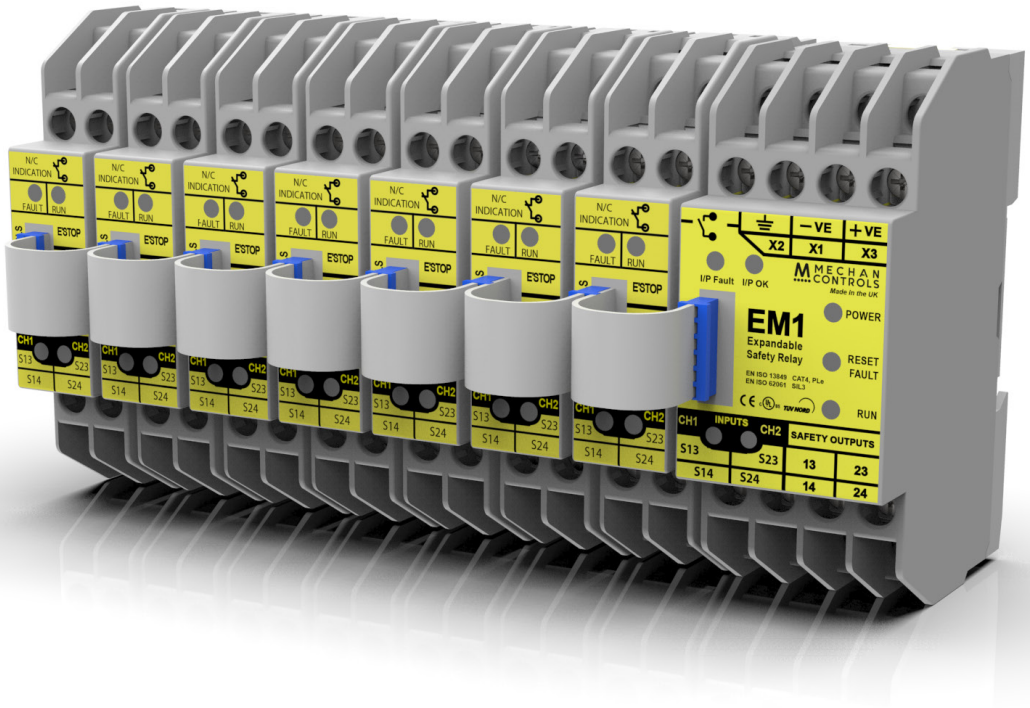
DESIGNED & MANUFACTURED
IN GREAT BRITAIN

MECHAN CONTROLS

Installation Instruction for

EM1 / ESM Expandable Safety Relay



Machine Safety for People and Productivity

Technical Specifications

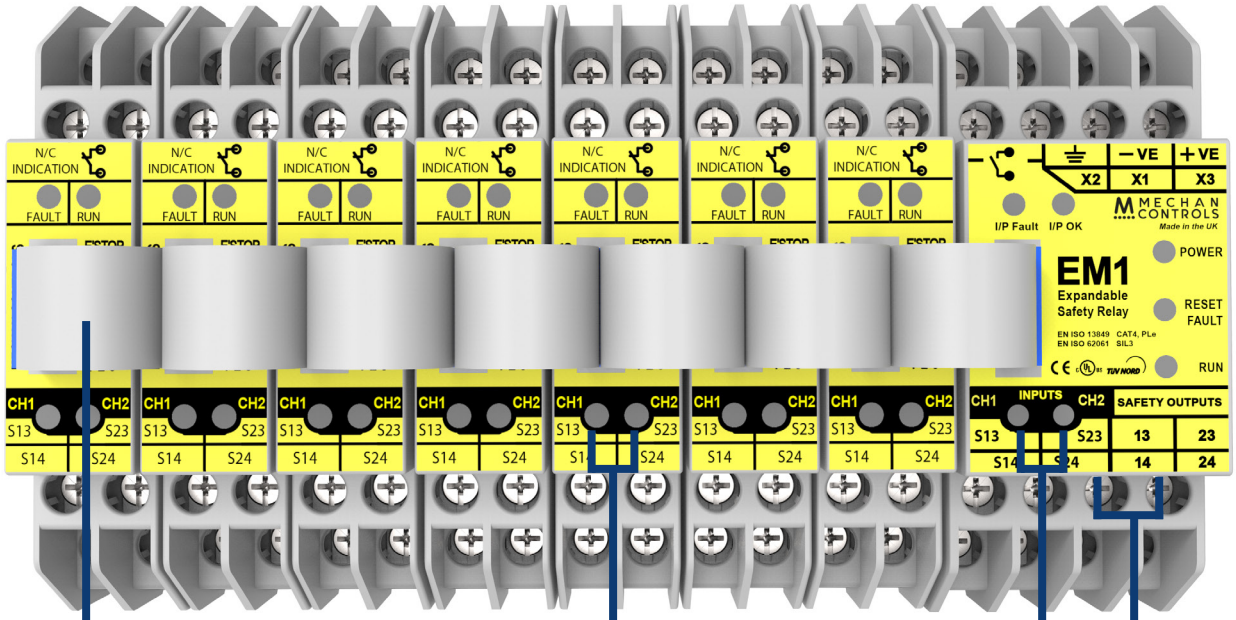
Technical Specifications	EM1 Control Unit	ESM Extender Unit
Supply Nominal Voltage	24Vdc (+/- 15 %)	From Control Unit
Nominal Power Consumption	100mA	30mA
Safety Inputs	2 x N/O (for E'Stops 2 x N/C)	2 x N/O (for E'Stops 2 x N/C)
Safety Output Contacts	2 x N/O	-
Auxiliary Contacts	1 x N/C	1 x N/C
Output contact rating (max)	4A/230Vac; 2A/24Vdc(Res.)@Cos=1	-
Output contact rating (min)	10V/10mA	-
Output contact fuse rating	AC=5A; DC=2.5A; Quick blow	-
Drop out time	Deactivation by inputs, 13ms	-
Internal fuse / Recovery Time	1.6 Amp Resettable / >2 Seconds	-
Reset Options	Reset Manual X1-X3 / Automatic X1-X2	-
Max conductor size	2 x 1.5mm Stranded with Sleeves, 2 x 2.5mm Solid	2 x 1.5mm Stranded with Sleeves, 2 x 2.5mm Solid
Operating temperature	0C to +45C (85% Humidity Max)	0C to +45C (85% Humidity Max)
Storage temperature	-10C to +55C	-10C to +55C
Housing material	Polycarbonate Grey	Polycarbonate Grey
IP Rating	Housing IP30, Terminals IP20	Housing IP30, Terminals IP20
Mounting / Fixing	35mm Symmetric DIN Rail	35mm Symmetric DIN Rail

Safety Related Data			
B10d	2,000,000	PFH	6.52 x 10-9
TM (Mission Time)	20 Years	PFHd	6.0 x 10-9
DC	99%	SFF	99.50%
MTTFd	High > 100 Years (Based on usage rate of 360 Days/Year, 24 Hours/Day, 10 Operations/Hour)		
PL in accordance with EN ISO 13849-1	PL-e, CAT 4		
SIL CL in accordance with EN IEC 62061	SIL3		

Safety Standards	
Approvals	CE Complies with all relevant sections of the CE Marking Directive
	UL 508 Industrial Control
	TUV Approved
International Directives	Machinery Directive 2006/42/EC, Low Voltage Directive 2006/95/EC; EMC Directive 2014/30/EU, RoHS Directive 2011/65/EC
International Standards	EN 12100 Safety of Machinery. General principles for design.
	EN ISO 14119 Safety of Machinery. Interlocking devices associated with guards. Principles for design and selection. EN ISO 13849 Safety of Machinery. Safety related parts of control systems.
	EN ISO 62061 Safety of Machinery. Functional safety of safety related electrical, electronic and programmable electronic control systems
	EN 60204 Safety of Machinery. Electrical equipment of machines.
	EN 60947-5-1 Low-voltage switchgear and controlgear.
	EN 60947-5-3 Low-voltage switchgear and controlgear.

EM1 Features and Benefits

The EM-Series is an expandable safety relay designed to eliminate fault masking **without the need for programming.** Using the EM1 master control unit and ESM expander module, the system can monitor up to 20 Dual channel safety devices ranging from Emergency Stops, Mechanical Interlocks, Non-Contact Safety Switches, Grab-Wires plus more.



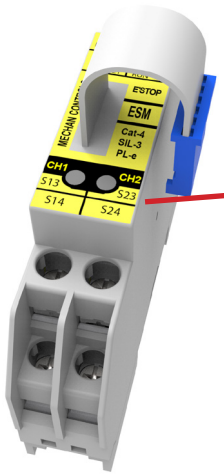
Simple 6-way connector for adding extender modules. Up to 20 additional ESMs can be used per EM1 control unit.

Two monitored safety outputs

Run and fault indication for every module. This means easy diagnosis of any problems in the panel or externally using the N/C volt free indication output.

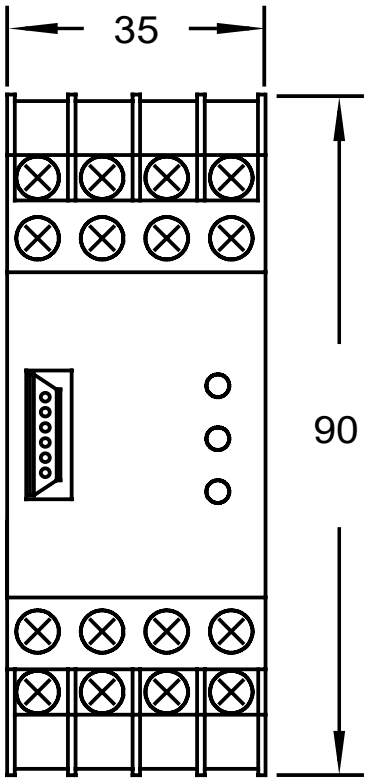
All safety inputs are monitored and have individual indication for each channel. Should a fault occur on either channel, the indication will flash to inform the user.

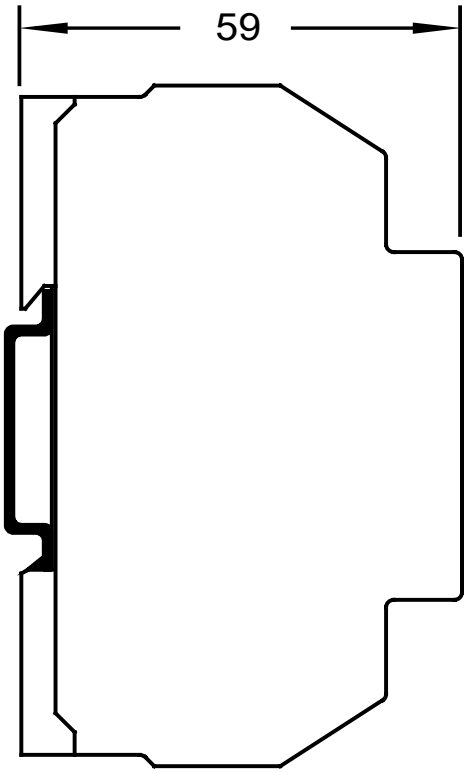
Power, Reset and Run indication on the master control unit.



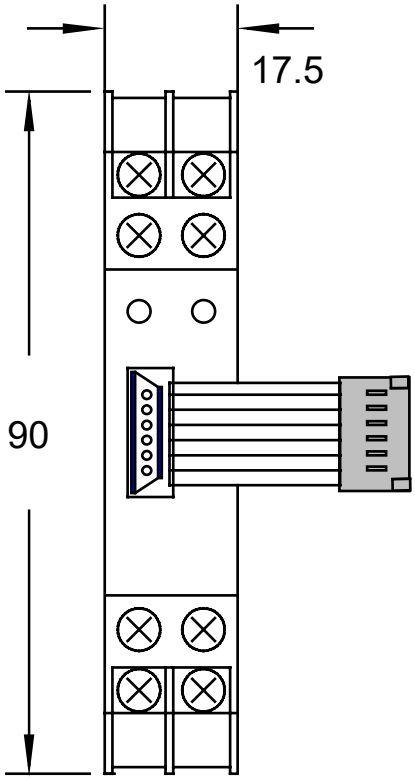
New and improved safety input indication diagnostics. When a channel is faulty, it will now indicate which one by flashing.

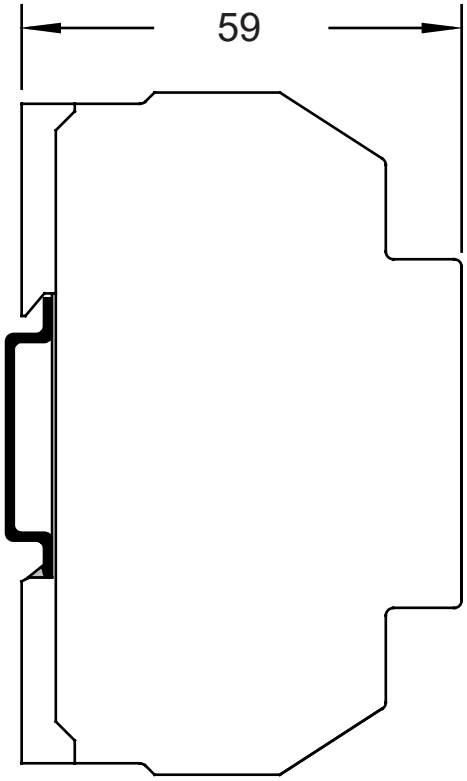
EM1 Master Control Unit





ESM Extender Module





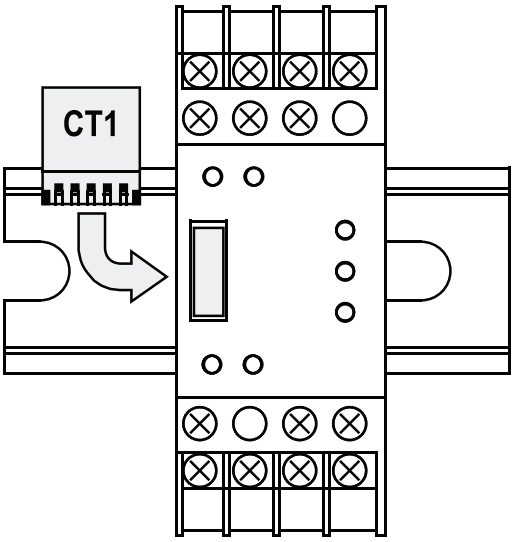
**ALL DIMENSIONS IN MM*

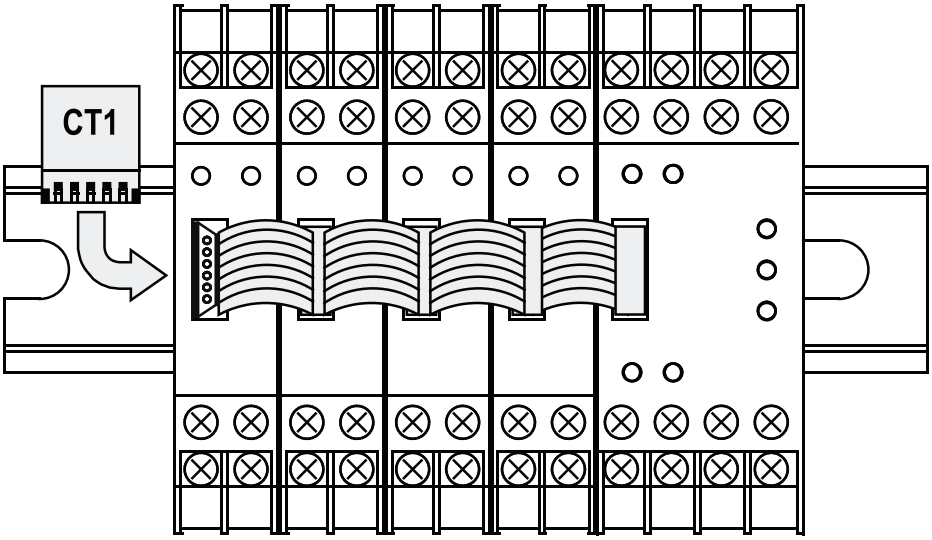
Assemble the required number of modules on the DIN-Rail, starting with the EM1 and clipping the ESM's to the left of the EM1.

Each EM1 and ESM requires 2 x inputs to operate.The maximum number of modules that can be added is 20.

The 'Control Bus' straps on each extender unit connect to the adjacent (right hand side) module as shown.

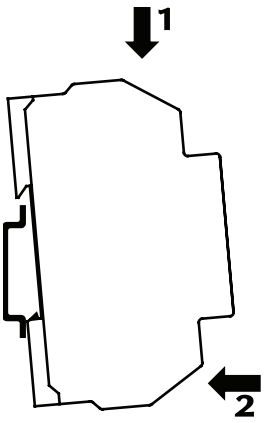
The 'Control Bus' terminator, CT1 (supplied with the EM1), must be plugged into the last ESM extender module in the system.





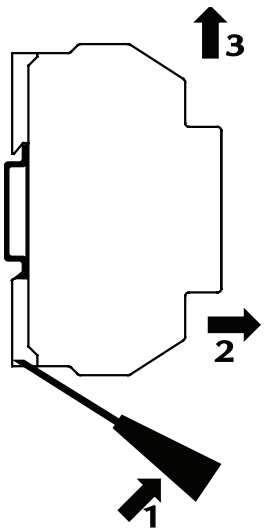
The control modules are designed to be mounted in an IP55 (minimum) control cabinet.

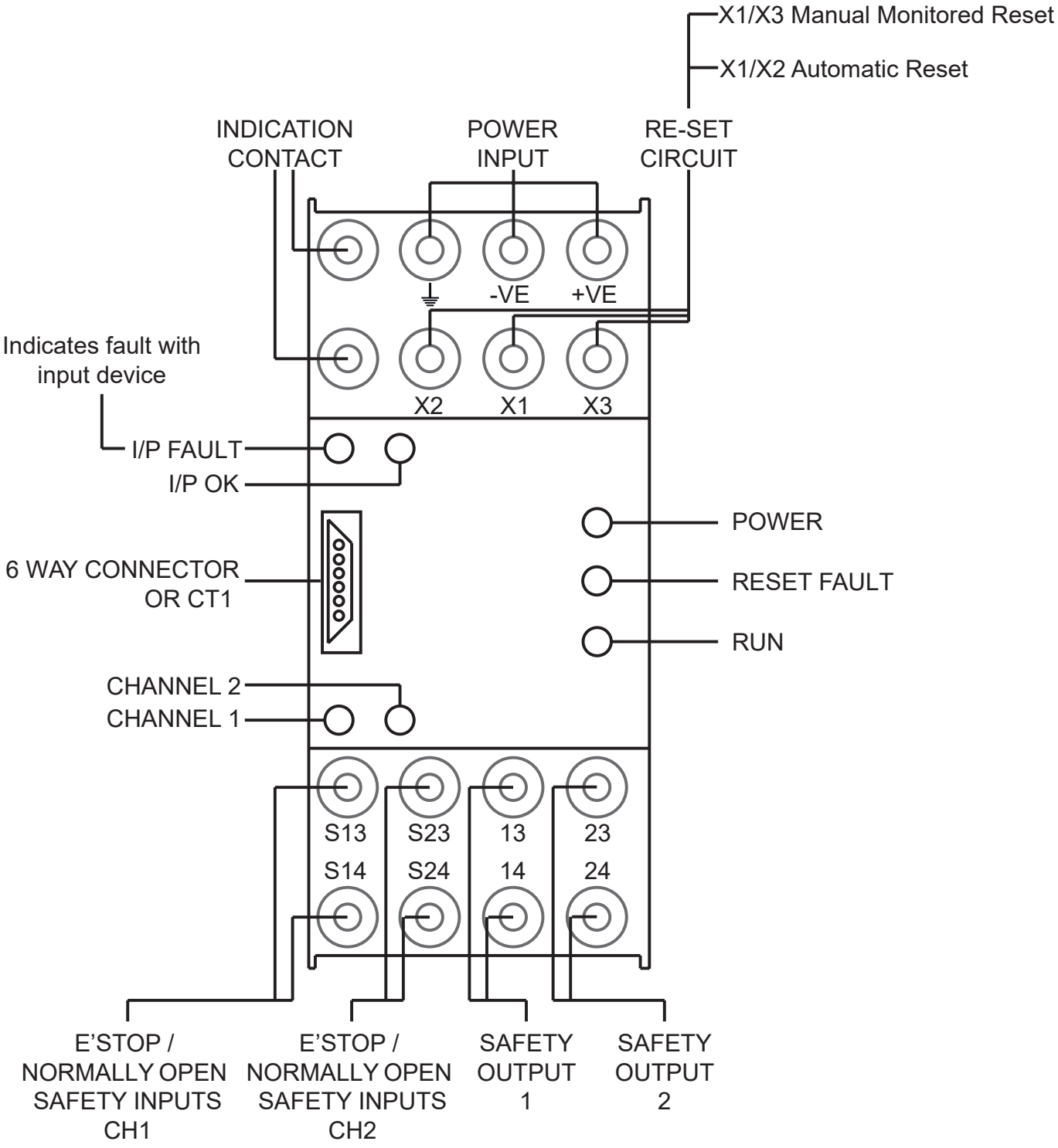
The modules clip on too standard 35 mm symmetric (top hat) DIN-Rail



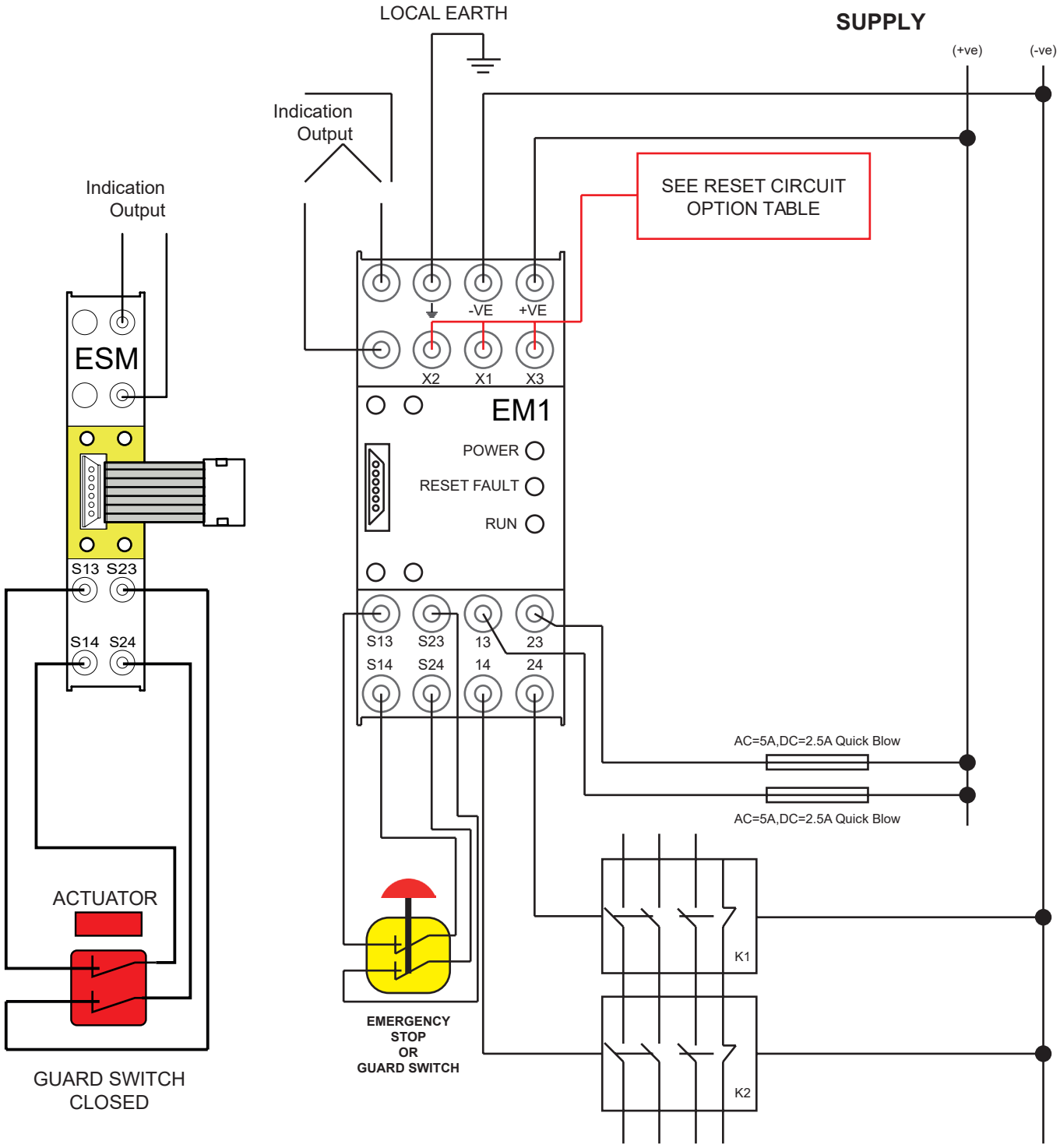
To remove the modules, gently lever out the DIN clip with a small screwdriver as shown (1).

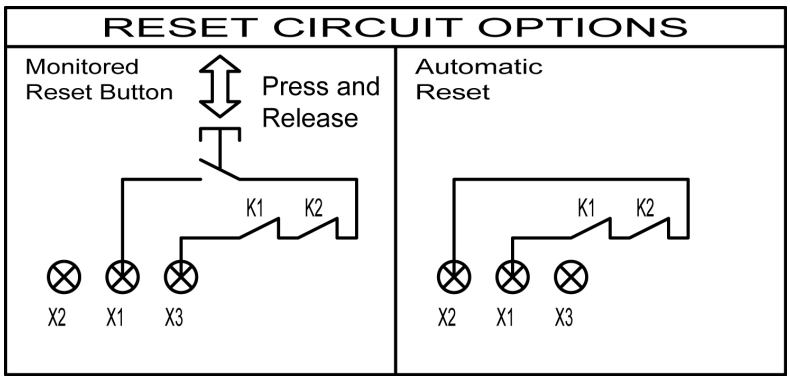
Tilt the unit in the direction (2) and slip the unit off the DIN Rail (3)




X1/X3 Manual Monitored Reset
X1/X2 Automatic Reset
INDICATION CONTACT
POWER INPUT
RE-SET CIRCUIT
-VE
+VE
Indicates fault with input device
X2
X1
X3
I/P FAULT
I/P OK
POWER
6 WAY CONNECTOR OR CT1
RESET FAULT
RUN
CHANNEL 2
CHANNEL 1
S13
S14
S23
S24
13
14
23
24
E'STOP / NORMALLY OPEN SAFETY INPUTS CH1
E'STOP / NORMALLY OPEN SAFETY INPUTS CH2
SAFETY OUTPUT 1
SAFETY OUTPUT 2

EM1 and ESM Connections





Important Information

Safety Assessment

A risk assessment should take place to establish that the specifications of these products are suitable for the application required. See Technical Specifications below or contact Mechan Controls for further information.

The products may only be installed, commissioned, operated,maintained by competent persons.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. An understanding of European and International laws, directives and standards is recommended.

Maintenance

It is recommended to check the safe operation of the modules and look for signs of damage or excessive wear on a weekly basis. Damaged units should be replaced or returned to the manufacturer for repair where practical.

Disclaimer

In the interest of product development specifications are subject to change without notice. It is the responsibility of the user to ensure compliance with any acts or by-laws in place. All information regarding Mechan equipment is believed to be accurate at the time of printing. Responsibility cannot be accepted for errors or omissions.

Warranty

Warranty will be void if the following points are true:

- The product was not used for it’s intended purpose
- Damaged was caused by usuage not stated in the manual
- Modifications have been made to the products (e.g exchanging components)
- Operating personnel are not suitably qualified

Warning!

Failure to use the product for its intended purpose may lead to loss of safety resulting in serious injury or death.

MECHAN CONTROLS

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