SPACEMASTER™ SERIES

SM 9000 SOLID STATE
DATASHEET

SENSOR PARTNERS

SPACEMASTER™ SERIES — SM 9000 SOLID STATE

Description

- Operation mode and max sensing range: **Thru-beam: 1-70 m**
- Cable or plug connection
- Sensitivity adjustment via control input
- Light / dark selection via wire connection
- Power and output indicators
- High tolerance to hostile environments
- 10-30 V dc supply voltage
- 5 wire, solid state relay output
- Test input
- High excess gain
- Optical cross talk elimination with 4 independent sensor channels
- Available with optional Ex ATEX approval

The SM 9000 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 with a 5 wire, opto-isolated solid state output. Light or dark function is selectable by wire connection. 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 SM 9000 series features cross talk elimination which enables up to 4 individual sensor pairs to operate independently ensuring that optical cross talk interference between the channels is prevented. The channels are selectable by control input in the transmitter, and chosen individually by type in the receiver. 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	942x	947x
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 / 30 V dc	
Maximum residual voltage		–		2,5 V	
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 mm²			

Environmental Data			
	SMT	SMR	
		942x	947x
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

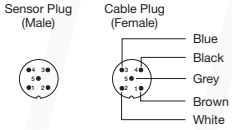
	Type	Control Feature / Output	Channels	Connection		5 m cable	15 m cable	0,1 m cable with 5 pin, M12 plug	Range
				Housing Material	Housing Type	Order Reference			
Transmitter	9020C	Adjustable range and test input	Selectable 1 to 4	Polycarbonate	M18 x 1	SMT 9020C TP 5	SMT 9020C TP 15	SMT 9020C TP 0.1-J5	1-20 m
				Stainless Steel		SMT 9020C TS 5 [1]	SMT 9020C TS 15 [1]	SMT 9020C TS 0.1-J5	
Receiver	9421	Solid State Relay LO/DO	1	Polycarbonate	M18 x 1	SMR 9421 TP 5	SMR 9421 TP 15	SMR 9421 TP 0.1-J5	20 m
				Stainless Steel		SMR 9421 TS 5 [1]	SMR 9421 TS 15 [1]	SMR 9421 TS 0.1-J5	
	9422		2	Polycarbonate		SMR 9422 TP 5	SMR 9422 TP 15	SMR 9422 TP 0.1-J5	
				Stainless Steel		SMR 9422 TS 5 [1]	SMR 9422 TS 15 [1]	SMR 9422 TS 0.1-J5	
	9423		3	Polycarbonate		SMR 9423 TP 5	SMR 9423 TP 15	SMR 9423 TP 0.1-J5	
				Stainless Steel		SMR 9423 TS 5 [1]	SMR 9423 TS 15 [1]	SMR 9423 TS 0.1-J5	
	9424		4	Polycarbonate		SMR 9424 TP 5	SMR 9424 TP 15	SMR 9424 TP 0.1-J5	
				Stainless Steel		SMR 9424 TS 5 [1]	SMR 9424 TS 15 [1]	SMR 9424 TS 0.1-J5	
Transmitter	9070C	Adjustable range and test input	Selectable 1 to 4	Polycarbonate	M18 x 1	SMT 9070C TP 5	SMT 9070C TP 15	SMT 9070C TP 0.1-J5	1-70 m
				Stainless Steel		SMT 9070C TS 5 [1]	SMT 9070C TS 15 [1]	SMT 9070C TS 0.1-J5	
Receiver	9471	Solid State Relay LO/DO	1	Polycarbonate	M18 x 1	SMR 9471 TP 5	SMR 9471 TP 15	SMR 9471 TP 0.1-J5	70 m
				Stainless Steel		SMR 9471 TS 5 [1]	SMR 9471 TS 15 [1]	SMR 9471 TS 0.1-J5	
	9472		2	Polycarbonate		SMR 9472 TP 5	SMR 9472 TP 15	SMR 9472 TP 0.1-J5	
				Stainless Steel		SMR 9472 TS 5 [1]	SMR 9472 TS 15 [1]	SMR 9472 TS 0.1-J5	
	9473		3	Polycarbonate		SMR 9473 TP 5	SMR 9473 TP 15	SMR 9473 TP 0.1-J5	
				Stainless Steel		SMR 9473 TS 5 [1]	SMR 9473 TS 15 [1]	SMR 9473 TS 0.1-J5	
	9474		4	Polycarbonate		SMR 9474 TP 5	SMR 9474 TP 15	SMR 9474 TP 0.1-J5	
				Stainless Steel		SMR 9474 TS 5 [1]	SMR 9474 TS 15 [1]	SMR 9474 TS 0.1-J5	

Note: SM 9000 Series with stainless steel housing and cable connection is available to comply with ATEX Ex II 3 G Ex nA IIC T6 Gc and II 3D Ex tc IIIC T100°C Dc. Add "/EX" after the series number e.g. SMT 9070C/EX TS 5. Sensors marked [1] are available to comply with ATEX approval.

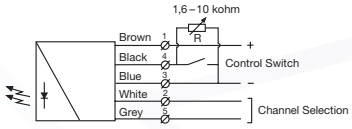
Connections

	Cable	M12 Plug / Cable
Supply +	Brown	Pin 1 / Brown
Supply –	Blue	Pin 3 / Blue
SMT control input	Black	Pin 4 / Black
SMR output	Black	Pin 4 / Black
SMT channel selection / SMR output	White	Pin 2 / White
SMT channel selection / SMR LO/DO selection	Grey	Pin 5 / Grey

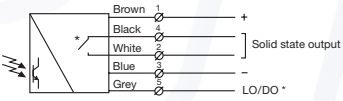
5 pin, M12



Wiring Diagrams



SMT 90xxC
Variable range and ON/OFF switch
for transmitting power

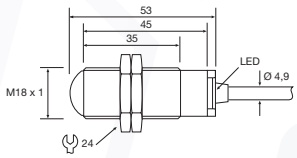


SMR 94xx
* Connect grey wire to + for LO and to – supply for DO

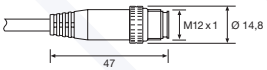
Channel Selection — SMT

Channel Number	Connection Configuration	
	Grey wire	White wire
1	Supply – (blue wire)	Supply – (blue wire)
2	Supply + (brown wire)	Supply – (blue wire)
3	Supply – (blue wire)	Supply + (brown wire)
4	Supply + (brown wire)	Supply + (brown wire)

Dimensions and Descriptions



TP/TS 5/15/0.1-J5

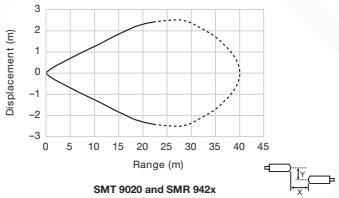


0.1-J5

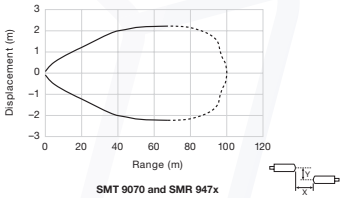
(Units in mm)

Sensing Characteristics

Parallel Displacement

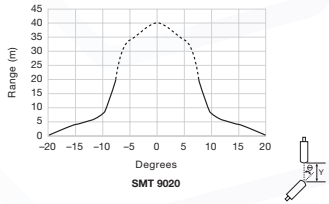


SMT 9020 and SMR 942x

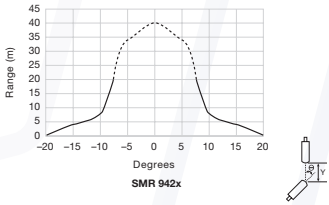


SMT 9070 and SMR 947x

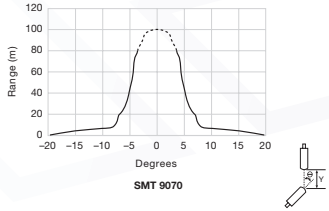
Angular Displacement



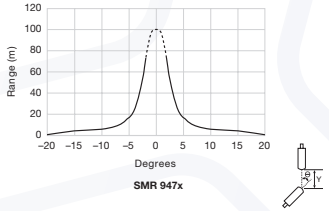
SMT 9020



SMR 942x



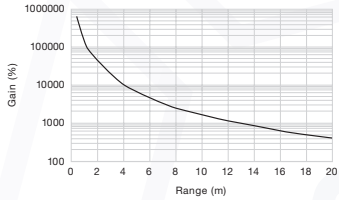
SMT 9070



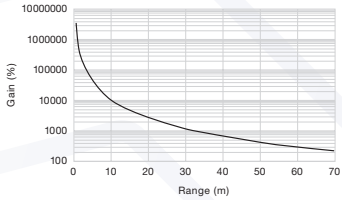
SMR 947x

Sensing Characteristics

Excess Gain



SMT 9020 and SMR 942x



SMT 9070 and SMR 947x

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