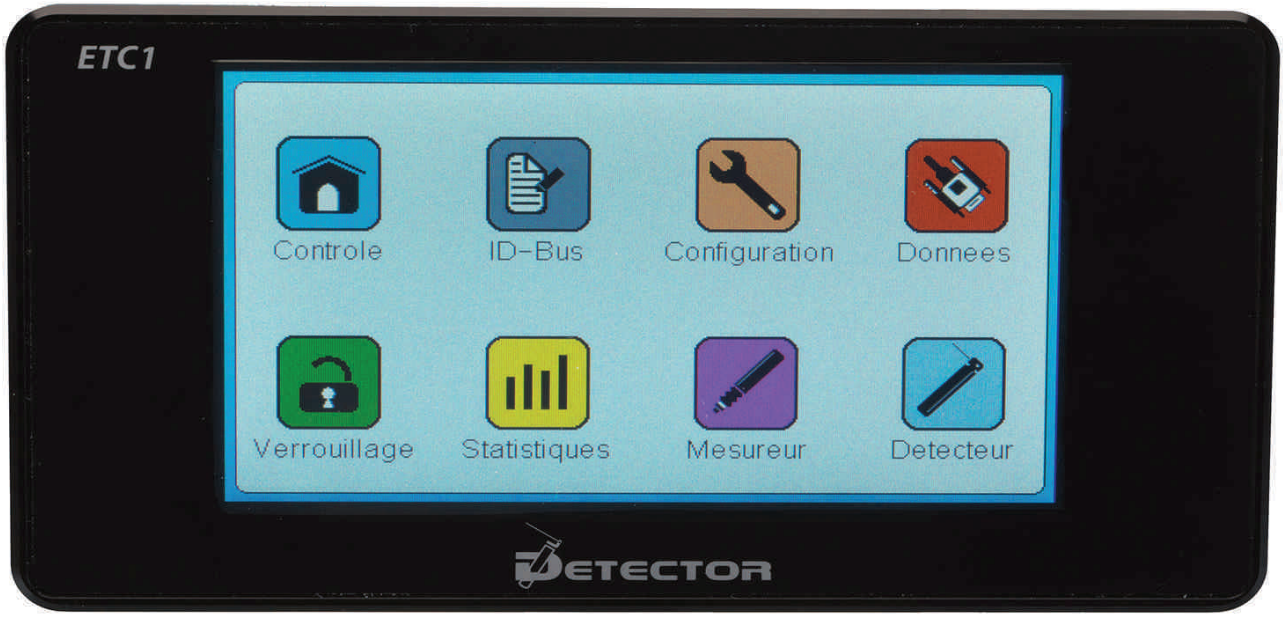
English

Programming Manual
Touchscreen + Conditioner
Measurer



www.detector-france.com

PROGCDT-PC2-EN – Index A

1. Introduction

After a short presentation of the system possibilities, this guide will describe all adjustments and settings of the conditioner CDT-PC2.
With regard to installation and wiring, please refer to the Electrical installation manual **INSELE-CDT-PC2.**
Do not hesitate to contact us for any additional information or in case of persistent problems, a technician will be present to answer you either by email:
commercial@detector-france.com or by phone +33 450 037 998.

The CDT-PC2 conditionner can connect 1 or 2 probe from the DETECTOR probe range.
Al the probes in the range are compatible with this conditioner. It is possible to connect several conditioners together to obtain a network. This system (Touchscreen + conditioners) can manage up to 8 probes whether 4 conditioners.

The **PC2003** is designed to measure part length or diameters (depending on the sensor type chosen) using an LVDT linear probe. Three measurement modes are available: **Peak , Peak Controlled** or **Realtime**.

The **Peak mode** (default) can be described as follows:
1- During the passing of a part (spindle indexing), the sensor moves when it comes in contact with the part.
2- The largest value (the sensor's peak movement) is stored by the amplifier.
3- After the valid signal is sent by the machine at end of the cycle, the stored value is compared to the reference value and the programmed tolerances.
4- The amplifier instantaneously triggers relays based on the results of its comparison (good part, min. part, max. part or machine shutdown).
5- If the measured part is not within tolerance, the machine can be shutdown using these relays. On the contrary, if the measured part is within tolerance, the amplifier is automatically reset and awaits the next cycle.

The **Peak Controlled** mode differs only from the Peak mode because there is another check (internal to the amplifier) to assure that the sensor is working correctly:
The first stages (**1 and 2**) are the same until the valid signal.
3-When the valid signal is sent from the machine, the value stored in memory is compared to the reference and to the programmed tolerances, but there is also another check of the instantaneous position of the sensor (sensor value at the time of the valid signal). This control will be correct only if this instantaneous value is not within the defined tolerances at the moment of the valid signal.
4-The amplifier instantaneously sends the results to the machine (control of the stored value + control of the instantaneous value)
5-If the measured part is not within tolerance, the machine will be shutdown at the end of the cycle and will show a bad part on the screen. If the sensor does not come back to its initial position, so the instantaneous value at the moment of the valid signal is still within tolerance, the machine will stop at the end of the cycle and show defective sensor on the screen. On the contrary if the 2 controls are Ok (peak measure within tolerance and instantaneous measure at the moment of the valid signal not within tolerance) the machine is not shutdown and the measurement is reset and will wait for the next cycle.

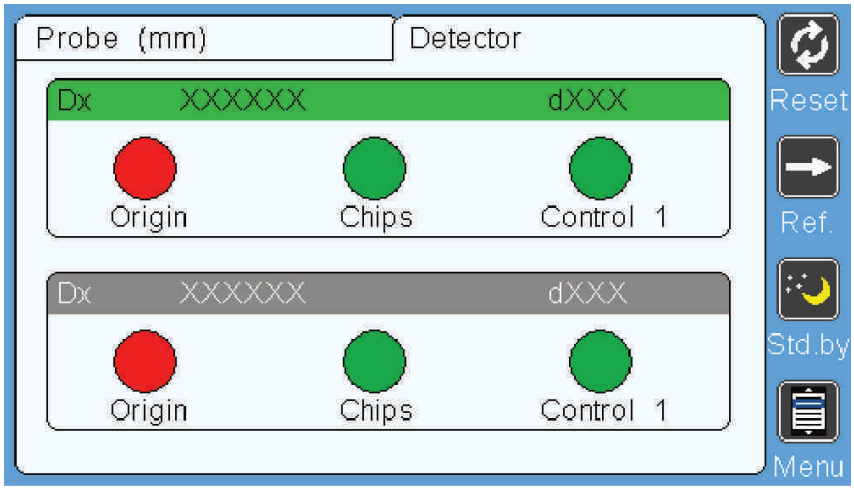
The **Realtime mode** can be described as follows:
1- The sensor, mounted at a station (like a drill tool), comes in contact with the part (during the work) until it is at the machining end stop.
2- Then the valid pulse is sent by the machine; the instantaneous (current position of sensor) value is directly compared to the reference and the tolerances.
3- The amplifier triggers the relays based on the result of its comparison (good part, min. part, max. part or machine shutdown).
4- If the measured part is not within tolerance, the machine can be shutdown using these relays. On the contrary, if the measured part is within tolerance, the measurement is reset and awaits the next valid signal.

Other functions are present in this conditioner, such as the **masking** of a measurement during a material feed operation, the **transfer** of a measurement, or the **machine shutdown** function.

The CDT-PC2 conditioner is suitable for most multi-spindle/single spindle machine tools which are cam driven or numerically controlled. Thanks to the user friendliness of the menus, any user can rapidly plug in and use the amplifier and easily navigate within it. In addition, once adjusted, the amplifier can be locked to prevent any handling errors.
All the menus and functions are detailed in the rest of this guide.

2. Pairing of the conditioner

When you turn on the power for the first time, the following page appears on the touchscreen :

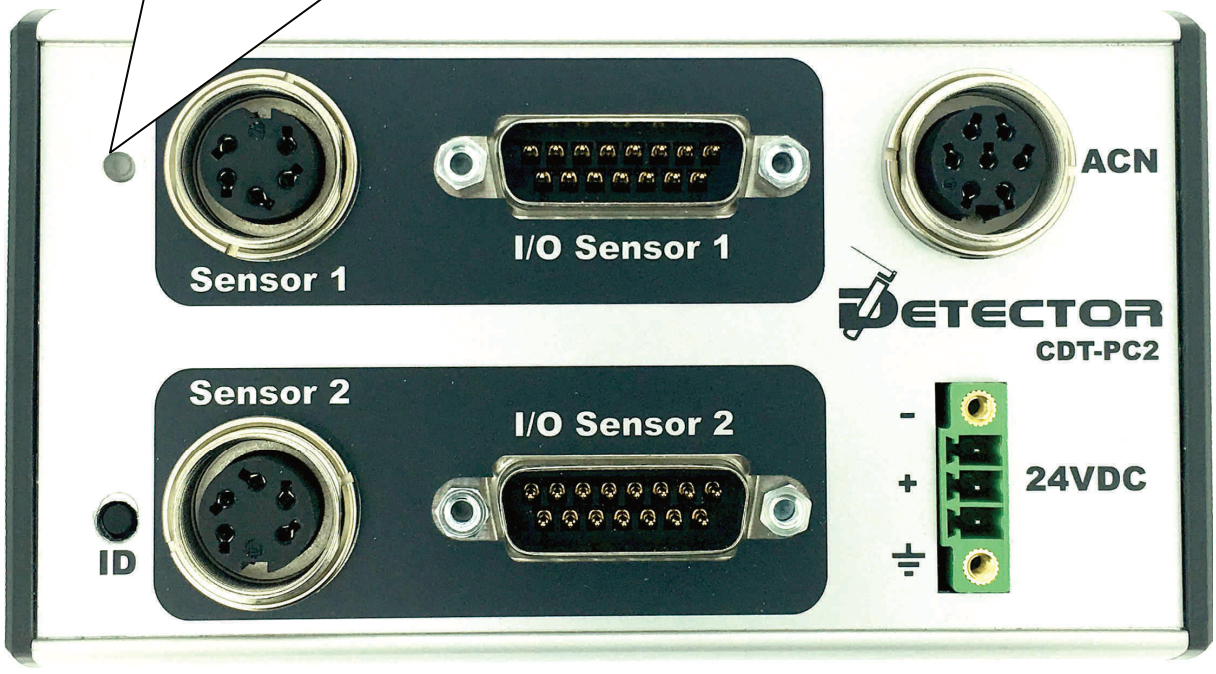


The first Step is to pair the conditioner CDT-PC2.

Note: The blue light on the conditioner flashes: it means that it is not recognized and cannot be operated.

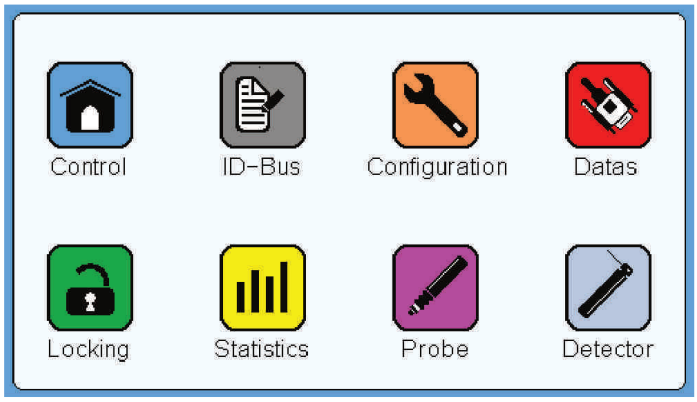
Flashing blue light: the conditioner is not paired with the touch screen.
The detector cannot operate until the pairing is made.

Solid blue light: The conditioner is paired by the touch screen.
The detector can be operated and parameters set.



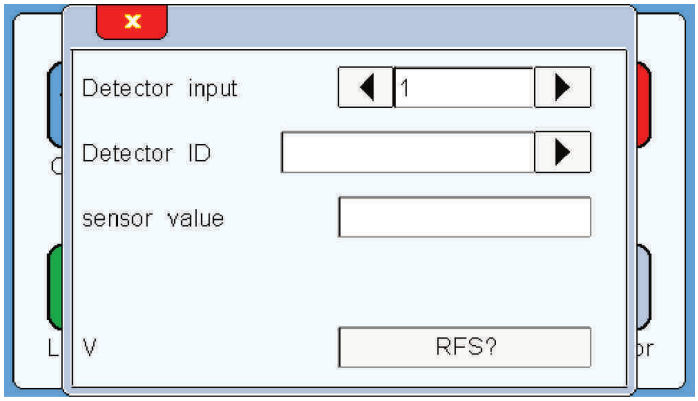
PRESS ICON 

The home page appears:



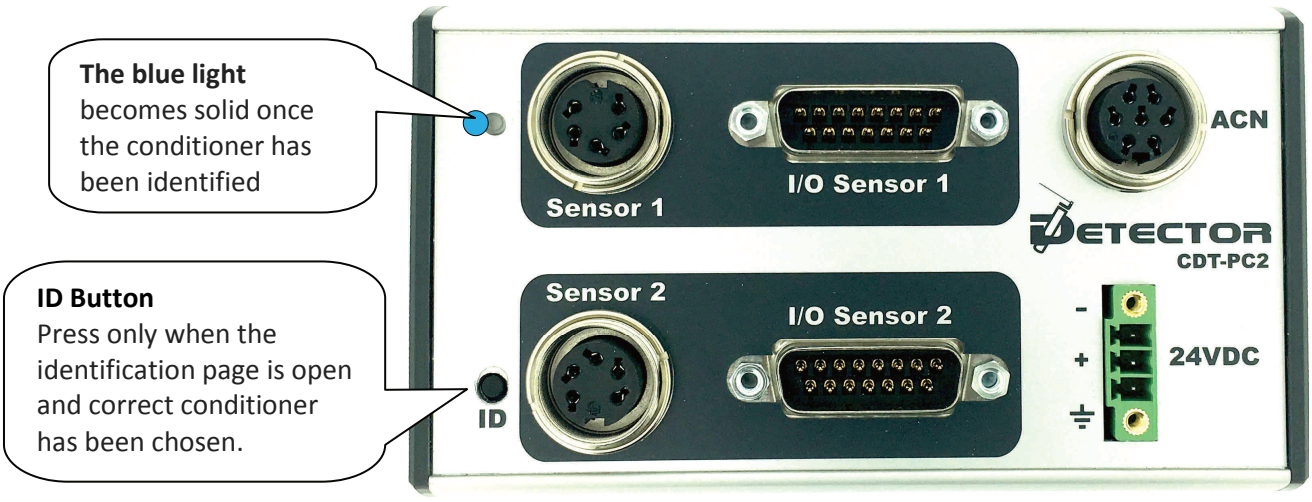
PRESS ICON 

The conditioner identification page appears:

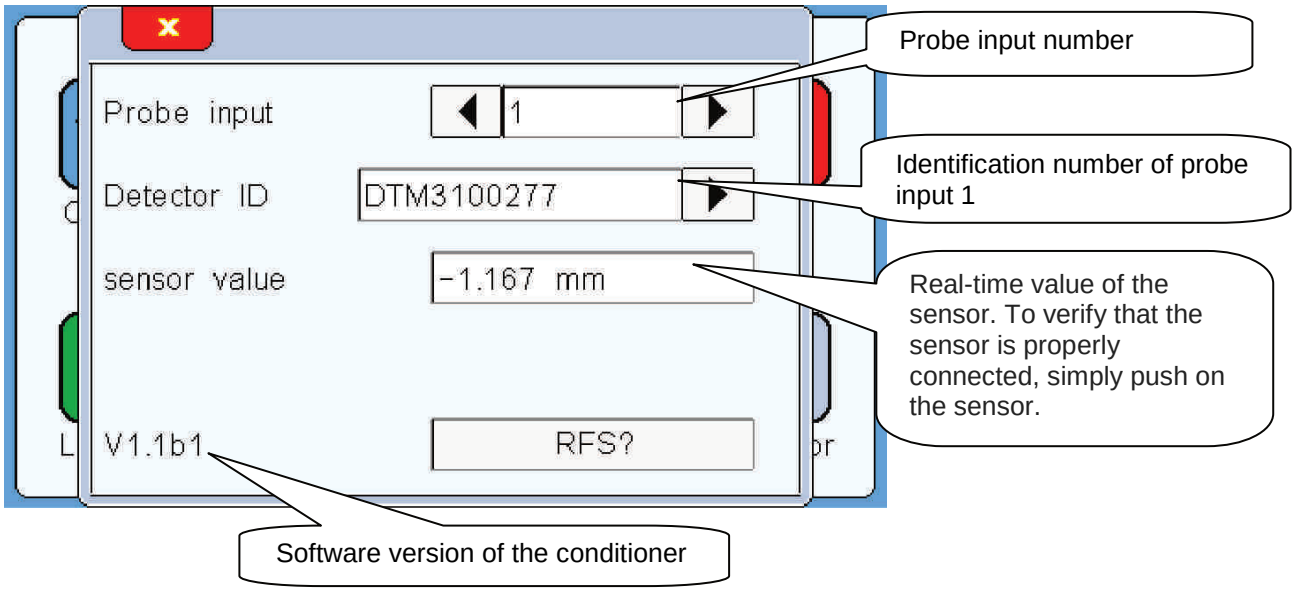


The settings on this page are empty because the conditioner has not been paired get.

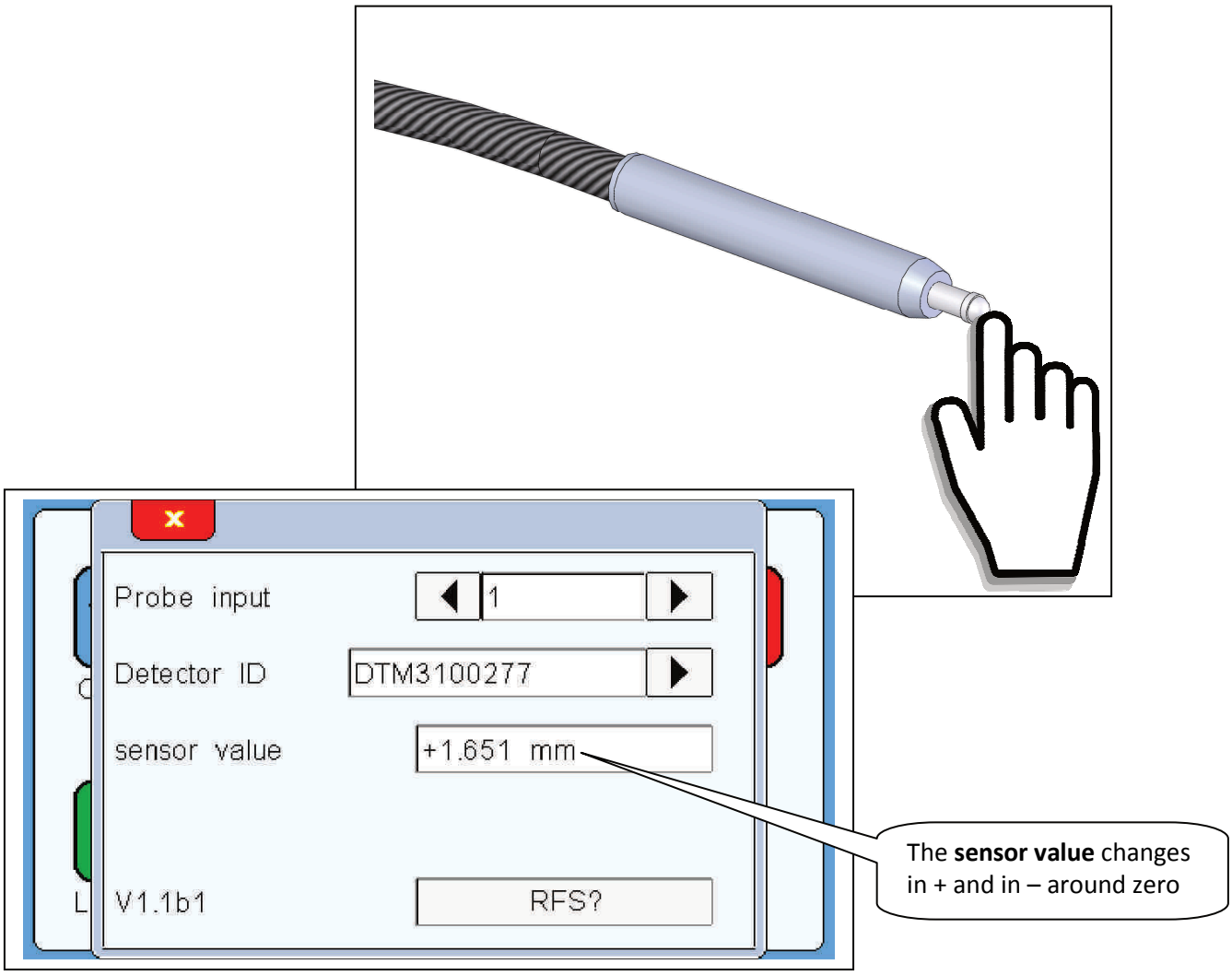
To pair the conditioner on the touch screen, simply **open this page and press the ID button** on the upper face of the conditioner.



The settings on the identification page are now filled in:



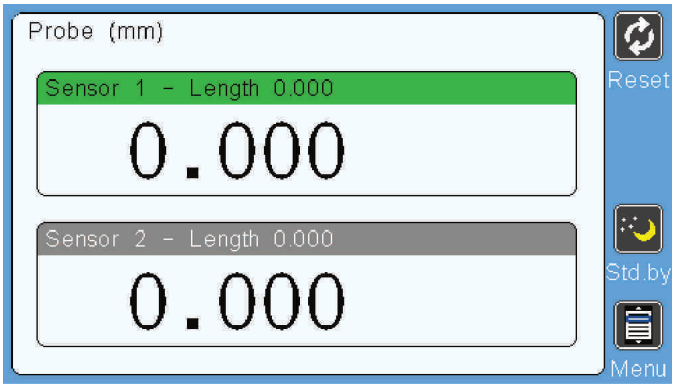
To verify that the probe is properly connected, you have to press the sensor to see **the sensor value** advanced.



3. Probe settings

The second step is to set parameters for the probe.

After the conditioner has been paired, the control page appears below:

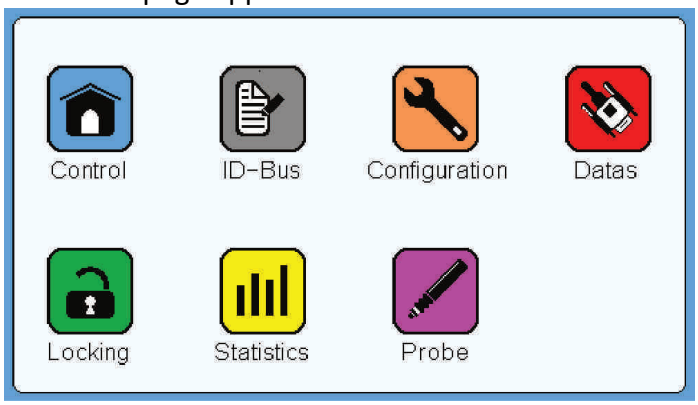


One of the first parameters to set is the **adjustment of the preload.**

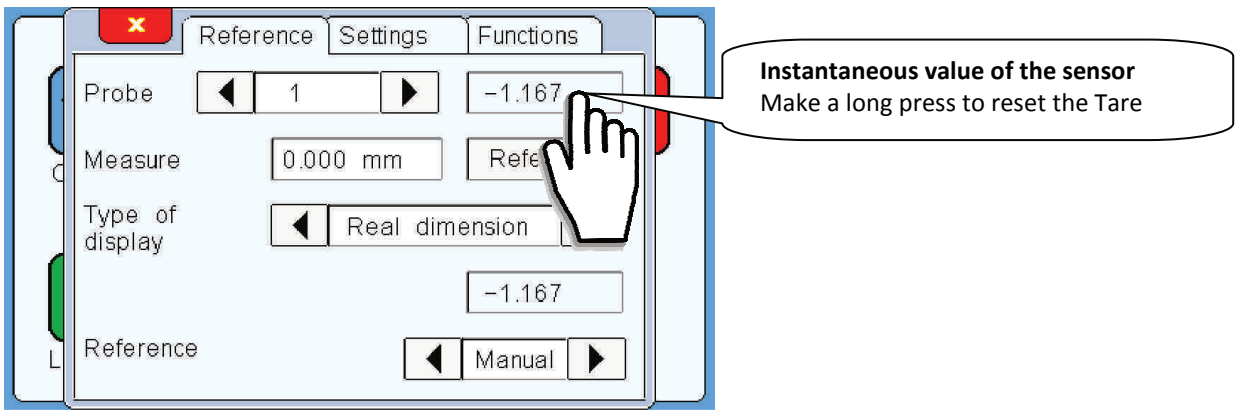
3-a Adjustment of the preload :

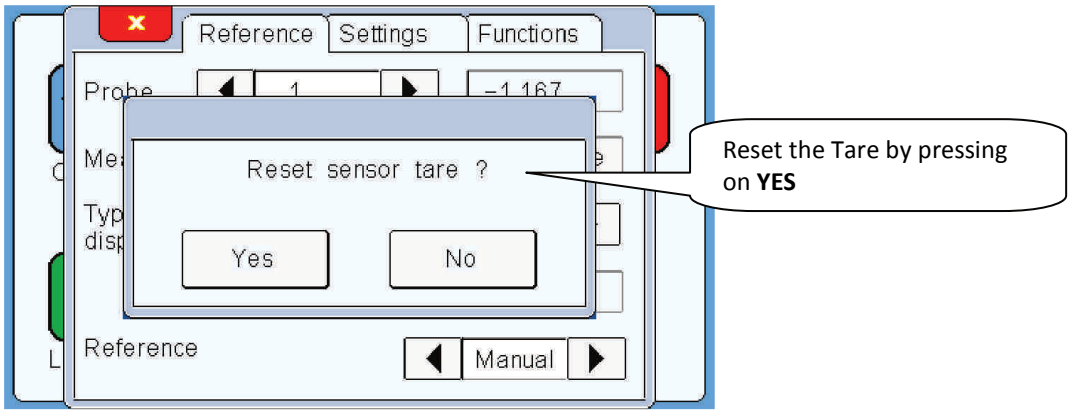
PRESS ICON 

The home page appears :



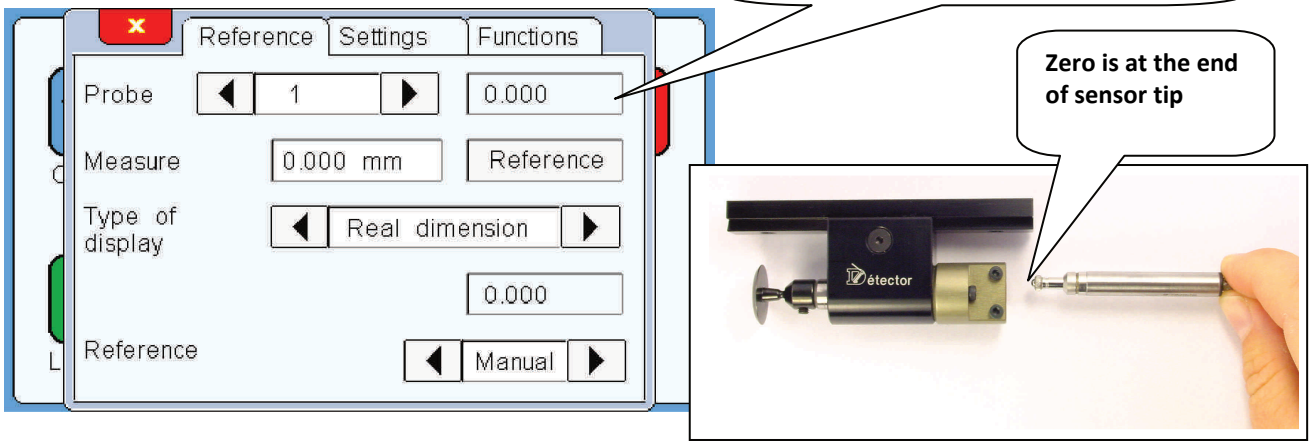
PRESS ICON Probe



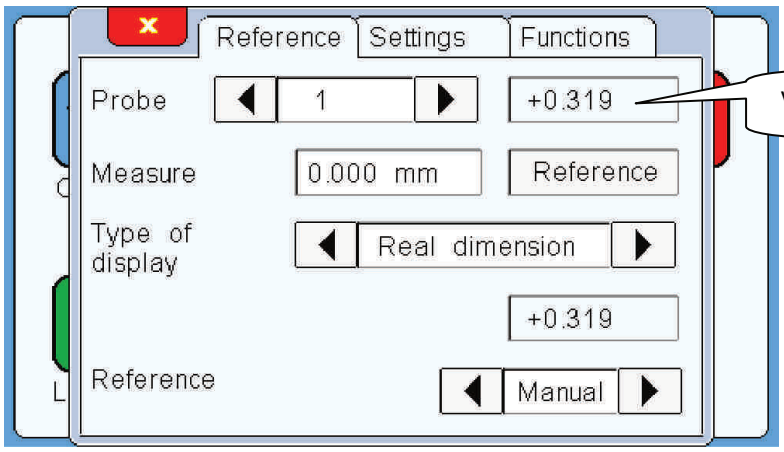


Reset the Tare by pressing on **YES**

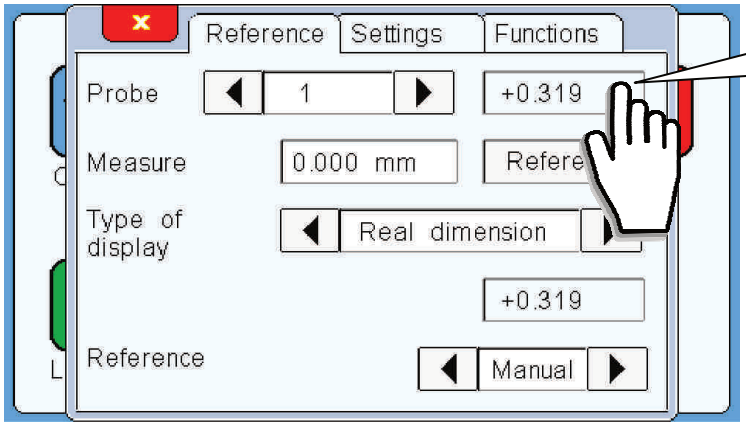
PRESS BUTTON Yes



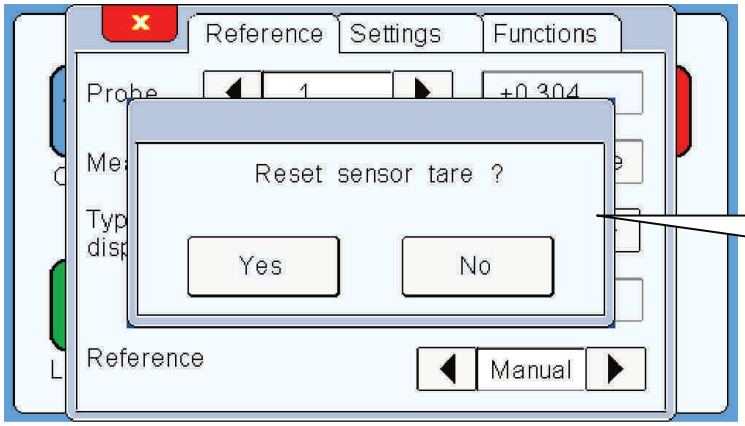
Take the sensor and insert it in the probe until a value of approximately **+0.200 to +0.400mm** is shown.



Using a hexagonal wrench 2 and the screw(s) CHC M2.5x10, tighten the sensor in the probe while maintaining the preload value from **+0.300 to +0.400mm**..
Once the screws are locked, reset the Tare by a long press on the instant value.

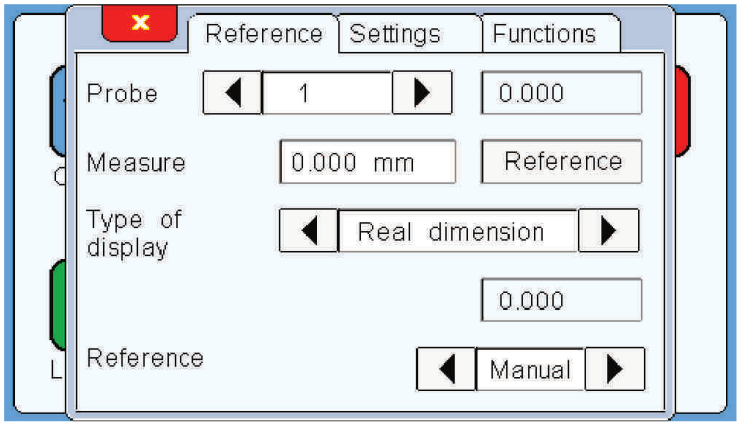


Instantaneous value of the sensor
Make a long press to reset the Tare



Reset the Tare by pressing on **YES**

PRESS BUTTON 



Le zéro est au bout de la touche du mesureur

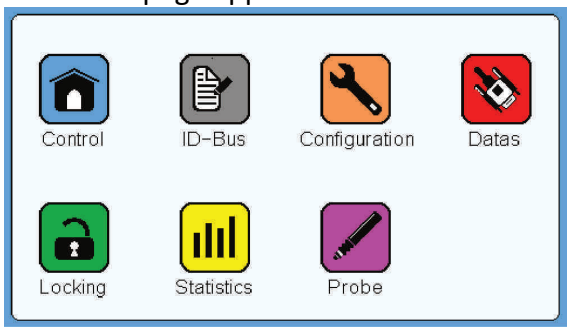
The **adjustment of preload** procedure is completed. The next step is the **calibrating the reference**.

3-b Calibrating the Reference :

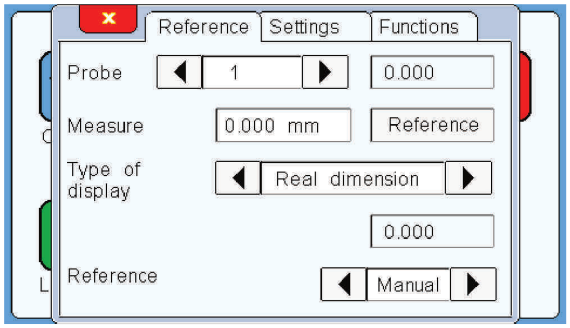
Calibrating the reference allows the calibration of the sensor to a reference part on your machine. Calibration must be done only after the amplifier has been correctly wired and your machine correctly adjusted so that the dimension to be measured is a mean and stable dimension (without machine drift). By default, the sensor is delivered to you preloaded in the probe. However, if the internal sensor was disassembled from the probe for replacement or a cleaning, the sensor has to be preloaded and tare reset in the probe. This procedure is detailed below in subsection **3-a Adjustement of the preload.**

PRESS ICON 

The home page appears :

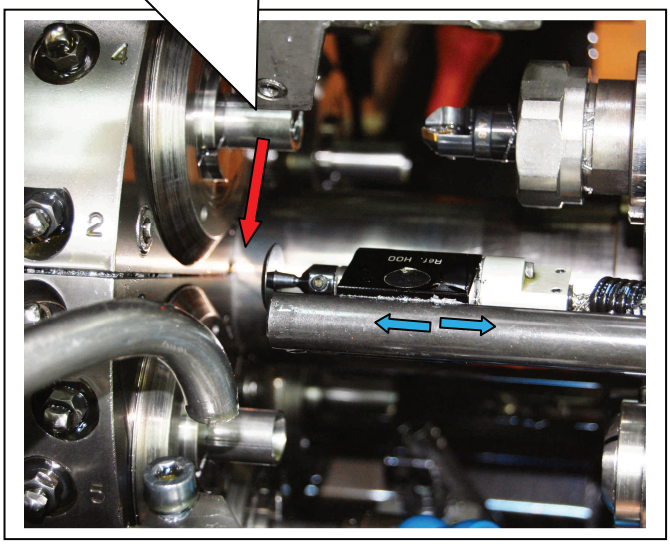


PRESS ICON 

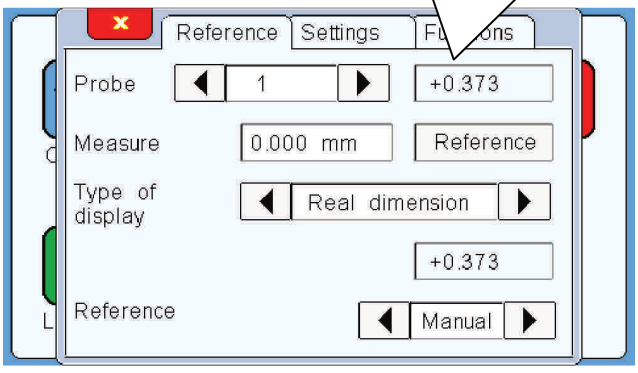


For the first calibrating of the reference , it is absolutely necessary to calibrate in **manual** mode, to have a precise mechanical adjustment of the reference.

The first step is to approch the part where the probing will take place

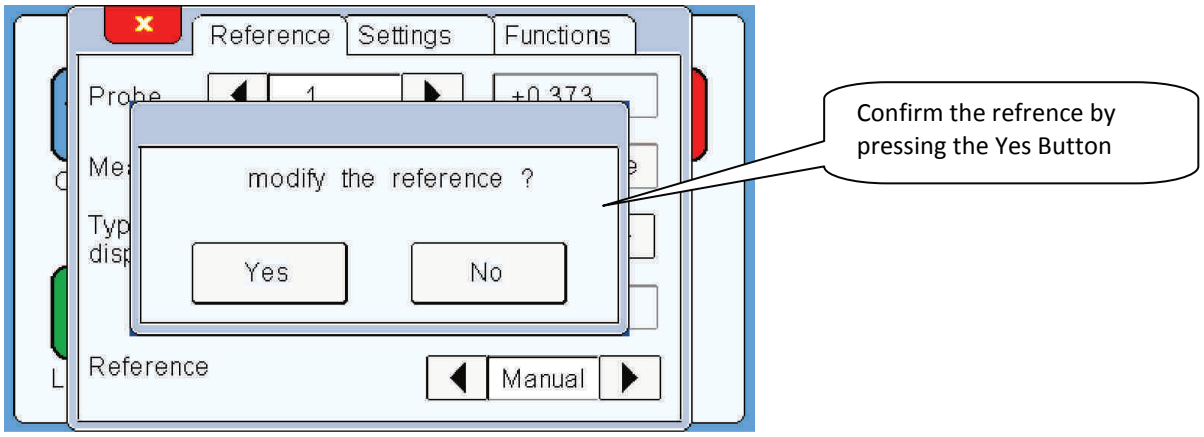


The 2nd step is to adjust the position of the probe using the mechanical settings, so that there is a press on the tip included between **0,200 and 0.400 mm**

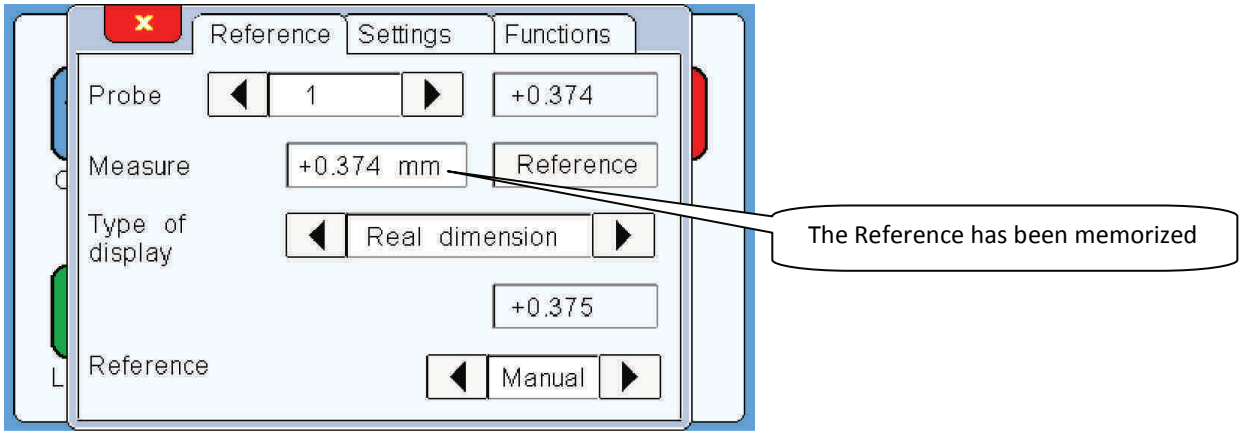


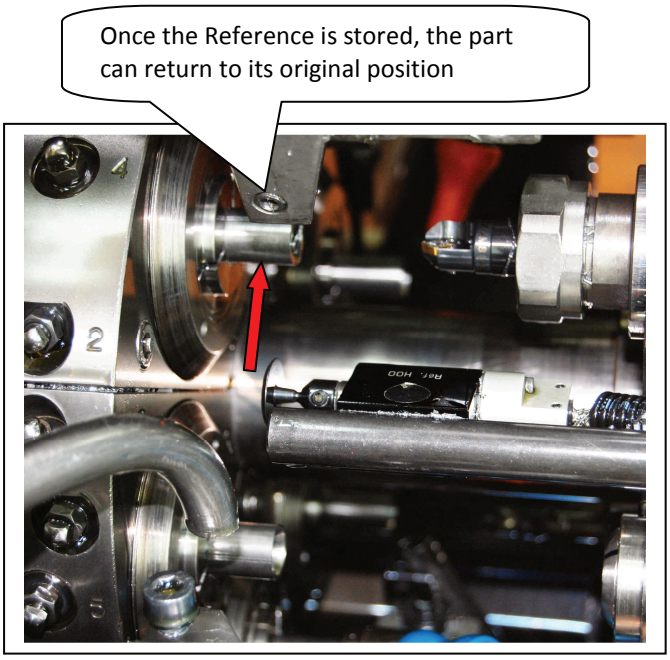
Once the probe is locked in position and the probe value is stabilized :

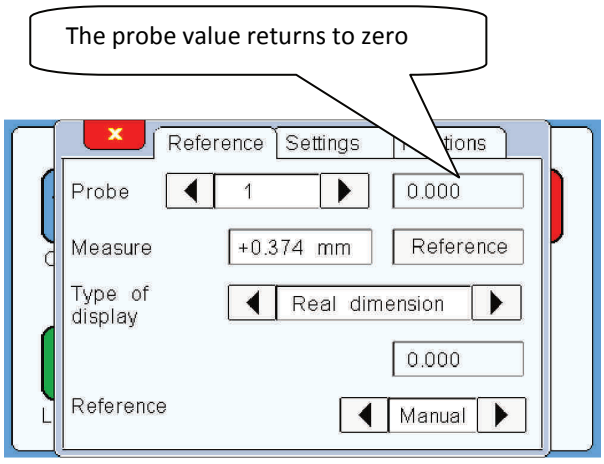
PRESS BUTTON Reference



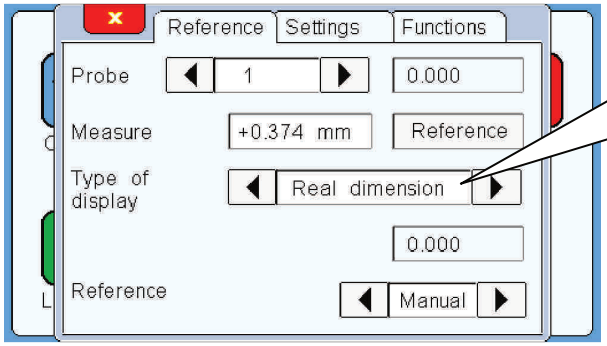
PRESS BUTTON Yes



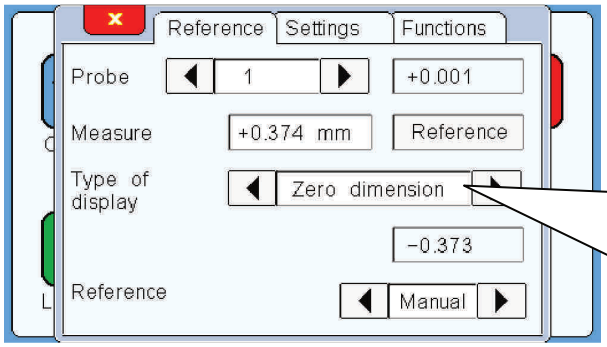




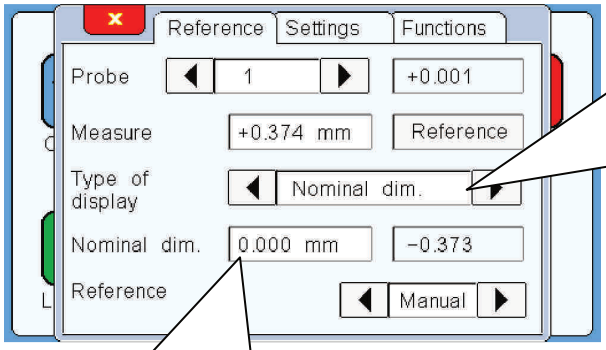
To complete the reference adjustment procedure, it remains to choose the type measurement display.



Real dimension:
The real dimension corresponds to the sensor value which you adjusted previously : +0.374mm remains display

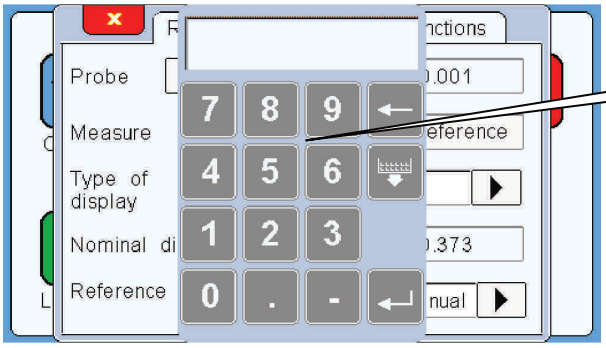


Zero dimension :
The **zero dimension** corresponds to the difference with the real dimension reset to zero:
+0.374mm becomes 0.000mm. A measured part of 0.390mm will be displayed +0.016mm

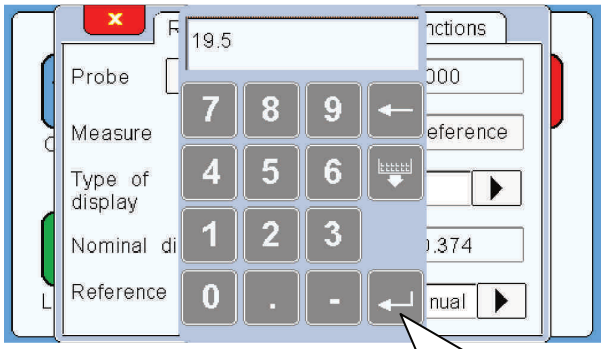


Nominal Dimension :
The **Nominal dim.** allows replacing the real dimension by a nominal dimension on your drawing.
Example:
19.500mm. A measured part of 0.390mm will be displayed as 19.516mm

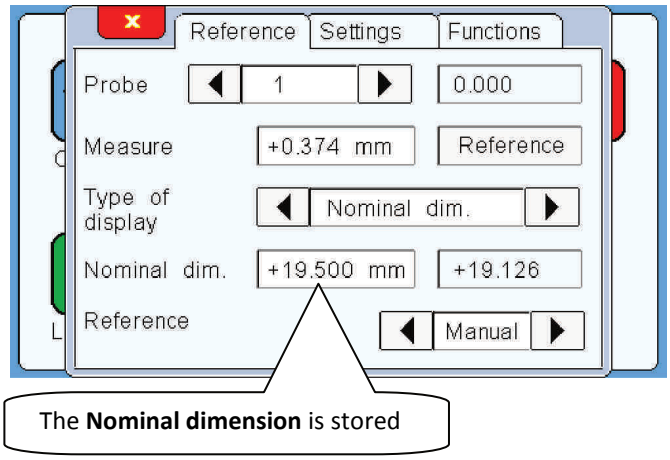
Press on « Nominal dim. »



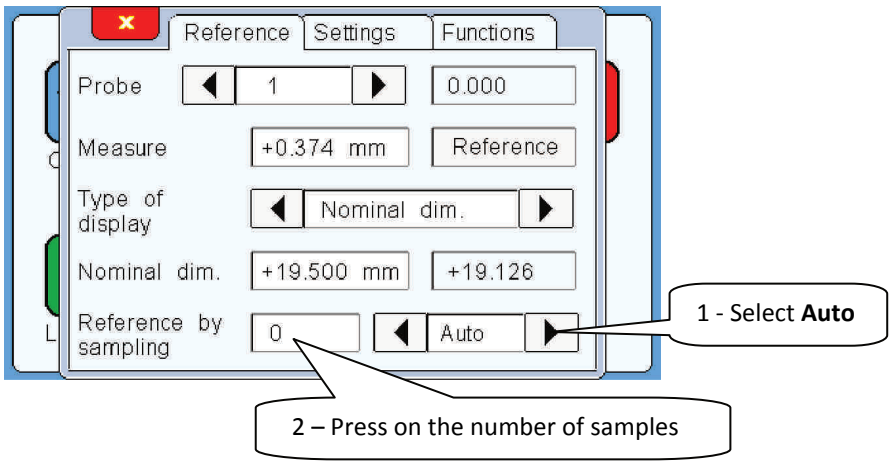
Enter a value with the keypad

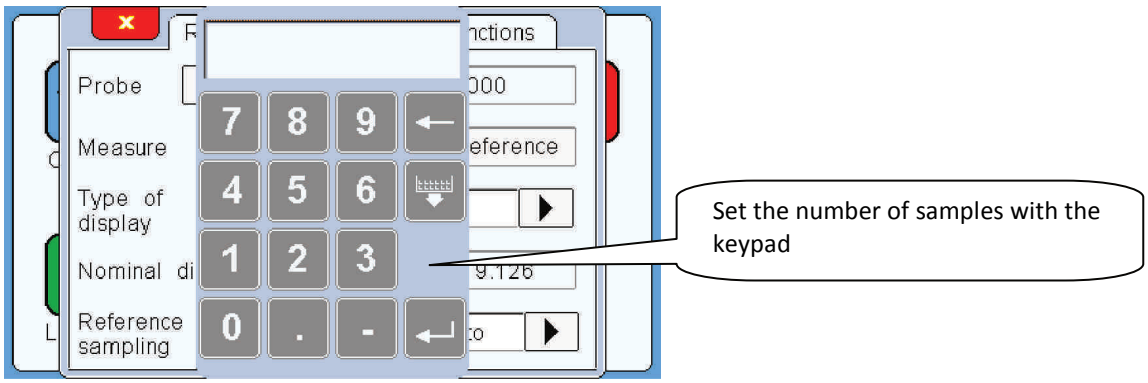


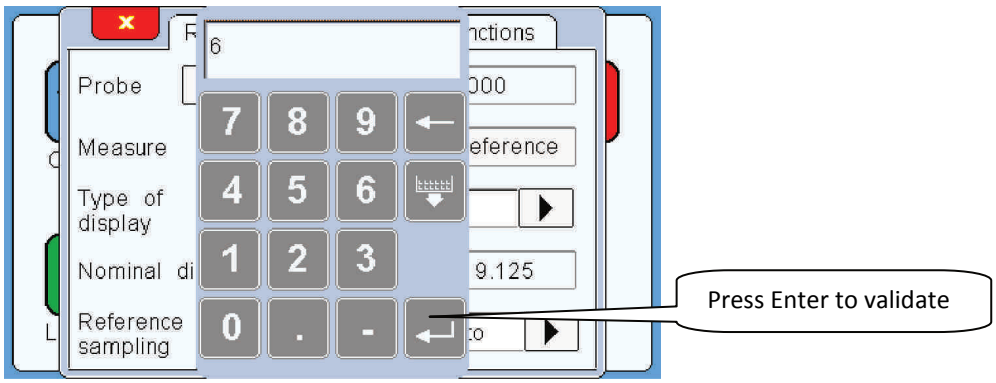
Press Enter to validate

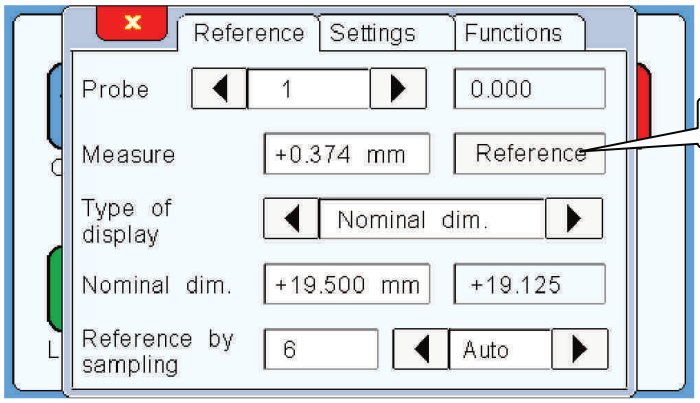


Here is the procedure to calibrate the reference in automatic :

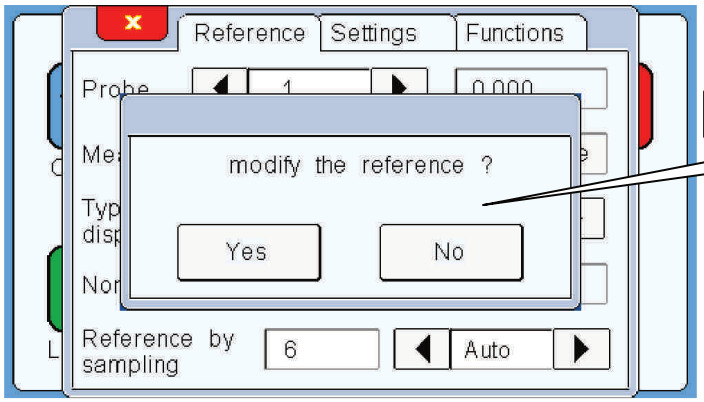






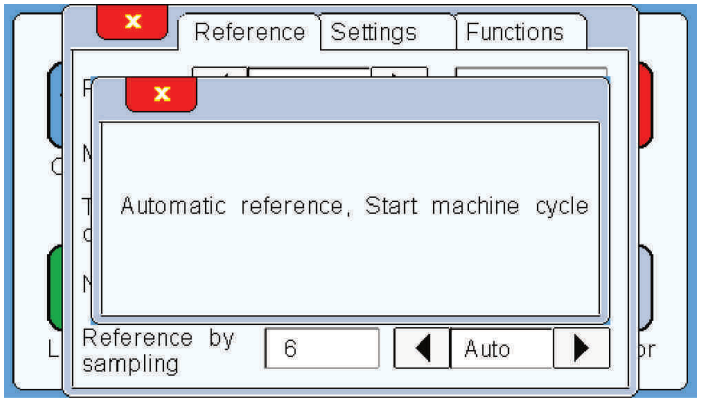


Press **Reference**

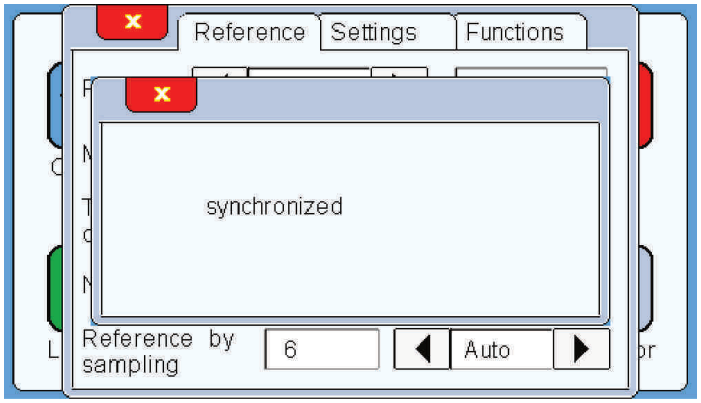


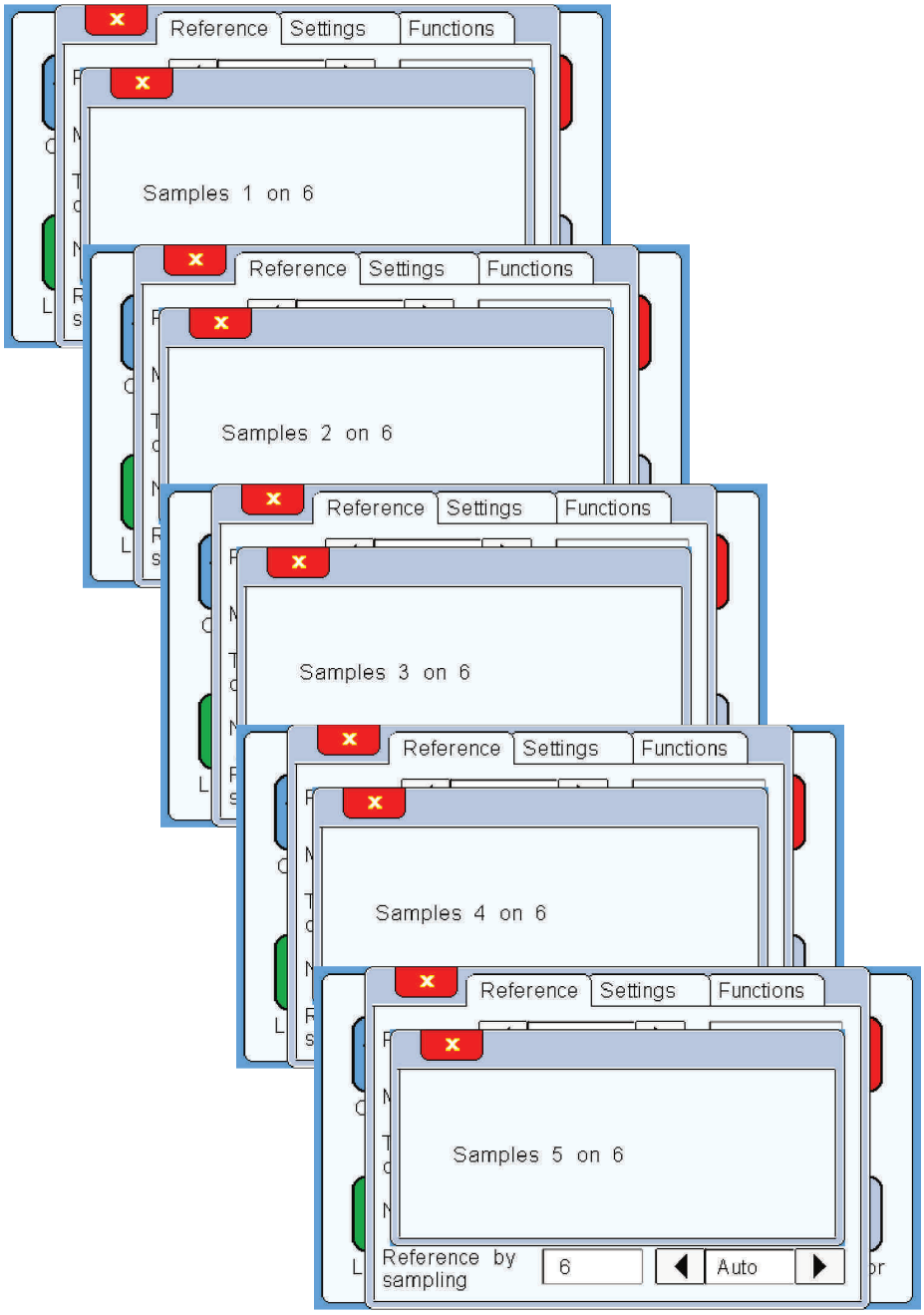
Confirm by pressing the **Yes Button**

PRESS BUTTON Yes

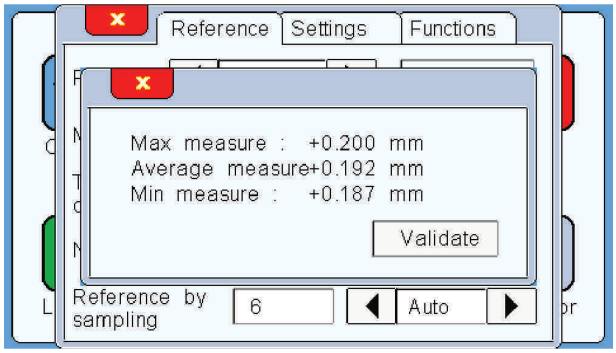


LAUNCH THE MACHINE CYCLE





Here is a summary of the 6 samples with the **Maxi** value, the **Average** value and the **Mini** value.
The Average value will be saved as reference after pressing the **Validate** button.

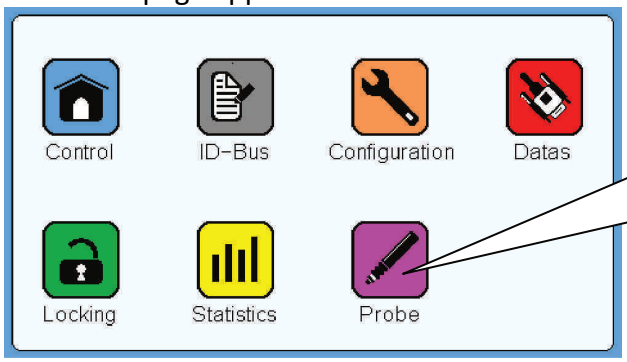


3-c Adjustment of tolerances :

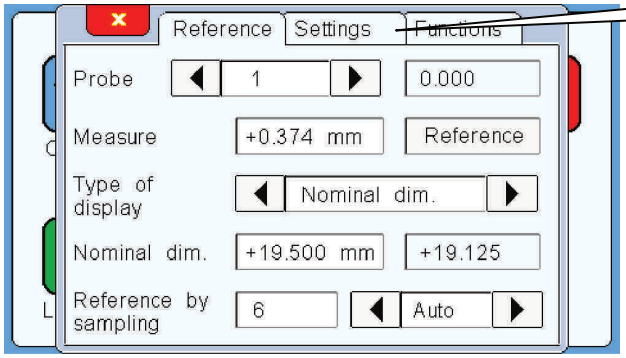
The tolerances limits define the range of acceptable readings, beyond which the amplifier is going to react by triggering relays to their fault states. These tolerances are adjusted with respect to a reference, which must be set earlier.

PRESS ICON Menu

The home page appears :



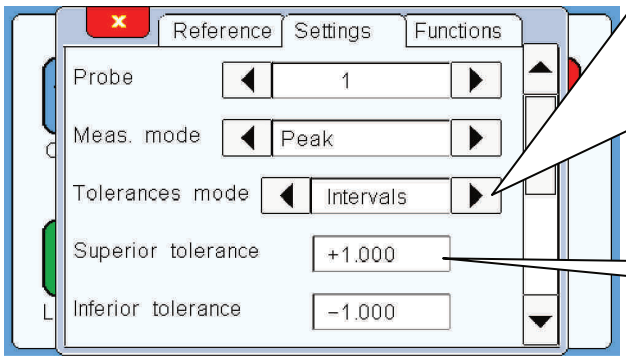
PRESS ICON Probe



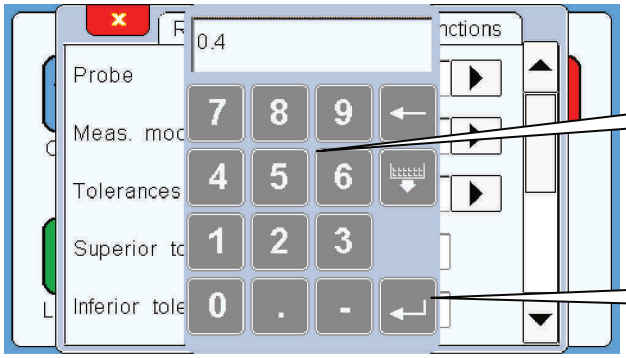
Select the **Settings** Tab

There are 2 modes to set tolerances ; The choice is made by using this drop-down list :
Intervals : it is a display mode with which you define upper and lower tolerance deviations from a nominal dimension (reference). Example : +0,05 et -0.05 with a reference to 19,5mm is a higher limit value of 19,55 and a lower limit value of 19,45.
Warning, if the reference is changed the limit values also change.

Limits : this display mode is used to define the upper limit value and the lower limit value that must to be excceeded. Example : 19,550 and 19,450.
Unlike intervals, the limits are fixed and do not change in a case of a new reference.

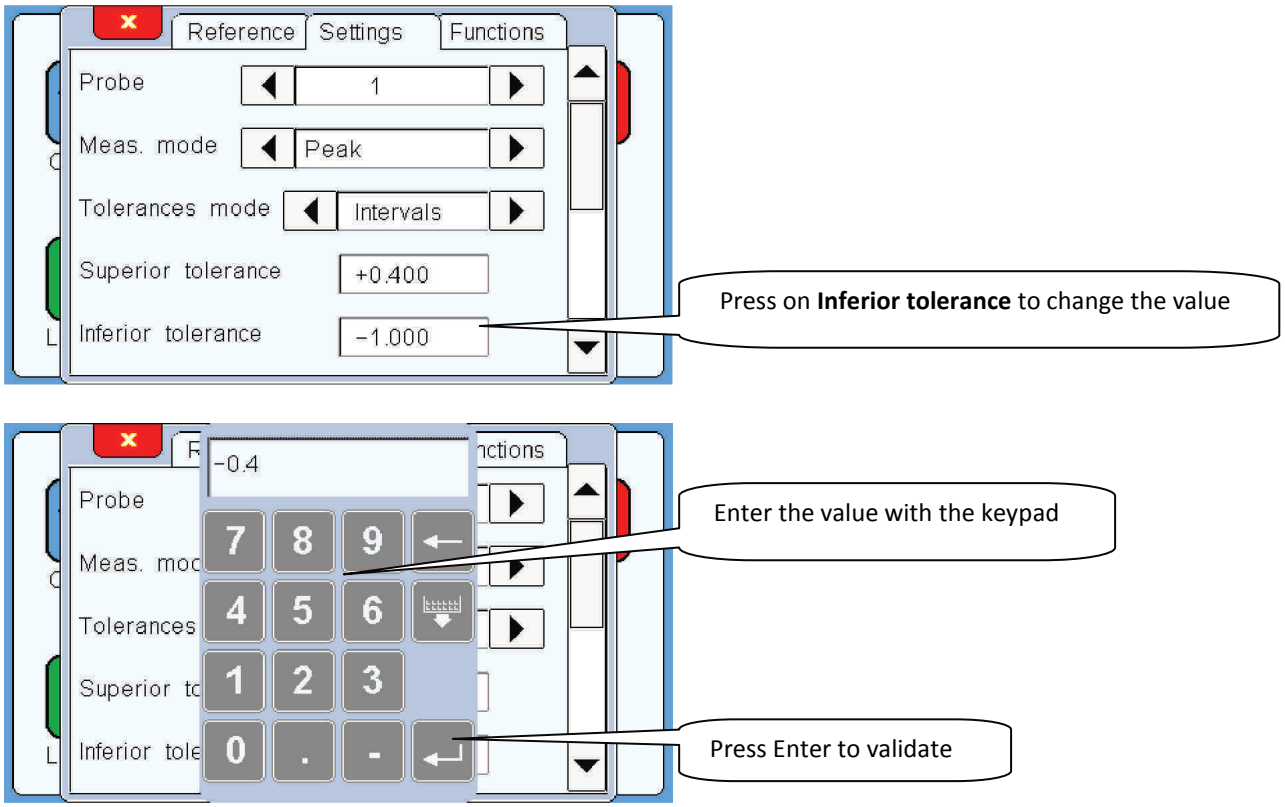


Press on **Superior tolerance** to change the value.



Enter the value with the keypad

Press Enter to validate

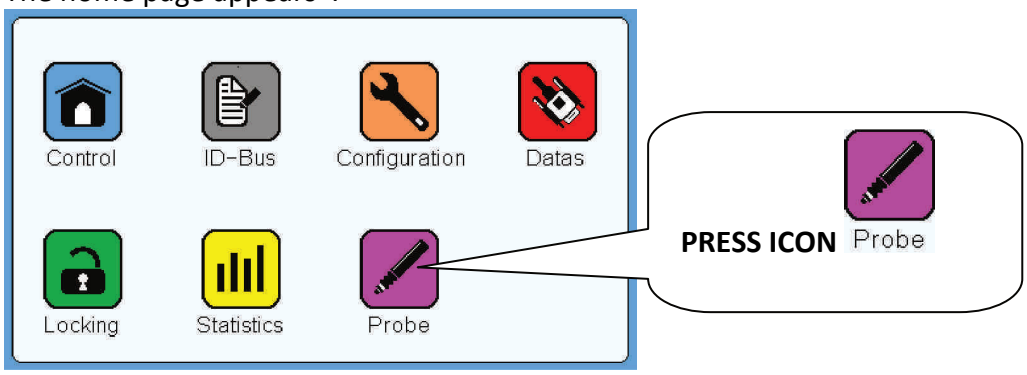

Reference
Settings
Functions
Probe
1
Meas. mode
Peak
Tolerances mode
Intervals
Superior tolerance
+0.400
Inferior tolerance
-1.000
Press on **Inferior tolerance** to change the value
-0.4
7 8 9
4 5 6
1 2 3
0 . -
Enter the value with the keypad
Press Enter to validate
Reference
Settings
Functions
Probe
1
Meas. mode
Peak
Tolerances mode
Intervals
Superior tolerance
+0.400
Inferior tolerance
-0.400

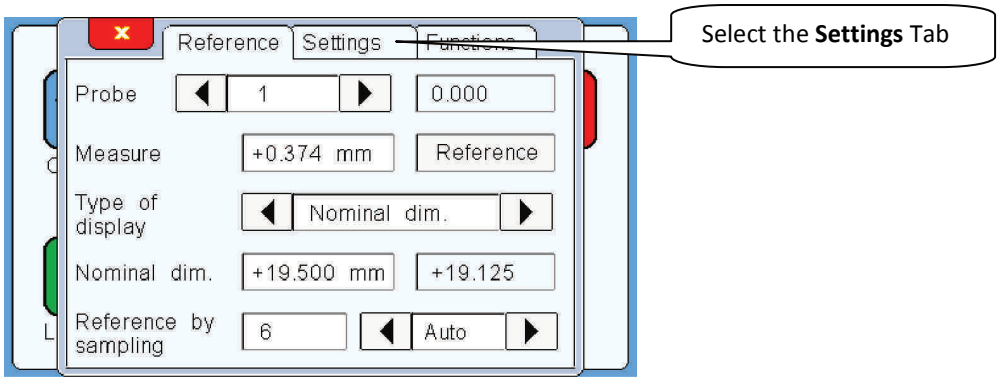
3-d Display Settings :

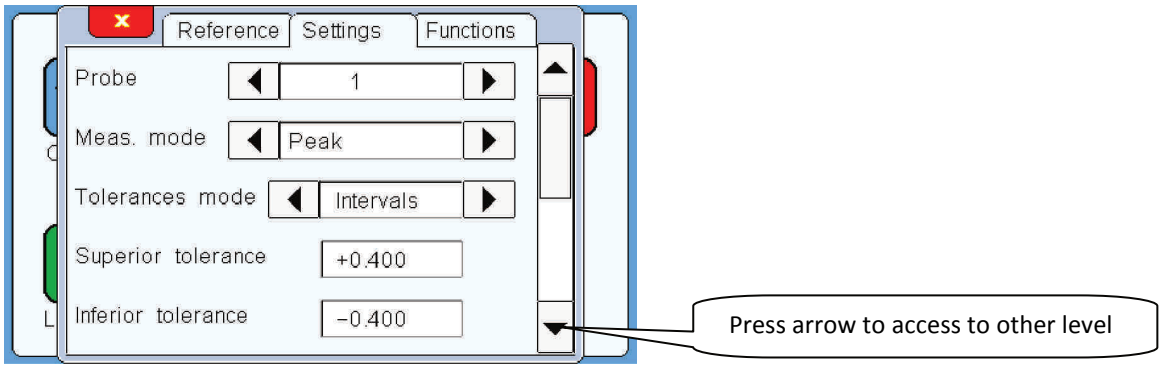
To ease readability and identification of different gauges on the control page, you can add descriptive elements for each of them.

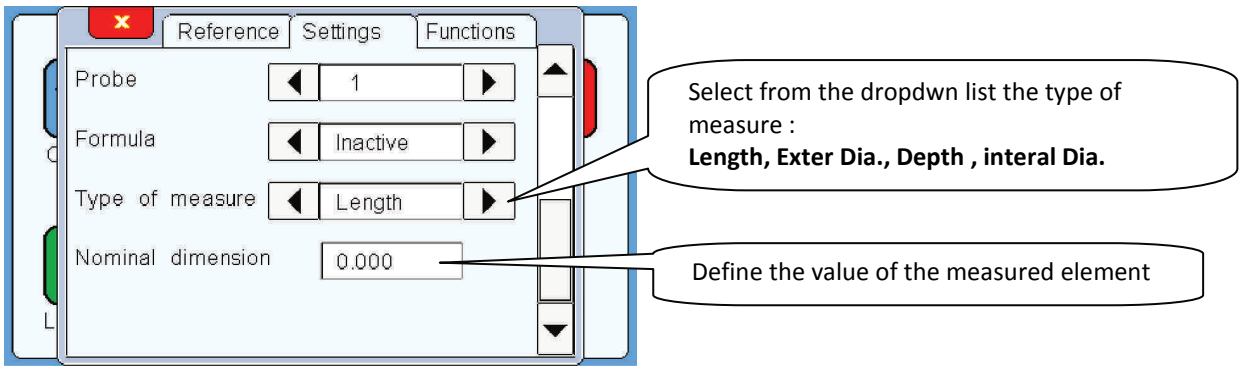
PRESS ICON Menu

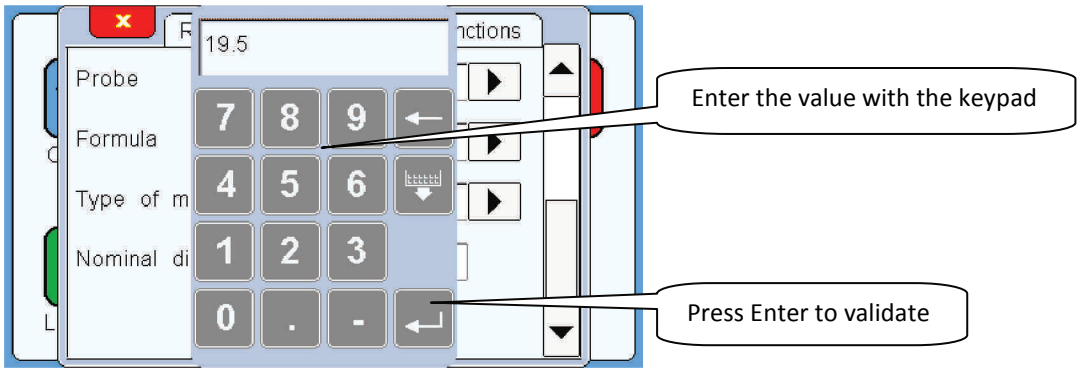
The home page appears :

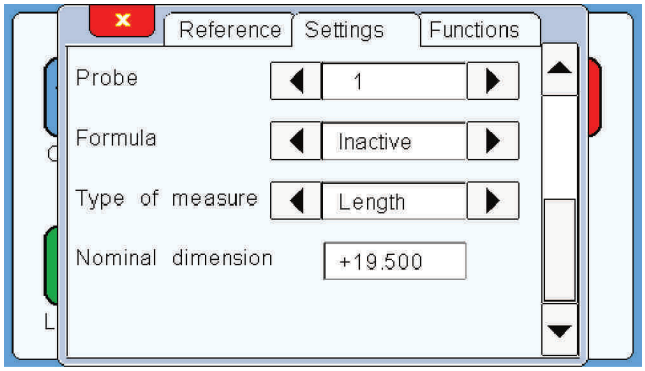




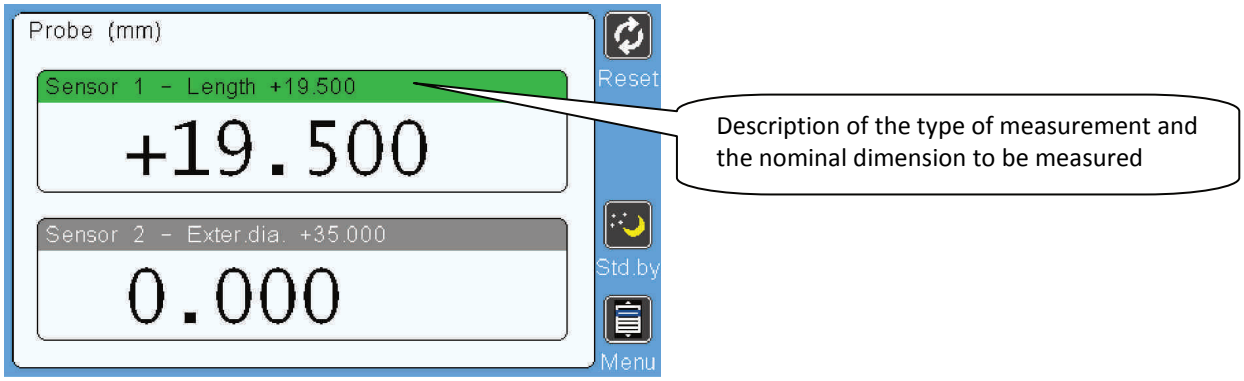








Here is the display on the control page once the setting is done.



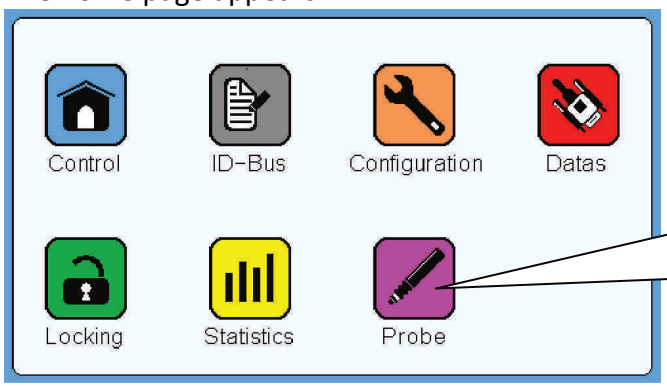
4. Function settings

4a- Masking a measurement

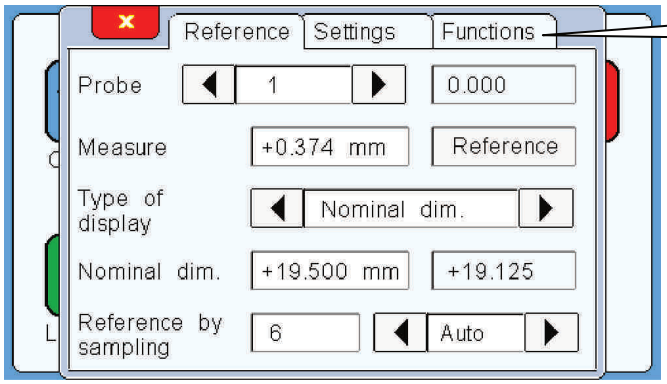
This function allows masking of a measurement during a material feed operation, isolating the fed part (short) without shutting down the machine.
The masking of a measurement can be configured:
- Either inactive (no masking) ;
- Or at N closures of the VALID input (N between 1 and 25) after the MASKING input is closed.
For a masked measurement, the corresponding channel indicates “VALUEMASKED” in addition to the display of the measured value; the indicator corresponding to the defect, if any, remains off and the outputs remain inactive.

PRESS ICON 

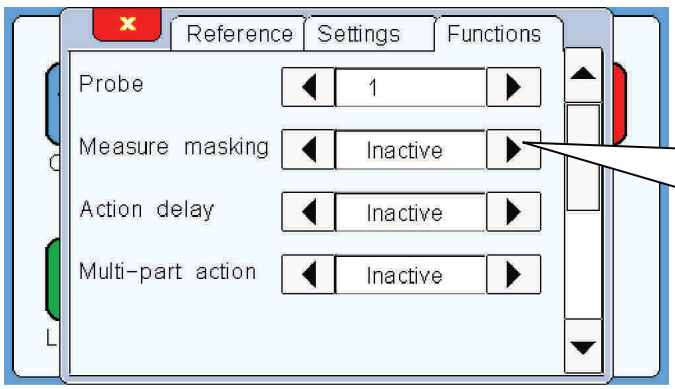
The home page appears :



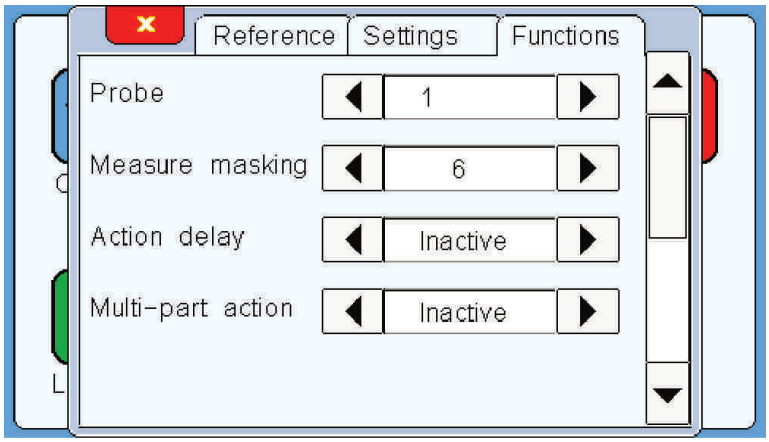
PRESS ICON 



Select the **Functions** Tab



Define the number of measurements after which the measured value will be masked.
Inactive to not use the function.



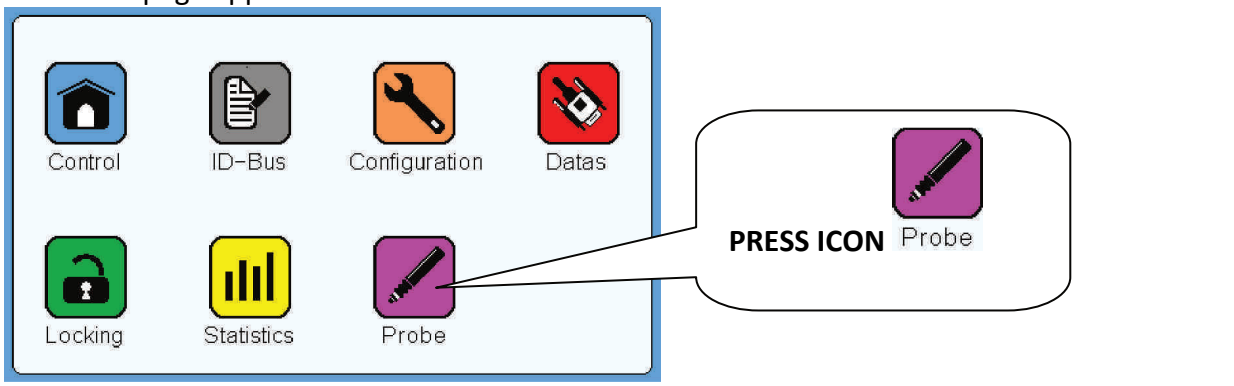
Here is an example to get a better understanding of this function:
Everything depends on the station which the machine feeds and where the sensor is positioned.
For our example, let's take a TORNOS SAS16 (6 spindles) machine and place the sensor between spindles 5 and 6:
The feeding takes place at station 6, and at the same time the feed information is sent to the amplifier. From then on, the electronic box is going to count down the number of measurements in order to mask the measurement of the fed part which will be short. Therefore, the 6th measurement after the masking pulse (feed information) has to be masked and so the amplifier has to be programmed **FOR 6 MEASUREMENTS**.

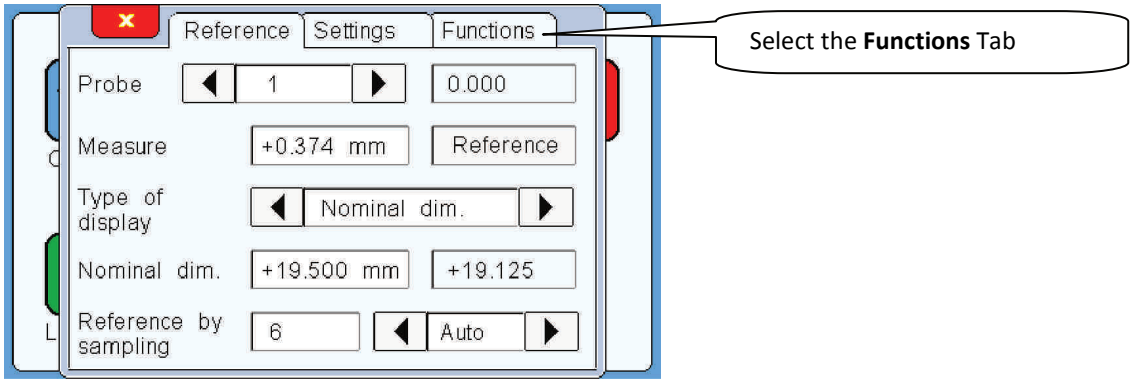
4b- Transferring a measurement

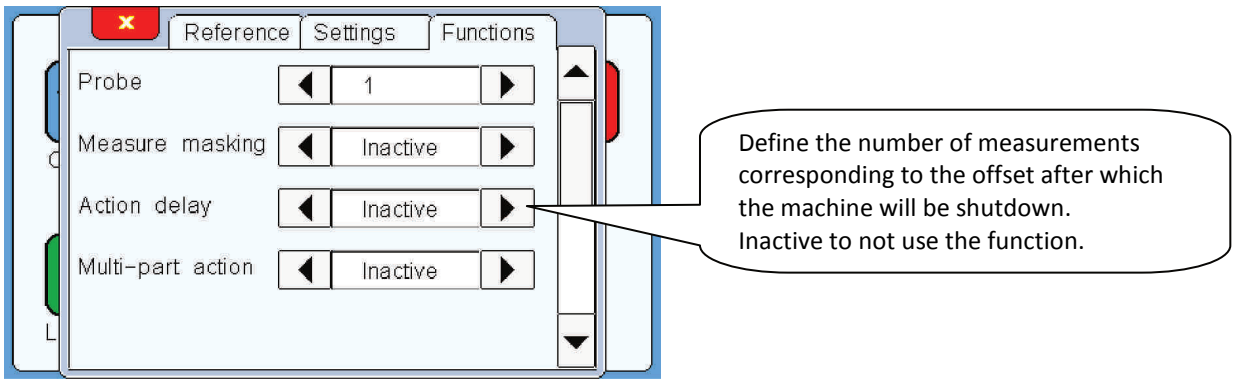
Transferring a measurement's processing consists of offsetting a relay's fault state to the desired station. An immediate action after a part is detected outside tolerance is not always practical for its removal. Therefore, this function allows triggering the machine shutdown relay when the bad part is accessible, such as when it is located in the pickoff spindle.
This function can be INACTIVE or ACTIVE after n measurements (1 to 25 maximum).

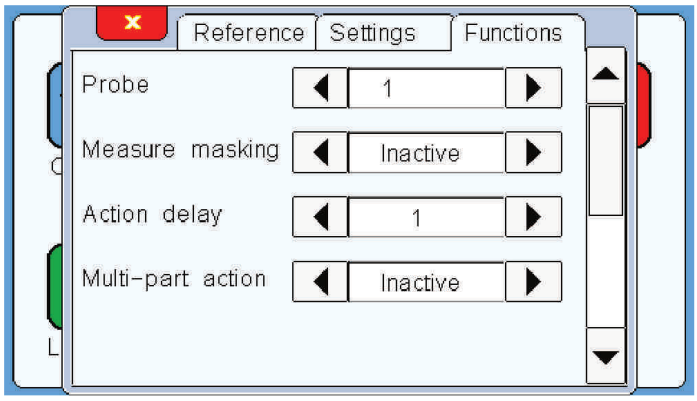
PRESS ICON 

The home page appears :









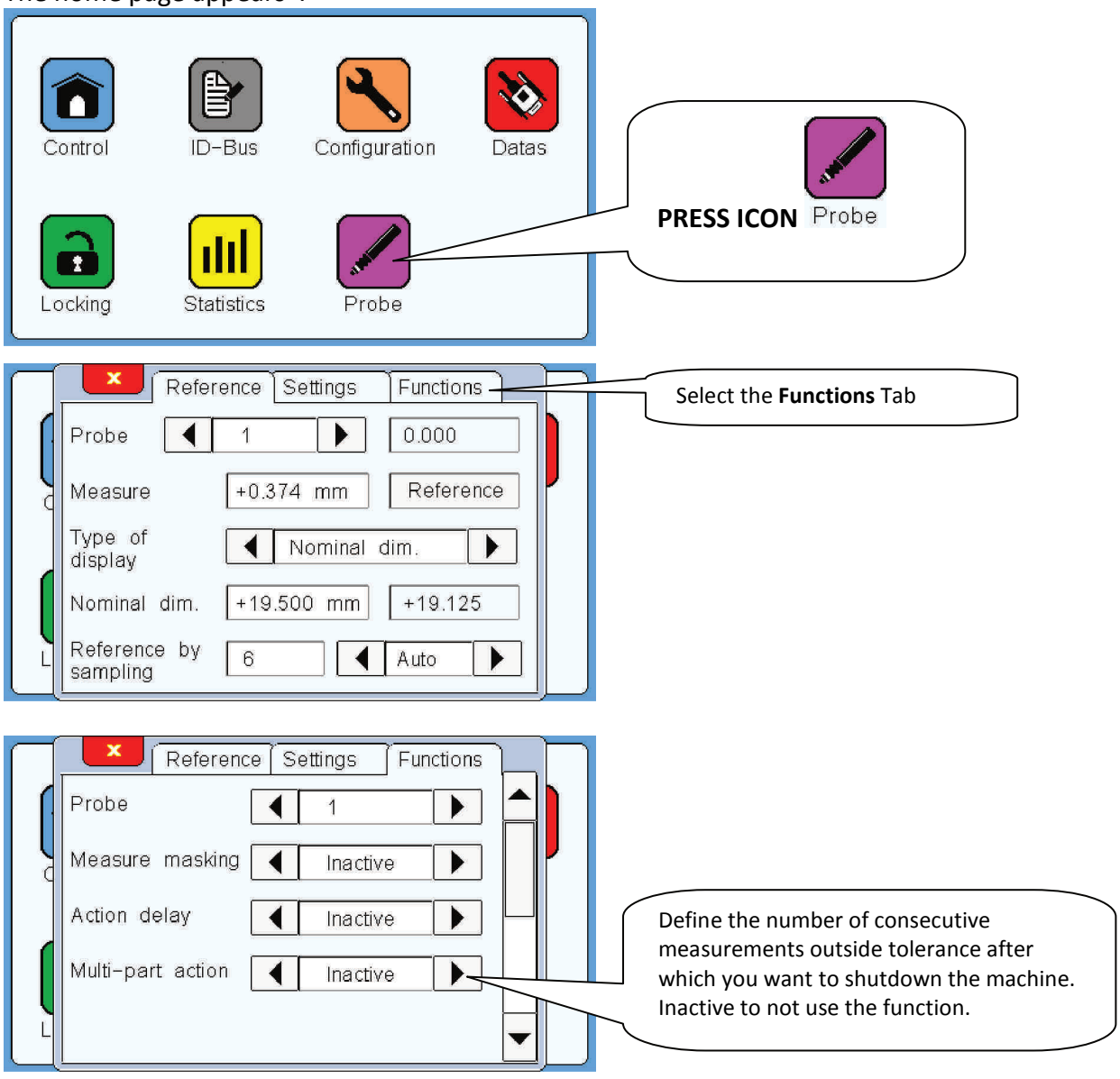
Here is an example to get a better understanding of this function:
Everything depends on the station which the machine feeds and where the sensor is positioned.
For our example, let's take a TORNOS SAS16 (6 spindles) machine and place the sensor between spindles 5 and 6:
The measurement is made between spindle 5 and 6, and the validation (top Valid) is done after, when the part measured is in position 6. If the part is measured bad, the machine will stop and the bad part will be at station 6.
If you set the action delay to 1, the machine will stop 1 cycle later. The bad part will then be in the pickup, which will make it easier to recover.

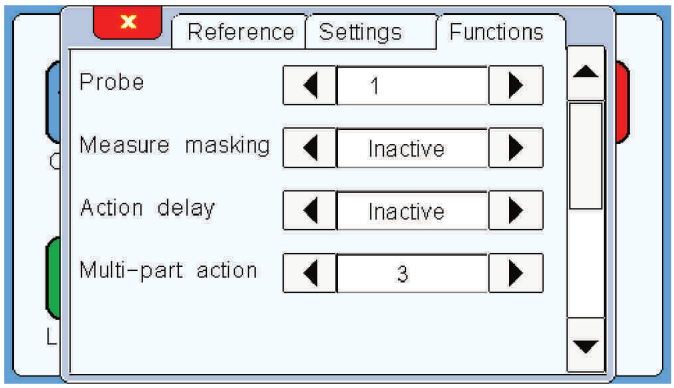
4c- Setting the machine shutdown parameter

Setting the “machine shutdown” parameter is very useful if you don’t want to penalize productivity by shutting down the machine even though the measured bad parts are isolated from production by a recovery system controlled by the MIN and MAX contacts.
The parameter to be adjusted is the number of consecutive measurements outside tolerances after which the machine will be shutdown. This parameter is adjusted by default to the minimum, that is, after 1 measurement outside tolerance. The maximum is 25 measurements.

PRESS ICON 

The home page appears :

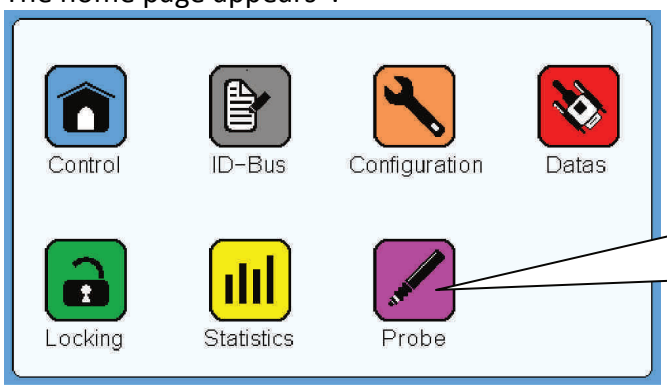


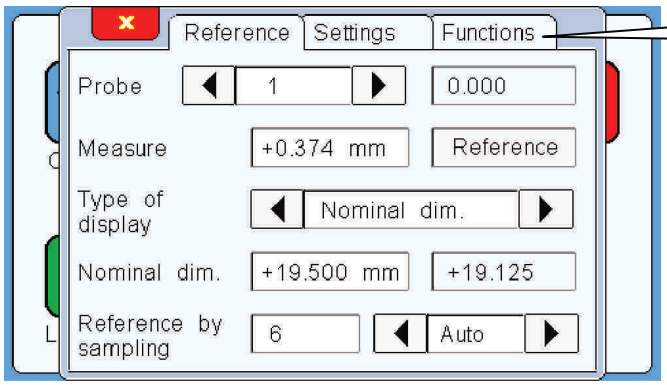


4d- Function Display-Activation

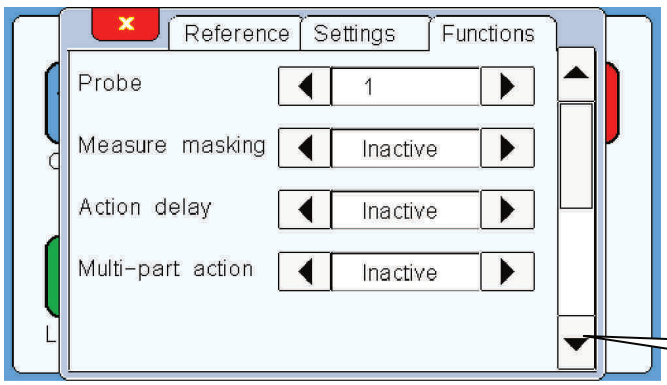
PRESS ICON 

The home page appears :

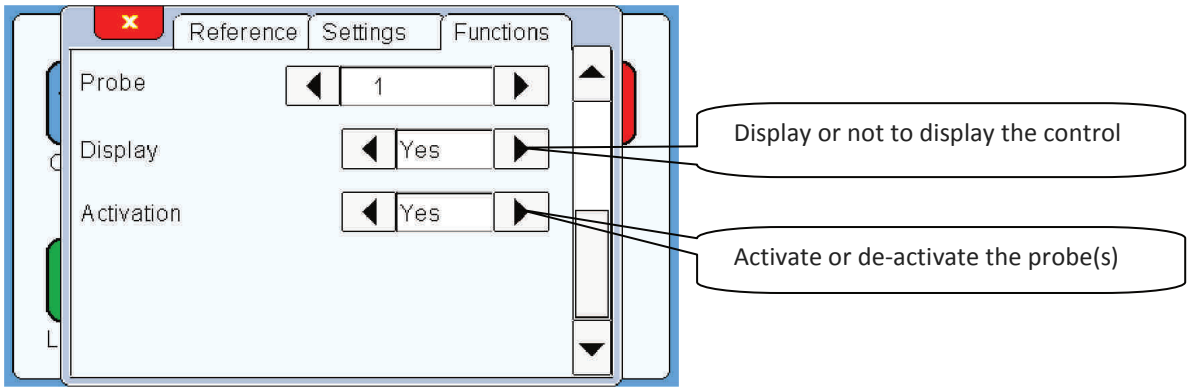




Select the **Functions** Tab



Press arrow to access to other level



Display :
The parameter lighten the display when a probe is not connected or not used.
Example : Only the measurer 1 is connected, by selecting Display NO on the probe input 2, you will only the probe 1 on the control page.

Activation :
This parameter will not show the second probe on the control page , but it will also disable all functions related to this probe.

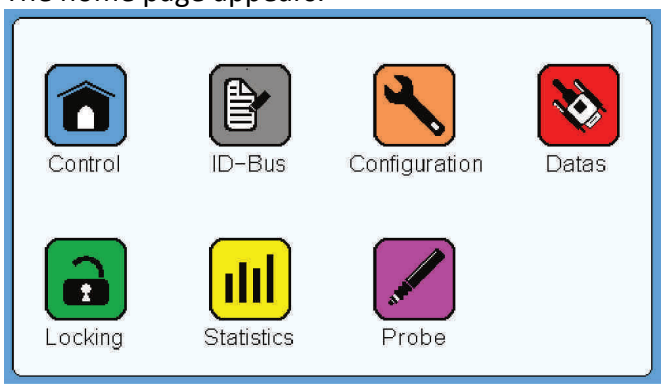
5. Additional settings

5.a Configuration

Here is a description of the settings **CONFIGURATION**:

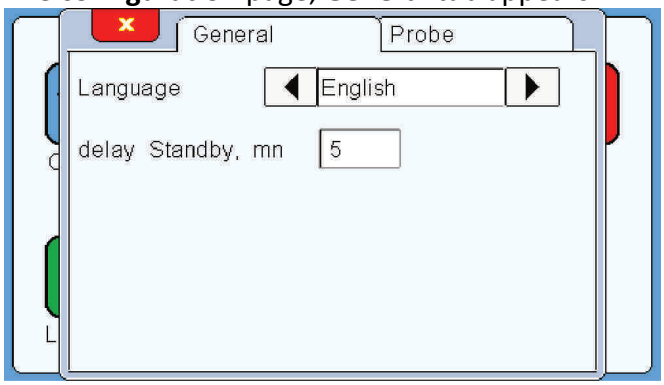
PRESS ICON 

The home page appears:



PRESS ICON 

The **configuration** page, **General** tab appears :

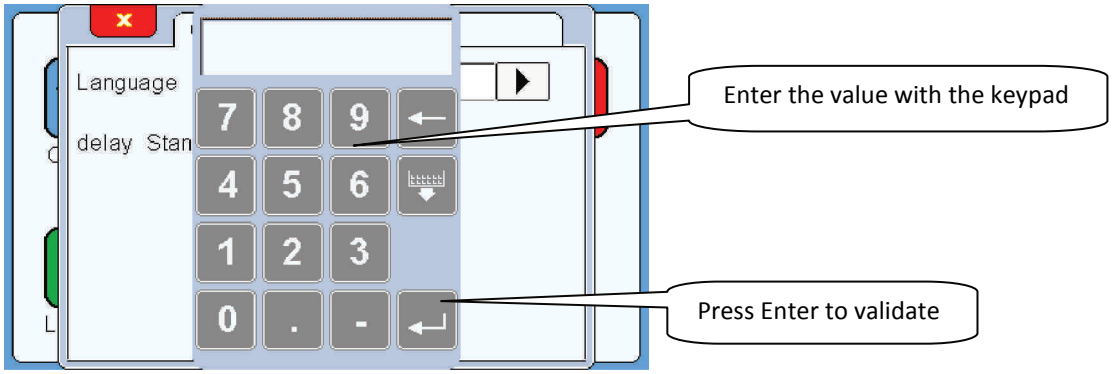


Language

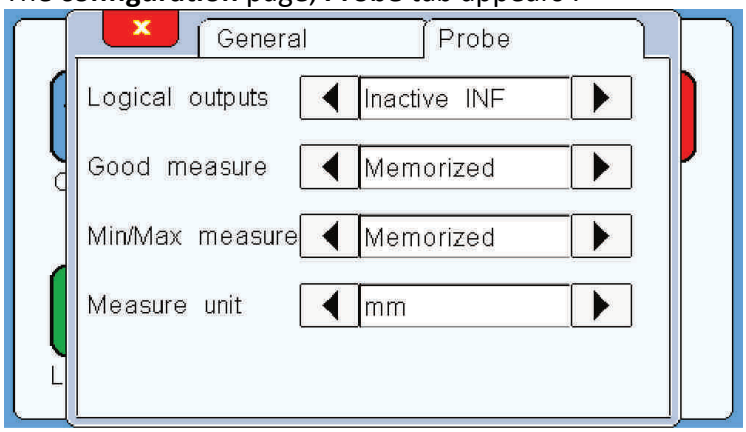
This setting is used to change the text language of the touch screen. French, English, German, Italian and Spanish

Delay Standby , mn

This parameter is used to set the time during which the standby will be active. Pressing the field opens the keypad to enter the time in minutes. Maxi 15mn.



The **configuration** page, **Probe** tab appears :



Logical outputs

This parameter makes it possible to configure the state of the logic outputs when there it is in the menus settings:

- **Inactive 60S** : The machine will not stop automatically when entering the setting mode. After 60 seconds without touching the screen, it automatically returns to measurement mode.
- **Inactive INF** : the same as for adjustment INACTIVE 60S; but without automatically return to control mode.
- **Active 60S** : The machine will stop automatically when entering the setting mode (Switching output "Shutdown Machine"). After 60 seconds without touching the screen, it automatically returns to control mode.
- **Active INF** : : the same as for adjustment ACTIVE 60S; but without automatically return to control mode.

Good Control

This parameter makes it possible to configure the state maintained or not of the output "Good Measurement " between 2 Control states :

- **Stored** : When the part is good, the output "Good measurement" closes and remains closed until the next Valid state. The output status is **stored**.
- **Not stored** : When the part is good, the output "Good measurement" closes for 50ms minimum and then reopens. The status of the output is **not stored**.

Mesure Min/Max

This parameter makes it possible to configure the state maintained or not of the output « Mini » et « Maxi » between 2 Control states:

- **Stored** : When a part is bad Min or Max, the outputs close (or open if Normally closed) and remains closed until the next Valid state. The output status is **stored**.
- **Not stored** : When a part is bad Min or Max, the outputs close (or open if Normally closed) for 50ms minimum and then reopens. The status of the output is **not stored**.

Measurement unit

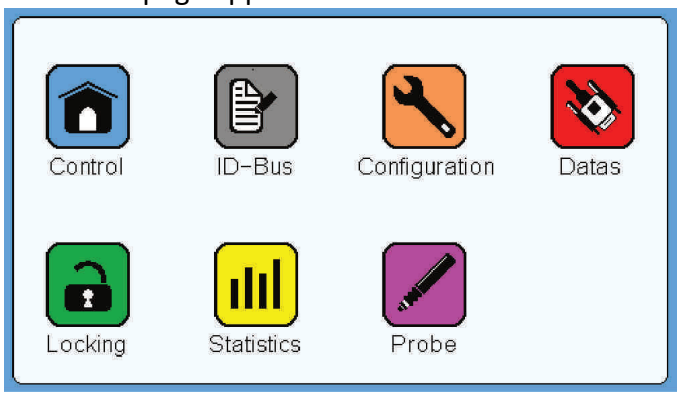
This parameter defines whether the measurements will be displayed in millimeters(mm) ou inches (inch).

5.b Datas

Here is a description of the settings **Datas** :

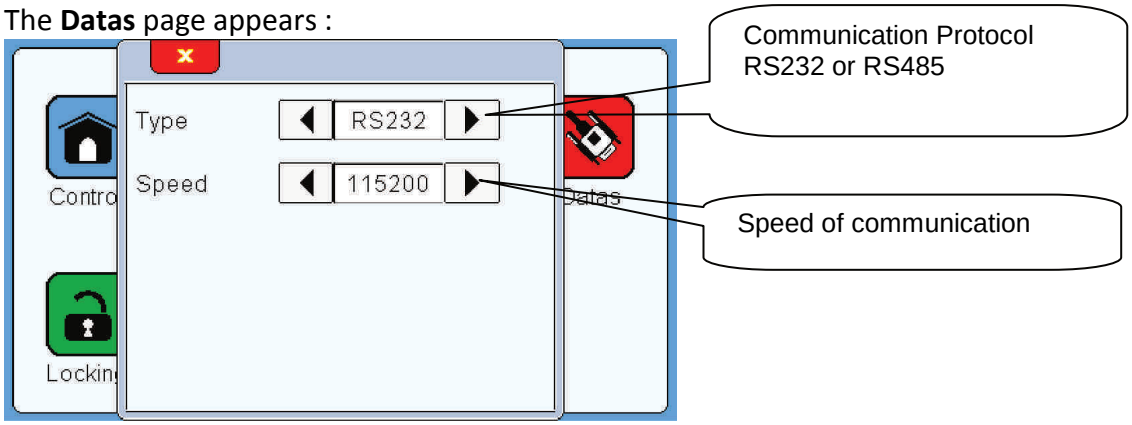
PRESS ICON 

The home page appears:



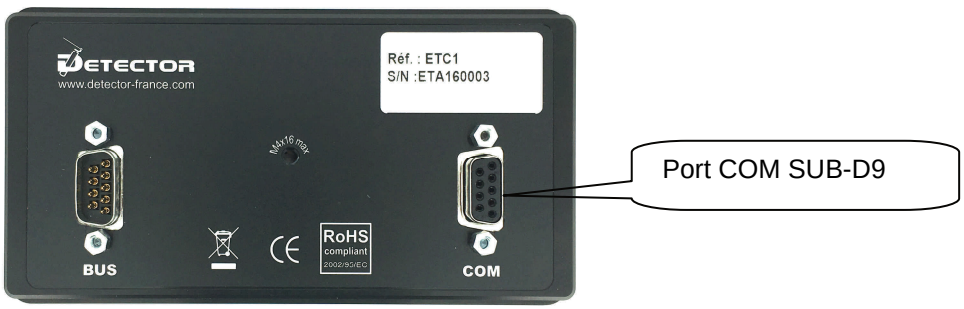
PRESS ICON 

The **Datas** page appears :



Type

This parameter defines the communication protocol with the connected element via the SUB-D9 COM on the back of the display.



Speed

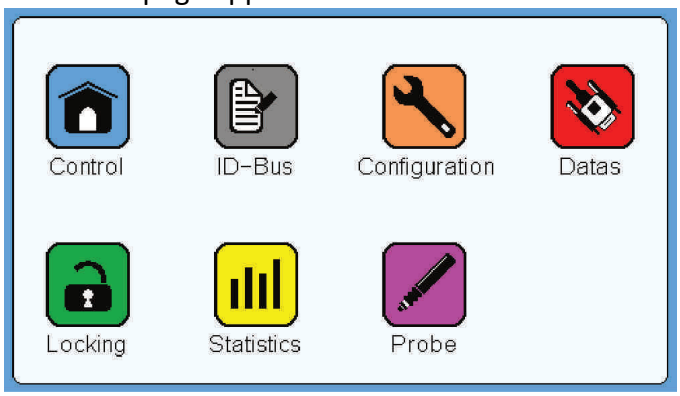
This parameter is used to set the communication speed: 9600, 19200, 38400, 57600, 115200 or 256000.

5.c Statistics

Here is a description of the settings **STATISTICS** :

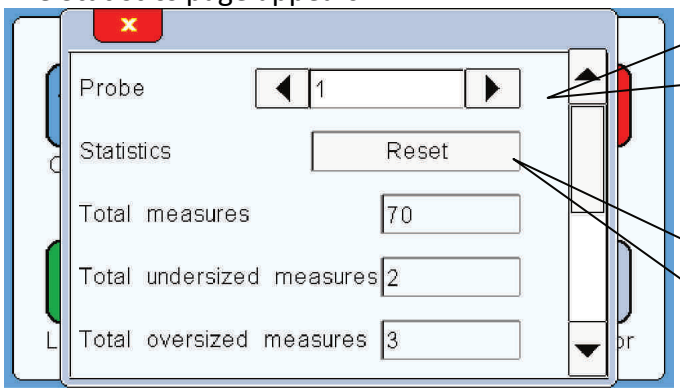
PRESS ICON 

The home page appears:



PRESS ICON 

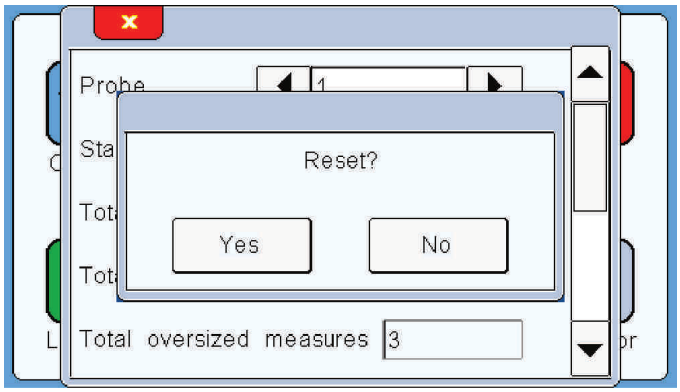
The **Statistics** page appears :



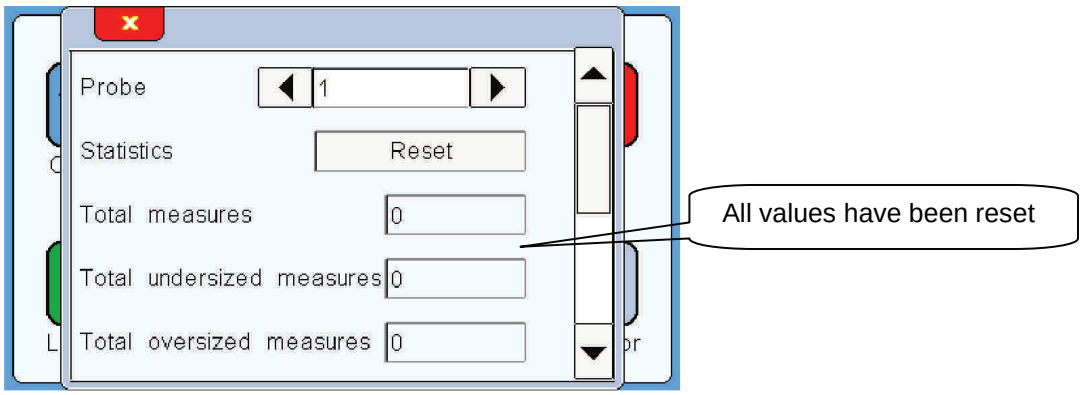
This page allows you to view all the measured parts, with the total number of parts measured, the number of measured parts out of mini and the number of parts measured out of maxi. And that for each measurer.

To reset these statistics, press the reset button

PRESS BUTTON 



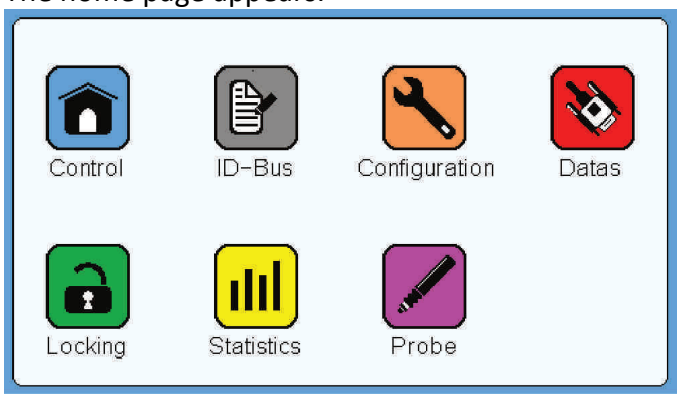
PRESS BUTTON Yes



The other method of statistics is the method of sampling with calculation of the average and identification of the maximum measurement and the minimum measurement.

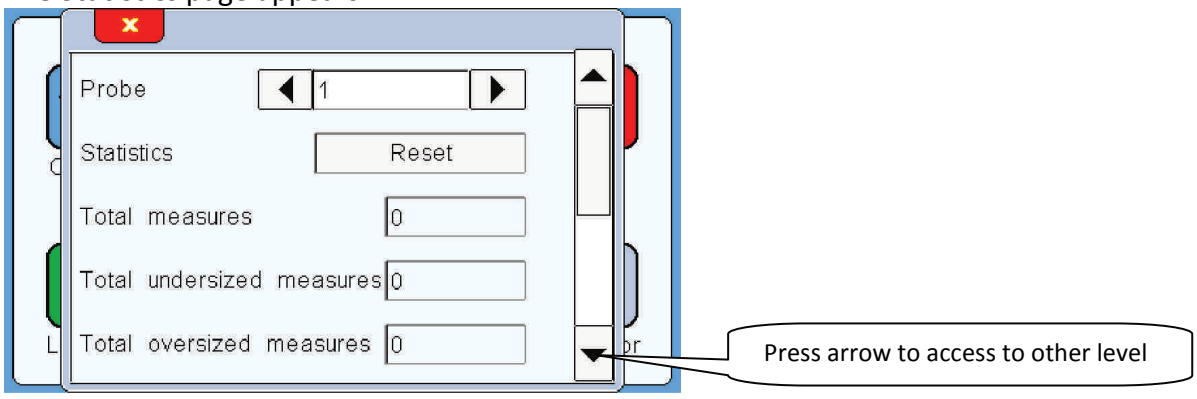
PRESS ICON Menu

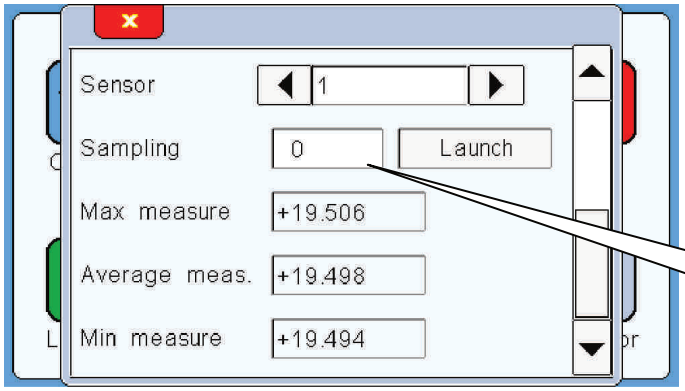
The home page appears:



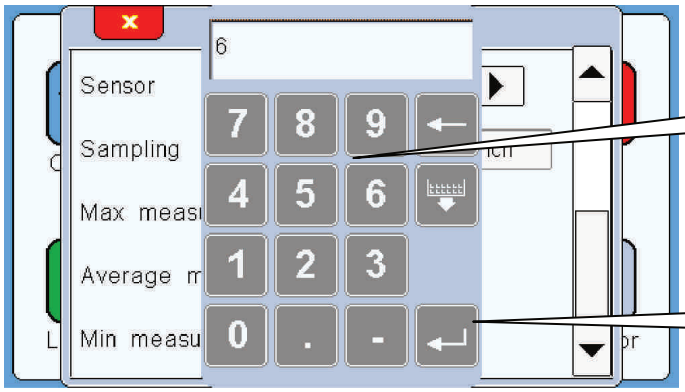
PRESS ICON Statistics

The **Statistics** page appears :



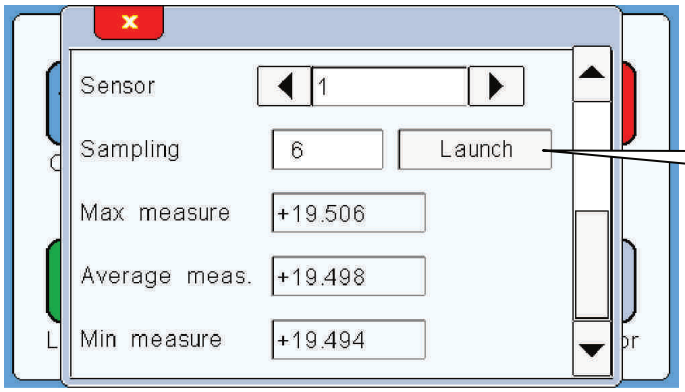


Press on value to define the number of sample

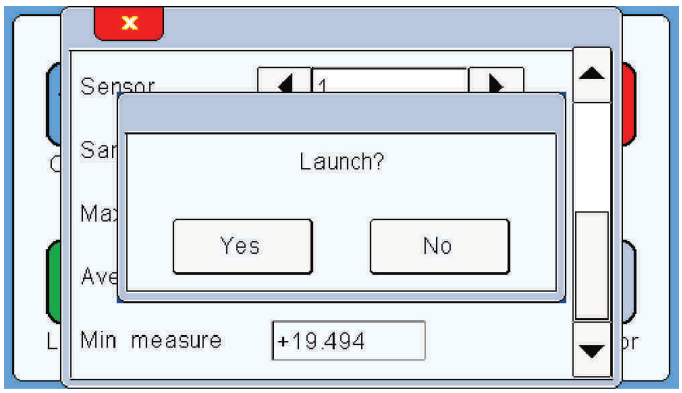


Enter the value with the keypad

Press Enter to validate

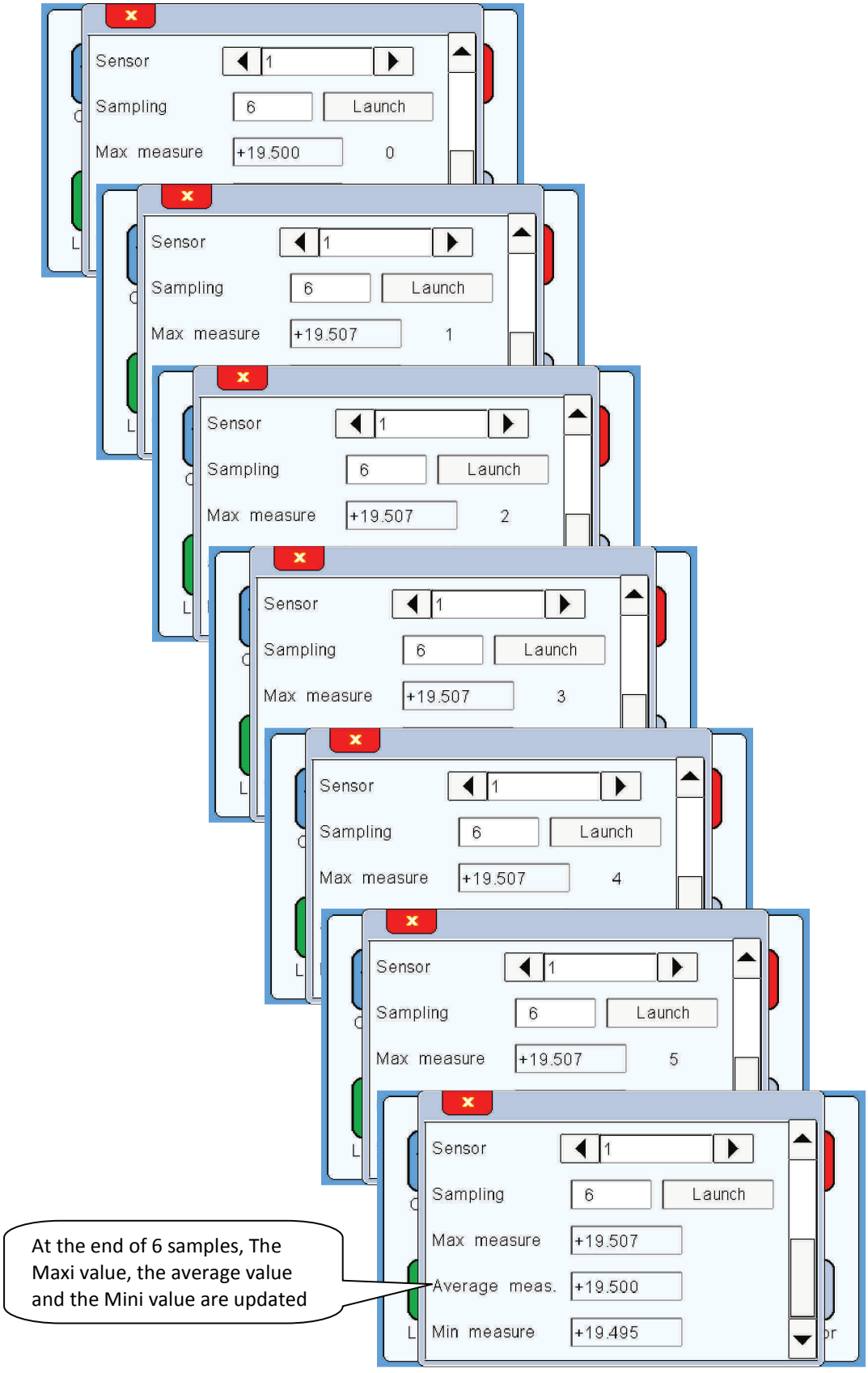


Press on **Launch**



PRESS BUTTON Yes

Start the machine.

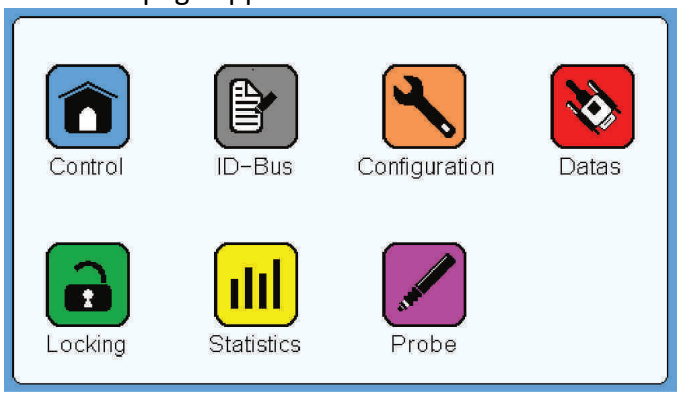


5.d Locking

Here is description of the settings **LOCKING** :

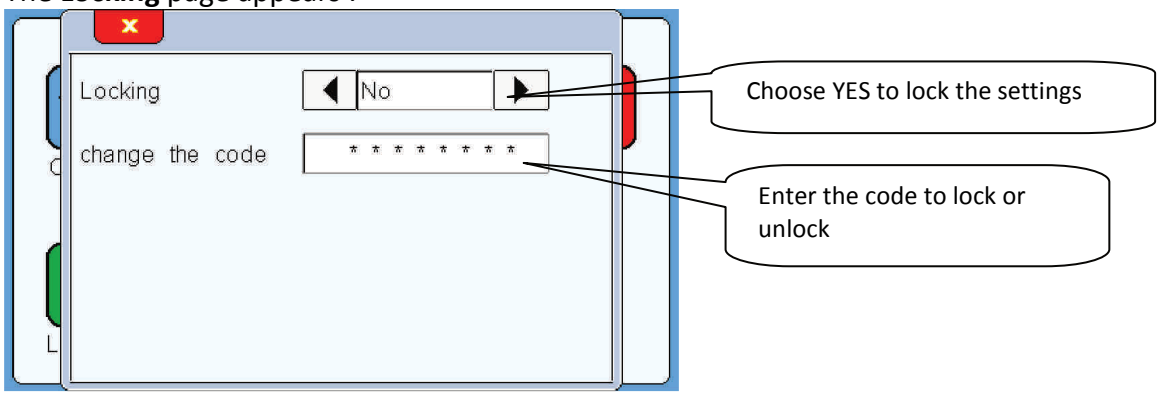
PRESS ICON 

The home page appears:



PRESS ICON 

The **Locking** page appears :



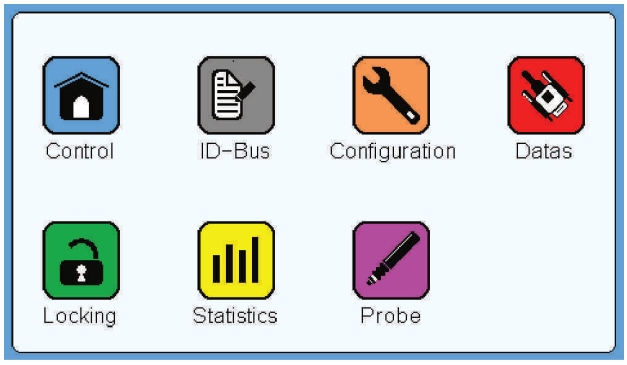
Verrouillage
Locking

Locking limits access to all parameters. Once locked, only access to the control page is possible. Reset and Standby functions remain accessible and usable.

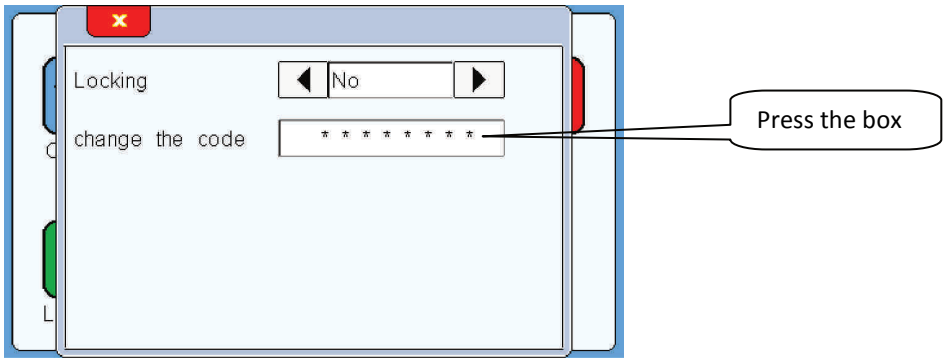
Change the code

It is possible to change the original (0000) by another code.

5.d-1 Lock code change

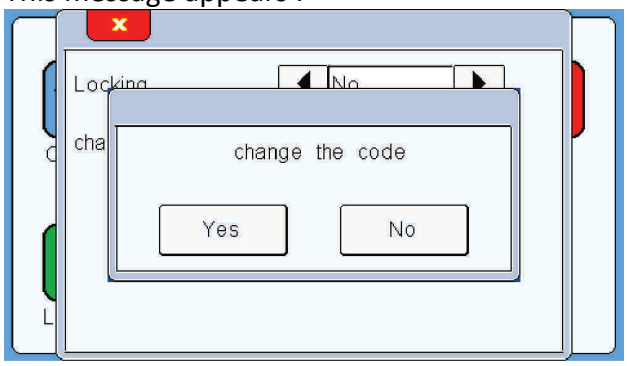


PRESS ICON 



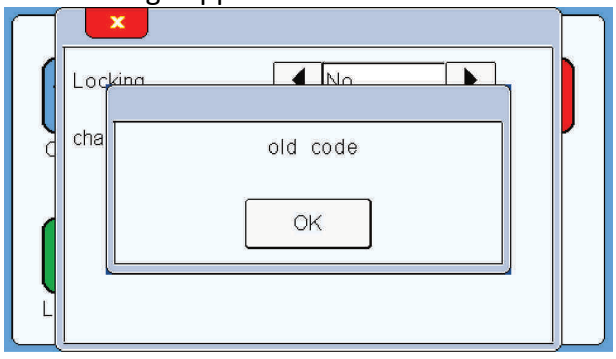
PRESS THE BOX 

This message appears :

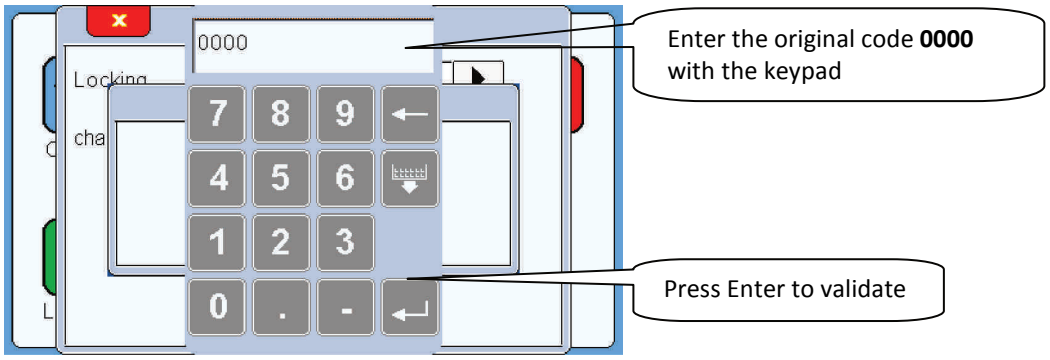


PRESS BUTTON 

This message appears :

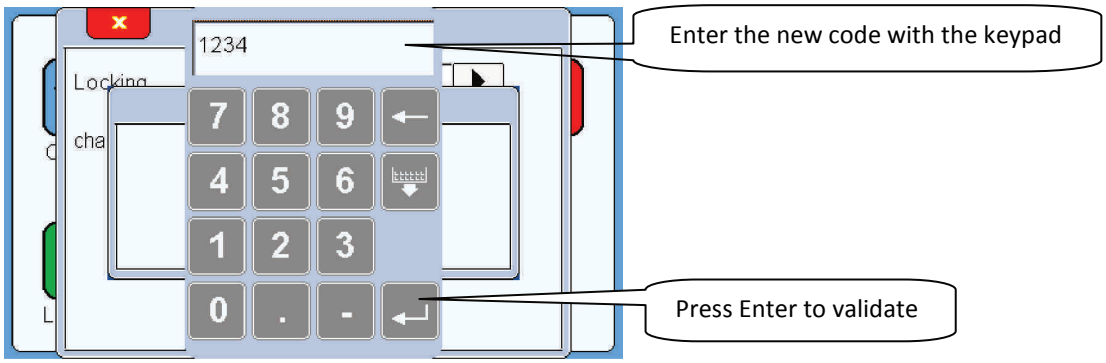


PRESS BUTTON OK

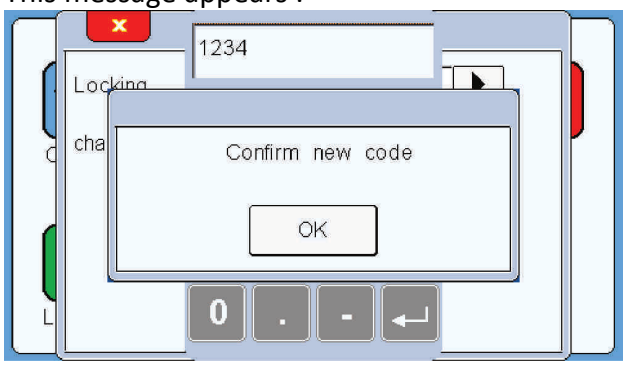


This message appears :

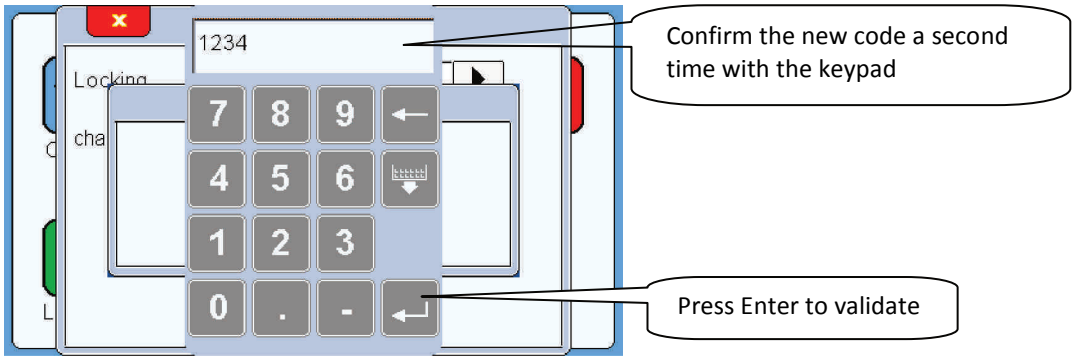
PRESS BUTTON OK



This message appears :



PRESS BUTTON OK

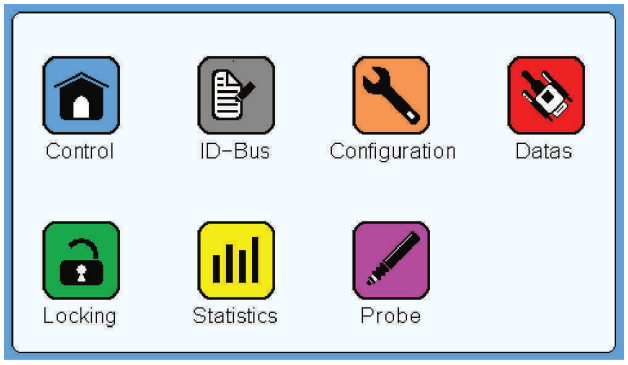


This message appears :

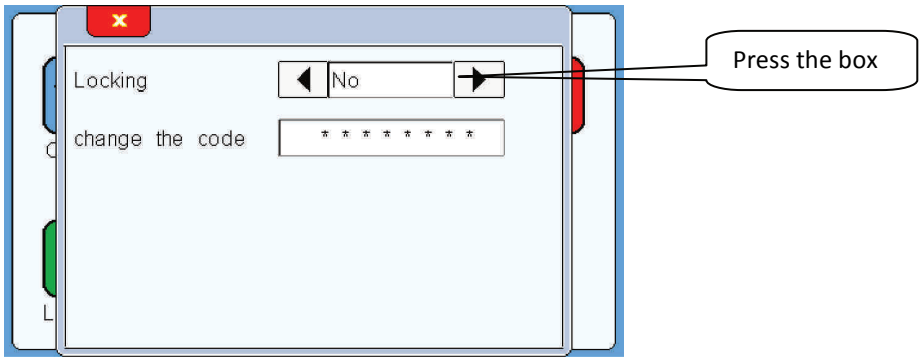
PRESS BUTTON OK

The lock code has been changed.

5.d-2 Lock screen

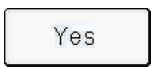


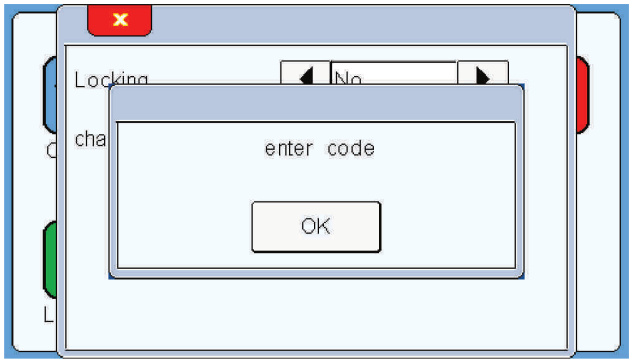
PRESS ICON 



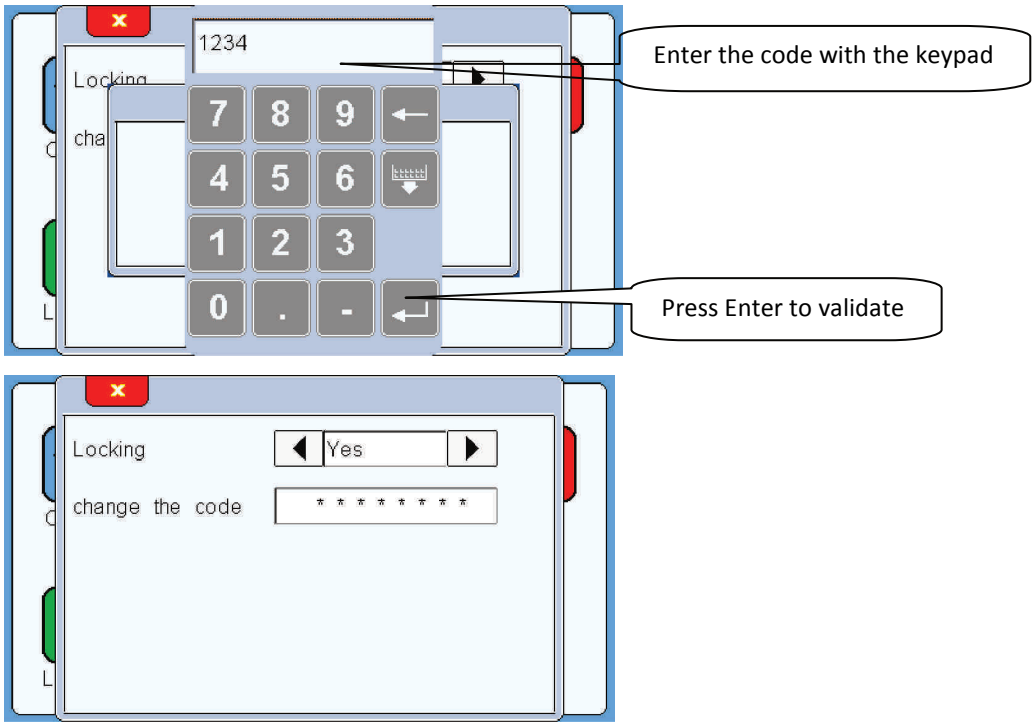
PRESS THE BOX 

This message appears :

PRESS BUTTON 

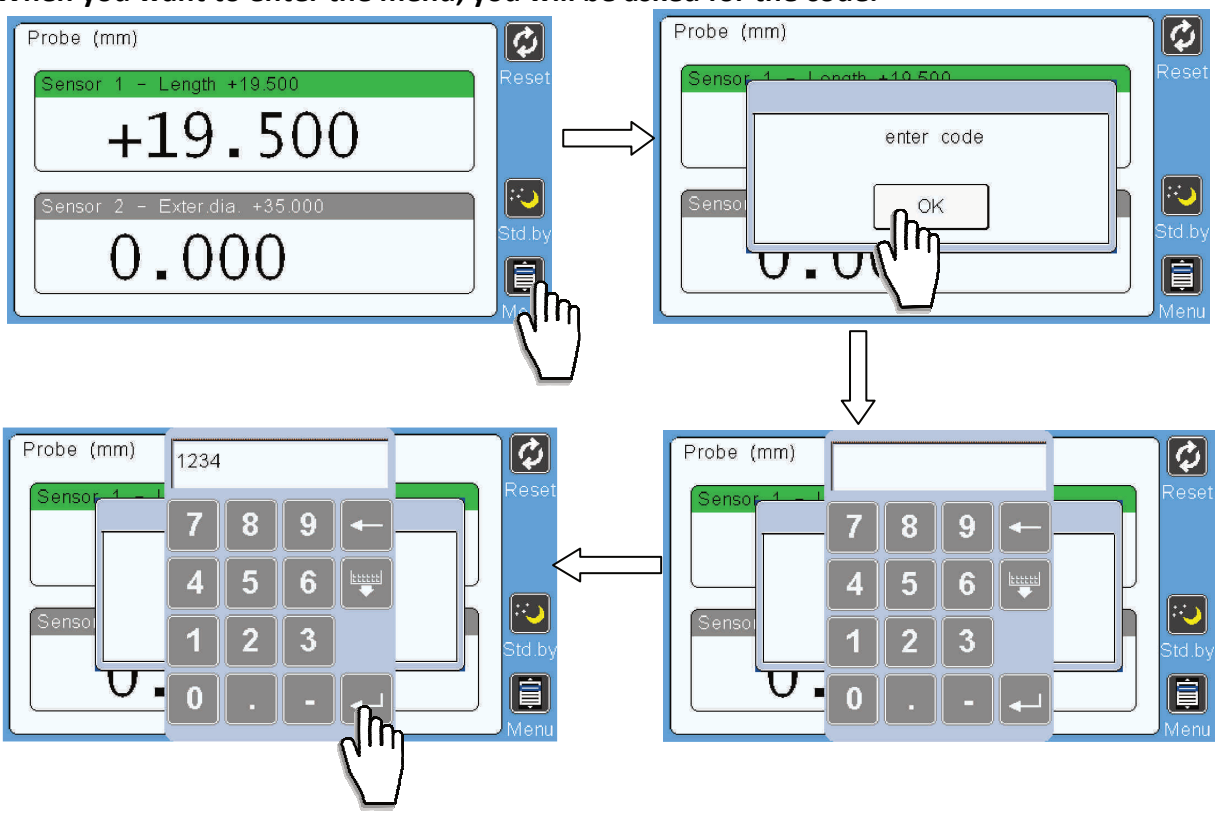


PRESS BUTTON 



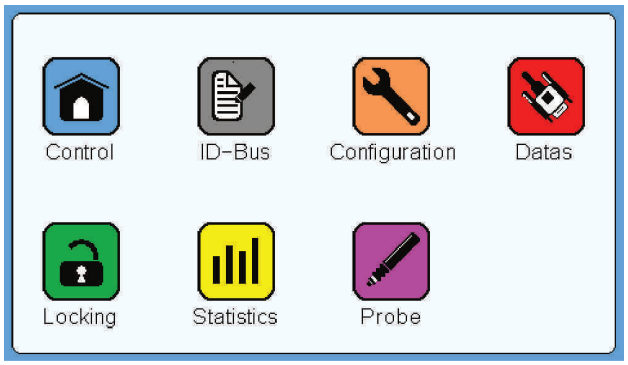
The screen is now locked.

When you want to enter the menu, you will be asked for the code.

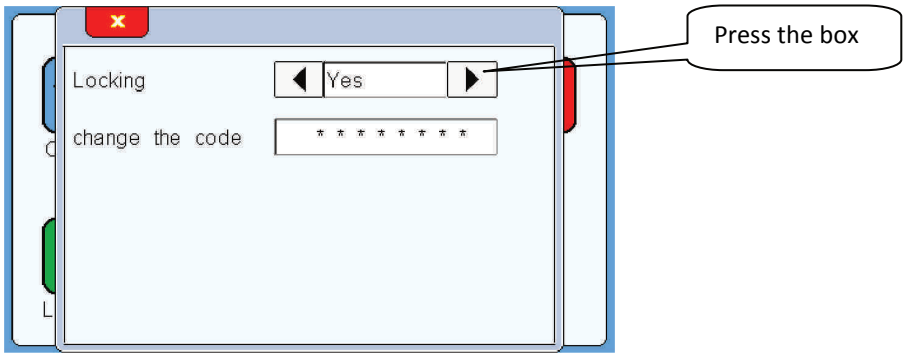


Note : In locked state, when you enter the menu, the code is required. By entering the code you enter the menu, but in any case you unlock the screen. When you return to the Control page and want to enter the menu again, the code will be asked again.

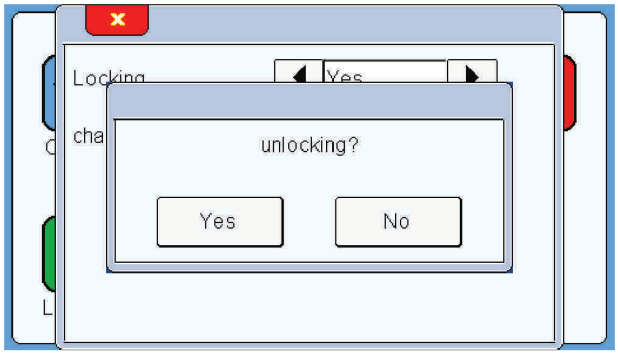
5.d-3 Unlocking screen



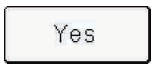
PRESS ICON

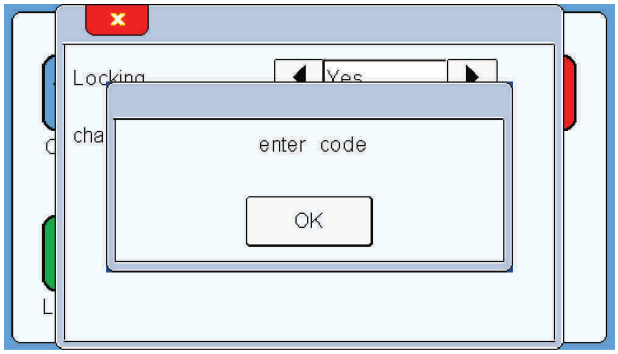


PRESS THE BOX

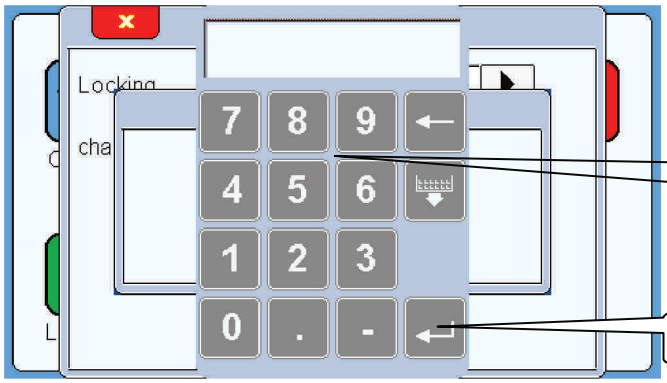


PRESS BUTTON



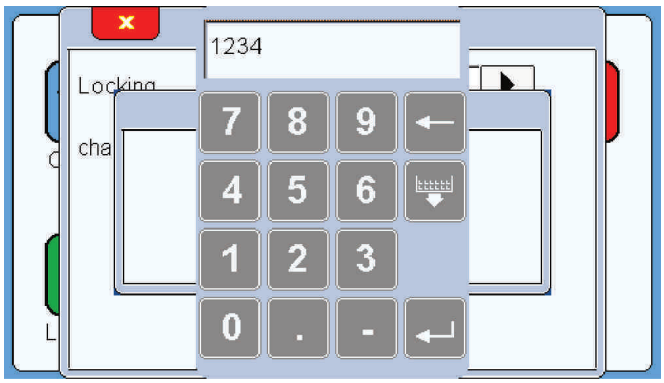


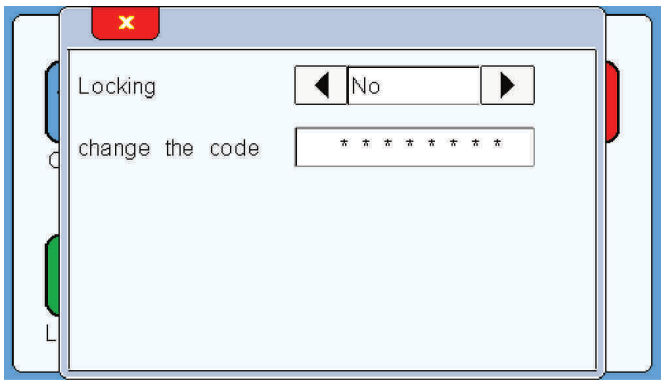
PRESS BUTTON



Enter the code with the keypad

Press Enter to validate





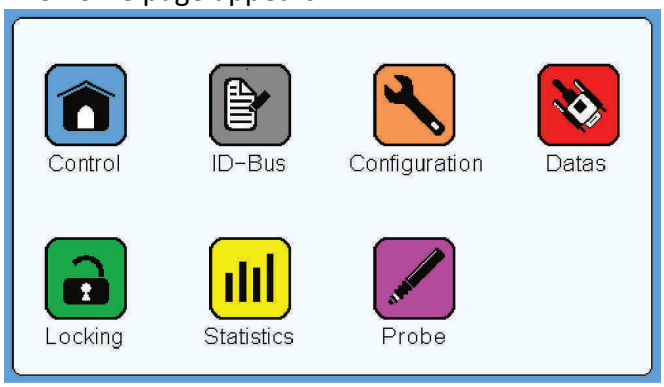
The screen is now unlocked.

6. Device Stanby

Standby is used in the case where it is desired to make an adjustment on the machine without the probe disturbing the cycle by repetitive stops. Standby allow you to run the machine without being in control.
The only setting for standby is the time that the device will remain in standby :

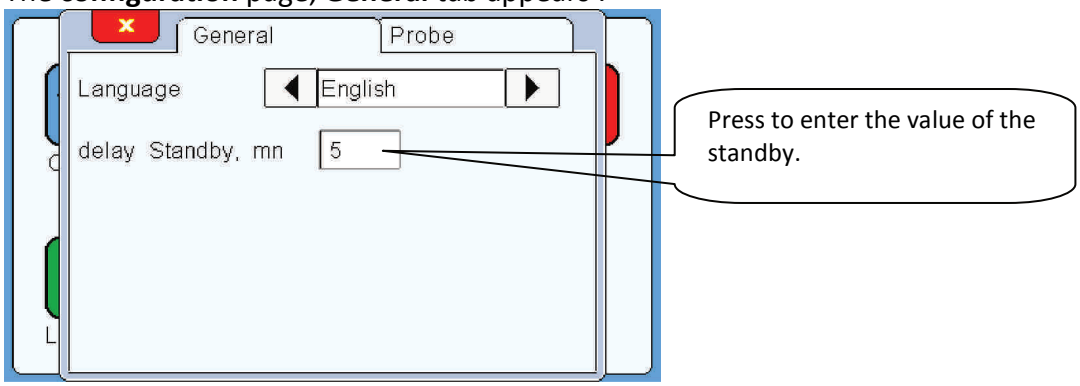
PRESS ICON 

The home page appears:



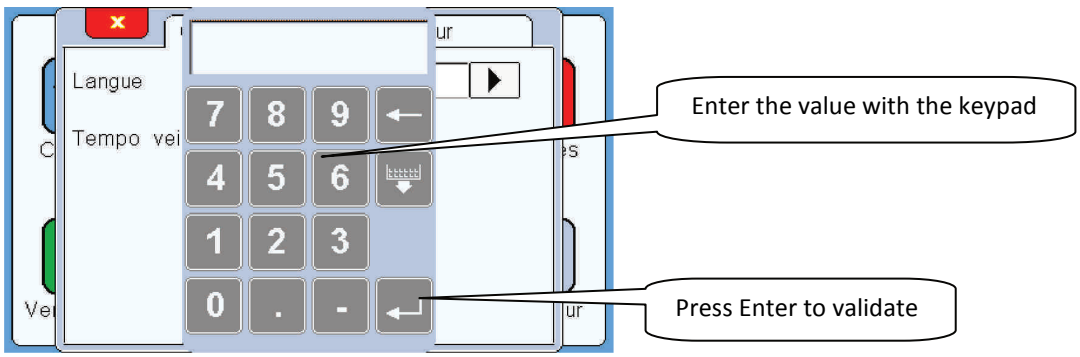
PRESS ICON 

The **configuration** page, **General** tab appears :

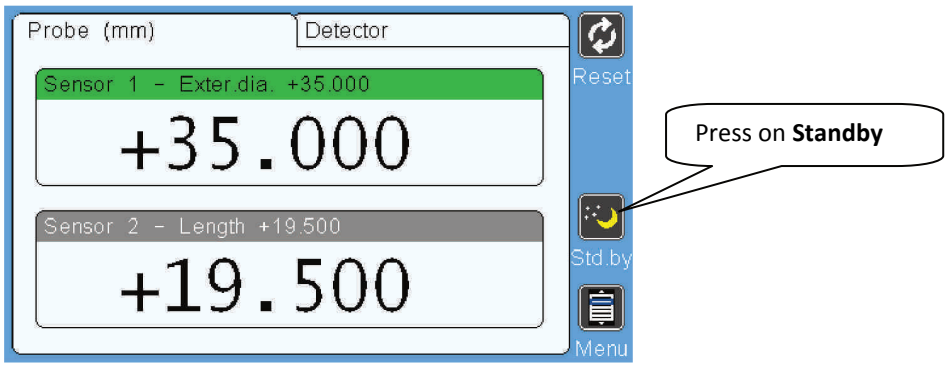


Delay Standby , mn

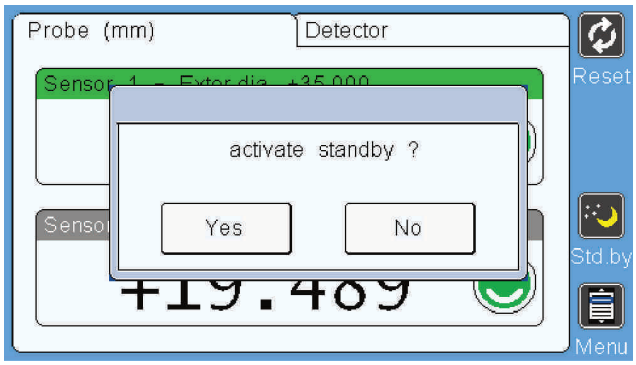
This parameter is used to set the time during which the standby will be active. Pressing the field opens the keypad to enter the time in minutes. Maxi 15mn.



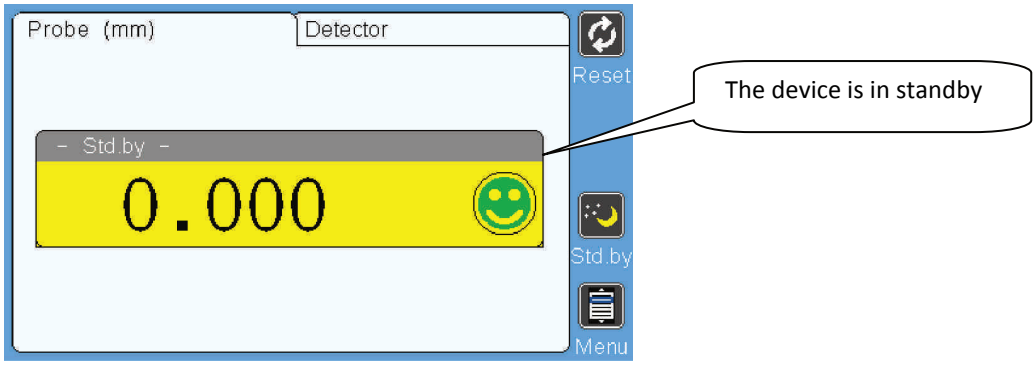
How to put the device on standby :



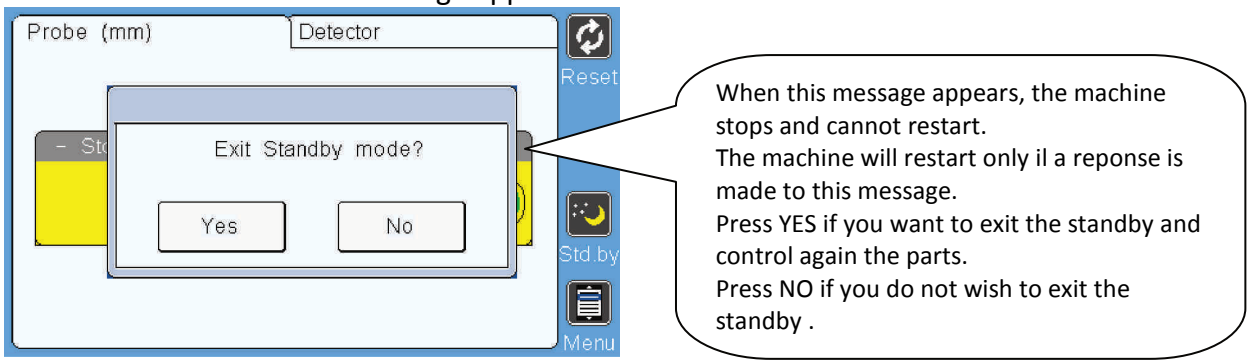
PRESS BUTTON 



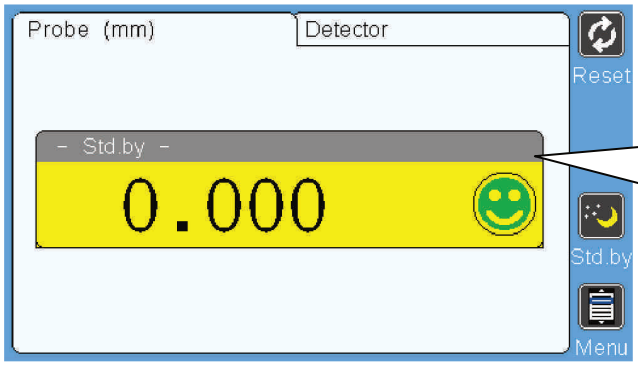
PRESS BUTTON 



The device is in standby, the measurements are not performed, but the machine can still start.
The standby will last the time that has been set before . (See setting **Delay standby** in **Configuration** page).
At the end of the time this message appears :

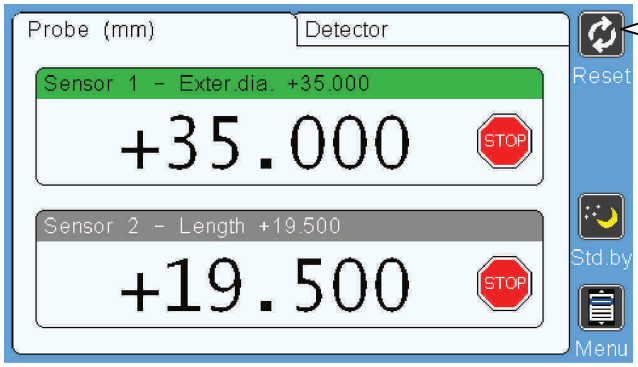


PRESS BUTTON No



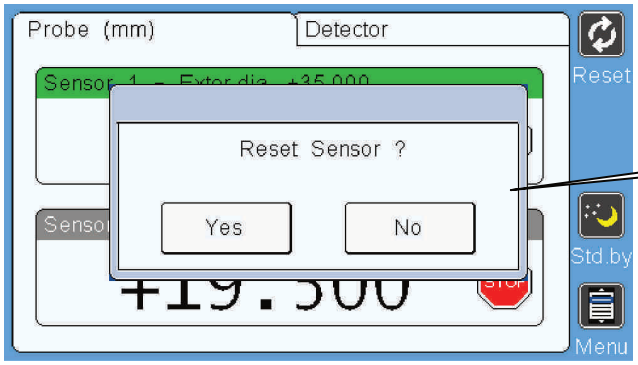
By not leaving the standby, it extends during the same time. The measurements are carried over and the machine can be restarted.

PRESS BUTTON Yes



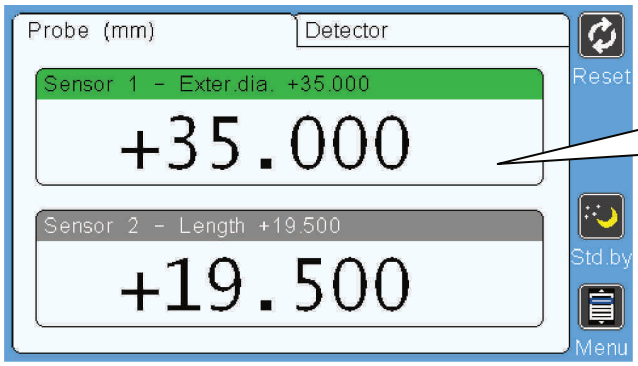
When leaving the stanby, the probes must be reset using the reset button.
Press Reset

PRESS BUTTON Reset



Press YES to reset probes

PRESS BUTTON Yes

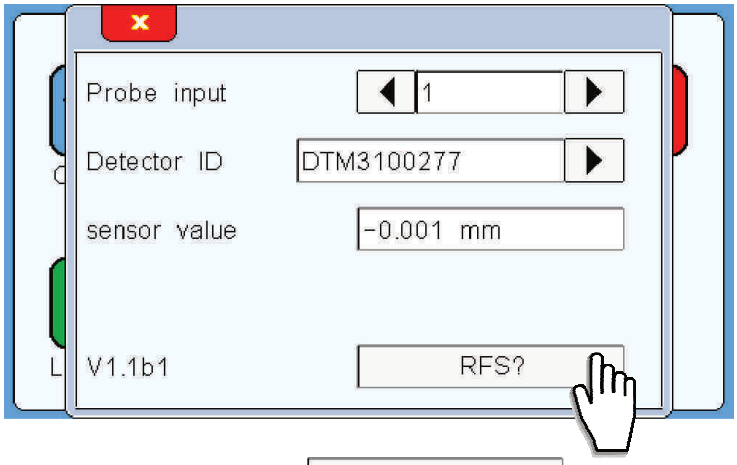


The probes have been set to zero. The measurements are made again and the machine can restart.

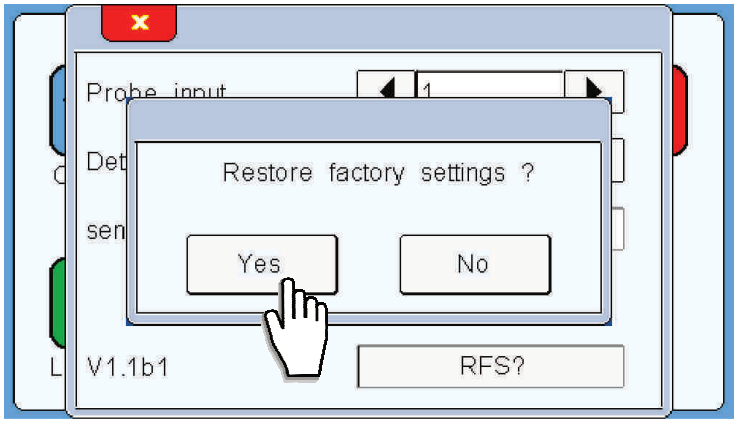
7. Reset Factory Setting

Here is the procedure to restore factory default settings. This restore only affects the following parameters :

Probe : Instantaneous value = raw sensor value (default value)
Reference = 0.000mm (default value)
Type of display = Real dimension (default value)
Reference Mode = Manual (default value)
Measurement Mode = Peak (default value)
Tolerances Mode = Intervals (default value)
Superior Tolerance = +1.000 (default value)
Inferior Tolerance = -1.000 (default value)
Formula = Inactive (default value)
Type de measure = Length (default value)
Nominal dimension = 0.000 (default value)
Measure Masking = Inactive (default value)
Action delay = Inactive (default value)
Multi-part action = Inactive (default value)
Display = Oui (valeur par défaut)
Activation = Oui (valeur par défaut)



PRESS BUTTON RFS?



PRESS BUTTON Yes

Factory settings are now restored.

Manufacturer

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