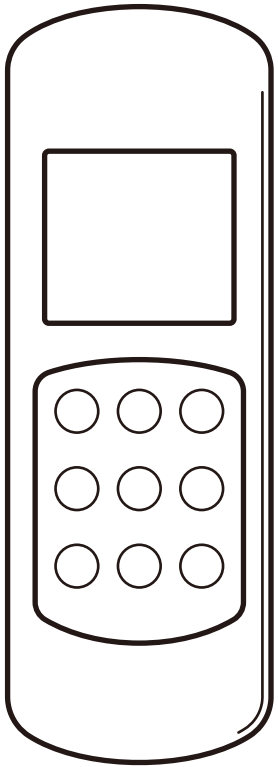
HORIBA

Instruction Manual

Gloss Checker

IG-340



December, 2019

Contents

1 Preface

This manual describes the operation of the gloss checker, IG-340.
Be sure to read this manual before using the product to ensure proper and safe operation of the product. Also safely store the manual so it is readily available whenever necessary.
Product specifications and appearance, as well as the contents of this manual are subject to change without notice.

Warranty and responsibility

HORIBA, Ltd. warrants that the Product shall be free from defects in material and workmanship and agrees to repair or replace free of charge, at option of HORIBA, Ltd., any malfunctioned or damaged Product attributable to responsibility of HORIBA, Ltd. for a period of one (1) year from the delivery unless otherwise agreed with a written agreement.
In any one of the following cases, none of the warranties set forth herein shall be extended;

- Any malfunction or damage attributable to improper handling or wrong use
- Any malfunction attributable to repair or modification by any person not authorized by HORIBA, Ltd.
- Any malfunction or damage attributable to the use in an environment not specified in this manual
- Any malfunction or damage attributable to violation of the instructions in this manual or operations in the manner not specified in this manual
- Any malfunction or damage attributable to any cause or causes beyond the reasonable control of HORIBA, Ltd. such as natural disasters

- Any malfunction or damage attributable to falling of the product or impact on the product
- Any malfunction or deterioration in appearance attributable to corrosion, rust, battery leakage, and so on

HORIBA, LTD. SHALL NOT BE LIABLE FOR ANY INCIDENTAL DAMAGES RESULTING FROM USE OF THE PRODUCT OR INABIITY TO USE THE PRODUCT (SCRATCH OR SOIL OF MEASURED OBJECTS CAUSED BY THIS PRODUCT, CHANGE OR LOSS OF DATA, LOSS OF BUISINESS INTEREST, OPPORTUNITY LOSS, AND SO ON).

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- Windows is a registered trademark or trademark of Microsoft Corporation in the United States and other countries.
- QR Code is a registered trademark of DENSO WAVE INCORPORATED in Japan and in other countries.

Other company names and brand names are either registered trademarks or trademarks of the respective companies. (R) and (TM) symbols may be omitted in this manual.

Use conditions of the open source software

If the Software includes open source software (referred to as OSS in the rest of this document) owned by a third party other than HORIBA Ltd., customers shall comply with the terms and conditions required by the OSS. HORIBA Ltd. grants the license for the use of the Software to customers so long as customers comply with such terms and conditions. In the event of inconsistency between the terms and conditions of the OSS and this manual, the terms and conditions of the OSS shall prevail. For customers' information, the OSS included in the Software is described in this manual.

Open source software license information

This product adopts OSS. The Conditions appropriate for each of the OSS licenses are applied to each of these software.
Before using the software, refer to
http://www.horiba.com/ig-340/legal/
where the information about the OSS adopted in this product is available.
No maintenance services are available for the OSS.

For your safety

Hazard classification and warning symbols

Warning messages are described in the following manner. Read the messages and follow the instructions carefully.

● Hazard classification

This indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

● Warning symbols

Description of what should be done, or what should be followed

Description of what should never be done, or what is prohibited

Safety precautions

This section provides precautions for using the product safely and correctly and to prevent injury and damage. The terms of CAUTION indicate the degree of imminency and hazardous situation. Read the precautions carefully as it contains important safety messages.

CAUTION
Do not drop the protective cover or have a strong impact on it. The standard plate of the protective cover is made of glass. A hand may be cut by broken glass.
Do not cause a short circuit between terminals of the battery case. If a short circuit occurs due to a contact of metal, smoking, firing or rupture may result. In the case of short circuit, stop using the product immediately, and contact HORIBA, Ltd. or your dealer.
Do not disassemble the product. This may cause a malfunction or deterioration in performance.
Do not touch the IG-340 main unit or the batteries with wet hands. This may cause a malfunction or deterioration in performance.

Operational precautions

Use of the product in a manner not specified by the manufacturer may impair the protection function or product performance provided by the product. Exercise the following precautions.

- Do not use or store the product at a location exposed to direct sunlight, dusty location and high-temperature/high-humidity location.
- Do not drop the IG-340 main unit or have a strong impact on it. This may cause a malfunction or deterioration in performance.
- The IG-340 main unit realizes a dust-proof/drip-proof structure (IP42) with the USB terminal cover attached. Note that the drip-proof function for the inside the protective cover is not provided. Do not subject the product to excessive moisture or dust.
- Keep the product away from fire.
- Turn OFF the power after use. Remove the batteries if the product is not used for prolonged periods.
- The lens is particularly a delicate item. Be careful not to rub it with force or scratch it when using.
  If there is a scratch on the lens, stop using the product immediately, and contact HORIBA, Ltd. or your dealer.
- Do not touch the lens and the standard plate attached on the protective cover with bare hands or a dirty item.
- If the standard plate or lens is dirty, correct measurements cannot be performed. If there is dirt or dust attached on it, be sure to wipe it off with a soft dry cloth to always keep it clean.
  If there is a scratch on the standard plate, stop using the product immediately, and contact HORIBA, Ltd. or your dealer.

- Do not press the buttons with great force. Also, do not press them with any sharp objects such as a pen and a screwdriver. The product may be damaged or a malfunction may occur.
- The provided accessories are only for use with this product.

Disposal of the product

When disposing of the product, follow the related laws and/or regulations of your country.

Designed life

This product is designed with an intended life-span of five years.

Description in this manual

Note

This interprets the necessary points for correct operation and notifies the important points for handling the product.

Tip

This indicates reference information.

2 Overview

Features of the product

The attribute that the light hitting a surface of an object is regularly reflected is called the gloss, and the amount that shows the degree is called the glossiness. This product is a checker that clearly quantifies ambiguous distinctions of the gloss.
Measured glossinesses can be stored in the IG-340 main unit or used for calculations of average data. Also, the data (measured data and average data) stored in the IG-340 main unit can be output to a personal computer (referred to as PC in the rest of this document) equipped with Windows via USB (refer to page 34).

Checking supplied items

The following items are included with this product.

- IG-340 main unit 1 pc
- Protective cover (with standard plate) 1 pc
- Instructions for Use (in Japanese only) 1 pc
- Regulations, Safety, and Packing List (in English) 1 pc
- Lens cloth 1 pc
- Soft case 1 pc

Note

Batteries (refer to page 43) and a micro USB cable (refer to page 34) are not included. They are to be prepared by the customer.

Names of parts

● Appearance

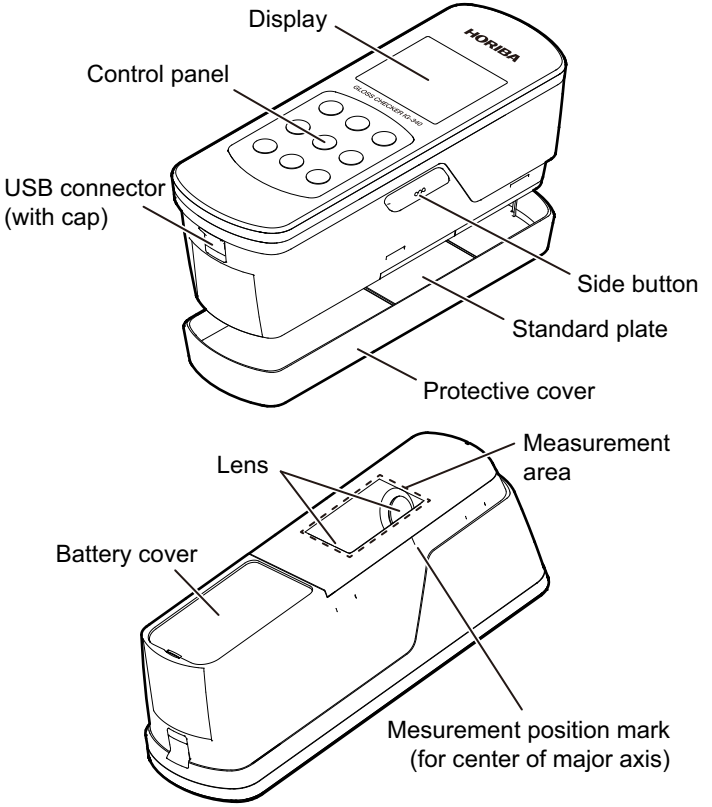


Fig. 1 IG-340 main unit

● Display

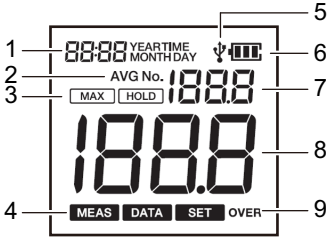


Fig. 2 Display (all lighting)

No.	Name	Function	Reference
1	Time	The current time or time when data is stored is indicated.	
2	[AVG]	• Measurement display: [AVG] lights when average data is being calculated. • Memory display: [AVG] lights when average data is being displayed.	page 27 page 32
3	Measurement mode and measurement status	The display conditions of measurement values are indicated. [MAX] lighting: MAX mode [HOLD] lighting: Measurement value hold status Both illuminations are off: Normal mode or measurement value updating status	page 19 page 25

No.	Name	Function	Reference
4	Operating status	The current operating status is indicated. [MEAS] lighting: Measurement display [DATA] lighting: Memory display [SET] lighting: Setting display	
5	USB	The USB connection status is indicated only on the memory display. OFF: USB not connected Lighting: USB connected Blinking: Data being output	page 34
6	Battery level	The battery remaining amount is indicated. Fewer the scale indications, less the battery remaining amount.  (Light) (Blink) When the battery level is displayed only with a frame, replace the batteries as soon as possible. When the frame blinks, button operations are ignored and the power turns OFF in approximately 30 seconds.	page 43

No.	Name	Function	Reference
7	Data No.	• Memory display: Data No. is indicated. • When an error has occurred: Error No. is indicated. • In MAX mode of measurement display: Current measurement value is indicated.	page 31 page 19
8	Glossiness	• Measurement value, measured data, average data and in MAX mode: Maximum value among measurement values (hereafter referred to as MAX value) is indicated. • When an error has occurred: [Err] is indicated.	
9	[OVER]	The status that the measurement value is outside the guaranteed range is indicated. Lighting: From 100.1 to 199.9 Blinking: 200.0 or more	

Control panel

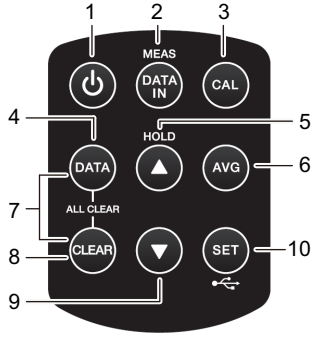


Fig. 3 Control panel

No.	Button name	Function	Ref.
1	Power	Pressing this button turns the power ON/OFF.	
2	[DATA IN/ MEAS]	Pressing this button performs either of the following. • Storing a measurement value displayed on the measurement display • Switching from the memory display or setting display to the measurement display	page 26 page 18
3	[CAL]	Pressing this button calibrates this product.	page 28
4	[DATA]	Pressing this button switches to the memory display.	page 18

No.	Button name	Function	Ref.
5	[△/HOLD]	Pressing this button performs either of the following. • Holding or canceling a measurement value • Switching displayed data or changing setting values	page 25 page 37
6	[AVG]	Pressing this button calculates average data from stored data.	page 27 page 32
7	[ALL CLEAR]	Pressing this button deletes all stored data (measurement data and average data).	page 33
8	[CLEAR]	Pressing this button deletes MAX value data or the latest stored data.	page 24 page 33
9	[▽]	Pressing this button switches displayed data or changes setting values.	page 37
10	[SET/⇢]	Pressing this button switches to the setting display. Outputs all stored data.	page 18 page 34

● Side button

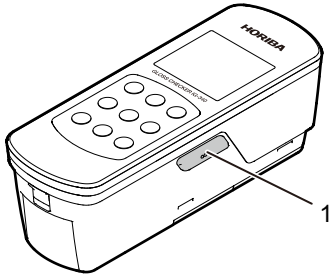


Fig. 4 Side button

No.	Button name	Function	Ref.
1	Side button	Pressing this button stores a measurement value displayed on the measurement display.	page 26

Types of displays

This product has three types of displays as shown below.

- Measurement display: Measuring gloss values and storing data can be performed (refer to page 22).
- Memory display: Stored data is displayed (refer to page 30).
- Setting display: Settings can be performed (refer to page 37).

Fig. 5 shows the displays and buttons used for switching between displays.

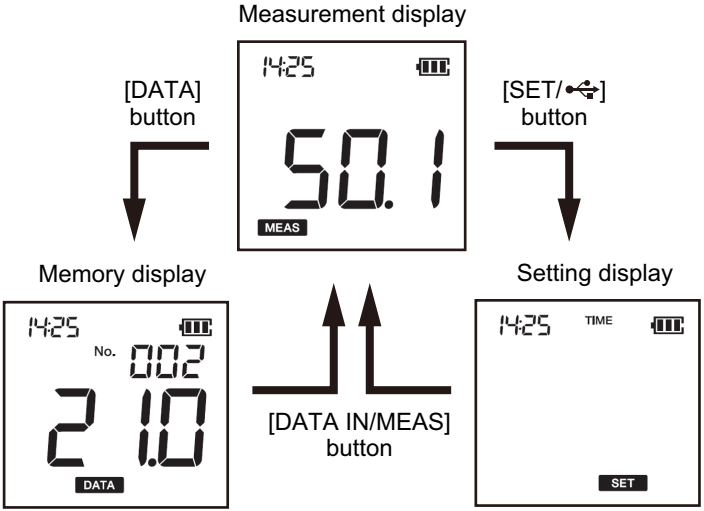


Fig. 5 Display flow diagram

Types of measurement modes

Two types of measurement modes are provided for the measurement display.

- Normal mode
  Only the glossiness being measured is displayed. Use this mode to check the glossiness at the measurement position.
  - Measurement values are displayed at the glossiness display position as needed.
- MAX mode
  Both a glossiness being measured and a maximum value immediately after the measurement starts are displayed.
  - The MAX value is displayed at the glossiness display position.
  - Measurement values are displayed at the data No. display position as needed.

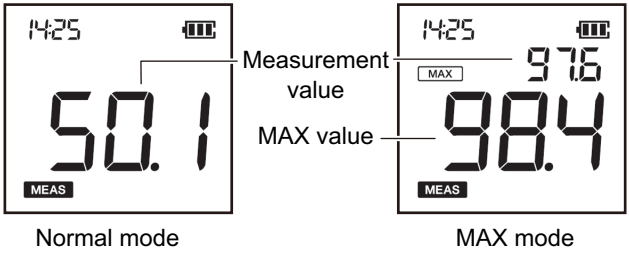


Fig. 6 Types of measurement modes

For switching the measurement mode, refer to "Measurement mode setting" (page 41), and for measurement method, refer to "Measurement" (page 22).

3 Using the product for the first time

Perform the following preparation work before using the product for the first time.

1. **Attaching the batteries (refer to page 43)**

2. **Power ON (refer to page 21)**

3. **Clock setting (refer to page 38)**

4. **Standard value setting (as needed) (refer to page 39)**

5. **Auto power OFF setting (as needed) (refer to page 40)**

6. **Measurement mode setting (as needed) (refer to page 41)**

7. **Calibration (refer to page 28)**

8. **Power OFF (refer to page 23)**

4 How to use

Measurement procedure

Perform measurement with the following procedure.

Power ON → Standard value check → (Calibration) → Measurement → Power OFF

● Power ON

1. **Attach the protective cover to the IG-340 main unit.**
   Be careful not to cause looseness and backlash of the cover when attaching.
2. **Press the power button.**
   The power turns ON and the measurement display appears.

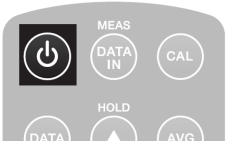


Fig. 7 Power button

Note

When a sound beeps at the time of power ON, the maintenance mode is activated. Since performing a wrong operation in maintenance mode may affect measurements, press the power button to turn OFF the power and then turn ON the power again.

Standard value check

1. **Read the value (measurement value) displayed at the glossiness position.**
   If the measurement value deviates from the glossiness of the standard plate, perform calibration (refer to page 28).

Tip

The calibration value is printed next to the standard plate in the protective cover.

Measurement

1. **Remove the protective cover, and bring the measurement area of the IG-340 main unit into close contact with the measurement target surface.**
   The measurement value is displayed.

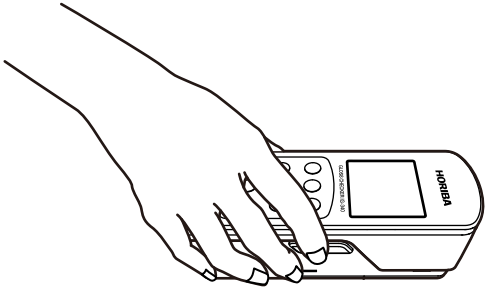


Fig. 8 Measurement

2. **Hold or store the measurement value, or calculate and store the average data as needed (refer to page 25 to page 27).**

● Power OFF

1. **After measurements, attach the protective cover to the IG-340 main unit.**
2. **Press the power button.**
   The power turns OFF.

Note for measurement

- **Perform measurements on a flat surface.**
  Glossinesses cannot be obtained with the following surfaces.
  - Uneven surface
  - Bent or distorted surface
  - Scratched surface
  - Curved surface
- **Remove the USB cable for measurement.**
  Performing measurement with the USB cable connected may cause measurement values to be unstable.
- **Bring the entire measurement area into close contact with the measurement target surface.**
  The measurement dimension (dimension where the light from light source hits the measurement area) is elliptical in shape (6 × 12 mm) at the center of the measurement area. If the entire measurement area is not kept in close contact with the measurement target surface, a correct measurement value may not be obtained due to the influence of ambient light (refer to page 52).
- **This product guarantees the performance of glossinesses from 0.0 to 100.0.**
  If a measurement value is outside the guaranteed range, the following are displayed.

- When the value is 100.1 or more and 199.9 or less: [OVER] at the bottom right of the display lights up.
- When the value is 200.0 or more: “199.9” blinks at the glossiness display position, and [OVER] at the bottom right of the display blinks.

- **When the auto power OFF is enabled (refer to page 40), the power turns OFF in the following cases.**
  - When no operation is performed for 10 minutes or more
  - When there is no change in the measurement values beyond the range of glossiness ±0.5 on the measurement display
- **Perform calibration using the standard plate supplied with the protective cover.**
  - If calibration is performed using an object other than the standard plate, the accuracy of measurement values cannot be guaranteed.

Tip

- A measurement value is updated every 0.5 seconds. It also can be held. For holding of the measurement value, refer to "Holding a measurement value" (page 25).
- Pressing the [CLEAR] button in the MAX mode deletes the MAX value.
  The MAX value is also deleted in the following cases.
  - When the power is turned OFF
  - When the [DATA IN/MEAS] button or the side button is pressed
  - When the [AVG] button is pressed
  - When the [DATA] button or the [SET/⇔] button is pressed

Measurement display functions

● Holding a measurement value

Stops updating the measurement value.

1. **Press the [△/HOLD] button.**
   Updating the measurement value displayed at the glossiness is stopped and [HOLD] is displayed.

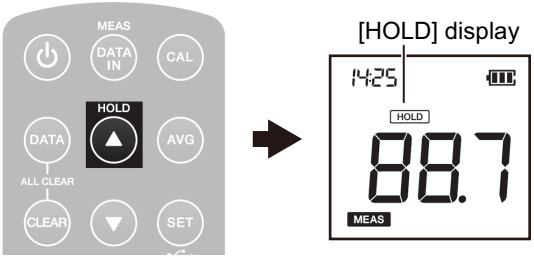


Fig. 9 Holding a measurement value

2. **To release the hold state, press the [△/HOLD] button again.**
   The hold state is released, and the [HOLD] disappears.

Tip

The held measurement value is also released in the following cases.

- When the power is turned OFF
- When the [DATA IN/MEAS] button or side button is pressed
- When the [AVG] button is pressed
- When the [DATA] button or [SET/⇢] button is pressed
- When the [CAL] button is pressed and held

● Storing a measurement value

Stores the measurement value on the IG-340 main unit.

1. **Press the [DATA IN/MEAS] button or the side button.**

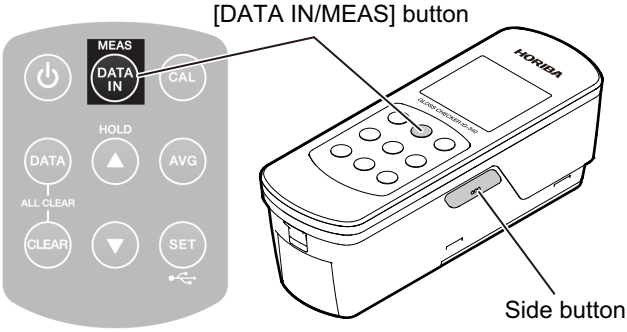


Fig. 10 Buttons for measurement value storage

- The measurement value and clock information displayed on the measurement display are stored in the IG-340 main unit together with the data No.
- Up to 100 pieces of measured data can be stored.
- The stored measured data can be viewed or deleted on the memory display (refer to page 30).
- The [DATA IN/MEAS] button and the side button function in the same way.

Note

- When pressing the side button, be careful not to allow the IG-340 main unit to be displaced.
- With this operation, the held measurement value is released, and the MAX value is deleted.

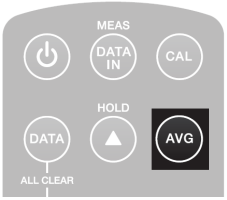
Calculating and storing an average value

The average value of the measured data stored during measurement can be calculated and stored. For details, refer to "Calculating and storing an average value" (page 32) in the “Memory display” section.

Note

- Calculating the average value deletes the measured data from the IG-340 main unit.
- With this operation, the held measurement value is released, and the MAX value is deleted.

1. **Press the [AVG] button.**
   The average value of the stored measured data is displayed for approximately one second and stored as average data.



Calibration

Calibration is recommended in the following cases.

- When the surrounding environment has drastically changed (example: the product is brought from the inside the room to the outside)
- When an hour or more has elapsed after measurement is started or after calibration

1. **Attach the protective cover to the IG-340 main unit.**
   Be careful not to cause looseness and backlash of the cover when attaching.
2. **Press and hold the [CAL] button for two seconds.**
   Calibration starts.
   [CAL] blinks at the glossiness display position during calibration. When the calibration is complete, [CAL] turns off.

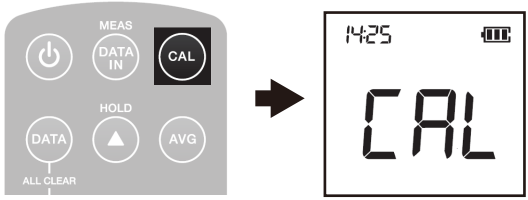


Fig. 11 Calibration execution

The IG-340 main unit is adjusted in such a way that the measurement value obtained when the standard plate has been measured is set as a standard value (refer to "Standard value setting" (page 39)).

Note

- Calibration stops with an error indication in the following cases.
  - When the protective cover is not correctly attached
  - When calibration is performed using an object other than the standard plate, and the gross value of the object is too large or too small
  - When the gross value is unstable
- If the standard plate inside the protective cover is floated from the measurement area or scratched, the measurement value will be smaller than it should be. Replace the entire protective cover before calibration.
- If the standard plate or lens is dirty, the measurement value will be smaller than it should be. Clean the lens and standard plate (refer to page 42) before calibration.
- If calibration is performed using an object other than the standard plate supplied with the protective cover, the accuracy of the measurement value cannot be guaranteed.

5 Memory display

Memory display overview

Press the [DATA] button on the measurement display to access the memory display. The following functions are available on the memory display.

- Viewing stored data (refer to page 31)
- Calculating and storing an average value (refer to page 32)
- Deleting the latest data (refer to page 33)
- Deleting all data (refer to page 33)
- Outputting data (refer to page 34)

Memory display functions

● Viewing stored data

On the memory display, stored measured data and average data can be viewed.

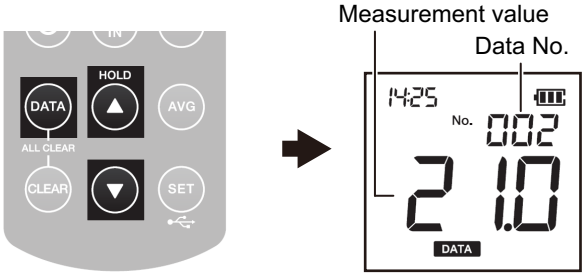


Fig. 12 Memory display

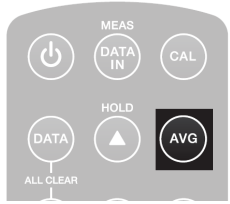
- Immediately after moving to the memory display, the measured data stored last is displayed (if there is no measured data, the average data calculated last is displayed).
- When the average data is displayed, [AVG] indication is added next to [No.].
- Press the [▽] button to display the previous data. Press the [△/HOLD] button to display the first data.
  - Each time the [△/HOLD] button is pressed, No. increases.
  - Each time the [▽] button is pressed, No. decreases.

● Calculating and storing an average value

Note

- Calculating the average value deletes the measured data from the IG-340 main unit.
- With this operation, the held measurement value is released, and the MAX value is deleted.

1. **Press the [AVG] button.**



- If three pieces or more of measured data are stored in the IG-340 main unit, an average value obtained excluding the maximum value and minimum value is stored in the IG-340 main unit as average data together with an AVG No.
- If two pieces or less of measured data are stored, an average value is stored in the IG-340 main unit as average data together with an AVG No.
- Up to 200 pieces of average data can be stored.
- The stored average data can be viewed or deleted on the memory display (refer to "Viewing stored data" (page 31)).

Tip

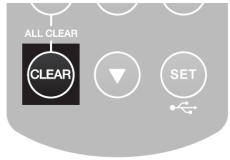
If both average data and measured data are stored, the average data (from AVG No.001) followed by the measured data (from No.001) is stored.

Deleting the latest data

The latest data stored in the IG-340 main unit can be deleted.
The latest data means the following.

- If there is measured data: Measured data stored last
- If there is no measured data: Average data calculated last

1. **Display the latest data.**
2. **Press the [CLEAR] button.**
   The latest data is deleted.



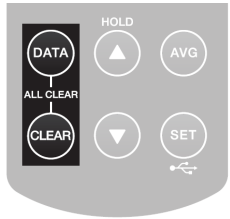
Note

When other data is displayed, pressing the [CLEAR] button does not delete the data.

Deleting all data

All measured data and average data stored in the IG-340 main unit can be deleted collectively.

1. **Press the [DATA] button and the [CLEAR] button simultaneously.**
   All data is deleted.



● Outputting data

Data stored in the IG-340 main unit can be output to PC via a USB cable and displayed on the application software.
There is no need to install a device driver that uses media or installer. When connected to PC for the first time, the IG-340 main unit is recognized as HID keyboard device. Then the Windows standard driver is automatically installed.

Note

Use a micro USB cable (2 m or less) that enables data output. Charge-only type of USB cable cannot be used.

- **Operable operating system**

Windows 10 (32-bit or 64-bit)

Note

Depending on the system configuration and settings on a PC, the above operating system may not operate correctly.

- **Data output procedure**

1. **Remove the USB terminal cover.**
2. **Connect the PC and the IG-340 main unit using the micro USB cable.**

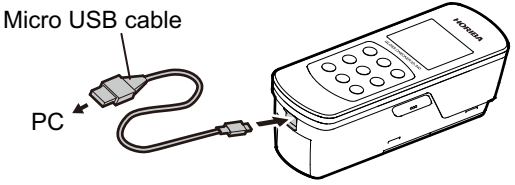


Fig. 13 Micro USB cable connection

3. **Switch to the memory display.**
Confirm that the USB indicator is lighting on the memory display.

Fig. 14 USB indicator lighting

4. **Move the cursor over the text input start position on the application software on the PC.**

5. **Set the character input mode of the PC to one byte.**

Note

Texts cannot be normally output when the character input mode is set to two bytes.

6. **Press the [SET/⇔] button.**
The data is output, and input to the application software.

Note

- Do not touch the keyboard and mouse of the PC during data output. An unexpected operation may be caused.
- Pressing the [SET/⇔] button during data output stops outputting the data.

- **Data output example**

Text file example
With 10 pieces of average data and 20 pieces of measured data

```
HORIBA, IG-340

Average Data
No.    Data   Time
001    91.0   2019/10/01 1120
002    90.9   2019/10/01 1125
 .
 .
009    90.1   2019/10/01 1129
010    90.0   2019/10/01 1130

Measurement Data
No.    Data   Time   Mode
001    91.0   2019/10/01 1220     Max
002    90.9   2019/10/01 1225     Max
 .
 .
019    90.1   2019/10/01 1229     Normal
020    90.0   2019/10/01 1230     Normal
```

Fig. 15 Data output example

6 Setting display

Setting display overview

Press the [SET/⇔] button on the measurement display to access the clock setting display of the setting display.

Each time the [SET/⇔] button is pressed, the display is switched to each setting display. Pressing the [SET/⇔] button on the measurement mode setting display returns to the measurement display.

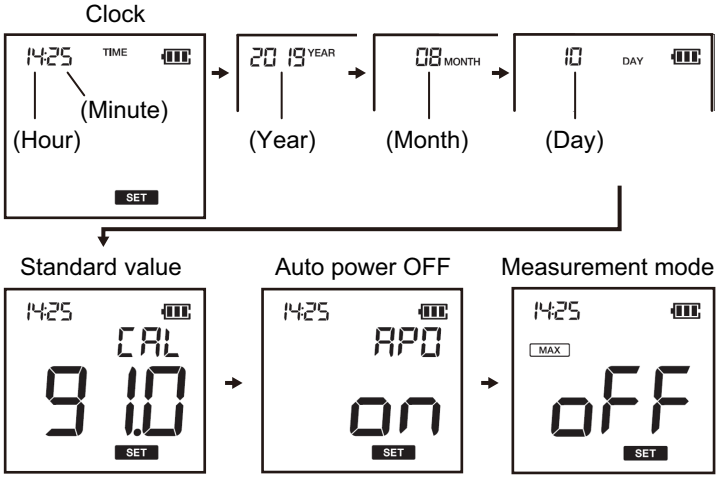


Fig. 16 Setting display flow diagram

Tip

Pressing the [DATA IN/MEAS] button while each setting display is being displayed will return to the measurement display.

Setting display functions

● Clock setting

When data is output via a USB cable, measurement date (year, month and day) is output simultaneously on this product. For that reason, set the clock before measurement.

1. **Press the [SET/⇨] button on the measurement display.**
   The display switches to the clock setting display (refer to page 37).
2. **Press the [△/HOLD] button or [▽] button to set the current time and date (year, month and day).**
   - When the (Hour) value blinks:
     Set the hours (0 to 23) and press the [SET/⇨] button.
     → The hour-setting is determined and the display moves to the minute-setting display.
   - When the (Minute) value blinks:
     Set the minutes (0 to 59) and press the [SET/⇨] button.
     → The minute-setting is determined and the display moves to the year-setting display.

- When the (Year) value blinks:
  Set the years (western calendar) and press the [SET/⇔] button.
  → The year-setting is determined and the display moves to the month-setting display.
- When the (Month) value blinks:
  Set the months (01 to 12) and press the [SET/⇔] button.
  → The month-setting is determined and the display moves to the day-setting display.
- When the (Day) value blinks:
  Set the days (01 to 31) and press the [SET/⇔] button.
  → The day-setting is determined and the display moves to the standard value setting display.

The clock setting is now complete. To return to the measurement display without setting the subsequent items, press the [DATA IN/MEAS] button.

● Standard value setting

Sets the standard value used for calibration of this product. Use the calibration value printed on the standard plate as the standard value. When the standard plate is changed due to replacement of the protective cover, set the value again.

1. **Press the [SET/⇔] button until the standard value setting display is displayed (refer to page 37).**
2. **Press the [△/HOLD] button or the [▽] button to set the standard value.**
   Setting range: 50.0 to 99.9
   Step: 0.1

3. **Press the [SET/⇨] button.**
   The standard value is determined and the display moves to the auto power OFF setting display.

The standard value setting is now complete. To return to the measurement display without setting the subsequent items, press the [DATA IN/MEAS] button.

● Auto power OFF setting

With the auto power OFF enabled on this product, when no operation is performed for 10 minutes or there is no change in the measurement values beyond the range of glossiness ±0.5 on the measurement display, the power automatically turns OFF. The auto power OFF can be enabled or disabled any time.

1. **Press the [SET/⇨] button until the auto power OFF setting display is displayed (refer to page 37).**
2. **Press the [△/HOLD] button or the [▽] button to switch between ON and OFF.**
   ON: Auto power OFF enabled
   OFF: Auto power OFF disabled
3. **Press the [SET/⇨] button.**
   The auto power OFF setting is determined and the display moves to the measurement mode setting display.

The auto power OFF setting is now complete. To return to the measurement display without setting the subsequent items, press the [DATA IN/MEAS] button.

Measurement mode setting

Sets the measurement mode to the Normal mode or the MAX mode (refer to "Types of measurement modes" (page 19)).

1. **Press the [SET/⇨] button until the measurement mode setting display is displayed (refer to page 37).**
2. **Press the [△/HOLD] button or the [▽] button to switch between ON and OFF.**
   ON: MAX mode
   OFF: Normal mode
3. **Press the [SET/⇨] button.**
   The measurement mode setting is determined and the measurement display returns.

7 Maintenance

Contact for maintenance

Manufacturer: HORIBA, Ltd.
2 Miyanohigashi, Kisshoin Minami-ku, Kyoto
601-8510 Japan

The contact information is written at the end of this manual.

Maintenance item list

- Cleaning of the lens and the standard plate (refer to page 42)
- Replacement of the batteries (refer to page 43)

● Cleaning of the lens and the standard plate

1. **Ensure that the power is turned OFF.**
   If the power is turned ON, turn it OFF.
2. **Remove the protective cover from the IG-340 main unit, and check the lens on the measurement area and the standard plate for dirt.**
   - If they are dirty, wipe off the dirt using the supplied lens cloth.
   - If they are very dirty, wipe off the dirt using a soft cloth slightly soaked in neutral detergent.

Note

Do not use alcohol or benzine.

Replacement of the batteries

This product uses two AA batteries. Replace the batteries with the procedure as shown below.

Note

After one minute or more has elapsed since the batteries are removed, the clock within the IG-340 main unit is reset. According to "Clock setting" (page 38), set the clock information again.

1. **Remove the battery cover.**
   Hook a flathead screwdriver on the hole of the battery cover, and lift it.
2. **Remove the old batteries, and attach new batteries while paying attention to the direction of the batteries.**

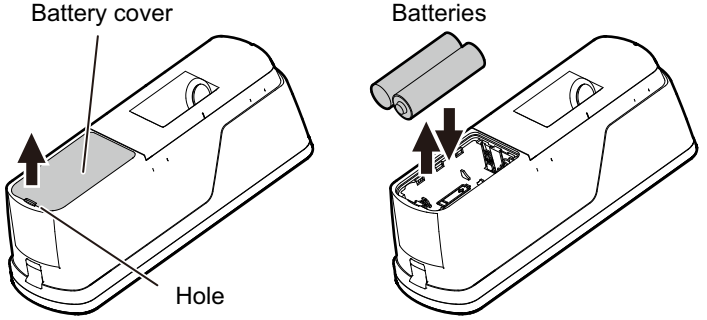


Fig. 17 Replacement of the batteries

3. **Attach the battery cover.**

(1) Hook the claws (2 places) on the opposite side of the battery cover hole into the recess of the main unit.

(2) Push in so that the remaining claws do not float.

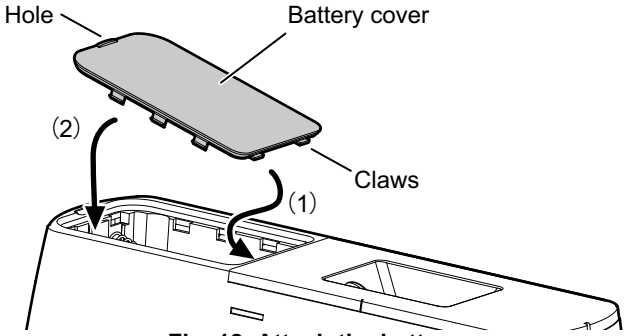


Fig. 18 Attach the battery cover

Note

- Use AA batteries. Though rechargeable nickel hydrogen batteries can also be used, the battery level indicator does not show the full charge state even if they are fully-charged.
- Remove the batteries if the product is not used for prolonged periods.
- When the battery level indicator is blinking only with a frame (refer to page 13), replace the batteries with new ones.
- Do not mix a new battery with an old battery.
- When disposing of the used batteries, follow the related laws and/or regulations of your country.

8 Troubleshooting

If any problem occurs with this product, check the Problem with the following table and take necessary action. In case that the problem cannot be solved, contact HORIBA, Ltd. or your dealer.

Problem	Cause	Action to take	Ref.
Nothing is displayed although the power button is pressed.	Battery shortage	Replace the batteries with new ones.	page 43
	Battery insertion direction is wrong	Insert the battery in correct direction.	
When the power button is pressed, [Err] is displayed at the glossiness display position.	When [MEAS] is not displayed		
	Internal failure of the product	Request repair to HORIBA, Ltd. or your dealer.	
	When [MEAS] is displayed		
	Strong light such as sunlight has entered the lens	Turn OFF the power once, and then turn ON the power again.	page 21

Problem	Cause	Action to take	Ref.
When the [CAL] button is pressed, [Err] is displayed at the glossiness display position.	The protective cover is not correctly attached.	Attach the protective cover correctly.	page 42
	The standard plate is dirty	Make sure there is no scratch on the standard plate, and then clean it.	page 42
Measurement values are not displayed or do not change.	Hold state	Press the [△/HOLD] button to release the hold state.	page 25
	Memory display	Press the [DATA IN/ MEAS] button to switch to the measurement display.	page 18
Measurement values are not stable.	Uneven measurement target surface	Change the measurement position to a flat surface.	
	Change in ambient temperature	After the ambient temperature is made constant, wait for 10 to 20 minutes until measurement values are stabilized.	

Problem	Cause	Action to take	Ref.
Measurement values are higher or lower than they should be.	Calibration failure	Make sure the standard value is correct, and then perform recalibration.	page 28
	The standard plate or lens is dirty.	Wipe off the dirt of the standard plate or lens, and then perform recalibration.	page 42
	The standard plate is damaged.	Replace the protective cover (with standard plate).	
	The measurement area is floating from the measurement target surface.	Bring the measurement area into close contact with the measurement target surface.	
Measured data is not displayed on the memory display.	Calculation of the average value	To store the measured data, do not press the [AVG] button.	page 27 page 32
Auto power OFF does not work.	The auto power OFF function is disabled.	Enable the auto power OFF function.	page 40

Problem	Cause	Action to take	Ref.
After measurement values are stored, [FUL] is displayed at the glossiness display position. After the [AVG] button is pressed, [FUL] is displayed at the glossiness display position.	Capacity shortage	Delete the latest data or delete all data to increase the capacity.	page 33
The average value stored by pressing the [AVG] button differs from the arithmetic mean value.	When there are three pieces or more of measured data, this product calculates the average value from the data with the maximum value and minimum value excluded.	---	page 27 page 32

Problem	Cause	Action to take	Ref.
USB is not displayed though the PC is connected on the memory display.	PC is not started up.	Start up the PC.	
	Connection failure or malfunction of the micro USB cable	Insert the micro USB cable again. If the problem is not solved, replace the cable.	
	Use of a charge-only type cable	Use a micro USB cable that enables data transfer.	page 34
Data is not transferred although the [SET/⇔] button is pressed on the memory display.	The input screen of application software of PC is not active.	Click (or tap) the input screen of application software to activate it.	page 34
After the [SET/⇔] button is pressed on the memory display, [USb] is displayed at the glossiness display position.	Connection failure or malfunction of the micro USB cable	Insert the micro USB cable again. If the problem is not solved, replace the cable.	
	Use of a charge-only type cable	Use a micro USB cable that enables data transfer.	page 34

9 Reference

Product specifications

Product name	Gloss checker
Model	IG-340
Measurement range	Glossiness: 0.0 to 100.0
Display range	Glossiness: 0.0 to 199.9 ([OVER] is displayed for values 100.1 and more.)
Repeatability[*1]	Glossiness: ±0.6 (±0.5%±1 digit of full scale)[*2]
Measurement area	6 × 12 mm of ellipse
Optical system	Incident angle and light receiving angle: 60° Light source: LED (wavelength 880 nm) Light receiver: Silicon photo-diode
Temperature/ Humidity range	Use: 0°C to 40°C / 35% to 85% Storage: −10°C to 40°C / 35% to 85% No condensation: for use and storage
Drip-proof/ Dust-proof	Protection rating IP42 (protection against water droplets from the ceiling side when measuring floor surface)
Power supply	Size AA battery (nominal 1.5 V or less) × 2
Dimension	61 (W) × 62 (D) × 176 (H) mm
Mass	320 g or less (including batteries and protective cover)

Function	• Auto power OFF (10 minutes) • Storing measured data (Number of storable: 100 pieces) • Storing average data (Number of storable: 200 pieces) • Outputting measured data, average data and storage date data (HID keyboard device)
USB terminal	Micro USB Type-B (bus power not available) Connect a micro USB cable (2 m or less) that enables data output
Accessories*3	• Protective cover (with standard plate, 3200840869) • Soft case (3200829076) • Lens cloth (3200829127)

*1: Variation in values when measurements are repeatedly performed in succession for a short time under the same conditions
Cited from: JIS Z 8101-2: 2015

*2: Full scale is 100.0.

*3: Accessories and battery cover (3200840873) can be purchased via your dealer.

About glossiness

What kinds of materials can be measured?

This product uses a 60° gloss meter for the optical system. Therefore, this product can be used broadly for quality control by checking gloss status or finished status of surfaces of various materials such as painted surface, plastic, stone material, tile, plating and metal material. Note that a measurement surface needs to be flat. If it is uneven or curved, measurements cannot be performed correctly. Also, in the case of a transparent material, measurements may not be performed correctly since it is affected by reflection from the bottom surface.

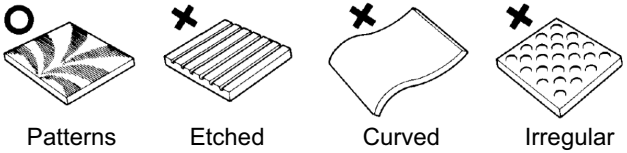


Fig. 19 Measurement propriety for materials

About glossiness standard

The glossiness is an amount that represents the degree of regular reflection when a light is applied to a surface. It is determined by a ratio between the intensity of reflected light at the measurement area and the intensity of reflected light from the gloss standard plate. When the incident angle is 60° and the light is completely mirror-reflected (100% reflection), the glossiness is 1000. There is no unit.

Glossinesses vary in reflection ratio depending on the wavelength of a light source to be used. Accordingly, there may be no relevance in displayed glossinesses between gloss

meters that use different light sources. This product adopts a method unique to HORIBA, Ltd. for the light source (near infrared LED).

● Optical system configuration

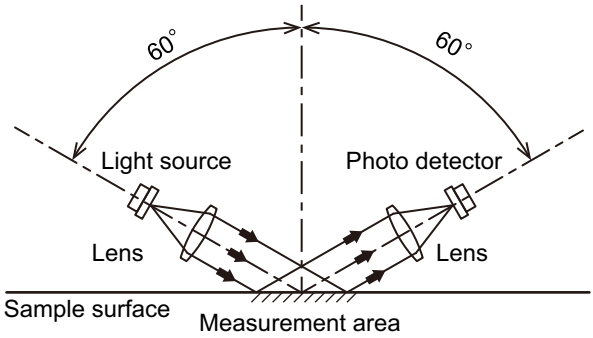


Fig. 20 Optical system configuration