

› Millenium PLC

AC/DC Power Supply

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 $\sim$	8 digital	4 relays - 8 A	MXB12RU3ET	MXD12RU3ET
24 V $\sim$	8 digital	4 relays - 8 A	MXB12RU1ET	MXD12RU1ET

Expansions & Interfaces		
Digital Expansions (same power supply as base)	Description	Part-number
MXR12	110-230 V $\sim$, 8 DI, 8 DO relay outputs, 70 mm	MXR16U3
MXR12	110-230 V $\sim$, 4 DI, 4 DO relay outputs, 35 mm	MXR08U3
MXR12	24 V $\sim$, 8 DI, 8 DO relay outputs, 70 mm	MXR16U1
MXR12	24 V $\sim$, 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	Codification EXPANSION	M	X	R	16	U1
	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 $\sim$ U3: 110-240 V $\sim$ D1: 24 V $\sim$ D7: 12-24 V $\sim$	ET: Ethernet		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 $\sim$ U3: 110-240 V $\sim$ D1: 24 V $\sim$ D7: 12-24 V $\sim$

You have a project? Contact us on www.crouzet.com

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

MX*12RU3ET (110 → 240 V $\sim$)MX*12RU1ET (24 V $\sim$)

General Features

Ethernet Modbus TCP/IP (Client///Server)*	Yes (16 IP range /// 24 words + 16 bits)
* Client possible only with FBD programming language	
Modbus RTU RS485 (Client /// Server)*	Yes via interface MI485 or MI485P
* Client possible only with FBD programming language	
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 $\sim$	24 V $\sim$
Operating limits	85 V $\sim$ → 265 V $\sim$ / 100 V $\sim$ → 253 V $\sim$	20.4 → 26.4 V $\sim$ / 20.4 → 28.8 V $\sim$
Max. absorbed power	10VA @ 90 $\Rightarrow$ 10VA @ 265 $\Rightarrow$ 4W @ 100 $\Rightarrow$ 4W @ 253 $\Rightarrow$	6VA @ 20.4 $\Rightarrow$ 6VA @ 26.4 $\Rightarrow$ 3W @ 20.4 $\Rightarrow$ 3W @ 28.8 $\Rightarrow$
Immunity to micro power cuts	10ms	
Supply frequency range	50 Hz → 60 Hz (AC) ($\pm$ 3 Hz)	
Power supply earthing	None	
Power Monitoring	Yes Voltage value available through the Function Block "FB Status"	

Inputs

Digital Inputs

Input voltage	85 V $\sim$ → 265 V $\sim$ / 100 V $\sim$ → 253 V $\sim$	0 → 26.4 V $\sim$ / 0 → 28.8 V $\sim$
Input current	I1...I8 AC ≈ 0.62 mA @ 85 V $\sim$ ≈ 0.80 mA @ 110 V $\sim$ ≈ 1.76 mA @ 240 V $\sim$ ≈ 1.95 mA @ 265 V $\sim$ I1...I8 DC ≈ 0.51 mA @ 100 V $\sim$ ≈ 0.56 mA @ 110 V $\sim$ ≈ 1.24 mA @ 240 V $\sim$ ≈ 1.37 mA @ 265 V $\sim$	I1...I8 AC ≈ 3.79 mA @ 20.4 V $\sim$ ≈ 4.54 mA @ 24 V $\sim$ ≈ 5.04 mA @ 26.4 V $\sim$ I1...I8 DC ≈ 2.55 mA @ 20.4 V $\sim$ ≈ 3.07 mA @ 24 V $\sim$ ≈ 3.78 mA @ 28.8 V $\sim$
Input impedance	400 K Ω	13.4 K Ω
Logic 1 voltage threshold	> 79 V $\sim$, > 79 V $\sim$	> 12 V $\sim$
Making current at logic state 1	0.54 mA @ 79 V $\sim$ / 0.38 mA @ 79 V $\sim$	2.04 mA @ 12 V $\sim$ / 1.31 mA @ 12 V $\sim$
Logic 0 voltage threshold	< 40 V $\sim$, < 30 V $\sim$	< 5 V $\sim$
Release current at logic state 0	0.28 mA @ 40 V $\sim$ / 0.13 mA @ 30 V $\sim$	0.58 mA @ 5 V $\sim$ / 0.29 mA @ 5 V $\sim$
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 → 240 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 1000 blocks Macro blocks: 127 max. (255 blocks per macro and on main program)		
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 → 240 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 → 240 V~)

MX*12RU1ET (24 V~)

Other Expansions Capabilities

Compatible expansion with any base (can be independantly supplied)

MXA	24 V~, 2 Analog (V/mA) outputs, 35 mm MXAO02D1
Analog	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

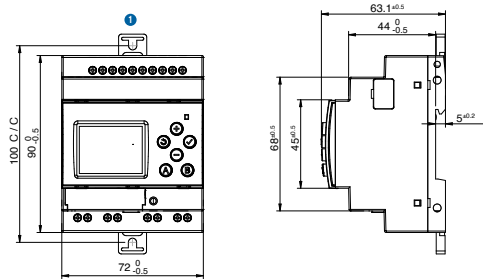
MXS	NA	24 V~, 8 DI, 8 DO Solid State Relays, 70 mm MXS16D1
Digital Expansions Static (transistor - Sourcing)		24 V~, 4 DI, 4 DO Solid State Relays, 35 mm MXS08D1
MXR	NA	12 → 24 V~, 8 DI, 8 DO relays, 70 mm MXR16D7
Digital Expansions Relay		12 → 24 V~, 4 DI, 4 DO relays, 35 mm MXR08D7

Product Dimensions

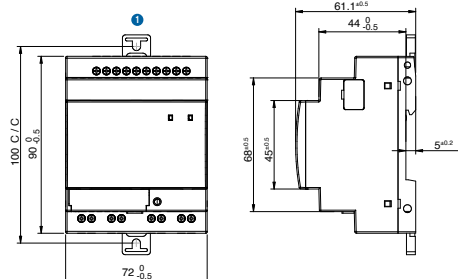
Front and Side

Version 24 V~ / 110 → 240 V~

With display - version 70 mm



Without display - version 70 mm



① Fixing Bracket

Electronic & Wiring Diagrams

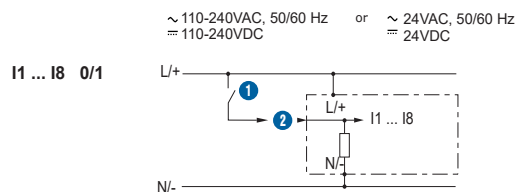
Inputs

Digital Inputs (AC/DC Voltage)

MXD12RU3ET, MXB12RU3ET → Inputs I1...I8

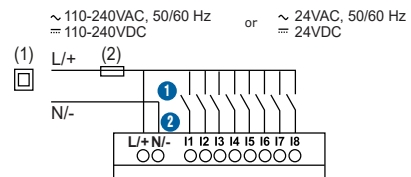
MXD12RU1ET, MXB12RU1ET → Inputs I1...I8

Electronic Diagram



① Contact
② Digital Input

Wiring Diagram



(1) Isolated source if 24 V~ or 24 V~ supply
(2) 1A quick blowing fuse, circuit breaker, or circuit protector
L: Line
N: Neutral

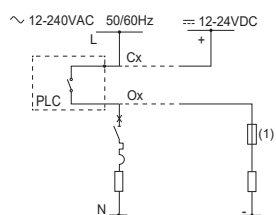
Outputs

Relay Outputs

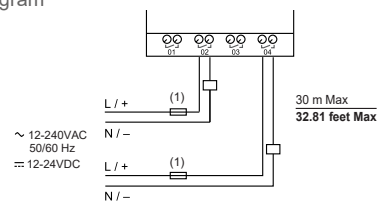
MXD12RU3ET, MXB12RU3ET

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.

Warning:

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