® CHAUVIN®
ARNOUX
CHAUVIN ARNOUX GROUP

C.A 1821
C.A 1822
C.A 1823

Thermometers

Measure up

Thank you for purchasing this **C.A 1821** or **C.A 1822 thermocouple thermometer** or **C.A 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.
ℹ	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.
CE	The CE marking indicates conformity with European directives, in particular LVD and EMC.
🗑	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 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.

CONTENTS

1. FIRST USE

1.1. DELIVERY CONDITION

C.A 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 multilingual safety data sheet,
- one test report,
- one carrying case.

C.A 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 multilingual safety data sheet,
- one test report,
- one carrying case.

C.A 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 multilingual safety data sheet,
- 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
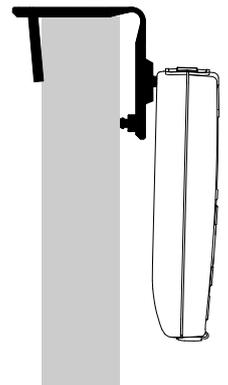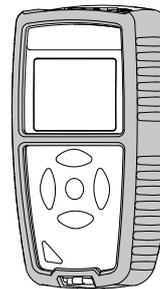
1.3. SPARE PARTS

- USB-micro USB cord

For the accessories and spares, consult our web site:
www.chauvin-arnoux.com

1.4. INSERTING THE BATTERIES

Notches to hang up the instrument.

Non-skid pads

- Magnet for attachment to a metallic surface.

- Battery compartment cover.

- Press the tab of the battery compartment cover and lift it clear.
- Withdraw the battery compartment cover.
- Insert the new batteries, paying attention to the polarity.
- Close the battery compartment cover; make sure that it is completely and correctly closed.

2. PRESENTATION OF THE INSTRUMENTS

2.1. PRESENTATION OF THE C.A 1821 AND 1822

T1 input.

T2 input.

Backlit LCD display unit.

Keypad with 5 keys.

On/Off key.

Type B micro-USB connector.

2.2. PRESENTATION OF THE C.A 1823

Probe input.

Backlit LCD display unit.

CHAUVIN® ARNOUX
CHAUVIN ARNOUX GROUP

C.A 1823
RTD PROBE THERMOMETER

°C / °F

MEM
REC

TYPE

HOLD

MAX
MIN

Keypad with 5 keys.

On/Off key.

Type B micro-USB connector.
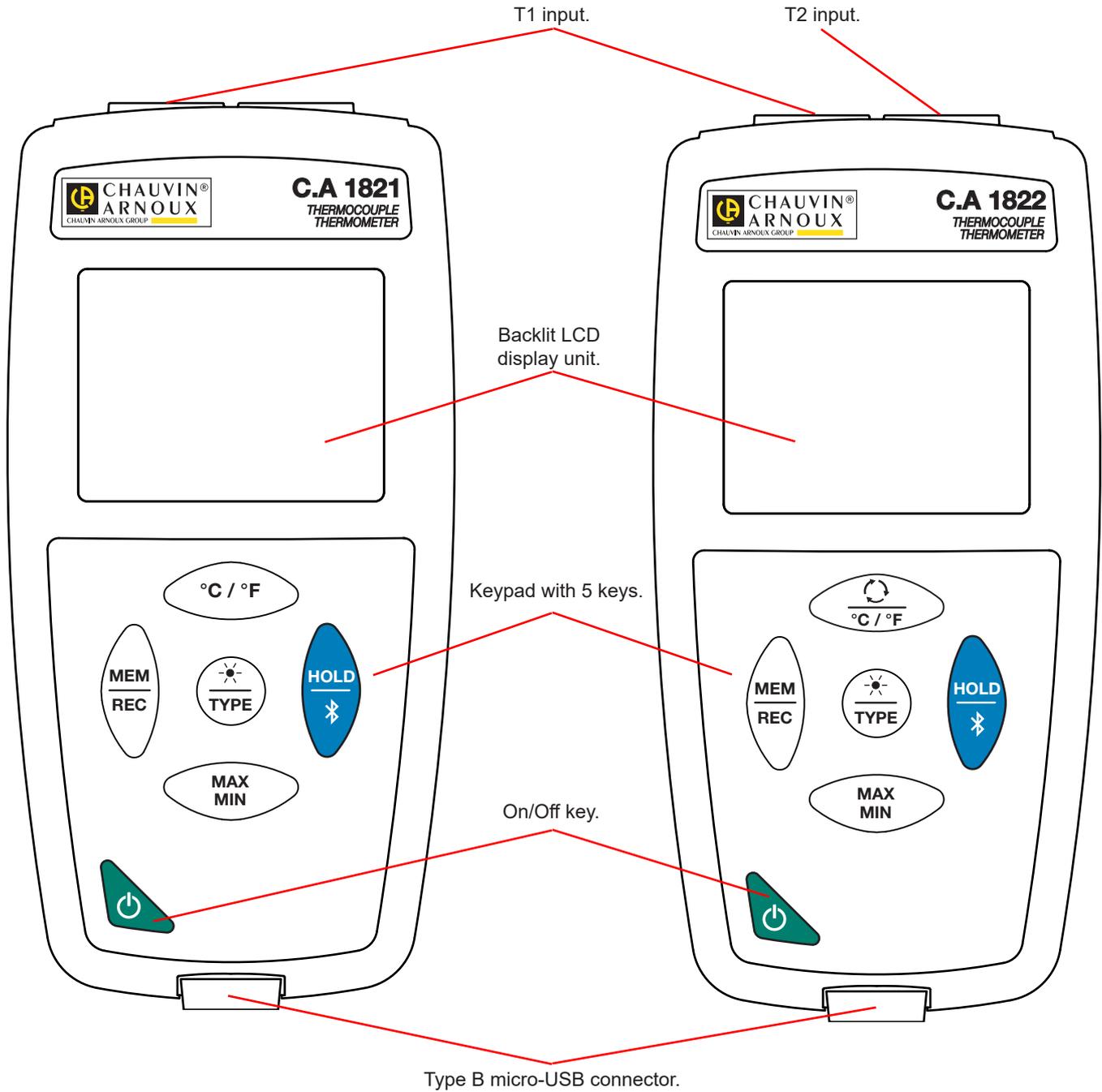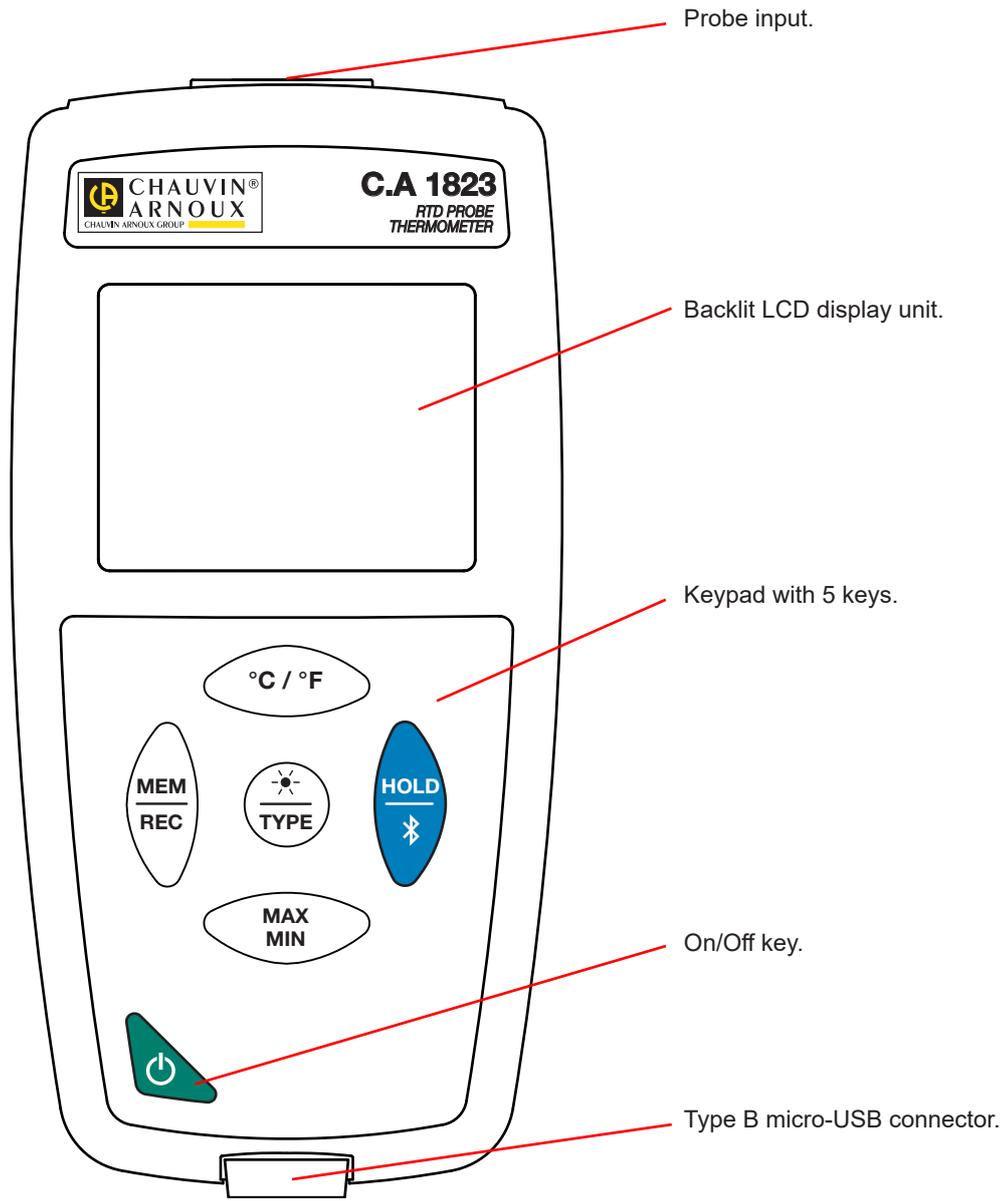
2.3. FUNCTIONS OF THE INSTRUMENTS

The C.A 1821 and the C.A 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 C.A 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 a Bluetooth link or a USB cable.

The Data Logger Transfer software can be installed on a PC and is used to configure the instruments 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.

REC

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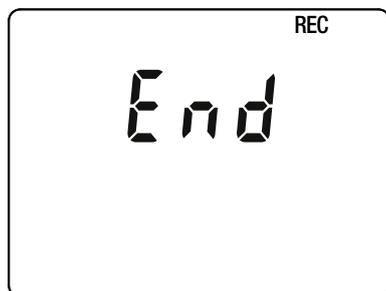
If during start-up the instrument displays the screen shown opposite, it means that a recording session has been brutally interrupted by a power outage.

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 C.A 1821 and the C.A 1823 ■ The °**C/°F** key toggles the unit in which the temperature is displayed between °C and °F.
⟳ °C/°F	For the C.A 1822 ■ 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	■ 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	■ 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 ✳	■ A short press on the **HOLD** key freezes the display. ■ A long press on the ✳ key activates or deactivates the Bluetooth link.
MAX MIN	■ 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

Secondary display unit (for the C.A 1822).

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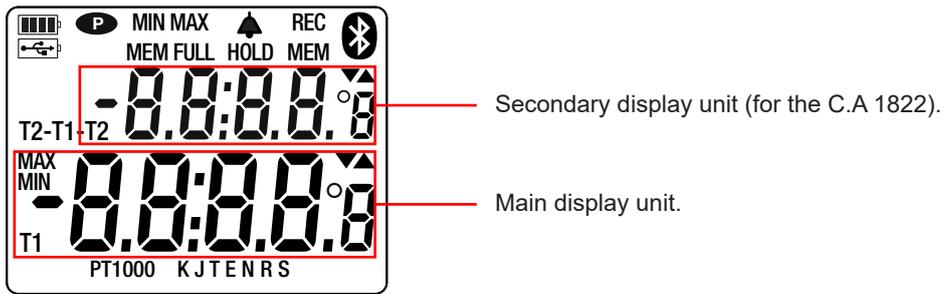
When the sensors or the probes are not connected, the instrument indicates - - - -.

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 they are controlled by a PC. This mode is described in the next section.

3.1. TEMPERATURE MEASUREMENT

■ Connect the sensor(s) to the instrument.
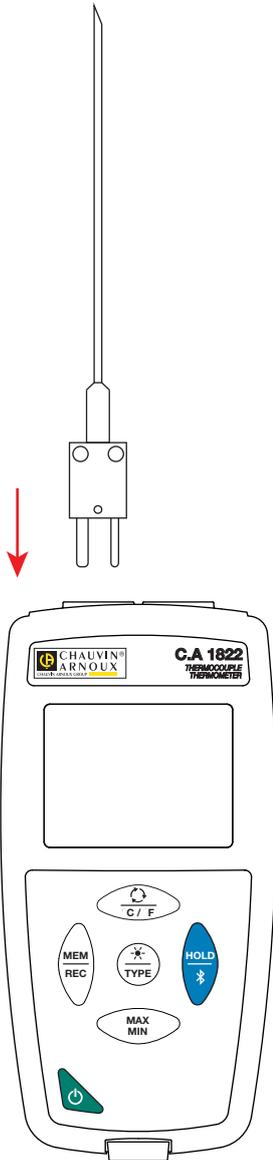
On the C.A 1821, connect one thermocouple.
On the C.A 1822, connect one or two thermocouples of the same type.
On the C.A 1823, connect one PT100 or PT1000 probe.

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

For the C.A 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).

■ For the C.A 1821 and 1822, select the type of sensor by long presses on the **TYPE** key.

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

For the C.A 1823, the type of probe is detected automatically.
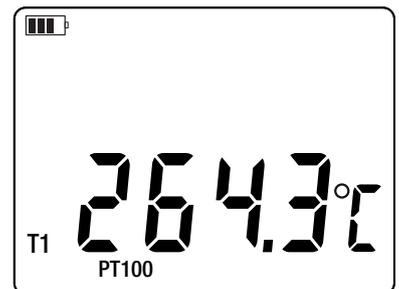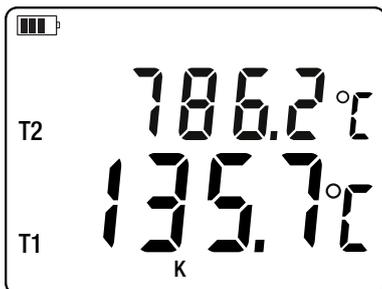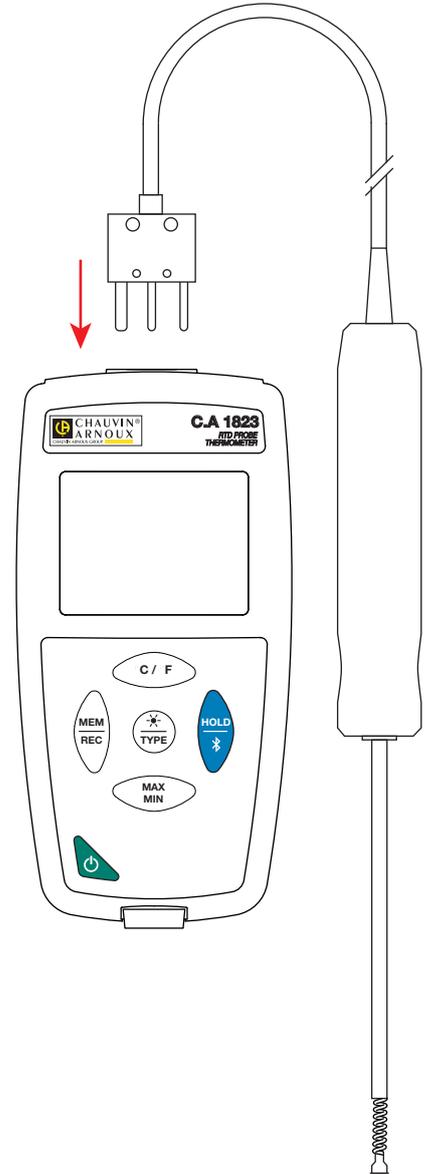
■ To display the measurements in °F, press the **°C/°F** key.

| ⓘ | 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 C.A 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 C.A 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 C.A 1822, when the MAX MIN function is active, the ⟳ key is deactivated.
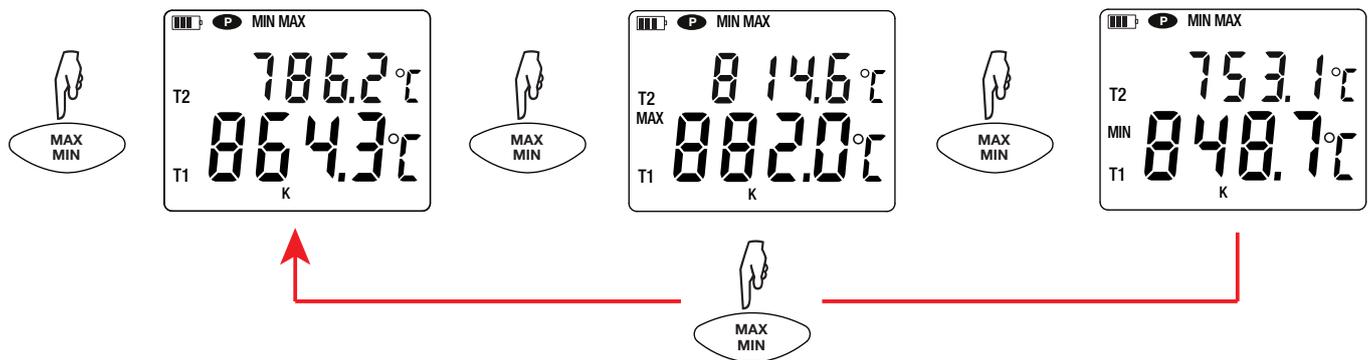
■ Pressing the **HOLD** key freezes the display**.** A second press unlocks it.

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**.**

To see the records, you must use a PC and install the Data Logger Transfer software (see §4).

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. The instrument must be sent in for repair.
Er.02: Error in internal memory. Format it using Windows.
Er.03: Hardware malfunction detected. The instrument must be sent in for repair.
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 internal software is not compatible with the instrument (the software is that of another instrument of the line). Install the correct internal software in your instrument.

Er.12: The update of the internal software is not compatible with the electronic boards in the instrument. Reload the previous internal software 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 they are controlled by a PC. This mode is described below.

4.1. CONNECTION

The device has 2 communication modes:
- A USB link via a USB-micro USB cord,
- A Bluetooth 4.0 BLE wireless link.

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.

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

Minimum computer requirements:
- Windows 7 (32/64 bits)
- 2 GB of RAM
- 200 MB of disc space

Windows® is a registered trade mark of Microsoft®.

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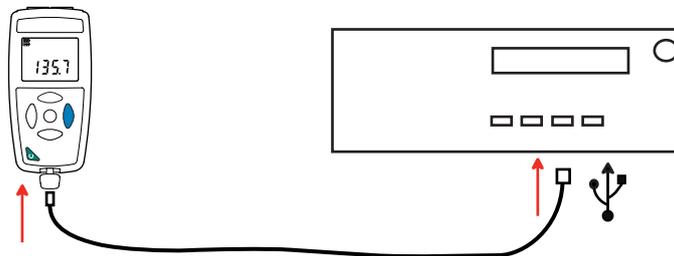
It is treated as a USB key and you can access its content. But to read the records, you must use the Data Logger Transfer software.

4.4. BLUETOOTH LINK

The instrument has a low-energy Bluetooth 4.0 link that requires no pairing.

■ Activate Bluetooth on your PC. If your PC does not have a Bluetooth link, you can add a board or Bluetooth adapter connected to a USB port (see §1.2).

| **i** | Since Windows 7 does not manage low-energy Bluetooth, a specific USB/Bluetooth adapter must be used (see §1.2).

■ 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 PC.

4.5. DATA LOGGER TRANSFER SOFTWARE

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

| **i** | 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: C.A 1227 - 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.

14
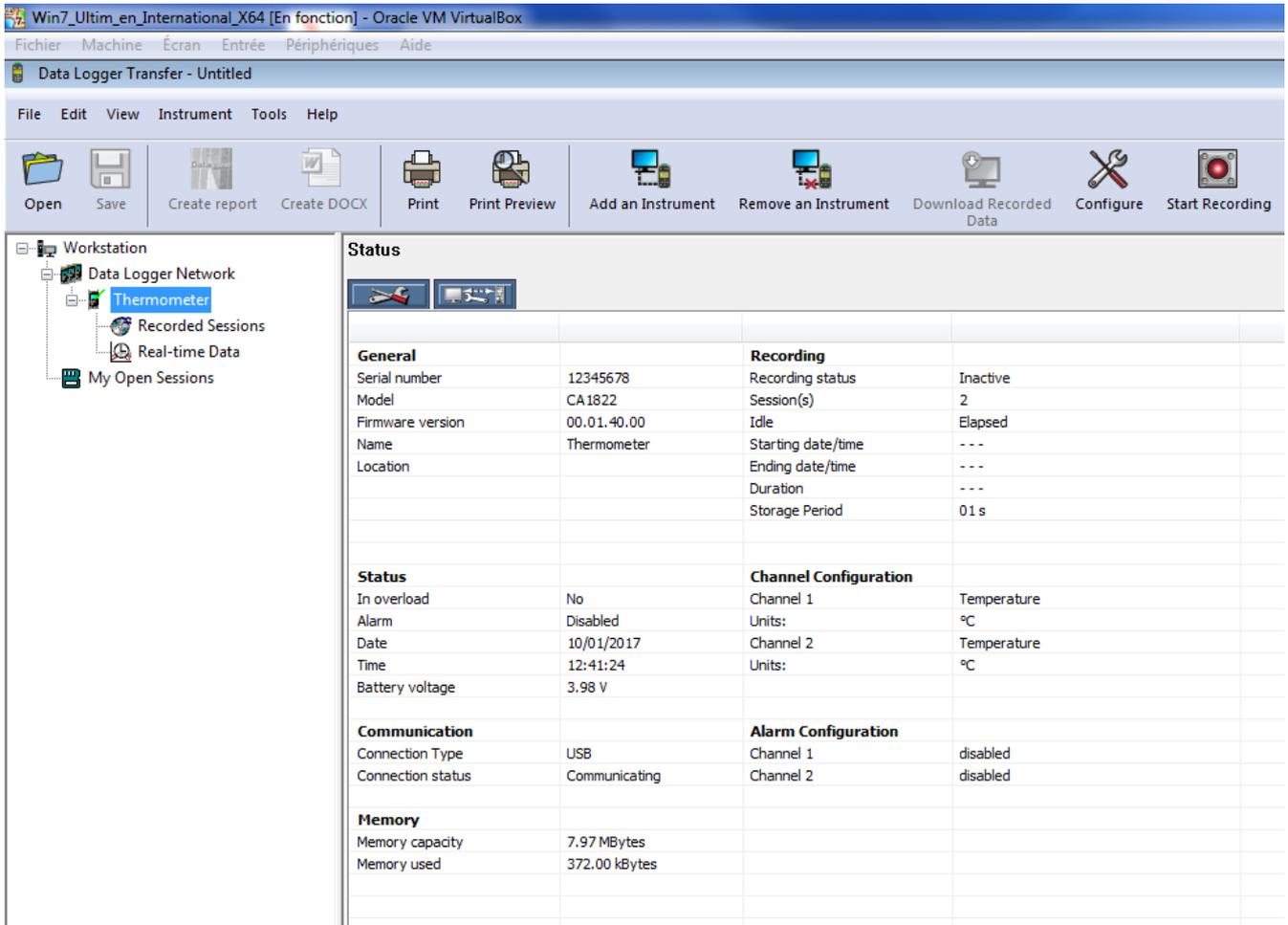
4.5.2. DATE AND HOUR

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.

| ℹ️ | 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).

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

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 C.A 1821 AND C.A 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 J T E N R S	- 200 to + 1372°C - 210 to + 1200°C - 200 to + 400°C - 150 to + 950°C - 200 to + 1300°C 0 to + 1767°C 0 to + 1767°C	-328 to + 2501°F -346 to + 2192°F -328 to + 752°F -238 to + 1742°F -328 to + 2372°F 32 to + 3212°F 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)	θ ≤ - 100°C - 100°C < θ ≤ + 100°C + 100°C < θ	± (0.2% R ± 0.6°C) ± (0.15% R ± 0.6°C) ± (0.1% R ± 0.6°C)	
Intrinsic uncertainty (R, S)	θ ≤ + 100°C + 100°C < θ	± (0.15% R ± 1.0°C) ± (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 C.A 1821 and the C.A 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.

ℹ Do not connect the C.A 1821 or the C.A 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 C.A 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	± 0.13°C / 10°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 4.0 BLE
Range 10m typical and up to 30m in line of sight.
Output power: +0 to -23 dBm
Nominal sensitivity: -93 dBm
Maximum transfer rate: 10 kbits/s
Average consumption: 3.3 µA to 3.3 V.

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 ▮▮ .

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:

	C.A 1821	C.A 1822	C.A 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.

> 110 V_{AC}
< 240 V_{AC}
50 / 60 Hz
2,5 W
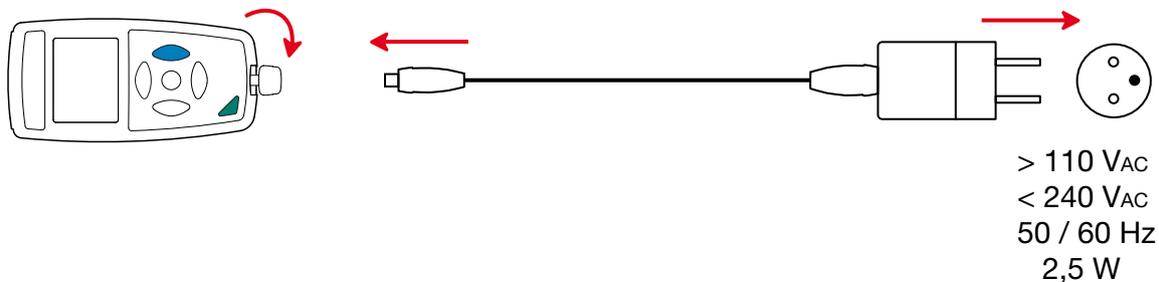
5.8. ENVIRONMENTAL CONDITIONS

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 60 529.

Drop impact test   1 m per IEC 61010-1.

5.10. COMPLIANCE WITH INTERNATIONAL STANDARDS

The instrument is compliant with standard IEC 61010-1.

5.11. ELECTROMAGNETIC COMPATIBILITY (CEM)

The instrument is compliant with standard IEC 61326-1.

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

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 EMBEDDED SOFTWARE

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 internal software 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 "C.A 1821", "C.A 1822" or "C.A 1823".

ℹ️ Updating the embedded software 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 embedded software.

Embedded software 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.
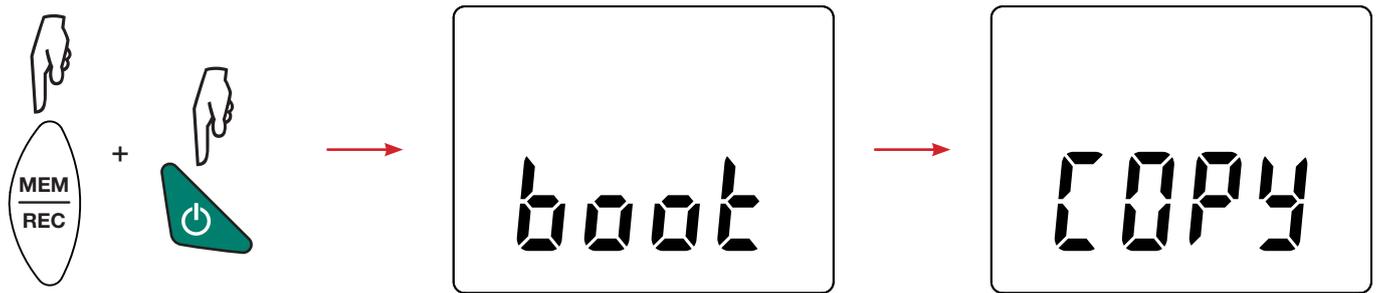
■ Release the keys and the instrument displays COPY, indicating that it is ready to receive the new software.
■ Connect the instrument to your PC using the USB cord provided.
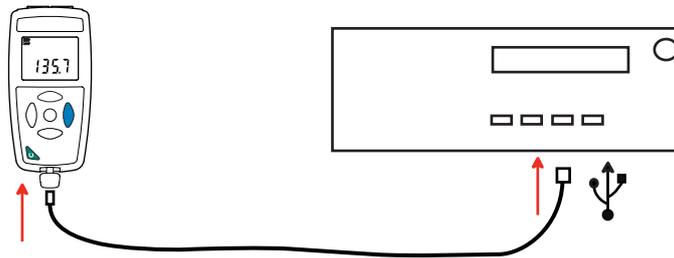
■ Copy the .bin file to the instrument as if were a USB key.
■ When the copying is done, press the MEM key and the instrument displays LOAD, indicating that the software is being installed.
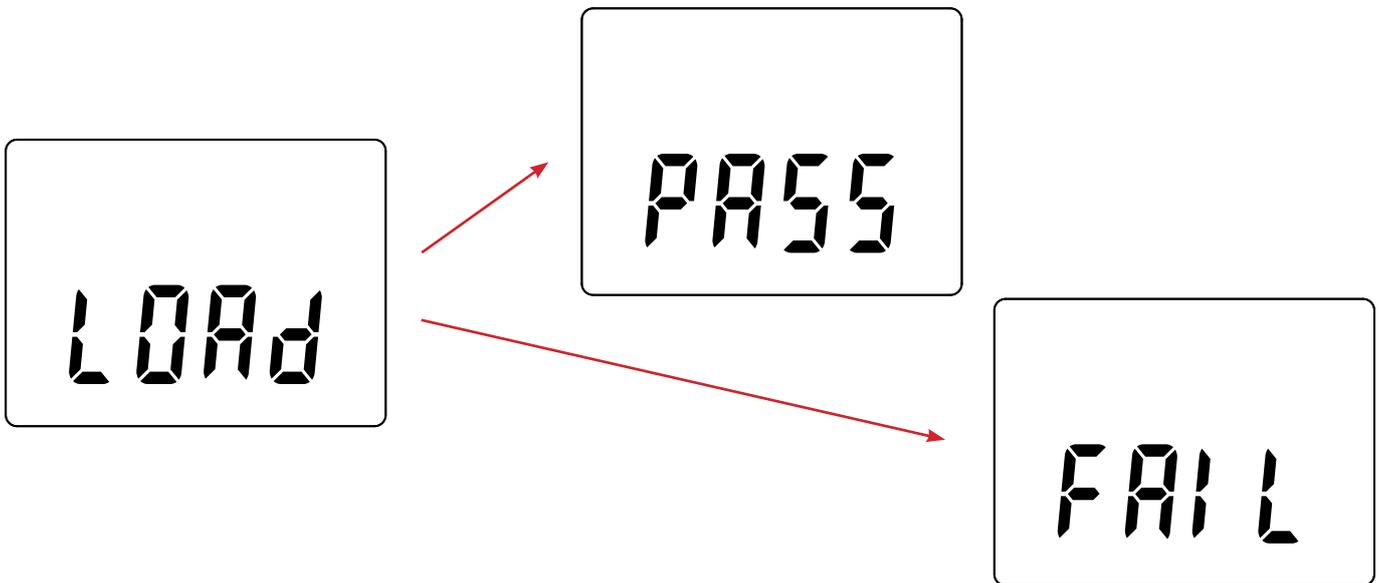
■ When installation is done, the instrument displays PASS or FAIL according to whether or not the operation succeeded. If installation fails, download the software again and repeat the procedure.
■ Then the instrument restarts normally.

| ℹ | After the internal software 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. Extract from our General Conditions of Sale provided on request.

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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