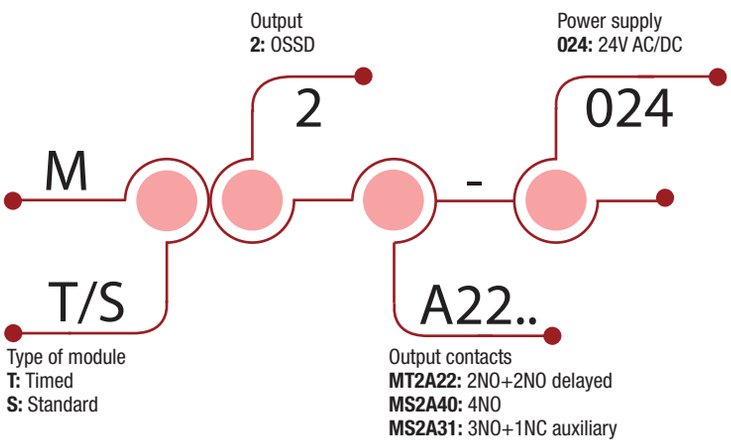
Safety modules
Multifunction Safety modules

APPROVALS: UL 508 / EN 60947-5-1

Type examination certificate number: 4420515176917
issued by TUV NORD
In accordance with the Machinery Directive 2006/42 / EC



HOW IS IT MADE?

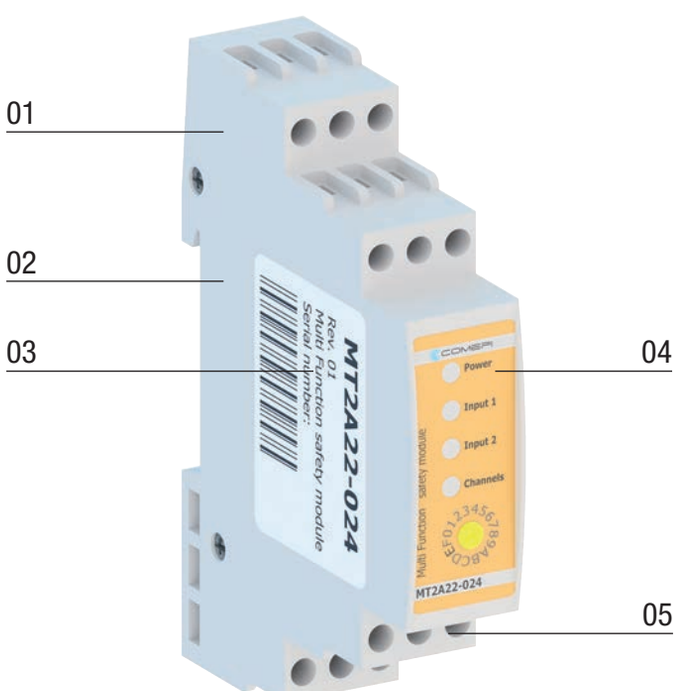
01 Casing
- Plastic casing IP40
- Standard dimension 18 x 90 mm.

02 DIN rail mounting

03 Output contacts
- 2NO instantaneous + 2NO delayed **(MT2A22-024)**
- 4NO instantaneous **(MS2A40-024)**
- 3NA instantaneous + 1NO instantaneous **(MS2A31-024)**

04 LED indicators for status, supply and diagnostic
- Power
- Input 1
- Input 2
- Feedback on outgoing channels

05 Electrical connection
- IP20 terminal blocks
- 1 or 2 x 0,75…1,5 mm²

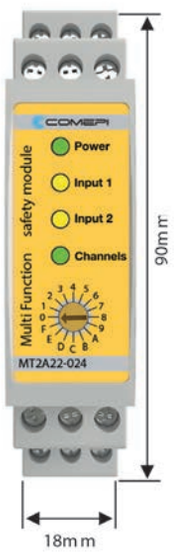


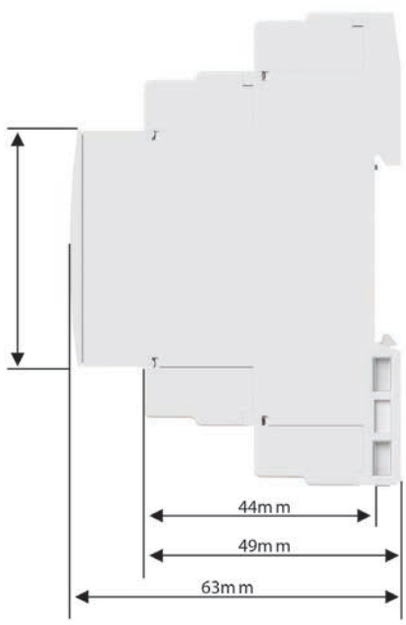
Safety modules
Multifunction Safety modules

APPLICATIONS
Multifunction safety modules are able to monitor multiple safety functions of industrial machinery, protecting operators from dangerous moving parts of the machine. The COMEPI modules provide a safety-related interruption of a safety circuit. These devices are compliant with the requirements of EN ISO 13849-1, EN 61508, EN62061 and may be used in applications with E-Stops, E-Gates, limit switches, non-contact switches, safety light curtains (ESPE Type4 and Type 2), safety light beams (single beam) and safety mats.

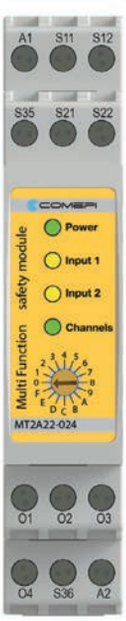
MAIN FEATURES
COMEPI provides up to 4 Output Signal Switching Devices. The correct opening and closing of the safety function OSSDs is tested automatically.
All the modules provide at least 1 auxiliary output.
MS2A22-024 model output actuation delay, can be easily set via the hex-switch, selected from a choice of 15 pre-defined configurations, from 0 to 30 sec.
MT2A22-024 include 2 delayed digital outputs and two instantaneous digital outputs.
4 LEDs on the front panel indicate the status and any possible errors during operation.

DIMENSIONS



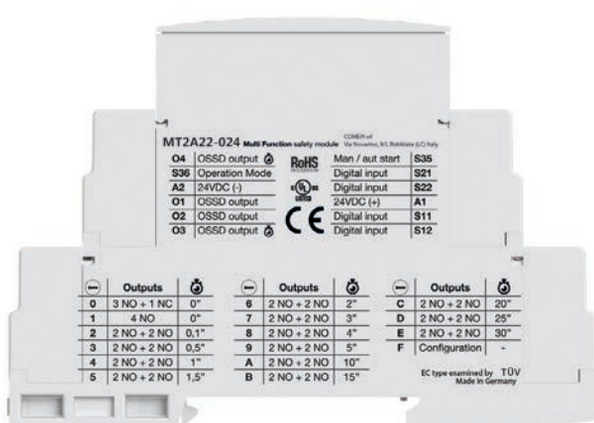


ELECTRICAL CONNECTION



A1	24VDC (+)
S11	Digital input
S12	Digital input
S35	Man / aut start
S21	Digital input
S22	Digital input

O1	OSSD output
O2	OSSD output
O3	OSSD output
O4	OSSD output
S36	Operation Mode
A2	24VDC (-)



Safety modules

Multifunction Safety modules - Main features

The MT2 and MS2 series multifunction safety modules are equipped with OSSD electronic safety outputs, suitable for monitoring safety circuits including electro-mechanical and electronic devices (ESPE type 2 and type 4); MT2 and MS2 modules are devices designed in category 4, with Performance Level "e" in accordance with EN ISO 13849-1, as well as conforming to SIL 3, SIL cl3 functional safety according to EN 62061.

Overwiev	MT2A22-024	MS2A31-024	MS2A40-024
Safety functions	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats	E-stop, ESPE Type 4 and Type 2 safety magnetic sensors, interlocks, limit switches, E-gate, safety mats
Type of safety outputs	OSSD (Output signal switching device)	OSSD (Output signal switching device)	OSSD (Output signal switching device)
Number of safety outputs	Selectable via hex-switch 2 delayed + 2 instantaneous 4 instantaneous 3 instantaneous	3 instantaneous	4 instantaneous
Auxiliary outputs	1 instantaneous	1 instantaneous	
Stard mode	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual	Automatic, manual or monitorated manual
Connection type	Screw terminals	Screw terminals	Screw terminals
Safety parameters	Cat. 4, PL e, SIL 3, SILcL 3	Cat. 4, PL e, SIL 3, SILcL 3	Cat. 4, PL e, SIL 3, SILcL 3
Approvals	CE, cULus, EC type by TÜV	CE, cULus, EC type by TÜV	CE, cULus, EC type by TÜV
Power supply	24Vdc ±20%	24Vdc ±20%	24Vdc ±20%
Dimensions (H x W x D)	90 x 17,5 x 63 mm	90 x 17,5 x 63 mm	90 x 17,5 x 63 mm

Suggested application within MT2A22-024 device

Multifunctional safety module with delayed contacts is suitable to control the unlocking of a FEP-Series interlocking device. The NO OSSD output can be delayed for a time equal to the inerthia of the machinery, providing unlocking signal to the device when the dangerous situation has ran out. This connection can be set with all Electrical Lock versions.

Multifunction Safety modules - When to use our products

Overwiev	MT2A22-024	MS2A31-024	MS2A40-024
Emergency buttons	✓	✓	✓
Emergency gates	✓	✓	✓
Limit switch	✓	✓	✓
Sensors	✓	✓	✓
Safety light curtains (ESPE Type 4, Type 2)	✓	✓	✓
Safety light curtains (single beam)	✓	✓	✓
Safety mats	✓	✓	✓

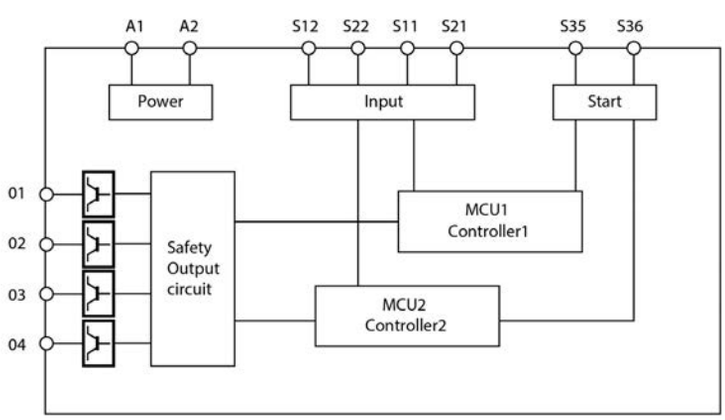
Safety modules

Multifunction Safety modules - Technical Data

		MS2-MT2 Series
Standards		EN60947-1, EN60947-5-1, EN61000-6-2, EN61000-4, EN61326-3-1, EN60204-1, EN ISO 13849-1, EN ISO 12100-1, EN ISO 12100-2 EN62061, EN1037, EN60664-1, EN60529
Directives		2014/35/UE low voltage 2006/42/CE machinery 2014/30/UE electromagnetic 2014/30/UE EMC
Certifications - Approvals		CE - UL - TUV
Air temperature near the device		
– during operation	°C	0 ... + 55
– for storage	°C	– 25 ... + 55
Protection against electrical shocks (acc. to IEC 60536)		Class II
Degree of protection (according to IEC 60529 and EN 60529)		Casing IP5X - Terminal blocks IP20
Pollution degree		3 external, 2 internal
Safety integrity level (Sil CL) (according to IEC 61508, IEC 62061)		Up to Sil 3
Performance level (PL) (according to EN ISO 13849-1)		Up to PLe
Safety category (according to EN ISO 13849-1)		Up to Cat 4
Mechanical durability		10 millions of operations
Electrical durability		100.000 operations
MTTFd		2403 a (55 °C) / 1268 a (65 °C)
Diagnostic coverage		H
PFHd		1,89 E^{-9} (55 °C) / 3,58 E^{-9} (65 °C)

Electrical Data

Rated insulation voltage U_i (acc. to IEC/EN 60947-1)	250 V (degree of pollution 3)
Rated impulse withstand voltage U_{imp} (acc. to IEC/EN 60947-1)	4 kV
Power supply	
Rated operating voltage U_N (±15%)	24 Vdc (10% max residual ripple in DC)
Rated power consumption	max current ≤ 400 mA - max drop voltage ≤ 2 V
Control circuit	
Protection against short circuits	Resistance PTC with intervention operating time >100ms, reset time >3s - Ih=0,5A
Input max resistance	50Ω
Input max current	30mA
Output circuit	
Utilization categories (according to EN 60947-1)	DC 13, Ue = 24 V, Ie = 6 A (6 oper/minute)
Max switching voltage	300 Vdc
Switching current range (per contact)	min 10 mA - max 6A (external protection fuse 6A F type)
Conventional free air thermal current I_{th}	6A (max current sum: $64A^2$)
Max contact resistance	100 mΩ



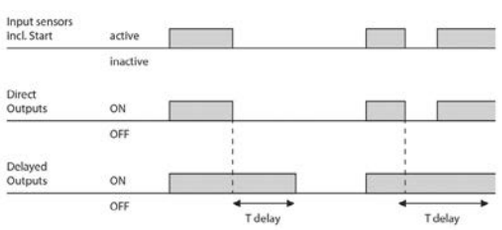
Download

Instruction sheet – OSSD safety modules MT2, MS2, MS3

CE declaration

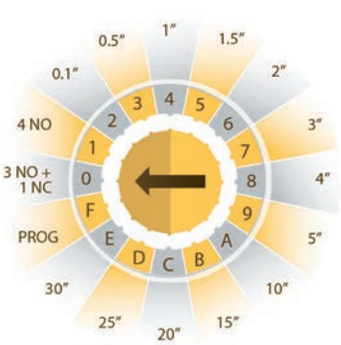
Safety modules

OSSD - Output signal switching device

Normally Open (NO) Outputs	**A**	The NO outputs react by closing their respective NO relays. At Startup are swiched off
	B	They switch on when the safety sensors are active and the application has been started
	C	In case of a Fail-Safe the NOs are swiched off
	D	If the power supply fails, the NOs are swiched off
Normally Closed (NC) Output	**A**	In most cases the NC types react alternately to the NO types, if the NOs are switched on, the NCs are switched off and vice versa
	B	During the configuration the nNCs are switched off
	C	In case of a Fail-Safe the NCs are switched off
	D	If the power supplyb fails, the NCs are switched off
	E	The NC is not a safety output
Delayed NO Outputs	**A**	There are 2 NOs delayed
	**B**	The behaviour is off-delayed and retriggerable

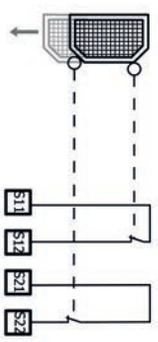
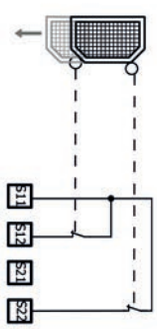
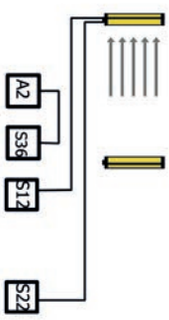
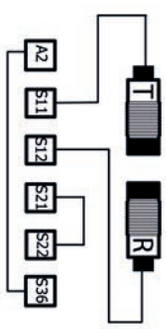
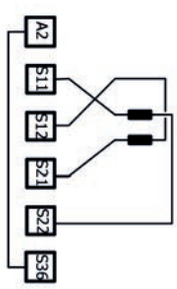
Available output configuration (MT2A22-024 only)

Configuration	Hex-position	Delay [s]
3 NO + 1 NC	0	0
4 NO	1	0
2 NO direct + 2 NO delayed	2	0,1
2 NO direct + 2 NO delayed	3	0,5
2 NO direct + 2 NO delayed	4	1
2 NO direct + 2 NO delayed	5	1,5
2 NO direct + 2 NO delayed	6	2
2 NO direct + 2 NO delayed	7	3
2 NO direct + 2 NO delayed	8	4
2 NO direct + 2 NO delayed	9	5
2 NO direct + 2 NO delayed	A	10
2 NO direct + 2 NO delayed	B	15
2 NO direct + 2 NO delayed	C	20
2 NO direct + 2 NO delayed	D	25
2 NO direct + 2 NO delayed	E	30
PROGRAMMING	F	–



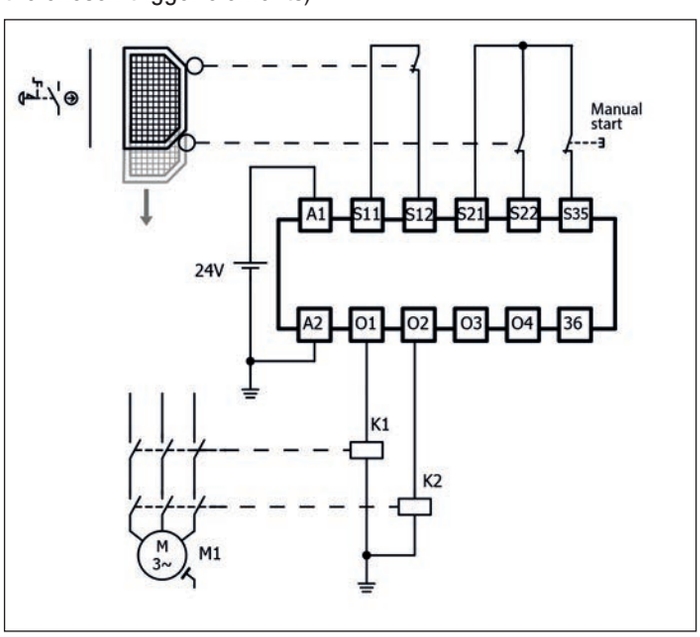
Safety modules
Operation configuration

The applications below show the correct wiring for the COMEPI devices.

N° configuration	SC1	SC2	SC3	SC4	SC5	SC6
Input type	E-stop E-gate	E-stop E-gate	E-stop E-gate	ESPE type 4	ESPE type 2	Safety mat
Channel	2	2	1	2	1	–
N° wires	4	3	2	–	2	4
Wiring						
Safety category	Cat. 4	Cat. 3	Cat. 2	Cat. 4	Cat. 2	Cat. 3
Performance level	PL e	PL d	PL c	PL e	PL c	PL e
Safety integrity level	SIL 3	SIL 2	SIL 1	SIL 3	SIL 1	SIL 3
Response time	20 msec	20 msec	20 msec	20 msec	25 msec	20 msec

Example of applications

Cat 4; PLe, SIL3 possible (also depending on the output wiring and the chosen trigger elements).



Cat 4; PLe; SIL3 possible (depending on the ESPE)