› Millenium PLC
Power Supply AC/DC
With/without display

- › Highly visible tricolor (green, white, orange) LCD display with 6 lines of 24 characters
- › Blind version: LED indication Power/Run
- › Expansion modules (up to 12 expansions)
- › Compatible with all the functions blocks available on the software
- › Wide operating temperature range (-20 °C → +55 °C)
- › Embedded Ethernet + Webserver
- › Modbus TCP (RS485 optional interface)
- › CrouzetSoft programming Ladder / FBD / SFC
- › Ladder front panel programming

MXB12RU3ET
without display

MXD12RU3ET
with display

Selection guide				
Power supply	**Inputs**	**Outputs**	**Without display**	**With display**
110 → 240 V⏦	8 digital	4 relays - 8 A	**MXB12RU3ET**	**MXD12RU3ET**
24 V⏦	8 digital	4 relays - 8 A	**MXB12RU1ET**	**MXD12RU1ET**

Expansions & Interfaces		
Digital Expansions (same power supply as base)	**Description**	**Part-number**
MXR12	110-230 V⏦, 8 DI, 8 DO relay outputs, 70 mm	**MXR16U3**
MXR12	110-230 V⏦, 4 DI, 4 DO relay outputs, 35 mm	**MXR08U3**
MXR12	24 V⏦, 8 DI, 8 DO relay outputs, 70 mm	**MXR16U1**
MXR12	24 V⏦, 4 DI, 4 DO relays outputs, 35 mm	**MXR08U1**
Other Compatible Expansions		
Analog & Digital Expansions	See page 5	
Interfaces	**Description**	**Part-number**
	SD Memory Interface	**MIMEMSD**
	Modbus RS485 Interface (with polarization)	**MI485P**
	Modbus RS485 Interface (without polarization)	**MI485**

Codification BASE

M	X	D	12	R	U1	ET
M: Millenium	**X:** Expandable	**Display** **D:** With **B:** Without	**Input/Output** **08 / 04**	**S:** Static Output **R:** Relay Output **AI:** Analog Input **AO:** Analog Output	**Power Supply** **U1:** 24 V⏦ **U3:** 110-230 V⏦ **D1:** 24 V⎓ **D7:** 12-24 V⎓	**ET:** Ethernet

Codification EXPANSION

M	X	R	16	U1
M: Millenium	**X:** Expandable	**S:** Static Output **R:** Relay Output **AI:** Analog Input **AO:** Analog Output	**Input/Output** **16:** 08 / 08 **08:** 04 / 04 **02:** 02 / 00 00 / 02	**Power Supply** **U1:** 24 V⏦ **U3:** 110-230 V⏦ **D1:** 24 V⎓ **D7:** 12-24 V⎓

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Description:

The Millenium is the latest product in Crouzet's Millenium series. This is a compact, networked, and communicative PLC. Its flexible deployment and extensive configuration options with various extensions make it suitable for a wide range of applications.
Accompanied by powerful, intuitive software, it will support you throughout your automation needs.

For more information about ***Millenium***: please visit **www.crouzet.com**

CROUZET

	MX*12RU3ET (110 → 230 V≂)	MX*12RU1ET (24 V≂)
General Features		
Ethernet Modbus TCP/IP (Client///Server)* * Client possible only with FBD programming language	Yes (16 IP range /// 24 words + 16 bits)	
Modbus RTU RS485 (Client /// Server)* * Client possible only with FBD programming language	Yes via interface MI485 or MI485P (16 devices /// 24 words + 16 bits)	
Webserver	Yes (Front face display, PLC status, Diagnosis, Run/stop, Update application, Download datalogs)	
Datalog	On SD card* - 24 data channel (Not compatible with Modbus RTU RS485 interface) * SD card not included	
Power Supply		
Nominal voltage	110-240 V≂	24 V≂
Operating limits	85 V∿ → 265 V∿ / 100 V⎓ → 253 V⎓	20.4 → 26.4 V∿ / 20.4 → 28.8 V⎓
Max. absorbed power	6.5VA @ 90 ➡∿ 6.5VA @ 265 ➡∿ 4W @ 100 ➡⎓ 4W @ 253 ➡⎓	6VA @ 20.4 ➡∿ 6VA @ 26.4 ➡∿ 3W @ 20.4 ➡⎓ 3W @ 28.8 ➡⎓
Immunity to micro power cuts	10ms	
Supply frequency range	50 Hz → 60 Hz (AC) (±3 Hz)	
Power supply earthing	None	
Power Monitoring	Yes Voltage value available through the Function Block “FB Status”	
Inputs		
Digital Imputs		
Input voltage	85 V∿ → 265 V∿ / 100 V⎓ → 253 V⎓	0 → 26.4 V∿ / 0 → 28.8 V⎓
Input current	**I1….I8 AC** ≈ 0.6153 mA @ 85 V∿ ≈ 0.8002 mA @ 110 V∿ ≈ 1.7620 mA @ 240 V∿ ≈ 1.9469 mA @ 265 V∿ **I1….I8 DC** ≈ 0.5096 mA @ 100 V⎓ ≈ 0.5620 mA @ 110 V⎓ ≈ 1.2421 mA @ 240 V⎓ ≈ 1.3729 mA @ 265 V⎓	**I1….I8 AC** ≈ 3.7875 mA @ 20.4 V∿ ≈ 4.5363 mA @ 24 V∿ ≈ 5.0354 mA @ 26.4 V∿ **I1….I8 DC** ≈ 2.5453 mA @ 20.4 V⎓ ≈ 3.0748 mA @ 24 V⎓ ≈ 3.7808 mA @ 28.8 V⎓
Input impedance	400 KΩ	13.4 KΩ
Logic 1 voltage threshold	> 79 V∿, > 79 V⎓	> 12 V≂
Making current at logic state 1	0.5371 mA @ 79 V∿ / 0.3761 mA @ 79 V⎓	2.0405 mA @ 12 V∿ / 1.3097 mA @ 12 V⎓
Logic 0 voltage threshold	< 40 V∿, < 30 V⎓	< 5 V≂
Release current at logic state 0	0.2824 mA @ 40 V∿ / 0.1349 mA @ 30 V⎓	0.5846 mA @ 5 V∿ / 0.2890 mA @ 5 V⎓
Response time	1 to 2 cycle time (normal input)	
Sensor type	Contact or 3-wire PNP	
Input type	Resistive	
Conforming to IEC/EN 61131-2	Type 1	
Isolation between power supply and inputs	None	
Isolation between inputs	None	
Protection against polarity inversions	Yes	
Max cable length	≤30m	
Status indicator	On Display (LCD) Only on LCD base	

	MX*12RU3ET (110 → 230 V⎓)	MX*12RU1ET (24 V⎓)
Outputs		
Relay Outputs		
Quantity	4 relays outputs, from O1 to O4 (Normally open)	
Max. breaking voltage	250 V∿ 30 V⎓	
Max. Breaking current	▪ 8 A @ 230 V∿ (resistive) ▪ 8 A @ 30 V⎓ (resistive)	
Mechanical life	1x 10^7	
Electrical durability	Resistive load at 85 °C: 8 A, 250 V∿, 50 K Cycles	
Minimum switching capacity	100 mA (at minimum voltage of 12V)	
Maximum operating rate	10Hz	
Voltage for withstanding shocks	2kV	
Response time	Make = 1 cycle time + 8 ms Release = 1 cycle time + 5 ms	
Isolation between power supply and outputs	Yes	
Isolation between outputs	Yes	
Built-in protections	▪ Against short-circuits: None ▪ Against overvoltages and overloads: None	
Status indicator	On LCD screen (Only on PLC with display)	
Cable length	≤ 30 meter	
Communication		
Ethernet connection	Type RJ45, 10/100 Mbit/s, MDI/MDIX	
Ethernet LED indicator	Green LED	
Addressing	Static or dynamic (DHCP server / Auto IP)	
Protocol supported	Discovery (PLC on network detection) CrouzetSoft communication via Ethernet (SSL/TLS) MODBUS TCP Server MODBUS TCP Client (FBD only)	
Cable length	Maximun length between 2 devices: 100 m / 3937 inch	
Ethernet earthing	Yes, refer to the installation guide supplied with the product	
Processing characteristics		
Programming software	CrouzetSoft	
Maximum Number of I/O	24 DI + 20 DO + 8 AI + 8 AO	
Program size function blocks (FBD)	Function blocks: typically 500 blocks Macro blocks: 127 max. (255 blocks per macro)	
Number of lines in Ladder	250 lines	
LCD display	▪ MXD: Display with 6 lines of 24 characters ▪ Backlight 3 colors: White, Green, Orange ▪ MXB: No display. Power/Status LED indicator	
Programming method	Function blocks / SFC (Grafcet) or Ladder	
Program memory	Flash	
Data memory	2 k octets	
Back-up time in the event of power failure	Program and settings in the controller: 10 years Data memory: 10 years	
Cycle time	FBD: 14 → 200 ms (typically 20 ms) Ladder: typically 20 ms	
Response time	Input acquisition time: + 1 to 2 cycle times	
Clock data retention	10 years (lithium battery) at 25 °C (77 °F)	
Clock drift	Drift < 12 min/year (at 25 °C) 6 s/month (at 25 °C with user-definable correction of drift)	
Timer block accuracy	0.5 % ± 2 cycle times	
Start up time on power up	< 5 s	

	MX*12RU3ET (110 → 230 V≂)	MX*12RU1ET (24 V≂)
Self tests	▪ Test firmware integrity (checksum memory) ▪ Stability of the internal power supply ▪ Check the conformity of the device configuration with the configuration in the application program.	
General & environment characteristics		
Certifications	CE, cULus	
Environmental certifications	REACH, ROHS	
Conformity with the EMC directive (in accordance with 2014/53/UE)	IEC/EN 61000-6-1 (Residential, commercial, and light-industrial environments) IEC/EN 61000-6-2 (Industrial) IEC/EN 61000-6-3 (Residential, commercial, and light-industrial environments) IEC/EN 61000-6-4 (Industrial)	
Earthing	Not included	
Protection rating	In accordance with IEC/EN 60529: ▪ IP40 on front panel ▪ IP20 on terminal block	
Overvoltage category	2 in accordance with IEC/EN 60664-1	
Pollution	Degree: 2 in accordance with IEC/EN 61131-2	
Max operating Altitude (m)	▪ Operation: 2000 ▪ Transport: 3000	
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, test Fc Immunity to shock IEC/EN 60068-2-27.15 g peak,11 ms duration	
Resistance to electrostatic discharge	IEC 61000-4-2 Level III (AD: ± 8 KV and CD: ± 4 KV), Criteria B	
Resistance to HF interference	Immunity to radiated electrostatic fields IEC 61000-4-3 Electrical fast transients IEC 61000-4-4 Surge IEC 61000-4-5 Conducted Susceptibility IEC 61000-4-6, Voltage dips As per IEC61131 -2	
Conducted and radiated emissions	CISPR11 Class B	
Operating temperature	-20 → +55 °C (-4 → 131 °F)	
Storage temperature	-30 → +70 °C (-22 → 158 °F)	
Relative humidity	10-95 % no condensing	
Screw terminals connection capacity	▪ Euro type terminal ▪ Wire Size 1 x 24 to 12 (AWG) ▪ Solid wire Range: 1*2.5 mm2 or 2*1.5 mm2 ▪ Flexible wire Range: 1*2.5 mm2 or 2*1.5 mm2	
Screw tightening Torque	0.4 N. m. (3.54 lb. in) (Including earth terminal)	
Clearance and creepage	IEC 60664, IEC 61131-2, IEC 61010	
Mechanical Specifications		
Mounting type	Base / Din-Rail Mounting	
Housing material	Polycarbonate	
Housing Color	Light Gray RAL 7035 (sole black RAL9011)	
Dimensions (W x H x D) (mm)	72 x 90 x 63.1 for bases with display 72 x 90 x 61.1 for bases without display	
Weight (g)	236 for bases with display 205 for MXB for bases without display	227 for bases with display 195 for bases without display
Enclosure type	4 M	
DIN Rail mounting	Mounting in 35 mm symmetrical DIN rail (see installation sheet of instructions), compatible with modular enclosures	
Panel Mounting	Flat panel mounting by screws (see installation sheet of instructions)	

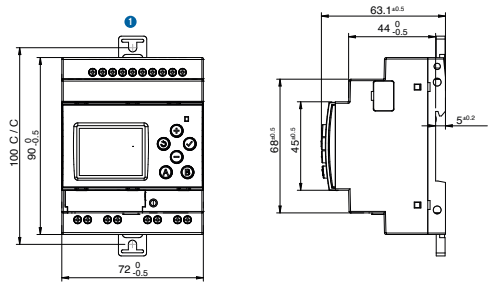
	MX*12RU3ET (110 → 230 V~)	MX*12RU1ET (24 V~)
Other Expansions Capabilities		
Compatible expansion with any base (can be independantly supplied)		
MXA Analog	24 V⎓, 2 Analog (V/mA) outputs, 35 mm MXAO02D1 12 → 24 V⎓, 2 Analog (V/mA) inputs, 35 mm MXAI02D7 12 → 24 V⎓, 2 RTD inputs, 35 mm MXAI02PD7	
Compatible expansion only if supplied with same 24 V⎓ Power Supply than base		
MXS Digital Expansions Static (transistor - Sourcing)	NA	24 V⎓, 8 DI, 8 DO Solid State Relays, 70 mm MXS16D1 24 V⎓, 4 DI, 4 DO Solid State Relays, 35 mm MXS08D1
MXR Digital Expansions Relay	NA	12 → 24 V⎓, 8 DI, 8 DO relays, 70 mm MXR16D7 12 → 24 V⎓, 4 DI, 4 DO relays, 35 mm MXR08D7

Product Dimensions

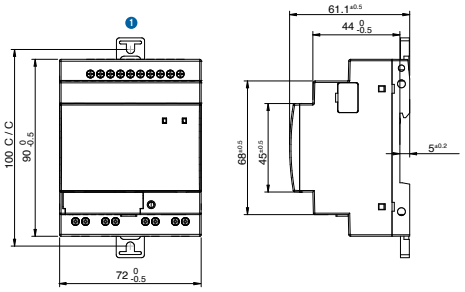
Front and Side

Version 24 V~ / 110 → 230 V~

With display - version 70 mm



Without display - version 70 mm



1 Fixing Bracket

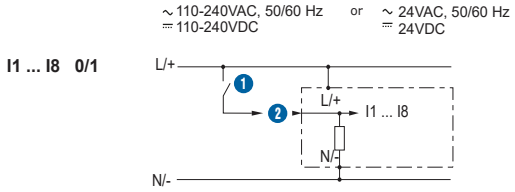
Electronic & Wiring Diagrams

Inputs

Digital Inputs (AC/DC Voltage)

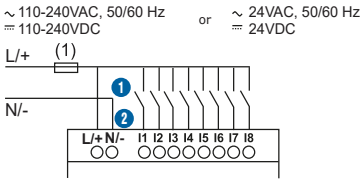
MXD12RU3ET, MXB12RU3ET → Inputs I1....I8
MXD12RU1ET, MXB12RU1ET → Inputs I1....I8

Electronic Diagram



1 Contact
2 Digital Input

Wiring Diagram



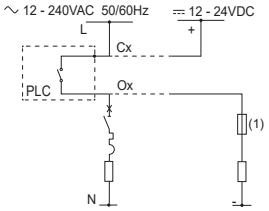
(1) 1A quick blowing fuse, circuit breaker, or circuit protector
L: Line
N: Neutral

Outputs

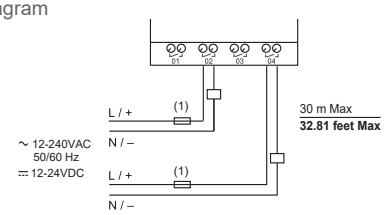
Relay Outputs

MXD12RU3ET, MXB12RU3ET
MXD12RU1ET, MXB12RU1ET

Electronic Diagram



Wiring Diagram



(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.