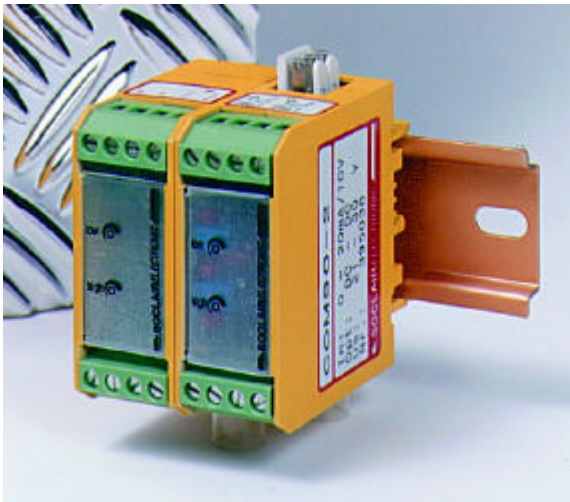


Configurable Double Limit Switch COM 90



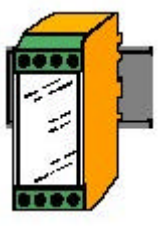
Double Limit Switch

General Description

This module contains two comparators and one or two relays for the monitoring of analog signals from 0-400 mV, 0-10 V or 0-20 mA. Input range and operating mode may be selected via DiL-switches. Two switching thresholds with status LED's, adjustment via a 12-turn potentiometer

- Choice of one or two relays with double-throw contacts
- Selectable operating modes: limit switch, window comparator, two-position controller
- Adjustable hysteresis (standard) und time delay (Option).
- Secure against short-circuits and terminal reversal, up to 40 VDC over-voltage at all inputs; fulfils all EMC-EC norms for industrial environments (EN500082/IEC801).

Overview

For DIN-Rails	Type	Input	Supply	Konfig.	Features
	COM 90-1	V, 0/4-20mA	21-30V	progr.	With one relay
	COM 90-2	V, 0/4-20mA	21-30V	progr.	With two relays

General

These DIN-rail modules possess two front-plate potentiometers for the two thresholds and three status LEDs, input values below "low" threshold, between "low" and "high" (window) and above "high". The optional relay has tree 2.8mm flat connectors on the top of the module, for which corresponding screw terminal connectors are available (type Imi 205 203 01).

Upon request, relay 2 can also be connected between screw terminals 5 and 6 (instead of the flat connectors). In that case only two single contacts are available for each relay.

Technical Data

Specifications (Max. values at 23°C, unless otherwise stated)

Input Impedance		Unit
0-20 mA, typ./max. ¹	90/105	Ohm
0-400 mV, typ.	100	MOhm
0-10 V	250	kOhm
Switching Threshold		Unit
Adjustability via 12-turn potentiometer	0.02	%
Temperature drift, max.	200	ppm/K
Switching limit adjustment range	1-105	%
Hysteresis adjustment range, typ.	0.1-2.5	%
Dynamic Response		Unit
Response time, max.	50	ms
Adjustment range of time delay ³ , typ. (option)	0.04-1	s
Relays		Unit
max. Switch voltage ²	250/220	VAC/DC
max. contact current/switch current	2	A
max. switching capacity	24/60	W/VA
Test voltage with intermittently open contacts	1000	VAC
Contact-coil test voltage	1500	VAC
Supply		Unit
Max. Current requirement	80	mA
min./max. supply voltage	20/30	VDC

¹ Input impedance increases form 60°C (current limit with PTC at ca. 150 mA)

² Gold plated relay contacts also for uV/uA-loads

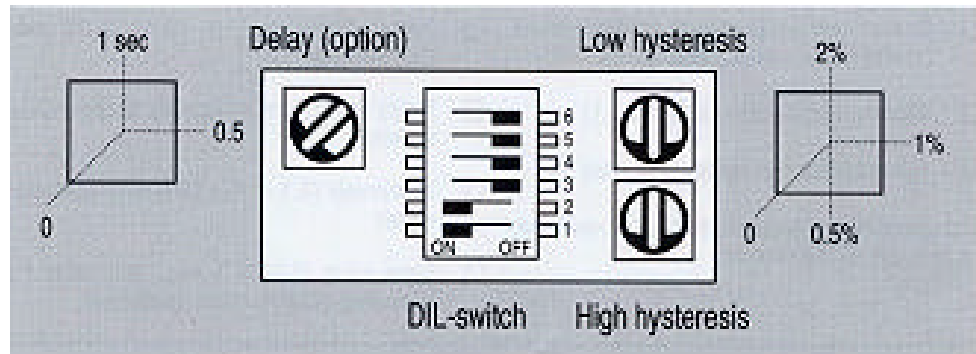
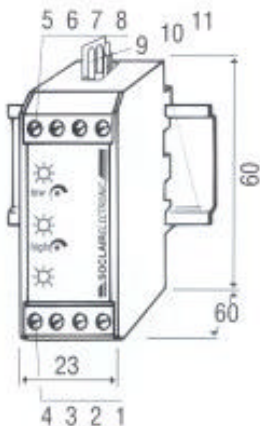
³ Option: Other delay times up to max. 5 sec. Available on request. Asymmetrical operation also available on request.

Temperature range °C: recommended: 0/60 °C functional: -20/90 °C

Warning:

The specification quoted is only for ohmic loads. Overvoltages occur when switching inductive loads (e.g. coils, transformers, motors) which can lead to EMC problems and, in certain cases, to the destruction of the relay contact. Appropriate measures (e.g. RC-circuits or varistors) must be taken to suppress these overvoltage spikes at the load.

Connection, Dimensions and Potentiometers



Input

Current: DC-currents up to 20 mA, input impedance ca. 100 Ohm. Overvoltage protection up to 30 V (self resetting PTC-fuse). Surge/burst protection up to 3 kV.

Voltage: Range 1: 0-400 mV, input impedance ca. 100 MOhm; range 2: 0-10 V, input impedance 250 kOhm. Upon request up to 60 VDC, also negative voltages. Overvoltage protection up to 30 V (self resetting PTC-fuse). Surge/burst protection up to 3 kV.

Supply

All modules are suited for unregulated, noisy industrial power supplies; nominal value is 24 VDC (min. 20V, max. 30V). Other supply voltages on request. Option: isolated power supply.

Operating modes/Settings

- Input: 0-400 mV, 0-10 V, 0-20 mA: DIL-Switch
- Relay inversion switching status: DIL-Switch
- Hysteresis (0.1-2 %): trimming potentiometer
- Time delay (0.05 - 1 sec., only for relay 1): trimming potentiometer (option)

Options

- DC-DC-converter for power supply (0.7 or 3 kV test voltage)
- Second relay (only for „high“ limiting value)
- Time delays (only for relay 1). Adjustable input filter.
- Open input detection, current interruption (4-20 mA) detection. Such a condition will switch the relays off (safe status, independent of operating condition).

Relays:

Relays with gold plated, switching $\mu\text{V}/\mu\text{A}$ as well as 2A/250VAC. Test voltage: 1000 V

Operating Modes

- One or two independent limiting values (thresholds, relays 1 and 2)
- Window comparator (only relay 1)
- Two-position controller (only relay 1)

The operating mode is selected by DIL-switches.

Operating Instructions

Connection

- 1: Power supply + (24 V DC)
- 2: Power supply - (24 V DC) / Ground

- 3: Analog Input - (Ground)
- 4: Analog Input + (current 0/4-20mA or voltage 0-10V or 0-400 mV)

- 5:
- 6: Relay 1 The optional relay2 has tree 2.8mm flat connectors on the top of the module (KTE-version two screw terminals).
- 7: Relay 1
- 8: Relay 1

Adjustment of Switching Limits, Status-LEDs

The two thresholds “low” and “high” are adjusted via two front-plate potentiometers. Three status LEDs show the position of the input: input values below “low” threshold, between “low” and “high” (window) and above “high”.

DIL-Switches

Operating Mode	Switch	Input	Switch
Limit switch	2 off 3 off	0-400 mV	1 off 6 off
Window comparator	2 on 3 off	0-10 V	1 on 6 off
Two-position controller	2 off 3 on	0-20 mA	1 off 6 on
Inversion Relay 1	5 on		
Inversion Relay 2	4 on		

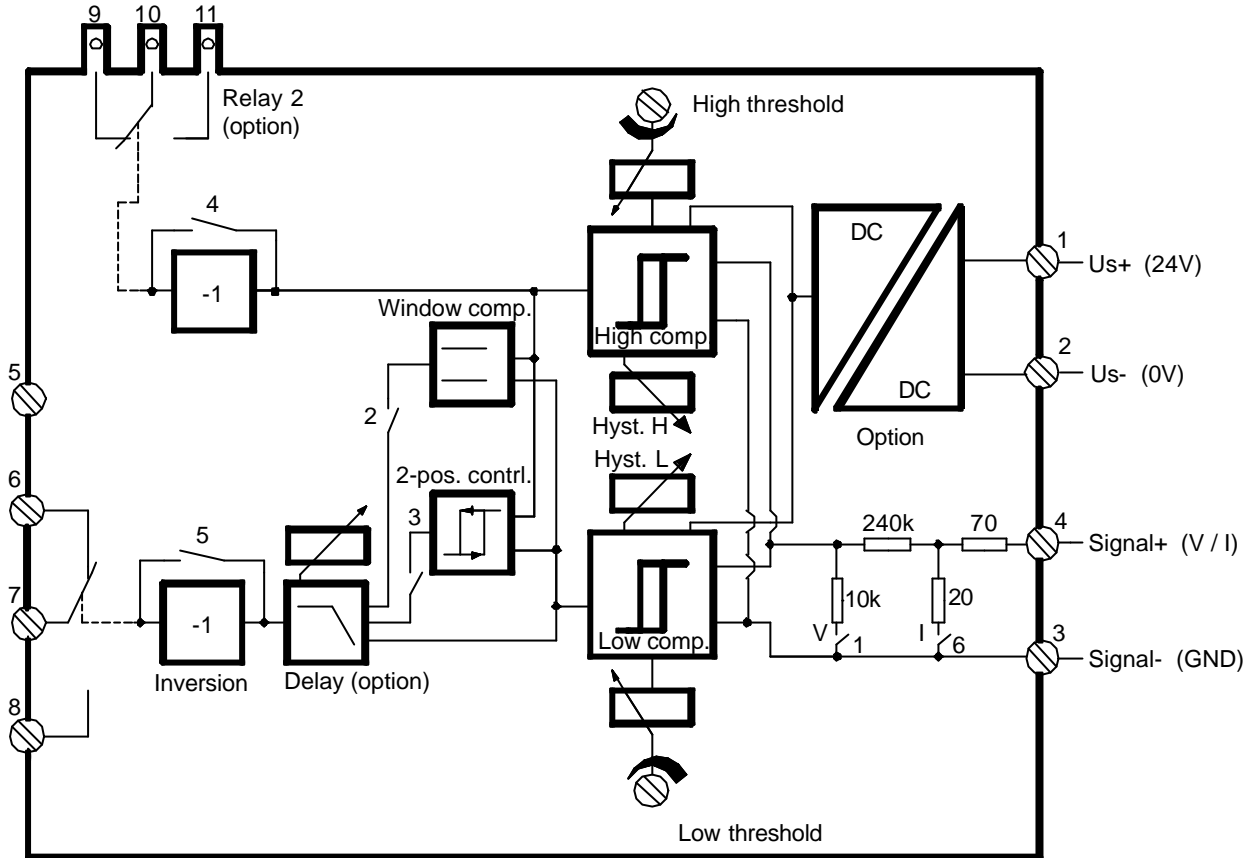
Note: Switch 2 and 3 may not both be simultaneously „on“.

Operating Modes

1. Limit switch: Relay 1 is controlled by the lower threshold („low“, relay 2 (if it exists) is controlled by the upper threshold („high“). Both relays operate independently.
2. Two position controller: The switching points are calibrated via the two thresholds „low“ and „high“ (hysteresis). Applications: e.g. for level control („low“ on, „high“: off).
3. Window comparator

Factory Configuration:

- Hysteresis: ca. 0.5 %
- Delay: Minimum
- Operating mode: Window comparator
- Input: Voltage 0-10 V



Block Diagram COM90-1 and -2.

Illustrated relay status: no current (released),
 Relay status in operation (no inversion, i.e. switches 4 and 5 "off")
 Relay 1 pulled-in, input < low or outside of window
 Relay 2 pulled-in, input < high

Version KTE: Relay 1 connected with terminals 7 and 8, relay 2 with terminals 5 and 6 (one contact each)

Important note:

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