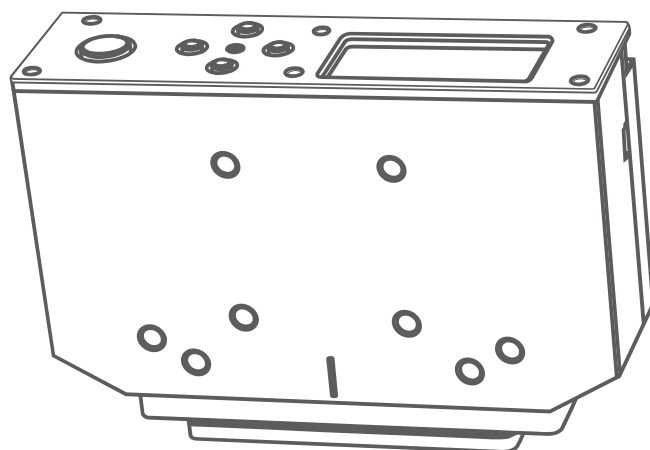


Non-contact Gloss Meter

OPERATION MANUAL



V1.0

Please read this manual carefully before using the instrument

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Non-contact gloss meter

Overview

The non-contact glossmeter can measure without contacting the sample and will not pollute the sample. It is also easy to install and fast to measure. It is very suitable for automatic production line glossiness detection. It can find defective products in time and reduce production costs.

1.External Structure Description

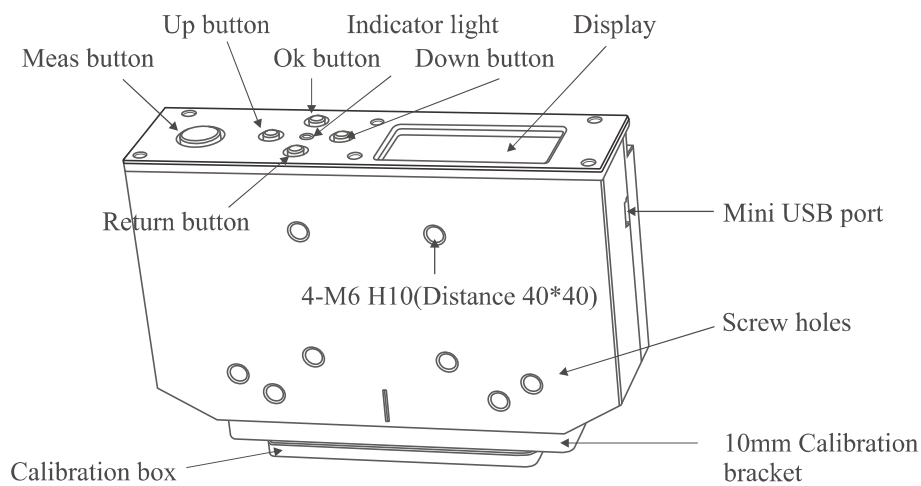


Figure 1 External structure

Button name	Icon	Function
Measurement button	⊙	Switch ON/OFF, measurement, quick return to measurement interface, operation confirmation
OK button	✓	Display menu, prompt or operation confirmation
Return button	↶	Return to previous menu or cancel operation
Up button	↑	Move up menu items
Down button	↓	Move down menu items

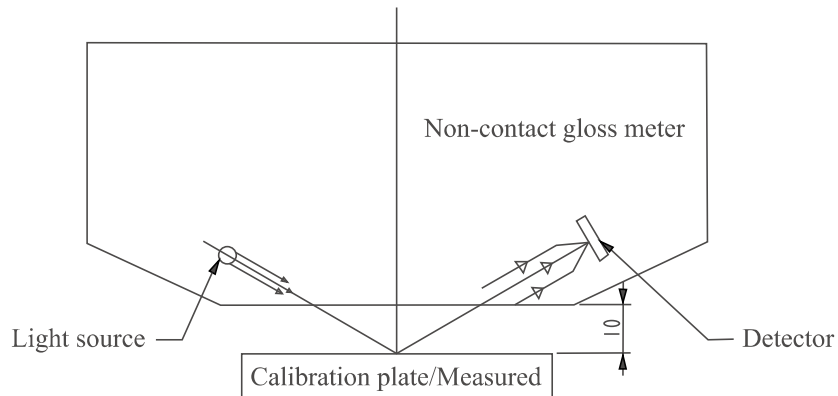
Remark: Use the above icons to represent the corresponding buttons in the instrument operation prompt

2.Measurement Principle and Introduction

This product conforms to the international standard ISO 2813 and the Chinese national standard GB/T9754, and meets the requirements of JJG696 working gloss meter. Under normal use conditions, Non-contact gloss meter is the same as our company's gloss meter. With automatic calibration, it has four measurement modes: basic mode, quality control mode, statistical mode and continuous mode to meet different measurement needs. At the same time, it has quality management software.

The special design of Non-contact gloss meter enables the instrument to carry out contact measurement and non-contact measurement with an interval of 10mm. As shown in the figure below, the distance between the calibration plate and the sample to be tested should be 10mm from the Non-contact gloss meter gloss base plate. When the instrument is connected to a 10mm calibration bracket (refer to Figure 1), the sample to be tested can be attached to the calibration bracket to achieve contact measurement. When the instrument is not connected to the 10mm calibration bracket (refer to Figure 1), the measured sample is 10mm away from the bottom of the instrument to achieve non-contact measurement.

There are two sampling procedures for Non-contact gloss meter. One is, in the normal measurement mode, that the lighting source is turned on, the sample to be tested is illuminated, the detector signal is collected, the lighting source is turned off, and the glossiness of the sample to be tested is output. The single measurement time is 1 second; the other is that when the online measurement mode is turned on, the lighting source will be turned on all the time, and the detector will collect and output signals uninterruptedly, so that the measurement period can be as short as possible, and the single measurement period is 180 milliseconds.



3. Switch on/off

3.1 Startup

The instrument is powered by an external power adapter through the USB interface (dry batteries can also be used in special cases). When using battery power, press the measurement button to turn on; if using USB power, it will automatically turn on when the USB is plugged in and connected to the power supply.

If the calibration plate is detected during startup, the instrument will be calibrated automatically.

If the calibration is passed, the interface shown in Figure 2 will be displayed, and at this time, press the measurement button to enter the measurement interface.

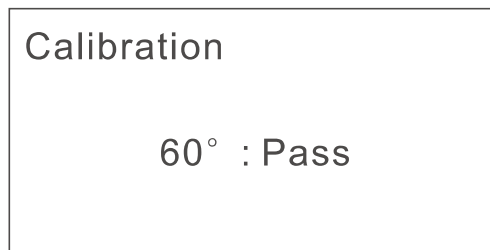


Figure 2 Calibration pass

If the calibration is failure, it is as shown in Figure 3.

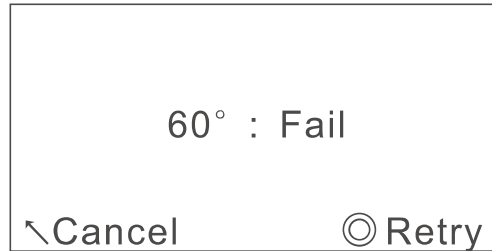


Figure 3 Calibration fail

After the calibration is failure, please choose to press the measurement button to retry or press the return button to directly enter the measurement interface. If you try again, please check these first:

1. Whether the calibration plate is in good connection or not;
2. Is the calibration tile clean?
3. Calibration tile protection paper is removed.

3.2 Shutdown

When using battery power, the instrument will automatically shut down within a certain period of time (30 seconds by default, which can be changed in the settings).

It can also be turned off by pressing and holding the measurement button for more than 3 seconds.

It is not able to turn off when using USB power.

4. Basic Operation

This chapter introduces some basic operations, which are the basis of the following chapters, and it is best to browse through them.

4.1 Menu Operation

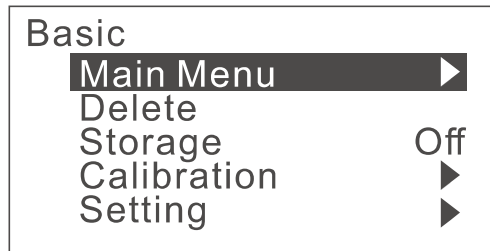


Figure 4 Menu introduction

Click the OK button on the measurement interface to enter the menu interface.

In the menu interface, the item displayed in reverse color indicates the currently selected menu item.

Press the up and down buttons to change the currently selected item.

If there is a down arrow (↓) in the lower right corner, it means that there are more menu items that need to be turned up to see; if there is an up arrow (↑) in the upper right corner, it means that there are more menu items that need to be turned up to see.

If there is a triangle symbol (▷) on the right side of the menu item, it means that you can enter the submenu item by clicking the OK button.

Tip 1: Normally press the measurement button on the menu interface to return to the measurement interface.

4.2 Enter the Main Menu

Press the OK button in the measurement interface to enter the menu of the corresponding mode, and select "Main Menu", then press the OK button to enter the main menu.

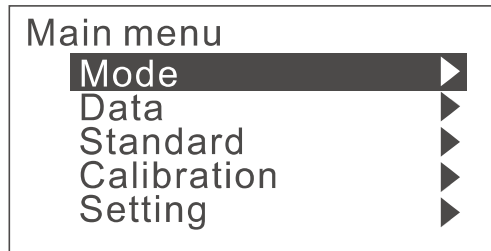


Figure 5 Main menu

The main menu contains the following items:

- Mode: Select the measurement mode;
- Angle: Select the measurement angle (only for multi-angles gloss meter);
- Data: Turn on/off storage function; check and delete records;
- Standard management: Turn on/off the difference value; check, modify, add and delete the standard;
- Calibration: Calibrate the instrument and modify the calibration parameters;
- Setting: System setting.

4.3 Confirm Prompt Interface

The prompt interface is used to prompt to confirm an operation or not like deleting the record as shown in Figure 6.

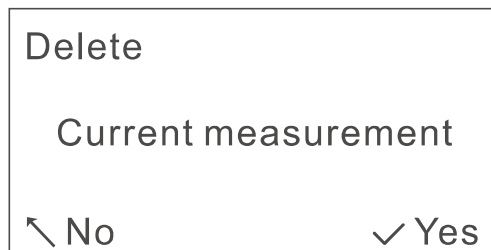


Figure 6 Delete the record

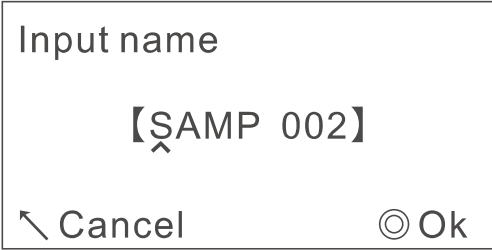
If you want to confirm the corresponding operation, press the OK button or the Measure button.

Press the return button if you want to cancel the operation.

Tip 2: If confirming “No” in the prompt interface means pressing the return button to perform a “No” operation, and “Yes” means pressing the OK button to perform a “Yes” operation.

4.4 Input Prompt Interface

The input interface is mainly used for prompting input the sample name or number as shown in Figure 7.



Input name

【SAMP 002】

↖ Cancel Ⓞ Ok

Figure 7 Input prompt interface

As shown in Figure 7, between the square brackets (between "[" and "]") is the input area, and the character on "^" is the current input focus.

Press the up or down button to switch the character at the focus position.

Press the OK button to move the input focus to the next position.

Press the measurement button to confirm the entry.

Press the return button to cancel the input operation.

4.5 Editing Operation

The number or character displayed on the right side of some menu items is editable. For example, in the item of the average number of statistical modes, when press the OK button, it will display as shown in Figure 9, which is an edit area enclosed by square brackets. When display the editing area as shown in Figure 7, press the up and down buttons to switch the character at the focus, and press the OK button to move the edit focus to the next character, or press the return button to cancel the changes and press the measurement button to save the changes.

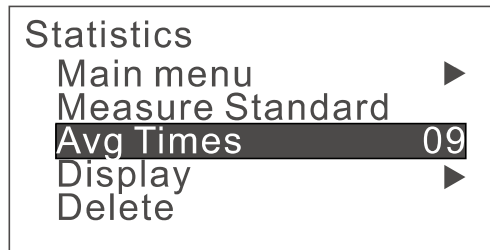


Figure 8 The number of average measurement is editable

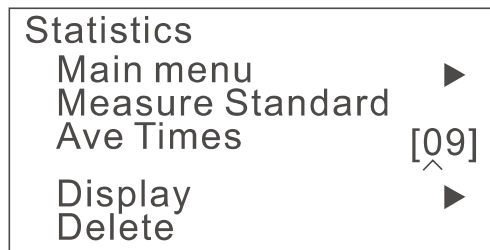


Figure 9 Press OK button to edit the number of average times

4.6 Display Item

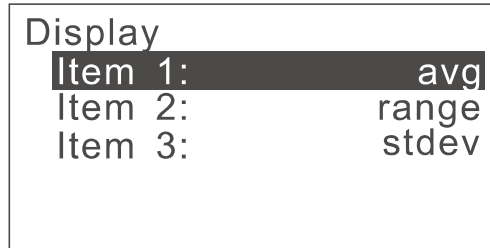


Figure 10 Display items in edit stats mode will show option box

Some setting values can only be one of several options. For example, in the display item of the statistics mode, press the OK button to select other options.

When you edit an item, it is anti-color display and the current item are enclosed in square brackets.

Press the up or down button to switch the current option.

Press the OK or measurement button to save the changes.

Press the return button to restore the original value.

5.Instrument Calibration

The calibration plate is automatically detected and calibrated when the instrument is turned on.

In order to the accuracy of measurement, it has to re-calibrate it after changing the power supply mode (for battery to USB or from USB to battery power), and it also needs to re-calibrate the instrument after modifying the calibration parameter. If the environment changes too much, it is also better to re-calibrate the instrument.

The related functions are under the Instrument Calibration menu.

Enter the main menu and select “Instrument Calibration” then press the OK button to enter the Instrument Calibration menu.

If you are in the basic measurement mode, you can also find the "calibration" menu item in the basic mode menu.

5.1 Calibrate the Instrument

Before calibration, please confirm that the calibration tile is clean and the calibration plate is in good connection.

During use, enter the “Calibration” menu to calibrate the instrument. Then select “Calibrate” in the “Calibration” menu as shown in Figure 11 and press the OK button.

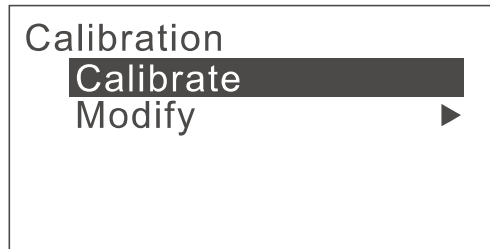


Figure 11 Press OK button after selecting "Calibrate"

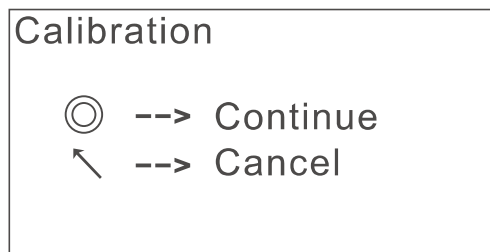


Figure 12 Press measurement button to start calibrate

This will enter the “Calibration” interface, and then press the measurement or OK button to start calibrate the instrument as shown in Figure 12.

When the instrument is calibrating, it will display “Calibrating” and flashes green light.

After the calibration is completed, if the calibration is successful, it is as shown in Figure 13. At this time, press the measurement button to return to the measurement interface or press the return button to return to the “Calibration” menu . If the calibration is failure, it is as shown in Figure 14. Press the measurement button or the OK button to retry, or press the return button to cancel it.

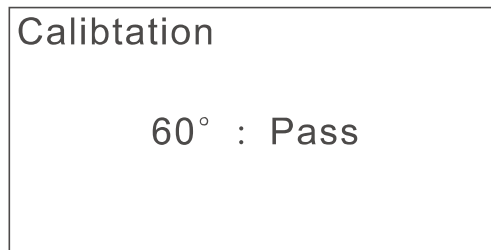


Figure 13 Calibration pass

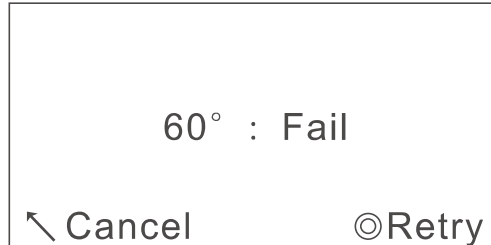


Figure 14 Calibration fail

5.2 Modify Calibration Parameters

Please modify the calibration plate parameters in the instrument simultaneously if replace or re-calibrate the calibration tile.

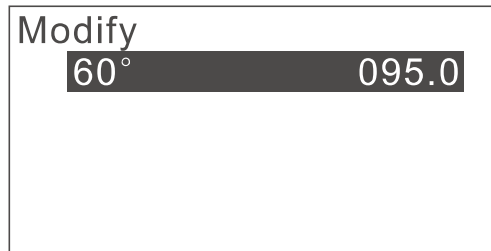


Figure 15 Modify the calibration board parameters

Please enter the “calibration” menu to modify the calibration tile parameters, then select the “modify parameters” menu item and press the OK button to enter the “modify parameters” interface.

Select the angle to be modified and press the OK button to start editing the corresponding value. Press the measurement button to save the changes after finishing the editing

Note: The random change of the calibration tile parameters will lead to the inaccuracy of measurement. Please consult the factory to re-calibrate the calibration tile or replace the calibration plate.

6.Measurement Modes

6.1 Switching Measurement Modes

The instrument is in the basic mode when it is turned on for the first time. Please enter the “main menu” and select the “measurement mode” menu item, then press the OK button to the “Mode” interface to change the measurement mode as shown in Figure 16. Select the appropriate measurement mode and press the OK button.

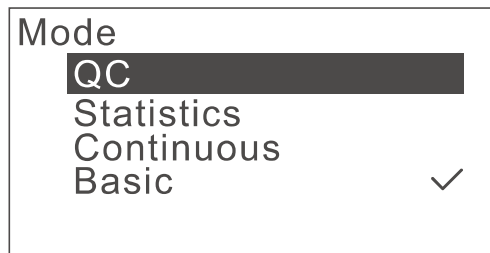


Figure 16 Measurement mode menu

6.2 Basic Mode

6.2.1 Measurement

Press the measurement button under the basic mode interface to measure.

During the measurement, the green indicator lights up, while the green indicator goes out after the measurement is completed and display the measurement results as shown in Figure 17.

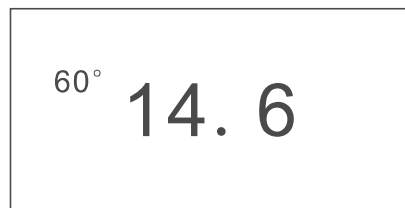


Figure 17 Basic mode measurement results

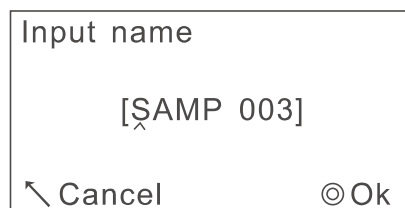


Figure18 Enter the sample name

Non-contact gloss meter

If the storage function is turned on, it prompts to enter the sample name after each measurement is completed as shown in Figure 18. The system will provide a default name and press the measurement button to confirm the name and save it or press the return button to cancel it.

Press the return button to delete the measurement result as shown in Figure 19.

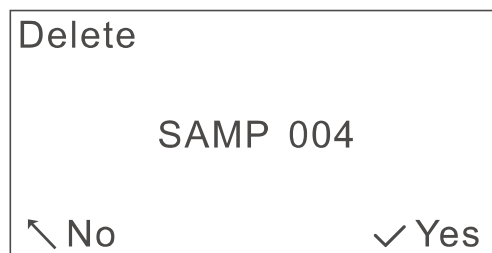


Figure 19 Press the return button to delete the measurement result

6.2.2 Basic Mode Menu

Press the OK button at the measurement interface to enter the basic mode menu.



Figure 20 Select "Main Menu" and press the OK button to enter the main menu

The basic mode menu contains the following menu items:

- The main menu: Enter the main menu;
- Delete: Delete the current measurement result;
- Storage: Enable or disable the storage function. If the storage function is turned on, "ON" will be displayed on the right, otherwise "OFF" will be displayed.
- Angle: Switch the instrument measurement angle (only for multi-angles instrument);
- Calibration: Functions related to instrument calibration, see 5 Instrument Calibration;
- Setting: Enter the system setting menu, see 10 System Setting.

6.3 Quality Control Mode

6.3.1 Interface Introduction

STD 01		SAMP 001	
	value	diff	pass
60°	14.7	0.0	OK

Figure 21 Figure 20 Select "Main Menu" and press the OK button to enter the main menu

The standard interface of the quality control mode is shown in the figure above, the upper left corner is the name of the current standard sample, and the upper right corner is the name of the current sample.

As shown in Figure 21, the "value" column shows the measured value; the "diff" column shows the difference between the sample value and the standard value; the "pass" column shows judgement results, and "OK" means within the tolerance of the standard, "NG" indicates out of tolerance.

If the difference display is not turned on, the measurement interface of the quality control mode is the same as the basic mode.

6.3.2 Measurement

Press the measurement button in the measurement interface to measure. The green light will light up during measurement, and will go out after the measurement is completed and the measurement result will be displayed.

6.3.3 Measure Standard

Press the OK button to enter the quality control mode menu, then select the measurement standard. After the measurement is ready, press the OK button to measure.

After the measurement is completed, the measurement result is displayed and prompted for confirmation as shown in Figure 22.

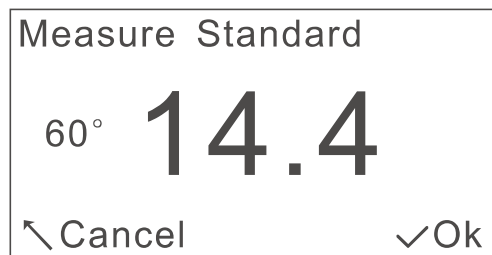


Figure 22 Confirm the measurement result of standard

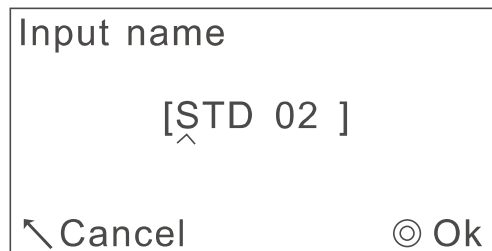


Figure 23 Enter the sample name

Press the OK button to confirm or press the return button to discard the result.

If the storage function is turned on, it prompts to enter the standard name after the confirmation is finished as shown in Figure 23.

After confirming the name of the standard, press the measurement button to save the standard or press the return button to cancel the storage. At this time the standard will be save as a temporary standard.

After the standard is measured, it is automatically set as the current standard; if the differential display is not turned on, it will be automatically turned on.

6.4 Statistical Mode

6.4.1 Interface Introduction

As shown in Figure 24, in the top left corner of the statistics mode, it displays the current standard name. The first row in the upper right corner shows the current sample name, and the second row shows the number of measurements, which is displayed in the form of "m/n". "m" indicates the number of measured times and "n" indicates the total numbers of requirement measurement.

In the figure 24, “avg” , “range” , “stdev” each shows the average value, the variation range of m measurements, and the standard deviation. They can be changed in the Display Options in the Statistics Mode menu.

STD 03		SAMP 001	
		9/9	
	avg	range	stdev
60°	14.6	0.4	0.0

Figure 24 Statistics Mode Measurement Interface

6.4.2 Measurement

After entering the statistical mode measurement interface, press the measurement button to measure. The measurement result will be updated at each measurement, and measurement will be automatically performed after the specified number of measurements. If the storage is turned on, it will prompt to enter the sample name when measurement is finished.

Please press the down button to finish the current measurement if the setting numbers of measurements are not enough.

Please press the up button (this operation can only be performed when the measurement is not completed) to delete the previous measurement data.

Please press the return button to delete the measurement result.

6.4.3 Measure Standard

Press the OK button to enter the statistical mode menu, then select the “Measure Standard” menu item, and press the OK button to enter the standard measurement interface.

The "m/n" in the top left corner of the measurement interface shows the current number of measurements and the total number of required measurements.

The "avg" column in the measurement interface shows the average of m measurements; the "min" column shows the minimum value in m measurements, and "max" shows the maximum value in m measurements.

Measure Standard			
	avg	min	max
60°	14.7	14.7	14.7

Figure 25 Statistics mode measurement standard interface

After entering the standard measurement interface, press the measurement button to measure. After measuring for a specified number of times, if the storage is turned on, it will be prompt to input the standard name, otherwise it is set as a temporary standard.

During the measurement, press the return button to cancel the measurement or press the OK button to complete the measurement.

6.4.4 Set the Number of Measurements

Enter the statistics mode menu and select the "Average" menu item, then press the OK button to modify the number of measurements.

The number of measurements in the statistical mode can be set from 2 to 99 .

6.4.5 Setting Display Options

After entering the statistics mode menu, select the "Display Options" menu item, and then press the OK button to enter the display options setting page.

The statistical mode measurement interface can display up to three columns, corresponding to the first, second and third items respectively.

The available display items are:

- "avg": Average;
- "min" : The minimum value of the measured value;
- "max" : The maximum value of the measured value;
- "range" : The value that the maximum value minus the minimum value;
- "stdev" : Standard deviation;
- "diff" : Difference that minus the standard deviation;
- "pass": The result of comparison with the standard sample, "OK" or "NG";
- Blank: no display.

The standard deviation calculation formula is:

$$\text{stdev} = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$$