

# Coaxial Relays, Series TR02

SPDT / N (DC – 12.4 GHz)

Switching: Failsafe / Latching



## Specifications

| Technical data                   |                         |
|----------------------------------|-------------------------|
| Contact material                 | Plated Au               |
| Switching Sequence               | Break before make       |
| Switching time                   | 20 msec max.            |
| Impedance                        | 50 Ω                    |
| Temperature range                | -55°C up to +85°C       |
| Relative humidity                | 5 up to 85 %            |
| Operation life (cycles)          | 1 million               |
| Vibration (operation)            | 10 G RMS, 20 – 2000 Hz  |
| Mechanical shock (non-operating) | 50 G, 1/2 sine, 11 msec |
| Weight (ca.)                     | 255 g                   |
| Control                          | Solder Pins or DSUB 9   |

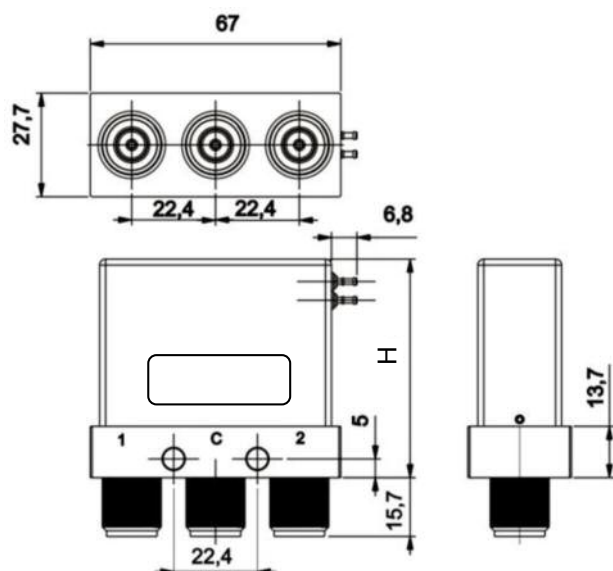
| Coil Voltage (V DC) |          | 12  | 18  | 24  | 28  |
|---------------------|----------|-----|-----|-----|-----|
| Current (mA) max.   | Failsafe | 270 | 220 | 150 | 110 |
|                     | Latching | 310 | 250 | 170 | 130 |

Other coil voltage options are available on request.

## Standard models

| Frequency Range (GHz) | VSWR max. | Insertion loss (dB) max. | Isolation (dB) min. |
|-----------------------|-----------|--------------------------|---------------------|
| DC – 2                | 1.15      | 0.20                     | 80                  |
| 2 – 4                 | 1.20      | 0.25                     | 80                  |
| 4 – 12.4              | 1.50      | 0.50                     | 60                  |

## Dimensions



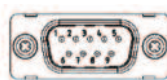
$H = 58 \text{ mm (max)}$

$H = 68 \text{ mm (max.)}$  for option with TTL and/or „self cutoff“

$H = 73 \text{ mm (max.)}$  with indicator

Mechanical drawing in mm, tolerance  $\pm 0,5 \text{ mm}$

## PIN-Assignment – Failsafe



9-Pin DSUB (M)

| Pin No. | PINOUT         |
|---------|----------------|
| 1       | A1/V1 (J1-COM) |
| 2       | UNUSED         |
| 3       | COM-           |
| 4       | UNUSED         |
| 5       | 1 (IND.)       |
| 6       | 2 (IND.)       |
| 7       | COM. I (IND.)  |
| 8       | UNUSED         |
| 9       | +VDC/+VDCI     |

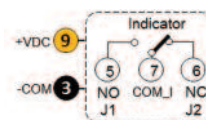
### Optional Indicator Specifications

Max. withstand Voltage: 60 V

Max. current capacity: 100 mA

Max. "ON" resistance: 16  $\Omega$

Note: +V DC and -C must be connected to operate



## PIN-Assignment – Latching



9-Pin DSUB (M)

| Pin No. | PINOUT         |
|---------|----------------|
| 1       | A1/V1 (J1-COM) |
| 2       | A2/V2 (J2-COM) |
| 3       | COM-           |
| 4       | UNUSED         |
| 5       | 1 (IND.)       |
| 6       | 2 (IND.)       |
| 7       | COM. I (IND.)  |
| 8       | UNUSED         |
| 9       | +VDC/+VDCI     |

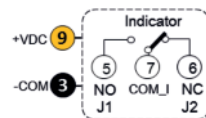
### Optional Indicator Specifications

Max. withstand Voltage: 60 V

Max. current capacity: 100 mA

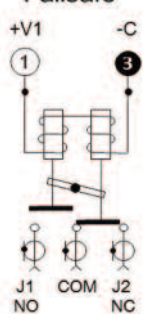
Max. "ON" resistance: 16  $\Omega$

Note: +V DC and -C must be connected to operate

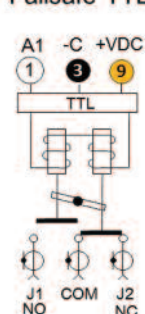


## Circuit Diagram – Failsafe

### Failsafe

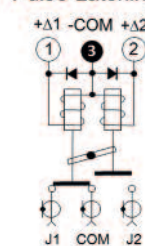


### Failsafe TTL

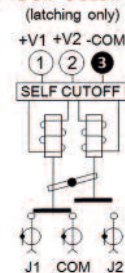


## Circuit Diagram – Latching

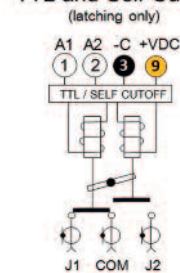
### Pulse Latching



### Self Cutoff



### TTL and Self Cutoff



Germany

**Telemeter Electronic GmbH**

Joseph-Gaensler-Str. 10, 86609 Donauwörth  
Phone +49 906 70693-0, Fax +49 906 70693-50  
info@telemeter.de, www.telemeter.info

Switzerland

**Telemeter Electronic GmbH**

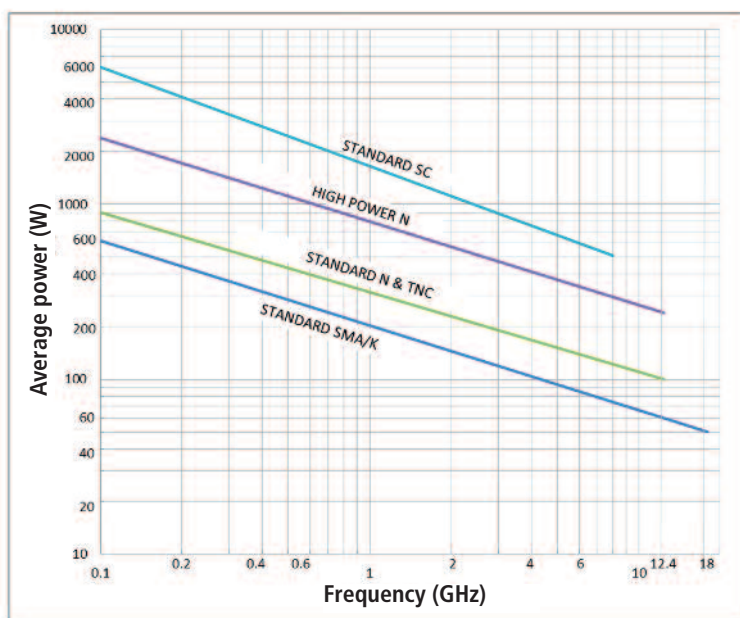
Romanshornestr. 117, 8280 Kreuzlingen  
Phone +41 71 6992020, Fax +41 71 6992024  
info@telemeter.ch, www.telemeter.info

Czech Republic

**Telemeter Electronic s.r.o.**

České Vrbné 2364, 37011 České Budějovice  
Phone +420 38 5310637  
info@telemeter.cz, www.telemeter.info

## Power chart



| VSWR    | Derating Factor |
|---------|-----------------|
| 1.5 : 1 | 0.96            |
| 2.0 : 1 | 0.88            |
| 2.5 : 1 | 0.84            |
| 3.0 : 1 | 0.75            |
| 3.5 : 1 | 0.70            |
| 4.0 : 1 | 0.64            |
| 4.5 : 1 | 0.60            |
| 5.0 : 1 | 0.56            |

This graph is based on the following conditions:

- Ambient temperature +20°C
- Sea level 0
- VSWR 1 : 1
- Cold switching

## Ordering scheme

|                                                                            | Switchmodel | Function/<br>configuration | Coil-<br>voltage | Connections        | Frequency range        | Actuator/Control                   | Special options                |
|----------------------------------------------------------------------------|-------------|----------------------------|------------------|--------------------|------------------------|------------------------------------|--------------------------------|
| TR                                                                         | XX-         | X                          | XX               | X                  | XX                     | X                                  | -XX                            |
| TEleRel                                                                    | 01 = DPDT   | F = Failsafe               | 12 Volt          | C = SC female      | 01 = DC up to 1 GHz    | 0 = with overvoltage protection    | C = positive common            |
| TEleRel                                                                    | 02 = SPDT   | L = Latching               | 18 Volt          | K = 2.92 mm female | 03 = DC up to 3 GHz    | without TTL/self cutoff            | D = Sub-D                      |
| TEleRel                                                                    | 03 = SP3T   | N = Normally open          | 24 Volt          | L = 2.4 mm female  | 04 = DC up to 4 GHz    | 1 = with TTL-driver                | E = extended temperature range |
| TEleRel                                                                    | 04 = SP4T   |                            | 28 Volt          | N = N female       | 05 = DC up to 5 GHz    | 2 = self cutoff (only at Latching) | H = high performance           |
| TEleRel                                                                    | 05 = SP5T   |                            |                  | S = SMA female     | 12 = DC up to 12.4 GHz | 3 = self cutoff & TTL              | (5 mio. switching cycles)      |
| TEleRel                                                                    | 06 = SP6T   |                            |                  |                    | 16 = DC up to 16 GHz   | (nur bei latching)                 | I = Indicators                 |
| TEleRel                                                                    | 07 = SP7T   |                            |                  |                    | 18 = DC up to 18 GHz   | 4 = without overvoltage protection | L = low PIM                    |
| TEleRel                                                                    | 08 = SP8T   |                            |                  |                    | 26 = DC up to 26.5 GHz | without TTL/self cutout            | M = moisture seal              |
| TEleRel                                                                    | 09 = SP9T   |                            |                  |                    | 40 = DC up to 40 GHz   | 5 = with binary decoder            | N = without mounting           |
| TEleRel                                                                    | 10 = SP10T  |                            |                  |                    |                        |                                    | bracket at DPDT                |
| TEleRel                                                                    | 11 = SP11T  |                            |                  |                    |                        |                                    | P = high power                 |
| TEleRel                                                                    | 12 = SP12T  |                            |                  |                    |                        |                                    | T = scheduling                 |
| TEleRel                                                                    | 13 = SP13T  |                            |                  |                    |                        |                                    | V = V-design                   |
| TEleRel                                                                    | 14 = SP14T  |                            |                  |                    |                        |                                    | Y = Y-design                   |
| TEleRel                                                                    | 15 = SP15T  |                            |                  |                    |                        |                                    |                                |
| TEleRel                                                                    | 16 = SP16T  |                            |                  |                    |                        |                                    |                                |
| TEleRel                                                                    | 17 = SP17T  |                            |                  |                    |                        |                                    |                                |
| TEleRel                                                                    | 18 = SP18T  |                            |                  |                    |                        |                                    |                                |
| ***Please note that some options are not available depending on the modell |             |                            |                  |                    |                        |                                    |                                |

\*\*\*Please note that some options are not available depending on the model