em4
Accessories
Analog expansions

- Up to two same or different expansions can be added to the base station to expand up to 46 I/OS
- 6 digital/analog configurable inputs (0-10 V, 0-20 mA, 4-20 mA) with a good accuracy for industrial sensors
- 4 outputs (2x Digital/PWM and 2x 0-10 V) allowing controlling analog actuators (controlled valve, controlled pump...)

em4 *local - Robust*

em4 *local - Glossy black*

em4 *local - Glossy white*

Specific characteristics			
Part number	88 982 212	88 982 213	88 982 214
Type	E10A		
Inputs	6 digital inputs (configurable as analog 0-10V / 4-20mA)		
Outputs	4 outputs (including 2 solid states 0.5 A PWM and 2 analog 0-10 V)		
Supply	24 VDC powered by the controller		
Finish	Robust	Glossy black	Glossy white
On front panel color	Black RAL 9011		White RAL 9003
On terminal block color	Blue RAL 5017		
Protection rating (in accordance with IEC/EN 60529)	IP 50 on front panel IP 20 on terminal block	IP 40 on front panel IP 20 on terminal block	
Weight	Without packing: 105 g With packing: 145 g		
Dimensions	Without packing: 60.4 x 90 x 60.3 mm / 2.37 x 3.54 x 2.37 inch With packing: 93 x 103 x 65 mm / 3.66 x 4.06 x 2.56 inch		

General characteristics	
Products certification (in accordance with IEC/EN 60529)	CE, cULus Listed
Conformity with the low voltage directive (in accordance with BT 2006/95/EC)	IEC/EN 61131-2 (Open equipment)
Conformity with the EMC directive (in accordance with 2004/108/EC)	IEC/EN 61000-6-1 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-2 (Industrial) IEC/EN 61000-6-3 (Residential, commercial and light-industrial environments) IEC/EN 61000-6-4 (Industrial)
Earthing	None
Overvoltage category	3 in accordance with IEC/EN 60664-1
Pollution	Degree: 2 in accordance with IEC/EN 61131-2
Maximum utilization altitude	Operation: 2000 m Transport: 3000 m
Mechanical resistance	Immunity to vibrations IEC/EN 60068-2-6, Fc test Immunity to shock IEC/EN 60068-2-27, Ea test
Resistance to electrostatic discharge	Immunity to ESD IEC/EN 61000-4-2, level 3
Resistance to HF interference (Immunity)	Immunity to radiated electrostatic fields IEC/EN 61000-4-3, level 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

CROUZET AUTOMATION | em4 REMOTE PLC

Conducted and radiated emissions (in accordance with EN 55022/11 group 1)	Class B
Operation temperature	- 20 °C (-4°F) ➔ +60°C (140°F) (+40°C (104°F) in a non-ventilated enclosure)
Storage temperature	- 40 °C (-40°F) ➔ +80°C (176°F)
Relative humidity	95% max. (no condensation or dripping water)
Screw terminals connection capacity	Flexible wire with ferrule: 1 conductor: 0.2 to 2.5 mm2 (AWG 24...AWG 14) Flexible wire with ferrule: 2 conductors: 0.2 to 0.75 mm2 (AWG 24...AWG 18) Rigid wire: 1 conductor: 0.2 to 2.5 mm2 (AWG 24...AWG 14) Rigid wire: 2 conductors: 0.2 to 0.75 mm2 (AWG 24...AWG 18) Tightening torque: 0.5 N.m (4.5 lb-in) (tighten using screwdriver diam. 3.5 mm) Stripping length: 6 mm

Supply	
Nominal voltage	Powered by the controller
Max. absorbed power	2.5 W

Inputs	
Digital 24 VDC and analog inputs 12 bits / 10 V & 11 bits / 0-20 mA - 6 inputs from I1 to I6	
Input used as digital input (power off state)	
Input voltage	24 VDC (-15% / +20%)
Input current	1.5 mA @ 20.4 V 1.7 mA @ 24 V 2.1 mA @ 28.8 V
Input impedance	13.9 kΩ
Logic 1 voltage threshold	≥ 11 VDC
Making current at logic state 1	≥ 0.8 mA
Logic 0 voltage threshold	≤ 8 VDC
Release current at logic state 1	≤ 0.5 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	Yes
Status indicator	On LCD screen
Cable length	≤ 100 m
Input used as 0-10 V analog input	
Measuring range	0 ➔ 10 V
Input impedance	13.9 kΩ
Maximum value without destruction	28.8 VDC max
Input type	Common mode
Resolution	12 bit / 10V
Value of LSB	2.45 mV
Conversion time	Controller cycle time
Maximum error at 25°C (77°F)	+/- 0.8 % of full scale
Maximum error at 55°C (131°F)	+/- 1.2 % of full scale
Repeat accuracy at 55°C (131°F)	+/- 0.5 %
Isolation between analog channel and power supply	None
Protection against polarity inversions	Yes for voltage ≤ 10 V
Potentiometer control	2.2 kΩ / 0.5 W (recommended), 10 KΩ max.
Cable length	≤ 10 m with shielded twisted cable (sensor not isolated)

Input used as 0-20 mA analog input	
Measuring range	0 ➔ 20 mA (4 ➔ 20 mA by the application)
Input impedance	245 Ω
Maximum value without destruction	30 mA max
Input type	Common mode
Resolution	11 bit (normalized at 0 - 2000) / 20 mA
Value of LSB	10 µA
Conversion time	Controller cycle time
Maximum error at 25°C (77°F)	+/- 1.2 % of full scale
Maximum error at 55°C (131°F)	+/- 1.7 % of full scale
Repeat accuracy at 55°C (131°F)	+/- 0.5 %
Isolation between analog channel and power supply	None
Protection against polarity inversions	Yes
Overvoltage protection	Yes If the input voltage is > 7 V, this one is automatically switched on 0-10V configuration.
Cable length	⩽ 30 m with shielded twisted cable (sensor not isolated)
Outputs	
Digital / PWM solid state outputs - 2 solid state outputs from O1 to O2	
Output used as digital output	
Breaking voltage	10 ➔ 28.8 VDC
Nominal voltage	12 / 24 VDC
Nominal current	0.5 A on resistive load @ 25°C (77°F)
Max. breaking current	0.625 A
Non repetitive overload current	1 A
Maximum breaking current in the common	1 A
Voltage drop	< 1 V for I = 0.5 A
Response time	Make = 1 cycle time + 30 µs typical Release = 1 cycle time + 40 µs typical
Built-in protections	Against overloads and short-circuits: Yes Against over voltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a potential free contact between the output of the programmable logic controller and the load
Galvanic isolation	No
Min. load	1 mA
Cable length	⩽ 10 m

Truth table of the default

	Command	Output	Fault
Normal condition	0	0	No
	1	1	No
Overheating	0	0	No
	1	0	Yes
Underpowered	0	0	X
	1	0	X
Short circuit (current limit)	0	0	No
	1	0	Yes

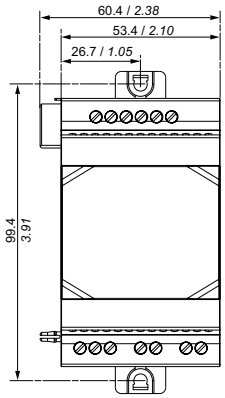
Output used as PWM output	
PWM frequency	14.11 Hz ; 56.45 Hz ; 112.90 Hz ; 225.80 Hz ; 451.59 Hz ; 1758.24 Hz
PWM cyclic ratio	0 ➔ 100 % 100 steps
PWM Max. error	⩽ 2 % (from 10 % ➔ 90 %)
Status indicator	On LCD screen
Cable length	⩽ 10 m with shielded twisted cable
Distance between the power source and the static outputs	⩽ 30 m

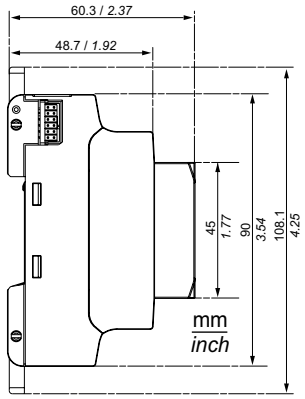
Analog outputs - 2 outputs from O3 to O4	
Output range	0 ➔ 10 VDC
Load type	Resistive (≥ 1 KΩ)
Load Max.	≤ 10 mA
Non repetitive Max. load	20 mA
Resolution	10 bits (normalized at 0 – 1000)
Valeur du LSB	10 mV
Conversion time	Controller cycle time
Response time	≤ 300 ms
Maximum error at 25°C (77°F)	+/- 1 % of full scale
Maximum error at 55°C (131°F)	+/- 1,5 % of full scale
Built-in protections	Against overloads and short-circuits: Yes Against over voltages (*): Yes Against inversions of power supply: Yes (*) In the absence of a potential free contact between the output of the programmable logic controller and the load
Galvanic isolation	No
Cable length	≤ 10 m with shielded twisted cable

Diagrams

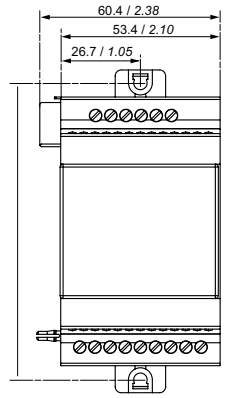
Dimensions

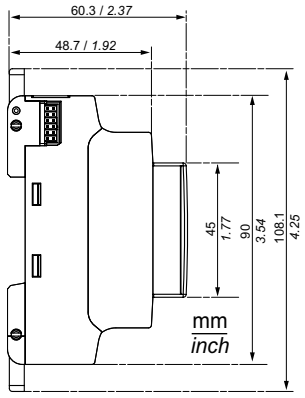
E10A Robust





E10A Glossy

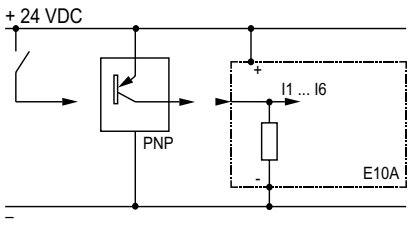


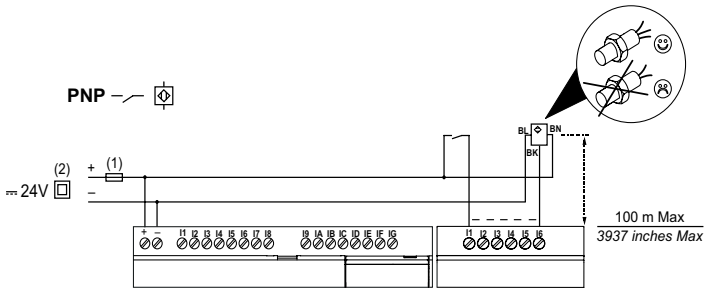


Connections

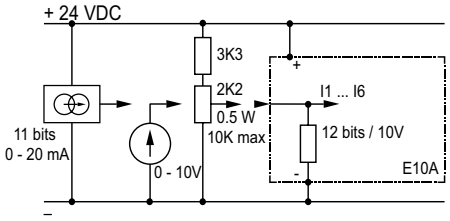
Inputs

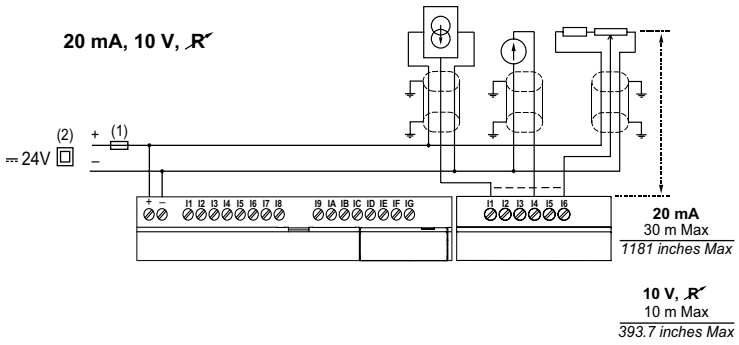
I1 ... I6 0/1





I1 ... I6 U / I

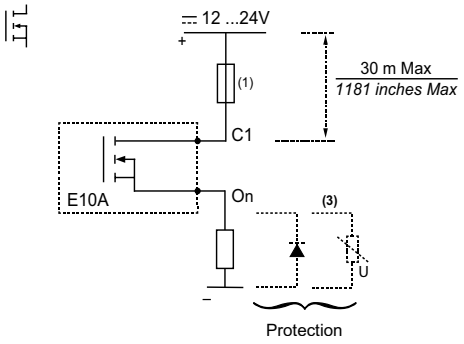




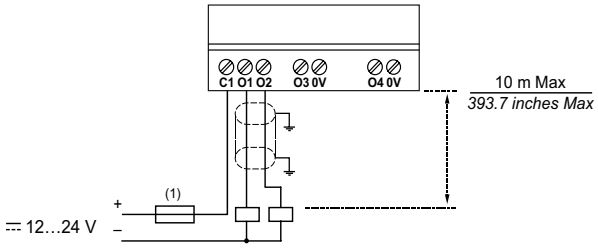
(1) 1 A (UL248) quick-blowing fuse, circuit-breaker or circuit protector (US)
(2) Isolating source

Outputs

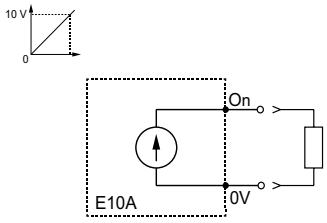
O1 & O2



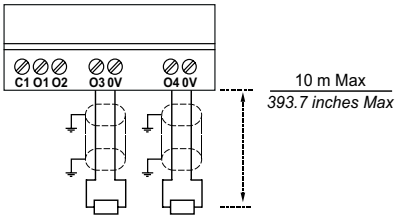
0,5 A



O3 & O4



0-10 V



I/O installations