

## Software Installation

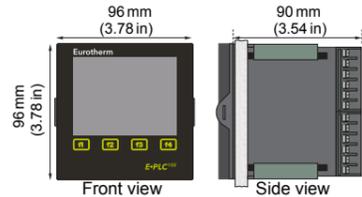
### Requirements

- The PC must be running Windows 7 SP1, 8 or 10 (32 or 64 bit).
- At least 1 GB RAM is required.

### Procedure

- Insert the DVD into the PC drive. The setup program should run automatically unless 'autorun' has been disabled.
- If the DVD fails to autorun, in Windows Explorer double-click the DVD icon to see contents, then double click the **setup.exe** file.
- In the **Do Install** section of the dialog, click the required button to start the installation.
- Follow the instructions shown on-screen for each item of the installation.

## Mechanical Installation



### Panel Cutout

92 mm (3.62 in) × 92 mm (3.62 in)  
[both -0 +0.8 mm (0.03 in)]

### Minimum inter-unit spacing

Horizontal = 10 mm (0.4 in).  
Vertical = 38 mm (1.5 in)

## Labelling

### Symbols used on this instrument

One or more of the symbols may appear as a part of the instrument labelling. When connecting a USB device, it must be plugged directly into the instrument. The use of extension USB leads may compromise the ESD compliance. Observe static precautions when accessing the rear terminals. Take special care with respect to USB and Ethernet connections.

Symbol	Meaning
	Refer to E+PLC100 User Manual for instructions.
	This unit is CE approved.
	RCM. Regulatory Compliance Mark for Australia and NZ.
	Underwriters laboratories listed mark for Canada and the U.S.
	For environmental reasons, this unit must be recycled before its age exceeds the number of years shown in the circle.
	Risk of electric shock.
	Precautions against static electrical discharge must be taken when handling this unit.
	Ethernet connector.
	USB connector.
	Protective earth ground conductor terminal

## Specification

### I/O Types

Analogue input: Four  
Digital input: Three max. (dependent on option board)  
Digital (logic) output: Two max. (dependent on option board)  
Relay output: Three max. (dependent on option board)  
DC output: Three max. (dependent on option board)

### Network communications

Ethernet: 10/100BASE-T (IEEE802.3)  
Protocols: Modbus TCP/IP master/slave  
Cable type: Category 5  
Maximum length: 100metres (110yards)  
Termination: RJ45  
LEDs: Green LED illuminated = link connected; Amber LED flashing shows link activity

### USB port

Number of ports: One at rear of instrument  
Standard: USB1.1  
Transmission speeds: 1.5Mbit/s (low speed device)  
Maximum current: < 100mA  
Peripherals supported: Memory stick (8GB max.), barcode scanner (US locale only), keyboard (US layout only)

### HMI

Display: 3.5" TFT colour display (320 pixels wide × 240 pixels high)  
Projected capacitive touchscreen; webserver

### Controls:

**Memory Resources**  
Application/Visualisation files: 12MB  
Data Recording history files: 28MB  
Retain/Persistent data: 62kB

### Data Recording Update/Archiving

Sample rate (input/output): 8Hz  
Trend update: 10Hz max.  
Archive sample value: Latest value at archive time  
Display value: Latest value at display update time

### Real time clock battery

Stored data: Time, date  
Replacement period: Three years typical  
Support time: Minimum of 1 year with unit unpowered  
Temperature stability: 0 to 55 °C < +3.5ppm  
RTC Ageing: First year to 10 year < ±5ppm  
Type: Lithium polycarbonmonofluoride Eurotherm Part Number PA260195

### CAUTION

Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

### Integrated development environment

Software: CODESYS IDE v3.5 with E+PLC packages

### Power specifications

Supply voltage: Standard: 100 to 230V ac ±15% at 48 to 62Hz  
Low voltage: 24V ac (+10% -15%) at 48 to 62Hz, or 24V dc (+20% -15%)  
Power dissipation: 9W (max.)  
Fuse type: No internal fuse fitted

### Interrupt protection:

Standard: Holdup >20ms at 85V RMS supply voltage  
Low voltage: Holdup >20ms at 20.4V RMS supply voltage

### Environmental specifications

Ambient temperature range  
Operating: 0 to 55 °C  
Storage: -20 to +70 °C, max. rate of change 1 °C/min  
Humidity range: Operating: 5% to 85% RH non-condensing  
Storage: 5% to 85% RH non-condensing  
Protection Front panel: IP66, NEMA12  
Rear panel: IP10 (International)

### Shock/Vibration:

To BS EN61131-2: section 4.2.1 (5 to 150Hz at 2g; 0.5 octave per min.)  
<2000 metres  
Altitude: Not suitable for use in explosive or corrosive atmospheres

### Electromagnetic compatibility

Emissions: Standard units: BS EN61326 Class B—Light industrial  
Low voltage option: BS EN61326 Class A—Heavy industrial  
Immunity: BS EN61326 Industrial

### Other approvals and compliance details

Regional: Europe: CE, RoHS, REACH, WEEE  
USA, Canada: UL, cUL  
Russia: EAC and Metrological Pattern Approval  
China: RoHS, CCC: Not subject to CCC

### Industry-specific:

Nadcap: suitable for use in furnace classes A–E, as per AMS 2750E Section 3  
Packaging: BS61131-2:2007 section 6.3.3/6.3.4.  
Electrical safety: BS EN61010-1 (Installation category II; Pollution degree 2)

### Physical

Panel mounting: ¼ DIN  
Weight: Instrument only: 0.44kg (15.52ozs)  
Panel cut out dimension: 92×92mm, both -0.0mm +0.8mm (3.62×3.62", both -0.00" +0.03")  
Depth behind panel: 90mm (3.54in) excluding wiring

### Fixed I/O

**Analogue Inputs (An In 1–4): General**  
Number of Inputs: Four  
Input types: dc volts, dc mV, dc mA, linear ohms, RTD (2-wire and 3-wire)  
Input type mix: Freely configurable  
Sample rate: 8Hz (125ms)  
Conversion method: 16 bit delta sigma  
Input ranges: See Table 1 and Table 2  
Mains rejection (48 to 62Hz) Series mode: > 95dB  
Common mode: >179dB

Common mode voltage: 250V ac max.  
Series mode voltage: 280mV at lowest range; 5V peak to peak at highest range  
Input Impedance: 40mV, 80mV, 2V ranges: >100MΩ  
10V range: input voltages > 5.6V: 62.5kΩ  
input voltages < 5.6V: 667kΩ

Overvoltage protection: Continuous: ±30V RMS  
Transient (<1ms): ±200V pk-pk between terminals

### Sensor break detection

Type: ac sensor break on each input giving quick response with no associated dc deviations  
Recognition time: <3 seconds  
Minimum break resistance: 40mV & 80mV ranges: 5kΩ; Other ranges: 12.5kΩ

### Isolation:

Channel to channel: 300V RMS or dc (Double insulation)  
Channel to common electronics: 300V RMS or dc (Double insulation)  
Channel to ground: 300V RMS or dc (Single insulation)

### Dielectric strength

Test: BS EN61010, 1 minute type test  
Channel to Channel: 2500V ac  
Channel to Ground: 1500V ac

Low Range	High Range	Resolution	Calibration accuracy (instrument at 25 °C)	Temperature performance
-40mV	+40mV	1.9µV	4.6µV + 0.053% of reading	13ppm of input per °C
-80mV	+80mV	3.2µV	7.5µV + 0.052% of reading	13ppm of input per °C
-2V	+2V	82µV	420µV + 0.044% of reading	13ppm of input per °C
-3V	+10V	500µV	1.5mV + 0.063% of reading	45ppm of input per °C

Table 1: An In 1–4 Voltage input ranges

### Analogue Inputs (An In 1–4): Thermocouple

Temperature scale: ITS90  
C/JC Types: Off, internal, external, remote.  
Remote C/JC source: Any input channel  
Internal C/JC accuracy: <1 °C max., with instrument at 25 °C  
Internal C/JC rejection ratio: 40:1 from 25 °C  
Upscale/downscale drive: High, low or none independently configurable for each channel's sensor break detection  
Types, ranges and accuracies: See Table 2

Thermocouple type	Range (°C)	Standard	Linearisation accuracy (°C)
B	0 to +1820	IEC584.1	0 to 400 = 1.7 400 to 1820 = 0.03
C	0 to +2300	Hoskins	0.12
D	0 to +2495	Hoskins	0.08
E	-270 to +1000	IEC584.1	0.03
G2	0 to +2315	Hoskins	0.07
J	-210 to +1200	IEC584.1	0.02
K	-270 to +1372	IEC584.1	0.04
L	-200 to +900	DIN43710:1985 (to IPTS68)	0.02
N	-270 to +1300	IEC584.1	0.04
R	-50 to +1768	IEC584.1	0.04
S	-50 to +1768	IEC584.1	0.04
T	-270 to +400	IEC584.1	0.02
U	-200 to +600	DIN43710:1985	0.08
NiMo/NiCo	-50 to +1410	ASTM E1751-95	0.06
Platinel	0 to +1370	Engelhard	0.02
Ni/NiMo	0 to +1406	Ipsen	0.14
Pt20%Rh/Pt40%Rh	0 to +1888	ASTM E1751-95	0.07

Table 2: An In 1–4 Thermocouple types, ranges and accuracies

### Analogue Inputs (An In 1–4): Current (dc mA)

Range: 0 to 20mA  
Shunt: 1Ω to 1kΩ mounted externally  
additional deviation due to shunt: 0.1% of input for 2.49Ω shunt

### Analogue Inputs (An In 1–4): Resistance (ohms)

Range: 0 to 400Ω (resolution 20mΩ)  
Calibration accuracy (instrument at 25°C): 120mΩ + 0.023% of reading  
Temperature performance: 25ppm of input per °C

### Analogue Inputs (An In 1–4): RTD (2-wire & 3-wire)

Temperature scale: ITS90  
Maximum source current: 200µA  
Range: 0 to 400Ω (-200 to +850 °C)  
Resolution: 0.05 °C  
Calibration accuracy: ±0.31 °C ±0.023% of measurement in °C at 25 °C ambient  
Temperature coefficient: ±0.01 °C / °C ±25ppm/ °C measurement in °C from 25 °C ambient  
0.05 °C peak-peak with τ = 1.6s input filter

Electrical noise: 0.0033% (best fit straight line)  
Lead resistance: 0 to 22Ω matched lead resistances  
Bulb current: 200µA nominal

RTD type	Overall range (°C)	Standard	Max. linearisation (°C)
Cu10	-20 to +400	General Electric Co.	0.02
Cu53	-70 to +200	RC21-4-1966	0.01
JPT100	-220 to +630	JIS C1604:1989	0.01
Ni100	-60 to +250	DIN43760:1987	0.01
Ni120	-50 to +170	DIN43760:1987	0.01
Pt100	-200 to +850	IEC751	0.01
Pt100A	-200 to +600	Eurotherm Recorders SA	0.09

Table 3: An In 1–4 RTD type details

### Digital Inputs (Dig In A and Dig In B): Contact closure

Short circuit sensing current (source): 5.5mA (min.) to 6.5mA (max.)  
Open circuit (inactive) resistance: > 600Ω  
Closed circuit (active) resistance: < 300Ω

### Relay Outputs (O/P4 and O/P5)

Type: Form A (normally open)  
Contact switching power (resistive): 1A max. at 240V RMS ±15%, 5mA min. at 5V  
Current through terminals: 1A  
Isolation: 300V RMS or dc; double insulated from processor/comms electronics

### Optional I/O

Channel positions Opt 1, Opt 2 and Opt 3 can either be fitted with an LLR board (logic, logic, relay) or a DDD board (dc output, dc output, dc output).

### LLR Logic input (Opt1 only)

Type: Active (current on) contact closure sourcing  
Input current: Input at 12V: 0mA min. to 44mA max.  
Input at 0V: 6mA (steady state) to 44mA (switch current)  
Open circuit input voltage: +11V to +13V  
Open circuit (inactive) resistance: > 500Ω  
Closed circuit (active) resistance: > 150Ω

### LLR Logic outputs (Opt1 and/or Opt2)

Type: Active (current on) current sourcing  
Voltage output across terminal: +11V to +13V  
Short circuit output current: 6mA (steady state) to 44mA (switch current)  
Type: Inactive (current off) current sourcing  
Voltage output across terminals: 0V to +300mV  
Output source leakage current into short circuit: 0µA to 100µA

### LLR Relay (Opt 3 only)

Type: Form A (normally open)  
Contact switching power (resistive): 2A max. at 240V RMS ±15%  
100mA min. at 12V  
Current through terminals: 2A  
Isolation: 300V RMS or dc; double insulated from processor/comms electronics

### DDD mA current outputs (Opt1, Opt2 and Opt3)

Output range: Configurable within 0 to 20mA  
Load resistance: 500Ω max.  
Calibration accuracy: < ±100µA ±1% of reading  
Resolution: > 11 bits  
Thermal drift: < 100ppm/°C  
Isolation: 300V RMS or dc; double insulated from processor/comms electronics

### DDD voltage output (Opt3 only)

Output range: Configurable within 0 to 10V dc  
Load resistance: 500Ω min.  
Calibration accuracy: < ±50mV ±1% of reading  
Resolution: > 11 bits  
Thermal drift: < 100ppm/°C  
Isolation: 300V RMS or dc; double insulated from processor/comms electronics

## Restriction of Hazardous Substances (China RoHS)

The data shown here is related to the following version of the China RoHS 2.0: Administrative Measures for the Restriction of Hazardous Substances in Electric Appliances and Electronic Products" released January 21st 2016.

Part Name	有害物质 - Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal parts	o	o	o	o	o	o
塑料部件 Plastic parts	o	o	o	o	o	o
电子件 Electronic	x	o	o	o	o	o
触点 Contacts	o	o	x	o	o	o
线缆和线缆附件 Cables & cabling accessories	o	o	o	o	o	o

本表格依据SJ/T11364的规定编制。

O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。  
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。

This table is made according to SJ/T 11364.

O: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.

X: indicates that concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572.

Signed (Kevin Shaw, R&D Director):

*K. Shaw*

Date:

24th June 2016

## Safety Notes

### WARNING

Any interruption of the protective conductor inside or outside the apparatus, or disconnection of the protective earth terminal is likely to make the apparatus dangerous under some fault conditions. Intentional interruption is prohibited.

Safety requirements for permanently connected equipment state:

- A switch or circuit breaker shall be included in the building installation
  - It shall be in close proximity to the equipment and within easy reach of the operator
  - It shall be marked as the disconnecting device for the equipment.
  - Recommended external fuse ratings: For 100–230V ac, fuse type: T rated 2A 250V
1. Before any other connection is made, the protective earth terminal shall be connected to a protective conductor. The mains (supply voltage) wiring must be terminated in such a way that, should it slip, the earth wire would be the last wire to become disconnected.
  2. Whenever it is likely that protection has been impaired, the unit shall be made inoperative, and secured against accidental operation. The manufacturer's nearest service centre should be contacted for advice.
  3. Where conductive pollution (e.g. condensation, carbon dust) is likely, adequate air conditioning/filtering/ sealing etc. must be installed in the enclosure.
  4. Signal and supply voltage wiring should be kept separate from one another. Where this is impractical, shielded cables should be used for the signal wiring.
  5. If the unit is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.
  6. Installation must only be carried out by suitably qualified personnel.
  7. To prevent hands or metal tools touching parts that may be electrically live, the unit must be installed in an enclosure.
  8. The designer of any control scheme must consider the potential failure modes of control paths and, for certain critical control functions, provide a means to achieve a safe state during and after a path failure.
  9. Separate or redundant control paths must be provided for critical control functions.
  10. System control paths may include communication links. Consideration must be given to the implications of unanticipated transmission delays or failures of the link.
  11. Each implementation of this equipment must be individually and thoroughly tested for proper operation before being placed into service.
  12. The maximum continuous voltage applied between any of the following terminals must not exceed 240V ac:
    - relay output to logic, dc or sensor connections;
    - any connection to ground.
 The unit must not be wired to a three phase supply with an unearthed star connection. Under fault conditions such a supply could rise above 240V ac with respect to ground and the product would not be safe.
  13. Grounding of the temperature sensor shield. In some installations it is common practice to replace the temperature sensor while the unit is still powered up. Under these conditions, as additional protection against electric shock, we recommend that the shield of the temperature sensor is grounded. Do not rely on grounding through the framework of the machine.
  14. Over Temperature Protection. To prevent overheating of the process under fault conditions, a separate over-temperature protection unit should be fitted which will isolate the heating circuit. This must have an independent temperature sensor. Alarm relays within the unit will not give protection under all failure conditions.
  15. Isopropyl alcohol, water or water based products may be used to clean labels. A mild soap solution may be used to clean other exterior surfaces.
  16. Before removing a unit from its sleeve, disconnect the supply and wait at least two minutes to allow capacitors to discharge. Avoid touching the exposed electronics of an unit when withdrawing it from the sleeve.
  17. This unit is intended for industrial temperature and process control applications within the requirements of the European Directives on Safety and EMC..

### CAUTION

**Live sensors.** The unit is designed to operate if the temperature sensor is connected directly to an electrical heating element. However, you must ensure that service personnel do not touch connections to these inputs while they are live. With a live sensor, all cables, connectors and switches for connecting the sensor must be mains rated for use in 240V ac CATII.

**Wiring:** It is important to connect the unit in accordance with the data in this sheet ensuring that the protective earth connection is ALWAYS fitted first and disconnected last. Wiring must comply with all local wiring regulations, i.e. UK, the latest IEE wiring regulations, (BS7671), and USA, NEC Class 1 wiring methods. Do not connect ac supply to low voltage sensor input or low level inputs and outputs.

### USB Device Precautions

#### NOTICE

The use of U3 USB Flash drives is not recommended.

1. Precautions against electrostatic discharge should be taken when the unit terminals are being accessed. The USB and Ethernet connections are particularly vulnerable.
2. Ideally, the USB device should be plugged directly into the unit, as the use of extension leads may compromise the unit's ESD compliance.
3. When using a USB extension cable, a high quality screened cable must be used with a maximum length of 3 metres (10 ft.).

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# E+PLC<sup>100</sup>

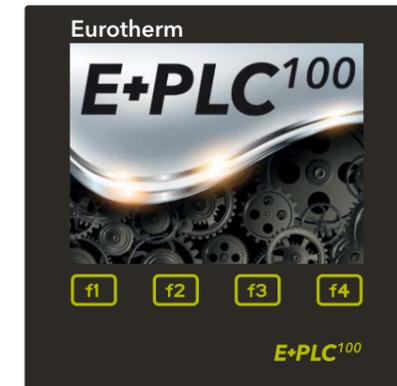
## Installation Guide

GB

E+PLC100 is a ¼ DIN instrument that combines a PLC with precise control, recording and archiving strategies that aids compliance with industry standards. It has the following features:

- Modbus TCP master/slave
- Programmer
- Control loops with autotune
- Zirconia probe support (optional)
- Recording
- Batch
- Archiving
- Webserver (optional)

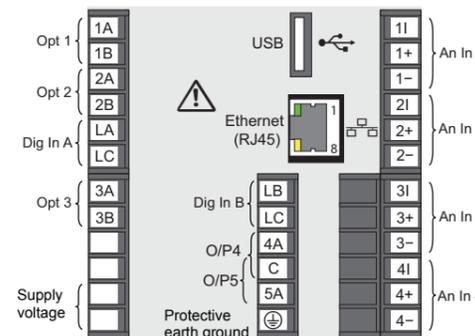
Further information is available in the *E+PLC100 User Manual*, part number HA032001, which may be downloaded from [www.eurotherm.co.uk](http://www.eurotherm.co.uk).



HA032021ENG Issue 9 ECN 35750 August 2017

**Eurotherm**  
by Schneider Electric

## Rear Terminals



## Communications

**Ethernet**  
(10/100 BASE-T)

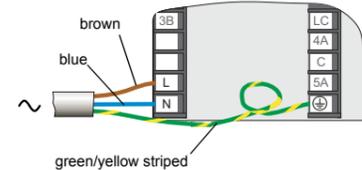
Pin	Function
1	Tx+
2	Tx-
3	Rx+
4	not connected
5	not connected
6	Rx-
7	not connected
8	not connected

**LEDs:**  
Green= link connected  
Amber= network activity

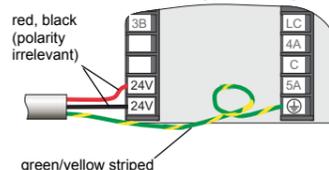
## Power supply

The power supply input is not fuse protected: this must be provided externally. Use copper conductors only.

**Mains (Line) voltage supply wiring**  
100 to 230Vac ±15%, 48 to 62Hz

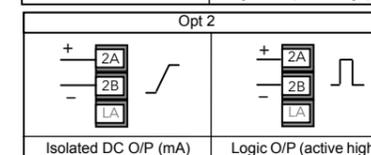
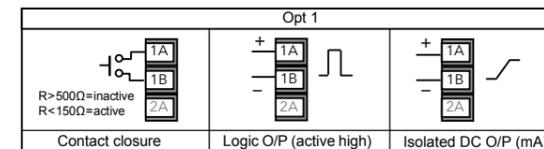


**Low voltage option supply wiring**  
24 Vac (-15%, +10%), 48 to 62Hz  
or 24Vdc (-15%, +20%)



## Termination Details

The screw terminals accept wire sizes in the range: Single wire 0.205 to 2.08 mm<sup>2</sup> (14 to 24 AWG). Two wires 0.205 to 1.31 mm<sup>2</sup> (16 to 24 AWG) inclusive. Screw terminals should be tightened to a torque between 0.4 N·m (3.54 lb-in) and 0.5 N·m (4.43 lb-in).



Each wire connected to LA, LB and LC must be less than 10 metres in length.

