Millenium II+

logic controller

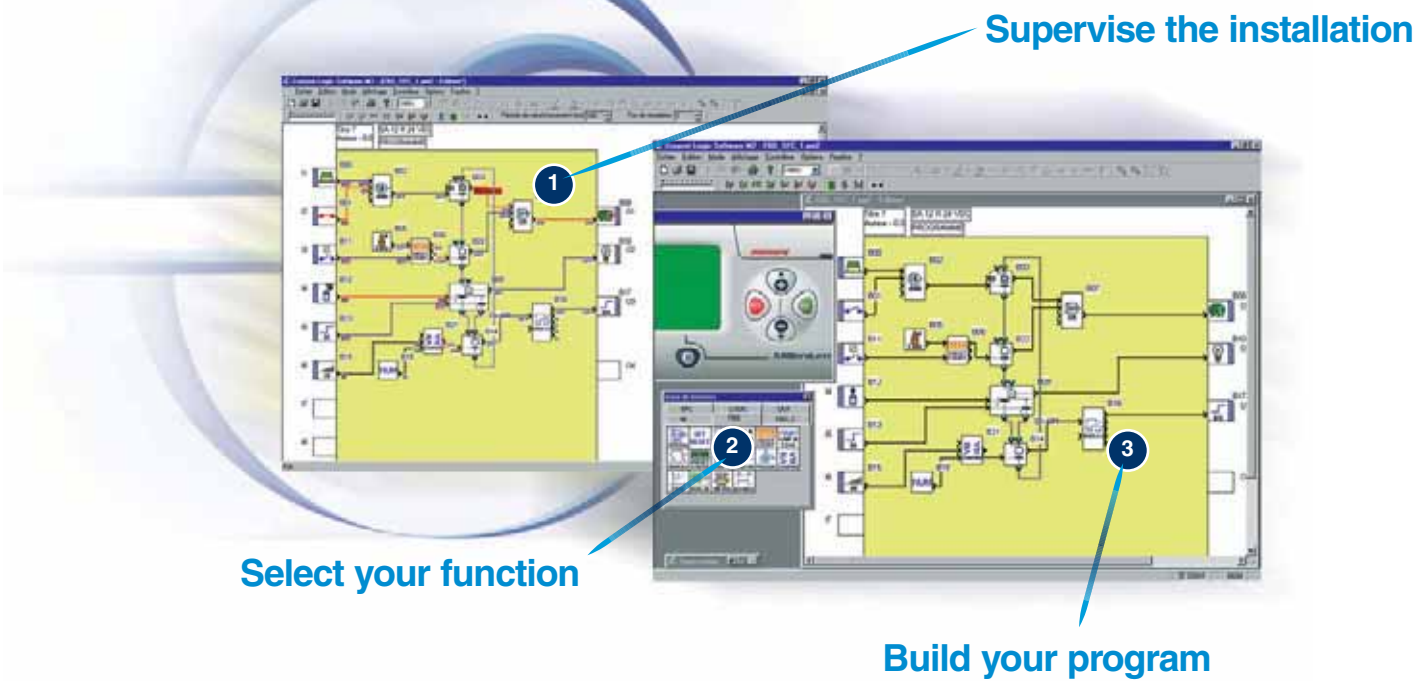
The most innovative software on the market

Preprogrammed functions

An adaptable and expandable configuration

Crouzet

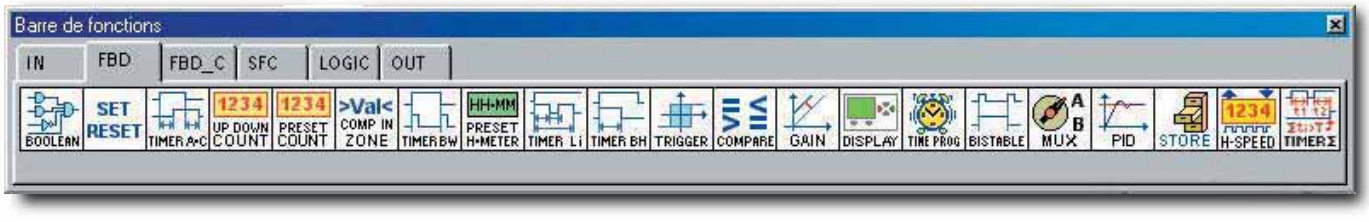
The **most innovative** software on the market



Function toolkit

FBD functions

21 **preprogrammed** functions are available for counting, timing, comparison, multiplexing, time-based programming and display, etc.



BOOLEAN
Used to create logic equations between connected inputs.

SET - RESET
Bistable memory - Priority assigned to either SET or RESET.

TIMER A/C
Timer - A/C function (Delay on/Delay off).

UP DOWN COUNT
Up/down counter.

PRESET COUNT
Preselection up/down counter.

COMP IN ZONE
Zone comparison (MIN ≤ VALUE ≤ MAX).

TIMER BW
Timer - BW function (pulse on a rising or falling edge).

PRESET H-METER
Hour Counter (preselection of hour, minute).

TIMER Li
Pulse generator (ON setting, OFF setting).

TIMER B/H
Timer. B/H function. (Adjustable pulsed signal).

TRIGGER
Defines an activation zone with Hysteresis.

COMPARE
Comparison of 2 analogue values using the =, >, <, ≥, ≤ operators.

GAIN
Used to convert an analogue value by changing the scale and offset.

DISPLAY
Display of digital and analogue data, date, time, messages for man-machine interface.

TIME PROG
Daily, weekly and yearly time programmer.

BISTABLE
Impulse relay function.

MUX
Multiplexing functions on 2 analogue values.

New

PID
Temperature controller.

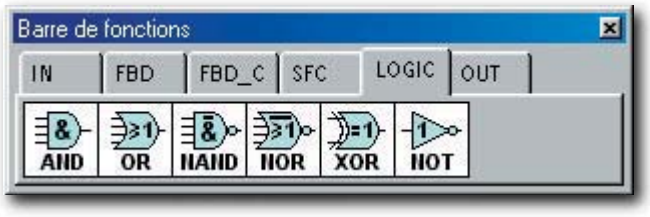
STORE
Storage of data values with an average value.

H-SPEED COUNT
High-speed counting 1 kHz for UP-DOWN, 500 Hz for PHASE TACHOMETER function as standard.

TIMER
4 sub-functions At, Ht, T which add up the total opening or closing time of a contact.
Tt: timed impulse relay.

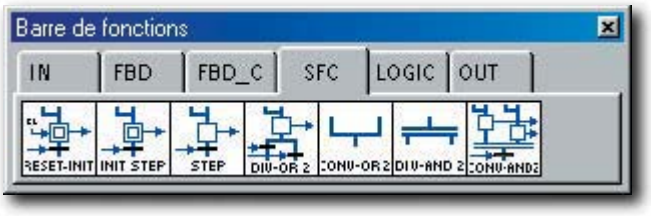
Logic functions

AND, OR, NAND, NOR, XOR, NOT functions.



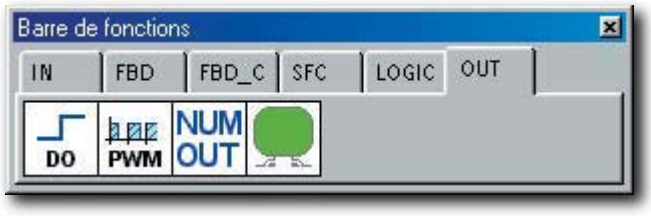
SFC functions (GRAFCET)

All the GRAFCET functions have been integrated with either **backup** or **reset** in the event of mains power failure (step, transition, divergence, convergence, etc).



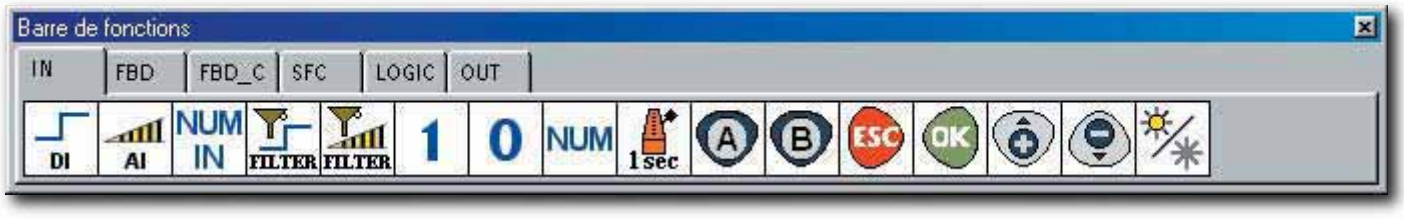
Outputs

You have two types of output:
physical (digital, solid state, PWM)
or **internal** (backlighting).



Inputs

You can connect **digital, analogue** or **potentiometer physical inputs**.
You also have **internal inputs** such as the keypad, constants, etc.

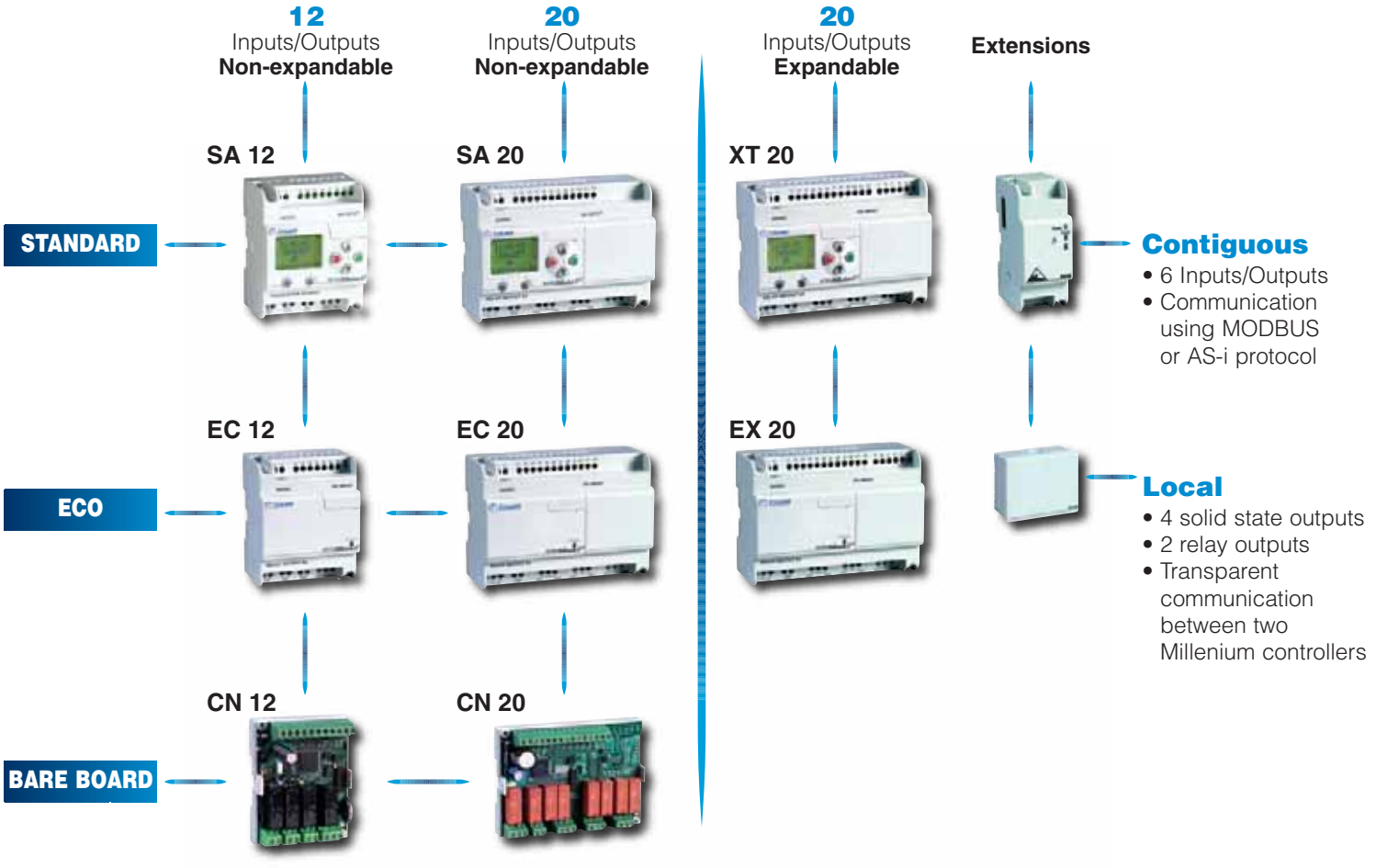


The **most complete** software offer on the market

Functions which meet the needs **of your applications.**

- **Calculation function** multiplication/division - addition/subtraction
- **Data archive function**
- **Cam timer function**
- **Clock function** with modifiable parameters
- **Pump rotation function**
- **Up/down counter** with calculation function

Your tailor-made **solution**



Example of configuration

The **logical complements** to Millenium II+

Converters

Analogue converter modules
0-20 mA inputs 0-10 V outputs
PWM input 0-10 V output
Conforming to EC/UI - CSA

Power supplies

Switch mode power supply modules
100 - 240 V AC/12 V DC 22 W - 1.9 A
100 - 240 V AC/24 V DC 31 W - 1.3 A
Conforming to EC/UI - CSA/TÜV/CTick

Temperature sensors

Ventilation duct
Controls the temperature in ventilation or heating ducts.

External
Used to anticipate thermal inertia phenomena during variations in the external temperature (energy saving)
Eg: underfloor heating, air conditioning, etc.

Atmosphere
Control of several domestic heating zones or of service rooms (council buildings, hospitals, hotels, etc)

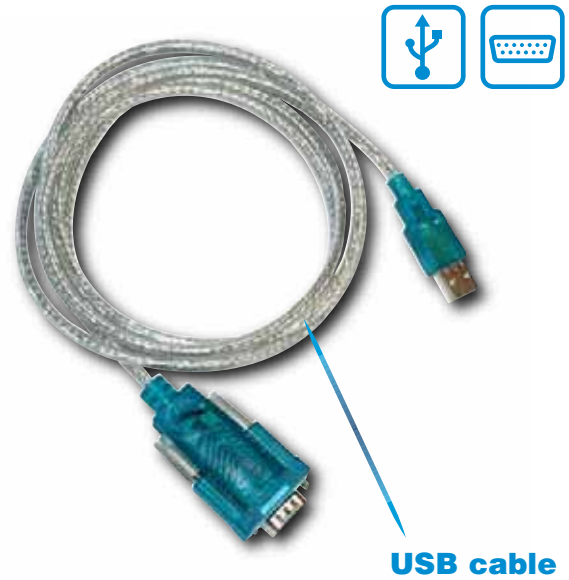
Remote/ submersible probe
Adapted for controlling the temperature of fluids in ovens, swimming pools, tanks, etc. with a stainless steel or copper protective sleeve.

Sealing

Sealed rigid front cover

Three IP67 front covers can be used to panel mount the M2+ range, from 4 modules to 13 modules of 17.5 mm.

Programming



USB cable

Link interface
PC (USB V1.1 output) - RS232

Communication

STN modem

Communication between PC and M2+ module via telephone line.

GSM modem

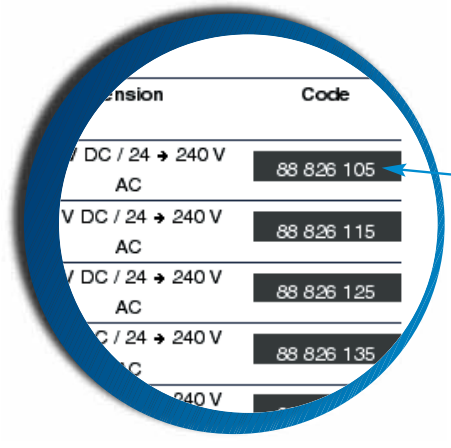
Communication between PC and M2+ module via GSM network.
Send SMS messages.
Change the state of outputs from a mobile phone.
Interrogate the state of inputs from a mobile phone.

To **order**

Special products, adaptations, additional information

Let's work together to find a **customised** solution

www.crouzet.com

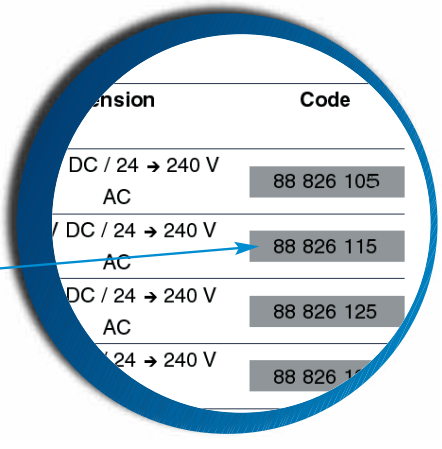


Standard products

Give the reference in white.

Standard products, not in stock

Give the reference in black and the additional characteristics



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Millenium II +: general characteristics

- ➜ Starter kit
- ➜ Special starter kits
- ➜ Level detection
- ➜ Standard
- ➜ Expandable
- ➜ Blind
- ➜ Bare board
- ➜ Local extensions
- ➜ Adjacent extensions
- ➜ Communication modules
- ➜ Temperature sensors
- ➜ Power supply
- ➜ Accessories

Insulation	7 MΩ
Safety class	0 industrial / II domestic casing
Earthing	None
Protection	IP20 / Terminal block IP40 IP00 for CN12 and CN20
Certifications	CE, UL, cUL
Conformity to standards	EN 60947-1 EN 60730-1 EN 60601-1
Programming method	Function blocks/SFC
Program size	128 blocks
Program memory	Flash EEPROM
Removable memory	EEPROM
Data memory	256 bits / 64 words backed up for 10 years
LCD display	Display with 4 lines of 12 characters
Real-time clock	Drift < 1 min/month at 25 °C with user-definable correction of drift Data retention : 10 years (lithium battery)
Storage temperature (°C)	-40 → +70
Operating temperature (° C)	-5 → +55
Relative humidity (no condensation)	90 → 95 %
Dimensions (l x h x w)	SA12-EC12 : 72 x 90 x 60 mm SA20-XT20 : 125 x 90 x 60 mm EC20-EX20 CN12 : 72 x 90 x 42 mm CN20 : 125 x 90 x 42 mm
Electrical characteristics Power supply 100 - 240 V AC	
Operating voltage	100 V AC → 240 V AC +10 % -15 % 50/60 Hz
Operating limits	85 V AC → 264 V AC
Immunity from micro power cuts	10 ms
Maximum inrush current	5 A
Max. absorbed power	SA12-EC12-CN12 : 6 VA SA20-EC20-CN20 : 6.5 VA XT20-EX20 : 8 VA
Power supply 24 V AC	
Operating voltage	24 V AC +10 % -15 % 50/60 Hz
Operating limits	20.4 V AC → 28.8 V AC
Immunity from micro power cuts	10 ms
Maximum inrush current	2.5 A
Max. absorbed power	SA12-EC12-CN12 : 6 VA SA20-EC20-CN20 : 6.5 VA XT20-EX20 : 8 VA
Power supply 24 V DC	
Operating voltage	24 V DC +20 % -15 %
Operating limits	20.4 V DC → 28.8 V DC
Immunity from micro power cuts	1 ms
Maximum inrush current	6 A
Max. absorbed power	SA12-EC12-CN12 : 3.5 W SA20-EC20-CN20 : 4 W XT20-EX20 : 5 W

Power supply 12 V DC	
Operating voltage	12 V DC +30% -15% +30% -11% for XT20 relay 88 950 065
Operating limits	10.2 V DC → 15.6 V DC 10.68 VDC → 15.6 V DC for XT 20 relay 88 950 065
Immunity from micro power cuts	1 ms
Maximum Inrush current	6 A
Max. absorbed power	SA12-EC12-CN12 : 2.2 W SA20-EC20-CN20 : 4.5 W XT20-EX20 : 5.5 W
100 - 240 V AC input	
Input voltage (V AC)	100 - 240 (+10 % / -15 %)
Supply frequency range (Hz)	50/60 Hz
Input impedance (kΩ)	700
Pull-in voltage at logic state 1 (V AC)	≥ 80
Drop-out voltage at logic state 0 (V AC)	≤ 40
Response time	50
Status indicator	On LCD screen for SA12, SA20 and XT20
24 V AC input	
Input voltage (V AC)	24 (+10 % / -15 %)
Supply frequency range	50/60 Hz
Input impedance (kΩ)	4
Pull-in voltage at logic state 1 (V AC)	≥ 15
Drop-out voltage at logic state 0 (V AC)	≤ 5
Response time	50 ms
Status indicator	On LCD screen for SA12, SA20 and XT20
Analogue input (24 V DC model only)	
CN12-SA12-EC12	4 inputs from I5 to I8
CN20-SA20-EC20-XT20	8 inputs from I5 to I12
Measurement range	(0 → 10 V) or (0→ V power supply)
Resolution	8 bits
Conversion time	10 ms
Max input voltage	28.8 V DC
Input impedance (kΩ)	> 22
Accuracy	+/- 5 %
Drift Temperature	+/- 3 LSB
Potentiometer control	2.2 kΩ / 0.5 W
24 V DC input	
Current drain	24 (+20 % -15 %) V DC
Input current	3.2 mA / 5.5 mA max.
Input impedance	6.8 kΩ
Pull-in voltage at logic state 1	≥ 15 V DC
Drop-out voltage at logic state 0	≤ 5 V DC
Response time	10 ms
Galvanic isolation	No
Sensor type	Contact or 3-wire PNP or 3-wire NPN
Status indicator	On LCD screen for SA12, SA20 and XT20

12 V DC input	
Input voltage	12 (+30 % -15 %) V DC (except XT20R +30 % -11 %)
Input current	1.9 mA / 2.3 mA max.
Input impedance	6.45 kΩ
Pull-in voltage at logic state 1	≥ 8 V DC
Drop-out voltage at logic state 0	≤ 3 V DC
Response time	10 ms
Sensor type	Contact or PNP or 3-wire NPN
Galvanic isolation	No
Status indicator	On LCD screen for SA12, SA20 and XT20
Analogue input (12 V DC model only)	
CN12 - SA12 - EC12	4 inputs I5 to I8
CN20-SA20-EC20-XT20	8 inputs I5 to I8
Measurement range	0 → 10 V
Resolution	8 bits
Conversion time (ms)	10
Max input voltage	15.6 V DC
Input impedance (kΩ)	> 10 (14 typically)
Precision	± 5 %
Temp. dependent derating	± 3 LSB
Potentiometer control	2.2 kΩ / 0.5 W
Relay output	
Max. breaking voltage	250 V AC / 30 V DC
Breaking current	8 A
Service life	8 A / 250 V AC resistive (100 000 operations)
Minimum load	10 mA to 5 V DC
Response time	10 ms
Status indicator	On LCD screen for SA12, SA20 and XT20
TOR / PWM solid state output	
PWM solid state output	SA12-EC12-CN12 : O1 to O4 SA20-XT20-EC20-CN20 : O1 to O6
Breaking current	5-28.8 V DC
Breaking voltage	0.7 A / 5-28.8 V DC
Min. load	1 mA
Maximum inductive load	0.7 A
Maximum incandescent load	0.1 A
Leakage	0.1 mA / 24 V DC
Response time	1 ms
Insulation	No
PWM frequency	120 Hz to 1920 Hz (user-definable)
PWM cyclic ratio	0 to 100 % (256 steps)
PWM precision at 120 Hz	< 5 % (from 15 % to 85 %) load at 10 mA
PWM precision at 500 Hz	< 10 % (from 20 % to 80 %) load at 10 mA
Status indicator	On LCD screen for SA12, SA20 and XT20

➜ Starter kit

- **Discover the benefits of Millenium II+**
- **Each kit includes :**
  - a standard or expandable Millenium II+
  - a PC/Millenium progrmming cable
  - an interactive CD-Rom including the software workshop, tutorial, application library and technical brochures.

Specifications

Type	Input	Output	Supply	Code
KIT SA 12	8	4 relays	24 VDC	88 950 070
	8	4 relays	100 - 240 V AC	88 950 071
Kit SA 20	12	8 relays	24 V DC	88 950 072
	12	8 relays	100 - 240 VAC	88 950 073
Kit XT 20	12	8 relays	24 V DC	88 950 074
	12	8 relays	100 - 240 V AC	88 950 075

➜ Special starter kits

- **Special Millenium II kits with all the extras needed for your application**
- **Each kit includes :**
  - a standard or expandable Millenium II+
  - a PC/Millenium programming cable
  - an interactive CD-ROM including the software workshop, tutorial, application library and technical brochures.

Specifications

Type	Designation	Supply	Code
Level control KIT	Level control	24 V AC	88 950 076
Temperature control KIT	Heating, cooling and air conditioning	24 V DC	88 950 077

➜ Standard

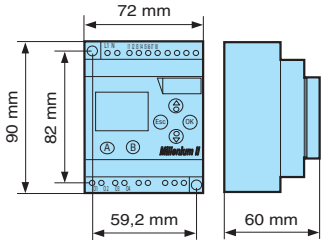
- Intuitive programming via function block (FBD) or grafcet (SFC)
- Function : timing, counting, etc
- Application-specific functions : rotation, cam timers, calculation, etc
- Discrete, analogue or potentiometer inputs
- Relay, solid state or PWM outputs
- Backlit LCD display
- Program password protection
- Integral calender and clock
- User-definable from the front panel
- Non-expandable

Specifications

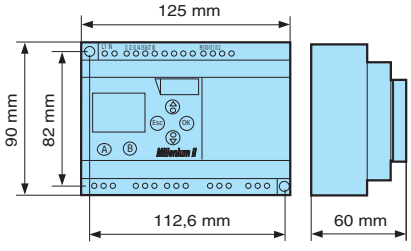
Type	Input	Output	Supply	Code
SA 12	8 PNP	4 relays	24 VDC	88 950 041
	8	4 relays	100 - 240 VAC	88 950 043
	8	4 relays	24 VAC	88 950 044
	8 PNP	4 solid state	24 VDC	88 950 042
	8 PNP	4 relays	12 V DC	88 950 045
	8 PNP	4 solid state	12 V DC	88 950 046
	8 NPN	4 relays	24 VDC	88 950 049
SA 20	12 PNP	8 relays	24 VDC	88 950 051
	12	8 relays	100 - 240 VAC	88 950 053
	12	8 relays	24 VAC	88 950 054
	12 PNP	8 solid state	24 VDC	88 950 052
	12 PNP	8 relays	12 V DC	88 950 055
	12 PNP	8 solid state	12 V DC	88 950 056
	12 NPN	8 relays	24 VDC	88 950 059

Dimensions

SA 12



SA 20



General characteristics

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➜ Level detection

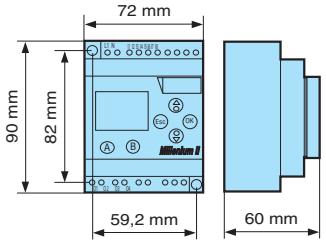
- Intuitive programming via function block (FBD) or grafcet (SFC)
- Function : timing, counting, etc
- Application-specific functions : rotation, cam timers, calculation, etc
- Discrete, analogue or potentiometer inputs
- Relay, solid state or PWM outputs
- Backlit LCD display
- Program password protection
- Integral calender and clock
- User-definable from the front panel
- Non-expandable

Specifications

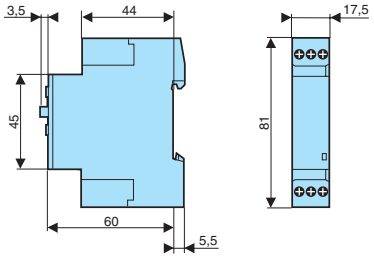
Type	Input	Output	Supply	Code
SA 12 + level sensor adaptor	8	4 relays	24 V AC	88 950 813

Dimensions

SA 12



Level sensor adaptor



➜ Expandable

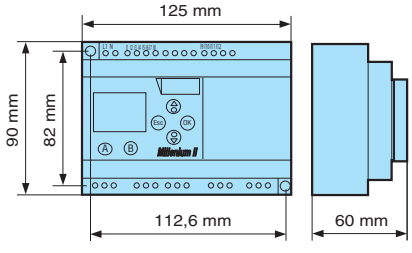
- Expandable : communication, inputs/outputs, etc
- Intuitive programming via function block (FBD) or grafcet (SFC)
- Function : timing, counting, etc
- Application-specific functions : rotation, cam timers, calculation, etc
- Discrete, analogue or potentiometer inputs
- Relay, solid state or PWM outputs
- Backlit LCD display
- Program password protection
- Integral calender and clock
- User-definable from the front panel
- Can take an XC adjacent extension and an XL local extension

Specifications

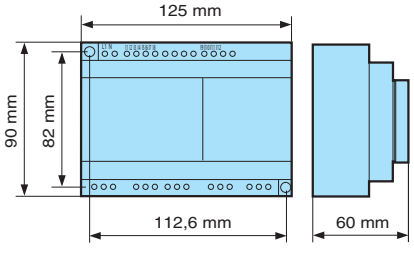
Type	Input	Output	Supply	Code
XT 20	12 PNP	8 relays	24 VDC	88 950 061
	12 PNP	8 relays	100 - 240 VAC	88 950 063
	12 PNP	8 relays	24 VAC	88 950 064
	12 PNP	8 solid state	24 VDC	88 950 062
	12 PNP	8 relays	12 V DC	88 950 065
	12 PNP	8 solid state	12 V DC	88 950 066
	12 NPN	8 relays	24 VDC	88 950 069
EX 20	12 PNP	8 relays	24 V DC	88 950 831
	12	8 relays	100 - 240 V AC	88 950 833
	12	8 relays	24 V AC	88 950 834
	12 PNP	8 solid state	24 V DC	88 950 832
	12 NPN	8 relays	24 V DC	88 950 839

Dimensions

XT 20



EX 20



General characteristics

see page 25

➜ Blind

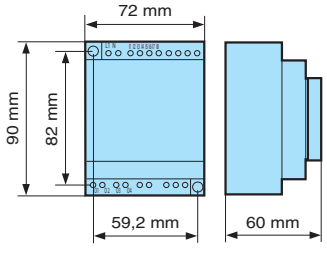
- No display or parameter-setting buttons
- Intuitive programming via function block (FBD) or grafcet (SFC)
- Function : timing, counting, etc
- Application-specific functions : rotation, cam timers, calculation, etc
- Discrete, analogue or potentiometer inputs
- Relay, solid state or PWM outputs
- Program protected by a password
- Integral calendar and clock

Specifications

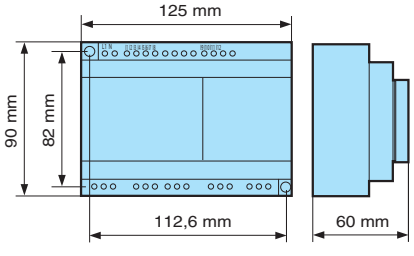
Type	Input	Output	Supply	Code
EC12	8 PNP	4 relays	24 VDC	88 950 021
	8	4 relays	100 - 240 VAC	88 950 023
	8	4 relays	24 VAC	88 950 024
	8 PNP	4 solid state	24 VDC	88 950 022
	8 PNP	4 relays	12 V DC	88 950 025
	8 PNP	4 solid state	12 V DC	88 950 026
	8 NPN	4 relays	24 VDC	88 950 029
EC 20	12 PNP	8 relays	24 VDC	88 950 031
	12	8 relays	100 - 240 VAC	88 950 033
	12	8 relays	24 VAC	88 950 034
	12 PNP	8 solid state	24 VDC	88 950 032
	12 PNP	8 relays	12 V DC	88 950 035
	12 PNP	8 solid state	12 V DC	88 950 036
	12 NPN	8 relays	24 VDC	88 950 039

Dimensions

EC 12



EC 20

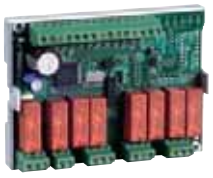


General characteristics

see page 25

➜ Bare board

- For mass-production applications
- Intuitive programming via function block (FBD) or grafcet (SFC)
- Function : timing, counting, etc
- Application-specific functions : rotation, cam timers, calculation, etc
- Discrete, analogue or potentiometer inputs
- Relay, solid state or PWM outputs
- Program protected by password
- Integral calendar and clock

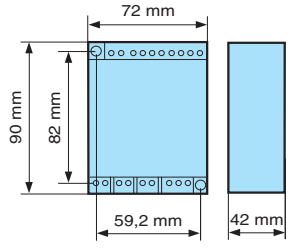


Specifications

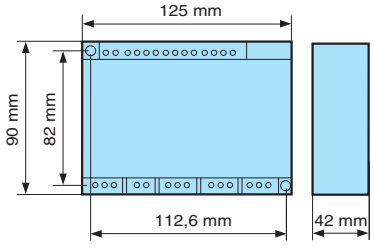
Type	Input	Output	Supply	Code
CN 12	8 PNP	4 relays	24 V DC	**88 950 001**
	8	4 relays	100 - 240 V AC	**88 950 003**
	8	4 relays	24 V AC	**88 950 004**
	8 PNP	4 solid state	24 V DC	**88 950 002**
	8 PNP	4 relays	12 V DC	**88 950 005**
	8 PNP	4 solid state	12 V DC	**88 950 006**
	8 NPN	4 relays	24 V DC	**88 950 009**
CN 20	12 PNP	8 relays	24 V DC	**88 950 011**
	12	8 relays	100 - 240 V AC	**88 950 013**
	12	8 relays	24 V AC	**88 950 014**
	12 PNP	8 solid state	24 V DC	**88 950 012**
	12 PNP	8 relays	12 V DC	**88 950 015**
	12 PNP	8 solid state	12 V DC	**88 950 016**
	12 NPN	8 relays	24 V DC	**88 950 019**

Dimensions

CN 12



CN 20



General characteristics

see page 25

➜ Local extensions

- For XT 20 only (1 local extension per module)
- Millenium - Millenium local link
- Doubles the hardware and software capacities
- Transparent communication between two XT 20 units
- Max. distance between two XT 20 units : 10 metres
- Cable type : screened twisted pair

Specifications

Type	Designation	Supply	Code
XL 01	M2 - M2 local link (2 modules)	universal	88 950 200
XL 05	4 solid state outputs	universal	88 950 204
XL 06	2 Relay outputs (250mA Maximum)	100 → 240 V AC	88 950 810

➜ Adjacent extensions

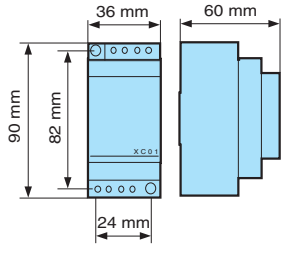
- For XT 20 only (one adjacent extension per module)
- 4 or 6 additional inputs/outputs

Specifications

Type	Designation	Supply	Code
XC 01	4 inputs PNP 2 relay outputs	24 V DC	88 950 210
	4 inputs relay outputs	24 V AC	88 950 211
	4 inputs 2 relay outputs	100 - 240 V AC	88 950 212
	4 inputs 2 relay outputs	12 V DC	88 950 215
	4 inputs NPN 2 relay outputs	24 V DC	88 950 219

Dimensions

XC 01



➜ Communication modules

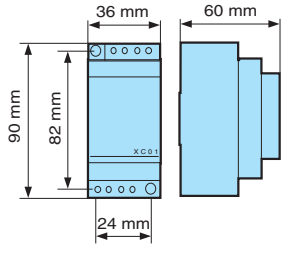
- For XT 20 only (one adjacent extension per module)
- Communication using MODBUS or AS-i protocol (Slave module)

Specifications

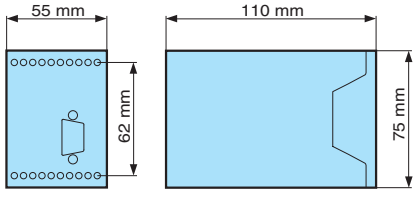
Type	Designation	Supply	Code
XC 02	AS-i communication module 24 V DC	24 V DC	88 950 213
XC 03	MODBUS communication module 24 V DC	24 V DC	88 950 214
Modems	STN		88 950 106
	GSM		88 950 107

Dimensions

XC02/XC03



Modem



➜ Temperature sensors

- **Built-in converter : 0-10 V DC output**
- **Applications : Industrial and domestic**



Specifications

Type	Range	Accuracy	Protection casing	Protection probe	Code
Zone	-10 → +40 °C	-0.2 °C +1.2 °C	IP30		89 750 150
Ventilation duct	-10 → +40 °C	-0.2 °C +1.9 °C	IP65	IP30	89 750 151
Outdoor	-10 → +40 °C	-0.2 °C +1.2 °C	IP65		89 750 152
Remote/submersible probe	-10 → +150 °C	-0.2 °C +1.2 °C	IP65	IP67	89 750 153
Outdoor	-40 → +20 °C	-0.2°C +1.9°C	IP65	IP67	89 750 155

Accessories

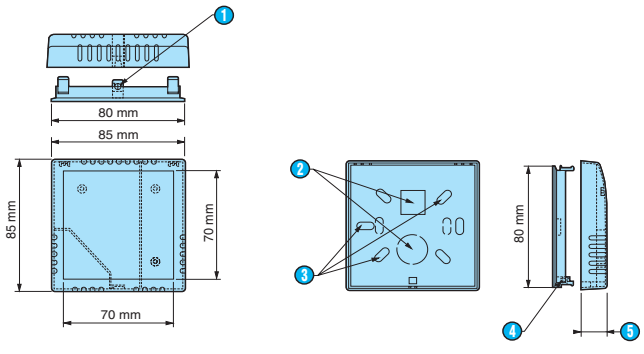
Type	Operating temperature (°C)	Operating pressure (bar)	Code
Copper protective sleeve for 89 750 153	-20 → +100	10	89 750 146
Stainless steel (316) protective sleeve for 89 750 153	-20 → +400	16	89 750 147
Heat transfer compound	-	-	18 372 112

General characteristics

Supply voltage	24 V DC (±10 %)
Output	0 → 10 V DC
Temperature coefficients Derating	0.01 % / °C of full scale
Temperature coefficients Offset	1.5 mV / °C
Ambient temperature (°C)	-10 → +60
Ambient humidity	5 → 95 % RH
Material housing	Self-extinguishing

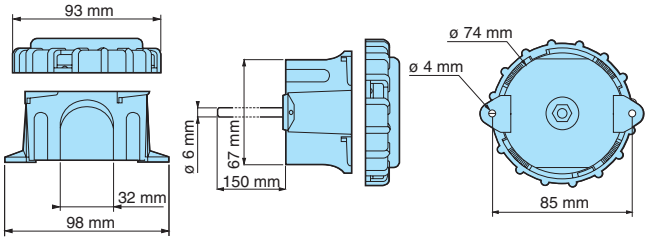
Dimensions

89 750 150

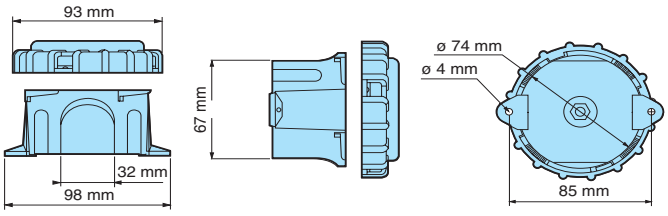


1. Ø3 mm for screw M3 x 8
2. Cut-outs
3. Fixing holes
4. Bolt hole M3
5. Maximum thickness 26 mm

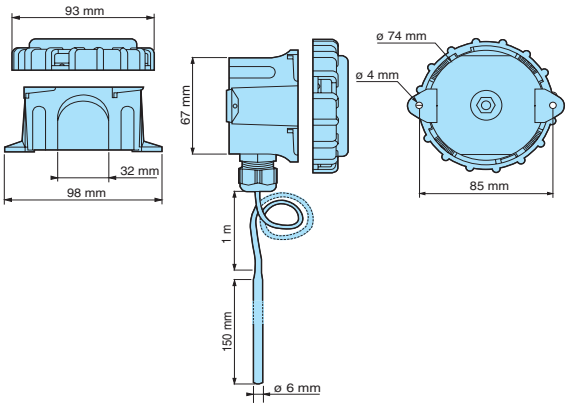
89 750 151



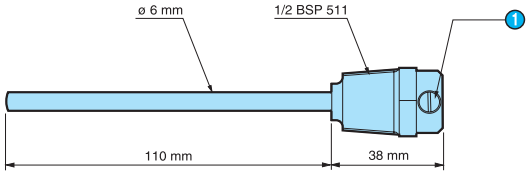
89 750 152



89 750 153 and 89 750 155



Accessories for 89 750 153 and 89 750 155



1 Screw M4

➜ Modular power supply

- The output voltage can be adjusted from 100 to 120 % with a potentiometer in order to compensate for possible voltage drops.
- Output voltage existance is indicated by a continuously lit LED. A flashing LED indicates an autoprotection mode.
- Regulated, power surge and short circuit safe, the new switching power supplies easily fit into control panels.

Specifications

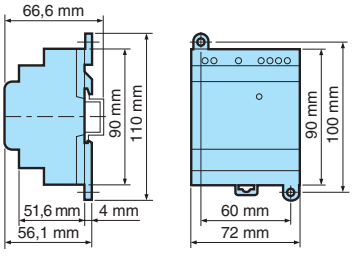
Type	Voltage	Nominal power	Code
PS	12 V DC	22 W	88 950 300
	24 V DC	30 W	88 950 301

General characteristics

Input voltage	100 → 240 V AC single phase
Output voltage	88 950 300 : 12 V DC 88 950 301 : 24 V DC ajustable de 100 à 120 %
Nominal power	88 950 300 : 22W 88 950 301 : 30W
Technology	Electronic with primary decoupling
Short-circuit protection	•
Overload protection	•
Reset after overload	automatic
Status indication	Output LED
Mounting	DIN rail EN 50022
Conformity to standards	EN 50081-1 EN 50082-1 CEI 61000-8-2 CEI 950
Certifications	CE, UL-CSA, TüV, CTick

Dimensions

PS



Accessories

➜ Front panel adaptors

Specifications

Type	Designation	Code
Front panel adaptor	Front panel adaptor for EC12-SA12	89 750 103
	Front panel adaptor for EC20-SA20-XT20-EX20	89 750 109
Waterproof panel	Waterproof panel adaptor for SA12-EC12	89 750 160
	Waterproof panel adaptor for SA20-XT20-EC20-EX20	89 750 161
	Waterproof panel adaptor for SA20-XT20-EC20-EX20 + 1 extension	89 750 162

➜ Interconnection cables

Specifications

Type	Designation	Code
Programming cables	Programming cable 9-pin D connector	88 950 102
	Programming cable USB	88 950 105
Modem cable		88 950 111

➜ Programming tools

Specifications

Type	Designation	Code
Software	Programming software on CD ROM	88 950 100
	Modem installation software	88 950 113
Module	EEPROM memory module	88 950 101

➜ Convertors

Specifications

Type	Designation	Input	Output	Code
Convertor 0-20 mA / 0-10 V	Input module 0-20 mA / 0-10 V	4	4	88 950 108
Convertor PWM / 0-10V	Output module PWM 0-10V	1	1	88 950 112

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