PCE INSTRUMENTS PCE-GM 60 Plus Gloss Meter Instruction Manual

Contents

PCE INSTRUMENTS PCE-GM 60 Plus Gloss Meter

Specifications

- **Product Name:** Gloss Meter
- **Models:** PCE-GM 60 Plus, PCE-IGM 60, PCE-IGM 100, PCE-PGM 60, PCE-PGM 100
- **Standards:** ISO 2813, GB/T 9754, ASTM D 523, ASTM D 2457
- **Display:** 3.5-inch full-view display with a resolution of 480×320
- **Power Source:** Built-in rechargeable battery

Product Usage Instructions

Safety Instructions

The instrument is a safe device. Before operating, please read the safety instructions and strictly comply with the following terms to avoid unexpected damages. We shall not be liable for any losses by incorrect operation.

Battery	The device configures a built-in battery. Please use the original one. Do not use other batteries to prevent unnecessary damage. Do not disassemble, extrude, or heat the battery. When fully charged, please cut off the external power supply in time. Please charge the battery biweekly if long time not use. Otherwise, it m ay cause damage to the battery. For the first three times, please run out the power and charge fully to en sure the battery reaches the optimal state.
External Power Source	Please use the original power adapter when charging. Otherwise, it will shorten the battery life or cause an explosion. Please cut off the external power source if you don’t use it for a long time.
Gloss Meter	Do not use the device in an inflammable and explosive environment. Do not disassemble the device which will cause damage and explosion. Please stop using the machine when you smell something burning and send it back to the repair center.

Introduction
The gloss meter is by IS0 2813(International Standard) and GB/T 9754(China National Standard). It has the characteristics of easy-to-use, stable performance, and precise measurement.

Advantages

- Large Screen (3.5 inches), high resolution (480*320), full-view display. b.Comply with ISO 2813 GB/T 9754 ASTM D 523 ASTM D 2457 standards.
- Aesthetic design perfectly combined with ergonomics structure.
- Three measurement angles (20°, 60°, 85°) can measure simultaneously(except the single-angle gloss meter).
- QC software with powerful extending functions (except certain models).
- Flexible choice of auto-calibrating when powered on, easy to operate.
- Display multiple sets of data, easy to compare.
- High hardware configuration with multiple innovative technologies.
- Built-in rechargeable battery, economical and environmental protection.
- Auto power-off function to save electricity consumption.

Cautions

1. The gloss meter is a precise measuring instrument. Please avoid the dramatic changes in the external environment when measuring. Those changes including the flicker of surrounding light, and the rapid change of

temperature and humidity will affect the measuring accuracy.

2. Keep the instrument balanced. Make sure the measuring aperture clings to the test sample, and no shaking or shifting when measuring. Please prevent the gloss meter from fierce collision or crash. This device is not water-proof. Do not use it in an environment of high humidity or mist.
3. Keep the device clean. Avoid dust, powder, or solid particles entering the measuring aperture and the devices.
4. After using it, please turn it off. Keep the instrument and calibration board inthe instrument case.
5. Keep the instrument in a cool, dry environment.
6. Users can not make any changes on the device without permission. Since itmay affect measuring accuracy or even damage the device.

Cautions

1. Avoid dramatic changes in the external environment during measurement.
2. Ensure the gloss meter is balanced and stable during measurement; prevent collisions or exposure to high humidity.
3. Keep the device clean and free from dust or particles.
4. Turn off the device after use and store it in a cool, dry place.

External Structure Description

The gloss meter features a large 3.5-inch display and complies with various standards for accurate measurements.

External Constructions

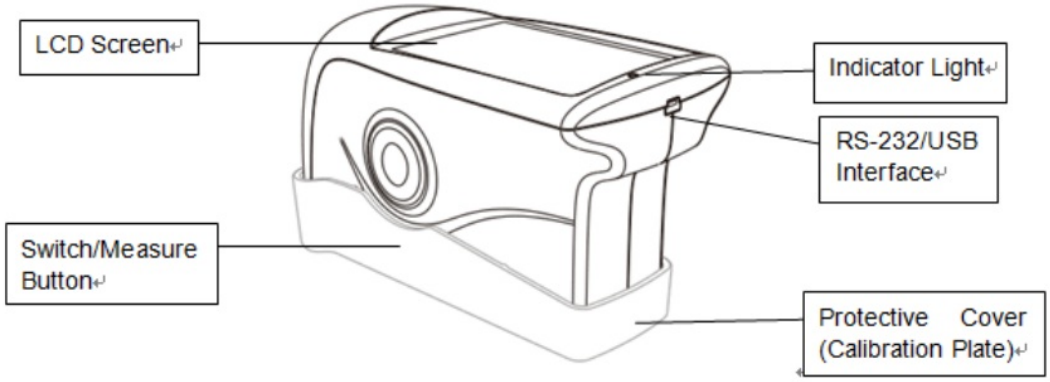

Figure 1 External Constructions

Button Function Instruction

- **LCD Screen:** Display measuring data and instrument operation navigation.
- **Switch/Measure button:** Long-press the button for 3 seconds to turn on or turn off the gloss meter. Short pressing the button to measure.
- **Indicator Light**: When turning on, it will show a green light. After startup, the light is off. Low power and charging status will show a red light. Fully charged will show a green light.
- **RS-232/USB interface:** This interface is common. The instrument automatically judges the connection status. USB interface is used to connect and transfer data to the PC. RS-232 interface is used to connect to the printer. USB cable can connect the power adapter and computer for charging the gloss meter (specification for the external adapter is: 5V=2A).

- **Protective Cover (Calibration plate):** It is to protect the measuring aperture. A built-in calibration plate is used for instrument calibrating.

Attention: The method to separate the protective cover from the instrument is shown in Figure 2. Hold the instrument with one hand, the other hand hold the protective cover, and then separate it according to the “Open” mark. You only need to separate it from one side. Do not separate it from two sides.

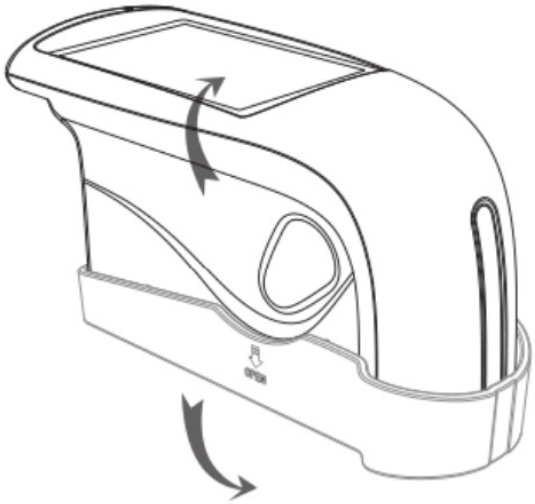

Figure 2 Separation Method

Operating Instructions

Turning On/Off
To turn on/off the device, follow the manufacturer’s instructions provided in the manual. Long-press the switch button for 3 seconds to turn on the instrument. The LCD screen will display the boot logo. After a few seconds, it will enter into the measurement interface automatically, as shown in Figure 3. Long-press the switch button for 3 seconds again, it will be turned off. The instrument will enter the standby mode if without operation within five minutes. And it will turn off atomically if without operation within one minute in standby mode.

Figure 3 Single Angle Measurement

Calibration
The instrument comes with an auto-calibrating function. Follow the guidelines for manual calibration if needed for specific applications.

Auto-Calibrating Description
The instrument has an auto-calibrating function. But for flexible use, it has an optional designation to judge

whether it will auto-calibrate at startup. If the last power-off is done manually, it will calibrate automatically when turned on next time. If the last power-off is automatic after 5 minutes of backlight off, then it will not calibrate automatically when turned on next time. When the operating environment changes (such as the rapid change in temperature, altitude, and humidity), it must do calibration. To ensure accuracy, please use the original standard plate for calibration. The dust on the standard plate will affect calibration accuracy. Please clean the standard plate and ensure it's clean when calibrating. The Standard plate is a precise optical component. Please avoid it from strong sunlight. Due to environmental factors, the gloss value of the standard plate will change over time. Therefore, it's better to send it back to the factory or qualified local National Institute of Metrology for calibration. (Once a year)

Attention:

- Each instrument has only a calibration plate. If using another calibration plate to pass the calibration, the measurement is also not accurate. Therefore, before calibrating, please check whether the serial number of the instrument is the same as that on the calibration plate.
- Before calibrating, please make sure the instrument and calibration plate are tightened. Otherwise, the calibration may fail and the measurement results may not be accurate.

Change Calibration Values
Users can change instrument calibration values through QC software.

Attention: Modify calibration value is better operated by the manufacturer or qualified metrological institutes. The calibration value needs to be modified only when it is different from the actual calibration plate value. Before modifying the standard value, please back up the original standard value.

Measurement
Place the measuring aperture on the test sample and ensure stability during measurement to obtain accurate results. The measuring mode is basic (Figure 4). Basic mode is a basic sample test mode that will display the glossiness value directly. It belongs to a single measurement. The results will be saved automatically each time (except for certain models). It can display multiple sets of test data simultaneously.

Figure 4 Multi-angle Measurement

- "T005" at the upper left means the record number of the last measurement.
- "16:12" and "2015.10.23" are time and date.
- "T001-T005" is the record number of five measurements. (Some models only display three records.)
- "T102316" is the default name of the measuring record. It is made up of "T"+" month"+" day", "T" means a basic

record, and “102316” means the measuring record 4:00pm0 pm on 23rd October.

The last record will be shown in yellow.

Data Save
Utilize the data save feature as needed for recording measurements. It defaults to save data automatically. Users can set a not-save function through QC software. The instrument can save 1000 data. When it’s full, it will prompt. If continue to measure, the new record will cover the last one. Users can delete data or manage other operations through QC software. (Remarks: some models don’t have this function.)

Connecting to PC
For connecting the gloss meter to a PC, refer to the user manual for detailed instructions. Turn on the instrument, and connect the USB to the PC. Then the instrument is charged and it will connect to the software automatically. Users can control the measurements through QC software.

Remarks: Some models don’t have this function.

Print
If printing is required, follow the provided instructions for printing data from the gloss meter.

Print
If the gloss meter connects miniature printer, it will print the testing data when measuring.

Function Description of QC Software
When connecting to QC software, users can manage the following operations:

- Check Status (Instrument basic information, such as model, and serial number)
- Calibrate
- Change Calibration Value (It’s better to handle by manufacturer of qualified metrological institutes.)
- Data Management (Check record, delete record, export record, print report)
- Set Time and Data
- Set Language
- Select Angles (only for tri-angle gloss meter)
- Set Auto Save or Not-save Function.

Routine Maintenance

Regularly clean the device to prevent dust or particles from entering the measuring aperture. Store the instrument properly after each use.

1. The gloss meter is a precise instrument. Please operate and store it in a standard laboratory environment (Temperature: 20℃ Standardatmospheric pressure, Humidity: 50~70%RH). Please avoid using it in humid environments, strong electromagnetic interface environments, highlight intensity environments, and dusty environments.
2. A standard plate is a precise optical component. Avoid being damaged by sharp objects, avoid dirtying the board, and avoid exposing it to the sun. Regularly clean the standard plate by using a soft cloth with alcohol in one direction. Ensure there are no tiny particles or sundries on the soft cloth. Before calibrating, clean the standard plate to make accurate calibration.

Attention: Forbid to use acetone solvent!

3. To ensure the accuracy of the instrument, it is better to send it back to the factory or qualified Local National Institute of Metrology for calibration. (Once a year)
4. It needs to modify the calibration value when the calibration value is different from the practical measurement value. View Chapter 2.2 for details.
5. The gloss meter is powered by a built-in battery. When a long time of not using this instrument, please charge it biweekly to protect the battery and extend the battery life.
6. The internal clean work of the instrument should be finished by manufacturer (suggest once a year). Do not use cleaning tools to clean the internal instrument. Otherwise, it will cause irreversible damage.

Technical Specifications

Refer to the user manual for detailed technical specifications of the gloss meter.

Measurement Angle	20°/60°/85°/20°60°85°						
Standard	ISO 2813, GB/T 9754, ASTM D 523, ASTM D 2457						
Measuring Area(mm)	20°: 10×10, 60°: 9×15, 85°: 5×36						
Measuring Range	Multi-angle Models			Single Models		Some Single Models	
	20°: 0-1000GU 60°: 0~1000GU 85°: 0~160GU			60°: 0~300GU		60°: 0~200GU	
Division Value	Some Models: 0.1 GU Some Models: 1 GU						
Range	Multi-angle Models			Single Models			Some Single Models
	0-10GU	10-100GU	100-1000GU	0-10GU	10-100GU	100-300GU	0-200GU
Repeatability	±0.1GU	±0.2GU	±0.2GU%	±0.1GU	±0.2GU	±0.2GU%	±1GU
Reproducibility	±0.2GU	±0.5GU	±0.5%GU	±0.2GU	±0.5GU	±0.5%GU	±1GU
Deviation	±1.5, ±1.5%						
Accuracy	Conform with JJG696 first-class gloss meter working requirements.						
Chromaticity Corresponding	Corresponding with CIE 1931(2°) under CIE C light source.						
Measuring Time	0.5s						
Dimension	L*W*H : 160mm*75mm*90mm						
Weight	350g						

Battery	3200mAh Li-ion Battery, >5000 times (within 8 hours)
Display	TFT 3.5inch, resolution: 320*480
Interface	USB/RS-232
Storage	1000
Software	GQC6 Quality Control Software with QC report printing function and more extended functions (except certain models).
Operation Temperature	0~40°C (32~104°F)
Storage Temperature	-20~50°C (-4~122°F)
Humidity	<85% relative humidity, no condensation
Standard Accessories:	Power Adapter, USB cable, User Manual, GQC6 software (except certain models), Wiping Cloth, Calibration Plate
Optional Accessories:	Miniature Printer
Note	The specifications are subject to change without notice.

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FAQ

Q: Can I use the gloss meter in high-humidity environments?
A: It is not recommended to use the gloss meter in high-humidity environments as it is not waterproof and may affect measurement accuracy.

Q: How do I know when to calibrate the gloss meter?
A: The gloss meter has an auto-calibrating function and will indicate when calibration is needed based on usage patterns. Refer to the manual for calibration instructions.

Documents / Resources

	PCE INSTRUMENTS PCE-GM 60 Plus Gloss Meter [pdf] Instruction Manual PCE-GM 60 Plus, PCE-IGM 60, PCE-IGM 100, PCE-PGM 60, PCE-PGM 100, PCE-GM 60 Plus Gloss Meter, PCE-GM 60, Plus Gloss Meter, Gloss Meter, Meter

References

- Make an offer on the domain instruments.co.uk - Domains.co.uk
- User Manual