



SPACEMASTER™ SERIES

SM 9000 SOLID STATE USER MANUAL



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**SENSOR
PARTNERS**



SM 9000 SOLID STATE OUTPUT - USER MANUAL

SpaceMaster Series

Photoelectric DC thru beam sensors

EN

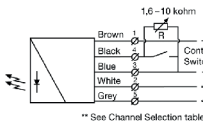


| Product Data | | | | | | |
|----------------------------|---------------|-------------------|-----------------|-------------------|----------------------|------|
| Electrical Data | | | | | | |
| | Transmitter | | Receiver | | | |
| Supply Voltage | 10-30 V dc | | | | | |
| Voltage ripple | +/-15% | | | | | |
| Reverse polarity protected | Yes | | | | | |
| Short circuit protected | - | | Yes | | | |
| Power consumption | Max. 40 mA | | | | | |
| Max. Output load | - | | 100 mA / 30V DC | | | |
| Environmental Data | | | | | | |
| Temperature, operation | -20 to +60 °C | | | | | |
| Sealing class | IP 69K | | | | | |
| Approvals | UK CR | | CE | | | |
| Available Models | | | | | | |
| | Model | Output | Output Mode | Channel | Sensing Range | |
| Transmitters | SMT 9020C | - | - | Selectable 1 to 4 | 4 - 20 m, adjustable | |
| | SMT 9070C | - | - | 1 to 4 | 4 - 70 m, adjustable | |
| Receivers | SMR9421 | Solid State Relay | Dark / Light | Fixed to CH 1 | 20 m | |
| | SMR9422 | | | Fixed to CH 2 | | |
| | SMR9423 | | | Fixed to CH 3 | | |
| | SMR9424 | | Fixed to CH 4 | | | |
| | SMR9528 | | Dark Operated | CH 1 / CH 2 | | |
| | SMR9529 | | | CH 3 / CH 4 | | |
| | SMR9628 | | Light Operated | CH 1 / CH 2 | | |
| | SMR9629 | | | CH 3 / CH 4 | | |
| | SMR9471 | | Dark / Light | Fixed to CH 1 | | 70 m |
| | SMR9472 | | | Fixed to CH 2 | | |
| | SMR9473 | | | Fixed to CH 3 | | |
| | SMR9474 | | Fixed to CH 4 | | | |
| | SMR9578 | | Dark Operated | CH 1 / CH 2 | | |
| | SMR9579 | | | CH 3 / CH 4 | | |
| | SMR9678 | | Light Operated | CH 1 / CH 2 | | |
| SMR9679 | CH 3 / CH 4 | | | | | |

Connection

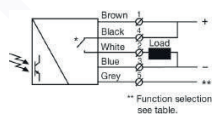
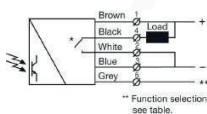
Wiring Diagrams

Transmitters



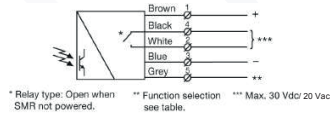
Receivers

SMT 90XXC
Variable range & test input setup



SMR 9XXX solid state relay used as NPN output

SMR 9XXX solid state relay used as PNP output



SMR 9XXX Solid State Output

| Connection Wires/Pins for transmitters | | | SMT |
|--|-----------------------|---------------|-----|
| Cable | 5 pin, M12 plug, male | | |
| Supply + | Brown | Pin 1 / Brown | |
| Supply - | Blue | Pin 3 / Blue | |
| SMT Test Input/Control | Black | Pin 4 / Black | |
| SMT Channel Selection | Grey | Pin 5 / Grey | |
| | White | Pin 2 / White | |

| Connection Wires/Pins for receivers | | | SMR |
|-------------------------------------|-----------------------|---------------|-----|
| Cable | 5 pin, M12 plug, male | | |
| Supply + | Brown | Pin 1 / Brown | |
| Supply - | Blue | Pin 3 / Blue | |
| Solid State Relay : Contact 1 | White | Pin 2 / White | |
| Solid State Relay : Contact 2 | Black | Pin 4 / Black | |
| Function selection wire | Grey | Pin 5 / Grey | |

Mounting & Alignment

- ### Mounting & Alignment
- Mount the transmitter and receiver sensors facing each other. Make sure the distance between the sensors does not exceed the specified sensing range of the system.
 - Align the sensors by moving, either the transmitter or receiver sensor, horizontally and vertically making sure they are pointing at each other until the output is:
 - Deactivated when no object is present. (Dark operated)
 - Activated when no object is present. (Light operated)
 - Fasten the transmitter and receiver sensors securely. Avoid acute angles on cable close to sensor.

Adjustments

| Output Logic | Output Mode | Output status | Yellow LED |
|----------------|-----------------------|---------------|------------|
| Detection | | | |
| Object absent | | | |
| Transmitter | Dark operated (N.O) | Open | Off |
| Receiver | Light operated (N.C.) | Closed | On |
| Object present | | | |
| Transmitter | Light operated (N.C.) | Open | Off |
| Receiver | Dark operated (N.O) | Closed | On |

Transmitter Power Adjustment

SMT 9020C / SMT 9070C

Maximum transmitting power can be used for most applications. Maximum transmitter power (factory set) is advised for applications with contaminated environments.

The transmitting power can be adjusted externally via the 'Black' control wire of the transmitter SMJ unit. The transmitter level can be adjusted using a resistor (e.g. potentiometer) of 1.6k to 10K ohm or a voltage source of 0.8—2.0 V dc connected respectively between the 'Black' control wire and —(negative) 'Blue' supply wires. Adjustment of transmitter SMT power may be required in applications where objects to be detected are small or translucent. Proceed with the following steps:

- Select target object with the smallest dimensions and most translucent surface.
- Place target object between transmitter and receiver sensors. If the output status changes, adjustment is not required. If the output status has not changed proceed to step 3.
- Decrease the transmitter power (by reducing the resistance) until the output status changes. If the output status has not changed, attempt to move the sensors further apart or angle one of the sensors, and then repeat procedure.
- Remove target object. Observe the output status has changed.

Note: If the transmitter power adjustment or test input is not to be used, it is recommended to



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| Test Input | | SMT 9020C / SMT 9070C |
|---|--|-----------------------|
| The transmitter SMT unit can be externally disabled and enabled, via the 'Black' control wire, for test purposes. The test input requires the 'Black' control wire to be connected to the negative (–) 'Blue' supply wire. Make sure no object is present in the detection area when the SMT transmitter is disabled for the test. When the SMT transmitter is disabled, the SMR receiver should change output state. | | |
| Enable transmitter | Open (off) control switch, a resistor over 10k ohm, or voltage over 2.5 V dc | |
| Disable transmitter | Close (on) control switch, a resistor below 200 ohm, or voltage below 0.7 V dc | |
| Note: If the transmitter test input or power adjustment is not to be used, it is recommended to connect the 'Black' control wire to the + (positive) 'Brown' supply wire. | | |

| Channel Selection table for transmitters | | | SMT |
|---|------------|------------|-----|
| The transmitter is capable of operating on 4 individual channels. Please see below. | | | |
| Channel n° | Wire Color | | |
| | Grey Wire | White Wire | |
| 1 | Supply – | Supply – | |
| 2 | Supply + | Supply – | |
| 3 | Supply – | Supply + | |
| 4 | Supply + | Supply + | |

| Function Selection table for receivers | | | | SMR |
|--|----------------------|------------------------------|-----------------------|-----|
| Each model has a fixed function and then 2 functions which can be selected using the Grey function selection wire. | | | | |
| Model | Fixed Function | Function Select by Grey Wire | | |
| | | Connected to Supply - | Connected to Supply + | |
| SMR9421 | Operate on Channel 1 | Dark operated | Light operated | |
| SMR9422 | Operate on Channel 2 | | | |
| SMR9423 | Operate on Channel 3 | | | |
| SMR9424 | Operate on Channel 4 | | | |
| SMR9528 | Dark Operated | Channel 1 | Channel 2 | |
| SMR9529 | | Channel 3 | Channel 4 | |
| SMR9628 | Light operated | Channel 1 | Channel 2 | |
| SMR9629 | | Channel 3 | Channel 4 | |
| SMR9471 | Operate on Channel 1 | Dark operated | Light operated | |
| SMR9472 | Operate on Channel 2 | | | |
| SMR9473 | Operate on Channel 3 | | | |
| SMR9474 | Operate on Channel 4 | | | |
| SMR9578 | Dark Operated | Channel 1 | Channel 2 | |
| SMR9579 | | Channel 3 | Channel 4 | |
| SMR9678 | Light Operated | Channel 1 | Channel 2 | |
| SMR9679 | | Channel 3 | Channel 4 | |





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