

# PR00

**Compact Configurable Paperless Recorder  
Format 96 x 96 mm.**



**Operator Manual**

**Cod. CRPL\_Serie\_EN\_M1**

**English Language**

**Product Rev: 1.0 - Manual Rev: 1.0**



**Dear Customer**

**We thank you for choosing one of our products, which we hope will meet your expectations, because our mission is not simply to do things that fulfill a technical function, but we work hard every day and not without difficulty to create something more complete. In the end conceptually it is more a basket that contains many things, our ideas, our ability to do, our entrepreneurial commitment to be able to contribute to the construction of a new world, even if it were with just one brick, and all this because we are convinced that companies like ours have a fundamental social role in building a sustainable tomorrow.**

**We are also ambitious and we like to hope that our work can contribute in a small way to its success.**

**Finally, we would like to underline that although we work daily for continuous improvement, we are not perfect and unfortunately it may happen that something has escaped us.**

**If you notice something even minimal and apparently irrelevant, or even if it is a suggestion, please report it to us promptly anyway, with an email message to [info@ceamgroup.it](mailto:info@ceamgroup.it)**

**The sincere and constructive feedback of the customer is a very important resource for us, and a concrete help to improve ourselves.**

**Thank you**

**Simone Campinoti  
President**



## **General index:**

- 1 - Instrument overview**
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## 1 – Instrument Overview

The CEAM PR00 paperless (paperless) datalogger recorder is a compact, economical and very performing instrument, suitable for the most varied uses, both in the industrial, food, medical research fields and in any application where it is necessary to measure and keep memory of measurable physical variables.

The PR00 is equipped with a high-performance High Speed Cortex M4 32-bit processor, equipped with a protection circuit that makes it immune to harmonics and electrical disturbances typical of the industrial environment and also the internal circuit is treated with an anticorrosive, anti-humidity protective coating and anti-dust in order to guarantee maximum protection even in harsh industrial environments.

The instrument format 96x96 mm. compact and modular, through the online configurator on [www.sensorstore.it](http://www.sensorstore.it) it can be ordered with various options, up to 18 configurable inputs for T / C- RTD and linear signals and various other options such as relay alarm outputs, communication serial etc.

### 1.1 – Caratteristiche generali

Functions	Paperless Data Recorder for physical variables
No. CH Analog	1 ÷ 18 independent CH configurable from keyboard
Allarm Output	1 ÷ 4 Independent Relay Outputs - NO - Max load 2A @ 250 Vac - Minimum Cycle Time 1 Second
Comunication	RS485 - Modbus Protocol - Optional Serial Gateway / LAN TCP / IP
Display	5 "Color TFT LCD - Resolution 320 x 240
Keyboard	6 Physical rubber buttons on the front panel
Internal Memory	48 Mbytes Flash memory
External Memory	Support USB 2.0 standard memory
RTC	Interior with Lithium Buffer battery
Power Supply	176 ÷ 264 Vac - 47 ÷ 63 Hz
Consumption	20 VA Max
Housing	Plastic
Montaggio	A Panel - With lateral screw fixing brackets
Installation	Front panel 96 x 96 mm. - Depth 96 mm (110 mm. Including clamps)
Panel Drilling	92 x 92 mm. - Panel thickness 1.5 ÷ 6 mm.
Electrical Connection	Removable screw terminals located on the back of the instrument
Weight	About 0.40 kg
Operating conditions	0 ÷ 50 ° C - 10 ÷ 85 RH% Non condensing

### 1.2 – Tabella Ingressi

Type	Range	Accuracy
RTD Cu50	-50 ÷ 140 °C	± 1.0
RTD Pt100	-200 ÷ 800 °C	± 1.0
Type	Range	Accuracy
Linear	1 ÷ 5 Vdc	± 0.1
	4 ÷ 20 mA	± 0.2
Type	Range	Accuracy
Thermocouple T	-200 ÷ -100 °C	± 1.9
	-100 ÷ 380 °C	± 1.6
Thermocouple E	-200 ÷ 1000 °C	± 2.4
Thermocouple J	-200 ÷ 1200 °C	± 2.4
Thermocouple K	-200 ÷ -100 °C	± 3.3
	-100 ÷ 1300 °C	± 2.0
Thermocouple N	-200 ÷ 1300 °C	± 3.0
Thermocouple S	-50 ÷ 100 °C	± 3.7
	100 ÷ 300 °C	± 2.0
	300 ÷ 1600 °C	± 1.5
Thermocouple R	-50 ÷ 100 °C	± 3.7
	100 ÷ 300 °C	± 2.0
	300 ÷ 1600 °C	± 1.5
Thermocouple B	600 ÷ 1800 °C	± 2.4

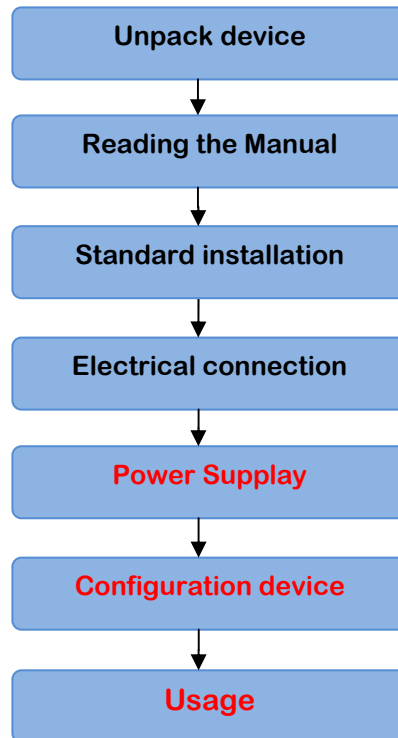
### 1.3 – Tabella Uscite

Type	Status	Contact	range	Cycle Time
1 ÷ 4 Relay Allarm	0/1	Normally Open	2A @ 250 Vac	1 Second

## 2 – Installation & Connection

In this chapter we will describe the correct method for the installation and electrical connection of the instrument for this reason it is mandatory to read it carefully before using the PR00.

Below is the flow chart of the correct use of the PR00 in compliance with current regulations and general good installation and safety practices.



### 2.1 – Unpack device

Once the instrument has been received, check that the package contains in addition to the product obviously in the ordered version also its panel fixing brackets, the removable terminals and all the required accessories, checking that the instrument is intact and not damaged during transport.

**If it is damaged, even slightly deformed, chipped, abraded, stained, damp and / or wet or if it is known that it has been hit or liquid has penetrated into the package, the device must absolutely not be installed or connected to the power supply, even if only test: Doing so runs the risk of damaging the product definitively if it is recoverable, and also runs serious risks for the operator's health.**

### 2.2 – Read Operating Manual

After carrying out the previous point, and the instrument was found to comply with the order and in perfect condition, it is necessary to carefully read the entire manual, and if there are any points that you do not understand, before improvising contact the CEAM technical service for clarification, in order to avoid damaging the instrument or risking damage, even fatal, due to a dangerous and incorrect connection.

### 2.3 – Installation

After having successfully satisfied the previous paragraphs, before proceeding with the installation, it is necessary to check whether the electrical system and the position chosen for mounting the instrument comply with the standards in force, and are protected from the sun, from driving rain, from splashes. and vapors, from dust and dirt, electrostatic disturbances and any type of situation that could generate risks for the instrument and / or for the health of the operators.

Mounting positions near flammable, explosive and dangerous products in general are strictly prohibited.

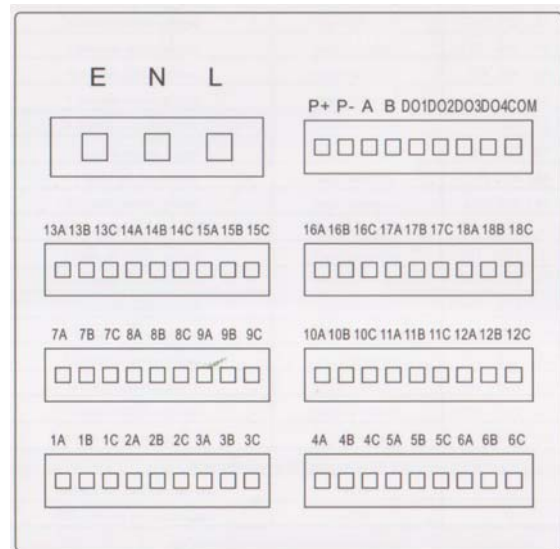


The instrument must imperatively be installed in **INDOOR** positions with maximum protection from any external and environmental agent in compliance with the following points:

- Temperature range 0 ÷ 50 ° C
- Relative humidity 10 ÷ 85% **NON-CONDENSING**
- Correctly ventilated and / or cooled point to avoid overheating of the device
- Total absence of vibrations
- Absence of radio frequency and inductive disturbances
- Stable power supply with the absence of harmful harmonics on the power supply
- Ground connection compliant with standards
- Firmly stationary installation position with no possibility of movement

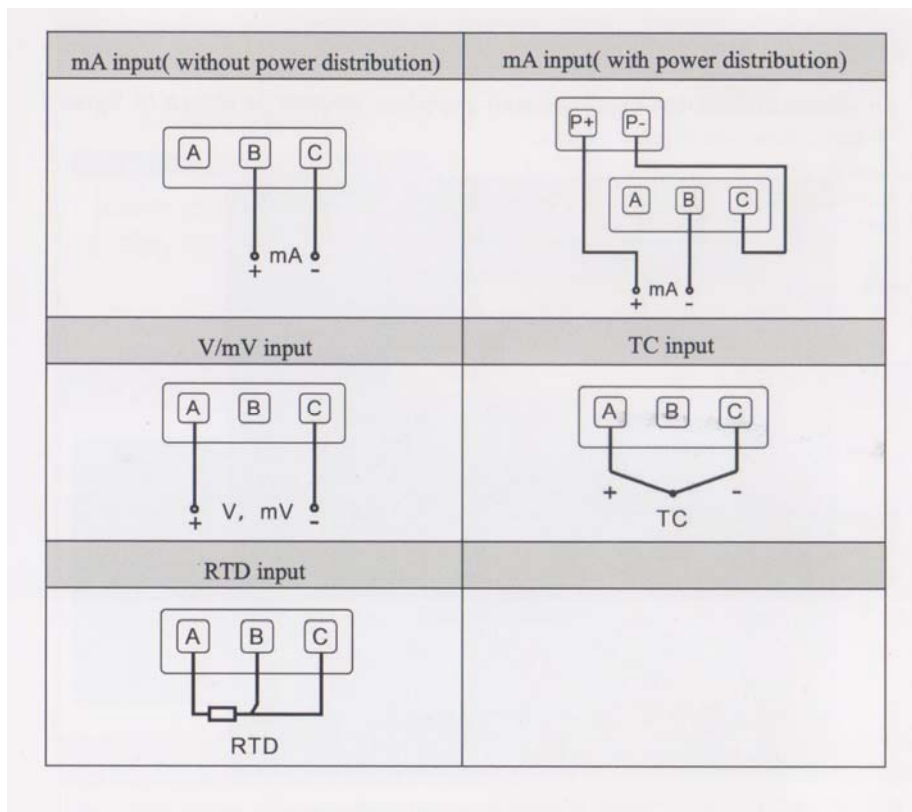
### 2.3.1 – Terminal block

The terminal block is visible in the figure below, the explanation of the individual terminals is defined in the following table



Initial	Definition	Description
<b>E N L</b>	<b>E=Earth – N=Neutral – L=Phase</b>	<b>Power Supply</b>
<b>1A – 1B – 1C</b>	<b>Channel 1 – A-B-C</b>	<b>Configurable Analog Input</b>
<b>2A – 2B – 2C</b>	<b>Channel 2 – A-B-C</b>	
<b>3A – 3B – 3C</b>	<b>Channel 3 – A-B-C</b>	
<b>4A – 4B – 4C</b>	<b>Channel e 4 – A-B-C</b>	
<b>5A – 5B – 5C</b>	<b>Channel 5 – A-B-C</b>	
<b>6A – 6B – 6C</b>	<b>Channel 6 – A-B-C</b>	
<b>7A – 7B – 7C</b>	<b>Channel 7 – A-B-C</b>	
<b>8A – 8B – 8C</b>	<b>Channel 8 – A-B-C</b>	
<b>9A – 9B – 9C</b>	<b>Channel 9 – A-B-C</b>	
<b>10A – 10B – 10C</b>	<b>Channel 10 – A-B-C</b>	
<b>11A – 11B – 11C</b>	<b>Channel 11 – A-B-C</b>	
<b>12A – 12B – 12C</b>	<b>Channel 12 – A-B-C</b>	
<b>13A – 13B – 13C</b>	<b>Channel 13 – A-B-C</b>	
<b>14A – 14B – 14C</b>	<b>Channel 14 – A-B-C</b>	
<b>15A – 15B – 15C</b>	<b>Channel 15 – A-B-C</b>	
<b>16A – 16B – 16C</b>	<b>Channel 16 – A-B-C</b>	
<b>17A – 17B – 17C</b>	<b>Channel 17 – A-B-C</b>	
<b>18A – 18B – 18C</b>	<b>Channel 18 – A-B-C</b>	
<b>D01</b>	<b>Contact Output 1</b>	<b>Allarm 1</b>
<b>D02</b>	<b>Contact Output 2</b>	<b>Allarm 2</b>
<b>D03</b>	<b>Contact Output 3</b>	<b>Allarm 3</b>
<b>D04</b>	<b>Contact Output 4</b>	<b>Allarm 4</b>
<b>COM</b>	<b>Common Contacts</b>	<b>Common</b>
<b>P+</b>	<b>+24 DC</b>	<b>Auxiliary Power supply for Trasmitters</b>
<b>P-</b>	<b>-24 DC</b>	
<b>A</b>	<b>+</b>	<b>RS485 Modbus</b>
<b>B</b>	<b>-</b>	

2.3.2 – Wiring









### 3 – Basic Methods of use




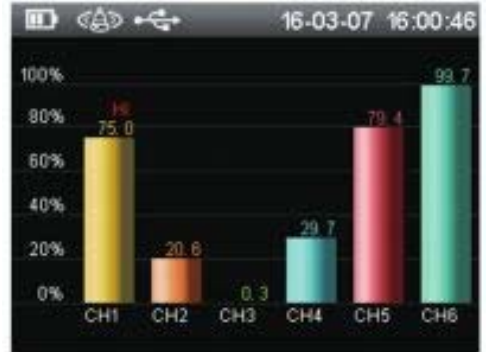
#### 3.1 – Overview



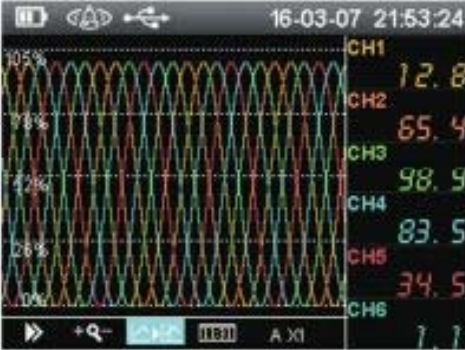

#### 3.2 – Button Functions

Button	Function	Button	Funzione
	UP – Increases		Move Right
	Down – Decrease		Enter - Confirm
	Move Left		Cancel - Cancel




3.2.1 – Display Functions

Prompt BAR	Description
 <p>The Prompt BAR display shows a status bar at the top with icons for battery, alarm, and USB. Below the icons, the date and time are displayed. Labels 'Stato Batteria', 'USB Status', 'Status Allarmi', and 'Orologio - Data &amp; Ora' are positioned around the display.</p>	<p><b>The Status Bar is positioned at the top of the display</b></p> <ol style="list-style-type: none"> <li>1) The battery is optional and not always present</li> <li>2) The Alarms symbol appears only in the event of an alarm</li> <li>3) The USB symbol appears only with the connected memory</li> </ol>
Front Panel	
 <p>The Front Panel display shows a 2x3 grid of channel data. Each cell contains the channel number (CH), a relative alarm status (HH), and a numeric value. The values are: CH1: 99.7, CH2: 65.4, CH3: 16.5, CH4: 1.1, CH5: 34.5, CH6: 83.5.</p>	<p>General digital summary display (18 CH):</p> <p>In each box it displays the channel number (CH), the relative alarm status (HH) and the variable with the configured resolution, but for compactness it does not display the unit of measurement</p> <p>If (XXXXX) or (.....) is displayed instead of the numeric variable, it means that the channel is disconnected</p> <p>To switch to the other display modes, press the Right &amp; Left arrow keys</p>
Digital Visualization	
 <p>The Digital Visualization display shows a 3x2 grid of channel data. Each cell contains the channel number (CH), a relative alarm status (HH), a numeric value, and a unit of measurement (mA). The values are: CH1: 4.692 mA, CH2: 6.055 mA, CH3: 13.663 mA, CH4: 19.608 mA, CH5: 17.945 mA, CH6: 10.337 mA.</p>	<p>Compact digital summary display (4/6 CH):</p> <p>In each box it displays the channel number (CH), the relative alarm status (HH) and the variable with the configured resolution, and at the bottom also the unit of measurement</p> <p>If (XXXXX) or (.....) is displayed instead of the numeric variable, it means that the channel is disconnected</p> <p>To switch to the other display modes, press the Right &amp; Left arrow keys</p>
Bar Display Visualization	
 <p>The Bar Display Visualization shows a bar chart with 6 channels. The y-axis represents percentage from 0% to 100%. The x-axis shows channel numbers CH1 to CH6. The bars are colored and labeled with their respective values: CH1 (75.0), CH2 (20.6), CH3 (0.3), CH4 (29.7), CH5 (79.4), CH6 (99.7).</p>	<p>Vertical Bar Display:</p> <p>Each colored bar that corresponds to a Channel (CH) displays the value of the variable both in percentage by lateral scale and in a precise manner above the bar.</p> <p>Each channel has a bar color which is then repeated in the views where the identifying color is provided</p> <p>To switch to the other display modes, press the Right &amp; Left arrow keys</p>

Horizontal Bar Visualization																																				
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Front Panel	
	<p><b>Multiple analog display:</b></p> <p>Each channel is displayed in a different color, and the point value is shown on the right of the display.</p> <p>Using the UP &amp; Down arrows you enter the functions of the lower part of the display, on which you move using the side arrows</p> <p>To switch to the other display modes, press the Right &amp; Left arrow keys</p>
Lower Functional Bar	
	<p>In the lower part of the analog display, a status bar appears, through which it is possible to use some functions</p> <p>1 = Standard Functionality                  2 = Selection of the channels to be displayed - Side Flag                  3 = Zoom to collapse expand                  4 = Select View Real-Time / Historical                  5 = TIME display                  6 = Zoom View Through Point 03</p>

3.2.2 – Access to Configuration Mode


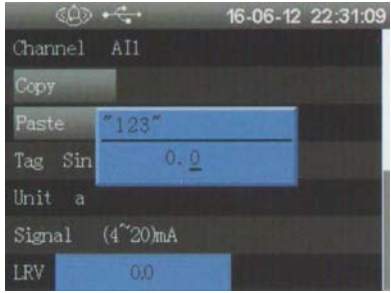
Step	Operation	Display
1	<p>To enter configuration:</p> <p>Simultaneously press and hold down the UP Arrow and Left Arrow keys for 4 seconds</p> 	
2	<p>Using the left and right arrows to move from the top display, to enter the password, in the Sub-Display that appears below.</p> <p>Confirm by pressing OK</p>	
3	<p>Move with the side arrows to select the Digit of the Pass and the vertical arrows to set the number</p> <p>Press the OK button to confirm</p> <p>After entering the Pass, use the side arrows to move to the lower display ENTER and confirm by pressing OK and you enter the configuration menu</p> <p>To exit the configuration press C</p>	



3.2.3 – Configuration Menu

Step	Operation	Display
1	<p>This is the general configuration menu of the instrument, through which it is possible to access each configuration area.</p> <p><b>Warning: The various menu items are accessible only if the relevant Hardware options are present and are highlighted with white writing, otherwise they are gray and not accessible.</b></p>	
2	<p>To exit the configuration press C, if it has been modified in any of its parts, you are asked to confirm the changes with the OK key</p>	
3	<p>While moving to Cancel and pressing OK you exit without saving the changes.</p>	
4	<p>The menu items are as follows:</p> <p><b>AI = Analog Input = Analog Inputs</b>  <b>AO = Not currently available</b>  <b>PWM = Not currently available</b>  <b>FLOW = Not currently available</b>  <b>ACC = Not currently available</b>  <b>Control = Not currently available</b>  <b>Function = Instrument functions</b>  <b>System = General system configuration</b></p>	

3.2.4 – AI – Analogic Input

Step	Operation	Display
1	<p>After pressing the AI selection from the general configuration menu, you enter the sub-menu that allows you to configure the analog inputs</p> <p>Each channel is identified by the initials AI1..AI2..AI3 etc.</p> <p>To move between the channels use the vertical side arrows.</p> <p>Press OK to confirm and enter the channel</p>	
2	<p>The following parameters can be configured on each selected channel by scrolling them and pressing OK to enter the Sub menu:</p> <p>Tag: Label for custom ID name  Unit: Unit of measure setting  Signal: Type of input mV-mA-RTD-TC  LRV: Start of scale displayed (Graphs)  URV: Full Scale Displayed (Graphs)  Correction A: Correction value (Multiplier)  Correction B: Correction value (Sum value)  Filter: Time filter value on the measure  Fault Output: Value to be displayed in case of Sensor Breack  Alarm: Setting type-Value-Alarm output on the CH</p>	
3	<p><b>ALARM Function</b></p>	<p>For each channel it is possible to set one or more alarms of different type and value, the types are as follows:</p> <p>HH = Very high  HI = High  LI = Low  LL = Very Low</p> <p>An independent numerical value can be set for each type of alarm</p>
	<p><b>Allarm Hysteresis (Important)</b></p>	<p>The Hysteresis function, which can be set numerically in engineering units, allows you to create a dead band in which the alarm remains active, and which is more useful in many applications, as well as making the alarm of unstable measurements more reliable.</p> <p>Example: Let's assume a level measurement with scale 0 ÷ 100, with alarm at 90 and Hysteresis set at 10:</p> <p>In this case the HH alarm is triggered at 90 but if the variable drops below 90 it remains active, until it reaches 80 (or 90 - 10 = 80)</p> <p>Otherwise, in the case of Hysteresis set = 0, the alarm is activated and deactivated by exceeding the punctual value.</p>
	<p><b>Physical Alarm Output</b></p>	<p>Each alarm can only be displayed or it can also be configured to generate a physical relay output by assigning one of the 4 outputs (D01 –D02 –DO3-DO4) if they have been ordered.</p>

3.2.5 – Function



Step	Operation	Display
1	Del Infos	Del Pow OnOff Info = Deletion of all info at shutdown Del Alm Info = Manual deletion of the alarm log Del Log Info = Manual deletion of analog historical data
2	U Disk	Save CFG = Saving configuration on USB key Read CFG = Reading configuration from USB key
3	Comm	Data relating to the communication of the RS485 serial port - Modbus protocol Device Addr = Instrument Serial ID Baud Rate = Communication speed 1200 - 9600 - 57600 Parity Bit = None - Odd Parity - Even Parity Float Format = 1234 - 2143 - 3412 - 4321

### 3.2.6 – System

Step	Operation	Display
1	Password	Configuration access password = 6 Digit - Factory value 000000
2	Device ID	Alphanumeric Name Instrument - 8 Digit Available
3	Time Format	Date Time Instrument Time format - yy = year - mm = month - dd = day Date format options: yymmdd - ddmmyy - mmddyy
4	Language	Lenguage
5	Default Pic	Default Picture = To Date - Numeric - None
6	Group Circle	0 Seconds - 5 Seconds - 10 Seconds - 30 Seconds
7	Atmosphere	Atmospheric Pressure Setting - Factory 0.10132 Mpa
8	Factory Reset	Reset and return to the factory configuration base

## 4 – Communication - RS485 Modbus

Step	Description	Range parameter
Instrument Address	Modbus Devices Address	1 ÷ 254
Baud Rate	Comunication speed	1200 – 9600 – 57600 - 115200
Parity bit	Communication Verify	No Parity – Odd Parity – Even Parity
Floating point format		1234 – 2143 – 3212 - 4321

### Example of communication real-time value of channel No. 2 Analogue

Dato esempio : 06 03 00 03 00 02 35 BC	
Item	Description
06	ID Instrument address (The configuration can be changed)
03	Code 03 Order to Modbus
00	Four bytes of returned date
00 03	Address 03 of register
00 02	The number of register is 2
35 BC	CRC Verify
Returned Data	
06	Instrument Address
03	Code 03 Order to Modbus
04	Four bytes of returned date
00 00 43 48	Floating Point , it represente 200.0
BD F5	CRC Verify

## 5 – Operation Disk & Memory

### 5.1 – External USB Memory

The tool supports USB Flash memories as external memory, for saving data for export, and for maintaining them as a Backup

Saving of historical and configuration data:

Step	Description	File
Sava All Data HDR	Saving all data in HDR format	.hdr
Save All Data CSV	Saving all data in CSV format	.csv
Save All Data HDA	Data saving in HDA format	.hda
Save Cumulative Report	Global saving of all data in CSV form	.csv
Save Alarm	Saving Alarms	.csv
Save Power-Fail	Power outage saving	.csv
Save LOG Record	Log history	.csv
Save Instrument Configuration	Saving the instrument configuration	.cfg
Read Instrument Configuration	Upload instrument configuration from USB memory. Attention the new saved configuration will be displayed only after disconnecting and reinserting the USB memory	.cfg

**PATH TO SAVE:**

The various files of the instrument are saved in the following Root of the USB Flash memory:

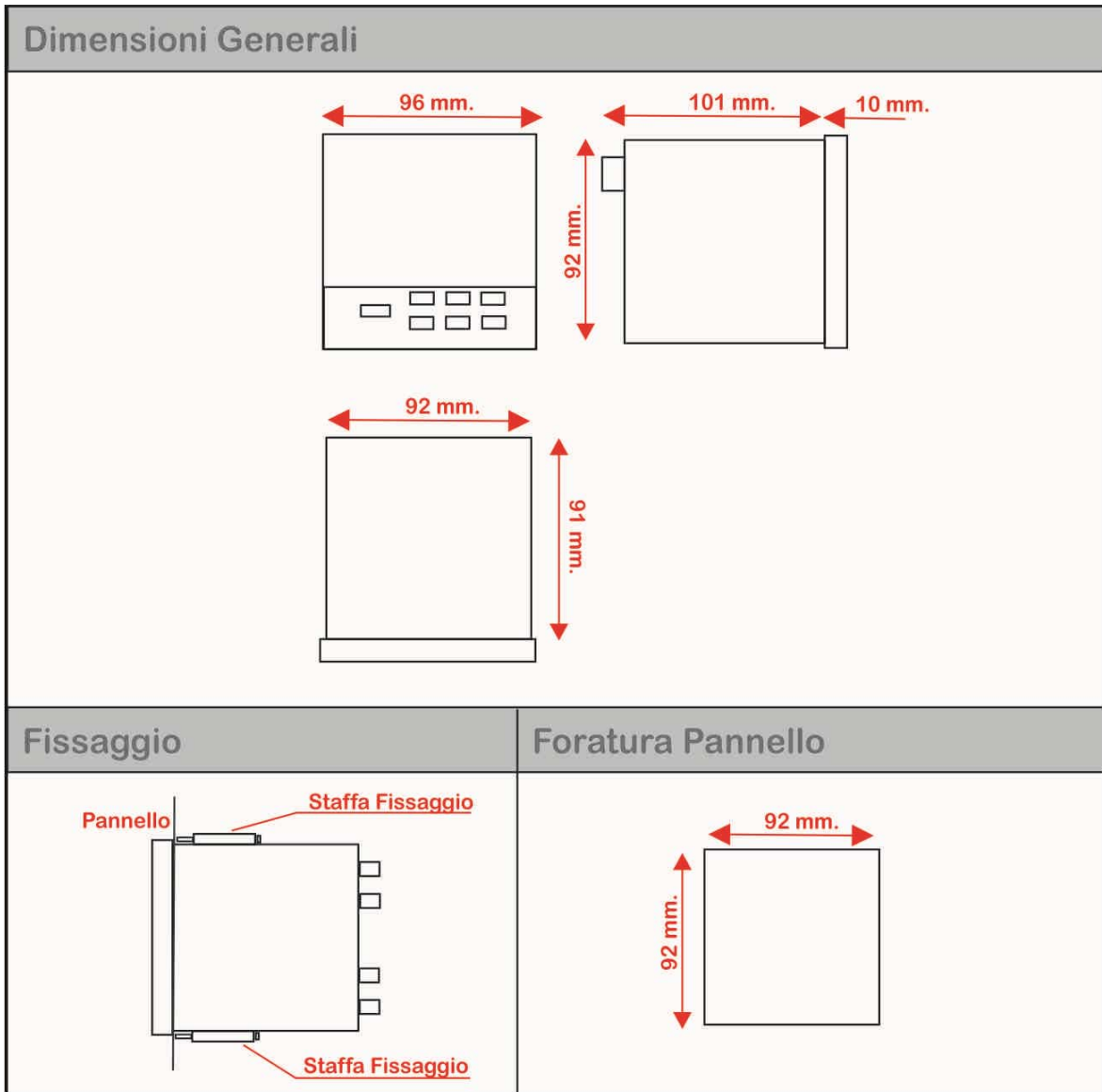
File	Subdirectory	File Name
History Record	/History	H161009A.csv oppure H161009A.HDA
Cumulative Report	/Info	A161009A.csv
Alarm Information	/Info	B161009A.csv
Power-Fail record	/Info	P161009A.csv
Log Record	/Info	L161009A.csv

Notes: The initial letters H - A - B - P - L represent the type of files, the next number indicates the date the file was saved, the last letter from A to Z indicates that various types of files can be saved up to to 23 times a day.

5.2 – Cleaning Operation

Configuration Item	Description Function
Clear Accumulated Value	Cleaning of all data accumulated in memory
Clear Accumulated Reports	Cleaning of all reports accumulated in memory
Clear Alarm Information	Clean up all saved alarm data
Clear Power-Fail Records	Clean up all saved power failure data
Clear Log Records	Clean up all LOG data

## 6 – Dimension & Panel Drilling



## 7 – Warranty

### **Attention!!**

This manual is purely indicative, and subject to change at any time, without giving any prior notice.

Failure to strictly observe the instructions contained in this manual, opening and tampering with the product, incorrect use, incorrect connection, use of non-original CEAM Control Equipment spare parts and accessories, removal of labels and signs of recognition affixed by CEAM Control Equipment, and hidden export to non-EC countries, will immediately invalidate product liability and the right to guarantee!

**Terms of Warranty:** The product is guaranteed for a maximum period of 12 months (Art. 1490 CC and following), the validity of the guarantee is starting from the date of the delivery document, even if it is on consignment then transformed into a sale, warranty conditions offered by CEAM Control Equipment in compliance with current regulations, are published, and available to those who explicitly request it, the document is deposited in paper and / or electronic form at the CEAM Control Equipment headquarters, in order to be able viewing it is sufficient to make a written request, specifying the applicant's title.

**\*\* Note:** For some types of probe, the maximum operating temperature indicated in the specific data sheet or directly on the product, may be lower, exceeding this limit immediately voids the warranty.

### **The Warranty Covers:**

The products and components whose malfunction can be traced back with certainty to manufacturing defects, any defect found gives the right only to the repair of the same and not to the replacement of the product, furthermore any production defect does not give the right to terminate the contract. or to suspend payment unless expressly agreed in writing by CEAM.

### **The Warranty not Covers:**

Defects generated by incorrect or improper use of the product Defects generated by the use of non-original CEAM spare parts or consumables Defects generated by environmental and / or atmospheric problems and / or natural disasters Products and / or services tampered with or modified even partially Products and / or services from which original CEAM labels and lot codes have been removed and / or tampered with, even if only partially

### **In any case, the Warranty covers:**

Batteries, magnetic media, perishable products, and / or consumables The components of third parties, for which their assistance service is directly responsible, in the manner provided by them. The time of the technician employed in the verification and / or repair of the products The costs for travel and technical interventions on site if they are carried out. The costs for packaging and shipping the products to and from the products. All ancillary costs incurred by CEAM for the fulfillment of the guarantee.

### **Disclaimer**

CEAM assumes no responsibility for any direct and indirect damage caused to things and people, or damage due to lack of production and / or incorrect production and / or any damage in any way attributable to the product and / or service covered by this manual.

CEAM assumes no responsibility for any damage caused to things and people by any non-compliance with the product and / or service of this manual, which is purely indicative, and can be changed by CEAM at any time without giving any prior notice.



## **8 – How to Order**

The PR00 is an instrument that can be ordered with various options, all of which can be viewed online directly at [www.sensorstore.it](http://www.sensorstore.it)

To generate the complete code for the order or to request an offer, use the online configurator <http://www.sensorstore.it/catalogo/pr00.html> where you can also download the available documentation and also view any accessories.

Or access directly using the following QR code of the QRceam.it system



## Operator Clipboard:

Date:

Operator

Plant:

Ch1:

Ch2:

Ch3:

Ch4:

Company With Quality System Certified

**UNI EN ISO 9001:2008**

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Rivenditore di zona: