## 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 Sel	ection							
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  3 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, RCM, SCM, UKCA			
Environmental certifications	Reach, RoHS			
Conformity with programmable controllers' standard	CEI/EN 61131-2 (Open equ	ipment)		
Conformity with the RADIO directive (in accordance with 2014/53/UE)				
Power supply earthing	None			
Overvoltage category	II (in accordance with IEC/E	EN 60664-1)		
Pollution Degree	2 (in accordance with IEC/E	,		
Maximum utilization altitude	Operation: 2000 m Transport: 3000 m	,		
Mechanical resistance		l 60068-2-27, Ea test	I equipment against external mechanical o, 40cm high)	
Resistance to electrostatic discharge	Immunity to ESD IEC/EN 6	1000-4-2, level 3		
Resistance to HF interference (Immunity)	<ul><li>Immunity to fast transients</li><li>Immunity to shock waves</li></ul>	rostatic fields IEC/EN 61000-4- s (burst immunity) IEC/EN 6100 IEC/EN 61000-4-5 on mode IEC/EN 61000-4-6, lev	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 f	ields)		
Operating temperature	Ventilated enclosure: -20 °C Non-ventilated enclosure: - UL: maximum surrounding	20 °C (-4 °F) to +40 °C (104 °F)		
Storage temperature	-40 °C (-40 °F) to +80 °C (1	76 °F)		
Humidity	95% max. (no condensation	n or dripping water)		
Connecting capacity	<ul><li>Flexible wire with ferrule:</li><li>Rigid wire: 1 conductor: 0</li><li>Rigid wire: 2 conductors:</li></ul>		,	
Housing material	Makrolon, UL94V0			
Housing Color	Light Gray RAL 7035			
Degree of protection	■ IP 40 on front panel	locks		
Weight	• Without packing: 103g (88	<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	■ Without packing: 18 x 90 x ■ With unitary packing: 22 x	x 69.6 mm (excluding terminal b 137 x 74 mm	olocks and DIN rail clip)	
Connectors Type		h compatibility for Screw connectible connectors recommended	ctors or Cage Clamp connectors (see )	
DIN rail mounting	Mounting in 35 mm symme modular enclosures	trical DIN rail (see installation sl	heet of instructions), compatible with	
Panel mounting	Flat panel mounting by scre	ews (see installation sheet of ins	structions)	

	Millenium Slim CB8R (AC)	Millenium Slim CB8R (DC)	Millenium Slim CB8S (DC)	
Processing Characteristics				
Part Number	88983903	88983901	88983902	
HMI / MMI	■ 1 green Led for Power/Status			
	<ul><li>1 blue Led for Bluetooth</li></ul>			
	<ul> <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), i	including SFC (Sequential Functio	n Chart) (Grafcet)	
Program size	■ Function blocks: typically 350 b	olocks (1024 max.)		
	■ Macro blocks: 127 max. (255 b	locks per macro)		
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			
Data back-up	Data backup in the flash memory	y is guaranteed if the product is po	wered on more than 10 seconds	
Cycle time	From 2 ms* to 90 ms, default val	lue: 10 ms		
	*: Depending on program memo	ry		
Clock data retention	10 years (lithium battery) at 25 °	C (77 °F)		
Clock drift	Drift < 12 min/year (at 25 °C (77	°F))		
	6 s / month (at 25 °C (77 °F) with	n user-definable correction of drift)		
Timer block accuracy	0.5 % ± 2 cycle time			
Startup time on power up	<3s			
Self-test	Test firmware integrity (checks)	um memory)		
	<ul> <li>Stability of the internal power s</li> </ul>	upply		
	<ul> <li>Check the conformity of the de</li> </ul>	vice configuration with the configu	ration in the application program.	

Power Supply				
Part Number	88983903	88983901	88983902	
Nominal supply voltage	110 V∼ → 240 V∼	24 V		
Voltage supply tolerance	-15% / +10%	-15% / +20%		
Operating limits	93.5 → 264 V∼	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	≤ 10 ms (repetition 20 times)	≤ 1 ms (repetition 20 times)		
Max. absorbed power	= 6.9 VA @ 240 V∼ = 6 VA @ 240 V∼ I/Os = 0	■ 1.2 W @ 24 V ■ 1.56 W @ 28.8 V, ■ 0.5 W @ 24 V I/Os = 0	■ 0.75 W @ 24 V ■ 0.8 W @ 28.8 V, ■ 0.5 W @ 24 V I/Os = 0	
Protection against polarity inversions	Not applicable	Yes		
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∼ → 240 V∼	24 V	
Voltage tolerance	-15% / +10%	-15% / +20%	
Operating limits	93.5 → 264 V~	20.4 → 28.8 V <del></del>	
Input current	■ 0.25 mA @ 93.5 V~	■ 1.8 mA @ 20.4 V	
	= 0.3 mA @ 110 V $\sim$	■ 2.1 mA @ 24 V	
	■ 0.6 mA @ 230 V~	■ 2.5 mA @ 28.8 V	
Input frequency	■ 0.7 mA @ 265 V 50/60Hz (-6% / +5%) so 47%	N/A	
Input impedance	→ 53Hz / 57 → 63Hz	11.7 1:0	
Input impedance	559 kΩ	11.7 kΩ ≥ 11 V	
Logic 1 voltage threshold	≥ 79 V~		
Making current at logic state 1	≥ 0.2 mA	≥ 1 mA	
Logic 0 voltage threshold	≤ 45 V∿	≤ 9 V <del></del>	
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	
		■ 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 <del></del>	
Release current at logic state 0	N/A	≤ 1 mA	
Maximum counting frequency	N/A	<ul> <li>2 independent counters: 5 kH</li> <li>Function: UP and DOWN</li> <li>* with a time cycle ≤ 10 ms and 12V and level 1 &gt; 22.8V</li> </ul>	z* I a ton / toff = 50% ± 5%, level 0 <
Cable length	NI/A	< 2 m with chicked twisted and	No.
Cable length	N/A	≤ 3 m with shielded twisted cab	ле

	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 <del></del>
Making current at logic state 1	N/A	≥ 1.9 mA
Logic 0 voltage threshold	N/A	≤ 12 V <del></del>
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	N/A	4 analog inputs -> from I1 to I4
Quantity		4 analog inputs -> from I1 to I4
Measuring range	N/A	<ul> <li>0 → 10 V</li> <li>0 → V power supply or Voltmeter</li> </ul>
Input impedance	N/A	11.7 kΩ
Maximum value without destruction	N/A	<ul> <li>28.8 V<sup></sup> max for 0 → 10 V and 0 → V power supply</li> <li>30.5 V<sup></sup> max for Voltmeter</li> </ul>
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	■ ± 5 % of full scale at 25 °C (77 °F) ■ ± 6.2 % of full scale at 55 °C (131 °F)
Repeat accuracy at 55 °C (131 °F)	N/A	± 2 %
Voltmeter	N/A	from 0 to 30.5 V Accuracy: $\pm$ 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	$2.2~\text{k}\Omega$ / $0.5~\text{W}$ (recommended), 10 K $\Omega$ max.

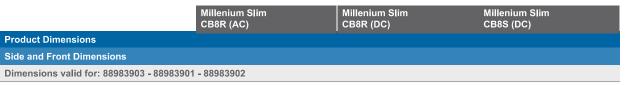
N/A

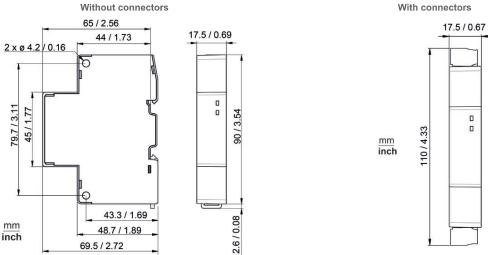
Cable length

≤ 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 -> O1, O2, O3, & O4		N/A
	• @ 40 °C -> O1, O2, O3, & O4 • @ 55 °C -> O1, O2, O3, & O4		
	■ @ 60 °C -> O1, O2, O3, & O4		
Breaking current in the common	■ @ 25 °C -> C1: 10A max & C2		N/A
·	• @ 40 °C -> C1 & C2: 8A max		
	■ @ 55 °C -> C1 & C2: 4A max		
	■ @ 60 °C -> C1 & C2: 2.6A ma	X	
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 cycles	Resistive		N/A
cycles	<ul> <li>24 V = tau = 0 ms: 6 A (UL/CL</li> <li>250 V ~ cos phi = 1: 6 A</li> </ul>	JL: 5A)	
	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	ax	N/A
·	Release = 1 cycle time + 5 ms	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
	<ul> <li>Against over voltages and over</li> </ul>	rload: None	
Status indicator	Yes, on Virtual Display (CVD &	Crouzet Soft)	N/A
Cable length	≤ 30 m		N/A
Static (Transistor) Outputs			
Quantity	N/A		4 static outputs -> from O1 to O4
Breaking voltage	N/A		10 → 28.8 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 max</li> </ul>
			Release = 1 cycle time + 60 μs max
Built-in protections	N/A		<ul> <li>Against overloads and short- circuits: Yes</li> </ul>
			Against over voltages (*): Yes  (*) In the absence of a volt free  (*)
			(*) In the absence of a volt-free contact between the output of the logic controller and the load
			Against inversions of power supply: Yes
			Current limitation (min: 1.1A, max: 2.6A, @VCC: 24 V, Rload < 10mOhms)

	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		<ul> <li>Against overloads and short- circuits: Yes</li> </ul>
			■ Against over voltages (*): Yes
			(*) 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

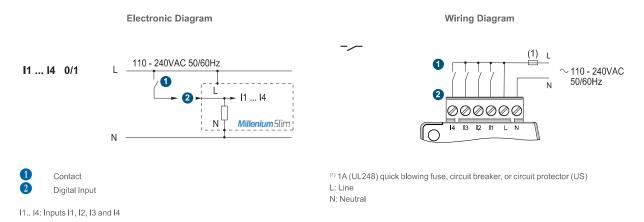




# Electronic & Wiring Diagrams Inputs

### Digital Inputs (AC Voltage)

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



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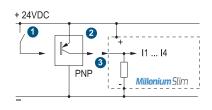
### Inputs

### Digital Inputs (DC Voltage)

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

### **Electronic Diagram**

I1 ... I4 0/1



Wiring Diagram

- <sup>(1)</sup> 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

Contact
2 3-wire PNP sensor
Digital Input

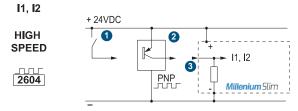
I1.. I4: Inputs I1, I2, I3 and I4

### Inputs

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

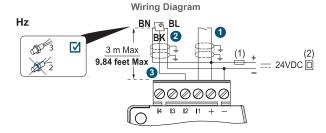
Millenium Slim - Type CB8R DC - 88983901  $\rightarrow$  Inputs I1 and I2 Millenium Slim - Type CB8S DC - 88983902  $\rightarrow$  Inputs I1 and I2

### **Electronic Diagram**



Contact
 3-wire PNP sensor
 Digital Input

I1, I2: Inputs I1 and I2



- $^{\rm (1)}\,{\rm 1A}\,({\rm UL}248)$  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

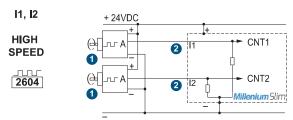
BK: Black cable of the 3-Wire PNP sensor

### Inputs

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

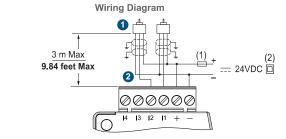
Millenium Slim - Type CB8R DC - 88983901  $\rightarrow$  Inputs I1 and I2 Millenium Slim - Type CB8S DC - 88983902  $\rightarrow$  Inputs I1 and I2

### **Electronic Diagram**



1 Encoder
2 High-Speed Input

Hz



 $^{\mbox{\scriptsize (1)}}\,\mbox{1A}\,(\mbox{\scriptsize UL248})$  quick blowing fuse, circuit breaker, or circuit protector (US)

(2) Isolating source

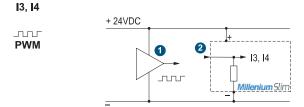
I1, I2: Inputs I1 and I2

### Inputs

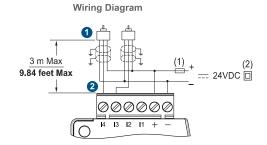
### **PWM Inputs**

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

### **Electronic Diagram**



PWM



PWM Source
PWM Inputs

I3, I4: Inputs I3 and I4

(1) 1A (UL248) quick blowing fuse, circuit breaker, or circuit protector (US)

(2) Isolating source

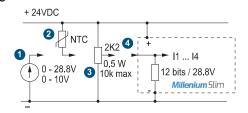
### Inputs

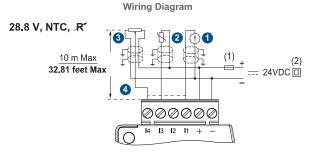
### **Analog Inputs**

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

### **Electronic Diagram**

### I1 ... I4 U





- 0-10 V
- NTC Probe
- Potentiometer Analog Input

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

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

### Outputs

### **Relay Outputs**

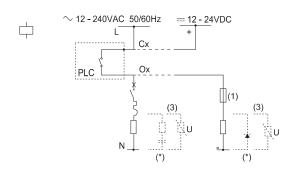
Millenium Slim - Type CB8R AC - 88983903  $\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,$  Outputs O1, O2, O3 and O4

Millenium Slim - Type CB8R DC - 88983901  $\,\,\,\,\,\,\,\,\,\,\,\,\,\,\,$  Outputs O1, O2,

### O3 and O4

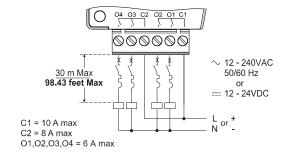
### **Electronic Diagram**

### 01 ... 04



### Wiring Diagram

6 A



(\*) Protection

\*PLC: Millenium Slim Logic Controller

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)

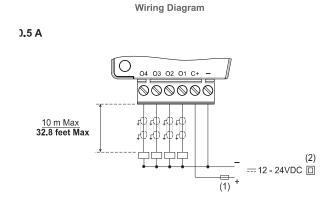
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### Outputs

### Static / PWM Outputs

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

## Electronic Diagram 01 ... 04 == 12 - 24VDC == 24VDC C+ Ох PLC



(3) Inductive load \*PLC: Millenium Slim Logic Controller

- (1) 1A (UL248) quick-blowing fuse, circuit-breaker, or circuit protector (US) (2) Isolating source

=== 12 - 24V

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### 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
NTC1, TPE probe	89750180
NTC2, INOX probe	89750182
NTC2, POM probe	89750185
NTC3, SILICONE probe	89750186

### **TEMPERATURE CONVERTERS**

407	
12	
景	
See.	

Part Number
88950150
88950151
88950152
88950153
88950154
88950155

### **POWER SUPPLIES**

	Description	Part Number
	Modular of 10W	89451001
	Modular of 30W	89451003
	Modular of 60W	89451006
-	Modular of 100W	89451010

### **TEMPERATURE SENSORS**

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

### Warning: