

CA 1821

CA 1822



CA 1823



Thermometers

Thank you for purchasing this **CA 1821** or **CA 1822 thermocouple thermometer** or **CA 1823 resistance thermometer**.
For best results from your instrument:

- **read** these operating instructions carefully,
- **comply** with the precautions for use.

| | |
|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | WARNING, risk of DANGER! The operator must refer to these instructions whenever this danger symbol appears. |
|  | Information or useful tip. |
|  | Battery. |
|  | Magnet. |
|  | The product is declared recyclable following an analysis of the life cycle in accordance with standard ISO 14040. |
|  | Chauvin Arnoux has adopted an Eco-Design approach in order to design this appliance. Analysis of the complete life-cycle has enabled us to control and optimize the effects of the product on the environment. In particular this appliance exceeds regulation requirements with respect to recycling and reuse. |
|  | |
|  | The CE marking certifies that the product is in compliance with the requirements applicable in the Union European, in particular as regards Low Voltage Directive 2014/35/EU, Electromagnetic Compatibility Directive 2014/30/EU, Radio Equipment Directive 2014/53/EU, and Restriction of Hazardous Substances Directives 2011/65/EU and 2015/863/EU. |
|  | The UKCA marking certifies that the product is in compliance with the requirements applicable in the United Kingdom as regards Low Voltage, Electromagnetic Compatibility, and Restriction of Hazardous Substances. |
|  | The rubbish bin with a line through it indicates that, in the European Union, the product must undergo selective disposal in compliance with Directive WEEE 2012/19/EU. This equipment must not be treated as household waste. |

PRECAUTIONS FOR USE

This instrument is compliant with safety standard IEC/EN 61010-2-030 or BS EN 61010-2-030, for voltages up to 5V with respect to ground. Failure to observe the safety instructions may result in electric shock, fire, explosion, and destruction of the instrument and of the installations.

- The operator and/or the responsible authority must carefully read and clearly understand the various precautions to be taken in use. Sound knowledge and a keen awareness of electrical hazards are essential when using this instrument.
- Observe the conditions of use, namely the temperature, the relative humidity, the altitude, the degree of pollution, and the place of use.
- Do not use the instrument if it seems to be damaged, incomplete, or poorly close.
- Before each use, check the condition of the housing and accessories. Any item of which the insulation is deteriorated (even partially) must be set aside for repair or scrapping.
- Do not make measurements on bare live conductors. Use a non-contact sensor or a sensor that provides the necessary electrical insulation.
- Always wear personal protective equipment (PPE), in particular insulating gloves, if there is any doubt or it is impossible to measure the voltage levels to which the temperature sensor is connected.
- All troubleshooting and metrological checks must be done by competent, accredited personnel.

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1. FIRST USE

1.1. DELIVERY CONDITION

CA 1821 thermocouple thermometer

Supplied in a cardboard box with:

- three AA or LR6 alkaline batteries,
- one USB-micro USB cord,
- one multilingual getting started guide,
- one test report,
- one carrying case.

CA 1822 thermocouple thermometer

Supplied in a cardboard box with:

- three AA or LR6 alkaline batteries,
- one USB-micro USB cord,
- one multilingual getting started guide,
- one test report,
- one carrying case.



CA 1823 resistance thermometer

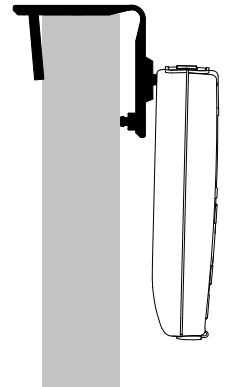
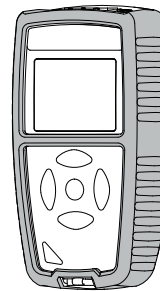
Supplied in a cardboard box with:

- three AA or LR6 alkaline batteries,
- one USB-micro USB cord,
- one multilingual getting started guide,
- one test report,
- one carrying case.

1.2. ACCESSORIES

You have an extensive choice of specialized sensors:

- K thermocouple (needle sensor, deformable sensor, semi-rigid sensor, surface sensor, surface sensor with spring, flexible sensor, air sensor, pipe sensor, magnet sensor).
- K thermocouple extension cable.
- PT100 probe (needle sensor, surface sensor with spring, air sensor, liquid sensor).
- Multi-purpose attachment accessory 
- Carrying bag.
- USB-Bluetooth adapter
- USB-mains adapter with USB-micro USB cord.
- Protecting sheath 
- DataView application software



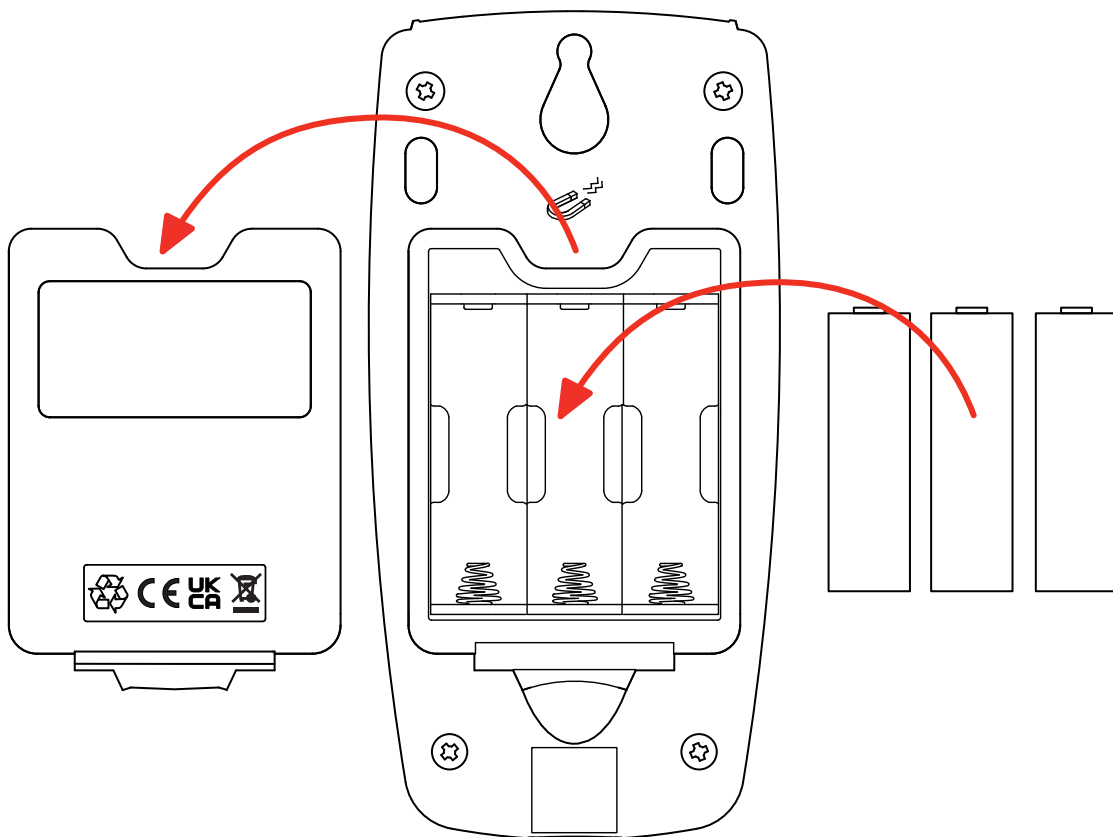
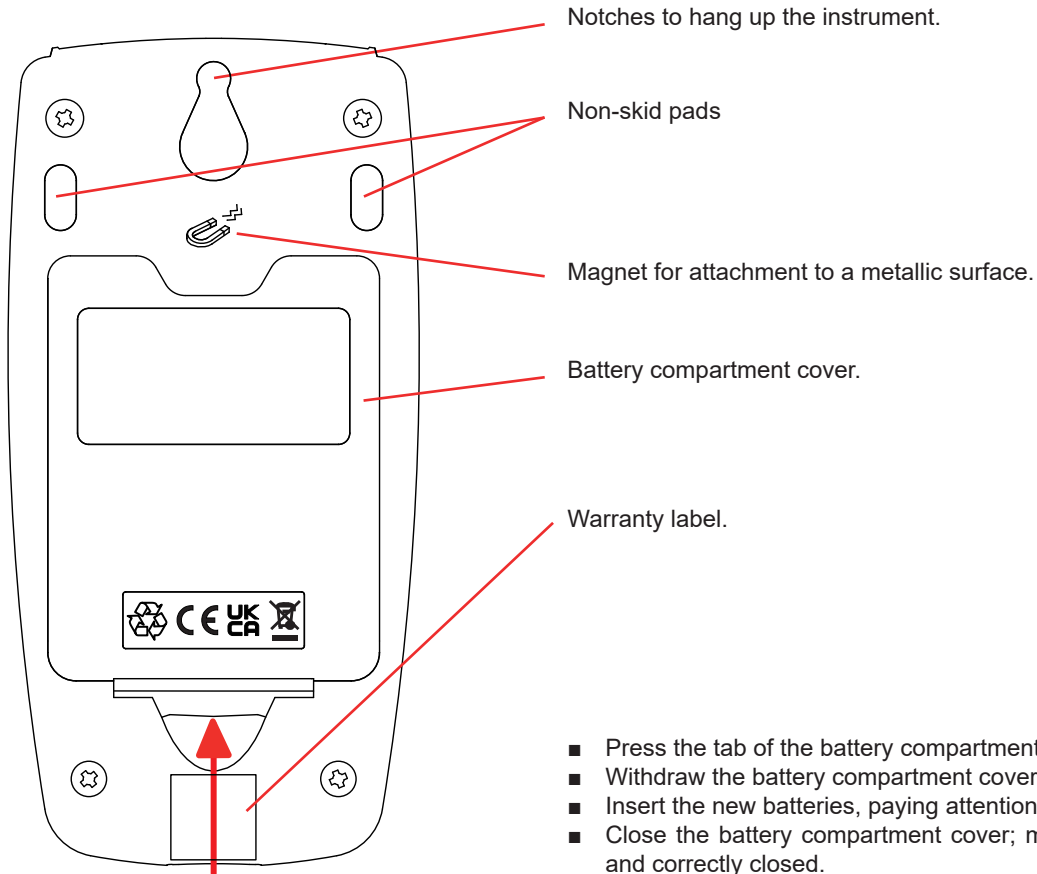
1.3. SPARE PARTS

- USB-micro USB cord

For the accessories and spares, consult our web site:

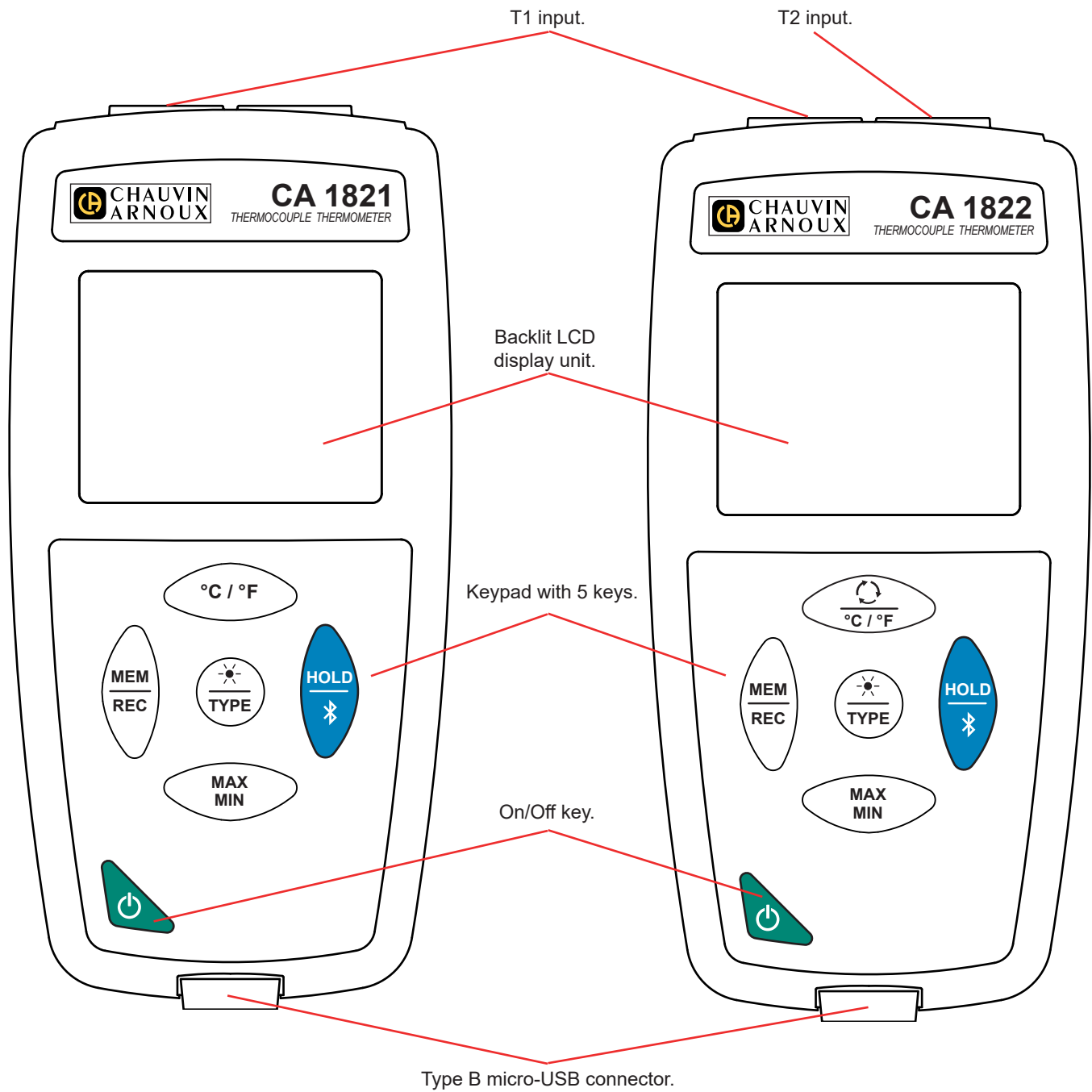
www.chauvin-arnoux.com

1.4. INSERTING THE BATTERIES

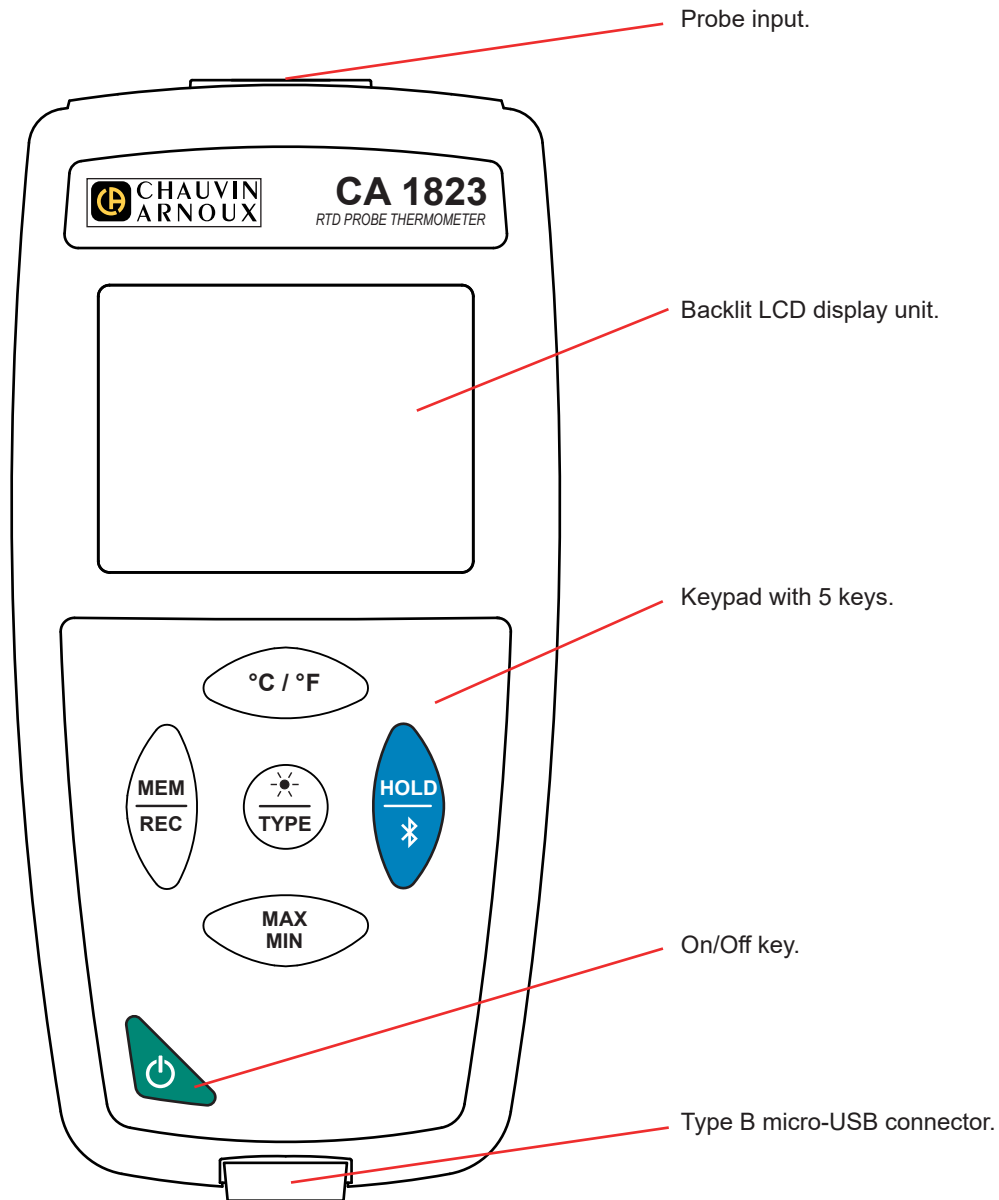


2. PRESENTATION OF THE INSTRUMENTS

2.1. PRESENTATION OF THE CA 1821 AND 1822



2.2. PRESENTATION OF THE CA 1823



2.3. FUNCTIONS OF THE INSTRUMENTS

The CA 1821 and the CA 1822 are thermocouple-based thermometers with one and two channels, respectively. They operate with thermoelectric sensors of types K (Chromel/Alumel), J (iron/Constantan), T (copper/Constantan), E (Chromel/Constantan), N (Nicrosil/Nisil), R (platinum-rhodium/platinum), and S (platinum-rhodium/platinum) and can measure temperatures from -250 to +1767°C.


The CA 1823 is a resistive-probe thermometer (PT100 or PT1000) having one channel and can measure temperatures from -100 to +400°C.


These instruments are easy to use. They have extensive stand-alone capabilities and can display:

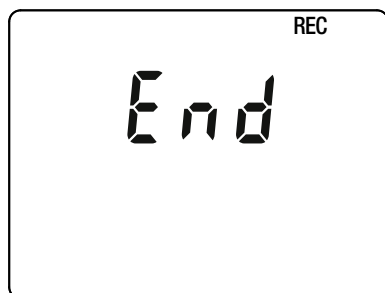
- temperature measurements in °C or in °F,
- to record a minimum and a maximum in a specified period,
- to record the measurements,
- to communicate with a PC via an USB cable,
- to communicate with a smartphone or a tablet via a Bluetooth link.

The Data Logger Transfer software can be installed on a PC. The CA Environmental Loggers app can be installed on a smartphone or tablet. Both are used to configure the device and to recover the recorded measurements.

2.4. ON/OFF KEY

A long press on the  key switches the instrument on.







A second long press on the  key switches the instrument off when it is on. However, it is not possible to switch the instrument off when it is in record mode and is recording.



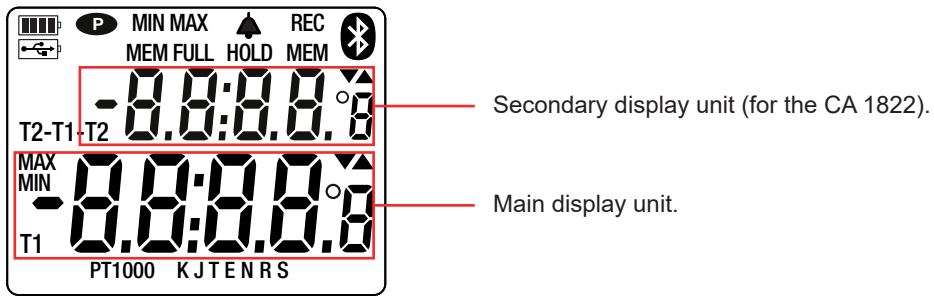
If during start-up the instrument displays the screen shown opposite, it means that a recording session has been brutally interrupted by a power outage.

During the display of this screen, the instrument recovers the recorded data. The longer the record, the longer the recovery. Do not interrupt the recovery or the data will be lost.

2.5. FUNCTION KEYS

| Key | Function |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| °C/°F | For the CA 1821 and the CA 1823 <ul style="list-style-type: none"> ■ The °C/°F key toggles the unit in which the temperature is displayed between °C and °F. |
|  °C/°F | For the CA 1822 <ul style="list-style-type: none"> ■ A short press on the  key toggles the display on the upper display unit between T2 and T1-T2. ■ A long press on the °C/°F key toggles the unit in which the temperature is displayed between °C and °F. |
| MEM REC | <ul style="list-style-type: none"> ■ A short press on the MEM key records the measurement and the date. ■ A long press on the REC key starts or stops a recording session. |
|  TYPE | <ul style="list-style-type: none"> ■ A short press on the  key switches on the back-lighting. ■ A long press on the TYPE key selects the type of thermocouple (K, J, T, E, N, R, S) or toggles between the PT100 and PT1000 probes. |
| HOLD  | <ul style="list-style-type: none"> ■ A short press on the HOLD key freezes the display. ■ A long press on the  key activates or deactivates the Bluetooth link. |
| MAX MIN | <ul style="list-style-type: none"> ■ A short press on the MAX MIN key opens the MAX MIN mode; the current values continue to be displayed. ■ A second press displays the maximum value. ■ A third press displays the minimum value. ■ A fourth press results in a return to the first-press condition and display of the current values ■ A long press is used to exit from the MAX MIN mode. |

2.6. DISPLAY



When the sensors or the probes are not connected, the instrument indicates - - - -.

When the measurement exceeds the limits (whether positive or negative), the instrument displays **OL**.

P: indicates that auto-off is disabled and the instrument is in permanent mode.

This occurs when:

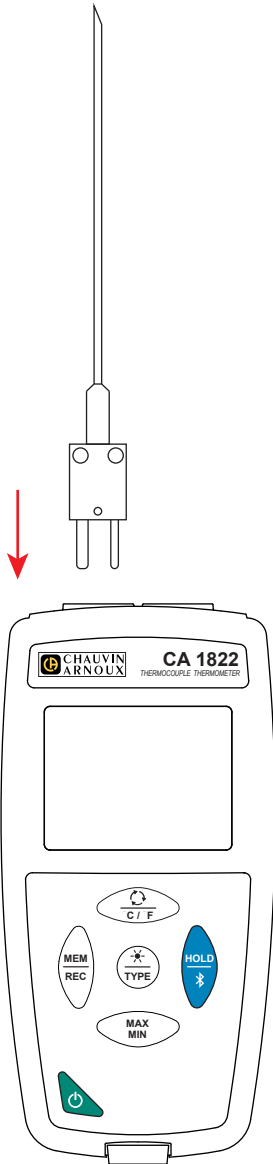
- the instrument is recording, in MAX MIN mode or in HOLD;
- the instrument is connected via the USB cord either to an external power supply or for communication with a PC;
- the instrument is in communication via Bluetooth;
- or auto-off is disabled (see §4.5.3).

3. USE IN STAND-ALONE MODE


- The instruments can operate in two modes:
- the stand-alone mode described in this section,
- the record mode, in which it is controlled by a PC, a smartphone or a tablet. This mode is described in the next section..

3.1. TEMPERATURE MEASUREMENT

- Connect the sensor(s) to the instrument.




On the CA 1821, connect one thermocouple.
On the CA 1822, connect one or two thermocouples of the same type.
On the CA 1823, connect one PT100 or PT1000 probe.

 Make sure that the sensors are connected with the correct polarity.

For the CA 1821 and 1822:

The pins of the male connectors of the thermocouples are made of compensated materials that while different from those of the thermocouple provide the same e.m.f. in the temperature range of use.
A temperature measurement on the terminals ensures automatic cold junction compensation.

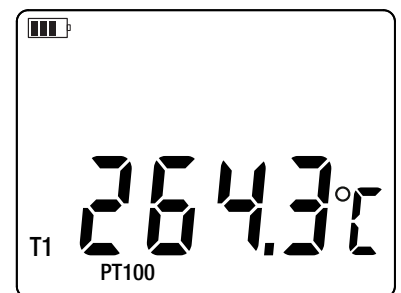
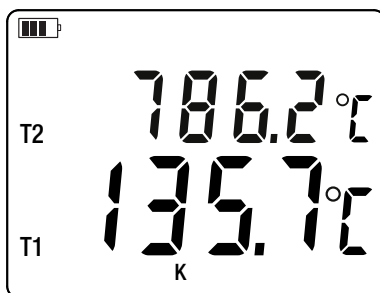
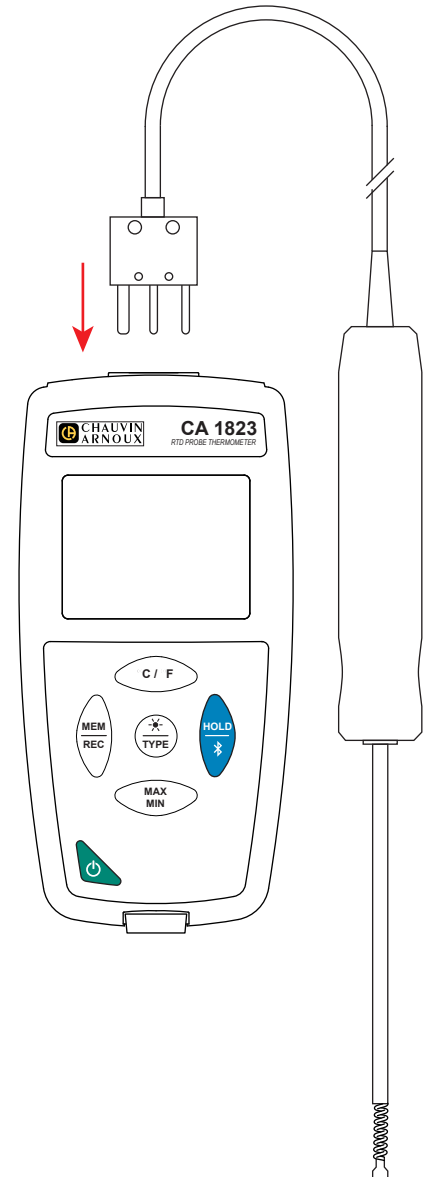
- Long-press the  key to switch the instrument on.

The instrument displays the time, then the measurement.
The time is set using the Data Logger Transfer software (see §4.5.2) or the CA Environmental Loggers application (see §4.6).

- For the CA 1821 and 1822, select the type of sensor by long presses on the **TYPE** key.

For the CA 1821 and 1822, the thermocouple can be a type K, J, T, E, N, R, or S.

For the CA 1823, the type of probe is detected automatically.



- To display the measurements in °F, press the °C/°F key.

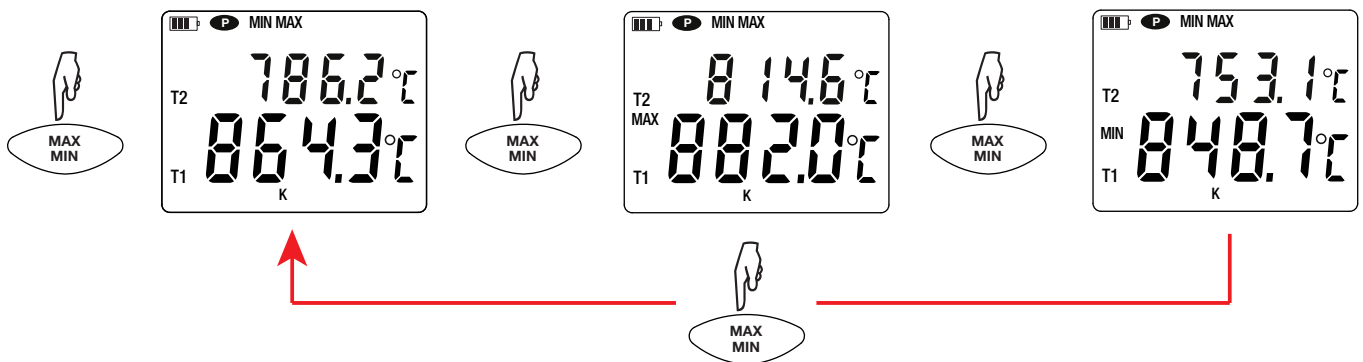


Wait for the display to stabilize before reading the measurement.

For more information about the response times of the sensors, refer to §5.2.3.

3.2. OTHER FUNCTIONS

- If 2 sensors are connected to the CA 1822, it is possible to display the difference between the measurements of the two sensors by pressing the key. The instrument then displays T1-T2 on the upper display unit. A second press restores the display of T2.
- The **MAX MIN** key can be pressed to monitor the minimum and maximum values. Pressing the **xx** key a second time causes the instrument to display the maximum (on both channels in the case of the CA 1822). After a third press, the instrument displays the minimum. A fourth press returns it to the current values. To exit from the MAX MIN mode, long-press the **MAX MIN** key. On the CA 1822, when the MAX MIN function is active, the key is deactivated.



- Pressing the **HOLD** key freezes the display. A second press unlocks it.

3.3. RECORDING THE MEASUREMENTS

- A short press on the **MEM** key records the measurement and the date.
- A long press on the **REC** key starts or stops a recording session.

When the memory is full, the instrument displays **MEM FULL**. You then need to clear the memory in order to continue recording.

To see and manage the records, you must use a PC and install the Data Logger Transfer software (see §4.5), or use a smartphone or a tablet on which the CA Environmental Loggers application (see § 4.6) has been installed.

3.4. ALARMS

You can program alarm thresholds on each of the measurement channels using the Data Logger Transfer software. When the instrument operates in stand-alone mode, if an alarm threshold is programmed, the symbol is displayed.

When a threshold is crossed, the symbol blinks.

- indicates that the measurement is above the high threshold,
- indicates that the measurement is below the low threshold,
- indicates that the measurement is between the two thresholds.

3.5. ERRORS

The instrument detects errors and displays them in the form Er.XX. The main errors are the following:

Er.01: Hardware malfunction detected. If the error persists, the instrument must be sent in for repair.

Er.02: Error in internal memory. Format it using Windows. To do this, connect the instrument to a PC using the USB-micro USB cable supplied.

- Er.03: Hardware malfunction detected. If the error persists, the instrument must be sent in for repair.
- Er.04: Communication problem between the device and the PC, smartphone or tablet. Switch the device off and on again and reset the communication with the PC, smartphone or tablet.
- Er.05: Problem occurred when activating Bluetooth. Contact your distributor.
- Er.10: The instrument has not been adjusted or is not correctly adjusted. The instrument must be sent back to customer service.
- Er.11: The update of the firmware is not compatible with the instrument (the firmware is that of another instrument of the line). Install the correct firmware in your instrument.
- Er.12: The update of the firmware is not compatible with the electronic boards in the instrument. Reload the previous firmware into your instrument.
- Er.13: Recording scheduling error. Check that the instrument's time and the time of the Data Logger Transfer software are the same.

4. USE IN RECORDING MODE

The instruments can operate in two modes:

- the stand-alone mode described in the previous section,
- the record mode, in which it is controlled by a PC, a smartphone or a tablet. This mode is described below.

4.1. CONNECTION

The device has 2 communication modes:

- A USB link via a USB-micro USB cord for use with a PC and the Data Logger Transfer software,
- A low-energy Bluetooth 4.2 wireless link for use with a smartphone or a tablet and the CA Environmental loggers application.

4.2. GET DATA LOGGER TRANSFER SOFTWARE

Visit our web site to download the latest version of the application software:

www.chauvin-arnoux.com

Go to the **Support** tab, then **Download our software**. Then search on the name of your instrument.

Download the software, then install it on your PC.




You must have administrator privileges on your PC to install the Data Logger Transfer software.

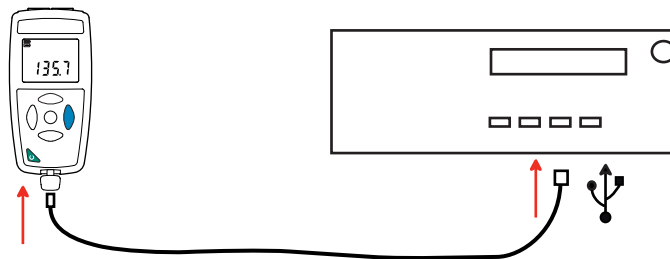


Do not connect the instrument to the PC until you have installed the Data Logger Transfer software.

4.3. USB LINK

Long-press the  key to switch the instrument on.




Once the Data Logger Transfer software has been installed, connect the instrument to the PC.



It is treated as a USB key and you can access its content. But to read the records, you must use the Data Logger Transfer software.

4.4. BLUETOOTH LINK

The instrument has a low-energy Bluetooth 4.2 link that requires no pairing.

- Activate Bluetooth on your smartphone or tablet.
- Switch the instrument on by a long press on the  key, then activate the Bluetooth link by a long press on the  key. The  symbol is displayed.

- The instrument is then ready to communicate with the smartphone or the tablet.





4.5. DATA LOGGER TRANSFER SOFTWARE

Once the instrument has been connected to the PC by USB, open the Data Logger Transfer software.





For context-sensitive information about the use of the Data Logger Transfer software, refer to the **Help** menu.

4.5.1. CONNECTING THE INSTRUMENT


- To connect an instrument, click **Add an instrument**, then choose the type of connection (USB or Bluetooth).
- A window opens with a list of all instruments connected to the PC.
The name of the instrument will be formed from the model of the instrument and the warranty number: CA 1822 - 123456ABC
You can personalize your instrument by adding a name and a location, by clicking on  or .
- Choose your instrument in the list. The software then displays complete information about the instrument and its measurements in progress.

| General | | Recording | |
|-------------------|---------------|-----------------------|-------------|
| Serial number | 12345678 | Recording status | Inactive |
| Model | CA1822 | Session(s) | 2 |
| Firmware version | 00.01.40.00 | Idle | Elapsed |
| Name | Thermometer | Starting date/time | - - - |
| Location | | Ending date/time | - - - |
| | | Duration | - - - |
| | | Storage Period | 01 s |
| Status | | Channel Configuration | |
| In overload | No | Channel 1 | Temperature |
| Alarm | Disabled | Units: | °C |
| Date | 10/01/2017 | Channel 2 | Temperature |
| Time | 12:41:24 | Units: | °C |
| Battery voltage | 3.98 V | | |
| Communication | | Alarm Configuration | |
| Connection Type | USB | Channel 1 | disabled |
| Connection status | Communicating | Channel 2 | disabled |
| Memory | | | |
| Memory capacity | 7.97 MBytes | | |
| Memory used | 372.00 kBytes | | |

4.5.2. DATE AND HOUR


The **Instrument**  menu lets you set your instrument's date and time. These cannot be changed while recording or when a recording session has been scheduled. By clicking , you can choose the date and time display formats.

4.5.3. AUTO OFF

As default, the instrument switches itself off automatically after 3 minutes of operation without the user's presence being confirmed by a key-press. By clicking , you can change this value to 3, 10, or 15 minutes.

It is also possible to disable this auto-off function; the instrument then displays the **P** symbol.

4.5.4. PROGRAMMED RECORDING SESSIONS

By clicking , you can program a recording session. Assign a name to the recording session. Then enter a starting date and time and an ending date and time or a duration. The maximum duration of a recording session depends on the memory available.

Choose a sampling period. The possible values are: 1 s, 2 s, 5 s, 10 s, 20 s, 30 s, 1 min, 2 min, 5 min, 10 min, 15 min, 30 min and 1 hour. The shorter the sampling period, the larger the recorded file.



Before and after the recording session, if the instrument is switched on, the sampling period will be that of the stand-alone mode (1s).

If the instrument is off when recording starts, it switches itself on by itself. Then it displays the measurement, which it refreshes at each sampling period.




Before starting a recording session, make sure that the battery life is sufficient, or else connect the instrument to an external power supply on/to a wall outlet using a micro USB cord.

4.5.5. DISPLAY


By clicking , then opening the **Thermometer** tab, you can modify the units in which the measurements are displayed in the same way as by pressing the  or **°C/°F** or **TYPE** keys.

4.5.6. ALARM

By clicking , then opening the **Alarms** tab, you can program an alarm threshold in each of the measurement channels. The alarm may be triggered if the measurement is:

- above a high threshold,
- below a low threshold,
- between 2 thresholds,
- above the high threshold or below the low threshold

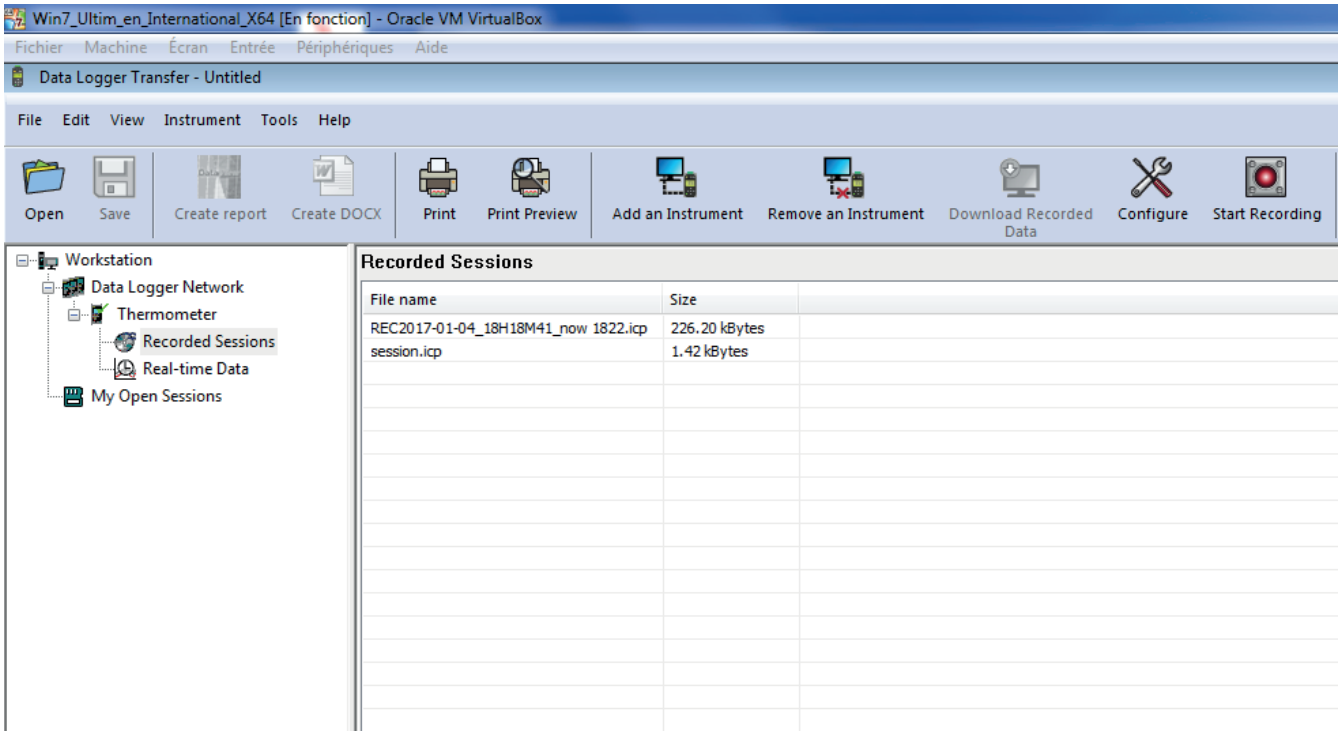
4.5.7. RECORDING WITH AN ALARM CONDITION

You can program recording to be triggered only when an alarm threshold is crossed (). The instrument then records the measurements for the programmed duration.

To make sure that no crossing of an alarm threshold can be missed, the instrument can no longer be switched off when this is done.

4.5.8. READING THE RECORDS

The Data Logger Transfer software lets you read the records made. Click **Recorded Sessions** under the name of your instrument to obtain a list of the records.



4.5.9. EXPORTING RECORDS

Once the list of the records is displayed, choose the one you want to export and convert it into a word-processing document (docx) or a spreadsheet (xlsx), in order to be able to use it in the form of reports or curves.

It is also possible to export the data to the DataView application software (see §1.2).

4.5.10. REAL-TIME MODE

Click **Real-time data** under the name of your instrument to see the measurements being made on the instrument as they are made.

4.5.11. FORMATTING THE MEMORY OF THE INSTRUMENT

The internal memory of the instrument is already formatted. But if there is a problem (if it becomes impossible to read or to write), it may be necessary to reformat it (in Windows).



In this case, all of the data will be lost.

4.6. CA ENVIRONMENTAL LOGGERS APPLICATION

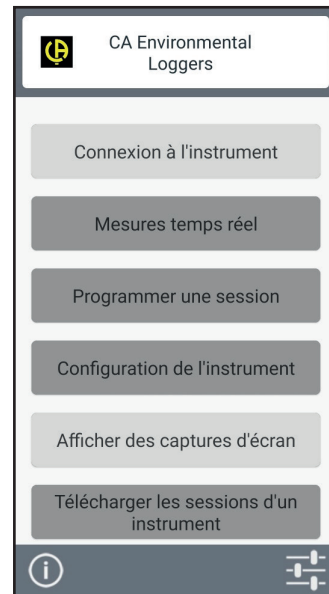
This Android application provides some of the functions of the Data Logger Transfer software. It lets you connect to your instrument remotely.

Look for the application by typing Chauvin Arnoux.



CA Environ..

Install the application on your smartphone or your tablet.



Activate Bluetooth on your smartphone or your tablet and on the CA 1821, CA 1822 or CA1823, then connect them.

The application lets you:

- see the measurements in real time,
- program a recording: choose its name, its starting and ending dates, and the sampling period,
- configure the instrument: synchronise the date and time, select the automatic switch-off time and enter the area for the air flow calculation,
- download the recordings.

5. TECHNICAL CHARACTERISTICS

5.1. REFERENCE CONDITIONS

| Quantity of influence | Reference values |
|-----------------------|------------------|
| Temperature | 23 ± 2°C |
| Relative humidity | 45% to 75% |
| Supply voltage | 3 to 4.5V |
| Electric field | < 1V/m |
| Magnetic field | < 40A/m |

The intrinsic uncertainty is the error specified for the reference conditions.

θ = temperature

R = reading

5.2. CHARACTERISTICS FOR THE CA 1821 AND CA 1822

5.2.1. TEMPERATURE MEASUREMENT

| Type of thermocouple | J, K, T, N, E, R, S | | | | | | |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------|-----------------------|---------------------|-------------|--------------------|
| Specified measurement range (according to the type of thermocouple used) | K - 200 to + 1372°C -328 to + 2501°F | | | | | | |
| | J - 210 to + 1200°C -346 to + 2192°F | | | | | | |
| | T - 200 to + 400°C -328 to + 752°F | | | | | | |
| | E - 150 to + 950°C -238 to + 1742°F | | | | | | |
| | N - 200 to + 1300°C -328 to + 2372°F | | | | | | |
| | R 0 to + 1767°C 32 to + 3212°F | | | | | | |
| | S 0 to + 1767°C 32 to + 3212°F | | | | | | |
| Resolution | Display in °C: θ < 1000°C: 0,1°C and θ ≥ 1000°C: 1°C Display in °F: θ < 1000°F: 0,1°F and θ ≥ 1000°F: 1°F | | | | | | |
| Intrinsic uncertainty (J, K, T, N, E) | <table border="0"> <tr> <td>θ ≤ - 100°C</td> <td>± (0.2% R ± 0.6°C)</td> </tr> <tr> <td>- 100°C < θ ≤ + 100°C</td> <td>± (0.15% R ± 0.6°C)</td> </tr> <tr> <td>+ 100°C < θ</td> <td>± (0.1% R ± 0.6°C)</td> </tr> </table> | θ ≤ - 100°C | ± (0.2% R ± 0.6°C) | - 100°C < θ ≤ + 100°C | ± (0.15% R ± 0.6°C) | + 100°C < θ | ± (0.1% R ± 0.6°C) |
| θ ≤ - 100°C | ± (0.2% R ± 0.6°C) | | | | | | |
| - 100°C < θ ≤ + 100°C | ± (0.15% R ± 0.6°C) | | | | | | |
| + 100°C < θ | ± (0.1% R ± 0.6°C) | | | | | | |
| Intrinsic uncertainty (R, S) | <table border="0"> <tr> <td>θ ≤ + 100°C</td> <td>± (0.15% R ± 1.0°C)</td> </tr> <tr> <td>+ 100°C < θ</td> <td>± (0.1% R ± 1.0°C)</td> </tr> </table> | θ ≤ + 100°C | ± (0.15% R ± 1.0°C) | + 100°C < θ | ± (0.1% R ± 1.0°C) | | |
| θ ≤ + 100°C | ± (0.15% R ± 1.0°C) | | | | | | |
| + 100°C < θ | ± (0.1% R ± 1.0°C) | | | | | | |

To determine the total intrinsic uncertainty, add the intrinsic uncertainty of the thermocouple to that of the instrument, given in the table above.

5.2.2. VARIATION WITHIN THE RANGE OF USE

| Quantities of influence | Range of influence | Quantity influenced | Influence |
|-------------------------|--------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Temperature | -10 to + 60 °C | θ | J : ± (0.02% R ± 0.15°C) / 10°C K : ± (0.03% R ± 0.15°C) / 10°C T : ± (0.03% R ± 0.15°C) / 10°C E : ± (0.02% R ± 0.15°C) / 10°C N : ± (0.035% R ± 0.15°C) / 10°C R : ± (0.01% R ± 0.25°C) / 10°C S : ± 0(0.01% R ± 0.25°C) / 10°C |

The aging of the internal reference voltage causes the intrinsic uncertainty to increase. After 4,000 hours of use with R and S thermocouples. After 8,000 hours with the others.

In the case of the CA 1821 and the CA 1822, connecting the instrument to a PC via a micro USB cord causes an internal temperature rise in the instrument that may lead to a temperature measurement error of the order of 1.5°C.

This temperature rise does not occur when the instrument is connected to a wall outlet or when it is powered by batteries.



Do not connect the CA 1821 or the CA 1822 to a PC to make measurements. Use this connection only to program the instrument or to transfer records.

5.2.3. RESPONSE TIME

The response time is the time at the end of which the e.m.f. reaches 63% of its total variation when the thermocouple is subjected to a temperature step.

The response time of the sensor depends on the heat capacity of the medium and on the thermal conductivity of the sensor. The response time of a thermocouple of which the thermal conductivity is good, immersed in a medium having a high heat capacity, will be short. On the other hand, in a thermally unfavourable medium (such as still air), the true response time may be as much as 100 times that of the thermocouple, or even more.

The values specified in the table below were established in the following conditions:

- For the surface, flexible, and pipe sensors, by contact with a polished stainless steel plate coated with silicone grease.
- For the air sensors, in moving air (1m/s).
- For the other sensors, immersed in moving water at 90°C (speed: 0.3 to 0.5m/s).

The temperature ranges given for each type of sensor assume use in a chemically neutral medium.

Using these sensors in a corrosive medium may substantially shorten their lives or limit their measurement ranges.

| Designation | Measurement range | Minimum response time | Length |
|-------------------------------------------------------|-------------------|-----------------------|--------|
| Sensor without handle | | | |
| SK1 needle | -50 to +800°C | 1 s | 15 cm |
| SK2 deformable | -50 to +1000°C | 2 s | 1 m |
| SK3 semi-rigid | -50 to +1000°C | 6 s | 50 cm |
| SK4 surface | 0 to +250°C | 1 s | 15 cm |
| SK5 surface with spring | -50 to +500°C | 1 s | 15 cm |
| SK6 flexible | -50 to +285°C | Contact: 1s, air: 3s | 1 m |
| SK7 air | -50 to +250°C | 5 s | 15 cm |
| SK8 pipe | -50 to +140°C | 10 s | 32 cm |
| SK19 surface with magnet | -50 to +200°C | 7 s | 1 m |
| Sensors with handle and extensible spiral cord | | | |
| SK11 needle | -50 to +600°C | 12 s | 13 cm |
| SK13 general purpose | -50 to +1100°C | 12 s | 30 cm |
| SK14 bent surface | -50 to +450°C | 8 s | 13 cm |
| SK15 surface with spring | -50 to +900°C | 2 s | 13 cm |
| SK17 air | -50 to +600°C | 3 s | 13 cm |

5.3. CHARACTERISTICS FOR THE CA 1823

5.3.1. TEMPERATURE MEASUREMENTS

| Temperature sensor | PT100 or PT1000 | |
|-----------------------------|----------------------|----------------------|
| Specified measurement range | - 100 to + 400°C | -148 to + 752°F |
| Resolution | Display in °C: 0.1°C | Display in °F: 0.1°F |
| Intrinsic uncertainty | ± (0,4% R ± 0,3°C) | |

To determine the total intrinsic uncertainty, add the intrinsic uncertainty of the platinum probe to that of the instrument, given in the table above.

5.3.2. VARIATION WITHIN THE RANGE OF USE

| Quantities of influence | Range of influence | Quantity influenced | Influence |
|-------------------------|--------------------|---------------------|-------------------------------------------------|
| Temperature | -10 to + 60 °C | θ | $\pm 0.13^{\circ}\text{C} / 10^{\circ}\text{C}$ |

5.4. MEMORY

The size of the flash memory containing the records is 8MB

This capacity is sufficient to record one million measurements. Each measurement is recorded with the date, the time, and the unit. For the instrument with 2 channels, both measurements are recorded.



5.5. USB

Protocol: USB Mass Storage
 Maximum transmission speed: 12 Mbit/s
 Type B micro-USB connector

5.6. BLUETOOTH

Bluetooth 4.2 BLE
 Range 10m typical and up to 30m in line of sight.
 Output power: +0 to -11 dBm
 Nominal sensitivity: -95 dBm
 Maximum transfer rate: 10 kbits/s

5.7. POWER SUPPLY

The instrument is supplied by three 1.5V LR6 or AA alkaline batteries. It is possible to replace the batteries by rechargeable NiMH batteries of the same size. But the rechargeable batteries, even when correctly charged, will not reach the voltage of the alkaline batteries and the life indicated will be  or .

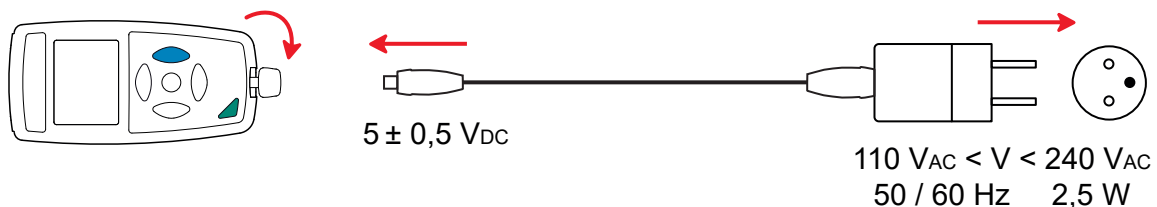
Batteries mass: about 3 x 26 g

The voltage range ensuring correct operation is from 3 to 4.5V for the alkaline batteries and 3.6V for the rechargeable batteries. Below 3V, the instrument stops making measurements and displays BAT.

Battery life (with the Bluetooth connection deactivated) is:

| | CA 1821 | CA 1822 | CA 1823 |
|---------------------------------------------------------------|-----------|-----------|-----------|
| In stand-alone mode | 1000 h | 1000 h | 800 h |
| In recording mode at rate of one measurement every 15 minutes | > 3 years | > 3 years | > 3 years |

The instrument can also be powered via a USB-micro USB cord, connected either to a PC or to a wall outlet via a mains adapter.



5.8. ENVIRONMENTAL CONDITIONS

For use indoors and outdoors.

| | |
|------------------|----------------------------------------------------------------------|
| Operating range | -10 to 60°C and 10 to 90%RH without condensation |
| Storage range | -20 to +70°C and 10 to 95%RH without condensation, without batteries |
| Altitude | < 2000m, and 10,000m in storage. |
| Pollution degree | 2 |

5.9. MECHANICAL CHARACTERISTICS

| | |
|------------------------|------------------|
| Dimensions (L x W x H) | 150 x 72 x 32 mm |
| Mass | 260g approx. |

Inrush protection IP 50, with the USB connector closed, per IEC 60529.

Drop impact test 1 m per IEC/EN 61010-2-030 or BS EN 61010-2-030.

5.10. COMPLIANCE WITH INTERNATIONAL STANDARDS

The instrument is compliant with standard IEC/EN 61010-2-030 or BS EN 61010-2-030.

5.11. ELECTROMAGNETIC COMPATIBILITY (CEM)

The instrument is compliant with standard IEC/EN 61326-1 or BS EN 61326-1.

While the instruments are not perturbed by electromagnetic waves, this is not true of the sensors connected to the CA 1821 and CA 1822. Their threadlike shapes turn them into antennas capable of receiving electromagnetic radiation and likely to perturb the measurements.

5.12. RADIO EMISSIONS

The instrument is in compliance with directive RED 2014/53/EU and with FCC regulations.

The Bluetooth module is certified in compliance with the FCC regulations under number QOQ-BT122.

6. MAINTENANCE



Except for the batteries, the instrument contains no parts that can be replaced by personnel who have not been specially trained and accredited. Any unauthorized repair or replacement of a part by an "equivalent" may gravely impair safety.

6.1. CLEANING

Disconnect everything connected to the instrument and switch it off.

Use a soft cloth, dampened with soapy water. Rinse with a damp cloth and dry rapidly with a dry cloth or forced air. Do not use alcohol, solvents, or hydrocarbons.

6.2. REPLACEMENT OF BATTERIES

The  symbol indicates the remaining battery life. When the  symbol is empty, all of the batteries must be replaced.

Disconnect everything connected to the instrument and switch it off.

- Refer to §1.4 for the replacement procedure.



Spent batteries must not be treated as ordinary household waste. Take them to the appropriate recycling collection point.

6.3. CONNECTION TO A CALIBRATOR

During calibration measurements performed on calibrators connected to line power, the test bench must be free of ground loops. This can be achieved in two ways:

- the instrument is powered by batteries.
- the instrument is connected to line power via the USB cord, in which case a USB isolator must be used.

6.4. UPDATING THE FIRMWARE

With a view to providing, at all times, the best possible service in terms of performance and technical improvements, Chauvin-Arnoux offers you the possibility of updating the firmware of this instrument by downloading, free of charge, the new version available on our web site.

See you on our site:


www.chauvin-arnoux.com

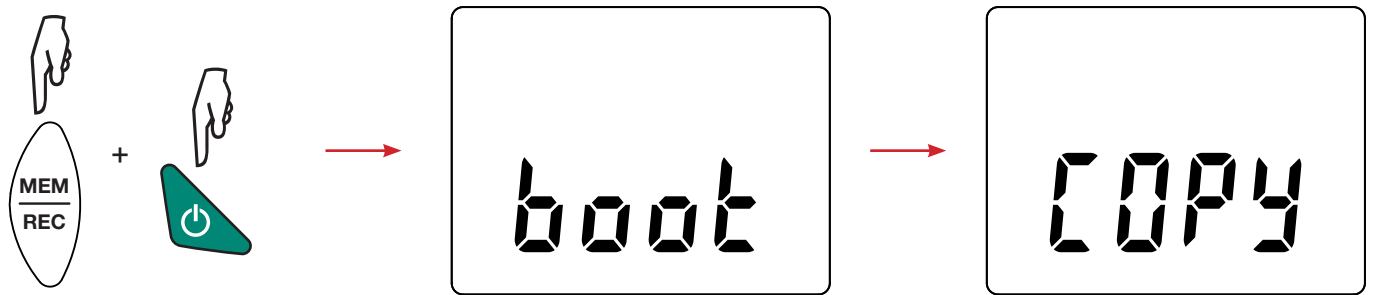
Then go to **Support**, then **Download our software**, then **CA 1821**, **CA 1822** or **CA 1823**.



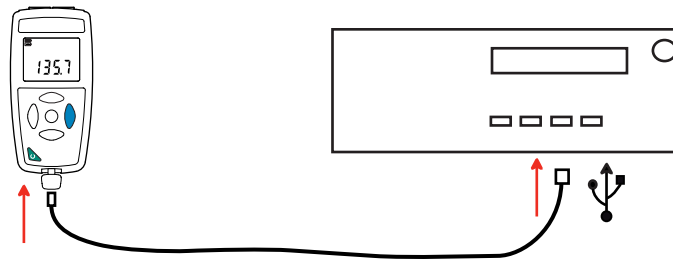
Updating the firmware may reset the configuration and cause the loss of the recorded data. As a precaution, save the data in memory to a PC before updating the firmware.

Firmware update procedure

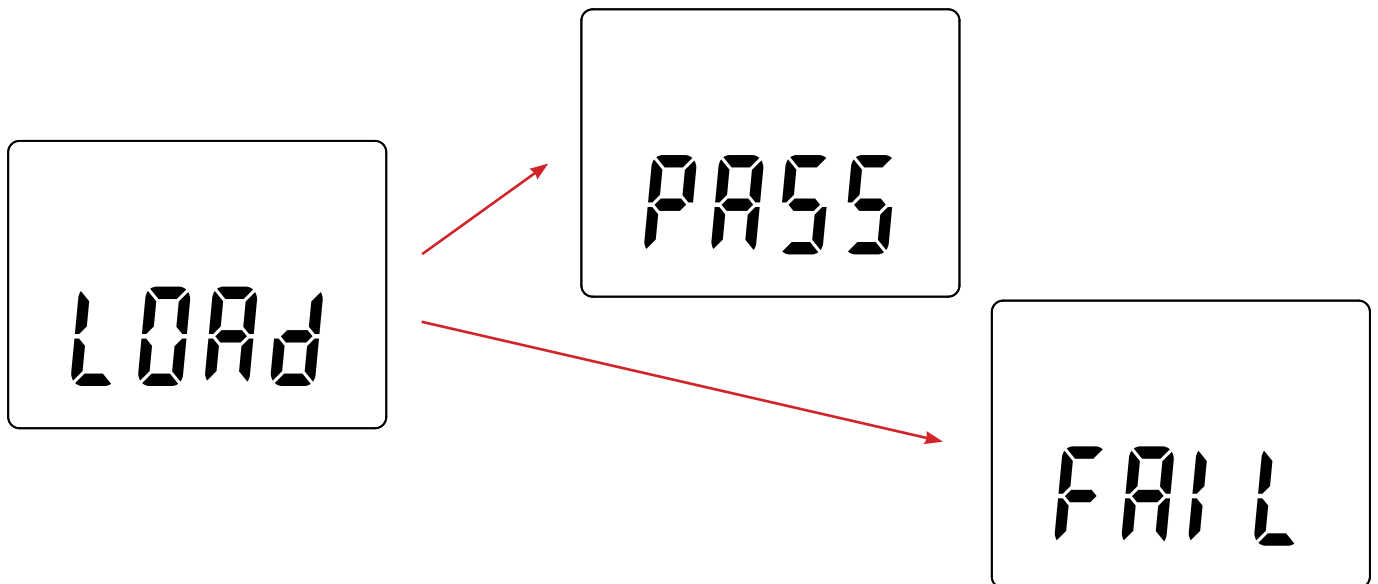
- Download the .bin file from our web site, then press and hold the **MEM** key and switch the instrument on by pressing the  key. The instrument displays **BOOT**.



- Release the keys and the instrument displays **COPY**, indicating that it is ready to receive the new software.
- Connect the instrument to your PC using the USB cord provided.



- Copy the .bin file to the instrument as if were a USB key.
- When the copying is done, press the **MEM** key and the instrument displays **LOAD**, indicating that the software is being installed.



- When installation is done, the instrument displays **PASS** or **FAIL** according to whether or not the operation succeeded. If installation fails, download the software again and repeat the procedure.
- Then the instrument restarts normally.



After the firmware is updated, it may be necessary to reconfigure the instrument; see §4.5.

7. WARRANTY

Except as otherwise stated, our warranty is valid for **24 months** starting from the date on which the equipment was sold. The extract from our General Conditions of Sale is available on our website.

www.group.chauvin-arnoux.com/en/general-terms-of-sale

The warranty does not apply in the following cases:

- Inappropriate use of the equipment or use with incompatible equipment;
- Modifications made to the equipment without the explicit permission of the manufacturer's technical staff;
- Work done on the device by a person not approved by the manufacturer;
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user's manual;
- Damage caused by shocks, falls, or floods.



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