› Millenium 3 PLC
Smart "Expandable" range XD10/XB10
With/without display

› Highly visible blue LCD with 4 lines of 18 characters and configurable backlighting

› Allow the use of the entire library of specific functions Blocks of the software workshop

› Wide temperature range (-20 °C → +70 °C)

› Analog inputs 0-10 V⎓, potentiometer, NTC, (0-20mA/Pt100 with converters)

› Open to XN network communication extensions, digital I/O, analog, Pt100 extensions

XD10 with display

XB10 without display

Selection guide

Power supply	Inputs	Outputs	XD10	XB10
24 V⎓	6 digital (including 4 analog)	4 relays 8A	**88974141**	**88974131**
		4 solid state 0.5 A (including 1 PWM)	**88974142**	**88974132**
100 → 240 V∿	6 digital	4 relays 8A	**88974143**	**-**

Accessories & Digital extensions

Accessories Types	Description	Code
M3 Soft	Programming Software containning a complete dedicated function library	**88970111**
Physical Accessories	EEPROM memory cartridge	**88970108**
	3m serial cable: PC → Millenium 3	**88970102**
	3m USB cable: PC → Millenium 3	**88970109**
	Milenium 3 → Bluetooth® interface (class A 10m)	**88970104**

Our Part-Number System

Expandable Version

Screen
D: Whith
B: Without

X D 10

Version
C: Compact
X: Expandable

Inputs
10: 6 inputs + 4 outputs
12: 8 inputs + 4 outputs
26: 16 inputs + 10 outputs

Expansion Modules

Type
E: Digital sandwich extensions
R: Digital termination extensions
A: Analog termination extensions

X R 06

Version
X: Expansion

Inputs/Output
03: 3 Pt100
04: 1 analog / 2 analog
05: Ethernet
06: 4 digital / 2 relay
10: 6 digital / 4 relay
14: 8 digital / 6relay

Type
N: Sandwich communication extensions

X N 06

Version
X: Expansion

Communication
05: Ethernet
06: Modbus

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

Description:

Millenium3: **The reference for more than 15 years**

The Millenium3 is a versatile, powerful logic controller designed to meet the needs of a wide range of industrial applications. Its ease of use and flexibility make it ideal for automation professionals.

It offers high reliability and accuracy, making it a trusted choice for your automation needs.

For more information about *Millenium3*: please visit **www.crouzet.com**

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Accessories & Digital extensions		
Expansion Modules	**Description**	**Code**
Sandwich communication extensions		
XN06	Modbus	**88972250**
XN05	Ethernet	**88970270**
Digital sandwich extension		
XE10	24 V⎓ controller	**88970321**
	100 → 240 V∿	**88970323**
	24 V∿	**88970324**
Digital extensions		
XR06	4 digital, 24 V⎓	**88970211**
	4 digital, 100 → 240 V∿	**88970213**
	4 digital, 24 V∿	**88970214**
	4 digital, 12 V⎓	**88970215**
XR10	6 digital, 24 V⎓	**88970221**
	6 digital, 100 → 240 V∿	**88970223**
	6 digital, 24 V∿	**88970224**
	6 digital, 12 V⎓	**88970225**
XR14	8 digital, 24 V⎓	**88970231**
	8 digital, 100 → 240 V∿	**88970233**
	8 digital, 24 V∿	**88970234**
	8 digital, 12 V⎓	**88970235**
Analog extension		
XA03	Analog extension: 3 temperature input	**88970800**
XA04	Analog extension: 2 inputs/2 outputs	**88970241**

	24 V⎓	100 → 240 V∿
General environment characteristics		
Certifications	CE, UL, CSA, GL	
Conformity to standards (with the low voltage directive and EMC directive)	IEC/EN 61131-2 (Open equipment) IEC/EN 61131-2 (Zone B) IEC/EN 61000-6-2 IEC/EN 61000-6-3 (*) IEC/EN 61000-6-4 (*) Except configuration (88 970 1X1 or 88 970 1X2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B in a metal enclosure)	
Earthing	Not included	
Protection rating	In accordance with IEC/EN 60529: IP40 on front panel IP20 on terminal block	
Overvoltage category	3 in accordance with IEC/EN 60664-1	
Pollution	Degree: 2 in accordance with IEC/EN 61131-2	
Max operating Altitude	Operation: 2000 m Transport: 3048 m	
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, test Fc Immunity to shock IEC/EN 60068-2-27, test Ea	
Resistance to electrostatic discharge	Immunity to ESD IEC/EN 61000-4-2, level 3	

	24 V⎓	100 → 240 V∿
Resistance to HF interference	Immunity to radiated electrostatic fields IEC/EN 61000-4-3	
	Immunity to fast transients (burst immunity) IEC/EN 61000-4-4, level 3	
	Immunity to shock waves IEC/EN 61000-4-5	
	Radio frequency in common mode IEC/EN 61000-4-6, level 3	
	Voltage dips and breaks (a) IEC/EN 61000-4-11	
	Immunity to damped oscillatory waves IEC/EN 61000-4-12	
Conducted and radiated emissions	Class B (*) in accordance with EN 55022, EN 55011 (CISPR22, CISPR11) group 1	
	(*) Except configuration (88 970 1X1 or 88 970 1X2) + (88 970 250 or 88 970 270) + 88 970 241 class A (class B in a metal enclosure)	
Operating temperature Millenium 3 Essential and extensions	-20 →+55 °C (+40 °C in a non-ventilated enclosure)	
	in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	
Operating temperature Millenium 3 Smart	-20 +70 °C except CB and XB versions in VDC: -30 →+70 °C (+40 °C in a nonventilated enclosure) in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	
Storage temperature Millenium 3 Essential and extensions	-40 →+70 °C in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	
Storage temperature Millenium 3 Smart	-40 → +80 °C in accordance with IEC/EN 60068-2-1 and IEC/EN 60068-2-2	
Relative humidity	95 % max. (no condensation or dripping water) in accordance with IEC/EN 60068-2-30	
Mounting	On symmetrical DIN rail, 35 x 7.5 mm and 35 x 15 mm, or on panel (2 x Ø 4 mm)	
Screw terminals connection capacity	Flexible wire with ferrule =	
	conductor: 0.25 to 2.5 mm 2 (AWG 24 →AWG 14)	
	conductors 0.25 to 0.75 mm 2 (AWG 24 →AWG 18) Semi-rigid wire = 1	
	conductor: 0.2 to 2.5 mm 2 (AWG 25 →AWG 14)	
	Rigid wire =	
	conductor: 0.2 to 2.5 mm 2 (AWG 25 →AWG 14)	
	conductors 0.2 to 1.5 mm 2 (AWG 25 →AWG 16)	
	Tightening torque =	
	0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm)	

| Processing characteristics, XD & XB product types		
Program size function blocks (FBD)	350 typical bloc	
	64 macros maximum	
	256 blocks maximum per macro	
Memory size function blocks (FBD)	8 K	
Number of lines in Ladder	120 lines	
LCD display	XD: Display with 4 lines of 18 characters	
Programming method	Function blocks / SCF (Grafcet) or Ladder	
Program memory	Flash EEPROM	
Removable memory	EEPROM	
Data memory	368 bit/200 words	
Back-up time in the event of power failure	Program and settings in the controller: 10 years	
	Program and settings in the plug-in memory: 10 years	
	Data memory: 10 years	
Cycle time	FBD: 6 → 90 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	
Clock drift	Drift < 12 min/year (at 25 °C)	
	6 s/month (at 25 °C with user-definable correction of drift)	
Timer block accuracy	1 % ± 2 cycle times	
Start up time on power up	< 1.2 s	

	24 V⎓	100 → 240 V∿
Characteristics of products with AC power supplied		
Supply		
Nominal voltage	-	100 → 240 V∿
Operating limits	-	-15 % / +10 % or 85 →264 V∿
Supply frequency range	-	50/60 Hz (+4 % / -6 %) or 47 → 53 Hz / 57→ 63 Hz
Immunity from micro power cuts	-	10 ms (repetition 20 times)
Max. absorbed power	-	XD10-XB10 with extension: 12 VA
Isolation voltage	-	1780 V∿
Inputs		
Input voltage	-	100 →240 V∿ (-15 % / +10 %)
Input current	-	0.24 mA @ 85 V∿ 0.75 mA @ 264 V∿
Input impedance	-	350 kΩ
Logic 1 voltage threshold	-	≥79 V∿
Making current at logic state 1	-	> 0.17 mA
Logic 0 voltage threshold	-	≤ 20 V∿ (≤ 28 V∿: XE10, XR06, XR10, XR14)
Release current at logic state 0	-	< 0.5 mA
Response time with function blocks programming	-	Configurable in increments of 10 ms 50 ms min. up to 255 ms State 0 →1 (50/60 Hz)
Response time with Ladder programming	-	50 ms State 0 →1 (50/60 Hz)
Maximum counting frequency	-	In accordance with cycle time (Tc) and input response time (Tr): 1 / ((2 x Tc) + Tr)
Sensor type	-	Contact or 3-wire PNP
Input type	-	Resistive
Isolation between power supply and inputs	-	None
Isolation between inputs	-	None
Protection against polarity inversions	-	Yes
Status indicator	-	On LCD screen for XD
Characteristics of relay outputs common to the entire range		
Max. breaking voltage	5 → 30 V⎓ 24 → 250 V∿	
Breaking current	XD10-XB10: 8 A	
Electrical durability for 500 000 operating cycles	Utilization category DC-12: 24 V, 1.5 A Utilization category DC-13: 24 V (L/R = 10 ms), 0.6 A Utilization category AC-12: 230 V, 1.5 A Utilization category AC-15: 230 V, 0.9 A	
Max. Output Common Current	12 A for O8, O9, OA	
Minimum switching capacity	10 mA (at minimum voltage of 12 V)	
Minimum load	12 V, 10 mA	
Maximum rate	Off load: 10 Hz At operating current: 0.1 Hz	
Mechanical life	10.000.000 (operations)	
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV	
Response time	Make 10 ms Release 5 ms	

	24 V⎓	100 → 240 V∿

	24 V⎓	100 → 240 V∿
Built-in protections	Against short-circuits: None Against overvoltages and overloads: None	
Status indicator	On LCD screen for XD	
Characteristics of product with DC power supplied		
Supply		
Nominal voltage	24 V⎓	-
Operating limits	-20 % / +25 % or 19.2 → 30 V⎓ (including ripple)	-
Immunity from micro power cuts	≤ 1 ms (repetition 20 times)	-
Max. absorbed power	XD10-XB10 with solid state outputs: 3 W XD10-XB10 with relay outputs: 4 W XD10-XB10 with extension: 8 W	-
Protection against polarity inversions	Yes	-
Digital inputs (I1 to IA and IH to IY)		
Input voltage	24 V⎓ (-20 % / +25 %)	-
Input current	2.6 mA @ 19.2 V⎓ 3.2 mA @ 24 V⎓ 4.0 mA @ 30.0 V⎓	-
Input impedance	7.4 kΩ	-
Logic 1 voltage threshold	≥ 15 V⎓	-
Making current at logic state 1	≥ 2.2 mA	-
Logic 0 voltage threshold	≤ 5 V⎓	-
Release current at logic state 0	< 0.75 mA	-
Response time	1 → 2 cycle times + 6 ms	-
Maximum counting frequency	Inputs I1 & I2: FBD (up to 6 kHz) & Ladder (1 kHz) Inputs I3 to IA & IH to IY: In accordance with cycle time (Tc) and input response time (Tr): 1/ ((2 x Tc) + Tr)	-
Sensor type	Contact or 3-wire PNP	-
Conforming to IEC/EN 61131-2	Type 1	-
Input type	Resistive	-
Isolation between power supply and inputs	None	-
Isolation between inputs	None	-
Protection against polarity inversions	Yes	-
Status indicator	On LCD screen for XD	-
Analog or digital inputs (IB to IG)		
CB12-CD12-XD10-XB10	4 inputs IB → IE	-
CB20-CD20-XB26-XD26	6 inputs IB → IG	-
Inputs used as analog inputs only in FBD		
Measurement range	(0 → 10 V) ou (0 → V power supply)	-
Input impedance	12 kΩ	-
Input voltage	30 V⎓ max.	-
Value of LSB	29 mV	-
Input type	Common mode	-
Resolution	10 bit at max. input voltage	-
Conversion time	Controller cycle time	-
Accuracy at 25 °C	± 5 %	-
Accuracy at 55 °C	± 6.2 %	-
Repeat accuracy at 55 °C	± 2 %	-

	24 V⎓	100 → 240 V∿
Isolation between analog channel and power supply	None	-
Cable length	10 m maximum, with shielded cable (sensor not isolated)	-
Protection against polarity inversions	Yes	-
Potentiometer control	2.2 kΩ / 0.5 W (recommended) 10 kΩ max	-
Inputs used as digital inputs		
Input voltage	24 V⎓ (-20 % / +25 %)	-
Input current	1.6 mA @ 19.2 V⎓ 2.0 mA @ 24.0 V⎓ 2.5 mA @ 30.0 V⎓	-
Input impedance	12 kΩ	-
Logic 1 voltage threshold	≥ 15 V⎓	-
Making current at logic state 1	≥ 1.2 mA	-
Logic 0 voltage threshold	≤ 5 V⎓	-
Release current at logic state 0	≤ 0.5 mA	-
Response time	1 →2 cycle times	-
Maximum counting frequency in FBD	In accordance with cycle time (Tc) and input response time (Tr): $1/((2 \times Tc) + Tr)$	-
Sensor type	Contact or 3-wire PNP	-
Conforming to IEC/EN 61131-2	Type 1	-
Input type	Resistive	-
Isolation between power supply and inputs	None	-
Isolation between inputs	None	-
Protection against polarity inversions	Yes	-
Status indicator	On LCD screen for XD	-
Characteristics of relay outputs common to the entire range		
Max. breaking voltage	5 → 30 V⎓ 24 → 250 V∿	
Max. Output Common Current	12 A (10 A UL) for O8, O9, OA	
Breaking current	XD10-XB10: 8 A	
Electrical durability for 500 000 operating cycles	Utilization category DC-12: 24 V, 1.5 A Utilization category DC-13: 24 V (L/R = 10 ms), 0.6 A Utilization category AC-12: 230 V, 1.5 A Utilization category AC-15: 230 V, 0.9 A	
Minimum switching capacity	10 mA (at minimum voltage of 12 V)	
Minimum load	12 V, 10 mA	
Maximum rate	Off load: 10 Hz At operating current: 0.1 Hz	
Mechanical life	10.000.000 (operations)	
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV	
Off-cycle response time	Make 10 ms Release 5 ms	
Built-in protections	Against short-circuits: None Against overvoltages and overloads: None	
Status indicator	On LCD screen for XD	
	-	

	24 V⎓	100 → 240 V∿
Digital / PWM solid state outputs		
PWM solid state outputs*	XD10-XB10: O4	-
* Only available with "FBD" programming language	-	
Breaking voltage	19.2 →30 V⎓	-
Nominal voltage	24 V⎓	-
Nominal current	0.5 A	-
Max. breaking current	0.625 A	-
Voltage drop	≤ 2 V for I = 0.5 A (at state 1)	-
Response time	Make ≤ 1 ms Release ≤ 1 ms	-
Frequency (Hz)	1 Maximum on inductive load	-
Built-in protections	Against overloads and short-circuits: Yes Against overvoltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a voltfree contact between the logic controller output and the load	-
Min. load	1 mA	-
Maximum incandescent load	0.1 A / 24 V⎓	-
Galvanic isolation	No	-
PWM frequency	14.11 Hz 56.45 Hz 112.90 Hz 225.80 Hz 451.59 Hz 1806.37 Hz	-
PWM cyclic ratio	0 →100 % (256 steps for XD)	-
PWM accuracy at 120 Hz	< 5 % (20 % →80 %) load at 10 mA	-
Max. Breaking current PWM	50 mA	-
Max. cable length PWM	20 m	-
PWM accuracy at 500 Hz	< 10 % (20 % →80 %) load at 10 mA	-
Status indicator	On LCD screen for XD	-

Schematics
Footprint
Version

XD10

XB10
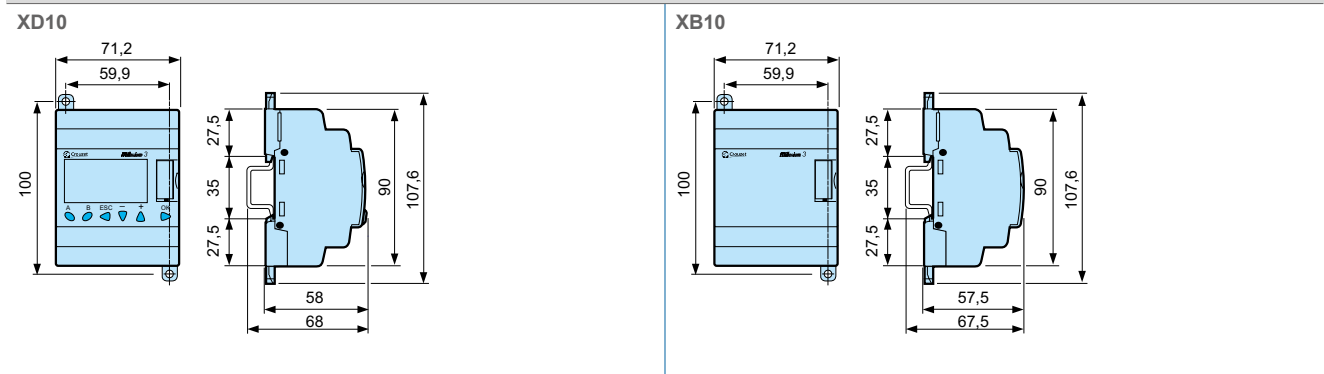
Input/output wiring

Inputs 24 V⎓

Extensions:
XN06, XN05, XE10, XR06, XR10, XR14
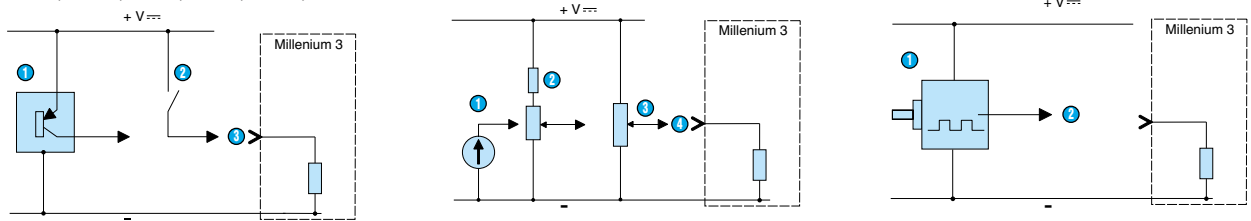
❶	3 wire PNP detector	0-10 V (input set to 0-10 V)	Encoder
❷	Contact	Potentiometer attachment (input set to 0-10 V)	Fast digital input
❸	Digital input	Potentiometer (input set to potentiometer)	-
❹	=	Analog input	-

Inputs 100-240 V∿

Extensions: XN06, XN05, XE10, XR06, XR10, XR14
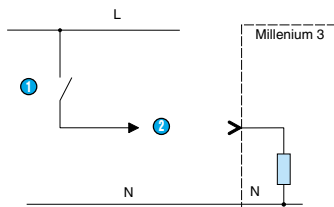
❶	Contact	-
❷	Digital input	-

Relay outputs

Extensions: XN06, XN05, XE10, XR06, XR10, XR14
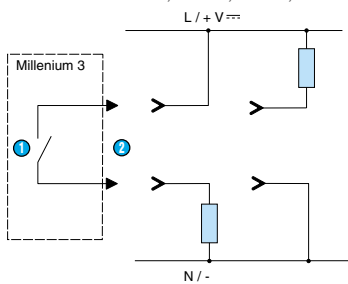
❶	Contact	-
❷	Digital input	-

Solid state outputs

Extensions: XA04
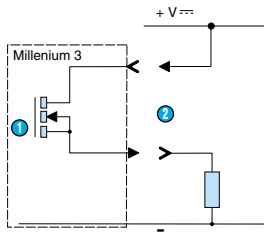
❶	MOS transistor	-
❷	Digital/PWM output	-

Input/output installations: Bases

Inputs

XD10, XB10

V~

XD10, XB10

V ⎓
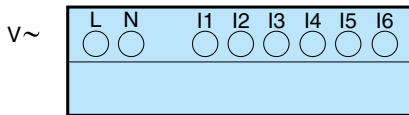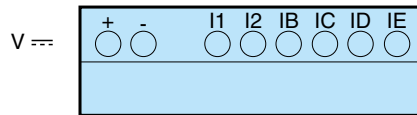
Relay outputs

XD10, XB10

Solid state outputs

XD10, XB10