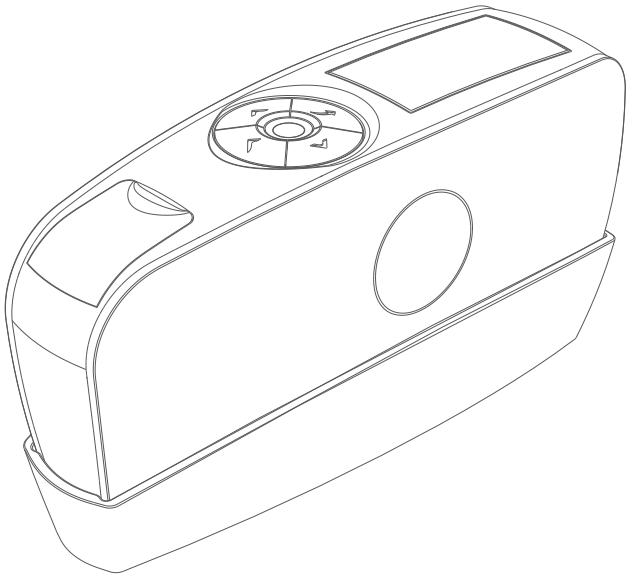
45°/75° GLOSS METER

OPERATION MANUAL



V 1.0

Contents

This manual is applicable to our company's multi-angle and single-angle high-precision multi-functional gloss meters.
Although the examples in the storytelling are illustrated with multiple angles, almost all operations except angle switching are applicable to single-angle instruments.

Instrument Introduction

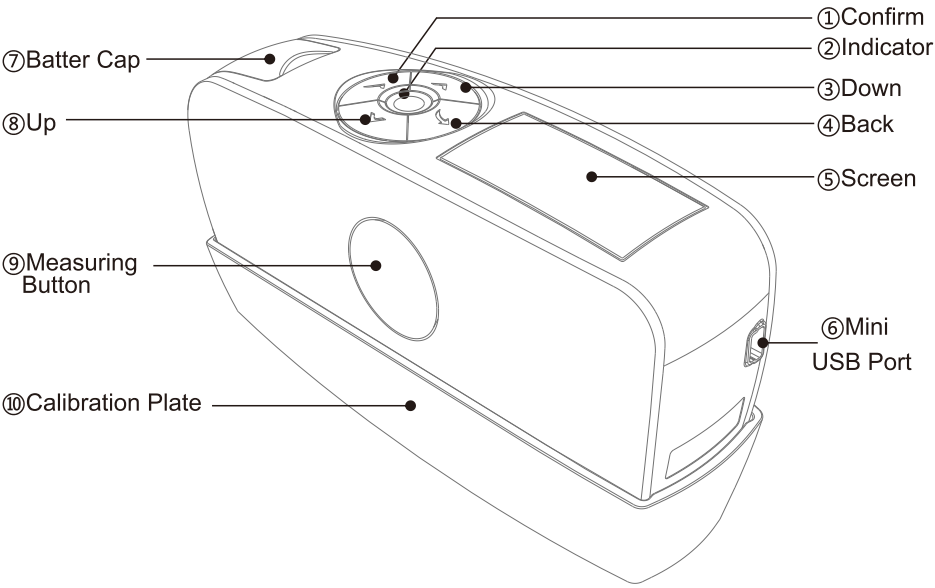
Our company's single-angle and multi-angle high-precision gloss meters are independently developed by our company with completely independent intellectual property rights , which comply with the international standard ISO 2813 and the Chinese national standard GB/T 9754, meet JJG 696 first-level working gloss meter requirements . It has four measurement modes: automatic calibration at startup, basic mode, quality control mode, statistical mode and continuous mode to meet different measurement needs, and is also equipped with high-end quality management software for free.

Precautions

(1) This instrument is a precision measuring instrument. During measurement, drastic changes in the external environment of the instrument should be avoided. For example, when measuring, you should avoid flickering ambient light, rapid changes in temperature and humidity, etc.
(2) When measuring, the instrument should be kept stable, the measuring port should be close to the object being measured, and shaking and displacement should be avoided:
This instrument is not waterproof and cannot be used in high humidity environments or water mist.
(3) Keep the instrument clean and prevent water, dust, liquids, powders or solid foreign matter from entering the measuring aperture.
Avoid impact or collision inside the instrument.
(4) After using the instrument, turn it off and put the instrument and standard plate into the instrument box for safekeeping.
(5) The instrument should be stored in a dry and cool environment.

(6) Users are not allowed to make any unauthorized changes to this instrument. Any unauthorized changes may affect.
This may affect the accuracy of the instrument or even cause irreversible damage to the instrument.

1. Instrument appearance diagram



Picture 1 Gloss meter appearance

Key Function Description

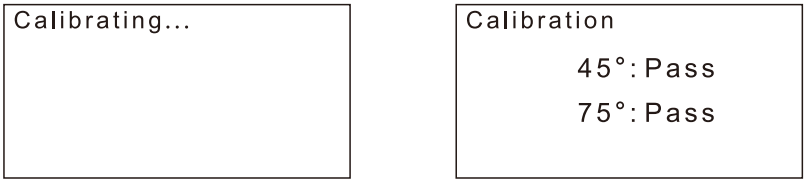
Button name	Icon	Function
⑨Measurement button	◎	Switch ON/OFF, measurement, quick return to measurement interface, operation confirmation
①OK button	√	Display menu, prompt or operation confirmation
④Return button	↩ (↖)	Return to previous menu or cancel operations
⑧Up button	▲	Move menu item up
③Down button	▼	Move menu item down

Note: The icons in the table above are used in the instrument operation prompts to represent the corresponding keys.

2. Turn on and off the machine

2.1 Power on

The instrument can be powered by batteries and USB . When powered by batteries, press the measurement button to turn it on . If powered by USB , it will automatically turn on when the USB is inserted and the power is connected.
At power-up, the instrument will automatically calibrate if a calibration box is detected.
If the calibration is successful, the interface steps in Figure 2 will be displayed .
If the calibration fails, the interface shown in Figure 3 will be displayed :



Ficture 2 Power- on calibration process

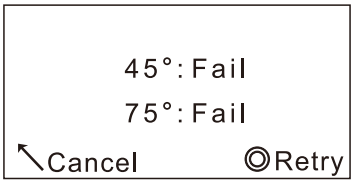


Figure 3 Calibration failed

If the calibration fails, you can choose to press the measurement key to try again, or press the return key to directly enter the measurement interface.
If you try again, please do the following tests first:
1.Is the calibration box closed?
2.Is the correction plate flat?
3.Is the protective paper of the correction plate removed?

2.2 Shutdown

30 seconds by default , which can be changed in the settings). Alternatively, you can also shut down by pressing the measurement key for more than 3 seconds. by USB .

3. Basic Operations

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

3.1 Menu Operation

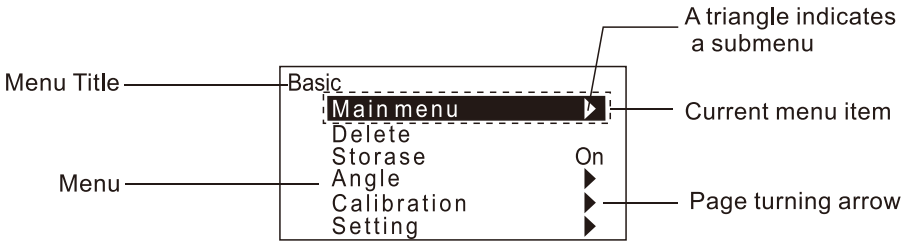


Figure 4 Menu interface

In the measurement interface, click the confirmation button to enter the menu interface.

In the menu interface, the inverted display item indicates the currently selected menu item.

Press the Up and Down keys to change the currently selected item.

If there is a downward arrow (↓) in the lower right corner , it means that there are more menu items that require turning the page to view; if there is an upward arrow (↓) in the upper right corner , it means that there are more menu items that require turning the page up to view.

(▷) on the right side of a menu item, it means that you can enter the submenu item by pressing the OK button .

Tip 1 : Normally, pressing the measurement key in the menu interface will return to the measurement interface.

3.2 Enter the main menu

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

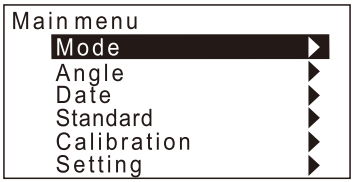


Figure 5 Main menu

The main menu contains the following menu items:

- Measuring mode: Select the measuring mode;
- Measuring Angle: Select the measuring angle (multi-angle instruments only);
- Data management: open and close storage, view and delete instrument records;
- Standard sample management: turn on and off the difference, view, modify, add and delete standards;
- Instrument calibration: calibrate the instrument and modify the calibration parameters;
- System Settings: System settings related options.

3.3Confirmation prompt interface

The prompt interface is used to prompt confirmation of an operation. The following figure is the prompt interface for deleting records.

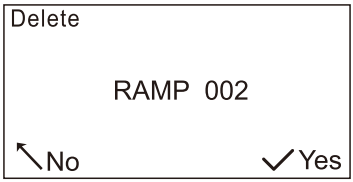


Figure 6 Deletion record confirmation interface

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

If you want to cancel the operation, press the Back key .

Tip 2 : Key prompts use the key icons in the icon key function table to add corresponding operations. For example, "↖No" in the confirmation prompt interface means pressing the return key to perform a "No" operation, and "√Yes" means pressing the confirmation key to perform a "Yes" operation.

3.4 Input prompt interface

The input interface is mainly used to prompt for sample name or number input. The following figure is a prompt interface for inputting sample name.

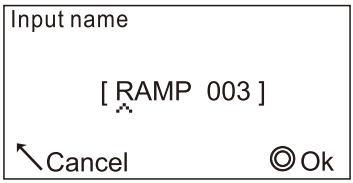


Figure 7 Input prompt interface

As shown in the figure above, the area between the square brackets (between " [" and "] ") is the input area, and the character above the " ^ " is the current input focus.
Press the up or down key to switch the character at the focus position.
Pressing the OK key moves the input focus to the next position.
Press the Measure key to confirm your entry.
Press the Return key to cancel the input operation.

3.5 Editing Operation

For example, in the statistics mode, the numbers or characters displayed on the right side of some menu items are editable, as shown in Figure 8. After pressing the OK key, an editing area enclosed by square brackets as shown in the input prompt interface will be displayed , as shown in Figure 9. When the editing area is displayed, you can press the Up and Down keys to switch the character in focus, press the OK key to move the editing focus to the next character, press the Back

key to cancel the change, and press the Measure key to store the change, just like in the input prompt interface.

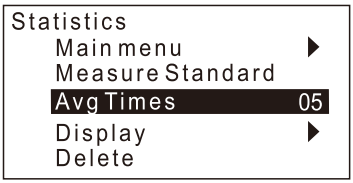


Figure 8 The number of average measurements is editable

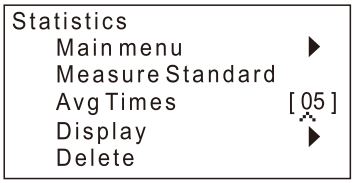


Figure 9 Click the OK button to edit the average times

3.6 Option Operation

key to cancel the change, and press the Measure key to store the change, just like in the input prompt interface.

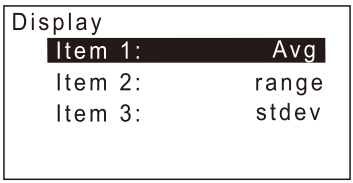


Figure 10 The display item in the edit statistics mode will display the option box

For example, in the display options of the statistics mode, the value of some settings can only be one of several options. In this case, pressing the confirm key can select other options , as shown in Figure 10.

When editing an option, it will be displayed in reverse color and enclosed in square brackets.

Press the Up or Down key to switch the current option.

Press the OK key or the Measure key to store the changes.

Press the return key to restore the original value.

4. Instrument Calibration

When the instrument is turned on, it will automatically detect the calibration box and calibrate it.
For measurement accuracy, recalibration is required after changing the power supply mode (from battery to USB or from USB to battery), and recalibration is also required after modifying the calibration parameters. Recalibration of the instrument should also be considered if the environment changes significantly.
Instrument calibration related functions are under the "Instrument Calibration" menu.
Enter the main menu, select “Instrument Calibration” and press the OK key to enter the “Instrument Calibration” menu.
If you are in basic measurement mode, you can also find the "Instrument Calibration" menu item in the basic mode menu.

4.1 Calibration of instruments

Before calibration, please make sure that the calibration plate is clean and the calibration box is closed.
To calibrate the instrument during use, enter the "Instrument Calibration" menu, then select "Calibrate Instrument" in the "Instrument Calibration" menu and press the OK key, as shown in Figure 11. At this time, you will enter the "Instrument Calibration" interface, and then press the Measure key or OK key to start calibrating the instrument , as shown in Figure 12.

Figure 11 Select "Calibrate Instrument" and press the OK button

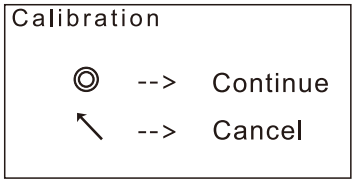


Figure 12 Press the measurement key to start calibration

When the instrument is calibrating, the words “Calibrating” will be displayed, as shown in Figure 13, and the green light will flash.
After the calibration is completed, if the correction is passed, the interface in Figure 14 will be displayed . At this time, press the measurement key to return to the measurement interface. If you want to return to the "Calibration Menu", press the return key.
If the calibration fails, the 15th screen will be displayed. If you want to try again, press the measurement key or the confirmation key . If you want to cancel, press the return key .

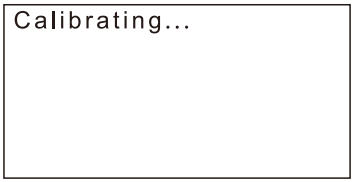


Figure 13 Calibration interface

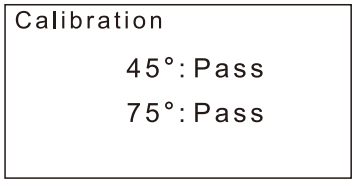


Figure 14 Calibration success interface

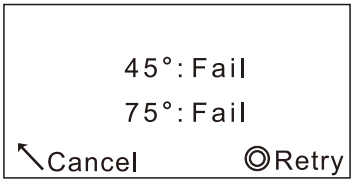


Figure 15 Calibration failed

4.2 Modify the calibration board parameters (only one parameter needs to be modified for a single angle)

If the calibration board is replaced or recalibrated, the calibration board parameters in the instrument need to be modified simultaneously.

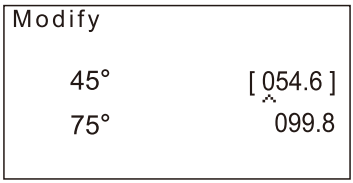


Figure 16 Modify the standard board parameters

If you want to modify the calibration plate parameters, enter the "Instrument Calibration" menu, then select the "Modify Parameters" menu item and press the OK key to enter the "Modify Parameters" interface , as shown in Figure 16. Select the angle to be modified and press the OK key to start editing the corresponding value. After editing, press the Measure key to store the changes.

Note: Randomly changing the calibration board parameters will result in inaccurate measurements. If you want to recalibrate the calibration board or replace the calibration box, please consult the manufacturer.

5. Measurement Mode

The instrument has four measurement modes: basic mode, quality control mode, statistical mode and continuous mode.
In basic mode, simple measurements can be performed; in quality control mode, the measurement results can be compared with standard samples; in statistical mode, multiple average measurements can be performed, basic statistics can be made on the data of multiple measurements, and the results can be compared with standard samples; in continuous mode, the specified number of continuous measurements can be automatically performed after pressing the measurement key.

5.1 Switching measurement mode

The instrument is in basic mode when it is turned on for the first time. If you want to change the measurement mode, enter the "Main Menu", select the "Measurement Mode" menu item, and press the OK key to enter the measurement

mode interface, as shown in Figure 17. Select the corresponding measurement mode and press the OK key .

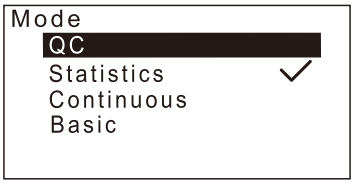


Figure 17 Measurement mode menu

5.2 Basic Mode

5.2.1 Measurement

In the basic mode measurement interface, press the measurement key to start measurement.

The green indicator light will light up during the measurement process, and will turn off after the measurement is completed, and the measurement result will be displayed , as shown in Figure 18.

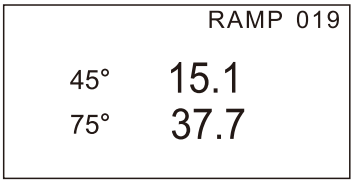


Figure 18 Basic mode measurement results

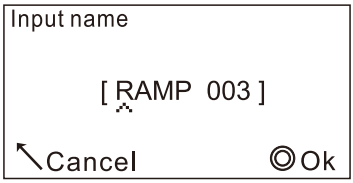


Figure 19 Input sample name

If the storage function is turned on, you will be prompted to enter the sample name after each measurement. The system will provide a default name. Press the measurement key to confirm the name and store it. If you do not want to store it, press the return key to cancel , as shown in Figure 19.

If you want to delete the measurement results, press the return key. As shown in Figure 20.

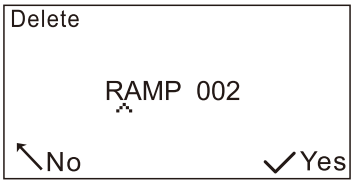


Figure 20 Press the Back key to delete the measurement results

5.2.2 Basic Mode Menu

Press the OK key in the measurement interface to enter the basic mode menu , as shown in Figure 21.

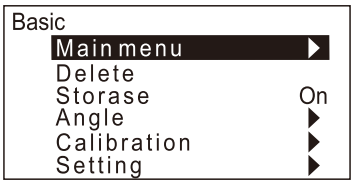


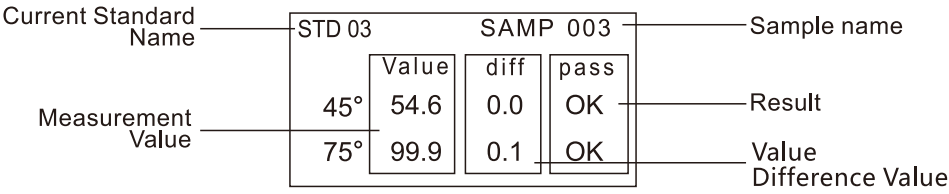
Figure 21 Select “Main Menu” and press the OK button to enter the main menu

The Basic Mode menu contains the following items:

- Main menu: enter the main menu;
- Delete: delete the current measurement result;
- Storage: Turn the storage function on or off. If the storage function is turned on, " On" will be displayed on the right, otherwise "Off" will be displayed;
- Measuring angle: used to switch the measuring angle of the instrument, only available on multi-angle instruments;
- Instrument calibration: For instrument calibration related functions, refer to the calibration instrument in operation step 2 Instrument calibration ;
- System Settings: Enter the system settings menu, refer to the system settings in step 7 of the manual ;

5.3 Quality Control Model

5.3.1 Interface Introduction



Picture 22 Quality control mode measurement interface

The standard interface of quality control mode is as follows As shown in Figure 22 , the upper left corner is the name of the current standard, and the upper right corner is the name of the current sample.

As shown in the figure above, the " value " column shows the measured value, the " diff " column shows the difference minus the standard, and the " pass " column shows the judgment result, where " OK " means it is within the tolerance range of the standard, and " NG " means it is out of tolerance.

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

5.3.2 Measurement

In the measurement interface, press the measurement key to start measurement. The green light will light up during measurement, and the green light will go out after completion and the measurement result will be displayed.

5.3.3 Measurement of standard samples

The OK key to start the measurement when ready .

After the measurement is completed, the measurement result will be displayed and a confirmation prompt will be displayed.

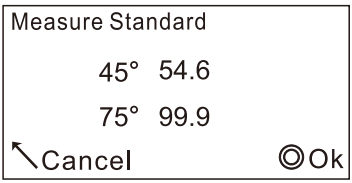


Figure 23 Confirmation of the results of the standard measurement

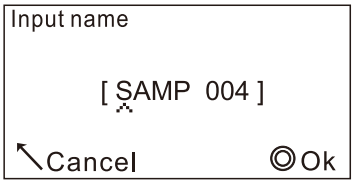


Figure 24 Input standard sample name

Press the OK key to confirm or the Back key to discard the result , as shown in Figure 23.

If the storage is turned on, you will be prompted to enter the sample name after confirming the result , as shown in Figure 24.

After confirming the sample name, press the measurement key to store the sample. The sample will be stored as a temporary sample . If you do not want to store it, press the return key.

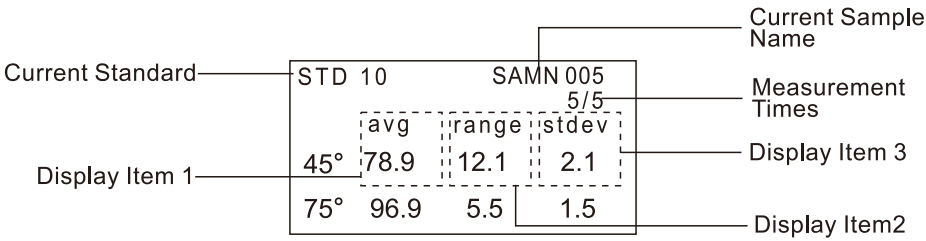
After measuring the standard sample, it will be automatically set as the current standard sample; if the difference display is not turned on, it will be automatically turned on.

5.4 Statistical Mode

5.4.1 Interface Introduction

As shown in Figure 25 , the upper left corner of the statistical mode displays the current standard sample name, the first line in the upper right corner displays the current sample name, and the second line displays the number of measurements. The number of measurements is displayed in the form of " m/n ", where " m " represents the number of times measured and " n " represents the total number of times required to be measured.

Figure 25 respectively show the average value, the variation range of m measurements and the standard deviation. Display Items 1, 2 and 3 can be changed in the "Display Options" in the Statistics Mode menu.



Picture 25 Statistics mode measurement interface

5.4.2 Measurement

After entering the statistical mode measurement interface, press the measurement key to measure. The statistical results will be updated every time a measurement is made. The measurement will be completed automatically after the specified number of measurements. If storage is turned on when the measurement is completed, you will be prompted to enter the sample name.

If you do not measure enough times and want to complete the current measurement, you can press the flip key , as shown in Figure 26.

If you want to repeat the last measurement, you can press the Up key (this operation can only be performed when the measurement is not completed) , and the current measurement data will be deleted, as shown in Figure 27.

If you want to delete the measurement results, press the Back key .

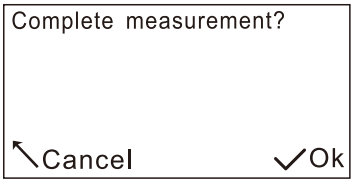


Figure 26 End measurement early

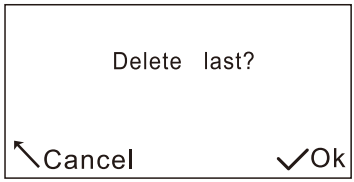


Figure 27 View the last set of measurement data

5.4.3 Measurement of standard samples

Press the OK key to enter the statistical mode menu, then select the "Measure Standard Sample" menu item and press the OK key to enter the standard sample measurement interface , as shown in Figure 28.
m/n ” in the upper left corner of the measurement interface shows the current number of measurements and the total number of measurements required.
avg " column in the measurement interface shows the average value of m measurements, the " min " column shows the minimum value among the m measurements, and the " max " column shows the maximum value among the m measurements.

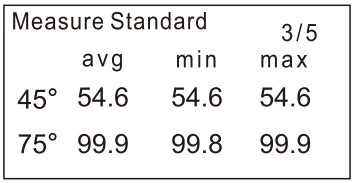


Figure 28 Measurement standard sample interface in statistics mode

After entering the standard sample measurement interface, press the measurement key to start measurement. After the specified number of measurements, if the storage is turned on, you will be prompted to enter the standard sample name, otherwise it will be directly set as a temporary standard sample.
During the measurement process, you can press the Back key to cancel the measurement or press the Confirm key to complete the measurement.

5.4.4 Set the number of measurements

After entering the statistics mode menu, select the "Average Times" menu item and press the OK key to modify the number of measurements.
The number of measurements in statistics mode can be set from 2 to 99 .

5.4.5 Setting display options

After entering the statistics mode menu, select the "Display Options" menu item and press the OK key 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 value;
- " min ": minimum value of the measurement;
- " max ": the maximum value of the measured value;
- " range ": the maximum value minus the minimum value of the measurement;
- " stdev ": standard deviation;
- “ diff ”: subtract the difference of the standard sample;
- “ pass ”: the result compared with the standard sample, “ OK ” or “ NG ”;
- Leave blank: Do not display.

The formula for calculating standard deviation is:

$$\text{stdev} = \sqrt{\frac{\sum_1^n (x_i - \bar{x})^2}{n-1}}$$

5.5Continuous mode

5.5.1 Measurement

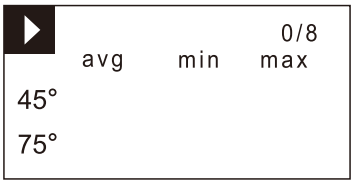


Figure 29 Continuous measurement interface (ready state)

In the continuous measurement interface, press the measurement key to start measurement . For automatic measurement, there is no need to press the measurement key again.
If storage is turned on, you will be prompted to enter a name before measuring. This name will be used as the name of the first measurement result, and subsequent measurements will automatically increase the sequence number based on this name.

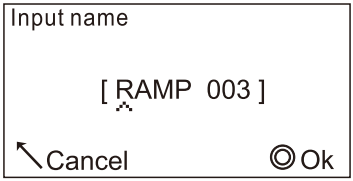


Figure 30 Enter the name of the first measurement

During the measurement process, the results of each measurement and the number of measurements being performed will be displayed.

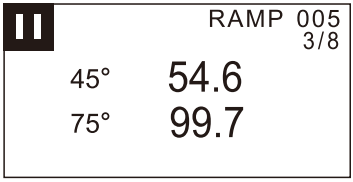


Figure 31 Continuous measurement interface (measuring)

During the measurement process, you can pause the measurement by pressing the measurement key or the return key. When the measurement is paused, the average value (" avg " column), minimum value (" min " column) and maximum value (" max " column) of all measured samples will be displayed, as shown in Figure 32. Pressing the measurement key again will continue the measurement.

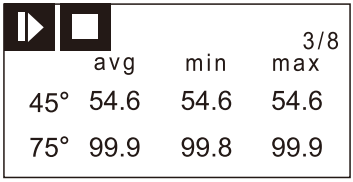


Figure 32 Continuous measurement interface (pause)

If you press the OK key during the pause, the measurement will be terminated. Press the OK key again to display the continuous mode menu.
When the specified number of measurements is reached, the measurement will stop automatically and the average value, minimum value and maximum value of all measured samples will be displayed , as shown in Figure 33.

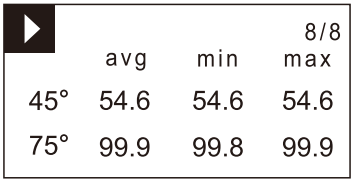


Figure 33 Continuous measurement (completed)

5.5.2 Specify the number of measurements

In the measurement interface, press the measurement key to enter the continuous mode menu (if the measurement is in progress, you need to stop the measurement first), select the "Number of measurements" menu item and press the OK key to modify it. The number of measurements can be specified from 1 to 999 .

5.5.3 Specifying the measurement interval

In the measurement interface, press the measurement key to enter the continuous mode menu (if measurement is in progress, you need to stop the measurement first), select the "Measurement Interval" menu item and press the OK

key to modify it.
The measurement interval can be specified from 2 to 120 seconds.
The measurement interval is the interval between the start of two measurements.

6. Data Management

Enter the main menu, select the “Data Management” menu item and press the measurement key to enter the data management interface , as shown in Figure 34.

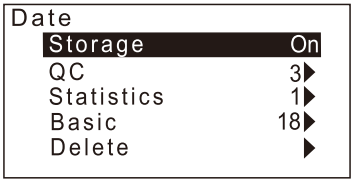


Figure 34 Data management menu

6.1 Enable or disable storage

After selecting the "Store" menu item, press the confirmation key , and after switching the option, press the measurement key again to store the changes.

6.2 View records

Record types are divided into quality control records, statistical records and basic records. Quality control records store the results of quality control measurements, statistical records store the results of statistical measurements, and basic records store the results of basic mode and continuous mode measurements.
To view the corresponding record, select the corresponding record and press the measurement key to start browsing.
When browsing, press the up and down keys to switch records.
Press the Back key to return to the Data Management menu.

Press the measurement key to return to the measurement interface.

6.3 Deleting records

Select the "Delete" item in data management and press the OK key to enter the "Delete" menu, then select the record type to be deleted, press the OK key after selection , and you will be prompted to confirm. Press the OK key or the measurement key to confirm the operation, and press the Return key to cancel the deletion.

Note: The deletion operation will clear all corresponding records at once, so please operate with caution.

7. Standard sample management

Select “Standard Sample Management” in the main menu and press the OK key to enter the Standard Sample Management menu , as shown in Figure 35.

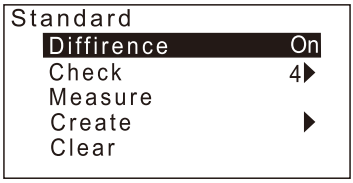


Figure 35 Standard sample management menu

7.1 Enable difference display

In the standard management menu, select "Difference Display" and press the OK key to modify the difference display switch. After the modification is completed, press the Measure key or the OK key to store the change.

7.2 View edit and delete samples

Select “View Standards” in the Standards Management menu and press the OK

key to enter the Standards Viewing interface , as shown in Figure 36.

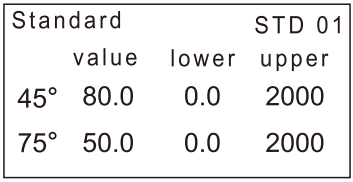


Figure 36 Viewing the Standard Sample Interface

As shown in the figure above, the name of the standard is displayed in the upper right corner. If it is the current standard, a " * " will be displayed in front of the name. " value " column is the target value of the standard sample, " lower " is the lower limit of the qualified sample, and " upper " is the upper limit. In quality control or statistical mode, the value within the upper and lower limits is " OK ", and the value beyond the upper and lower limits is " NG ".
When browsing standards, press the up and down keys to switch standards.

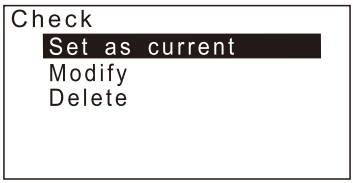


Figure 37 View Standard Sample Menu

Press the OK key to open the View Standard Sample menu . As shown in Figure 37, the View Standard Sample menu includes:

- Set as current standard: Set the standard being viewed as the current standard;
- Modify standard: modify the name and value of the standard being viewed;
- Delete: Delete the standard being viewed.

7.3 Measurement of standard samples

Select “Measure” in the Standard Sample Management menu and press the OK button to perform standard sample measurement.
If in statistics mode the average measurement is used, otherwise the basic measurement is used.
The average measurement steps are similar to the standard sample measurement under the statistical mode sample menu, and the basic measurement is similar to the standard sample measurement under the quality control mode, so they will not be described again.

7.4 Create a standard sample

Select “Create Standard” under the Standard Management menu and press the OK key to create a new standard, as shown in Figure 38. Then modify the name of the standard and set the target value and upper and lower limits of each angle in the “Create Standard” interface.

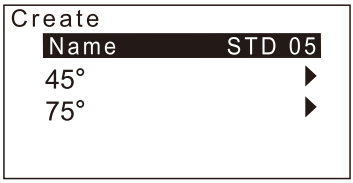


Figure 38 Create Standard Sample Interface

7.5 Clear the standard sample

Clear Standards deletes all stored standards.
Select "Clear" in the Standard Management menu and press the OK key. The system will prompt you to confirm. Press the Measure key or the OK key to execute the clear operation. Press the Return key to cancel the clear operation.

8. Switch the measurement angle

For multi-angle instruments, you can modify the measurement angle used when taking measurements.
Select "Measure Angle" in the main menu and press the OK key , then select the angle to be used for measurement. After selecting, press the OK key .

9. System Settings

Select the "System Settings" menu item in the main menu and press the OK key to enter the system settings menu.

9.1 Language Settings

In the system settings menu, select "Language Settings" and click the OK button to enter the language menu. Select the language you want to use and press the OK button to set it as the system language.

9.2 Bluetooth

This instrument can use Bluetooth to connect to the host computer software. Select " Bluetooth " in the system settings menu and click the OK button to enter the [Open] or [Close] interface. Use the up key ↑ or down key ↓ to make a selection, then press the OK button . The instrument is closed by default.

9.3 Prompt sound

In the system settings menu, select the "Prompt Sound" menu item and press the OK key , then modify the switch options. After the modification is completed, press the OK key or the measurement key to store the changes.

9.4 Automatic shutdown options

In the system settings menu, select the "Auto Power On" menu item and press the OK key , then modify the idle time for automatic shutdown.
The automatic power-on time can be set to 30 seconds, 60 seconds, 90 seconds, 2 minutes, or never.
Automatic power on is only available when powered by battery, and cannot be turned off when powered by USB .

9.5 Reset the instrument

When an abnormality occurs in the system, consider resetting the instrument. Resetting the instrument will clear all user data and settings except the calibration board parameters, so please operate with caution before use.
After selecting "Reset Instrument" in the system menu, press the OK key. The system will then prompt you whether to execute the operation. If you are sure you want to execute, press the OK key or the Measure key . If you want to cancel the operation, press the Return key .

9.6 View device information

Select "Device Information" under the system menu and press the OK button to view the device information.
Equipment information includes instrument model (“ Model ”), serial number (“ SN ”), software version number (“ SV ”) and hardware version number (“ HV ”).

10. Technical Specifications (Specifications may vary for different models)

Product number	Dual Angle High Precision Gloss Meter
Measuring Angles	45°/75°
Measuring spot(mm)	45°: 10x13 75°:4x6
Measuring range	45°: 0~800GU 75°: 0~150GU
Graduation value	0~100GU:0.1GU; 100~800GU:1GU;
characteristic	It can be used for gloss measurement and gloss data transmission in paint, ink, coating, paper printing, plastic electronics, furniture, ceramics, electroplating, hardware, marble and other industries.
Measurement Mode	Basic mode, statistical mode, continuous mode, quality control mode
measure time	0.5 seconds/per angle
Repeatability	0~100GU:±0.2GU ; 100~800GU:±0.2%GU
accuracy	Meet the requirements of JJG 696 working gloss meter
Automatic shutdown time	30~120 seconds optional
Long time calibration	Automatic calibration standard plate check function / manual calibration
language	Simplified Chinese, English, Traditional Chinese
Storing data	35,000 (15,000 in basic mode and continuous mode,
Display	2.3 inch black and white display
size	160X52X84mm
weight	About 300g (including calibration box and batteries)
interface	USB

power supply	1 AA alkaline battery or NiMH rechargeable battery,
PC Software	GQC6 quality management software, quality
Operating	0~40°C (32~104°F)
Storage temperature range	-20~50°C (-4~122°F)
humidity	Less than 85% RH, no condensation
Standard accessories	USB data cable, instruction manual, quality management software (downloaded from the official website or provided by after-sales), calibration board
Optional accessories	Micro printer, Bluetooth adapter
Note	The technical parameters are for reference only, please refer to the actual products sold

11. Simple troubleshooting

Problem Description	Problem Description
The instrument cannot be turned on	The instrument cannot be turned on
Automatically shut down after power on	Automatically shut down after power on
The test data has large deviation	The test data has large deviation
Calibration failed	Calibration failed
Sampling anomaly	Sampling anomaly
Usb cannot connect to PC	Usb cannot connect to PC
Unable to install USB driver	Unable to install USB driver