# > Logic Controller Millenium Slim

- > A logic controller in a 17.5 mm (0.69") width
- > DIN rail mount and panel mount
- > 8 I/Os: 4 digital inputs (convertibles to analog in DC versions) and 4 digital outputs (relay or static)
- > Highspeed & PWM inputs available in DC versions, PWM outputs available in static versions
- > DC (24V) and AC (110-240V) power supply available
- > Removable connectors
- > Wireless Bluetooth to communicate with other MilleniumSlim logic controllers, retrieve datalog and program transfer
- > Virtual display possible in mobile devices trough Crouzet app
- > Intuitive & easy-to-use graphical programming software (FBD)
- > Certified CE, cULus Listed, NOM, RCM, SCM, UKCA



Millenium Slim

Product Selection								
Туре	Total I/Os	Input	Output	Supply Voltage	Communication	Screen	Connectors	Part Number
CB8R (AC)	8	4 Inputs > 4 x Digital	4 Outputs > 4 x 6 A Relay	110-240 V∼				88983903
CB8R (DC)		4 Inputs > 2 x Convertibles to	4 Outputs > 4 x 6 A Relay	24 V				88983901
CB8S (DC)		<ul> <li>Digital</li> <li>Analog</li> <li>High-Speed</li> <li>2 x Convertibles to</li> <li>Digital</li> <li>Analog</li> <li>PWM</li> </ul>	4 Outputs > 4 x 0.5 A Static (Transistor - Sourcing)		Bluetooth Embedded	Via App: Crouzet Virtual Display	Included	88983902



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

#### **Description:**

#### Millenium Slim: The smallest logic controller ever!

Designed for **space reduction** in any control panel or machine thanks to its 17.5 mm (0.69") body, this multipurpose industrial logic controller with 8 highly configurable I/Os, can replace dozens of control panel products, and will give **wireless capabilities** to your applications via Bluetooth. Powered by the **easiest-to-use** and free programming software "CrouzetSoft", a virtual display from any smartphone or PC, remote program transferring and plenty of pre-programmed applications ready to quick-start your next small-scale automation project.

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





	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)	
General Characteristics				
Part Number	88983903	88983901	88983902	
Safety certifications	CE, cULus Listed, NOM, F	RCM, SCM, UKCA		
Environmental certifications	Reach, RoHS			
Conformity with programmable controllers' standard	CEI/EN 61131-2 (Open equipment)			
Conformity with the RADIO directive	• EN 61010-1 & EN 61010	-2-201: Safety requirements		
(in accordance with 2014/53/UE)	<ul> <li>EN 301489-1 &amp; EN 301489-17: EMC requirements</li> <li>EN 61000-6-1, EN 61000-6-2, EN 61000-6-3 &amp; EN 61000-6-4: EMC requirements</li> <li>EN 300328: Radio requirements</li> <li>EN62311: Health requirements</li> </ul>			
Power supply earthing	None			
Overvoltage category	II (in accordance with IEC	/EN 60664-1)		
Pollution Degree	2 (in accordance with IEC	/EN 61131-2)		
Maximum utilization altitude	<ul><li>Operation: 2000 m</li><li>Transport: 3000 m</li></ul>			
Mechanical resistance		N 60068-2-27, Ea test	l equipment against external mechanica	
Resistance to electrostatic discharge	Immunity to ESD IEC/EN		, -oom mgn)	
Resistance to HF interference (Immunity)	Immunity to radiated electrostatic fields IEC/EN 61000-4-3, level 3			
	<ul> <li>Immunity to fast transien</li> <li>Immunity to shock waves</li> </ul>	ts (burst immunity) IEC/EN 6100	0-4-4, level 3	
Conducted and radiated emissions (in accordance with EN 55032)	Class B			
Bluetooth protocol	Bluetooth ≥ V5.0			
Bluetooth range	≤ 10 m (max. 20 m in free	fields)		
Operating temperature		°C (-4 °F) to +60 °C (140 °F) -20 °C (-4 °F) to +40 °C (104 °F) g air: +50 °C (122 °F)	)	
Storage temperature	-40 °C (-40 °F) to +80 °C (	(176 °F)		
Humidity	95% max. (no condensatio	on or dripping water)		
Connecting capacity	<ul> <li>Flexible wire with ferrule.</li> <li>Rigid wire: 1 conductor:</li> <li>Rigid wire: 2 conductors:</li> </ul>		,	
Housing material	Makrolon, UL94V0			
Housing Color	Light Gray RAL 7035			
Degree of protection	<ul> <li>IP 40 on front panel</li> <li>IP 20 excluding terminal</li> </ul>	blocks		
Weight	<ul> <li>IP 20 excluding terminal blocks</li> <li>Without packing: 103g (88983903), 97g (88983901), 79g (88983902)</li> <li>With unitary packing: 119g (88983903), 113g (88983901), 95g (88983902)</li> </ul>			
Dimensions	<ul> <li>Without packing: 18 x 90</li> <li>With unitary packing: 22</li> </ul>	x 69.6 mm (excluding terminal b x 137 x 74 mm	olocks and DIN rail clip)	
Connectors Type		ith compatibility for Screw conne patible connectors recommended	ctors or Cage Clamp connectors (see )	
DIN rail mounting	Mounting in 35 mm symmetrical DIN rail (see installation sheet of instructions), compatible with modular enclosures			

	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)	
Processing Characteristics				
Part Number	88983903	88983901	88983902	
HMI / MMI	<ul> <li>1 green Led for Power/Status</li> <li>1 blue Led for Bluetooth</li> <li>Virtual display &amp; keypad with C</li> </ul>	rouzet Virtual Display or Crouzet S	Soft	
Programming Software	Crouzet Soft			
Programming method	FBD (Function Block Diagram),	including SFC (Sequential Functio	n Chart) (Grafcet)	
Program size	<ul> <li>Function blocks: typically 350 blocks (1024 max.)</li> <li>Macro blocks: 127 max. (255 blocks per macro)</li> </ul>			
Program memory	Flash			
Data memory	2 k octets			
Back-up time (in the event of power failure)	<ul> <li>Program and settings in the controller: 10 years</li> <li>Data memory: 10 years</li> </ul>			
Data back-up	Data backup in the flash memor	y is guaranteed if the product is po	owered on more than 10 seconds	
Cycle time	From 2 ms* to 90 ms, default value: 10 ms *: Depending on program memory			
Clock data retention	10 years (lithium battery) at 25 °C (77 °F)			
Clock driftDrift < 12 min/year (at 25 °C (77 °F))6 s / month (at 25 °C (77 °F) with user-definable correction of drift).		l.		
Timer block accuracy	0.5 % ± 2 cycle time			
Startup time on power up	< 3 s			
Self-test	<ul> <li>Test firmware integrity (checks)</li> <li>Stability of the internal power s</li> </ul>	57		

- Check the conformity of the device configuration with the configuration in the application program.

Power Supply				
Part Number	88983903	88983901	88983902	
Nominal supply voltage	110 V $\sim \rightarrow$ 240 V $\sim$	24 V		
Voltage supply tolerance	-15% / +10%	-15% / +20%		
Operating limits	$93.5  ightarrow 264 V \sim$	20.4 → 28.8 V		
	* Accepts temporary overvoltage occurring on the power network	* Accepts temporary overvoltage	occurring on the power network	
AC supply voltage frequency	50/60Hz (-6% / +5%) so 47Hz $\rightarrow$ 53Hz / 57 $\rightarrow$ 63Hz	N/A		
Immunity to power micro cuts	$\leq$ 10 ms (repetition 20 times)	≤ 1 ms (repetition 20 times)		
Max. absorbed power	<ul> <li>6.9 VA @ 240 V~</li> <li>6 VA @ 240 V~ I/Os = 0</li> </ul>	<ul> <li>1.2 W @ 24 V<sup></sup></li> <li>1.56 W @ 28.8 V<sup></sup>,</li> <li>0.5 W @ 24 V<sup></sup> I/Os = 0</li> </ul>	<ul> <li>0.75 W @ 24 V</li> <li>0.8 W @ 28.8 V,</li> <li>0.5 W @ 24 V I/Os = 0</li> </ul>	
Protection against polarity inversions	Not applicable	Yes	1	
Power monitoring	Yes, but no value available through the application "FB Status"	Yes, and value available through 1/10V, 5% of full scale	the application "FB Status",	

	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)
Inputs			
Part Number	88983903	88983901	88983902
Used as Digital Inputs			
Quantity	4 digital inputs -> from I1 to I4		
Rated voltage	110 V $\sim$ $ ightarrow$ 240 V $\sim$	24 V	
Voltage tolerance	-15% / +10%	-15% / +20%	
Operating limits	$93.5  ightarrow 264 \ V \sim$	$20.4 \rightarrow 28.8 \text{ V}_{\overline{\cdots}}$	
Input current	■ 0.25 mA @ 93.5 V~	■ 1.8 mA @ 20.4 V	
	■ 0.3 mA @ 110 V~	■ 2.1 mA @ 24 V	
	■ 0.6 mA @ 230 V~ ■ 0.7 mA @ 265 V~	• 2.5 mA @ 28.8 V	
Input frequency	50/60Hz (-6% / +5%) so 47% $\rightarrow$ 53Hz / 57 $\rightarrow$ 63Hz	N/A	
Input impedance	559 kΩ	11.7 kΩ	
Logic 1 voltage threshold	≥ 79 V∿	≥ 11 V	
Making current at logic state 1	≥ 0.2 mA	≥1 mA	
Logic 0 voltage threshold	$\leq$ 45 V $\sim$	≤ 9 V	
Release current at logic state 0	≤ 0.1 mA	≤ 0.8 mA	
Response time	1 to 2 cycle times		
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	Not applicable	Yes	
Status indicator	Yes, on Virtual Display (CVD &	Crouzet Soft)	
Cable length	≤ 30 m		
Used as High-Speed Inputs			
Quantity	N/A	2 High-Speed inputs -> from I1	to I2
Input voltage	N/A	24 V	
Voltage tolerance	N/A	-5% / +20%	
Operating limits	N/A	22.8 → 28.8 V	
Input current	N/A	■ 1.9 mA @ 22.8 V	
		■ 2.1 mA @ 24 V	
	<b>N1/A</b>	• 2.5 mA @ 28.8 V	
Input impedance	N/A	11.7 kΩ	
Logic 1 voltage threshold	N/A	≥ 22.8 V	
Making current at logic state 1	N/A	≥ 1.9 mA	
Logic 0 voltage threshold	N/A	≤ 12 V	
Release current at logic state 0	N/A	≤ 1 mA	_+
Maximum counting frequency	N/A	<ul> <li>2 independent counters: 5 kHz</li> <li>Function: UP and DOWN</li> <li>* with a time cycle ≤ 10 ms and 12V and level 1 &gt; 22.8V</li> </ul>	²* a ton / toff = 50% ± 5%, level 0 <
Cable length	N/A	≤ 3 m with shielded twisted cab	le
-			

	Millenium Slim CB8R (AC)	Millenium Slim Millenium Slim CB8R (DC) CB8S (DC)
Used as PWM Inputs		
Quantity	N/A	2 PWM inputs -> from I3 to I4
Input voltage	N/A	24 V
Voltage tolerance	N/A	-5% / +20%
Operating limits	N/A	22.8 → 28.8 V
Input current	N/A	• 1.9 mA @ 22.8 V
		■ 2.1 mA @ 24 V
		■ 2.5 mA @ 28.8 V
Input impedance	N/A	11.7 kΩ
Logic 1 voltage threshold	N/A	≥ 22.8 V
Making current at logic state 1	N/A	≥ 1.9 mA
Logic 0 voltage threshold	N/A	≤ 12 V
Release current at logic state 0	N/A	≤ 1 mA
Input frequency	N/A	from 10 Hz to 1 KHz
Restitution	N/A	0 to 100% duty cycle reading
Accuracy	N/A	5% with duty cycle between 10% and 90%
Cable length	N/A	≤ 30 m
Used as Analog Inputs		
Quantity	N/A	4 analog inputs -> from I1 to I4
Measuring range	N/A	$ 0 \rightarrow 10 \text{ V} $
	N1/A	• $0 \rightarrow V$ power supply or Voltmeter
Input impedance	N/A	11.7 kΩ
Maximum value without destruction	N/A	• 28.8 V max for 0 $\rightarrow$ 10 V and 0 $\rightarrow$ V power supply • 30.5 V max for Voltmeter
Input type	N/A	Common mode
Resolution	N/A	12 bits at maximum input voltage (10 bits at 10V)
Value of LSB	N/A	7.03 mV
Conversion time	N/A	Controller cycle time
Maximum error in 0-10V mode	N/A	■ ± 3.5 % of full scale at 25 °C (77 °F)
		• ± 5 % of full scale at 55 °C (131 °F)
Maximum error in 0-V power supply mode	N/A	• $\pm$ 5 % of full scale at 25 °C (77 °F)
Repeat accuracy at 55 °C (131 °F)	N/A	• ± 6.2 % of full scale at 55 °C (131 °F) ± 2 %
Voltmeter	N/A	from 0 to 30.5 V Accuracy: ± 5% of full scale at 25 °C (77 °F)
		$\pm$ 6.2 % of full scale at 55 °C (131 °F)
Isolation between analogue channel and power supply	N/A	None
Protection against polarity inversions	N/A	Yes
Potentiometer control	N/A	$2.2~k\Omega$ / 0.5 W (recommended), 10 K $ \Omega$ max.
Cable length	N/A	≤ 10 m with shielded twisted cable (sensor not isolated)

	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)
Outputs	_		
Part Number	88983903	88983901	88983902
Relay Outputs			
Quantity	4 relay outputs, from O1 to O4		N/A
Breaking voltage	■ 30 V max		N/A
	■ 250 V~ max		
Breaking current in the outputs	■ @ 25 °C -> 01, 02, 03, & 04	: 6A max	N/A
	• @ 40 °C -> 01, 02, 03, & 04	: 4A max	
	• @ 55 °C -> 01, 02, 03, & 04	: 2A max	
	■ @ 60 °C -> O1, O2, O3, & O4	: 1.3A max	
Breaking current in the common	■ @ 25 °C -> C1: 10A max & C2	2: 8A max	N/A
	• @ 40 °C -> C1 & C2: 8A max		
	• @ 55 °C -> C1 & C2: 4A max		
	■ @ 60 °C -> C1 & C2: 2.6A ma		
Mechanical life	10 000 000 operations (cycles)		N/A
Electrical durability	100 000 operations (cycles) res	istive loads, @ 25 °C	N/A
Electrical durability for 100 000 operating	Resistive		N/A
cycles	■ 24 V tau = 0 ms: 6 A (UL/CL		
	■ 250 V~ cos phi = 1: 6 A		
	Inductive		
	■ 1/4 HP 250 V~ @ 25 °C		
Minimum switching capacity	100 mA (at minimum voltage of	12V)	N/A
Maximum operating rate	360 per hour		N/A
Response time	Make = 1 cycle time + 8 ms m	Make = 1 cycle time + 8 ms max	
	Release = 1 cycle time + 5 ms	s max	
Isolation between power supply and outputs	Reinforced insulation		N/A
Isolation between outputs	Simple isolation between block	C1 / O1 / O2 and C2 / O3 / O4	N/A
Built-in protections	Against short-circuits: None		N/A
	Against over voltages and over	erload: None	
Status indicator	Yes, on Virtual Display (CVD &	Crouzet Soft)	N/A
Cable length	≤ 30 m		N/A
Static (Transistor) Outputs			
Quantity	NI/A		4  static outputs  > from  01  to

Quantity	N/A	4 static outputs -> from O1 to O4
Breaking voltage	N/A	$10 \rightarrow 28.8 \text{ V}$
Nominal voltage	N/A	12 / 24 V===
Nominal breaking current	N/A	0.5 A
Maximum breaking current	N/A	0.7 A
Breaking current in the common	N/A	2.8 A
Voltage drop	N/A	< 2V for I=0.5A
Min. load	N/A	1 mA
Response time	N/A	<ul> <li>Make = 1 cycle time + 60 μs</li> <li>max</li> </ul>
		<ul> <li>Release = 1 cycle time +</li> <li>60 μs max</li> </ul>
Built-in protections	N/A	Against overloads and short- circuits: Yes
		<ul> <li>Against over voltages (*): Yes</li> </ul>
		(*) In the absence of a volt-free contact between the output of the logic controller and the load
		<ul> <li>Against inversions of power supply: Yes</li> </ul>
		<ul> <li>Current limitation (min: 1.1A, max: 2.6A, @VCC: 24 V, Rload &lt; 10mOhms)</li> </ul>

	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)
Isolation between power supply and outputs	N/A		None
Isolation between outputs	N/A		None
Wiring	N/A		PNP (Load Common at 0V)
Status indicator	N/A		Yes, on Virtual Display (CVD & Crouzet Soft)
Cable length	N/A		≤ 10 m
Static PWM Outputs			
Quantity	N/A		4 static outputs -> from O1 to O4
PWM frequency	N/A		20 Hz to 1500 Hz
PWM duty cycle	N/A		0 → 100 %

PWM Max. error	N/A	< 2% (de 10% à 90%)
Built-in protections	N/A	Against overloads and short- circuits: Yes
		<ul> <li>Against over voltages (*): Yes</li> </ul>
		(*) In the absence of a volt-free contact between the output of the logic controller and the load
		<ul> <li>Against inversions of power supply: Yes</li> </ul>
		• Current limitation (min: 1.1A, max: 2.6A, @VCC: 24 V, Rload < 10mOhms)
Cable length	N/A	≤ 10 m



# Electronic & Wiring Diagrams

Digital Inputs (AC Voltage)

Millenium Slim - Type CB8R AC - 88983903  $\,\rightarrow$  Inputs I1, I2, I3 and I4

**Electronic Diagram** 



Wiring Diagram



<sup>(1)</sup> 1A (UL248) quick blowing fuse, circuit breaker, or circuit protector (US) L: Line N: Neutral

11.. 14: Inputs 11, 12, 13 and 14

Digital Input

2

#### Inputs

#### **Digital Inputs (DC Voltage)**

 $\label{eq:Millenium} \begin{array}{l} \mbox{Millenium Slim} \mbox{-}\mbox{Type CB8R DC} \mbox{-}\mbox{88983901} \ \rightarrow \mbox{Inputs I1, I2, I3 and I4} \\ \mbox{Millenium Slim} \mbox{-}\mbox{Type CB8S DC} \mbox{-}\mbox{88983902} \ \rightarrow \mbox{Inputs I1, I2, I3 and I4} \\ \end{array}$ 



I1.. I4: Inputs I1, I2, I3 and I4

# Inputs High-Speed Inputs (Wiring of 3-wire PNP sensors)

Millenium Slim - Type CB8R DC - 88983901  $\,\to$  Inputs I1 and I2 Millenium Slim - Type CB8S DC - 88983902  $\,\to$  Inputs I1 and I2



2 3-wire PNP sensor 3 Digital Input

I1, I2: Inputs I1 and I2



 $^{(1)}$  1A (UL248) quick blowing fuse, circuit breaker, or circuit protector (US)  $^{(2)}$  Isolating source

BN: Brown cable of the 3-Wire PNP sensor

BL: Blue cable of the 3-Wire PNP sensor

BK: Black cable of the 3-Wire PNP sensor

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#### Inputs

#### High-Speed Inputs (Wiring of Encoders)

Millenium Slim - Type CB8R DC - 88983901  $\,\rightarrow$  Inputs I1 and I2 Millenium Slim - Type CB8S DC - 88983902  $\,\rightarrow$  Inputs 11 and 12





<sup>(1)</sup> 1A (UL248) quick blowing fuse, circuit breaker, or circuit protector (US) (2) Isolating source

I1, I2: Inputs I1 and I2

## Inputs

**PWM Inputs** Millenium Slim - Type CB8R DC - 88983901  $\rightarrow$  Inputs I3 and I4 Millenium Slim - Type CB8S DC - 88983902  $\rightarrow$  Inputs I3 and I4



Wiring Diagram

PWM



 $^{\scriptscriptstyle (1)}$  1A (UL248) quick blowing fuse, circuit breaker, or circuit protector (US) (2) Isolating source

I3, I4: Inputs I3 and I4

PWM Inputs

2

#### Inputs

#### **Analog Inputs**

Millenium Slim - Type CB8R DC - 88983901  $\,\rightarrow$  Inputs I1, I2, I3 and I4 Millenium Slim - Type CB8S DC - 88983902  $\,\rightarrow$  Inputs I1, I2, I3 and I4



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11... 14: Inputs 11, 12, 13 and 14

#### Outputs

#### **Relay Outputs**

Millenium Slim - Type CB8R AC - 88983903  $\rightarrow$  Outputs O1, O2, O3 and O4 Millenium Slim - Type CB8R DC - 88983901 → Outputs O1, O2, O3 and O4



Electronic Diagram

⊢

 $\sim$  12 - 240VAC  $\,$  50/60Hz ---- 12 - 24VDC Ľ Сх Ox PLC [](1) (3) (3)

U

(\*) Protection

\*PLC: Millenium Slim Logic Controller

Wiring Diagram



Common limits currents O1+O2= 10A max @25C (8A @40C, 4A @55C, 2.6 @ 60C) O3+O4=8A max @25C (8A @40C, 4A @ 55C, 2.6 @ 60C)

#### Outputs

#### Static / PWM Outputs

Millenium Slim - Type CB8S DC - 88983902  $\,\rightarrow$  Outputs O1, O2, O3 and O4



Wiring Diagram



(3) Inductive load \*PLC: Millenium Slim Logic Controller  $^{(1)}$  1A (UL248) quick-blowing fuse, circuit-breaker, or circuit protector (US)  $^{(2)}$  Isolating source

Accessories

BLUETOOTH DONGLE		
Description	Part Number	
USB Dongle Bluetooth, CE, FCC and IC certified	88980124	

SIGNAL CONVERTER			
Description	Part Number		
0-20 mA to 0-10 V	88950108		

## **TEMPERATURE PROBES**

	Description	Part Number
	NTC2, PVC probe	89750174
$\bigcirc$	NTC1, TPE probe	89750180
	NTC2, INOX probe	89750182
	NTC2, POM probe	89750185
	NTC3, SILICONE probe	89750186

# **TEMPERATURE CONVERTERS**

Description	Part Number
Pt1000 3-wire	88950150
Pt100 3-wire (-40 → +40°C)	88950151
Pt100 3-wire (0 → +100°C)	88950152
Pt100 3-wire (0 → +250°C)	88950153
Thermocouple J	88950154
Thermocouple K	88950155

# POWER SUPPLIESDescriptionPart NumberModular of 10W89451001Modular of 30W89451003Modular of 60W89451006Modular of 100W89451010

### **TEMPERATURE SENSORS**

	Description	Part Number
Margin .	Air Sensor	89750190
T	Duct Probe	89750191
P	External Probe	89750192
	Remote/Submersible	89750193

#### Warning:

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