

INTRODUCTION.

The Auto-Eye 640 Series are portable gonio- (multiangle) spectrophotometers. In addition to either 15°, 20° or 25°, all models measure at 45°, 75°, and 110°. Reflectance at each angle is measured at 10nm intervals from 360nm to 750nm. As a portable, each instrument can be used “stand-alone” or in conjunction with Optiview® and other compatible software.

SAFETY INSTRUCTIONS



The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions in the literature that accompanies the unit.



The lightning flash with arrowhead, enclosed within an equilateral triangle, is intended to alert you to the presence of uninsulated “dangerous voltage” within the product’s enclosure. This voltage may be of sufficient magnitude to constitute a risk of electrical shock.

- PLEASE READ AND FOLLOW INSTRUCTIONS—Read and follow all safety and operating instructions before you attempt to install and operate this unit.
- RETAIN THIS MANUAL FOR FUTURE REFERENCE—Once you have read this manual, keep it handy for others to read or refer to when they need to operate the unit.
- OBEY WARNINGS—Please comply with all warnings and safeguards that we provide in this manual. They have been written to keep you and your unit safe. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired.
- THIS DEVICE IS *NOT* EXPLOSION-PROOF and should *not* be used in a hazardous atmosphere with exposure to flammable substances.
- PROTECT FROM WATER AND MOISTURE—Maintain electrical safety when you use this unit. Do not use it in an area where there is possible hazard of electric shock from spilled water or other liquids or uncontrolled moisture.
- CLEAN PROPERLY—Use only a slightly damp, lint-free cloth to clean the surface of the unit. Do not attempt to clean the inside of the viewport or the unit itself.
- DO NOT FORCE OBJECTS INTO THE PRODUCT—Never push objects of any kind into the viewport or interior of the unit in an attempt to clean them or to mop up spilled liquids that may have entered these areas. If spills should occur that enter the unit, turn off the unit immediately and disconnect all power sources. You should contact a Service Representative to determine the best way to handle clean up.
- RECYCLE THE Ni-Cd BATTERY—The product that you have purchased is powered by a rechargeable battery pack. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options and proper disposal. The battery may explode if mistreated. Keep away from children. Do *not* disassemble. Charge the battery pack using the supplied charger and follow the instruction provided.
- USE ONLY A PROPER POWER SOURCE—If you have any doubt, consult the unit label for this information.

Important Battery Safeguards and Recommendations

- Do not charge the battery assemblies with a battery charger not specified or approved by GretagMacbeth. Do not modify the specifications of the battery or charger as this can result in damage to the battery assemblies and equipment.
- Do not burn the battery pack.
- Do not short circuit the terminals.
- Do not damage or drop the unit or subject it to mechanical vibration.
- The lower the temperature, the longer the recharging time will be.
- Store battery pack in a cool dry place. Long exposure to high temperatures increases battery discharge and reduces battery life. Total battery discharge may naturally occur during long storage. Discharge batteries before re-storing them to extend battery life.

SPECIFICATIONS

Electrical Requirements	Power consumption: 30 watts
	Optional AC/DC Power Supply AC Input: 115 or 230 V, 50/60Hz DC Output: 12 V, 2.5 amp
Environmental Requirements	Operating Temperature: 50°F to 104°F (10°C to 40°C) Operating Relative Humidity: 10% to 90% (Noncondensing) Battery Charging Temperature: 50 °F to 95°F (10°C to 35°C)

CALIBRATION AND OPERATION

Calibration Procedure

The following calibration procedure is applicable to the White Tile, Open Port, and Setup Transfer Calibrations.

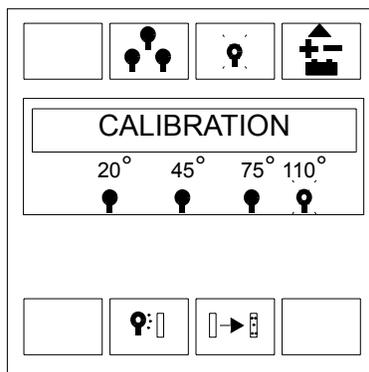


Figure 1. Calibration Screen

1. Connect a charged battery to the instrument.
2. Power on the instrument.
3. From the main menu, press softkey 1.
4. Position the calibration tile at the viewport. Make sure that the tile is pressed against all three pressure sensors.
5. At the calibration screen, press softkey 3 (). The lamps flash.
6. When calibration is complete, the message CALIBRATION COMPLETED appears.
7. Press softkey ESCAPE and return the calibration tile to its storage area.
8. The message TAKE OPEN PORT MEASUREMENT appears.
9. Make sure there are no tiles or other objects present at the viewport. Point the instrument viewport away from objects or light sources
10. Pull the trigger.
11. When calibration is complete, the message CALIBRATION COMPLETE. PRESS ANY KEY appears. Press softkey ESCAPE. Then the message MEASURE THE TRANSFER STANDARD appears.
12. Position the transfer tile holder at the viewport. Make sure that the tile is pressed against all three pressure sensors. The lamps flash when all three pressure sensors have made contact with the tile.
13. The message CALIBRATION COMPLETED appears.

Daily Calibration Procedure

Perform the Daily Calibration Procedure once a day. Follow this procedure whenever the unit requests calibration. This may occur if the unit has been in continuous operation throughout the day.

1. Connect a charged battery to the instrument.
2. Power on the instrument.
3. From the main menu select softkey 1.
4. Position the transfer tile holder at the viewport. Make sure that the tile is pressed against all three pressure sensors.
5. At the calibration screen, press softkey 2 (☺:☐). The lamps flash.
6. The message CALIBRATION COMPLETED appears.
7. When calibration is complete, press softkey ESCAPE and return the transfer tile to its storage area.

Measurement Procedure

Use this procedure whenever you wish to take a measurement.

1. After calibration is complete, from the Main Menu select Quality Control, softkey 1.
2. Remove the lens cap.
3. Press softkey MENU until icon Set 1 appears.

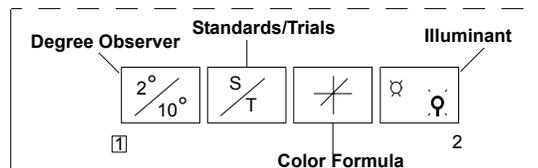


Figure 2. QC Softkey Icon Set 1

4. Press softkey 2 (☺:☐) to toggle between standard and trial. This selects the “type” of measurement to be taken as well as data set to display.
5. Place the instrument viewport flat against the sample pressing against all three pressure sensors or pull the trigger to take a measurement. The lamps flash.
6. The following screen appears:

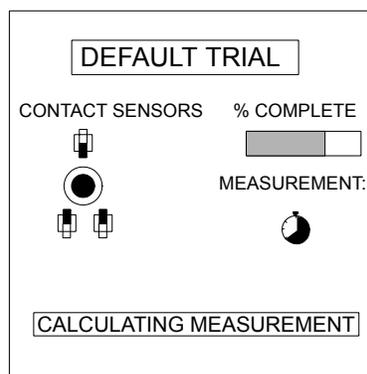


Figure 3. Measurement Screen

7. When the measurement is complete, a QC screen appears.

CLEANING AND MAINTENANCE

Cleaning the Instrument

Maintain full electrical safety when you clean the instrument by unplugging the unit (if connected to an AC/DC converter) and disconnecting it from all cabling to other equipment such as the personal computer. Use only a slightly damp, lint-free cloth to clean the surface of the unit. Do not attempt to clean the inside of the Viewport or the inside of any other part of the spectrophotometer. Cleaning the inside of the instrument should be done only by an authorized Factory Service Representative.

Cleaning Calibration Tiles

Ceramic standards (calibration tiles) are widely used in color science as standards of reflectance factor. Their principal virtue is the stability of their reflection properties. If they are to serve their intended purpose, it is necessary that the surface be kept clean and damage-free. The cleaning of any precision optic risks degrading the surface. Therefore, the need for cleaning should be minimized by returning the tile to its storage case or covering it with a protective bag when it is not in use. If cleaning is required, the following procedure is recommended:

Materials Required

Camel's-Hair brush: Available at hardware stores.

Distilled water: Available at the pharmacy.

Isopropyl alcohol: Spectroscopic grade.

Soap: Ivory[®] brand soap or any non-moisturizing bar soap.

Dust Free tissue: Use a lens tissue which meets Federal Specification NNN-P-40A, Type I or equivalent.

CAUTION

Make certain that your hands are clean before handling the tile. Do not touch the white surface of the tile with the fingers while you are cleaning it. Natural oils, creams and other materials found in the hands can alter the optical properties of the tile and can result in an inaccurate calibration.

Lint and other small particles are usually best observed by illuminating the tile with a diffuse light source that does not produce surface glare. Inspect the tile at a sharp angle rather than looking directly at the tile's front surface.

1. Brush the tile surface with a camel's-hair brush.
2. Breathe a light mist of condensed vapor on the tile. Immediately wipe lightly with lens tissue. Avoid smearing the tile with natural greases from the hands by wiping with the untouched center part of the lens tissue.
3. After the tile has been wiped, inspect it again. If it is clean, STOP. If any smears remain, proceed as follows:
 - a. Wet the center of the tile with isopropyl alcohol. DO NOT USE RUBBING ALCOHOL.

CAUTION

Never use cleaning solutions that contain abrasives. Use of abrasives or physically scraping the tile can change the surface reflectance values. This will invalidate calibration.

- b. Wipe the tile lightly with lens tissue.
- c. Dust with a camel's-hair brush to remove any remaining paper fibers.
- d. Breathe a light vapor mist on the tile, and wipe it lightly with lens tissue.
- e. Inspect the tile for remaining smears. Repeat if necessary. If foreign matter persists, proceed as follows:
 - (1) Wet fresh lens tissue with distilled water, and rub on bar of Ivory[®] brand or any non-moisturizing soap.
 - (2) Wipe the center of the tile with soapy tissue to remove the matter.
 - (3) Rinse the tile with hot tap water and then with cold distilled water. Apply this method only when necessary to remove something from the area actually involved in measurement.

Spare Parts: Consult your Price List for additional information or call your local GretagMacbeth sales office.

RS232 Communication Cable	10032610	RAM Card (512 K)- Additional Memory	10034360
Battery Pack	10033190	Optiview	59005650
Battery Charger	10033930	Auto-Eye 640 Series Language Kit	59007430
Operation Manual	17016660	(Italian and French)	
Transfer Calibration Tile Assembly	29009610		
Carrying Case	52006390		
External Power Supply (12V DC)	10033550		

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