c-pro 3 nano

Programmable controllers (up to 25 I/O)

PLEASE READ CAREFULLY
and save this document
CONSIDER THE ENVIRONMENT

The**Innovation**Evolution

	IMPORTANT
⚠	Read this document carefully before installation and before using the device and take all the prescribed precautions. Keep this document with the device for future consultation. Only use the device in the ways described in this document.

Index

1   INTRODUCTION

1.1   Initial information

c-pro 3 nano is a range of extremely compact programmable controllers with numerous inputs and outputs (up to 25) and with an enhanced memory capacity to meet the management needs of the HVAC/R sector and OEM companies in particular.

Both versions with a CAN port and those with their proprietary INTRABUS port can have the number of I/O increased with the addition of expansions. Moreover, the CAN protocol enables a c-pro 3 nano to be integrated with the entire family of c-pro 3 series controllers and displays.

The MODBUS RTU option, used with an external interface, is always available in both master and slave formats. c-pro 3 nano plus is supplied with an RS-485, making possible the simultaneous presence of 2 MODBUS protocols.

The application software can be designed in a simple, intuitive and portable way thanks to the UNI-PRO 3 integrated development environment. The USB port, supplied as standard, makes the controller easy to program in the development phase and in debugging and it can be updated using the most common USB flash drives.

The stylish design and compact format, only 74x32 mm, make it the ideal controller for panel installation. The user interface consisting of a double LED display (4 + 4 digit), function icons and 4 capacitive touch keys, has IP65 level protection.

## 1.2   Main features of the models available and purchasing codes

The table below shows the main features of the models available and the purchasing codes.

MAIN FEATURES	MODELS AVAILABLE AND PURCHASING CODES					
	c-pro 3 nano basic		c-pro 3 nano CAN		c-pro 3 nano plus	
Power supply	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
12 VAC	•		•		•	
24 VAC/DC		•		•		•
Analogue inputs	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input	5	5	5	5	5	5
for NTC probes, 0-5 V ratiometric transducers, 0-10 V, 0-20 mA or 4-20 mA transducers; can be configured also for dry contact digital input	2	2	2	2	4	4
Digital inputs	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
dry contact and for pulse trains up to 2 KHz	2	2	2	2	2	2
dry contact	1	1	1	1	3	3
Analogue outputs	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
for 0-10 V, PWM or phase cutting signal	2	2	2	2	2	2
for 0-10 V, 0-20 mA or 4-20 mA signal					2	2
Digital outputs	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
SPST electro-mechanical relay, 3 A res. @ 250 VAC	6	6	6	6	7	7
Communications ports	EPN2L	EPN3L	EPN2LXC	EPN3LXC	EPN2LXP	EPN3LXP
INTRABUS port (RS-485 MODBUS master/slave by connecting the serial interface EVIF22ISX)	1	1	1	1	1	1
RS-485 MODBUS port					1	1
CAN port			1	1	1	1
USB port	1	1	1	1	1	1

For more information see section *TECHNICAL SPECIFICATIONS*.

2   DESCRIPTION

The picture below shows the appearance of the devices.

c-pro 3 nano basic

c-pro 3 nano CAN

c-pro 3 nano plus
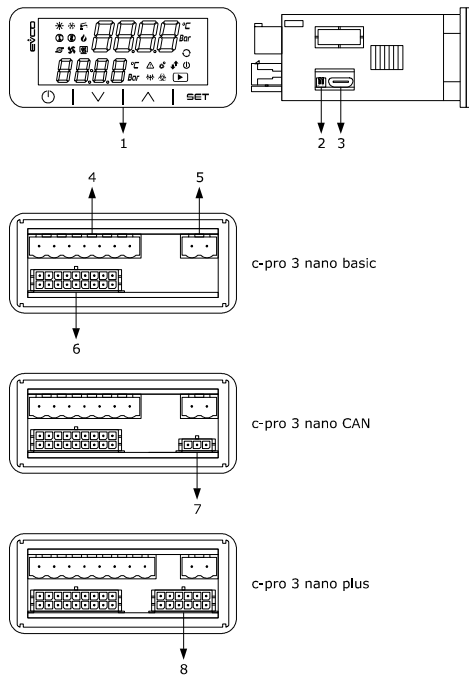
The table below describes each part of the devices.

| PART	DESCRIPTION
1	user interface
2	Micro-switch for: - fitting the termination resistor for the RS-485 MODBUS port - fitting the termination resistor for the CAN port
3	Micro USB connector for USB port
4	plug-in screw terminal block for digital outputs 1... 6
5	plug-in screw terminal block for digital output 7
6	Micro-Fit connector for: - device power supply - auxiliary power supply (12 VDC) - analogue inputs 1... 7 - digital inputs 1... 3 - analogue outputs 1... 2 - INTRABUS port
7	Micro-Fit connector for CAN port
8	Micro-Fit connector for: - auxiliary power supply (5 VDC) - analogue inputs 8... 9 - digital inputs 4... 5 - analogue outputs 3... 4 - RS-485 MODBUS port - CAN port

For more information see subsequent sections.
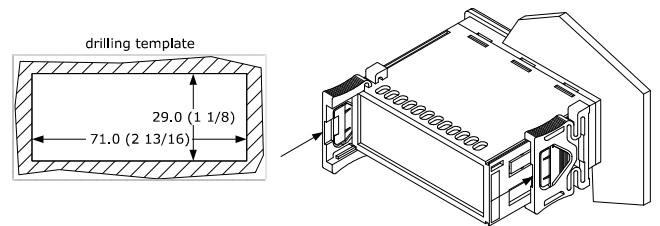
3   MEASUREMENTS AND INSTALLATION

3.1 Measurements

The picture below shows the measurements of the devices.
Measurements are expressed in mm (inches).
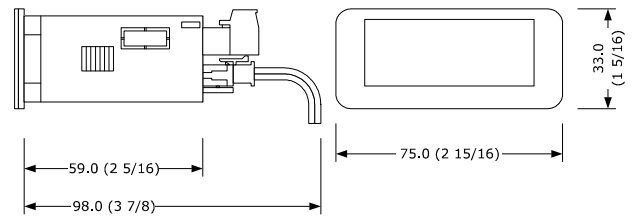
3.2 Installation

The picture below shows the installation of the devices.
To be fitted to a panel, snap-in brackets provided.

INSTALLATION PRECAUTIONS
- The thickness of the panel must be between 0.8 and 2.0 mm (1/32 and 1/16 in).
- Ensure that the working conditions are within the limits stated in the *TECHNICAL SPECIFICATIONS* section.
- Do not install the device close to heat sources, equipment with a strong magnetic field, in places subject to direct sunlight, rain, damp, excessive dust, mechanical vibrations or shocks.
- In compliance with safety regulations, the device must be installed properly to ensure adequate protection from contact with electrical parts. All protective parts must be fixed in such a way as to need the aid of a tool to remove them.

4 ELECTRICAL CONNECTION

|	N.B. - Use cables of an adequate section for the current running through them. - To reduce any electromagnetic interference connect the power cables as far away as possible from the signal cables and, if necessary, connect to a RS-485 MODBUS network and/or a CAN network by using a twisted pair. - The device is not compatible with controllers, I/O expansions and remote user interfaces of the c-pro series. - For more information see section *TECHNICAL SPECIFICATIONS*.

4.1 Connectors

The picture below shows the c-pro 3 nano basic connectors.
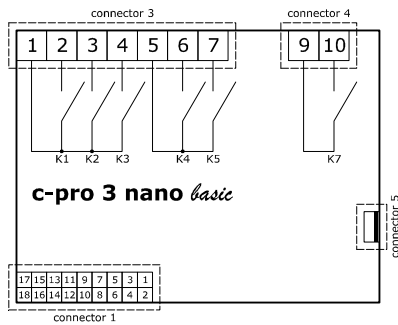
The picture below shows the c-pro 3 nano CAN connectors.
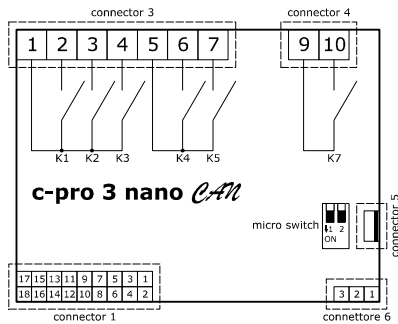
The picture below shows the c-pro 3 nano plus connectors.
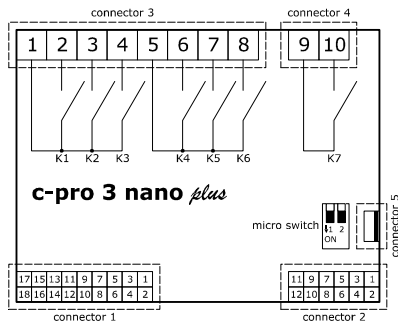
The tables below describe the connectors.

Connector 1

No.	DESCRIPTION
1	analogue input 6 (for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input)
2	analogue input 1 (for NTC probes, 0-5 V, 0-10 V, 0-20 mA or 4-20 mA transducers; can be configured also for dry contact digital input)
3	analogue input 7 (for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input)
4	analogue input 2 (for NTC probes, 0-5 V, 0-10 V, 0-20 mA or 4-20 mA transducers; can be configured also for dry contact digital input)
5	digital input 1 (dry contact and for pulse trains up to 2 KHz)
6	analogue input 3 (for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input)
7	digital input 2 (dry contact and for pulse trains up to 2 KHz)
8	analogue input 4 (for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input)
9	digital input 3 (dry contact)
10	analogue input 5 (for PTC, NTC or Pt 1000 probes; can be configured also for dry contact digital input)
11	analogue output 1 (for 0-10 V, PWM or phase cutting signal)
12	reference (GND)
13	analogue output 2 (for 0-10 V, PWM or phase cutting signal)
14	INTRABUS port data
15	auxiliary power supply (12 VDC)
16	reference (GND)
17	device power supply (12 VAC or 24 VAC/DC, according to the model). If the device is fed by DC power, it is not necessary to take account of the supply voltage polarity
18	device power supply (12 VAC or 24 VAC/DC, according to the model). If the device is fed by DC power, it is not necessary to take account of the supply voltage polarity

Connector 2

No.	DESCRIPTION
1	signal + RS-485 MODBUS master/slave port
2	signal + CAN port
3	signal - RS-485 MODBUS master/slave port
4	signal + CAN port
5	ratiometric transducer power supply 0-5 V (5 VDC)
6	reference (GND)
7	analogue output 3 (for 0-10 V, 0-20 mA or 4-20 mA signal)
8	analogue output 4 (for 0-10 V, 0-20 mA or 4-20 mA signal)
9	digital input 4 (dry contact)
10	analogue input 8 (for NTC probes, 0-5 V ratiometric transducers, 0-10 V, 0-20 mA or 4-20 mA transducers; can be configured also for

No.	DESCRIPTION
	dry contact digital input)
11	digital input 5 (dry contact)
12	analogue input 9 (for NTC probes, 0-5 V ratiometric transducers, 0-10 V, 0-20 mA or 4-20 mA transducers; can be configured also for dry contact digital input)

Connector 3

No.	DESCRIPTION
1	K1, K2 and K3 digital output common contact
2	K1 digital output normally open contact (3 A res. @ 250 VAC)
3	K2 digital output normally open contact (3 A res. @ 250 VAC)
4	K3 digital output normally open contact (3 A res. @ 250 VAC)
5	K4, K5 and K6 digital output common contact
6	K4 digital output normally open contact (3 A res. @ 250 VAC)
7	K5 digital output normally open contact (3 A res. @ 250 VAC)
8	K6 digital output normally open contact (3 A res. @ 250 VAC)

Connector 4

No.	DESCRIPTION
1	K7 digital output common contact
2	K7 digital output normally open contact (3 A res. @ 250 VAC)

Connector 5
USB port.

Connector 6

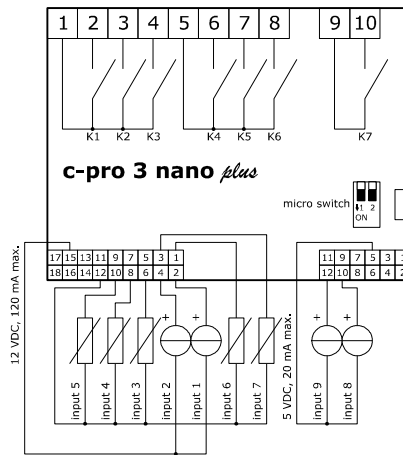| No.	DESCRIPTION
1	reference (GND)
2	signal - CAN port
3	signal + CAN port

4.2 Connection to the power supply

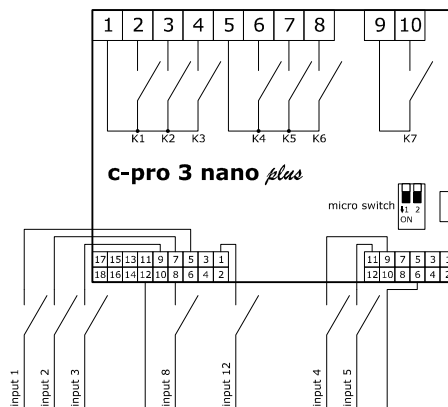The picture below shows the c-pro 3 nano plus connection to the power supply.
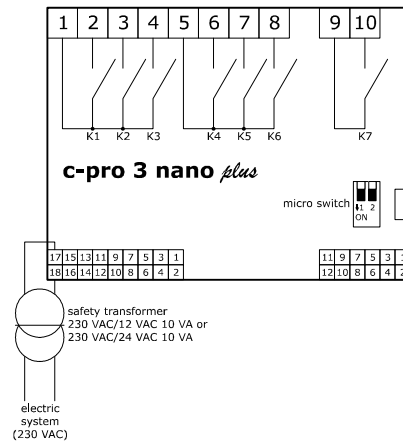
4.3 Analogue input wiring diagram

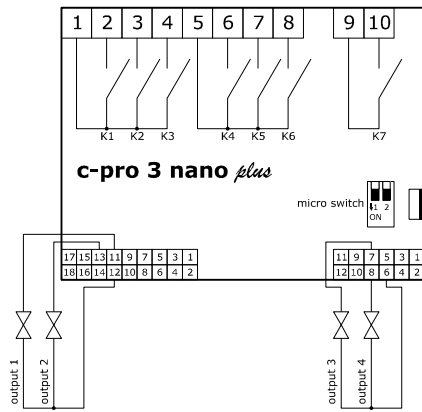The picture below shows an example of c-pro 3 nano plus analogue input connection.

4.4 Digital input wiring diagram

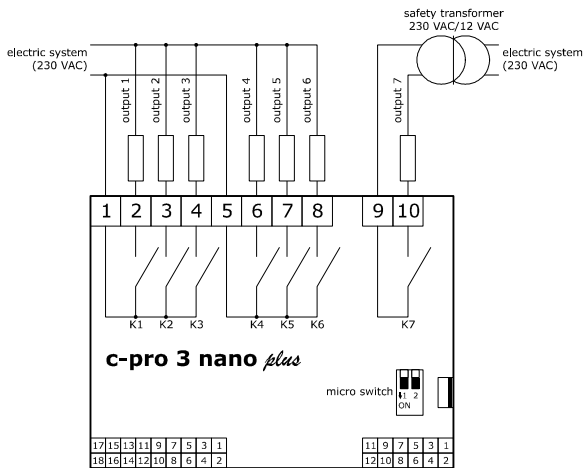The picture below shows the c-pro 3 nano plus digital input connection.

4.5 Analogue output wiring diagram

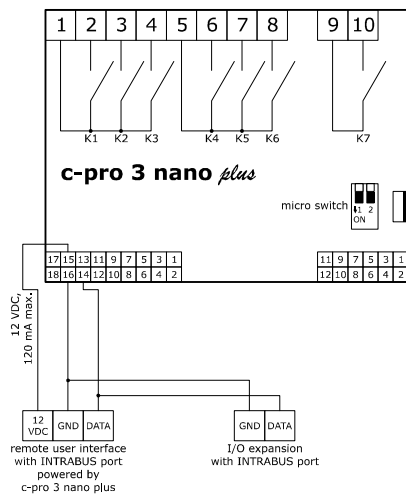The picture below shows the c-pro 3 nano plus analogue output connection.

4.6 Digital output wiring diagram

The picture below shows an example of c-pro 3 nano plus digital output connection.

4.7 INTRABUS port wiring diagram

The picture below shows an example of c-pro 3 nano plus INTRABUS port connection.

The maximum configuration of the INTRABUS network permits 1 programmable controller, 1 I/O expansion and 1 remote user interface.

4.8 RS-485 MODBUS port wiring diagram

The picture below shows an example of c-pro 3 nano plus RS-485 MODBUS port connection.
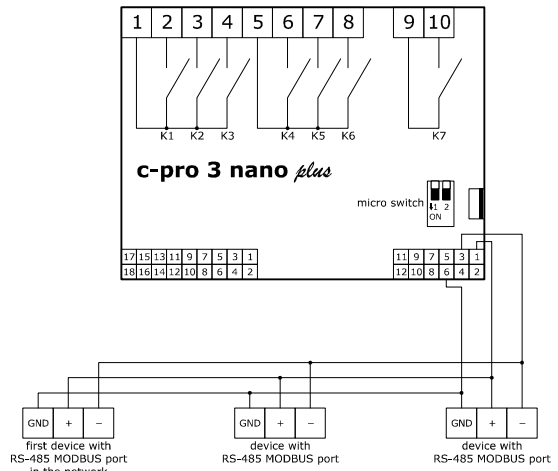
In the example, the c-pro 3 nano plus is the last device on the network with an RS-485 MODBUS port.

4.9 CAN port wiring diagram

The picture below shows an example of c-pro 3 nano plus CAN port connection.
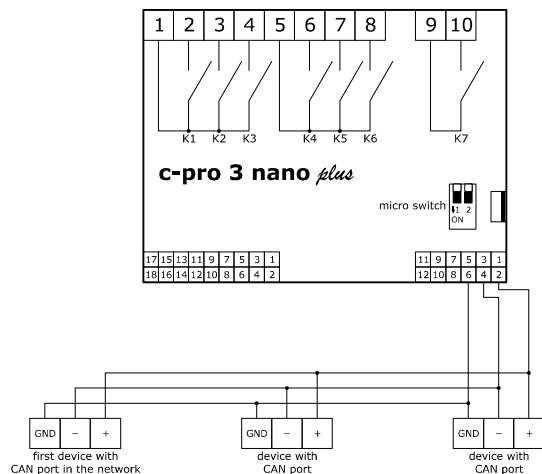
The maximum CAN network configuration permits 32 devices and it depends on the BUS load. The BUS load depends on the baud rate and type of device connected.

The list below gives an example of the CAN network configuration.

-      1 programmable controller
-      4 I/O expansions
-      4 remote user interfaces
-      baud rate 500,000 baud.

4.10 USB port connection to a personal computer

The picture below shows the c-pro 3 nano plus USB port connection to a personal computer.

4.11 USB flash drive connection

The picture below shows a USB flash drive connection to the c-pro 3 nano plus.
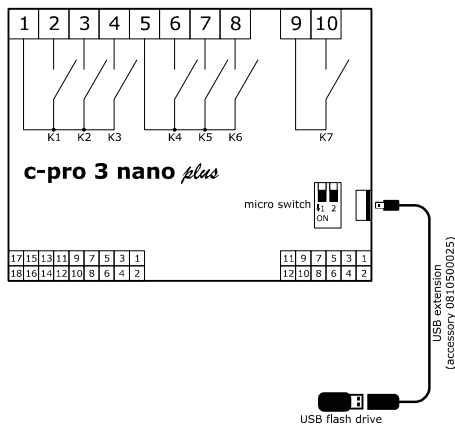
4.12 Fitting the termination resistor for the RS-485 MODBUS and CAN networks

To reduce any reflections on the signal transmitted along the cables connecting the devices to a RS-485 MODBUS network and/or a CAN network it is necessary to fit a termination resistor to the first and last device in the network.
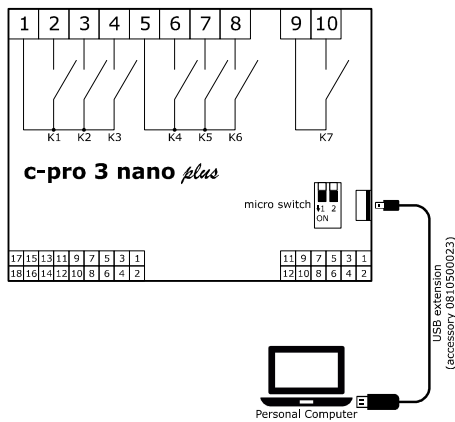
The picture below shows the left side of the devices.

To fit the RS-485 MODBUS network termination resistor, place micro-switch 1 in position ON. To fit the CAN network termination resistor, place micro-switch 2 in position ON.

4.13 Polarisation of RS-485 MODBUS network

The RS-485 MODBUS network can be polarised using the UNI-PRO 3 development environment.

PRECAUTIONS FOR ELECTRICAL CONNECTION
- If using an electrical or pneumatic screwdriver, adjust the tightening torque.
- If the device has been moved from a cold to a warm place, the humidity may have caused condensation to form inside. Wait about an hour before switching on the power.
- Make sure that the supply voltage, electrical frequency and power are within the set limits. See the section *TECHNICAL SPECIFICATIONS*.
- Disconnect the power supply before doing any type of maintenance.
- Do not use the device as safety device.
- For repairs and for further information, contact the EVCO sales network.

5   FIRST-TIME USE

Proceed as follows.

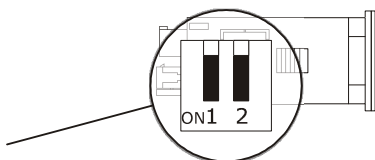1.   Install following the instructions given in the section *MEASUREMENTS AND INSTALLATION*.

2.   Power up the device as shown in the section *Connection to the power supply*: an internal test will start up.
     The test normally takes a few seconds, when it is finished the display will switch off.

3.   Configure the device as shown in the section *DEVICE CONFIGURATION*.

4.   Disconnect the device from the mains.

5.   Make the electrical connection as shown in the section *ELECTRICAL CONNECTION* without powering up the device.

6.   Power up the device.

6   USER INTERFACE AND MAIN FUNCTIONS

The picture below shows the appearance of the device user interface.

ON/STAND-BY   DOWN   UP   SET
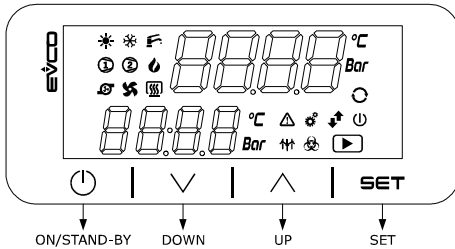
7   DEVICE CONFIGURATION

	N.B.
	- The configuration can be uploaded provided that the firmware of the devices is compatible.
	- Turn off the power after changing the configuration.

To access the procedure proceed as follows.

1.	∨	Touch the DOWN key for 6s.
	The display will show	
	Upper line	**MEnu**
	Lower line	**InFo**

To access the "**InFO**" sub-menu proceed as follows.

2.	SET	Touch the SET key.
3.	∧	Touch the UP or DOWN key to select a parameter, for example the sub-menu parameter "**Pr u**".
	The display will show	
	Upper line	**Pr u** (parameter)
	Lower line	**1** (parameter value)
4.	⏻	Touch the ON/STAND-BY key a few times to return to the main display.

To access the other sub-menus proceed as follows.

2.	∧	Touch the UP or DOWN key to select the sub-menu, for example the sub-menu "**Pr u**".
	The display will show	
	Upper line	**MEnu**
	Upper line	**PAr**
3.	SET	Touch the SET key.
4.	SET	Touch the SET key again.
5.	∧	Touch the UP or DOWN key to set "**-19**".
6.	SET	Touch the SET key.
7.	∧	Touch the UP or DOWN key to select a parameter, for example the parameter "**AI 2**".
	The display will show	
	Upper line	**AI 2** (parameter)
	Lower line	**ntC** (parameter value)
8.	SET	Touch the SET key.
9.	∧	Touch the UP or DOWN key to set the value.
10.	SET	Touch the SET key.
11.	⏻	Touch the ON/STAND-BY key a few times to return to the main display.

If option available, to set the language for viewing the application software proceed as follows.
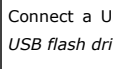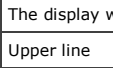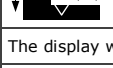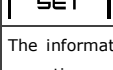
2.		Touch the UP or DOWN key to select the current viewing label, for example the label "**EnG**" (English).
	The display will show	
	Upper line	**MEnu**
	Lower line	**EnG**
3.	**SET**	Touch the SET key.
4.		Touch the UP or DOWN key to select a label, for example "**ItA**" (Italian).
	The display will show	
	Upper line	**MEnu**
	Lower line	**itA**
5.	**SET**	Touch the SET key.
6.	⏻	Touch the ON/STAND-BY key a few times to return to the main display.

To set the date and time proceed as follows (only available for the c-pro 3 nano plus).
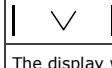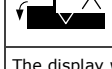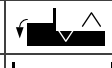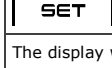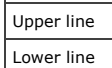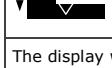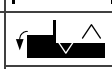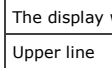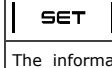
2.		Touch the UP or DOWN key to select the sub-menu "**rtC**".
	The display will show	
	Upper line	**Menu**
	Lower line	**rtC**
3.	**SET**	Touch the SET key.
	The display will show	
	Upper line	**YEAr**
	Lower line	The last two digits of the year
4.	**SET**	Touch the SET key again.
5.		Touch the UP or DOWN key to set the year.
6.	**SET**	Touch the SET key.
7.		Touch the DOWN key to select the next label.
	The display will show	
	Upper line	**Mont**
	Lower line	month (01… 12)
8.	**SET**	Touch the SET key.
9.		Touch the UP or DOWN key to set the month.
10.	**SET**	Touch the SET key.
11.		Touch the DOWN key to select the next label.
	The display will show	
	Upper line	**dAY**
	Lower line	day (01… 31)
12.	**SET**	Touch the SET key.
13.		Touch the UP or DOWN key to set the day.
14.	**SET**	Touch the SET key.
15.		Touch the DOWN key to select the next label.
	The display will show	
	Upper line	**Hour**

	Lower line	Hour (00… 23)
16.	**SET**	Touch the SET key.
17.		Touch the UP or DOWN key to set the hour.
18.	**SET**	Touch the SET key.
19.		Touch the DOWN key to select the next label.
	The display will show	
	Upper line	**Min**
	Lower line	minute (00… 59)
20.	**SET**	Touch the SET key.
21.		Touch the UP or DOWN key to set the minute.
22.	**SET**	Touch the SET key.
23.		Touch the DOWN key to select the next label.
	The display will show	
	Upper line	**SEc**
	Lower line	second (00… 59)
24.	**SET**	Touch the SET key.
25.		Touch the UP or DOWN key to set the second.
26.	**SET**	Touch the SET key.
27.	⏻	Touch the ON/STAND-BY key.
	The display will show	
	Upper line	**SAvE**
	Lower line	**YES**
28.	**SET**	Touch the SET key to save the changes and exit the procedure.
28'.		Touch the UP or DOWN key to select the label "**no**".
	The display will show	
	Upper line	**SAvE**
	Lower line	**no**
28".	**SET**	Touch the SET key if the changes are not to be saved and to exit the procedure.
29.	⏻	Touch the ON/STAND-BY key a few times to return to the main display.

To download the device configuration using a USB flash drive proceed as follows.

1.	Connect a USB flash drive to the device as shown in the section *USB flash drive connection*.
2.	Touch the DOWN key for 4s.
	The display will show
Upper line	**MEnu**
Lower line	**InFo**
3.	Touch the UP or DOWN key to select the sub-menu "**Strd**".
	The display will show
Upper line	**Menu**
Lower line	**Strd**
4.	Touch the SET key.
5.	Touch the SET key again.
6.	Touch the UP or DOWN key to set "**-19**".
7.	Touch the SET key.
	The display will show
Upper line	**PAr** (device parameters)
Lower line	**KEY**
7'.	Touch the UP or DOWN key to select the label "**bK**".
	The display will show
Upper line	**bK** (device backup memory)
Lower line	**MEM**
8.	Touch the SET key.
	The display will show
Upper line	**Key** (or **MEM**)
Lower line	**APPl** (application software parameters)
8'.	Touch the UP or DOWN key to select the label "**HU**".
	The display will show
Upper line	**KeY** (or **MEM**)
Lower line	**HU** (hardware parameters)
9.	Touch the SET key.
10.	Touch the UP or DOWN key to select "**SAvE**".
	The display will show
Upper line	**SAvE**
Lower line	**OK**
11.	Touch the SET key again.
	The information will be downloaded to the USB flash drive. This operation normally takes a few seconds. If there is an error the system alarm LED will light up.
12.	Disconnect the USB flash drive from the device.
13.	Touch the ON/STAND-BY key a few times to return to the main display.

To upload the device configuration using a USB flash drive proceed as follows.

1.	Connect a USB flash drive to the device as shown in the section *USB flash drive connection*.
2.	Touch the DOWN key for 4s.
	The display will show
Upper line	**MEnu**
Lower line	**InFo**
3.	Touch the UP or DOWN key to select the sub-menu "**Strd**".
	The display will show
Upper line	**Menu**
Lower line	**Strd**
4.	Touch the SET key.
5.	Touch the SET key again.
6.	Touch the UP or DOWN key to set "**-19**".
7.	Touch the SET key.
	The display will show
Upper line	**PAr** (device parameters)
Lower line	**KEY**
7'.	Touch the UP or DOWN key to select the label "**bK**".
	The display will show
Upper line	**bK** (device backup memory)
Lower line	**MEM**
8.	Touch the SET key.
9.	Touch the UP or DOWN key to select "**rESt**".
	The display will show
Upper line	**rESt**
Lower line	**oK**
10.	Touch the SET key again.
	The information will be uploaded to the USB flash drive. This operation normally takes a few seconds. If there is an error the system alarm LED will light up.
11.	Disconnect the USB flash drive from the device.
12.	Touch the ON/STAND-BY key a few times to return to the main display.

8   List of hardware parameters

The table below shows the hardware parameters of the device. The hardware parameter values are overwritten by the parameter values of the application software.

Text in italics indicates the way the labels appear on a graphic display, for example on a remote user interface.

No.	SUB-MENU	PARAMETER	DEFAULT	DESCRIPTION	MIN... MAX.
1	InFo *Info*	Pr n *PROJ NUM*	- - - -	application project number	read-only parameter
2	InFo *Info*	Pr u *PROJ VER*	- - - -	application project version	read-only parameter
3	InFo *Info*	Pr r *PROJ REV*	- - - -	application project revision	read-only parameter
4	InFo *Info*	FU u *FW VER*	- - - -	firmware version	read-only parameter
5	InFo *Info*	FU r *FW REV*	- - - -	firmware revision	read-only parameter
6	InFo *Info*	FU S *FW UND*	- - - -	firmware sub-revision	read-only parameter
7	InFo *Info*	HU u *HW VER*	- - - -	hardware version	read-only parameter
8	InFo *Info*	HU r *HW REV*	- - - -	hardware revision	read-only parameter
9	InFo *Info*	SPEc *SPEC*	- - - -	type of hardware (G general; S special)	read-only parameter
10	InFo *Info*	SU u *SW VER*	- - - -	UNI-PRO 3 version	read-only parameter
11	InFo *Info*	SU r *SW REV*	- - - -	UNI-PRO 3 revision	read-only parameter
12	InFo *Info*	SU S *SW UND*	- - - -	UNI-PRO 3 sub-version	read-only parameter
13	InFo *Info*	Sn *SN*	- - - -	serial number	read-only parameter
14	InFo *Info*	tESt *Test*	- - - -	information concerning production testing and calibration	read-only parameter
15	InFo *Info*	MK n *MASK N*	- - - -	mask number (according to the manufacturer's coding system)	read-only parameter
16	InFo *Info*	MK u *MASK VER*	- - - -	mask version (according to the manufacturer's coding system)	read-only parameter
17	InFo *Info*	MK r *MASK REV*	- - - -	mask revision (according to the manufacturer's coding system)	read-only parameter
18	InFo *Info*	dAtE *date and time*	- - - -	date and time the application project was last compiled	read-only parameter
19	PAr *Parameters*	AI 1 *AI 1*	ntC *NTC*	type of probe analogue input 1	ntC = NTC *NTC* 0-20 = 0-20 mA *0-20mA* 4-20 = 4-20 mA *4-20mA* 0-5 = 0-5 V ratiometric *0-5V* 0-10 = 0-10 V *0-10V* rES = electric heater reading *RESIST* nA = not available *nA*

20	PAr *Parameters*	AI 2 *AI 2*	ntC *NTC*	type of probe analogue input 2	ntC *NTC* 0-20 *0-20mA* 4-20 *4-20mA* 0-5 *0-5V* 0-10 *0-10V* rES *RESIST* nA *nA*	= = = = = = =	NTC 0-20 mA 4-20 mA 0-5 V ratiometric 0-10 V electric heater reading not available
21	PAr *Parameters*	AI 3 *AI 3*	ntC *NTC*	type of probe analogue input 3	PtC *PTC* ntC *NTC* Pt10 *PT1000* rES *RESIST* nA *nA*	= = = = =	PTC NTC Pt 1000 electric heater reading not available
22	PAr *Parameters*	AI 4 *AI 4*	ntC *NTC*	type of probe analogue input 4	PtC *PTC* ntC *NTC* Pt10 *PT1000* rES *RESIST* nA *nA*	= = = = =	PTC NTC Pt 1000 electric heater reading not available
23	PAr *Parameters*	AI 5 *AI 5*	ntC *NTC*	type of probe analogue input 5	PtC *PTC* ntC *NTC* Pt10 *PT1000* rES *RESIST* nA *nA*	= = = = =	PTC NTC Pt 1000 electric heater reading not available
24	PAr *Parameters*	AI 6 *AI 6*	ntC *NTC*	type of probe analogue input 6	PtC *PTC* ntC *NTC* Pt10 *PT1000* rES *RESIST* nA *nA*	= = = = =	PTC NTC Pt 1000 electric heater reading not available

25	PAr *Parameters*	AI 7 *AI 7*	ntC *NTC*	type of probe analogue input 7	PtC　　=　PTC *PTC* ntC　　=　NTC *NTC* Pt10　=　Pt 1000 *PT1000* rES　　=　electric heater reading *RESIST* nA　　=　not available *nA*
26	PAr *Parameters* - not available for c-pro 3 nano basic	AI 8 *AI 8*	ntC *NTC*	type of probe analogue input 8	PtC　　=　PTC *PTC* ntC　　=　NTC *NTC* Pt10　=　Pt 1000 *PT1000* rES　　=　electric heater reading *RESIST* nA　　=　not available *nA*
27	PAr *Parameters* - not available for c-pro 3 nano basic	AI 9 *AI 9*	ntC *NTC*	type of probe analogue input 9	PtC　　=　PTC *PTC* ntC　　=　NTC *NTC* Pt10　=　Pt 1000 *PT1000* rES　　=　electric heater reading *RESIST* nA　　=　not available *nA*
28	PAr *Parameters*	Errt *AI Err Time*	2	Analogue input alarm delay by lack of communication	0… 240 s
29	PAr *Parameters*	AOiM *AO impulse*	20	Phase cutting pulse duration	1… 50 ms/10
30	PAr *Parameters*	AO 1 *AO 1*	010V *0-10V*	type of signal analogue output 1	FAn　　=　phase cutting *FAN* 0-10　=　0-10 V *0-10 V* PUM　=　PWM *PWM* nA　　=　not available *nA*
31	PAr *Parameters*	AO1F *Freq*	1000 *1000*	PWM signal frequency analogue output 1	10… 2,000 Hz
32	PAr *Parameters*	AO1d *Delay ph.*	0	PWM signal shift analogue output 1	0… 50 ms/10
33	PAr *Parameters*	AO 2 *AO 2*	010V *0-10V*	type of signal analogue output 2	FAn　　=　phase cutting *FAN* 0-10　=　0-10 V *0-10 V* PUM　=　PWM *PWM* nA　　=　not available *nA*
34	PAr *Parameters*	AO2F *Freq*	1000 *1000*	PWM signal frequency analogue output 2	10… 2,000 Hz
35	PAr *Parameters*	AO2d *Delay ph.*	0	PWM signal shift analogue output 2	0… 50 ms/10

36	PAr *Parameters* - only available for c-pro 3 nano plus	AO 3 *AO 3*	010V *0-10V*	type of signal analogue output 3	0-20 = 0-20 mA *0-20mA* 4-20 = 4-20 mA *4-20mA* 0-10 = 0-10 V *0-10V*
37	PAr *Parameters* - only available for c-pro 3 nano plus	AO 4 *AO 4*	010V *0-10V*	type of signal analogue output 4	0-20 = 0-20 mA *0-20mA* 4-20 = 4-20 mA *4-20mA* 0-10 = 0-10 V *0-10V*
38	Par > Par2 *Parameters*	IOto *I/O Timeout*	60 *60*	remote I/O disable delay by lack of CAN communication	1... 240 s
39	Par > Par2 *Parameters*	EnLE *En. Prg Level*	nO *NO*	enable access to the first level page by touching a key	yES *YES* = proceed as follows. - touch the SET key for 3 seconds to access the first page of level 1 - touch the SET key for 3 seconds to access the first page of level 2 - touch the SET key for 3 seconds to access the first page of level 3
40	Par > Par2 *Parameters*	PUIn *Password Indi*	nO *NO*	password requirement for access to the different levels	nO *NO* = access to a lower level does not require a password yES *YES* = access to each level requires a password
41	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	nLoG *MyNode*	1	device CAN address	1... 127
42	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	MASt *Master*	YES *YES*	enable master function in a CAN network	YES *YES* = YES
43	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	bAUd *Baud*	20 *20K*	baud rate in a CAN network	20 = 20,000 baud *20K* 50 = 50,000 baud *50K* 125 = 125,000 baud *125K* 500 = 500,000 baud *500K*
44	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	tiME *Time*	5	exclusion of a CAN network device delayed by lack of communication	1... 60 s

45	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	nLoG *NetworkNode Logic*	[1]	CAN network device node	[1]... [32]
46	nEt > CAn *Networks > CAN Bus* - not available for c-pro 3 nano basic	NPHI *NetworkNode Phisical*	99	CAN network device address	0... 127
47	nEt > CAn > bit tiM *Networks > CAN Bus > Bit Timing* - not available for c-pro 3 nano basic	tSG1 *TSEG1*	- - - -	unused	- - - -
48	nEt > CAn > bit tiM *Networks > CAN Bus > Bit Timing* - not available for c-pro 3 nano basic	tSG2 *TSEG2*	- - - -	unused	- - - -
49	nEt > CAn > bit tiM *Networks > CAN Bus > Bit Timing* - not available for c-pro 3 nano basic	SJU *SJW*	- - - -	unused	- - - -
50	nEt > CAn > bit tiM *Networks > CAN Bus > Bit Timing* - not available for c-pro 3 nano basic	btr1 *BTR(1)*	- - - -	unused	- - - -
51	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	StAt *Status*	- - - -	CAN communication machine status	read-only parameter init = initialisation *INIT* StoP = stop *STOPPED* oPEr = operating *OPERAT* PrEo = pre-operating *PRE-OP*

52	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	BUS *Bus Status*	- - - -	CAN communication BUS status	read-only parameter OH = ok *OK* UArn = warning *WARNING* PASS = receive mode only *PASSIVE* bOFF = off *BUS OFF*
53	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	rU *Cnt Rx*	- - - -	number of packages received	read-only parameter
54	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	tU *Cnt Tx*	- - - -	number of packages transmitted	read-only parameter
55	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	OuF *Cnt Ovf*	- - - -	number of overflow packages	read-only parameter
56	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	PASS *Cnt Passive*	- - - -	number of transitions with BUS in receive mode only	read-only parameter
57	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	bOFF *Cnt Bus Off*	- - - -	number of transitions with BUS off	read-only parameter
58	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	rHEr *Cnt Rx Err*	- - - -	number of reception errors	read-only parameter

59	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	tHEr *Cnt Tx Err*	- - - -	number of transmission errors	read-only parameter
60	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	StuF *Cnt Stuff*	- - - -	stuff number	read-only parameter
61	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	ForM *Cnt Form*	- - - -	form number	read-only parameter
62	nEt > CAn > CAn dbg *Networks > CAN Bus > Debug* - not available for c-pro 3 nano basic	AcK *Cnt Ack*	- - - -	ack number	read-only parameter

9   ACCESSORIES

9.1   0810500023

USB extension cable

Makes it possible to connect to a personal computer.
Length: 1 m (3.28 ft).

9.2   0810500025

USB extension cable

Makes it possible to connect a USB flash drive.
Length: 2 m (6.56 ft).

9.3   EVIF20SUXI

RS-485/USB serial interface

Makes it possible to connect to the Parameters Manager setup software system.

9.4   EVIF22ISX

INTRABUS/RS-485 serial interface

Makes it possible to convert the INTRABUS signal into an RS-485 signal.

9.5   EVDFAN1

Phase cutting speed regulator for single-phase fans

Makes it possible to regulate a single-phase fan speed with a PWM command signal.
The maximum operating current is 5 A.

9.6   EVUSB4096M

4GB USB flash drive

Makes possible quick configuration upload and download and application software upload.

9.7   CJAV

Connection kit

Makes cabling possible.
The table below lists the kits available.

KIT	SUITABLE FOR
CJAV40	c-pro 3 nano basic
CJAV41	c-pro 3 nano CAN
CJAV42	c-pro 3 nano plus

10 TECHNICAL SPECIFICATIONS

Purpose of the control device	Function controller
Construction of the control device	Built-in electronic device
Container	Black, self-extinguishing
Category of heat and fire resistance	D
Measurements	75.0 x 33.0 x 59.0 mm (2 15/16 x 1 5/16 x 2 5/16 in)
Mounting methods for the control device	To be fitted to a panel, snap-in brackets provided
Degree of protection provided by the covering	IP65 (front)

Connection method		
Micro-Fit connectors	Plug-in screw terminal blocks for wires up to 2.5 mm²	Female Micro USB connector

Maximum permitted length for connection cables	
Power supply: 10 m (32.8 ft)	Analogue inputs: 10 m (32.8 ft)
Auxiliary power supply and 0-5 V ratiometric transducer power supply: 10 m (32.8 ft)	Digital inputs: 10 m (32.8 ft)
0-10 V, 0-20 mA and 4-20 mA analogue outputs: 10 m (32.8 ft)	PWM analogue outputs: 1 m (3.28 ft)
Phase cutting analogue outputs: 1 m (3.28 ft)	Digital outputs: 100 m (328 ft)
INTRABUS port: 10 m (32.8 ft)	RS-485 MODBUS port: 1,000 m (3,280 ft)

CAN port:	
	1,000 m (3,280 ft), baud rate: 20,000 baud
	500 m (1,640 ft), baud rate: 50,000 baud
	250 m (820 ft), baud rate: 125,000 baud
	50 m (164 ft), baud rate: 500,000 baud

USB port: 1 m (3.28 ft)

To cable the device, we recommend using the CJAV40, CJAV41 or CJAV42 connection kit (to be ordered separately). To program it, use USB 0810500023 cable (to be ordered separately).

Operating temperature	from 0 to 55 °C (from 32 to 131 °F)
Storage temperature	from -20 to 70 °C (from -4 to 158 °F)
Operating humidity	Relative humidity without condensate from 5 to 95%
Pollution status of the control device	2

Compliance:		
RoHS 2011/65/EC		WEEE 2012/19/EU
REACH (EC) Regulation no. 1907/2006		EMC 2014/30/EU
Power supply (according to the model)	12 VAC	12 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 7 VA not insulated
	24 VAC/DC	24 VAC (+10% -15%), 50/60 Hz (±3 Hz), max. 7 VA not insulated
		24 VDC (+30% -15%), max. 5 W not

	insulated

Protect the power supply with a 2 A-T 250 VAC fuse.

Earthing methods for the control device	None
Rated impulse-withstand voltage	4 KV
Over-voltage category	III
Software class and structure	A
Clock	According to the model (with secondary lithium battery)
Clock drift	≤ 60 s/month at 25 °C (77 °F)
Clock battery autonomy in the absence of a power supply	> 6 months at 25 °C (77 °F)
Clock battery charging time	24 h (the battery is charged by the power supply of the device)
Analogue inputs	5 for PTC, NTC or Pt 1000 probes (can be configured also for dry contact digital input)
	Up to 4 for NTC probes, 0-5 V, 0-10 V, 0-20 mA or 4-20 mA transducers (can be configured also for dry contact digital input)

PTC probes	Sensor type	KTY 81-121 (990 Ω @ 25 °C, 77 °F)
	Measurement range	from -50 to 150 °C (from -58 to 302 °F)
	Resolution	0.1 °C (1 °F)
NTC probes	Sensor type	ß3435 (10 KΩ @ 25 °C, 77 °F)
	Measurement range	from -50 to 120 °C (from -58 to 248 °F)
	Resolution	0.1 °C (1 °F)
Pt 1000 probes	Sensor type	1 KΩ @ 0 °C, 32 °F
	Measurement range	from -100 to 400 °C (from -148 to 752 °F)
	Resolution	0.1 °C (1 °F)
0-5 V transducers	Input resistance	≥ 10 KΩ
	Resolution	0.01 V
0-10 V transducers	Input resistance	≤ 200 Ω
	Resolution	0.01 mA
4-20 mA transducers	Input resistance	≤ 200 Ω
	Resolution	0.01 mA

Auxiliary power supply:			
If the device has a power supply of 12 VAC, 12 VDC +10% -15%, 120 mA max.	If the device has a power supply of 24 VAC/DC, 12 VDC, 120 mA max.		
Ratiometric transducer power supply	5 VDC, +10% -15%, 20 mA max.		
Digital inputs	2 dry contact and for pulse trains up to 2 KHz		
	Up to 3, dry contact		
Dry contact	Contact type	3.3 VDC, 2 mA	
	Power supply	None	
Analogue outputs	2 for 0-10 V, PWM or phase cutting signal		
	On request, 2 for 0-10 V, 0-20 mA or 4-20 mA signal		
0-10 V signal	Minimum applicable impedance	1 KΩ	
	Resolution	0.01 V	
PWM signal	Power supply	0... 10 VDC (+16% -25%), 10 mA max.	
	Frequency	10 Hz... 2 KHz	
	Duty:	0... 100%	
0-20 mA and 4-20 mA signal	Input resistance	40... 300 Ω	
	Resolution	0.05 mA	
Digital outputs	Up to 7 with SPST electro-mechanical relay, 3 A res. @ 250 VAC		

The device guarantees reinforced insulation between each digital output connector and the rest of the components of the device.

Type 1 or Type 2 Actions	Type 1
Additional features of Type 1 or Type 2 actions	C
Displays	Double custom display, 4 + 4 digit, with function icons
Alarm buzzer	Built-in
Communications ports	
1 INTRABUS port (RS-485 MODBUS master/slave by connecting the serial interface EVIF22ISX)	According to the model, 1 RS-485 MODBUS master/slave port
According to the model, 1 CAN port	1 USB port

c-pro 3 nano
Programmable controllers (up to 25 I/O)
Hardware Manual ver. 1.0
PT - 20/16
Code 114CP3NI103

N.B.
The device must be disposed of according to local regulations governing the collection of electrical and electronic waste.

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