sauermann®

USER MANUAL

TM 210

THERMOMETER

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1.1 Instrument description

1.2 Keys description

- **Left key:** allows to navigate from left to right
- **Right key :** allows to navigate from right to left
- **Up key** : increments a value or a level
- **Down key** : decrements a value or a level
- **OK key** : validates an action
- **Esc key** : cancels the action or backs to previous step

1.3 Remove battery

- Turn off the instrument.
- Turn it over.
- Press the red button while sliding down the battery.

1.4 Directive 2014/53/EU

Hereby, Sauermann Industrie SAS declares that the radio equipment type TM 210 is in compliance with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: www.sauermanngroup.com

2.1 Main features

- **Screen**

120 x 160 pixels graphic display and backlight. Display of 6 measurements, 3 simultaneously. Size 50 x 67 mm.

- **Printer (available as option)**

The paper of the instrument is a thermal paper with a 10-year guarantee. It has an easy replacement system of the paper (Easyload). In addition, printing is fast.

- **Battery**

Rechargeable Li-ion battery inside the instrument, 16 h battery-life with a pressure module or 14 h a hotwire probe. The instrument is supplied with a 5 V, 1 A power adapter to load the internal battery. The current loading is indicated by a battery symbol on the top left of the screen. The orange led on the bottom of the instrument is also on until the full loading of the battery (the led turns green).

2.2 Connections

Interchangeable modules

The interchangeable modules have the SMART-2014 system and are automatically recognized once the connection is made on the instrument.

Module thermocouple

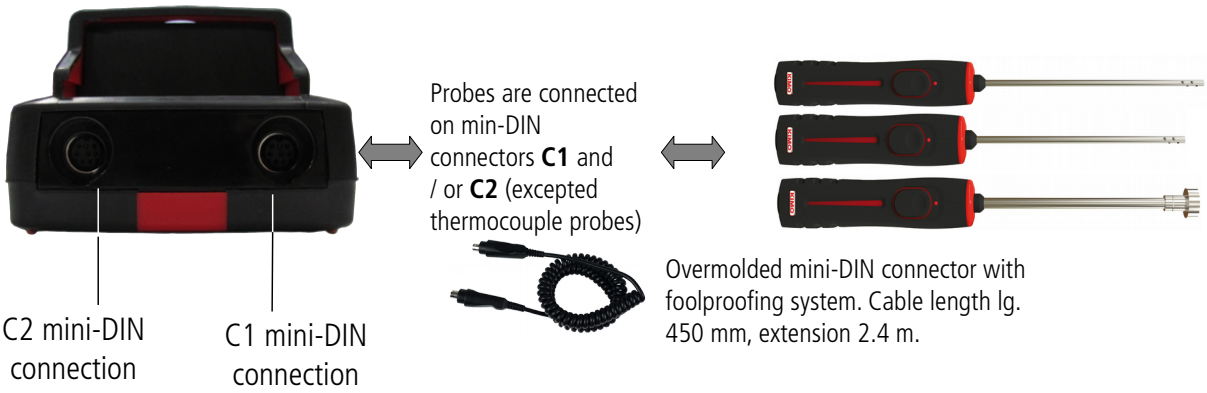
Allows to measure temperature on Tc1, Tc2, Tc3 and Tc4 channels with wired thermocouples K, J, T or S probes ended with a male miniature connector

Module Coefficient U

Allows to calculate the U coefficient thanks to the average of 3 contact temperature probes, the T thermocouple ambient temperature and the measurement of external temperature (manually entered or measured by a wireless temperature probe)

- **Wire probes with SMART-2014 system**

Wire probes with SMART 2014 system are automatically recognized when connected to the instrument.

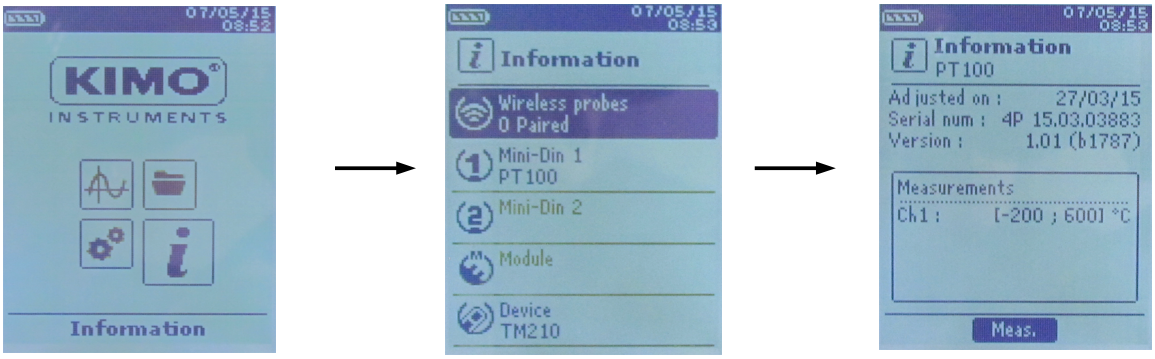


- **Wireless probe / instrument communication**

Wireless communication between probe and instrument with automatic recognition after power-up.

Wireless probes shall be located near the instrument for initial recognition. Connection between TM 210 and wireless probes must be established.

"Information" menu allows to view information about the instrument, probes and module connected to the **"Wireless probe"**, **"Mini-DIN 1"**, **"Mini-DIN 2"** or **"Module"** connections**.** To enter in this menu from home screen, select the **"Information"** menu with the arrow keys then press **OK**.



Available information for probes and module is:

- Type of probes and module
- Date of the last calibration or adjustment
- Serial number
- Firmware version
- Measuring range

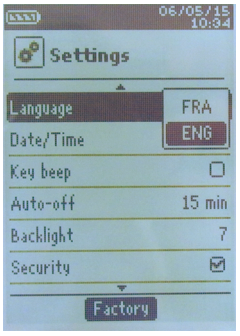
Available information for the instrument is:

- Type of instrument
- Serial number
- Firmware version

➢ The function key **"Measurement"** allows to access directly to the **"Measurement"** menu.

The instrument is on.

- With the arrow keys, go to **"Configuration"** menu.
- Press **OK.**

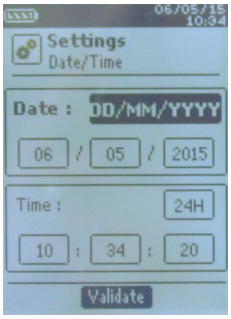


4.1 Set language

"Configuration" *screen is displayed.*

- Select **"Language"** with the arrow keys then press **OK.**
  Available languages are displayed.
- Press Up and Down arrows to select the required language : FRA, ENG...
- Press **OK.**

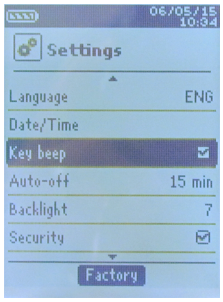
4.2 Set date and time



"Configuration" *screen is displayed.*

- Select **"Date/time"** with the arrow keys then press **OK.**
  The screen of configuration for date and time is displayed.
- Go to the **"Date"** format with arrow keys then press **OK**.
- Select : DD/MM/YYYY, MM/DD/YYYY or YYYY/MM/DD then press **OK**.
- Go to the day then press OK.
- With Up and Down keys, set the first digit of the day then go to the following one with right arrow.
- Press **OK** to validate.
  Perform the same procedure to set the month and year.
- Go the **"Time"** format with arrow keys then press **OK**.
- Select the time format : **"12H"** or **"24H"** then press **OK.**
  *If **"12H"** is selected, it is possible to choose between "AM" for ante meridiem or **"PM"** for post meridiem.*
- Press **OK**, select **"AM"** or **"PM"** then press OK to validate.
- Go the time then press OK.
- With Up and Down keys set the first digit of the day then go to the following one with right arrow.
- Press **OK** to validate.
  Perform the same procedure to set minutes and seconds.
- Press function key **"Validate"** to leave the screen and to save modifications or press **Esc** to cancel.

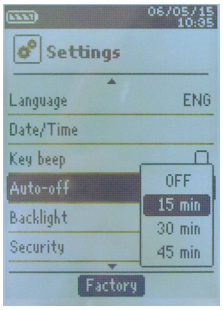
4.3 Activate or deactivate the beep key



"Configuration" *screen is displayed.*

- Select **"Key beep"** with arrow keys.
- Press OK to activate or deactivate the beep key.
  The box is ticked if the beep is activated and unticked when the beep is deactivated.

4.4 Set auto-off

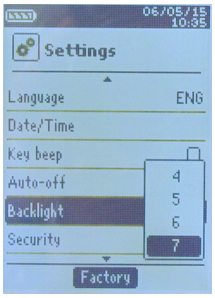


The auto-off function turns off the instrument after a moment of unused.
It is possible to set the auto-off of the instrument at 15 / 30 / 45 / 60 / 75 / 90 / 105 or 120 minutes or to deactivate it.

"Configuration" *screen is displayed.*

- Select **"Auto-off"** with arrow keys then press **OK.**
- Select the required duration or OFF to deactivate it with Up and Down keys.
- Press **OK** to validate.

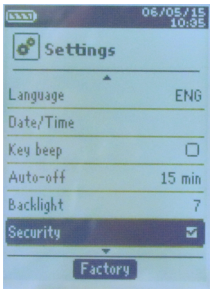
4.5 Set backlight



*"**Configuration**" screen is displayed.*

- Select "Backlight" with arrow keys then press **OK.**
- Select the backlight level between **1 and 9** or **"Auto"** with Up and Down keys.
- Press **OK** to validate.

4.6 Set security

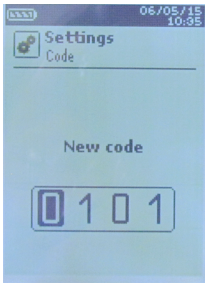


This part allows to activate or deactivate a security code. This code will be asked when starting the instrument.

*"**Configuration**" screen is displayed.*

- Select **"Security"** with arrow keys.
- Press **OK** to activate or deactivated the security.
  If the security is activated, please create a security code.

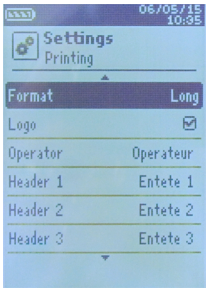
4.7 Set code



If the security is activated, the selected code will be asked when starting the instrument.
*"**Configuration**" screen is displayed and the security is activated.*

- **Go to "Code"** then press **OK.**
- With arrow keys, set each digit then press OK when the last digit is set.
  *Modifications are validated, the instrument backs to "**Configuration**" screen.*

4.8 Set printing



*"**Configuration**" screen is displayed.*

- Select **"Printing"** with arrow keys then press **OK.**
- Go to **"Format"** then press **OK.**
- Select the ticket format : long or short then press **OK**.
  ***Long ticket format :** prints the measurement results + header (operator name, date and time of the intervention, type of instrument and its serial number)*
  ***Short ticket format :** prints only the measurement results and the serial number of the instrument*
- Go to **"Logo"** then press **OK** to activate or deactivate it.
  The box is ticked when the logo is activated and unticked when the logo is deactivated.
- Go to **"Operator"** to enter an operator name then press **OK**.
  Keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.

To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : **aA1**
*To delete a letter press the function key **"Delete"**.*

- Press the function key "Validate" to validate the name.
- Go to **"Header 1"** to enter the header name then press **OK**.
  Keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
- Press the function key **"Validate"** to validate the header 1.
- Perform the same procedure to enter a name for the **"Header 2"**, **"Header 3"** and **"Header 4"**.
- Press **ESC** to back to the "**Configuration**" screen and to validate the modifications.

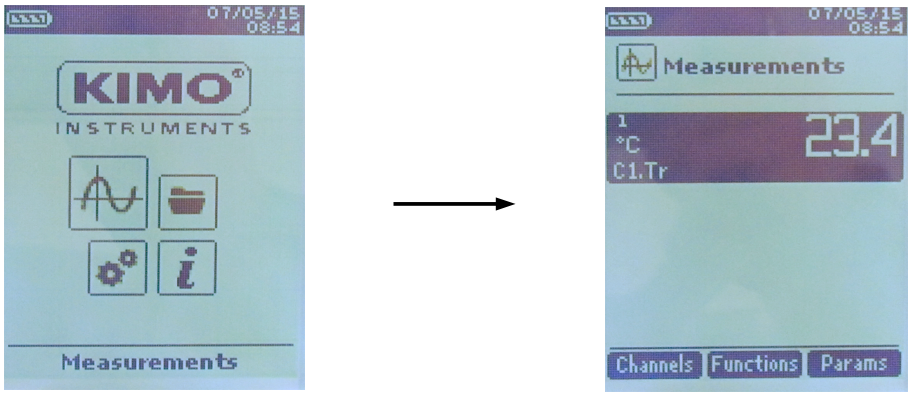
5.1 Use of the wire probes and modules

- **Connect a probe**

  ➢ Connect the mini-DIN cable on the mini-DIN connection of the probe.
  ➢ Connect the mini-DIN cable with the probe on the instrument.
  A beep indicates that the operation has been correctly performed.

Probe connection **Instrument connection**

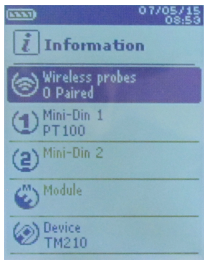
➢ Go to **"Measurement"** menu from the home screen.
➢ Press OK
Measurement are displayed.



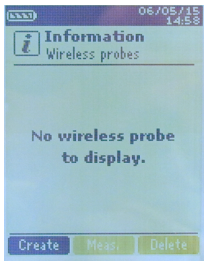
5.2 Use of wireless probes

- **Add a wireless probe**

With arrow keys, go to **"Information"** menu then press **OK**.

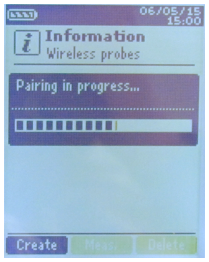


In **"Information"** menu go to **"Wireless probe"** then press **OK.**

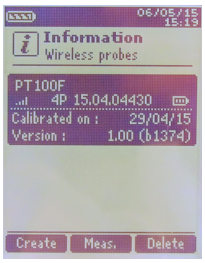


On the bottom of the screen press the function key **"Create"**.

Turn on the wireless probe and keep it press until the light blinks



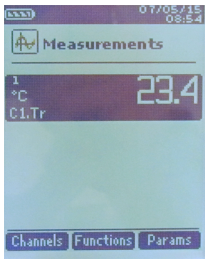
Pairing is in progress



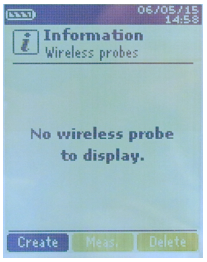
The probe information is displayed With the function key **"Meas."** It is possible to back to the measurement screen. It is also possible to delete the wireless probe pressing the function key **"Delete"**.

OR

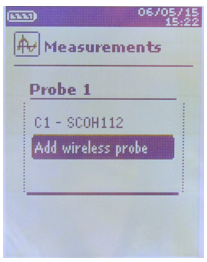
With arrow keys, go to **"Measurements"** menu then press **OK**.



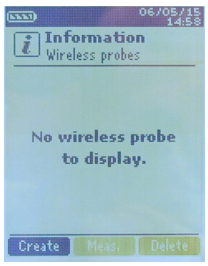
In **"Measurement"** menu, press the function key **"Channels"**.



Press the function key **"Probes".**



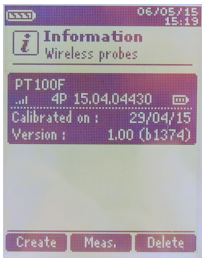
With the arrow keys, select **"Add wireless probe..."** then press **OK.**



On the bottom of the screen press the function key **"Create"**.

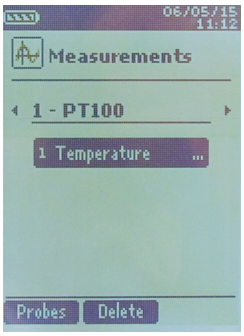
Turn on the wireless probe and keep it press until the light blinks

Pairing is in progress



The probe information is displayed With the function key **"Meas."** It is possible to back to the measurement screen. It is also possible to delete the wireless probe pressing the function key **"Delete"**.

6. CHANNEL CONFIGURATION



The channel configuration allows to modify the displaying of the measured parameters.

The instrument is on.

- With the arrow keys, go to "**Measurement"**.
- Press **OK.**
- Press the function key **"Channels"**.

  The different functions of the probe are displayed.

It is possible from the **"Channels"** menu to add or delete some measurements.

- Press the function key **"Delete"** in order to delete the selected measurement.
- Press the function key **"Add"** to display the selected measurement.
- Press **"Add"** to add a measurement on the screen (the default measurement displayed on the screen are the primary measurements).

It is possible from the **"Channels"** menu to choose the displaying order of the measurement on the screen.

- With arrow keys, select the measurement to modify and press **OK**.
- Go to the line **"Channel num."** then press **OK**.
- Select the channel number and press **OK**.

6.1 Delta T

Delta T is a function which allows to define a temperature difference calculated between two temperature channels of the same type.

- Connect the thermocouple module then the probes.

  In the **"Channels"** menu :
- Select with arrow keys the sub-menu **"Delta T"** then press **OK**.
- Select **"Channel number"** and press **OK**.
- Select a channel number and press **OK**.
- Select the channels in which Delta T will be calculated.
- Go to **"Channel A"** with arrow keys and press **OK.**
- Select the channel T1, T2, T3 or T4 and press **OK**.
- Go to **"Channel B"** with arrow keys and press **OK.**
- Select the channel T1, T2, T3 or T4 and press **OK**.
- Press the key **"Measurement"**.

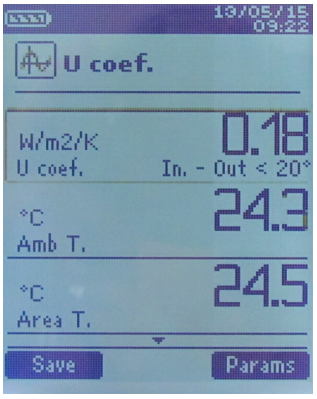
  The instrument displays the measurements.

7. U COEFFICIENT

The thermal transmission coefficient of a wall is called "U" and characterizes the amount of heat which crosses a wall in permanent regime, by time unit, surface unit and temperature difference unit between the ambiance located on both sides of the wall. The thermal transmission coefficient is expressed in W/m²K and is the opposite of the total thermal resistance of the wall. More the value is low, more the building is insulated.

- Connect the U coefficient module on the TM 210.
- Fix the temperature cables of the wire probe on the internal wall of the room or on the internal wall of the window in order to obtain the surface temperature as indicated below.

Fixation of the wire probe on the wall



- Select the **"Measurement"** tab with the navigation arrows.
- Press **"OK".**

The device displays the surface temperature and the ambient temperature.

- Press the **"Functions"** key, select **"U coef."** and press **"OK"**.
- Use the radiofrequency probe to obtain the external temperature. Put the Pt100 probe on the outside to obtain the external temperature (see page for the pairing of the RF probe 13).

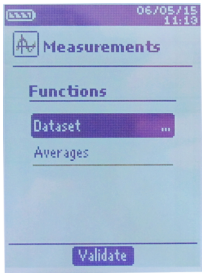
The device displays the U coefficient, the surface temperature, the ambient temperature and the external temperature.

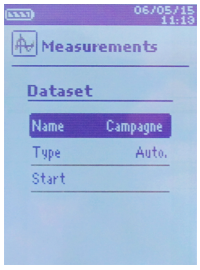
For the measurements record, see chapter **"Start and record datasets"** page 16.

If you do not have a RF probe, you can enter manually the external temperature value : go to **"Functions"**, select **"U coef."** and press **"OK"**. Go to **"Parameters"** and set the temperature value with the navigation arrows, press **"OK"** to validate.

The instrument in on.

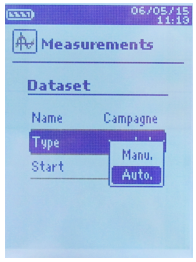
- Select with arrows keys **"Measurement"** menu.
- Press **OK.**
- Select with arrows keys the measurement in which the dataset will be performed.
- Press **"Functions"** key then select **"Dataset"** with arrow keys and press **OK**.
  Dataset menu is displayed.
- Go to line "**Name"** with arrow keys and press **OK.**
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : **aA1**
  *To delete a letter press the function key **"Delete"**.*
- Press the function "Validate" to validate the name of the dataset.





A dataset is composed of several dated measuring points. You can choose between an automatic dataset or a manual dataset.

- Go to **"Type"** with arrow keys then press OK.
- Select **"Manu."** for manual or **"Auto."** for automatic.
- Go to **"Start"** then press **OK.**



8.1 Start and record datasets

8.1.1 Manual dataset

A **manual dataset** is composed of measuring points selected by the operator.

Manual mode is selected, measurements are displayed.

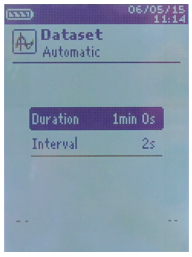
- Press **OK** to validate a measuring point.
- Press **OK** as many time as the required number of points.
- Press the function key **"Save"**.
  The instrument displays the measuring dataset : type of dataset, number of points, date, minimum, maximum, average and standard deviation.
  The dataset is automatically recorded.
- Press **OK** to display the graph of the results.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the dataset display.
- Press **Esc** to back to **"measurement"** menu.

8.1.2 Automatic dataset

An **automatic dataset** is composed of measuring points with interval of time.

Automatic mode is selected, measurements are displayed.

- Press the function key **"Duration"** to set the dataset duration.
- Press **OK** on the line **"Duration"**.



- Go to **"Hour"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the minutes and seconds.
- Press the function key **"Validate"** when the duration is set.
- Press **OK** on the line **"Interval"**.
- Go to **"min"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the seconds.
- Press the function key **"Validate"** when the interval is set.
- Press **Esc** to back to measuring dataset.
- Press the function key **"Start"** to launch the measuring dataset.
  The countdown starts.
  - It is possible to stop the measuring dataset by pressing the function key **"Stop"**.
  - Press "**Start"** to restart the dataset.
  - Press **"Duration"** to modify the duration.
  - *Press **"Save"** to save the dataset.*

  The instrument displays the measuring dataset : type of dataset, number of points, date, minimum, maximum, average and standard deviation.
  The dataset is automatically recorded.
- Press **OK** to display the graph of the results.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the dataset display.
- Press **Esc** to back to **"Measurement"** menu.

8.1.3 View the recorded datasets

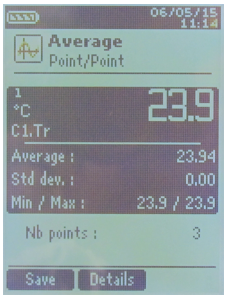
- Go to the **"Dataset"** menu with the arrow keys from the home screen.
  The different measuring datasets are displayed. They are listed by date.
- To delete all the datasets : press the function key **"Del all"**.
- To delete just one dataset : go to the dataset to delete with the arrow keys and press the function key **"Delete"**.
- A confirmation window opens : select **YES** to confirm the deletion or **NO** to cancel.

8.2 Launch and save averages

The instrument is on.

- Go to **"Measurement"** with the arrow keys.
- Press **OK.**
- Press the function key **"Functions"** then select **"Averages"** then press **OK**.
  ***"Average"** menu is displayed.*

8.2.1 Point/Point average



This function allows to calculate the average value of various points that you can select.

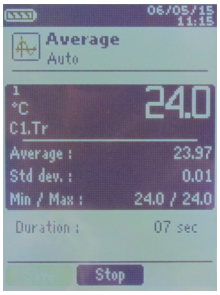
- Go to **"Point/Point"** line in the "**Averages"** menu and press **OK**.
- Press OK to add measuring points.
  The instrument displays the type of dataset, number of points, date, minimum, maximum, average and standard deviation.
- Press the function key **"Details"** to get details for each point.

- Press the function key **"Save"** to save the Point/Point average.
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad : press the function key : **aA1**
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the Point/Point average is displayed.
- Press OK to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the Point/point average display.
- Press **Esc** to back to **"Measurement"** menu.

8.2.2 Automatic average

This function allows to calculate an average value that the device measured in an interval chosen time.

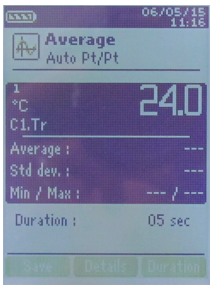
- Go to **"Automatic"** line in the "**Averages"** menu and press **OK**.
- Press the function key **"Start"** to start the measurement.
  Duration is displayed.
- Press the function key **"Stop"** to stop the measurements.
  Measurements, average, minimum and maximum values, standard deviation and duration are displayed.
- Press the function key **"Start"** to launch a new automatic average.
- Press the function key **"Save"** to save the results.
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad :
- *press the function key :* **aA1**
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the automatic average is displayed..
- Press OK to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the automatic average display.
- Press **Esc** to back to **"Measurement"** menu.



8.2.3 Automatic Point/Point average

This function allows to calculate the average value of various points, calculated themselves on a duration beforehand defined.

- Go to **"Auto Pt/Pt"** line in the "**Averages"** menu and press **OK**.
  A duration is displayed on the bottom right of the screen.



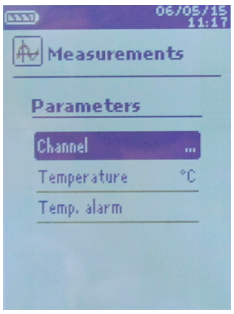
- Press the function key **"Duration"** to modify the duration if necessary.
- Go to **"min"** with the arrow keys then press **OK**, set the duration with arrow keys then press OK**.**
- Perform the same procedure for the seconds.
- Press the function key **"Validate"** when the interval is set.
- Press **OK** to start the measurement.
  A the end of the measuring dataset, measurements, average, minimum and maximum values, standard deviation and duration are displayed.

- Press **OK** to add a new measuring point to the calculation.
  The countdown starts.
- Press the function key **"Details"** to get details of the results.
- Press the function key "**Save"** to save the results of the automatic average.
  A keypad is displayed on the bottom of the screen.
- Select the letters with arrow keys then press **OK**.
  To go from the lower case keypad to the upper case keypad then to the numeric keypad :
- *press the function key :* **aA1**
  *To delete a letter press the function key **"Delete"**.*
- Press the function key **"Validate"** to validate the name.
  The recap of the dataset is displayed.
- Press **OK** to display the graph.
- Press the function key **"Zoom+"** to display the detail of the calculated points.
- Press **Esc** key to back to the dataset screen.
- Press the function key **"Print"** to print the dataset.
  Printing mode is displayed.
- Go to the line **"Channels info"** and press **OK** to print the channels on the printing ticket.
- Go to the line **"Details"** and press **OK** to print details of the dataset on the printing ticket.
- Press the function key **"Validate"** to print.
  The instrument backs to the automatic point/point average display.
- Press **Esc** to back to **"Measurement"** menu.

8.3 Hold-Min./Max.

- Go to **"Measurement"** menu with the arrow keys and press **OK**.
  Measurements are displayed.
- Press OK.
  Measurements are frozen on the screen and the minimum and maximum values are displayed.

The instrument is on.



- Go to **"Measurement"** menu with the arrow keys and press **OK**.
- Select the measurement to set with the arrow keys.
- Press the function key **"Params"**.
  The different parameters are displayed.

- For all probes and modules, it is possible to modify the channel number.
- Select **"Channels"** with the arrow keys and press **OK**.
- Select **"Channel num."** and press **OK**.
  Select a channel number for the parameter, and press **OK**. This number defines the order display of the parameters.

9.1 Thermocouple and Pt100

9.1.1 Unit

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit : °C or °F
- Press OK to validate the unit selection.

9.1.2 Type (only for thermocouple)

- Go to the line **"Type Tc"** and press **OK**.**« »**.
- Select the type of thermocouple : K, T, J and S
- Press OK to validate.

9.1.3 Alarm

- Go to the line **"Temp.alarm"** and press **OK**.
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**.

9.2 U coefficient module

9.2.1 Unit

- Go to the line **"Temperature"** and press **OK**.
- Select the required unit : °C or °F
- Press OK to validate the unit selection.

9.2.2 Alarm

- Go to the line **"Temp.alarm"** and press **OK**.
- Select **"High alarm"** and/or **"Low alarm"** by pressing **OK**.
  It is possible to set the high and low thresholds.
- Go to the line **"High threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**.
- Go to the line **"Low threshold"** and press **OK**.
- Set the threshold with the arrow keys between -9999.9 and 9999.9°C then press **OK**

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