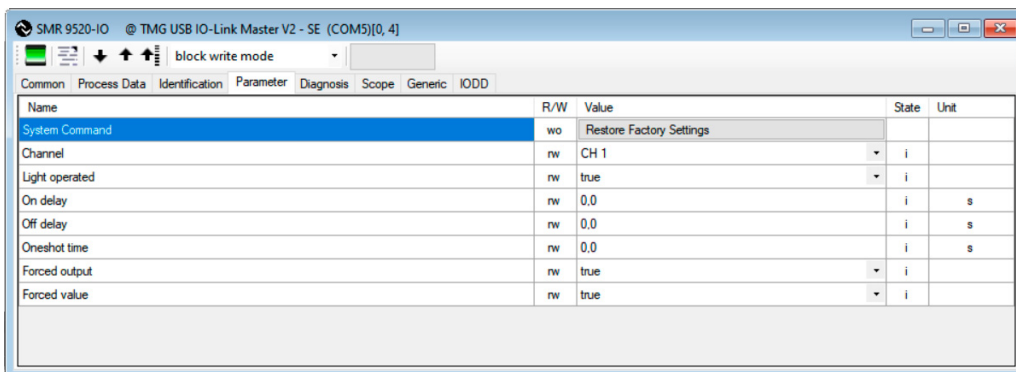
**USB-IO Link Master 02 PC Software Screenshot**



**Receiver**

	Settings	Function	Parameters
1	System Command – Restore Factory Settings	Restores all user settings to default values	N/A
2	Channel	Select channel. Same channel selected for matching SMT and SMR pair	CH 1 / CH 2 / CH 3 / CH 4
3	Light Operated	Select between light or dark operation	True / False
4	On Delay	On delay time between the expression becomes true and the output is switched	0.00-600.00 s
5	Off Delay	Off delay time between the expression becomes false and the output is switched	0.00-600.00 s
6	One-Shot Time	Select duration the output be active when switching from not active to active	0.00-600.00 s
7	Forced Output	Select if output shall be forced to the value in Forced Value or from the sensor input	True / False
8	Forced Value	Select output state if the Forced Output is True	True / False

**USB-IO Link Master 02 PC Software Screenshot**



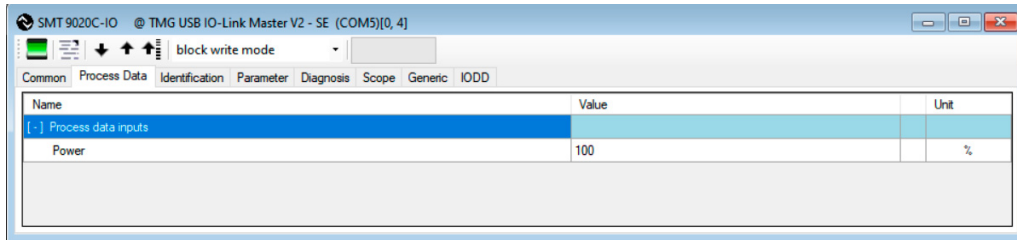
**PC Programming and Monitoring**

**Process Data**

**Transmitter**

	Name	Description	Parameters
1	Power	Indicates transmitter power setting	0-100 %

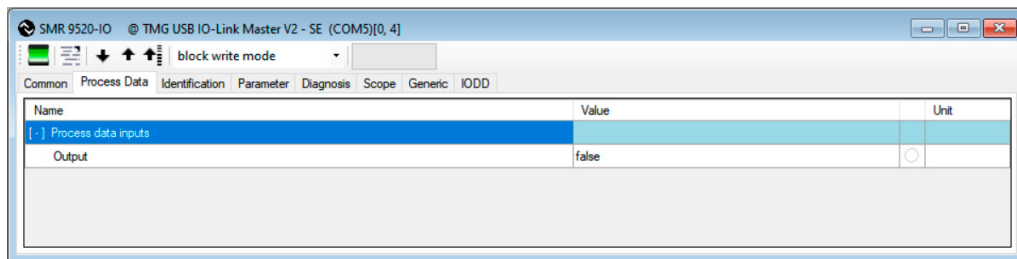
**USB-IO Link Master 02 PC Software Screenshot**



**Receiver**

	Name	Description	Parameters
1	Output	Indicates status of output	True / False

**USB-IO Link Master 02 PC Software Screenshot**



Telco reserves the right to change specifications without notice.