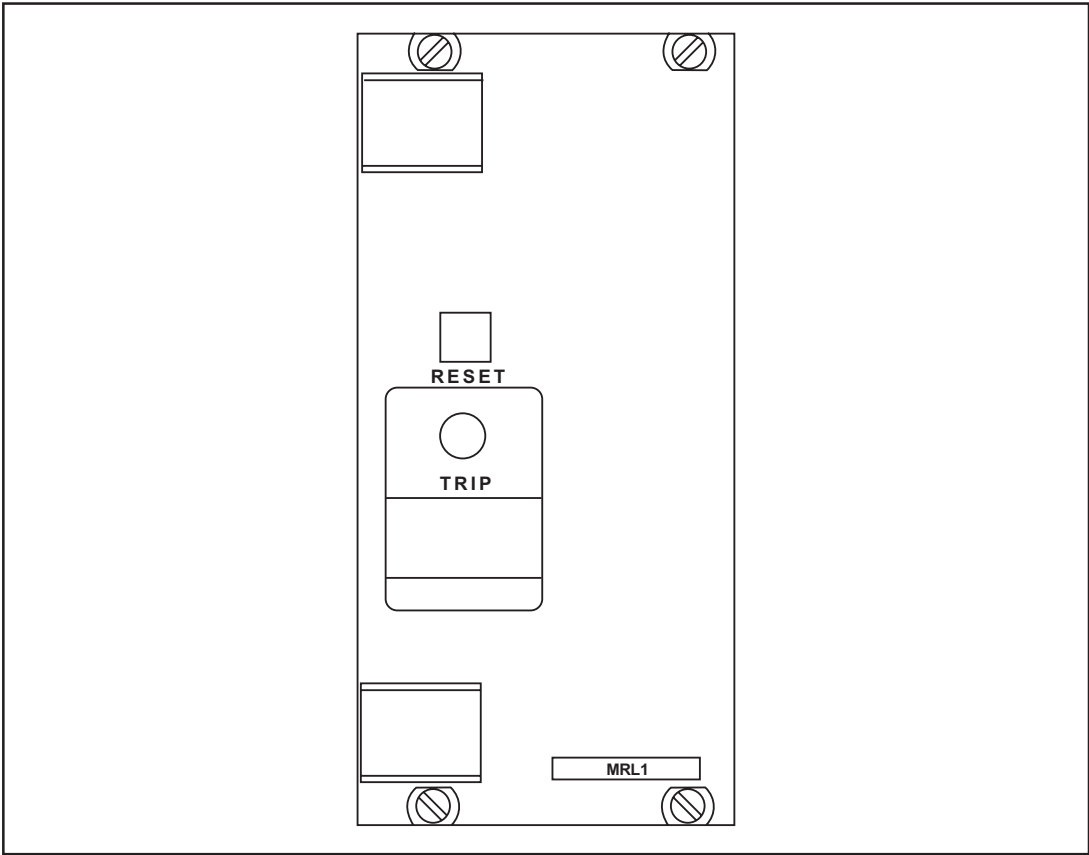


# High-Tech Range

MRL1 - Lock-out Relay



C&S Protection & Control Ltd.

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## 1. Summary and Application

The **MRL1** of the **HIGH-TECH RANGE** is generally used as a common lock-out relay, e.g. when the number of the available tripping contacts of the protection relay is to low or when the maximum switching capacity of the relay contacts is exceeded while the tripping coil of the circuit breaker is actuated.

## 2. Characteristics and Features

- high switching capacity of the relay contacts fulfills the requirements, acc. to BS 142 and IEC 255
- manual, electrical or automatic reset
- low-resistive and high resistive design
- tripping time  $\leq 10$  ms

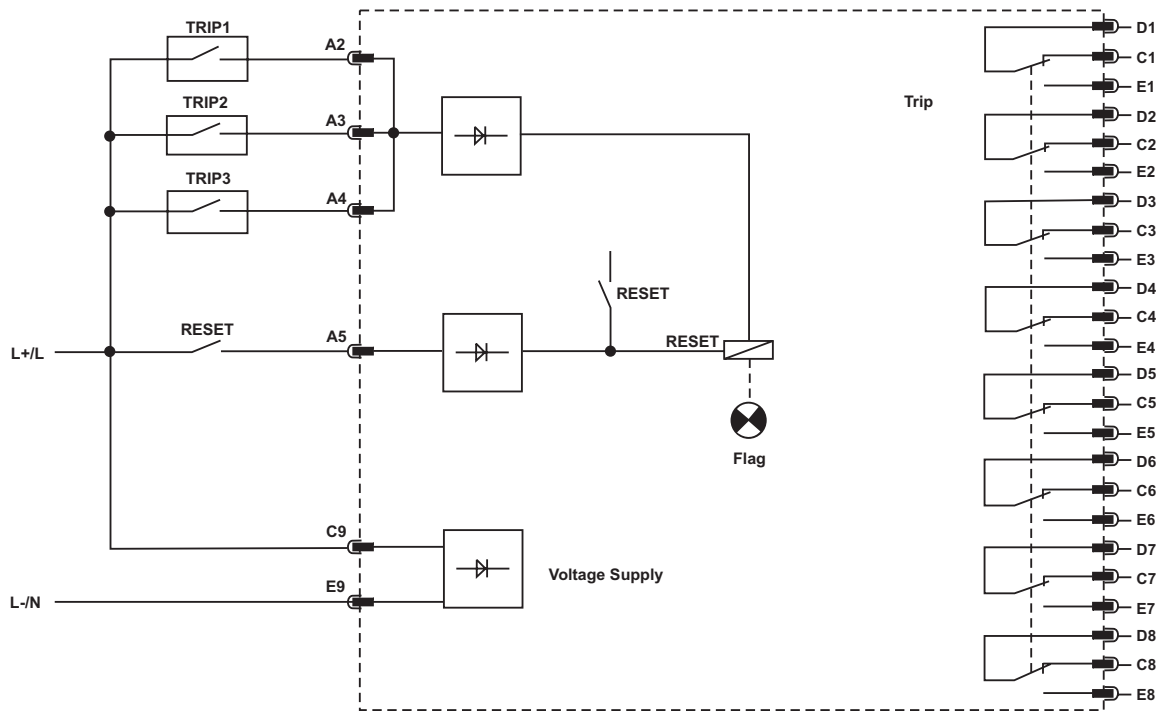


Fig. 1.1: connection diagram MRL1

## 3. Function

The input signals (tripping contacts of the protection relays) are connected to terminals A2- A4 of **MRL1**. In case of tripping the eight change-over contacts are switched over by the output relay. The **MRL1** module is available in two different versions:

### **MRL1-HB** :

Malfunctions can occur by induced currents in case of long lines. In order to avoid these malfunctions the **MRL1-HB** has a high burden. Power consumption of the inputs is 150 W at a minimum operating current of 100 mA. At tripping the **MRL1-HB** interrupts the coil current automatically, the inputs become high-resistive.

### **MRL1-LB** :

Version **MRL1-LB** with low burden can be used everywhere, where no disturbance influences are to be expected on the lines. The minimum operating current is here about 25 mA. In case of tripping the **MRL1-LB** interrupts the coil current whereby a resistor (low burden) is switched to the input so that the tripping circuit does not become high resistive.

The coil current is interrupted, independent of the burdening, abt. 40 - 60 ms after activation of the relay. This delay period enables other relays connected in series to activate before the tripping circuit is interrupted.

### 3.1 <RESET> Push Button

The <RESET> push button is used for acknowledging and resetting the tripping relays after tripping when coding was done accordingly (see para. 3.2).

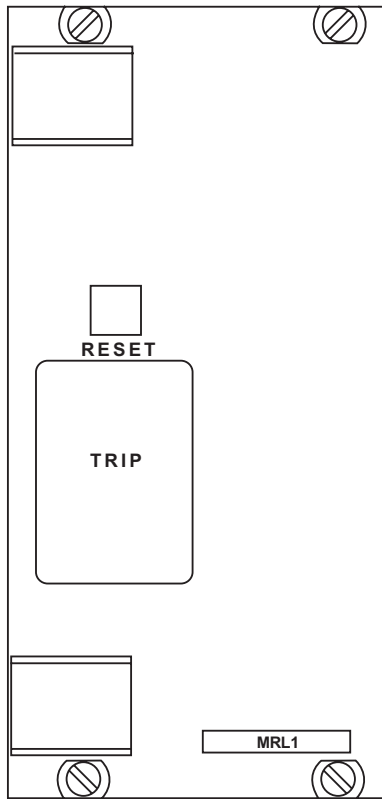


Fig. 3.1: Front plate

### 3.2 Coding Plugs

A coding plug for presetting the resetting behaviour of the output relay is on the bottom behind the front plate.

When the coding plugs are plugged in the output relays are automatically reset when the tripping command at inputs A2, A3 and A4 is removed.

When the coding plugs are not plugged in the output relays have to be reset manually by actuating the reset push button.

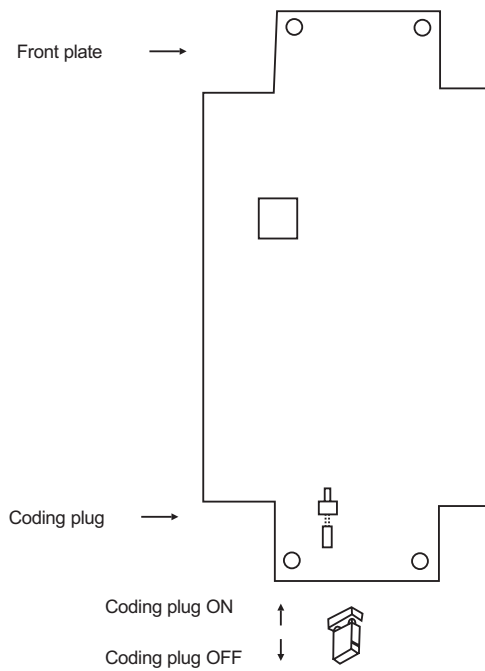


Fig. 3.2: coding plugs

#### 4. Terminal Block

The plug-in module **MRL1** has a very compact base with plug connectors and screw-type connectors:

- 8 screw -type terminals (connection plug row A) for voltage inputs
- 27 poles tab terminals for relay outputs, supply voltage etc. (terminal connectors series C, D and E, max. 6A current carrying capacity).
- Connection with tabs 6.3 mm x 0.8 mm for cable up to max. 1.5 mm<sup>2</sup> or with tabs 2.8 mm x 0.8 mm for cable up to max. 1 mm<sup>2</sup>.

By using 2.8 x 0.8 mm tabs a bridge connection between different poles is possible.

Screw terminals are provided for easy wiring (daisy chain) of the RS485 interface.

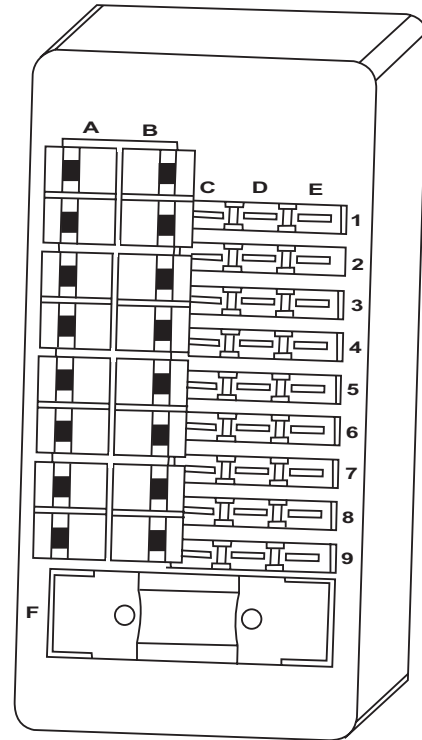


Fig. 4.1: Terminal block

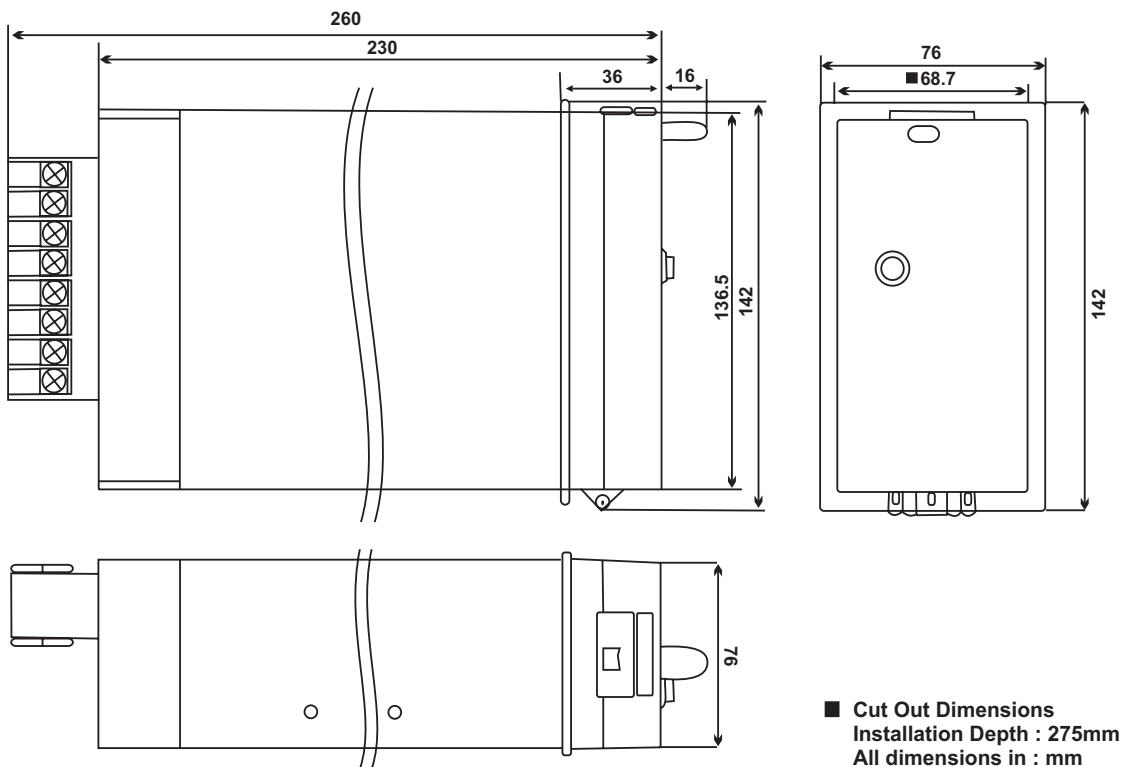


Fig. 4.2: Dimensional drawing

#### Please observe!

A distance of 50 mm is necessary when the units are mounted one below the other for the front cover to be easily opened. The front cover can be opened downwards.

## 5. Technical Data

### Output relay

Output contacts	:	8 changeover contacts
Making capacity for 3 s	:	7500 VA / 30 A AC and DC
Breaking capacity AC	:	2200 VA / max. 250 V
Breaking capacity DC	:	
ohmic	:	24 V / 5A 110 V / 0.35 A 220 V / 0.25 A
Inductive (L/R < 40 ms)	:	24 V / 1 A 110 V / 0.2 A 220 / 0.15 A

### Measuring inputs

Response time	:	7 - 10 ms
Making capacity (Terminals A2; A3; A4)	:	
HB - type	:	150 W
LB - type	:	50 W
Minimum operating current	:	
HB - type	:	≥ 100 mA
LB - type	:	≥ 25 mA

### System Data

Design standard	:	VDE 0435, part 303, IEC 255-4, BS 142
Specified ambient service	:	
Temperature range	:	
- for storage	:	- 25°C to + 70°C
- for operation	:	- 25°C to + 55°C
Moisture-carrying capacity class F as per DIN 40040 and per DIN IEC 68 2-3	:	relative humidity 95 % at 40°C for 56 days
Insulation test acc. to VDE 0435, part 303	:	
Isolation test IEC 255-5	:	2.0 kV (eff.)/50 Hz; 1 min (between all independent circuits) 1.0 kV (eff.)/50 Hz; 1 min (above open relay contacts)
Impulse test IEC 255-5	:	5 kV; 1.2/50 μs, 0.5 J
High frequency test IEC 255-6-4	:	2.5 kV/1 MHz 4 kV/2.5 kHz, 15 ms
Rotation interference suppression acc. to EN 55011	:	limit value class B
Mechanical tests	:	
Shock	:	class 1 acc. to DIN IEC 255-21-2
Vibration	:	class 1 acc. to DIN IEC 255-21-1
degree of protection - unit front	:	IP 54 at closed front cover (only D-version single housing)
Vibration test	:	0.5 g, 10 - 300 Hz.

Technical data subject to change without notice !

**6. Order form**

Lock-out Relay

**MRL1-**

High burden		<b>HB</b>	
Low burden		<b>LB</b>	
Rated voltage (DC)	24 V operating range 18 - 32 V		<b>24</b>
	110 V operating range 80 - 150 V		<b>110</b>
	220 V operating range 125 - 300 V		<b>220</b>
Housing (12TE):	19"- equipment frame flush mounting		<b>A</b> <b>D</b>



## **BASIC RANGE**

- Micro-controller based compact economical design
- DIN rail mounted
- Status indication via LED
- Step-less settings through front potentiometer



## **FUNCTIONAL RANGE**

- Genset Supervision & Control
- Auto Synchroniser
- Load Balancing & Control
- Related Protection



## **INTEGRATED RANGE**

- Complete numeric protection, solution for sub-station in association with TEAM-ARTECHE, Spain
- Distance protection
- Comprehensive transformer protection –
  - a. Three winding transformer
  - b. Two winding transformer
- Multi-functional relay: variety of protection combination

For further information, please contact :

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