Multitechnology Know-how

Millenium II

logic controller

- The most complete software offer on the market
- Pre-programmed application-specific functions
- An open, adaptable configuration

More than a standard

Crouzet

Millenium II the logic controller that's flexible and adaptable to your applications

Millenium 2 offers a number of solutions for your applications. It's simpler than ever to incorporate automation control functions such as timing, counting, monitoring, temperature control, sequencing, etc.

Your pre-programmed functions

Millenium 2 incorporates the most extensive function library on the market, which now includes application-specific functions (calculation, pump rotation, Cam timer, etc). Moreover, Crouzet will offer to design the function which is perfect for your application.

Your open, adaptable configuration

Millenium 2 consists of a complete range with versions which are:

- user-definable from the front panel
- low-cost (no displays and parameter-setting buttons)
- bare boards for mass-production applications
- numerous extensions (I/O, communication, etc)

Your flexibility for programming

Millenium 2 is the only logic controller to combine flexible programming using function blocks with the added benefit of sequential flow chart blocks. Its user-oriented design simplifies the process of designing your programs.

Millenium II

Positive advantages for your applications!

Machines

With Millenium 2, small machines benefit from adaptability and simplicity of installation. Exploit its communication capacities and add more functions to your devices with the greatest of ease.

Building management

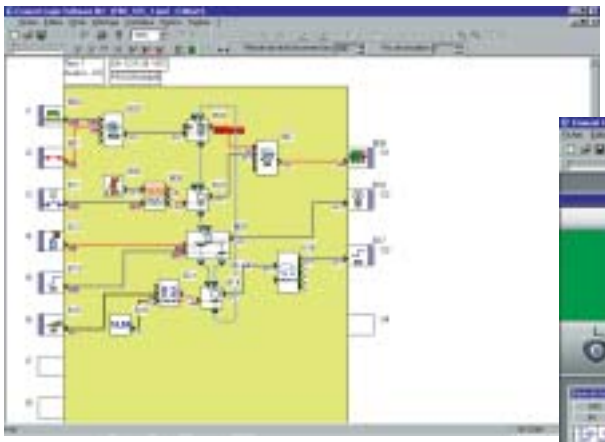
With its pre-programmed function blocks, analogue inputs, and powerful calendar clock, Millenium 2 makes it easy to monitor your installations: heating, air conditioning, pumping, lighting, and access control (gates, management of safety devices, etc).

Temperature control

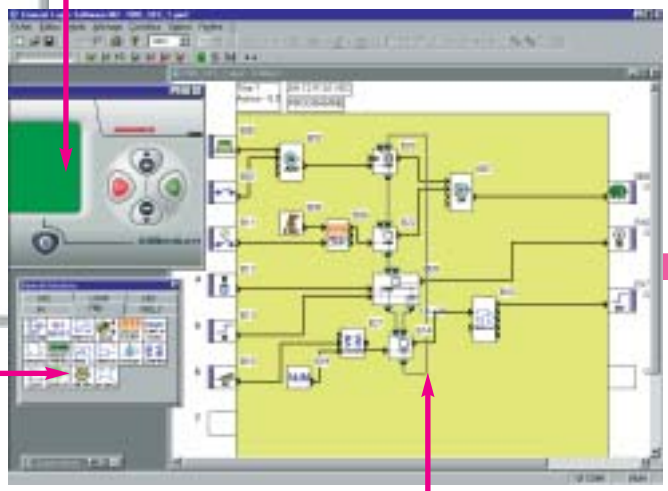
Software functions are included which simplify the design of your heating cycles.
In addition, as your systems evolve, there will be a version of Millenium 2 to suit.

Millenium II

The most complete software offer on the market



Supervise the installation



Select your function

Construct your program

The 6+ points of Millenium 2

The user-oriented design of Millenium 2 simplifies program creation by combining speed, performance and safety:

- pre-programmed functions
- application-specific functions
- proprietary functions
- FBD (Function Block Diagram) functions
- GRAFCET SFC (Sequential Function Chart) functions

A genuine CLS (Crouzet Logic Software) software workshop for PC:

- programming,
- simulation,
- monitoring and supervision,
- program uploading/downloading,
- customized documentation,
- automatic program compilation,
- online help.

- **Large processing capacity: 128 function blocks.**
- **Battery backup of data in the event of a power failure: 10 years.**
- **Password protection.**
- **Automation control parameters set using buttons on the front panel.**

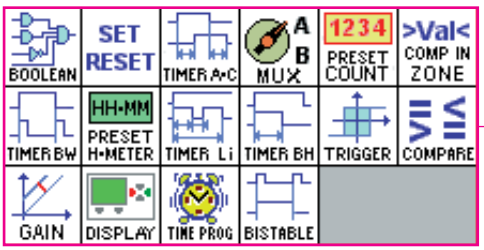
Interactive CD-Rom

- CLS software workshop

+ tutorial
+ application library
+ promotional sales brochure
+ technical sales brochures

Function toolbar

▶ FBD functions



16 pre-programmed functions are available for counting, timing, comparison, multiplexing, timer programming and display.

▶ SFC (GRAFCET) functions

All sequential flow chart functions are incorporated, with backup or reinitialization in the event of a power failure (step, transition, divergence, convergence, etc).

▶ Logic functions

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

▶ Inputs

You can connect physical inputs, whether discrete, analogue or potentiometer. There are also internal inputs such as the keypad, constants, etc.

▶ Outputs

You have two types of output:
- physical: discrete, solid state or PWM (Pulse Width Modulation),
- internal: display backlighting.

BOOLEAN
Used to create logic equations between connected inputs.

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

TIMER A/C
Timer - Function A/C
(On-delay and off-delay).

MUX
Multiplexing functions on 2 analogue values.

PRESET COUNT
Up/down counter.

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

TIMER BW
Timer - Function BW
(impulse on a rising or falling edge).

PRESET H-METER
Hour counter
(presetting of hour, minute).

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

TIMER B/H
Timer. Function BH.
(adjustable impulse signal).

TRIGGER
Defines an activation zone with Hysteresis.

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

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

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

TIME PROG
Hourly, weekly and annual programmer.

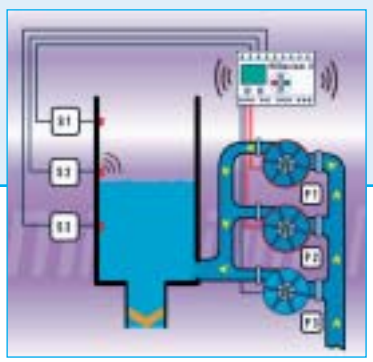
BISTABLE
Impulse relay function.

Your applications already pre-programmed with our application-specific functions!

CROUZET offers you a library of application-specific functions which can be added to according to your requirements:

- Calculation function
  Multiplication/Division
  Addition/Subtraction
- Data archiving function
- Cam timer function
- Clock function
  with modifiable parameters
- Pump rotation function
- Up/down counter with calculation function

Example of application-specific function:
Rotation of 3 pumps
The pump rotation function is used to manage the water level in a tank by means of 3 sensors and 3 pumps.



An open, adaptable configuration

Power supply:
24 VDC/VAC
100-240 VAC

Inputs:
Discrete
3-wire PNP IPD
Analogue 0-10 V
Full-scale potentiometer input

Interface:
PC programming
Program memory cartridge
Modem link

Backlit LCD display:
Status indicator
User messages
Values

Adjacent extension:
AS-I or MODBUS communication
Additional inputs and outputs

Modular case:
DIN rail, screw or front panel fixing

Local extension:
Additional solid state outputs
Communication between two Millenium XT20

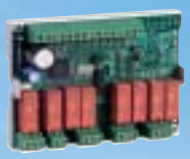
Outputs:
Discrete including one changeover or solid state
PWM (Pulse Width Modulation)

Parameters set via an ergonomic keypad

Millenium II

Improved design to suit your applications

Versions and extensions for you to construct your own solution

	12 Inputs/Outputs	20 Inputs/Outputs
Type XT Expandable version with display and parameter-setting buttons		
Type SA Standard version with display and parameter-setting buttons		
Type EC Blind version without display or parameter-setting buttons		
Type CN Bare board version for mass-production applications		

Extensions

Adjacent

- **6 Inputs/Outputs**
- **Communication using MODBUS or AS-i protocol**

Local

- **4 solid state outputs**
- **Transparent communication between two XT20**

Example of configuration:

Millenium II

Technical characteristics

Insulation	7 MΩ
Safety class	0 industrial / II domestic casing
Earthing	None
Protection	IP20/Terminal block IP40 IP00 for CN12 and CN 20
Certification	CE, UL, cUL
Compliance	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	-40 -> +70 °C
Operating temperature	-5 -> +55 °C
Relative humidity (without condensation)	90 -> 95 %
Dimensions (w x h x d)	SA12-EC12: 72 x 90 x 60 mm SA20-XT-EC20: 125 x 90 x 60 mm CN12: 72 x 90 x 42 mm CN20: 125 x 90 x 42 mm

Technical characteristics

100 ... 240 VAC power supply

Operating voltage	100 VAC -> 240 VAC (+10 % - 15 %) 50/60 Hz
Operating limits	85 VAC -> 264 VAC
Immunity from micro power cuts	10 ms
Maximum inrush current	7 A
Maximum power consumption	SA12-EC12-CN12: 6 VA SA20-EC20-CN20: 6,5 VA XT20: 8 VA

24 VAC power supply

Operating voltage	24 VAC +20 % - 15 % 50/60 Hz
Operating limits	20,4 VAC -> 28,8 VAC
Immunity from micro power cuts	10 ms
Maximum inrush current	7 A
Maximum power consumption	SA12-EC12-CN12: 6 VA SA20-EC20-CN20: 6,5 VA XT20: 8 VA

24 VDC power supply

Operating voltage	24 VDC +20 % - 15 %
Operating limits	20,4 VDC -> 28,8 VDC
Immunity from micro power cuts	1 ms
Maximum inrush current	7 A
Maximum power consumption	SA12-EC12-CN12: 3,5 W SA20-EC20-CN20: 4 W XT20: 5 W

Analogue inputs (24 VDC model only)

CN12-SA12-EC12	4 inputs from I5 to I8
CN20-SA20-EC20-XT20	8 inputs from I5 to I12
Measuring range	(0 -> 10 V) or (0 -> Power supply V)
Resolution	8 bits
Conversion time	10 ms
Max. input voltage	28,8 VDC
Input impedance (kΩ)	> 10
Precision	+/- 5 %
Temperature drift	+/- 3 LSB
Potentiometer control	2,2 KΩ / 0,5 W

100 - 240 VAC input

Input voltage	100 - 240 (+10 % / -15 %) VAC
Operating frequency	50/60 Hz
Input impedance	700 kΩ
Pull-in voltage at logic state 1	≥ 80 VAC
Drop-out voltage at logic state 0	≤ 40 VAC
Status indicator	On LCD screen for SA12, SA20, XT20

24 VAC input

Input voltage	24 (+10 % / -15 %) VAC
Operating frequency	50/60 Hz
Input impedance	4 kΩ
Pull-in voltage at logic state 1	≥ 15 VAC
Drop-out voltage at logic state 0	≤ 5 VAC
Status indicator	On LCD screen for SA12, SA20, XT20

24 VDC input

Input voltage	24 (+20 % -15 %) VDC
Input current	3,2 mA/5,5 mA max
Pull-in voltage at logic state 1	≥15 VDC
Drop-out voltage at logic state 0	≤ 5 VDC
Response time	10 ms
Sensor type	Contact - 3-wire PNP
Status indicator	On LCD screen for SA12, SA20, XT20

Relay outputs

Max. voltage breaking capacity	250 VAC
Max. current breaking capacity	8 A
Service life	8 A / 250 VAC resistive (100 000 operations)
Min. load	10 mA / 5 VDC
Response time	10 ms
Status indicator	On LCD screen for SA12, SA20, XT20

Discrete/PWM solid state outputs (24 VDC model only)

PWM solid state outputs	SA12-EC12-CN12: 01 to 04 SA20-XT20-EC20-CN20: 01 to 06
Voltage breaking capacity	5-28,8 VDC
Current breaking capacity	0,7 A / 5-28,8 VDC
Min. load	1 mA
Max. inductive load	0,7 A
Max. incandescent load	0,1 A
Off-state leakage	0,1 mA / 24 VDC

Response time	1ms
Isolated	no
PWM frequency	120 Hz to 1 920 Hz (user-definable)
PWM Cyclic ratio	0 to 100 % (256 steps)
PWM precision at 120 Hz	< 5 % (15 % to 85 %) load at 10 mA
PWM precision at 500 Hz	< 10 % (20 % to 80 %) load at 10 mA
Status indicator	On LCD screen for SA12, SA20, XT 20

Starter kit

■ Each kit includes:
- a standard or expandable Millenium 2
- a PC/Millenium 2 link interface
- an interactive CD-Rom including the software workshop, tutorial, application library and technical brochures.

Type	Input	Output	Power supply	Code
KIT SA 12	8	4 relay	24 VDC	88 950 070
	8	4 relay	100 - 240 VAC	88 950 071
KIT SA 20	12	8 relay	24 VDC	88 950 072
	12	8 relay	100 - 240 VAC	88 950 073
KIT XT 20	12	8 relay	24 VDC	88 950 074
	12	8 relay	100 - 240 VAC	88 950 075

Standard versions

■ Preconfigured
■ 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
■ Indicator on backlit LCD display
■ Program protected by a password
■ Calendar program clock
■ User-definable from the front panel

Type	Input	Output	Power supply	Code
SA 12	8	4 relay	24 VDC	88 950 041
	8	4 relay	100 - 240 VAC	88 950 043
	8	4 relay	24 VAC	88 950 044
	8	4 solid state/4 PWM	24 VDC	88 950 042
SA 20	12	8 relay	24 VDC	88 950 051
	12	8 relay	100 - 240 VAC	88 950 053
	12	8 relay	24 VAC	88 950 054
	12	8 solid state/6 PWM	24 VDC	88 950 052

Standard products
Standard products, non stocked

Expandable version

- 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
- Indicator on backlit LCD display
- Program protected by a password
- Calendar program clock
- User-definable from the front panel
- Can take an XC adjacent extension and an XL local extension

Type	Input	Output	Power supply	Code
XT 20	12	8 relay	24 VDC	88 950 061
	12	8 relay	100 - 240 VAC	88 950 063
	12	8 relay	24 VAC	88 950 064
	12	8 solid state/6 PWM	24 VDC	88 950 062

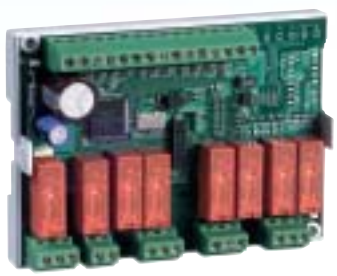
Blind versions

- 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
- Calendar program clock

Type	Input	Output	Power supply	Code
EC 12	8	4 relay	24 VDC	88 950 021
	8	4 relay	100 - 240 VAC	88 950 023
	8	4 relay	24 VAC	88 950 024
	8	4 solid state/4 PWM	24 VDC	88 950 022
EC 20	12	8 relay	24 VDC	88 950 031
	12	8 relay	100 - 240 VAC	88 950 033
	12	8 relay	24 VAC	88 950 034
	12	8 solid state/6 PWM	24 VDC	88 950 032

Bare board versions

- 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 a password
- Calendar program clock



Type	
CN 12	For mass-production applications: please consult us
CN 20	For mass-production applications: please consult us

Standard products

Standard products, non stocked

For further information please go to www.crouzet.co.uk

Local extensions

- For XT 20 only (1 local extension per module)
- Millenium - Millenium local link
- Doubles the hardware and software capacities
- Transparent communication between 2 XT 20
- Max. distance between 2 XT 20: 10 metres
- Cable type: screened twisted pair

Type	Description	Code
XL 01	M2 - M2 local link (2 modules)	88 950 200
XL 05	4 solid state outputs	88 950 204

Adjacent extensions

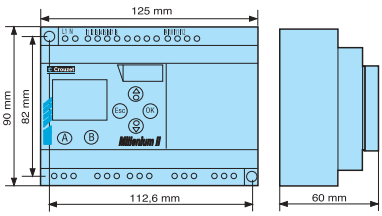
- For XT 20 only (one adjacent extension per module)
- Communication using MODBUS or AS-i protocol (Slave module)
- 6 additional inputs/outputs

Type	Description	Code
XC 01	4 inputs 2 relay outputs 24 VDC	88 950 210
	4 inputs 2 relay outputs 24 VAC	88 950 211
	4 inputs 2 relay outputs 110 - 240 VAC	88 950 212
XC 02	AS-i exchange unit 24 VDC	88 950 213
XC 03	MODBUS exchange unit 24 VDC	88 950 214

Accessories

Type	Range	Precision	Code
Programming software on CD ROM			88 950 100
EEPROM memory module			88 950 101
PC-module link interface			88 950 102
Faceplate for front panel mounting EC 12 - SA 12			89 750 103
Faceplate for front panel mounting EC 20 - SA 20 - XT 20			89 750 109
Room temperature sensors	-10 –> +40 °C	- 0,2 °C +1,2 °C (-10 –> +40 °C)	89 750 150
Ventilation duct temperature sensors	-10 –> +60 °C	- 0,2 °C +1,9 °C (-10 –> +60 °C)	89 750 151
Outdoor temperature sensors	-10 –> +40 °C	- 0,2 °C +1,2 °C (-10 –> +40 °C)	89 750 152
Immertion/remote probe temperature sensors	-10 –> +150 °C	- 0,2 °C +1,9 °C (-10 –> +150 °C)	89 750 153

Dimensions



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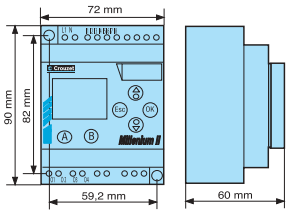

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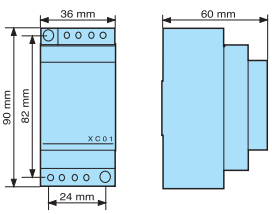

XC extensions

Standard products

Standard products, non stocked

For further information please go to www.crouzet.co.uk

2000 sales outlets worldwide

12 subsidiaries - 7 production sites

1970 employees

> Belgium

Ets Crouzet SA
40 Avenue Roi Albert I
1780 Wemmel
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Fax: +32 02-461 00 23
E-mail: com-be@crouzet.com

12 sales outlets

> France

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Fax: +33 4 75 55 98 03
E-mail: com-fr@crouzet.com

Customer Service
Technical and sales information

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N°Indigo 0 825 333 350

PRIX APPEL LOCAL
Fax N°Azur 0 810 610 102

3 production sites
400 sales outlets

> Germany

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Fax: +49 21 03 9 80-2 50
Sensing
Tel: +49 21 03 9 80-1 51 and 1 71
Fax: +49 21 03 9 80-2 50
Motors
Tel: +49 21 03 9 80-1 51 and 1 71
Fax: +49 21 03 9 80-2 50
Pneumatic Automation
Tel: +49 21 03 9 80-1 08 and 1 76
Fax: +49 21 03 9 80-2 50
Severe Environment Switching
Tel: +49 21 03 9 80-1 23
Fax: +49 21 03 9 80-2 00
Gas Burner Control Units
Tel: +49 21 03 9 80-1 23
Fax: +49 21 03 9 80-2 00

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60 sales outlets

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14 sales outlets

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Fax: +39 049 8841037
• **Bologna**
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3 sales offices
116 sales outlets

> Mexico

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1 production site
35 sales outlets

> Spain

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1 production site
92 sales outlets

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212 sales outlets

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3 sales outlets

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86 sales outlets

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40 sales outlets

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406 sales outlets

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480 sales outlets

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More than a standard

Crouzet

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Mercury promotion