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ISQ-DG8
20°/60°/85° GLOSS METER
OPERATION MANUAL

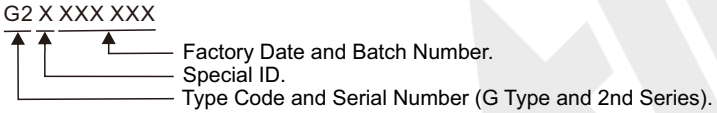
Precautions

- The working temperature of the meter is ranged from 5°C to 45°C with the relative humidity less than 85%. The meter might fail to work properly in condensation.
- Strong electromagnetic interference sources should be avoided during the meter use.
- The plane of the measurement aperture as the reference plane for measuring should be kept intact from adhering to any foreign objects and away from being deformed.
- If there is a large temperature difference between the meter and an environment, please wait for a temperature balance, and then recalibrate the meter for a measurement.
- To prevent battery leaks from corroding the meter, high-quality batteries are highly recommended. Used batteries should be collected and disposed by regulations, avoiding environment contamination.
- The meter should be stored in a dry place and kept away from heat and corrosives. The storage temperature should be ranged from -10°C to 60°C.
- When stored remove a battery from the meter.

Important Notices

- Hardware number and its meaning

  You can enter into the main menu, then to Information, and find Hardware Number. The meaning of this number is as below:



- The definition of "Haze" in this manual is quoted from ASTM D4039.
- A gloss value is presented by "Gs (X)", of which, X in brackets is 20°, 60°or 85°; and the gloss unit is GU.

  Example: Gs (60°)=78GU, means that the gloss measured by an incident beam of measuring light at 60° is 78 gloss units.

  Note: The complete expressions of "gloss" and "reflectivity" should be related to corresponding measurement angles.

Description

The glossmeter is a gloss measuring meter that is designed in accordance with the ISO 2813 and GB/ T 9754, Technical parameters of the meter also conform to stipulations in ASTM D523, ASTM D2457,GB/ T 13891, GB/ T 7706, and GB/ T 8807. The definition of haze is equivalent to that of ASTM D4039. All performance indicators reach requirements of the first-class working glossmeter stipulated in JJG 696-2015 "Specular Gloss Meters and Gloss Plates". The gloss values can be traced to the those of the National Primary Standards in SIMT in the China.

Main Applications:

All kinds of coating and finishing surfaces, such as paints, varnishes, printing ink, etc.

Decorative materials, such as marble, granite, polishing brick, ceramic tile and so on.

The other kinds of materials and objects, such as plastic, woodenware, paper, etc.

Major Functions

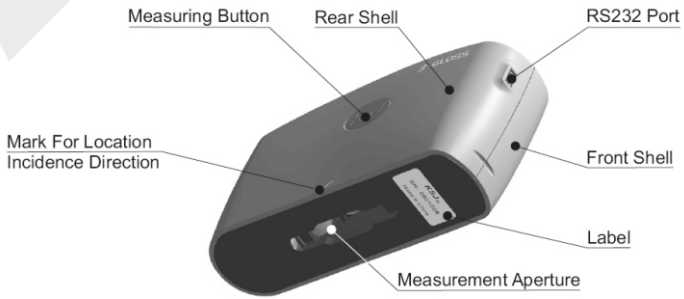
- Multi-language display : Eight languages including Chinese, English, French, German, Spanish, Portuguese, Italian and Russian can be selected as the display language in the meter menu and the software.
- One-key measurement : Measurements can be done at the same time with just one-key operation and saved immediately to the meter.
- Starting-up self-diagnosis and self-calibration: Self-diagnosis can promptly detect problems such as system errors and improper operation, etc, prompt the operator to correct errors; And the starting-up self-calibration can contribute to convenient and quick meter operation.
- Menu options presetting : Standby time, the size of the measuring group, etc, can be preset.

- Instant deletion of invalid measurement : Long press the measuring key (for about 2seconds) to delete the measured value in the current measurement group and then, measure again.
- Mass storage of the meter : 20,000 measured data or 999 groups of data can be stored cumulatively in this meter.
- Low energy consumption : A single AA (LR6) battery, either alkaline or rechargeable battery is used for power supply.
- The unit of measurement is GU by default, which can also be converted to the percentage reflectivity (%).
- Local data browsing : Measuring data of any groups can be browsed by specifying the group number.
- Prompts for operation : The meter is provided with functions such as prompt for self-diagnosis and self-calibration, prompt for low battery, and prompt for storage full.
- Bluetooth connection is provided for easy connection between the meter and a computer or the mobile device, not only extending functions, but also implementing intelligent measurement operation and production automation.
- The gloss data processing software (Win version) is provided for free. With the software users can preset parameters of the meter easily. Meanwhile , measured data stored in the meter can be uploaded to a computer for storage and processing, etc.
- Free mobile software. With the software, the meter can be operated cooperatively with the mobile for online measurement, setting and data loading, etc.

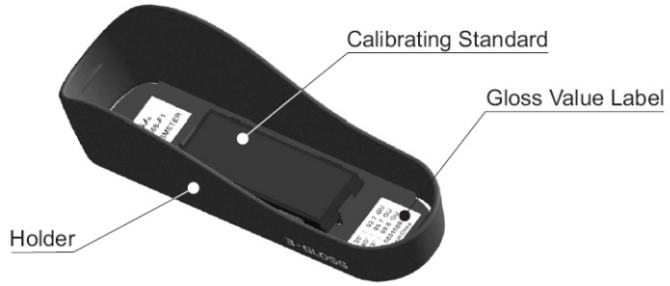
Structure

1 Front:

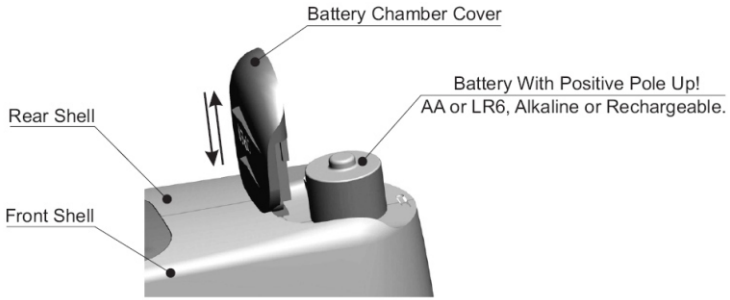
2 Rear:



3 Base with calibration block:



4 Battery changing:



Basic Operations

◆ Start-up

After the meter is buckled into the holder, the meter starts up by pressing the Menu Wheel with the meter model and number displaying on the screen. And then, self-diagnosis and self-calibration should be performed. Normally, "Pass" displayed at all angles. Measurement can be conducted upon accessing to the measurement interface. And "FAIL" will be displayed with the following tips when some problems is detected in self-diagnosis.

At this point, please note:

1.Face towards the light and check whether the surface of the Calibration STD dirty or not. If dirty, clean it up.

Please
Clean STD
Reset Holder

2. Make sure that the meter is placed properly on the Holder.

After the above operations are done, please press the Menu Wheel to calibrate the meter.

Explanation:

1. You can also enter the Calibration menu to calibrate the meter (refer to relevant contents on page 8 and from page 17) if necessary.

2. If the meter is not placed into the Holder, it will enter the measuring interface directly without any self-diagnosis and self-calibration.

◆ Measurement

When the Measurement Aperture is positioned at the measured position after removing the Holder, by pressing the Measuring Button, the meter will automatically complete measurement and data storage within 2 seconds and display measured results. The display format is presented as follows:

	008/ 03/05	
	x	$\bar{x}$
20°	87.4	87.5
60°	91.9	91.8
85°	98.8	98.7

Explanation:

1. 008/03/05 indicates the third of the five measurements set in the eighth group. $\bar{x}$ represents the mean value.

2. The first, the second and the third columns represents the measurement angle, the current value measured x, and the mean value $\bar{x}$ of the group, respectively.

◆ Deleting current measurements

Long press the Measuring Button for about 2 seconds to delete a current measurement.

Explanation: This operation is designed for deleting measurements with incorrect operations, which can delete measuring records in the current group through multiple deletions. However, measuring records in the completed group cannot be deleted.

◆ Shutdown

The meter will be off automatically according to the preset standby time, or after long pressing the Menu Wheel. Please refer to "Standby Time" on page 9 for setting.

Explanation: When the meter is shut down, it enters the sleep state with the support of trickle current provided by the battery, and energy consumption is very small. However, if the meter is not used for a long time, it is recommended to remove the battery from the meter.

◆ Precautions for measuring operation

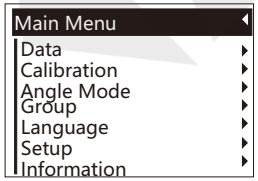
1. Do not remove the battery cover for powering off when the meter executes operation instructions.

2. The meter should be properly buckled into the Holder before starting up the meter, so as to ensure that the meter can perform the self-diagnosis and self-calibration smoothly upon starting up the meter. If the meter is not correctly placed into the Holder, the meter might enter the measurement interface directly without self-diagnostics and

self-calibration.
3. The Holder should be placed upside-down in a safe and clean place to ensure that the Calibrating Standard is away from being broken or stained.
4. Do not stick and adhere foreign objects on the surface of the Measurement Aperture of the meter, so as not to affect the measuring accuracy.
5. When the ambient temperature for measurement is changed significantly, the meter must be re-calibrated for measurement after the meter temperature approaches to the ambient temperature and no condensation is found on the lens surface in the Measurement Aperture and the surface of the Calibrating Standard on the Holder.
6. When the measurement lasts a long time after starting up the meter, it is recommended to re-calibrate the meter before continuing the measurement. Please refer to "Calibration" in Menu Operations on page 8 for more details.
7. If the memory of the meter is filled up with measured data during the measurement, it will prompts "Memory is Full". In that case, it is recommended to clear the meter memory after uploading data to a computer.
8. "Low Power" is displayed in the case of dead battery. Please change the battery.
9. The surface cleanliness of the Calibrating Standard should be well maintained. If foreign matters such as dirt, spray, dust, and water vapor are attached, please wipe it gently with a lens paper or a soft cloth dipped with the absolute ethanol (or other appropriate mild solvent).

Menu Operation

- Menu operation interface
  Press the menu wheel in the measuring interface to enter the interface of menu operation, shown as the figure on the right.



- Menu selection
  Scroll through the Menu Wheel to select menu item. Press the Menu Wheel to confirm the option, or enter the sub-menu or return to the previous menu.

Meanings of marked symbols are shown as follows:
- ▸ Execute or enter the next menu
- ◂ Return to the previous menu
- ⬍ There are still options upwards and downwards
- ✓ Current setting entry

Hint: It will return to the measuring interface upon pressing the measuring button in most of the menu interfaces.

- Data submenu
  1.Browse: Browse the data contained in the measuring group through entering the group number.
  2.Delete All: In this operation, all measured data stored in the meter's memory will be cleared permanently. Please operate it with caution!
- Calibration submenu
  1. Modify Value: Set or modify verified gloss values of the Calibrating Standard on the Holder.
  Note: Normally, the values of the Calibrating Standard stored in the meter is consistent with the values marked on the Holder, which is the basis for calibrating the meter and can not be changed arbitrarily. The operation will only be implemented when the Calibrating Standard is re-evaluated after checking or a new one is used.
  Hint: The operation is disabled when the reflectivity is used as a unit.
  2. Calibration: It's an operation for re-calibrating the meter.
  Note: The meter must be properly placed in the Holder before calibration, otherwise illegal calibration might be caused.
  Hint: When the use environment is changed, or the meter is operated for a long time, or precision measurement is required, the meter must be re-calibrated.
- Angle Mode submenu
  Regarding the selection of measurement angle and its combination, there are six options for the full-function model.
  Hint: The combination modes including 20° and 60° can only be selected for haze measurement.
- Group submenu
  The number of measurements to be accommodated in each measuring group is set here with the effective setting range between 1 and 99 times.

- Language submenu
  Chinese, English, French, German, Spanish, Portuguese, Italian and Russian can be selected as the display language of the meter.
- Setup submenu
  a. Bluetooth: Turn on/off the Bluetooth. After the function is on, the Bluetooth mark is displayed on the measuring interface.
  Hints:
  1. When Bluetooth is on, you can turn on the Bluetooth search of the mobile software or configure a Bluetooth adapter on the computer to achieve connection with the meter for function expansion. See page 10 and page 13for more details.
  2. More energy will be consumed when the Bluetooth is on. Therefore, please turn it off when not in use!
  b. Unit: The meter is operated with GU as the unit of measurement by default. Besides, reflectivity can be also selected for measurement with the unit of percentage %.
  Hint: The letter "R" is generally added in front of the measurement angle of the measurement interface in the reflectance measuring mode.
  c. Standby Time: Time interval for automatic shutdown without operation is set. There are four options.
  Hint: If you select "OFF", the meter won't be off automatically. The meter will be off by long pressing the Menu Wheel. Please process it with caution!
  d. Factory Setup: When the meter settings are disordered, or some failures occur, you can restore factory settings by selecting this option.
  Hints:
  1. Since selecting this option indicates that all measured data are cleared, please back up your data before any operation.
  2. Please re-calibrate the meter after restoring factory settings.
- Information
  The software and hardware version numbers of the meter are recorded in this part for easy management and maintenance of the meter.

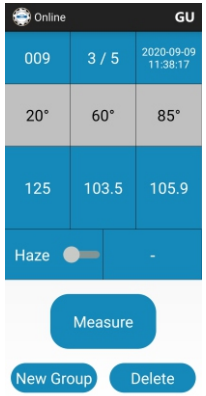
Operation of Mobile Software

This meter can be used with the Gloss Data Operator (data processing software) on the mobile end, making the measurement more convenient, data storage and processing simpler! The software on the mobile end is briefed below. For detailed instructions, please refer to the software help.

- Getting software
  User can discover the software version for different ends on the USB disk provided with the meter.
- Instructions of the software
  1. It should be Android 4.4 or above. After software download, the software can be installed and uninstalled in a routine way.
  2.The storage permissions are required for accessing measurement data when the software is installed on the mobile end.
  3.You can get help from the Help menus during the use of the software. Moreover, you can also get technical support by contacting with our company via contact information mentioned in the manual or on the Internet.
  4.This meter belongs 2 series produced by our company. The software is effective in the following operations:
  A. Online measurement and data upload are implemented between the meter and the software via Bluetooth connection.
  B.The Calibrating Standard values and the standby time, etc. of the meter can be modified on the mobile end.
  C.Look up the online measurement and historical data uploaded on the mobile end and export it as an Excel file .
  Explanation: During online measurement, data are uploaded to the mobile end immediately, and no data is saved on the meter end!
- Bluetooth connection
  1. Turn on the meter and open the mobile software;
  2. Turn on the Bluetooth on the meter end: Main menu-Settings-Bluetooth(see page 9);
  3. Click the Bluetooth symbol of the software, and then click "Search for devices".

4. Select the name of the device searched to implement Bluetooth connection. And then, the Bluetooth status on the meter is connected. The Bluetooth symbol on the software end is changed from to .
Explanation: Only one meter can be connected via the Bluetooth, even though several meters turn on the Bluetooth at the same time.

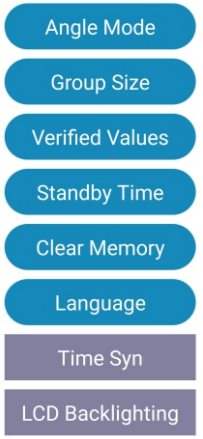
- Online measurement
  After connecting to Bluetooth, click " " on the pull-down menu in the upper right corner and click "Online" . The software interface is shown on the right.



1. Measure: Measured data of the meter are saved in the software immediately; besides, the function can be also implemented through pressing the Measuring Button of the meter end.
2. New group: A new group is created for measurement. At this time, the number of measurements included in each group can be set. When the group is filled up with data, a new group is created automatically.
3. Delete: Delete the measurement data saved newly.

- Setup
  Click " " on the pull-down menu in the upper right corner and click "Setup" for presetting. The interface settings are described as follows:
  1. Language: Set the software display language. There are eight languages to choose from.
  2. Acceptable Range: Any data beyond the limit are highlighted in red upon setting.
  3. Clear All: Clear data stored in the software. Please use it with caution!
  4. Factory Settings: Restore initial settings of the software.

- Meter Settings
  After connecting to Bluetooth, click " " on the pull-down menu in the upper right corner and click "Meter Settings" for setting the meter end. The software interface is shown on the right.



Explanation: All options in rectangular boxes are disabled for the current model.
1. Angle mode: There are six options to be chosen for this model.
2. Group Size: The value is ranged from 1 to 99.
3. Verified Values: Refer to "Modify Value" on page 8.
4. Standby Time: Refer to "Standby Time" on page 9.
Clear Memory: Refer to "Delete All" on page 8.
Language: There are eight language options for setting the menu display language in the meter end.

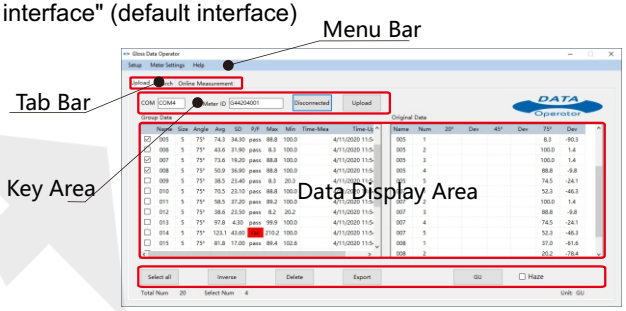
- Export data
  After connecting to Bluetooth, click " " on the pull-down menu in the upper right corner and click "Export" to export data in the current data area to the GlossDATA folder in the mobile memory area in the format of Excel file.

Use of Computer Software

- Introduction to Gloss Data Operator
  Gloss Data Operator (computer end, only Windows version is currently available) is a type of software that can assist and expand functions of the glossmeter. Communication between the meter and the computer can be implemented with the software. In that case, it can set measurement parameters of the device, clear stored data, upload measured data, and query, delete, save, and export measured data on the computer end. Moreover, convenience and creativity can be witnessed in a variety of application scenarios thanks to online measurement.
  Hint: This software can run on Windows 7 or above versions. Please refer to the software help for detailed usage.

- Acquisition, installation, and uninstallation of Gloss Data Operator
  You can obtain the software on a USB disk provided with the meter. The installing and uninstalling process of the software is similar to that of the general software, just following the hint. During installation, the installation path can be changed.
  Hint: Please back up the database file GDO.mdb in the installation directory on a regular basis to prevent data loss.
- Driver installation
  After the software is installed, the device driver must be installed as below:
  The driver can be installed by locating the "Driver v1.18.0" folder in the USB flash disk provided with the meter to execute the file of PL2303_DriverInstaller.exe.
  Hint: Installation can be also conducted by enabling the system to automatically search for a matching driver.
- Use of USB cable
  After the driver is installed, the meter can be connected to the computer with a USB cable to achieve communication.
- Use of Bluetooth adapter
  You can also purchase an optional Bluetooth adapter if you prefer to use Bluetooth on a computer without Bluetooth function. Firstly, turn on the Bluetooth on the meter end (see page 9), and then plug the adapter into the USB port of the computer for automatic search, pairing and connection.
  Hints:
  1. An optional Bluetooth adapter must be purchased during meter ordering;
  2. Bluetooth 4.0 is adopted on the meter end, which is set as passive;
  3. Certainly, a computer with the Bluetooth function can be also used for searching and pairing the meter Bluetooth.

- Software interface
  "Upload interface" (default interface)



  Explanation: "Upload", "Search" and "Online Measurement" are three tabs on the software interface, which are used for switching among the three interfaces. As they are similar, the other interfaces is ignored.
- Setup menu group
  1. Language: Eight languages can be selected as the software display language.
  2. Reference: Here allow you to create, edit, delete or apply a set of reference values, The set of reference values is used for comparing with the measured values, judging whether it is beyond the range of control, and displaying the deviation of measured values from the reference values in the Data Display Area.
  Hint: When a set of reference values is set as currently-effective through selecting and applying the group name, it is highlighted in blue in the reference value dialog box.
- Meter Settings menu group
  1. Angle Mode: There are six options for this model.
  2. Group Size: The optional scope is between 1 and 99.
  3. Verified Values: Set or modify verified gloss values of the Calibrating Standard on the Holder.
  Note: Normally, the values of the Calibrating Standard stored in the meter is consistent with the values marked on the Holder, which is the basis for calibrating the meter and can't be changed arbitrarily. The operation will only be implemented when the Calibrating Standard is re-evaluated after checking or a new one is used.

4. Standby Time: Set a time interval for automatic shutdown without operation.

Note: When "off" is selected, the meter can only be shut down by long pressing the "Menu Wheel". Otherwise, the meter is not shut down until the battery runs out. Please choose it with caution!

5. Clear Memory: Clear all measured data stored in the meter. Users are advised to operate this after uploading backups, so as to ensure data security.

Explanation: The dim commands are not available on the software since this meter is not equipped with the function.

- Help menu group

1. User Guide: Guide for this software.
2. About Gloss Data Operator: Information about the software and the developer.
3. Meter Information: Information about a connecting meter.

- Connection and Upload tab

Operate the Gloss Data Operator after starting up the meter. Press the "Connect" key upon connecting the meter and the computer with the USB cable that comes with the meter. In this way, communication connection is established between the meter and the software to identify the meter number. At last, press the "upload" key to upload data from a meter.

- Search tab

This software can receive and manage data uploaded from multiple meters. After clicking the "Search" key in the "Search" tab, a search dialog box pops up for data searching. At this time, you can select the series (the second digit of the meter number) and the meter number, and set search conditions to search data meeting the setting conditions.

1. Select all: All data groups listed in the data display area are selected.

Hint: Check or uncheck the box of the group name in the Group Data area to select or deselect the group of data. Measured data contained in the selected group are displayed in the Original Data area on the right.

2. Inverse: The selected is deselected, while the unselected is selected.
3. Delete: One or more sets of data selected in the data display area are deleted. It will be deleted permanently. Please use it with caution!

4. Export: The selected group data are exported and saved in the format of Excel file. If none is selected, all data is exported.

- Online Measurement tab

After communication between the meter and the software is established, the meter end will be automatically switched to the online measuring interface by click the "Online" tab, and then click the "Start" button. At this moment, online measurement can be conducted by pressing the measurement key on both of the meter end and the software end.

1. New Group: Create a new group.
2. End: Terminate online measurement.

Hint: Online measured data are uploaded to the software simultaneously and won't be saved on the meter!

- Group Data area

This area displays group data, including name, size, measurement angle, average, standard deviation, P/F, maximum, minimum, and upload date. Of which, "P/F" is used for determining whether the average of this group is within maximum and minimum values set by the active set of reference values, displaying with "pass" or "fail".

Note: No time stamp is provided in this meter. "Time Measurement" is disabled!

- Original Data area

After checking the box before the group name, measured data of this group can be displayed in this area, which consists of group name, serial number, measured value and deviation of each measurement angle. Specifically, "deviation" refers to the difference between the measured value and the preset reference value.

FAQs

- Solutions to self-diagnosis and self-calibration errors

  If the meter fails to complete the self-calibration when it is turned on, the display window will prompt as shown on the right, users shall perform troubleshooting and processing in the following order:

  1. Wipe clean the Calibrating Standard.

  Observe the surface of the STD against the light to check whether it clean or not. If fingerprints, dust, water vapor and other stains are found, it shall be gently wiped with lens paper or soft cloth dipped in solution of absolute ethanol and ether half by half. If it is severely scratched or cracked, its gloss value bearing function will be taken out. In such a situation, please contact the manufacturer for reconfiguration.

  Hint: If the meter is idle for a long time, a layer of mist will be generally formed on the surface of the Calibrating Standard, resulting in errors in self-diagnosis.

  2. Place the meter into the Holder correctly: Place the meter into the Holder again, and make sure that the bottom plane of the meter just against the surface of the Calibrating Standard.

  Hint: If the above two cases are excluded, it may be caused by errors in the last calibration. For instance, calibration is still conducted even though the surface is dirty. In this case, please make another calibration. Refer to the "Calibration" on page 8.

- The meter failing to start up or it's interrupted suddenly while starting up

  In order to protect the chip, voltage detection is set during the meter starting up. If the battery is under voltage, the meter won't start up. In this case, please start up the meter after changing a new battery.

- Condensation processing

  Large temperature differences often result in meter condensation. The meter cannot be operated normally once the lens, the calibrating Standard and other surfaces in the meter are condensate, generating measurement errors. If this occurs, wait for the condensation disappearing after the meter temperature tends to be balanced with the ambient temperature. After that, measurement can be conducted again.

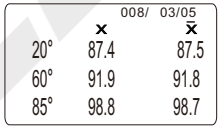
Note: Please use the meter at the specified temperature and humidity range.

- Battery leakage processing

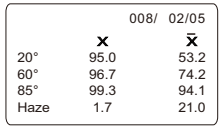
  Batteries over-discharged or in poor quality can result in leakage that corrodes electrodes and internal components of the meter, causing that the meter is unable to work or even permanently damaged. Once this occurs, please replace a new battery after wiping the dirt on the electrode with a cotton swab dipped in absolute ethanol. If the meter still fails to work properly after that, please contact the manufacturer for repair.

- About measurement interface

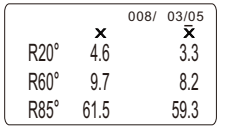
  The following three different measurement interfaces might be switched as per different settings. It's a normal situation. Please refer to page 8.



Gloss Interface



Haze Interface



Reflectance Interface

- Troubleshooting with computer communication

  In general, data transmission and all communication operations can be implemented smoothly with a data cable. Failures might be caused by the following situation. Please check one by one:

  1. The data cable is not properly connected to the computer or the connection with the computer is poor;
  2. It fails to click the "Connect" key on the upload interface to establish a communication connection;
  3. The meter is off or no data is stored in the meter;
  4. The driver is not (correctly) installed.

  Special prompt: Please refer to the installation of the drive program in page 12 and 13.

Main Technical Parameters

Specifications	Unit		
Measuring Range	GU	Gs(20°):0.0~119.9 Gs(60°):0.0~119.9 Gs(85°):0.0~119.9	Gs(20°):120~2000 Gs(60°):120~1000 Gs(85°):120~160
Resolution	GU	0.1	1
Repeatability	GU	≤0. 2	≤0. 2%
Reproducibility	GU	≤0. 5	≤0. 5%
Deviation	GU	≤±1. 5	≤±1. 5%
Zero-point Deviation	GU	≤0. 2	
Operating Environment		Temperature: 5 °C to 45 °C; humidity: less than 85% RH, no moisture condensation.	
Storage Temperature		-10°C~60°C	
Measuring Spot	mm	Gs(20°): 9x10 Gs(60°): 9x16 Gs(85°): 5x39	
Measurement Aperture	mm^2	MG 268 and MG 68:12x60 MG 6 and MG 26:12x28	
Power Supply		One AA-sized battery, 1.2V ~ 1.5V, Rechargeable or alkaline.	
Power Consumption		More than 15,000 measurements can be conducted with an alkaline dry battery.	
Volume	mm^3	155×48×75 (without a holder)	
Weight	g	400 (with a battery and a holder)	

Note: GU is short for Gloss Unit.