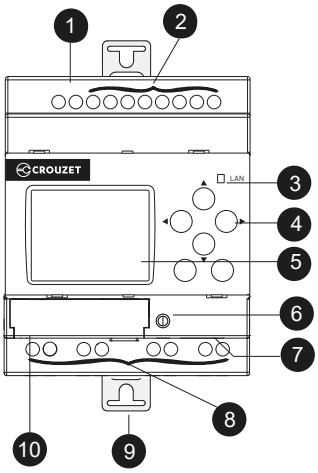
# INSTALLATION GUIDE

***Millenium*** CONTROLLERS

- MXD12RU3ET
- MXD12RU1ET
- MXD12RD7ET
- MXD12SD1ET
- MXB12RU3ET
- MXB12RU1ET
- MXB12RD7ET
- MXB12SD1ET

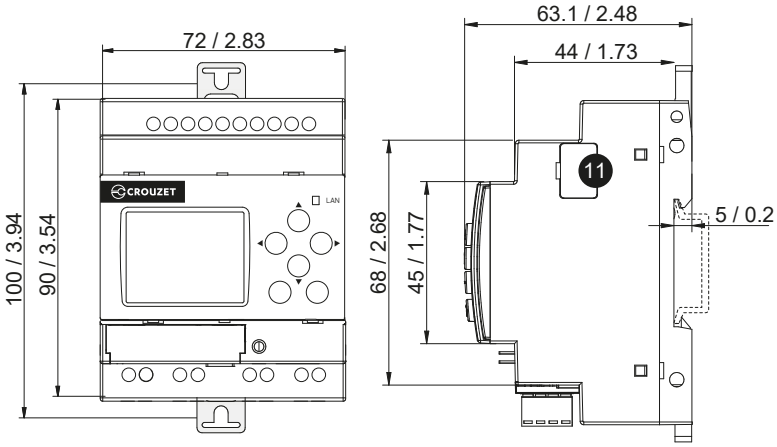
# PRODUCT OVERVIEW

## 1. Controller with LCD

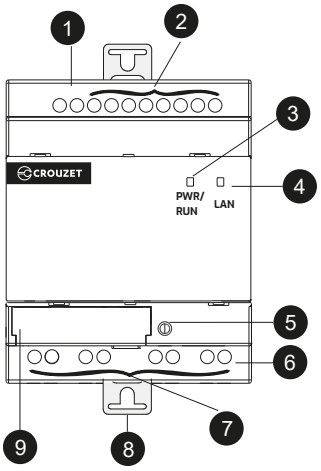



1 - Power supply terminals
2 - Input terminals
3 - LAN status LED
4 - Navigation + A/B buttons
5 - LCD display
6 - Functional earth terminal
7 - RJ45 connector
8 - Output terminals
9 - Retractable mounting clip
10 - Interchangeable interface
11 - Expansion connector cap

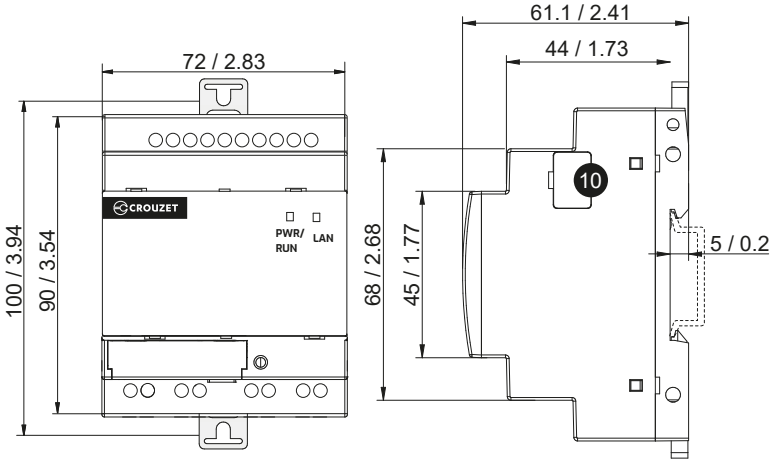
### Mounting Dimensions (mm / in)



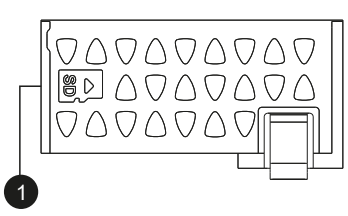

## 2. Controller without LCD



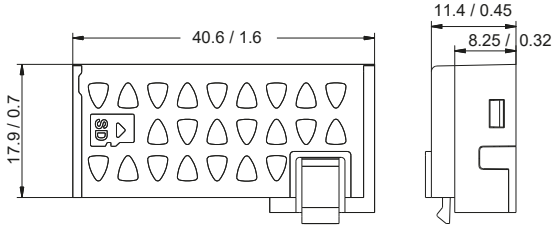

1 - Power supply terminals
2 - Input terminals
3 - Power/Run LED
4 - LAN status LED
5 - Functional earth terminal
6 - RJ45 connector
7 - Output terminals
8 - Retractable mounting clip
9 - Interchangeable interface
10 - Expansion connector cap




## 3. Memory Card Interface




1 - SD card slot

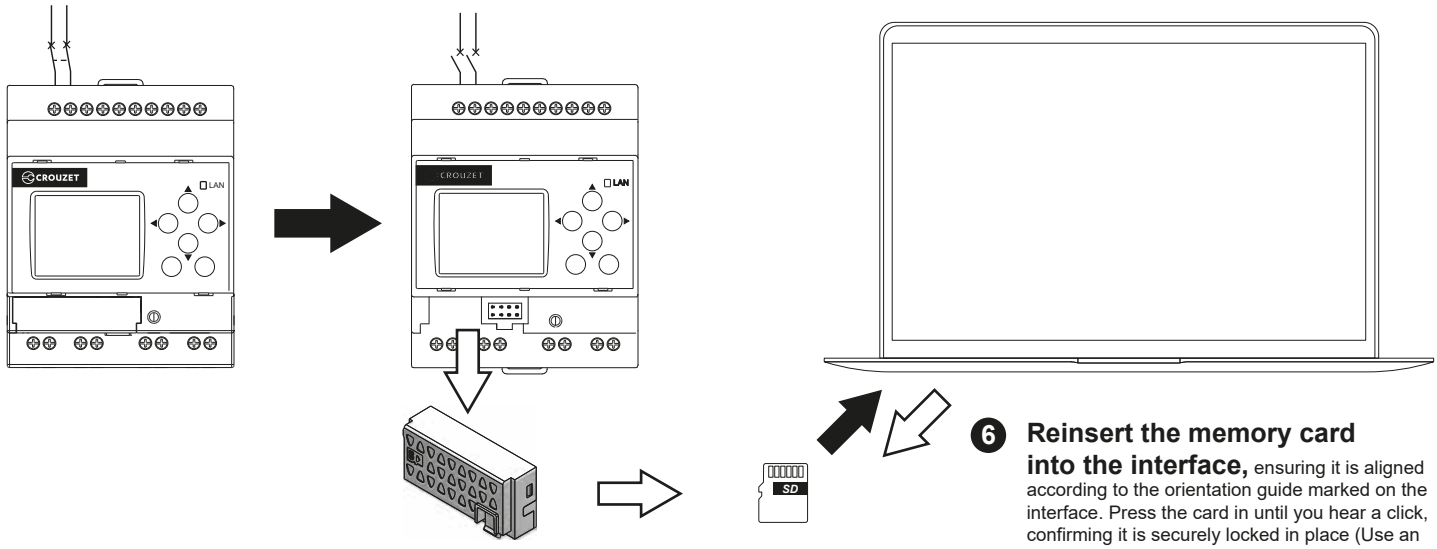


## Memory Card Interface Instructions

**1** **ON**

**2** **Turn OFF**

**5** **Transfer your files**




**6** **Reinsert the memory card into the interface,** ensuring it is aligned according to the orientation guide marked on the interface. Press the card in until you hear a click, confirming it is securely locked in place (Use an external tool if needed). Then, insert the interface back into the Millenium Controller. Power the controller back on to complete the process.

**3** **Remove Memory Card Interface** (MIMEMSD) with a flat screwdriver

**4** **Remove Memory Card**

**Note:** Memory Card Interface can be replaced by any other Millenium Interface (MI485, MI485P,...)

## LED indication

| | | |
|---|---|---|
| **PWR/RUN** (Blind versions only) | **Green ON =** RUN mode | **Red ON =** Default |
| | **Green Blinking** (30% ON / 70% OFF) **=** STOP mode or During start up | **Red Blinking** (50%) **=** Warning and PLC STOP mode |
| | **Green Blinking** (50%) **=** Read/Write in progress | **3 Green + 3 Red Blinking =** Warning and PLC RUN mode |
| **LAN** | **Green ON =** Ethernet Connected | **Green Flashing =** Data Exchange |

# ⚠ DANGER

### Hazard of electric shock, explosion or arc flash

- Turn power off before installing, removing, wiring or maintaining.

*Failure to follow this instruction will result in death or serious injury.*

# ⚠ WARNING

### Explosion hazard

- Confirm that the product power supply voltage and its tolerances are compatible with those of the network.
- Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

### Unintended equipment operation

- This product is not intended for use in safety critical machine functions. Where personnel and or equipment hazard exist, use appropriate hard-wired safety interlocks.
- Do not disassemble, repair or modify the controllers.
- This controller is designed for use within an enclosure (closed with a key or a tool) according to specifications described in these instructions in the paragraph on installation conditions.
- Install the controller in the operating environment conditions described below.

*Failure to follow these instructions can result in death, serious injury or equipment damage.*

### General precautions during wiring:

1. In cases of high noise levels on the power lines, it is recommended to use an isolation transformer with the Millenium power supply, despite the built-in precautions within the Millenium.
2. When utilizing the DC-powered Millenium, ensure that the 24 VDC input line is routed separately from the 100 V AC and 240 V AC lines.
3. Keep the input lines and output lines separated from each other.
4. If the output lines are close to power supply lines or input lines, use shielded cables for both the input and output lines and ensure proper grounding.
5. In disturbed environments, we recommend adding a ferrite (e.g. Wurth 742 711 31) to the Ethernet cable.

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# IMPORTANT

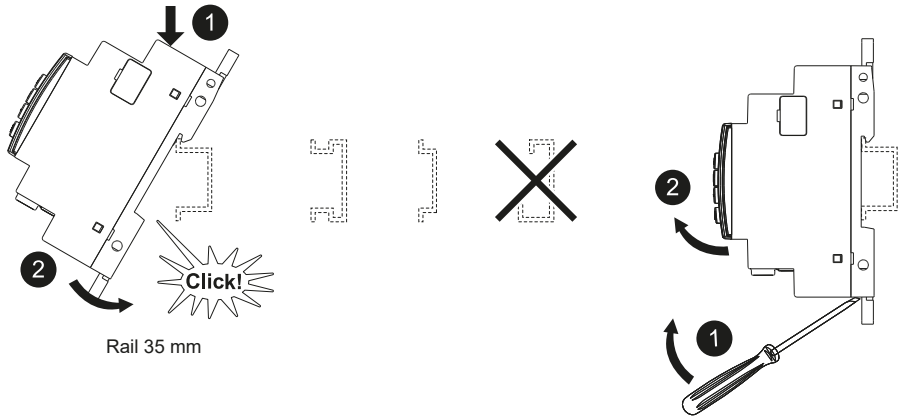
This document provides installation instructions only.
See the software's help section for its operation and programming. Those responsible for the application, implementation or use of this product must ensure that the necessary design considerations have been incorporated into each application, completely adhering to applicable laws, performance and safety requirements, regulations, codes and standards.
The customer is responsible for all consequences of the application.

Electrical equipment should be installed, operated, serviced and maintained only by qualified personnel. No responsibi-lity is assumed by Crouzet for any consequences arising out of use of this manual.

For more technical details on the characteristics and intended use of the product, please refer to the datasheet available on CROUZET web site

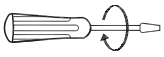
| | |
|---|---|
| ⎓ | Direct current. |
| ~ | Alternative current. |
|  | Caution, possibility of electric shock. |
|  | User manual and datasheet must be consulted in all cases where this symbol is marked. |
|  | Recyclable materials. |
|  | Made from 100% Recycled materials. |
|  IS2400 | Refer to the product recycling instructions. |
|  | This product is not disposable in a conventional trash can. This must be brought to a collection point. |

## Installation on Rail



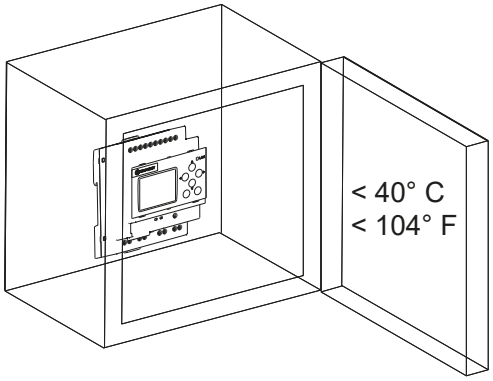

Rail 35 mm

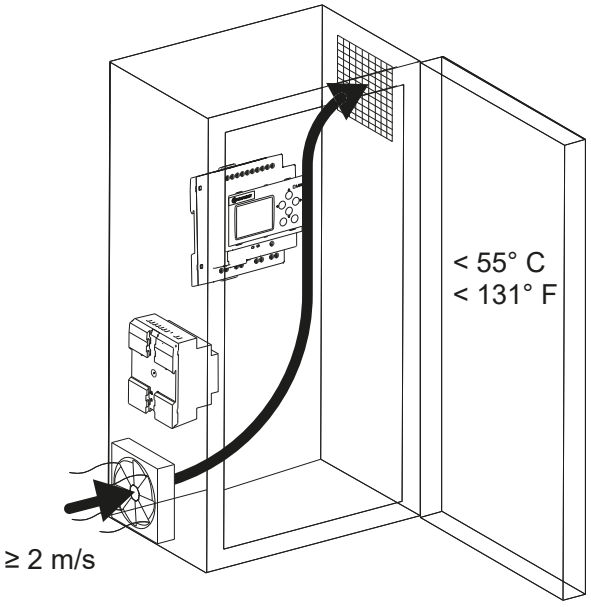
## Terminal & Torque details

| Type | Wire gauge (AWG) | Stripped length |  | Torque |
|---|---|---|---|---|
| **Solid** | 24 - 12 | 7 - 8 mm | | 0.5 N.m (4.4 Lb.in) |
| **Stranded** | 24 - 12 | 7 - 8 mm | ø 3.5 mm 0.14 inch | 0.5 N.m (4.4 Lb.in) |


| |  |
|---|---|
| ⎓ 12 V | 8 A |
| ≃ 24 V | 8 A |
| ≃ 110-240 V | 8 A |

## Installation conditions

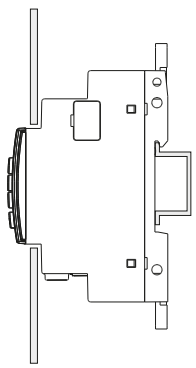


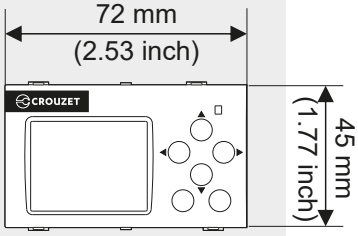

## Service conditions

| | |
|---|---|
| Operating temperature | (-20 °C to +55 °C) / (-4 °F to +131 °F) |
| Storage temperature | (-30 °C to +70 °C) / (-22 °F to +158 °F) |
| Relative Humidity | 10-95%, non-condensing |
| Pollution degree | 2 (IEC/EN 61131-02) |
| Degree of Protection | IP40 Front Panel, IP20 Terminals |
| Altitude | Operations: 0 - 2000 m (0 - 6562 ft) |
| | Transport: 0 - 3000 m (0 - 9843 ft) |
| Vibration resistance (IEC 60068-2-6) | 5 Hz ≤ f < 8.4 Hz, Amplitude: 3.5 mm |
| Shock resistance (IEC 60068-2-27) | 8.4 Hz ≤ f ≤ 150 Hz, Acceleration: 1 g |
| Enclosure material | Self-extinguishable |
| Standard applicable/operating conditions | 61131-02 |

## Enclosed type mounting



## Mounting dimension

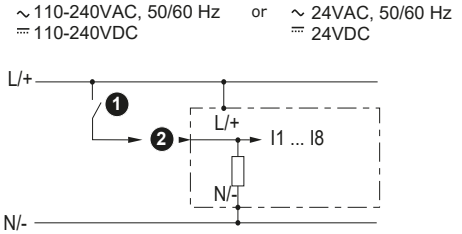


# INPUTS Electronic & Wiring Diagrams

## Digital Inputs (AC/DC Voltage)

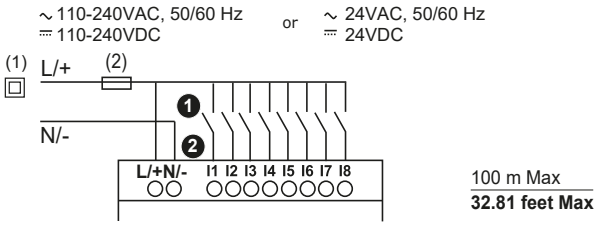
MXD12RU3ET, MXB12RU3ET → Inputs |1....I8
MXD12RU1ET, MXB12RU1ET → Inputs |1....I8

**Electronic Diagram**




1. Contact
2. Digital Input

**Wiring Diagram**



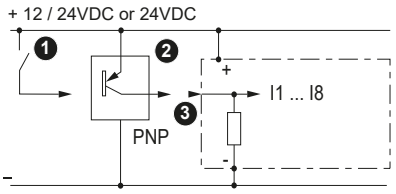

(1) Isolated source if 24VAC or 24VDC supply
(2) 1A quick blowing fuse, circuit breaker, or circuit protector

L: Line
N: Neutral

## Digital Inputs (DC Voltage)

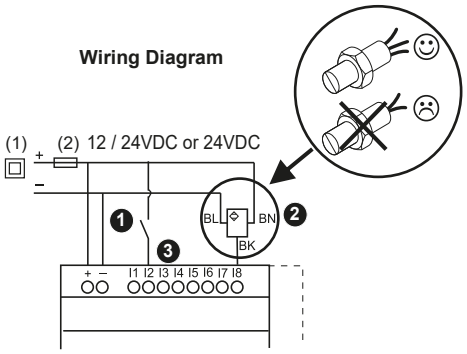
MXD12RD7ET, MXB12RD7ET → Inputs |1....I8
MXD12SD1ET, MXB12SD1ET → Inputs |1....I8

**Electronic Diagram**




1. Contact
2. 3-wire PNP sensor
3. Digital Input

**Wiring Diagram**




(1) Isolated source
(2) 1A quick blowing fuse, circuit breaker, or circuit protector

BN: Brown cable of the 3-Wire PNP sensor
BL: Blue cable of the 3-Wire PNP sensor
BK: Black cable of the 3-Wire PNPsensor

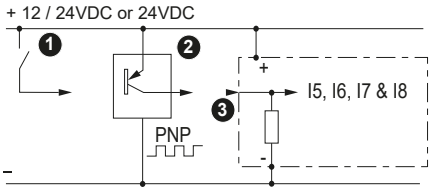
## High-Speed Inputs (Wiring of 3-wire PNP sensors)

MXD12RD7ET, MXB12RD7ET → Inputs |5....I8
MXD12SD1ET, MXB12SD1ET → Inputs |5....I8

**Electronic Diagram**

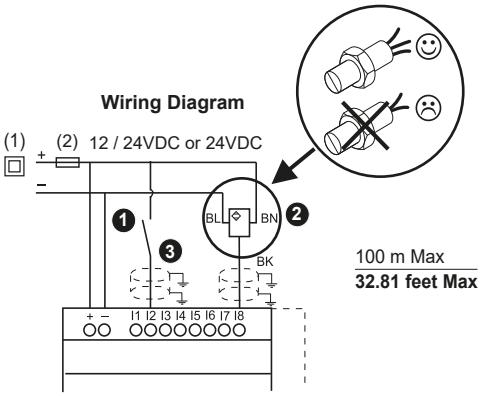
**I5, I6, I7 & I8**

**HIGH SPEED**




1. Contact
2. 3-wire PNP sensor
3. Digital Input

**Wiring Diagram**




(1) Isolated source
(2) 1A quick blowing fuse, circuit breaker, or circuit protector

BN: Brown cable of the 3-Wire PNP sensor
BL: Blue cable of the 3-Wire PNP sensor
BK: Black cable of the 3-Wire PNP sensor

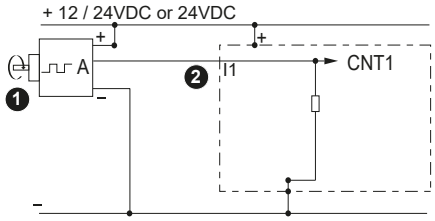
## High-Speed Inputs (Wiring of Encoders)

MXD12RD7ET, MXB12RD7ET → Inputs |5....I8
MXD12SD1ET, MXB12SD1ET → Inputs |5....I8

**Electronic Diagram**

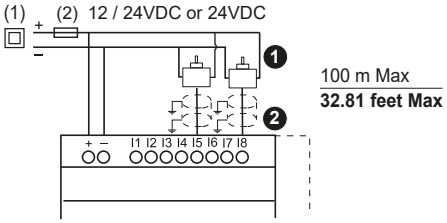
**I5, I6, I7 & I8**

**HIGH SPEED**




1. Encoder
2. High-side Input

**Wiring Diagram**



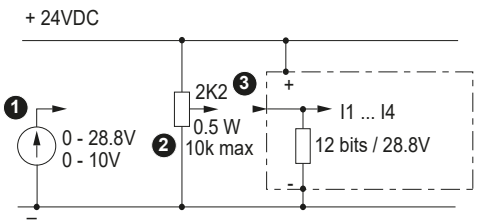

(1) Isolated source
(2) 1A quick blowing fuse, circuit breaker, or circuit protector

## Analog Inputs

MXD12RD7ET, MXB12RD7ET → Inputs |5....I8
MXD12SD1ET, MXB12SD1ET → Inputs |5....I8

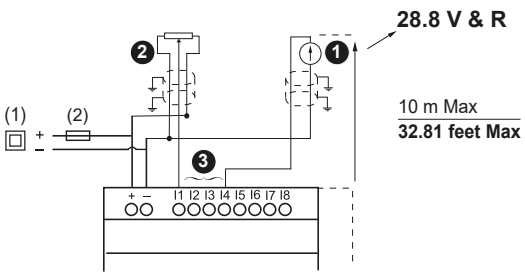
**Electronic Diagram**

**I1 ... I4 U**




1. 0-10V/0-28.8V
2. Potentiometer
3. Voltmeter

**Wiring Diagram**

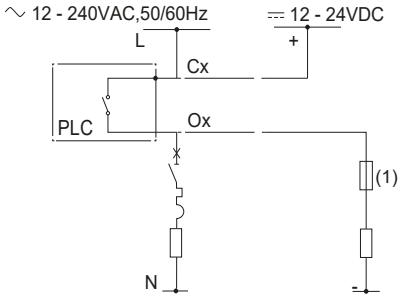


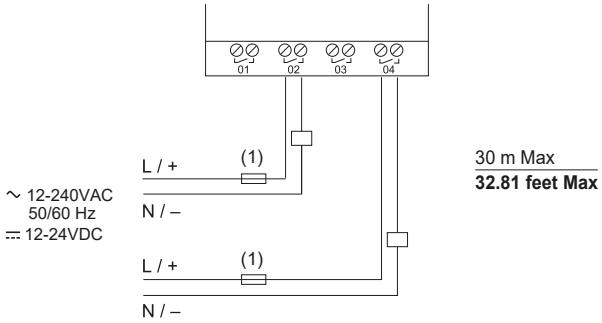

(1) Isolated source
(2) 1A quick blowing fuse, circuit breaker, or circuit protector

# OUTPUTS Electronic & Wiring Diagrams

## Relay Outputs

MXD12RU3ET, MXB12RU3ET
MXD12RU1ET, MXB12RU1ET
MXD12RD7ET, MXB12RD7ET

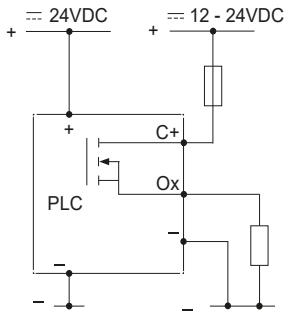


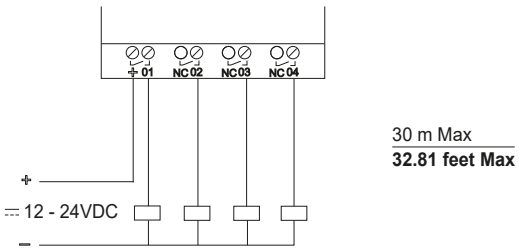




(1) Fuse, circuit breaker or current protector as per relay rating.
For 8A relay use 8A circuit breaker or current protector.
For 5A relay use 5A circuit breaker or current protector.

## Static / PWM Outputs

MXD12SD1ET, MXB12SD1ET



# ADDRESSING MEMORY

| Name | R/W | Address |
|---|---|---|
| XWIN<br>XWIN | R/W<br>R/W | 0001<br>0002 |
| : : | : : | : : |
| XWIN | R/W | 0023 |
| XWIN | R/W | 0024 |
| XBIN (Word) | R/W | 0025 |
| XWOUT | R | 0026 |
| XWOUT | R | 0027 |
| : : | : : | : : |
| XWOUT | R | 0048 |
| XWOUT | R | 0049 |
| XBOUT (Word) | R | 0050 |

## Modbus functions supported

| Code (Hexa) | Function | Data Type |
|---|---|---|
| 0x01 (R) | Read Coils | N x 8 bits |
| 0x03 (R) | Read multiple registers (R) | N x 16 bits (Word) |
| 0x05 (W) | Write single Coil (OFF) | 2 x 16 bits<br>0x0000: request the coil to be OFF |
| | Write single Coil (ON) | 2 x 16 bits<br>0xFF00: request the coil to be ON |
| 0x06 (W) | Write single register (W) | 16 bits (Word) |
| 0x0F (W) | Write multiple coils (W) | N x 8 bits (Word) |
| 0x10 (R/W) | Write multiple registers (W) | N x 16 bits (Word) |
| 0x2B (R) | Read device identification (R) | ASCII string |

| | | | | |
|---|---|---|---|---|
| LSB STATE | R | 0051 | 0x0000: Stop | 0x0001: Run<br>0x0002: Debugging<br>0x0040: Setting front |
| MSB STATE | R | 0052 | 0x0000 | |
| LSB STATUS | R | 0053 | See code warning / error | |
| MSB STATUS | R | 0054 | See code warning / error | |
| CLOCK | R/W | 0055 | Second | |
| | R/W | 0056 | Minute | |
| | R/W | 0057 | Hour | |
| | R/W | 0058 | Weekday | 0x0000: Monday<br>0x0006: Sunday |
| | R/W | 0059 | Day of the month | |
| | R/W | 0060 | Month | |
| | R/W | 0061 | Year | |
| | R/W | 0062 | Time zone | |
| SUMMER / WINTER | R/W | 0063 | Change | 0x0000: Invalid<br>0x0001: Europe<br>0x0002: USA<br>0x0003: Manual |
| | R/W | 0064 | SUMMER month | 0x0001: January<br>0x000C: December |
| | R/W | 0065 | Date SUMMER | 0x0001: 1st Sunday<br>0x0005: 5th Sunday |
| | R/W | 0066 | WINTER Month | 0x0001: January<br>0x000C: December |
| | R/W | 0067 | WINTER Date | 0x0001: 1st Sunday<br>0x0005: 5th Sunday |
| DRIFT | R/W | 0068 | Drift | 0xFFC5: -59<br>0x003B: +59 |
| RUN/STOP | W | 0069 | 0x0000: Stop | 0x0001: Run |
| XBIN (bit)<br>code: 0x01, 0x05 | R/W | 1000<br>\|<br>1015 | | |
| XBOUT (bit)<br>code: 0x01 | R | 1016<br>\|<br>1031 | | |