

## GLOSS CHECKER IG-410 INSTRUCTION MANUAL

### 1 PREFACE

The handy gloss checker, IG-410, quantifies gloss levels, which were measured by visual check. Before using the Gloss Checker, read this manual thoroughly to ensure proper usage. The instruction manual should be carefully stored.

### 2 PRECAUTIONS

- The sensor is not scratch resistant. Take care not to scratch or scrub the sensor.
- Never touch the standard plate, and the lens with your bare hands or any other dirty item.
- Dirtiness on the standard plate or lens may cause inaccurate measurement. Clean the parts by wiping them with the supplied lens cloth.
- Do not handle the main unit and the protection cap roughly.
- Never leave the Gloss Checker under direct sunlight for long hours.
- Do not store the Gloss Checker in areas with high humidity or excessive dust.
- After using the Gloss Checker, be sure to turn it off. If the Gloss Checker will not be used for a long time, remove the batteries.

### 3 CHECKING THE CONTENTS

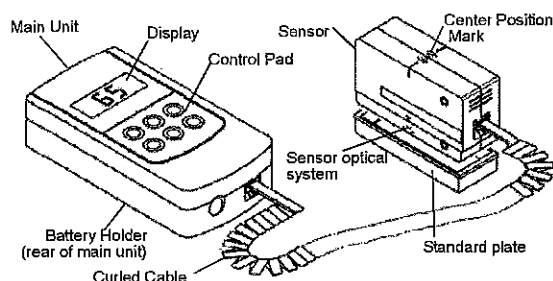
Check that all of the items listed below are included in the carton:

Main unit with battery holder lid	1 pc.
Sensor	1 pc.
Standard plate of 100 range model IG-41L	1 pc.
Standard plate of 1000 range model IG-41H	1 pc.
Curled cable	1 pc.
AA battery (LR6)	4 pcs.
Instruction Manual	1 copy
Lens cloth	1 sheet

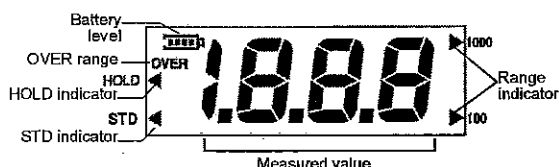
#### Note

The batteries included in the carton may have a shorter life.

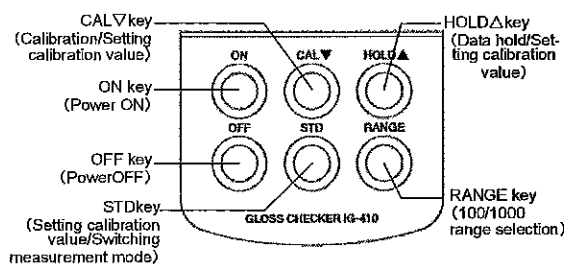
### 4 PART NAMES



### 4.1 Display



### 4.2 Control Pad



### 5 PREPARATIONS

#### 5.1 Loading the Batteries

Load the batteries as follows. The Gloss Checker uses four AA batteries.

1. Remove the battery lid.
2. Load new batteries. Check polarities.



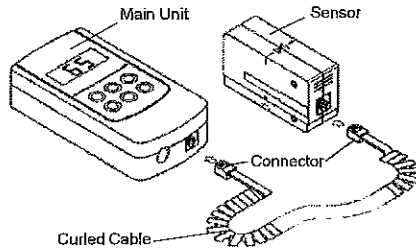
3. Attach the battery lid. Make sure to fit the lid securely.

#### 5.2 Caution on Batteries

- Use alkaline batteries (LR6) or manganese batteries (R6). Rechargeable batteries such as NiH<sub>2</sub> batteries can not be used.
- Remove the batteries if the Gloss Checker will not be used for a long period.
- If Battery Level Mark ( ) blinks, replace with new batteries.
- If the Battery Level indicator ( ) blinks, replace with new batteries.
- Do not mix new batteries with old ones.

#### 5.3 Connecting the Cable

1. Insert the connectors on the curled cable into the ports on the main unit and sensor. A click sound assures proper connection.



**Note**

Use only the curled cable included. Do not use a curled cable for other devices. Otherwise, the instrument will not work properly and may even fail.

**6 MEASUREMENTS**

Be sure to calibrate the Checker before taking measurements.

**6.1 Power ON**

- Press the ON key.  
The power turns ON and the Checker enters measurement mode.

**6.2 Power OFF**

- Press the OFF key.  
The power turns OFF.

**6.3 Calibration**

Calibrate the 100 range (0 - 100) and the 1000 range (0 - 1000) with the plate for calibration that corresponds to each range.

Before calibrating, set the calibration value.

● **Setting the calibration value**

1. Press the RANGE key to set the range indicator to 100.
2. Press the STD key for more than 2 seconds.  
The STD indicator blinks and the calibration value setting mode starts.
3. Set the value printed on the standard plate in the 100 range, IG-41L, using the CAL▽ and HOLD△ keys.
4. Press the RANGE key to set the range indicator to 1000.
5. Set the value printed on the standard plate in the 1000 range, IG-41H, using the CAL▽ and HOLD△ keys.
6. Press the STD key.  
These values become the calibration values for the 100 range and 1000 range. The Checker then returns to measurement mode.

**Note**

Pressing the OFF key or the RANGE key while making this setting will set the calibration value to the current value. Check the current calibration value in the calibration value setting mode (press and hold the STD key two seconds).

● **Calibration**

● **Calibrating the 100 range (0 - 100)**

7. Attach the reference plate for calibrating the 100 range (IG-41L) to the sensor.
8. Set the range indicator to 100 using the RANGE key.
9. Set the sensor on a flat surface, and press down at the center (center position mark) with your finger until calibration completes.
10. Press and hold the CAL key for two or more seconds.  
The letters "CAL" will blink and automatic calibration will begin.  
When calibration completes the Checker enters measurement mode.
11. Verify the calibration value appears in the display (within  $\pm 1$  of the value printed on the standard plate).

● **Calibrating the 1000 range (0 - 1000)**

1. Attach the reference plate for calibrating the 1000 range (IG-41H) to the sensor.
2. Set the range indicator to 1000 using the RANGE key.
3. Set the sensor on a flat surface, and press down at the center (center position mark) with your finger until the calibration completes.
4. Press and hold the CAL key for two or more seconds.  
The letters "CAL" will blink and automatic calibration will begin.  
When the calibration completes the Checker enters measurement mode.
5. Verify the calibration value appears in the display (within  $\pm 10$  of the value printed on the calibration plate).

**Note**

- Make sure that the proper standard plate is attached in accordance with calibration value.
- If an error occurs during calibration ("Err" appears in the display), the Checker was not calibrated properly. In this case, the previous calibration value will remain in effect. Review the procedures and repeat the calibration.

**6.4 Measurement**

1. Remove the reference plate for calibration.
2. Press the RANGE key to set the measurement range.
3. Place the sensor as close to the measuring object and lightly press the center position mark with a finger.

● **Selecting the 100 range or 1000 range**

Each press of the RANGE key alternates between the 100 and 1000 range. The 100 range shows one decimal place while the 1000 range shows only the integer portion. Select the measurement range according to the object being measured.

100 range: floors, painted surfaces, stonework, etc.

1000 range: polished metal surfaces, plated surfaces, etc.

● **Data Hold**

When you wish to hold a reading on the display, press the HOLD key. The reading will freeze and the HOLD indicator will blink.

The measurement range cannot be switched during HOLD. Press the HOLD key again to release the reading and return to normal operation.

● **Auto Power-OFF**

If no key is pressed for approximately 5 minutes, the power will automatically turn OFF.

To restart measurement, press the ON key and enter the measurement mode. Make sure to calibrate before measuring.

● **OVER range**

If the measurement exceeds 102.0 in the 100 range, or 1020 in the 1000 range, the reading will hold at 102.0, or 1020 (whichever applies) and the OVER indicator will blink.

**Note**

- This instrument is suitable for comparing the gloss on materials with the same surface characteristics, and for controlling variation. However, for certain materials it may indicate differently from gloss checkers by other manufacturers. This is noticeable on painted and metal surfaces.
- Pressing the sensor against certain objects may cause scratches on the surface of that object. To prevent this, wipe away any dust on the surface of the object, and avoid pressing the sensor against the object too hard.

## 7 CHECKS AND STORAGE AFTER USE

After the measurement, store the Gloss Checker as follows.

- Attach the standard plate to the sensor.
- If the Gloss Checker is not going to be used for a long period, remove the batteries.
- Clean the gloss checker by wiping with a soft dry cloth, or with the supplied lens cloth.
- For heavy contamination, use a mild detergent such as liquid cleaners available in markets. Apply a little drop of mild detergent on the cloth and lightly wipe the contaminated part.

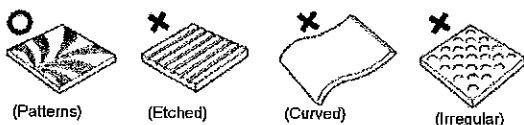
### Note

- Make sure not to use any organic solvents such as thinner.
- The Gloss Checker is not water-proof. Never wash the unit with water.

## 8 USEFUL INFORMATION

### ● What materials can be measured?

This instrument uses measurement angle of  $60^\circ - 60^\circ$ , making it suitable for quality control of glossiness and finishes on the surfaces of various materials such as painted surfaces, plastics, ceramics, tiles, plated surfaces and metals. However, it requires that the surface to be measured is flat. Otherwise, the measurements may be inaccurate, particularly for rough or curved surfaces. Additionally, with transparent objects, reflections from the bottom surface may affect the measurement.

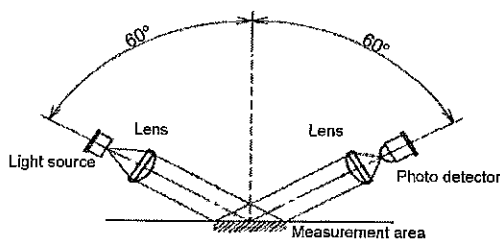


### ● What is the reference of gloss levels?

Gloss level is a measurement of the reflection when a beam of light is shined on a surface. It is determined by the ratio of the intensity of the light reflected off the measured spot to that from the reference plate. The gloss level of a mirror (with a refractive index of 100%) when light is projected at an incident angle of 60 degrees is 1000. No unit is applied to this value.

The reflectance ratio differs according to the wavelength of the light source used. This is why the glossiness may not correlate with gloss checkers that use a different type of light source. The light source in the IG-410 is based on HORIBA's original near-infrared LED technology.

### ● Configuration of Optical Systems



## 9 TROUBLESHOOTING

Problem	Cause	Remedy
The readout displays nothing	The power is OFF.	Press the ON key.
	The batteries are not set.	Set batteries.
	The batteries have run out.	Replace the batteries.
	The batteries are set with the polarities reversed.	Reload the batteries in the correct position.
The reading is abnormal / The reading does not change	The measured surface is rough.	Measure a flat surface.
The reading is abnormal (Value too high or too low)	The sensor part is floating	Hold the sensor square against the spot to be measured.
	The lens is dirty	Wipe the lens with the supplied lens cloth.
	The standard plate is dirty	Clean the standard plate with the supplied lens cloth and perform the calibration.
	The batteries have run out	Check the Battery Level and replace with new batteries if low.
The reading does not change	The standard plate is attached to the sensor.	Remove the standard plate.
	In the Hold state	Press the HOLD key.
Value after calibration differs from standard plate	Calibration value of the reference plate was not entered correctly.	Set the calibration value to the value of the reference plate.
	Calibration affected by large scratch on the standard plate.	Replace the standard plate
Display changes "Err" after calibration.	Calibration failed.	Check the instruction manual and recalibrate.
Shows abnormal figure or "Err" shows on the display		Take out the batteries, wait for about 10 seconds and then reload the batteries and perform the calibration. If the problem persists, notify the dealer where you purchased the Gloss Checker for repair service.
	Cable not connected properly.	Make sure you hear an audible click when you insert the cable into the connector.

## 10 SPECIFICATIONS

Item	100 range	1000 range
Measurement range	0 to 100	0 to 1000
Display range	0.0 to 102.0	0 to 1020
Measurement angle	Incident angle 60° - Receiving angle 60°	
Measurement area	6 mm × 3 mm (oval)	
Light source	LED (Wavelength 890 nm)	
Photo detector	Silicon photodiode (Wavelength 890 nm)	
Display	LCD 3-1/2 digits	
Repeatability	±1% of full scale	
Ambient temperature range	0°C to 40°C	
Power	Four AA batteries	
Battery life	Continuous Operation: 200 hours (AA battery (LR6) at 25°C ambient temp.)	
Features	OVER range Data HOLD Range selection Auto calibration (each range) Calibration value setting Battery level warning (5 levels) Auto Power-OFF (5 minutes)	
Size	Main unit: 75 W × 34 D × 140 H mm Sensor: 30 W × 45 D × 88 H mm	
Mass	Approx. 350 g (including battery)	

## 11 CONSUMABLE PARTS

Name	Model	No.	Description
Standard plate of 100 range	IG-41L	3200200856	for IG-410
Standard plate of 1000 range	IG-41H	3200200118	for IG-410
Curled cable	—	3200207668	for connecting Main Unit and Sensor

## 12 REGULATIONS

### ● Conformable Directive

This equipment conforms to the following directive(s) and standard(s);



Directive(s): The EMC Directive 2004/108/EC

Standard(s): EN61326-1:2006 Emission: Class B,  
Immunity: Portable test and measurement equipment

### ● Information on Disposal of Electrical and Electronic Equipment and Disposal of Batteries and Accumulators

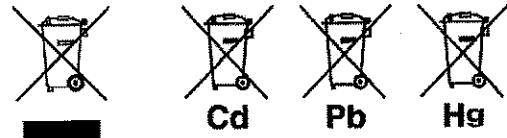
The crossed out wheeled bin symbol with underbar shown on the product or accompanying documents indicates the product requires appropriate treatment, collection and recycle for waste electrical and electronic equipment (WEEE) under the Directive 2002/96/EC, and/or waste batteries and accumulators under the Directive 2006/66/EC in the European Union.

The symbol might be put with one of the chemical symbols below. In this case, it satisfies the requirements of the Directive 2006/66/EC for the object chemical.

This product should not be disposed of as unsorted household waste.

Your correct disposal of WEEE, waste batteries and accumulators will contribute to reducing wasteful consumption of natural resources, and protecting human health and the environment from potential negative effects caused by hazardous substance in products.

Contact your supplier for information on applicable disposal methods.



### ● FCC Rules

#### ● Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Consult the dealer or an experienced radio/TV technician for help.