em4
Accessories
Digital expansions

- Up to two digital / analog expansions can be added to the em4 nanoPLC to expand up to 46 I/Os
- 6 digital / analog configurable inputs (0-10 VDC, 0-28.8 VDC, Potentiometer) allowing the use of NTC temperature sensors or LDR light sensors without using an additional converter
- 4 relay outputs (2x 6A/250VAC & 2X 8A/250VAC allowing controlling power actuators (valves, pumps...)

Digital expansion - Glossy black

Digital expansion - Glossy white
Contact us

Specific characteristics		
Part number	88 982 113	88 982 114
Type	E10R	
Inputs	6 digital inputs (configurable as analog 0-10 VDC, 0-28.8 VDC, Potentiometer)	
Outputs	4 relay outputs (including 2x 6A/250VAC and 2x 8A/250VAC)	
Supply	24 VDC powered by the controller	
Finish	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 40 on front panel IP 20 on terminal block	
Weight	Without packing: 130 g With packing: 170 g	
Dimensions	Without packing: 60.4 x 90 x 60.6 mm 2.37 x 3.54 x 2.38 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
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 bit / 28.8 V - 6 inputs from I1 to I6	
Input used as digital input (power off state)	
Input voltage	24 VDC (-15% / +20%)
Input current	1.8 mA @ 20.4 V 2.1 mA @ 24 V 2.5 mA @ 28.8 V
Input impedance	11.6 kΩ
Logic 1 voltage threshold	≥ 11 VDC
Making current at logic state 1	≥ 1 mA
Logic 0 voltage threshold	≤ 9 VDC
Release current at logic state 1	≤ 0.7 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 analog input	
Measuring range	0 ➔ 10 V or V power supply
Input impedance	11.6 kΩ
Maximum value without destruction	28.8 VDC max
Input type	Common mode
Resolution	12 bit at maximum input voltage (10.5 bit at 10V)
Value of LSB	7.03 mV
Conversion time	Controller cycle time
Maximum error in 0-10V mode	+/- 1.1 % of full scale at 25°C (77°F) +/- 1.6 % of full scale at 55°C (131°F)
Maximum error in 0-V power supply mode	+/- 3.5 % of full scale at 25°C (77°F) +/- 4.4 % of full scale at 55°C (131°F)
Repeat accuracy at 55°C (131°F)	+/- 0.5 %
Isolation between analog channel and power supply	None
Protection against polarity inversions	Yes
Potentiometer control	2.2 kΩ / 0.5 W (recommended), 10 KΩ max.
Cable length	≤ 10 m with shielded twisted cable (sensor not isolated)

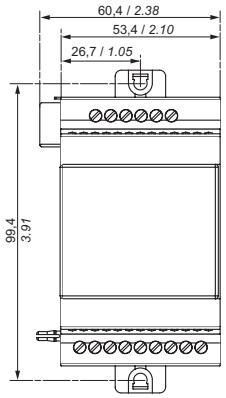
Outputs	
6 A relay output - 2 outputs from O1 to O2	
Breaking voltage	250 VAC max
Breaking current	6 A
Maximum breaking current in the common	IEC @ 25°C (77°F): 12 A IEC @ 60°C (140°F) or UL: 10 A
Mechanical life	5 000 000 operations (cycles)
Electrical durability for 50 000 operating cycles	24 VDC tau = 0 ms: 6 A, tau = 7 ms: 3 A, tau = 15 ms: 1.8 A Usage category DC-12: 24 V, 6 A Usage category DC-14: 24 V, 1.8 A 250 VAC cos phi = 1: 6 A, cos phi = 0.7: 5 A, cos phi = 0.4: 2.5 A Usage category AC-12: 250 V, 6 A Usage category AC-13: 250 V, 5 A Usage category AC-15: 250 V, 2 A
Minimum switching capacity	100 mA (at minimum voltage of 12V)
Maximum operating rate	Off load: 10 Hz At operating current: 0.1 Hz
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV
Response time	Make = 1 cycle time + 8 ms typical Release = 1 cycle time + 4 ms typical
Built-in protections	Against short-circuits: None Against over voltages and overload: None
Status indicator	On LCD screen
Cable length	⩽ 30 m

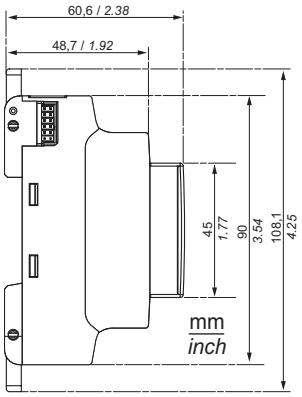
8 A relay output - 6 outputs from O3 to O4	
Breaking voltage	250 VAC max
Breaking current	8 A, ⩾ 55°C: 6 A
Maximum breaking current in the common	IEC @ 25°C (77°F): C3, C6: 8 A ; C4, C5: 16 A IEC @ 60°C (140°F) or UL: C3, C6: 8 A ; C4, C5: 10 A
Mechanical life	20 000 000 operations (cycles)
Electrical durability for 50 000 operating cycles	24 VDC tau = 0 ms: 8 A, tau = 7 ms: 3 A, tau = 15 ms: 1.5 A Usage category DC-12: 24 V, 8 A Usage category DC-14: 24 V, 1.5 A 250 VAC cos phi = 1: 8 A, cos phi = 0.7: 4.75 A, cos phi = 0.4: 3 A Usage category AC-12: 250 V, 8 A Usage category AC-13: 250 V, 4.3 A Usage category AC-15: 250 V, 1.5 A
Minimum switching capacity	100 mA (at minimum voltage of 12V)
Maximum operating rate	Off load: 10 Hz At operating current: 0.1 Hz
Voltage for withstanding shocks	In accordance with IEC/EN 60947-1 and IEC/EN 60664-1: 4 kV
Response time	Make = 1 cycle time + 10 ms typical Release = 1 cycle time + 5 ms typical
Built-in protections	Against short-circuits: None Against over voltages and overload: None
Status indicator	On LCD screen
Cable length	⩽ 30 m

Diagrams

Dimensions

E10R Glossy

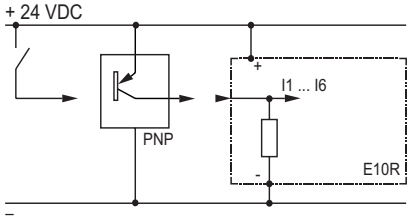


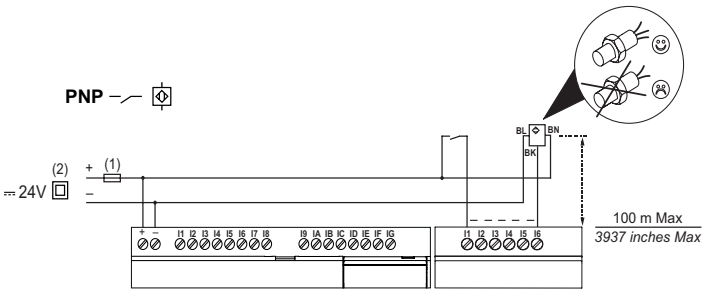


Connections

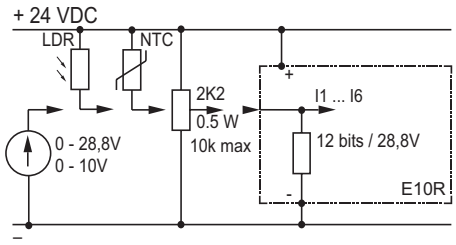
Inputs

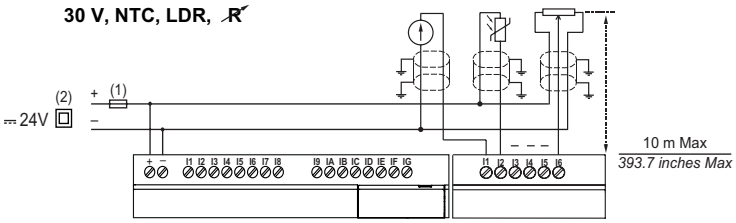
I1 ... I6 0/1





I1 ... I6 U

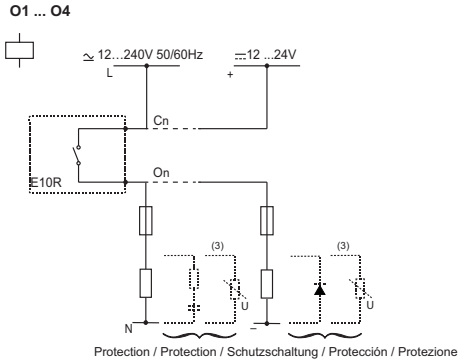


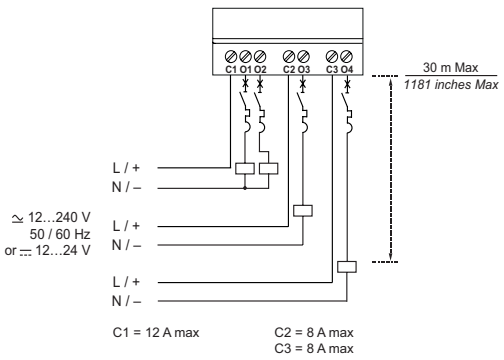


(1) 1 A (UL248) quick-blowing fuse, circuit-breaker or circuit protector (US)
(2) Isolating source

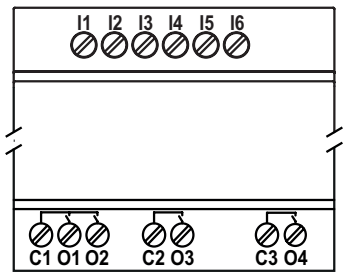
Outputs

O1 ... O4





I/O installations


I1 I2 I3 I4 I5 I6
C1 O1 O2
C2 O3
C3 O4