MiniScan® EZ
Supplemental Manual for EasyMatch® QC

The world's true measure of color
HunterLab

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Preface

Copyrights and Trademarks

Safety Notes

Caution: If the equipment is used in a manner not specified by HunterLab, the overall safety and protection provided by the equipment may be impaired. The instrument is for indoor use only and not suitable for a wet location.

Caution: There is a potential of a UV Light hazard in using this instrument. Please avoid looking directly at the light. The frequency of this flashing light is in the range of sensitivity for those prone to epileptic seizures.

For your safety when using the MiniScan EZ, you should pay attention to the following types of statements in this User's Manual:

- General safety instruction that should be observed at all times while operating the instrument.
- Specific safety instruction critical to the type of instrument operation being explained in the manual where the caution appears.
- Use of this equipment in a manner not specified by the manufacturer may impair the protection afforded by the equipment.
- Danger of electric shock if liquids are spilled and fire if volatile or flammable liquids are spilled. Use care when measuring liquid samples**.**

Legal Disclaimers: Instrumental – Visual Evaluation

The HunterLab MiniScan EZ Colorimetric Spectrophotometer is designed for precision color and appearance measurement. It measures numerical color and related data in absolute and relative terms. HunterLab cannot guarantee the accuracy, completeness, efficacy, and timeliness of the data due to inherent uncertainties in instrumental readings, variations in sample presentation, and potential inconsistencies in human color perception. It is strongly advised that each user verify the instrumental data with meticulous visual evaluation.

Disclaimer of Liability: Utilization of Data, Metadata, and Information

Hunter Associates Laboratory, Inc (including its employees, agents and assignees) assumes no responsibility for consequences from the use of the data derived from its colorimetric spectrophotometer or from the information contained herein or in any respect for the content of such information including but not limited to errors or omissions, the accuracy or reasonableness of factual or scientific assumptions, studies or conclusions, the defamatory nature of statements, ownership of copyright or other intellectual property rights and the violation of property, privacy or personal rights of others. Hunter Associates Laboratory, Inc. is not responsible for and expressly denies all liability for damages of any kind arising out of use, reference to or reliance on such data and/or information. No guarantees or warranties, including but not limited to any express or implied warranties of merchantability or fitness for any particular use or purpose made by Hunter Associates Laboratory, Inc. with respect to such data and/or information.

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Setting Up the MiniScan

The MiniScan EZ spectrophotometer is a versatile color measurement instrument that can be used on products of virtually any size, and in industries as diverse as paint and textiles. Because of its compact design and portability, MiniScan EZ can be used to measure objects that would be difficult to position at the measurement port of a larger color instrument normally found in a laboratory, and in locations other than a laboratory.

Figure 1. Photo of MiniScan EZ

The instrument uses a xenon flash lamp to illuminate the sample. The light reflected from the sample is then separated into its component wavelengths through a dispersion grating. The relative intensities of the light at different wavelengths along the visible spectrum (400-700 nm) are then analyzed to produce numeric results indicative of the color of the sample. This is an objective means of quantifying what was once considered a subjected aspect of a sample's appearance—its color.

Note: Use of this equipment in a manner not specified by the manufacturer may impair the protection afforded by the equipment. Take care not to drop the MiniScan EZ. If it is dropped, have it evaluated for damage before operation.

MiniScan EZ is available in four different models based on viewing area and geometry. A label on the bottom of the instrument provides this information.

Figure 2. Bottom of MiniScan EZ

Table 1. MiniScan EZ Versions

Model	Geometry	Viewing Area
MSEZ-4500L	45°/0°	Large
MSEZ-4500S	45°/0°	Small
MSEZ-4000L	Diffuse/8° (Sphere)	Large
MSEZ-4000S	Diffuse/8° (Sphere)	Small

The MiniScan EZ may be operated using the keypad and display on the instrument itself, and it may also be operated while connected to a computer running EasyMatch QC. Therefore, having purchased both a MiniScan EZ and EasyMatch QC, you have two sources of information on the instrument in addition to this User's Manual: the MiniScan EZ User's Guide, which describes stand-alone operation, and the EasyMatch QC help file, which describes operation of the MiniScan EZ using the software. Refer to those information sources as required.

MiniScan EZ Accessories

The following accessories are included with the MiniScan EZ system and can be found in the provided carrying case:

- Sample port cover - screws on over the sample port to protect the instrument's optics when it is not in use.
- Calibration cylinder - houses the NIST traceable white calibrated tile that is placed at the sample port during standardization to set the top of the scale, the black glass or light trap that is placed at the sample port during standardization to set the zero, and the green check tile that is used to assess long-term instrument performance during the green tile test.
- Rechargeable batteries - a set of 6 rechargeable AA batteries and a charger (with 110V plug and 220V adapter) are provided for continuing use of the MiniScan EZ.
- USB cable for connecting the MiniScan EZ to the computer.
- Certificate of traceability for the standard white tile.
- Tile data sheet - provides NIST-traceable calibrated values for the standard white tile and values read at factory for the green tile.
- MiniScan EZ User's Guide.
- Utility program.

Selecting a Space for the MiniScan EZ

The following illustrates a successful installation. Set up the HunterLab MiniScan EZ in a laboratory setting with controlled, consistent temperature and humidity. It is recommended that access to the rear connectors be maintained. The selected workspace should be free of drafts and characterized by proper room lighting. Place the spectrophotometer on a stable and vibration-isolated surface to minimize vibrations that could affect measurements. Input power from the utility company must be 'perfect' power, i.e., constant voltage, current and frequency without harmonics.

Laboratory Environment – The HunterLab MiniScan EZ Spectrophotometer is a high-precision laboratory instrument. Laboratory grade environments are required and should be maintained to ensure precise and accurate measurements. This includes environmental factors and conditions such as temperature humidity, atmospheric pressure, and cleanliness. The environment should be free of contaminants such as airborne dust and/or particulate matter and aerosols to avoid contamination of the precision equipment.

Samples

Implement protocols for handling and preparing samples to minimize contamination to the inside of the instrument.

Personnel

Train laboratory personnel on clean practices, including wearing appropriate attire, using cleanroom-like protocols and being mindful of their actions to prevent contamination.

Power Required

Voltage: 100-240 VAC, 3.75A, 47/63 Hz; Single Phase; 60 VA maximum.

Installation Category (Over Voltage): II

Safety

- Do not view the instrument light source directly as it may be damaging to the eyes.
- Do not submerge the instrument in water.
- Do not take the instrument apart as there are 'no user serviceable parts' in the instrument.
- Do not disassemble the instrument and attempt to clean the optical components.
- Do not open the instrument or remove any covers except using the instructions given in this User's Manual or under the direction of HunterLab Technical Support.
-

Note: Failure to comply with these conditions and protocols set forth in this document may adversely affect the instrument performance.

For more information, please refer to **SPECIFICATIONS**.

Cleaning the MiniScan EZ

Clean the outside surfaces of the MiniScan EZ using a soft cloth. Do not spray liquids directly on the instrument. . Care should be taken to avoid degradation of optical surfaces. Refer to **MAINTENANCE** for more detail.

Getting Started with MiniScan EZ

Unpack your Box

Place the MiniScan EZ on the bench. Remove wrappings and cable ties. Inspect for damage and notify the carrier and HunterLab immediately if any is discovered.
Retain the packaging in case of needing to return the instrument return to HunterLab.

Setting Up the Instrument

The MiniScan EZ is simple to set up and attach to your computer. Before operating the MiniScan EZ with EasyMatch QC, you need only install the batteries and connect the instrument to your computer. These steps are outlined below.

1. Unpack the carrying case and remove wrappings and cable ties. Inspect for damage and notify the carrier and HunterLab immediately if any is discovered. Save the packing materials in case it becomes necessary to return the instrument to the factory.
2. Open the battery compartment on the bottom of the MiniScan EZ.

Figure 3. Battery Compartment of the MiniScan EZ

3. Install the 6 AA batteries, observing the positive (+) and negative (-) polarity guides inside the battery compartment.

Figure 4. Install AA Batteries

Note: The MiniScan EZ can use six standard AA alkaline batteries or six rechargeable AA NiMH batteries. Do not mix battery types in the instrument. To recharge the NiMH batteries, remove them from the instrument and recharge them using the supplied charger.

4. Close the battery compartment.

5. Plug the hexagonal (Mini-A) end of the USB cable into the USB port on the MiniScan EZ.

Figure 5. USB Cable for Computer Connection

6. Plug the flat end of the USB cable into the appropriate USB port on the computer. Windows' plug and play feature automatically finds and installs the device. Let it do so until the ***FOUND NEW HARDWARE*** message disappears.

MiniScan EZ Options and Sample Devices

There are many options and devices available for positioning samples at the measurement ports of the MiniScan EZ and for making the instrument easier to use. For the latest information, please refer to **https://support.hunterlab.com/hc/en-us/articles/218375923-Accessories-for-HunterLab-Instruments**.

45/0 Fiber Package Adapter (HL#C02-1002-030)

This option provides a special nose cone assembly and three removable adapters for measuring 152-mm (6-inch), 254-mm (10-inch), and 305-mm (12-inch) cylindrical fiber or yarn package diameters. To use the assembly, snap the appropriate port adapter onto the nose cone of the MiniScan EZ. Position the port adapter over the cylindrical fiber or yarn package and proceed with measurements. Take care to position the MiniScan EZ so that it will not move during readings. Averaging is recommended when measuring fibers or yarns with large diameters.

Figure 6. Nose Cone Adapters

Figure 7. Inserting the Nose Cone Adapter

Figure 8. Using the Nose Cone Adapter

Skein Holder (HL# 02-7396-00)

The skein holder is available only for 45°/0° MiniScan EZ models. This is a device for measuring yarn skeins. Wind the yarn around the skein holder in multiple taut layers until it is effectively opaque and is as flat as possible. Secure it in place with the detachable arms on the sides of the skein holder. Place the skein holder on a flat surface or the calibration tile holder and press the MiniScan EZ's sample port flat against the sample. Make several measurements of the skein, rotating the holder 90° between measurements and averaging the readings for the result.

Figure 9. Skein Holder

Figure 10. Measuring with the Skein Holder

45/0 LAV Nose Cone with Lower Glass Assembly (HL#A02-1014-374)
Nose Cone with Lower Polycarbonate Assembly (HL# D02-1014-427)

This option includes a special nose cone with a removable glass or plastic port cover assembly. The nose cone (black) portion is intended for permanent use on the instrument and should not be removed. Replacement cover assemblies (the lower portion of the device) are available from HunterLab. The assembly is sealed but is not to be considered waterproof. The nose cone/lower cover is generally in place when the MiniScan EZ is shipped from the factory. However, if installation is required, place the assembly over the instrument port and secure it using three Phillips-head screws. If the glass or plastic cover is to be replaced, remove the three machine screws with lock washers, replace the window and the O-ring, and secure it using the machine screws.

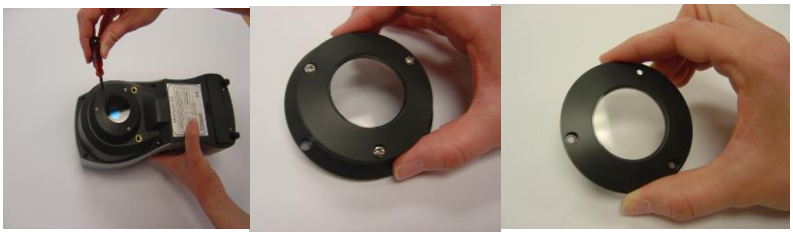


Figure 11. Nose Cone with Glass or Polycarbonate

420-nm UV Filter Assembly (HL# D02-1014-436)

This option provides a 420-nm UV filter in a replaceable assembly for the 45/0 LAV MiniScan EZ. The UV filter may be replaced when necessary, however, the instrument is not to be used without the UV filter assembly in place.

Note: The special nose cone required for use of this part is not included but may be purchased separately.

To install the UV filter assembly, secure it to the instrument nose cone using three 4-40 pan-head screws with split-lock washers. Replacement UV filter assemblies are available from HunterLab and are marked ***UV*** to differentiate them from cover glass assemblies. To replace the UV filter assembly, remove the screws and lift the assembly off the nose cone. Place the new UV filter assembly on the nose cone and replace the screws.

MiniScan EZ with EasyMatch QC

Install EasyMatch® QC Software

Complete the following steps:

1. Log into the system using an account that has **ADMINISTRATOR** privileges for the PC — network or local.
2. Insert the installation CD into the CD-ROM drive. If the system is setup to automatically run CD programs, the menu will appear and you may skip to Step f. Otherwise, continue with Step c.
3. Select the Easy Match QC Icon or from Windows, go to ***START > RUN > EZMQC_MENU*** and ***OPEN***. The following screen will be shown.

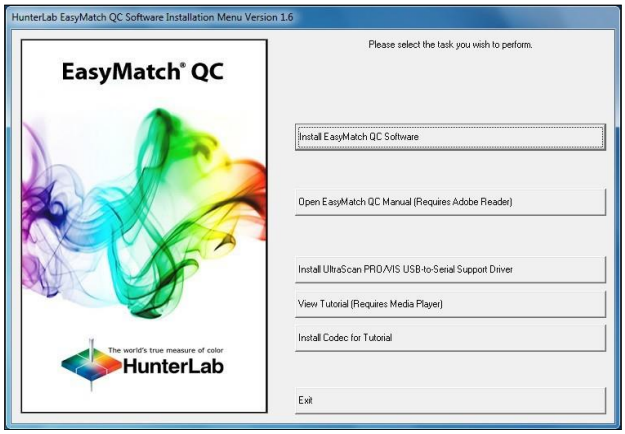


Figure 12. EasyMatch QC Installation

4. Select ***INSTALL EASYMATCH QC SOFTWARE*** and follow the screen prompts.
5. Select ***SOFTKEY LICENSE*** as the type of key to use with the software.

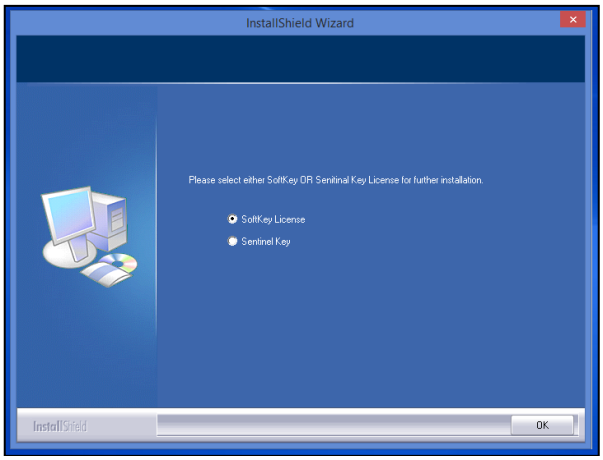


Figure 13. Software Key License

6. When the EasyMatch QC installation is finished, select the **OPTION BUTTON** next to ***YES, I WANT TO RESTART MY COMPUTER NOW*** and then ***FINISH*** to restart the computer and log back in.

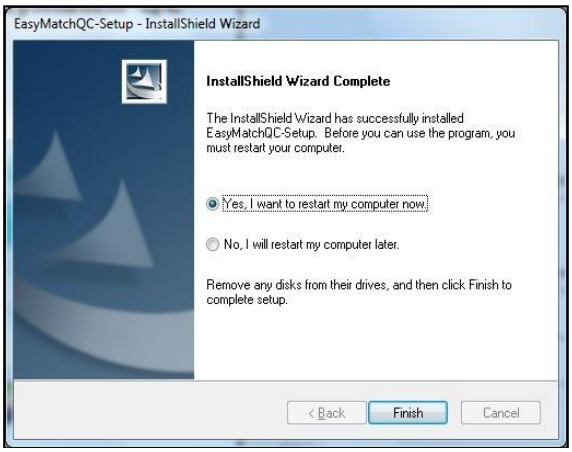


Figure 14. Completed Install

7. The CD can now be removed.

Activate the SoftKey License

1. From the Desktop, select the EasyMatch QC Icon or from the Windows Start menu, choose the following to open the software:

   START > PROGRAMS > HUNTERLAB > EASYMATCH QC

2. A warning message to activate the license will be displayed as shown below.

   Note: EasyMatch QC functions are unavailable before key activation.

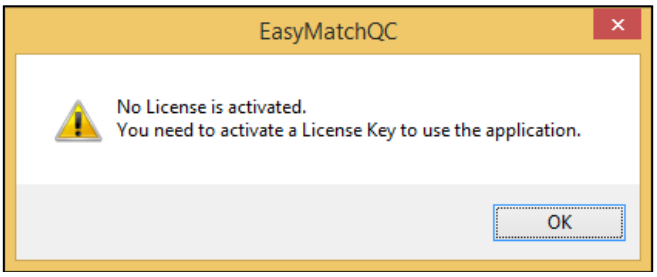


Figure 15. No License Warning

3. The SoftKey License is uniquely associated with the sensor serial number and is provided on a thumb drive supplied with EasyMatch QC or via email from HunterLab.
4. Go to ***HELP > LICENSE REGISTRATION > ACTIVATION***.
5. Select ***ACTIVATE LICENSE***.

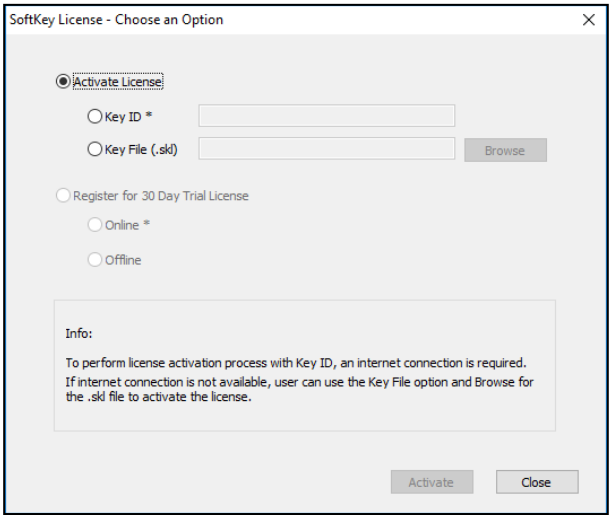


Figure 16. Activate License

i. Option #1: Key ID.

This method is for copying the ID from an email or writing down the 32-digit code. This requires an internet connection.

a. From the ***Choose an Option*** page (Figure 10), select ***Key ID***.

b. Paste-in or type-in the License Key ID and click ***Activate***.

c. An acknowledgement will be displayed showing the activation status.

ii. Option #2: Key File (.skl)

This method is for using the SoftKey License (.skl file) on the thumb drive.

a. Place the thumb drive with the SoftKey License in the USB port.

b. From the ***Choose an Option*** page (Figure 5), select ***Key File*** (.skl).

c. Browse the USB to find the SoftKey License (.skl) file, then click ***Activate***.

d. An acknowledgement will be displayed showing the activation status.

iii. Option #3: Sentinel Key

a. If the user has a HunterLab USB hardware key, then it can be used with a new sensor on the same computer. Return to Install the Software, Step 5 (Figure 11) and select Sentinel Key to continue.

iv. *Option #4: 30-day trial*

a. Fill out the registration form provided for the 30-day trial. Connect to the internet. HunterLab will approve the trial and email the SoftKey license back. Follow the directions for Option #1 or #2 to complete.

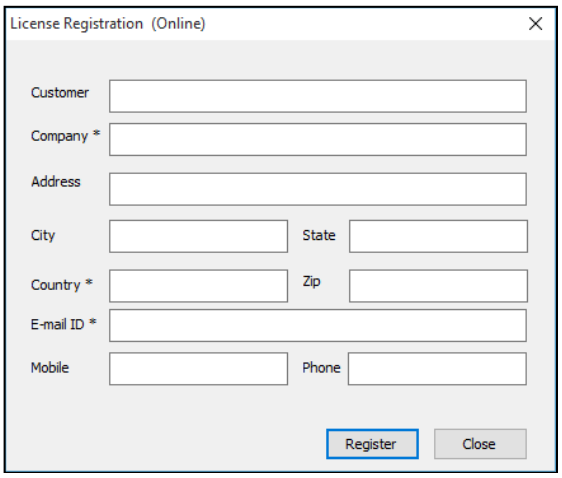


Figure 17. Request 30-day Trial

Sensor > Add Sensor

1. Upon initial startup, the following message will be displayed: ***SENSOR NOT YET INSTALLED***. ***PLEASE INSTALL A SENSOR TO TAKE MEASUREMENTS***. This message will remain until you proceed to the ***INSTALL > CONFIGURE*** command in the Sensor menu and install a new sensor.
2. The Sensor Manager appears first:

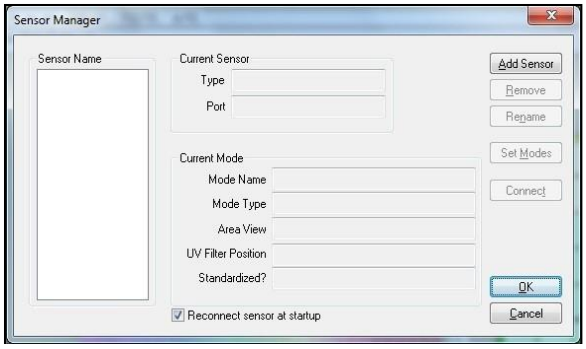


Figure 18. Sensor Manager

3. Select ***ADD SENSOR*** to install a new sensor. The Setup Sensor screen allows selection of the instrument model and the communications port. Select ***NEXT*** when ready.

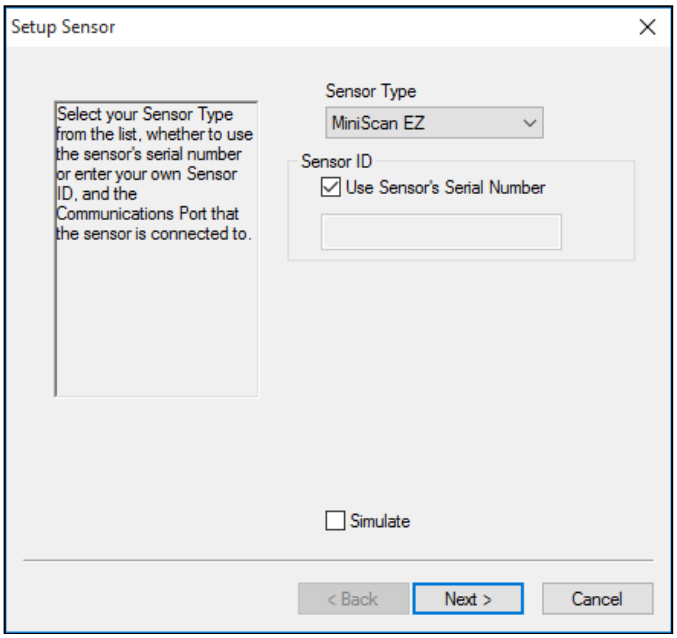


Figure 19. Setup Sensor

Note: If using a typical 9-pin serial cable for communications between the sensor and PC, select COM1. If using USB-to-serial adapter, then select the highest number COM Port No. offered. If using USB communications, the COM port will automatically be selected.

4. Turn on the MiniScan EZ by switching the on/off switch on the back of the sensor to the on position. Allow the instrument to warm up for two hours prior to standardizing and making measurements.

Sensor > Standardization

Standardization sets the top and bottom of scale for the neutral axis. During standardization, the bottom of the scale (zero) is set first. For this, you simulate the case where all the source light is absorbed by the sample. This is done by placing the black glass or light trap that is contained in the calibration can at the sample port. The top of the scale is then set by scaling the light which is reflected back from the calibrated white tile also in the calibration can. Messages from EasyMatch QC prompt you through the standardization process as described below.

It is recommended that the MiniScan EZ be standardized at least once every four hours. Using the ***SENSOR > SET INTERVAL*** feature, the instrument can be set up to automatically prompt for standardization when the time limit has been met. The MiniScan EZ should also be standardized any time there is a significant change (greater than 5°F) in ambient temperature. For example, if you move your MiniScan EZ from your air-conditioned office to an outdoor site that is 90°F, you should standardize again outdoors after the instrument has had a chance to stabilize under the new temperature.

To initiate go to ***SENSOR > STANDARDIZE*** to proceed to standardization. Select ***NEXT*** to complete the installation.

It is very important that the standards used in standardization be treated carefully. They must be clean and in good condition if standardization is to be successful.

Standardization of a MiniScan EZ is performed as follows:

1. Remove the calibration cylinder from the carrying case.
2. Check that the tiles are clean and that the light trap is free of dust and scratches. If they are dirty (including marked with fingerprints), clean them as described in **MAINTAINING AND TESTING MINISCAN EZ**.

Figure 20. Calibration Cylinder

Note: If your MiniScan EZ is a 45°/0° model, your cylinder will contain a black glass. If it is a diffuse/8° (sphere) model, it will contain a light trap.

3. Select ***SENSOR > STANDARDIZE***. The Standardization screen appears, prompting you to place the black glass or light trap.

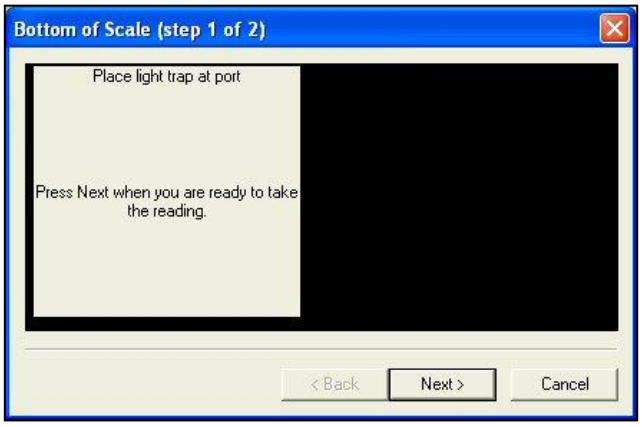


Figure 21. Begin Standardization

4. Remove the end cap of the calibration cylinder that covers the black glass and press the nose cone of the MiniScan EZ to the shiny side of the glass. Check that the sample port is flat against the black glass.

OR

Remove the end cap of the calibration cylinder that covers the light trap and cover the MiniScan EZ's sample port with the light trap. Check that the light trap completely covers the port.

Figure 22. Reading the Calibration Cylinder

5. Press ***NEXT*** and the MiniScan EZ reads the glass or trap and sets the instrument zero.
6. Replace the black glass or light trap with the white tile, which is contained in the calibration can's end cap. Press the nose cone of the MiniScan EZ to the white side of the tile. Check that the sample port is flat against the tile.

Figure 23. Reading the White Tile

7. Press ***NEXT***. The MiniScan EZ reads the white tile and sets the top of scale. When it is finished, the screen indicates that the instrument has been successfully standardized.

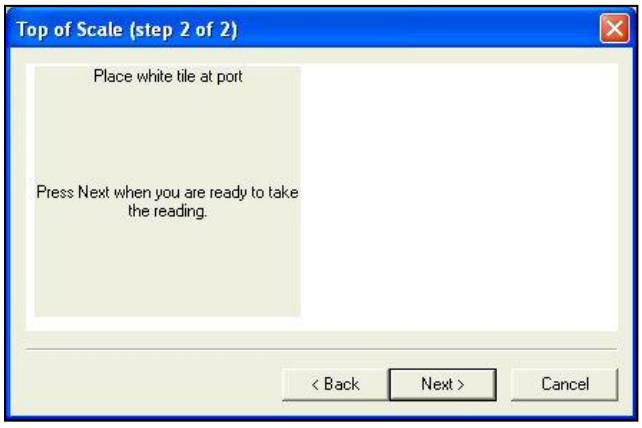


Figure 24. Prompt to Read the White Tile

It is recommended that the instrument be standardized at least once every four hours. Then you may proceed with sample measurement.

Take Sample or Standard Measurement

Reading Samples and Standards

From the ***MEASUREMENTS MENU***, you may read either a standard or a sample. You may also average data. The functions available through the ***MEASUREMENTS MENU*** are described in the EasyMatch QC Reference Manual.

Sensor > Configure Setups (for Product Measurements)

The **CONFIGURE SETUPS** command in the **SENSOR** menu appears when the connected instrument is a MiniScan EZ. When selected, the Setup Groups window appears to create, edit, or delete setup groups and upload, modify, and download individual setups.

Figure 25. Configure Setups

Upload

When you click ***UPLOAD***, all of the setups stored in the instrument are brought into EasyMatch QC. These setups can then be edited, if desired. The setups can also be saved as a setup group by typing a name into the white box or selecting a name from the drop-down list and clicking ***SAVE***. Later, you can select the desired group and click ***GET*** to retrieve that saved group of setups or ***DELETE*** to delete the group of setups.

Download

When you click ***DOWNLOAD***, the setups in the current EasyMatch QC setup group are sent back to the instrument.

Edit

When you click ***EDIT***, the Product Setup Configuration screen appears.

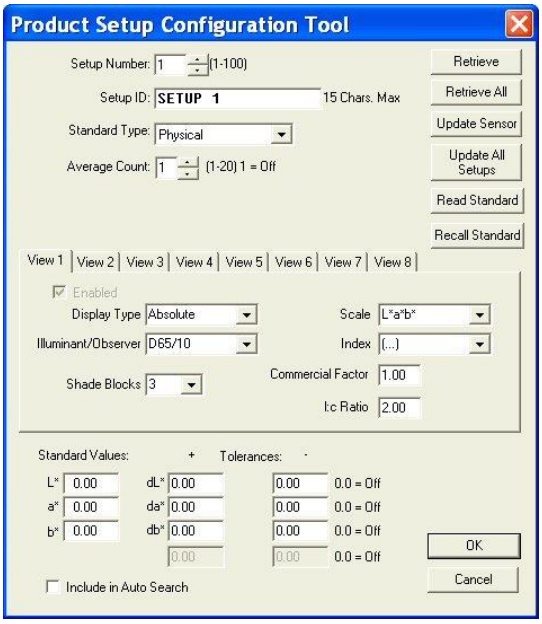


Figure 26. Product Setup

Use the scroll bar next to Setup Number or type a setup number into the box to choose a setup with which to work. If you wish to begin working with the version of the setup that is already resident in your instrument, click ***RETRIEVE***. If you wish to work with the version of the setup that is shown on-screen, do not click ***RETRIEVE***.

Alter the setup parameters as desired. The parameters and selections available are the same as those configured through your instrument firmware. If you are using a physical standard, you may click the ***READ STANDARD*** button to read the standard to be saved with the setup using your instrument or ***RECALL STANDARD*** to recall a standard from your EasyMatch QC database to be saved with the setup.

When all parameters are as desired for this setup, click ***UPDATE SENSOR*** to send the setup to your instrument. You may retrieve all the setups from the instrument at once using the **RETRIEVE ALL** button or send all the setups back to the instrument at once using the **UPDATE ALL SETUPS** button.

Sensor > Import Logged Reads

The **IMPORT LOGGED READS** command in the **SENSOR** menu appears when the connected instrument is a MiniScan EZ. There must be items saved to the instrument Data log in order to use this command.

The Data log screen appears first.

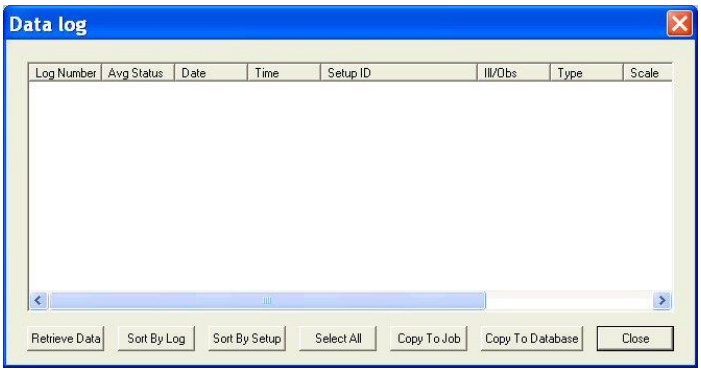


Figure 27. Data Log Screen

Retrieve Data

Copies of the measurements stored in the instrument's Data log can be retrieved to the Data log screen.

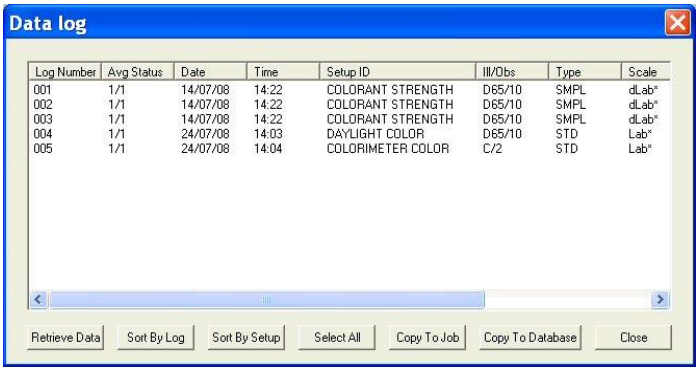


Figure 28. Retrieve Data

Once the measurements are shown, the remainder of the buttons at the bottom of the screen become active and serve the following functions:

Sort By Log

Causes the measurements shown in the Data log window to be sorted by their instrument Data log ID numbers for easier viewing.

Sort by Setup

Causes the measurements shown in the Data log window to be sorted by their instrument setup numbers for easier viewing.

Select All

Selects (highlights) the measurements shown on the Data log screen so that the **COPY TO JOB** or **COPY TO DATABASE** command may be applied to all of them at once. (The alternative to **SELECT ALL** is to use the Windows convention of clicking on a single item to select it, **CTRL +** clicking on multiple items to select them, or **SHIFT +** clicking on the first and last of a list of items to select all the items between.)

Copy to Job

Places the measurements that are currently selected into the active job. Standards are automatically placed in the job as standards. You are prompted to indicate the standard under which samples should be saved.

Copy to Database

Places the measurements that are currently selected into the database. Standards are saved as standards and samples as samples, and the Data log ID number is used as the item ID.

The measurements copied to the job or EasyMatch QC database are NOT deleted from the instrument's Data log. If you wish to delete them, you must do so manually though the instrument firmware.

MiniScan EZ Maintenance and Testing

The MiniScan EZ does require some maintenance. This chapter outlines the parts of the MiniScan EZ you must maintain in order for the instrument to function properly and tests that you may run to assess its performance.

Note: The MiniScan EZ contains hazardous voltages and no user-replaceable parts. It should be disassembled only by HunterLab personnel.

Routine Maintenance

The following schedule outlines recommended maintenance procedures for the MiniScan EZ. The actual frequency of maintenance required will be determined by the measurement application and plant operating conditions.

Weekly

Clean the exterior of the sensor and mounting. The MiniScan EZ is NOT waterproof, but the exterior of the case may be wiped with a damp cloth. Keep the glass cover under the port plate free of dust, smears, and fingerprints..

Monthly

Clean the standards as per the directions below. If a Hitch Standard has been used, then compare hitch standard values for the MiniScan EZ to those of the off-line colorimeter. Re-hitch the MiniScan EZ if necessary or desired.

As Needed

Perform Diagnostics.

System Warm-Up

If power to any of the system components has been turned off, it must be restored to all components before operation can resume. When restoring power to system components:

- Restore power to the instrument and computer (if included).
- Allow at least thirty minutes of warm-up time.
- Standardize.
- Select the desired product setup and begin operation.

Cleaning the Instrument Standards

The White Standard tile and Black Glass are unique to each individual instrument and should be treated with great care. They should always be protected from physical damage and dirt .

Cleaning the White Tile

The White Standard is an optical coating and should be handled in much the same way as other optical surfaces. Although the material is durable, care should be taken to prevent contaminants such as finger oils from contacting the material's surface. Always keep tiles in the Standards box when not in use

- If the surface appears lightly soiled, it may be air brushed with a jet of clean dry air. For heavier soil, the material can be cleaned by scrubbing with a soft brush under running water. Blow dry with clean air or allow the material to air dry. If the material is heavily stained, soak with either an extremely mild mix of soap and water, 5% white distilled vinegar, or hydrogen peroxide. Then run under water while scrubbing with a soft brush.

Cleaning the Black Glass and Green Tile

The **Green tile and Black Glass** can be cleaned using a soft nylon-bristle brush, warm water, and laboratory grade detergent such as SPARKLEEN. Wipe the tiles dry using a clean, non-optically brightened, lint free paper towel, or use warm water as a rinse and let stand to air-dry for a couple of minutes.

Note: SPARKLEEN is manufactured by Fisher Scientific Co., Pittsburgh, PA 15219, and may be ordered from them using catalog number 4-320-4. Add one tablespoon of SPARKLEEN to a gallon of water.

The above procedure is particularly useful if the lab area is not clean. If, however, the lab is clean, an equally effective method for occasional tile cleaning is to use IPQ (isopropyl alcohol) sprayed onto a clean, non-optically brightened, lint free paper towel such as a Kimwipe. Wipe tile thoroughly watching for fingerprints and let air dry.

Keep the **Black Glass** in the standards case when not in use to prevent it from becoming scratched or collecting dust. Before standardizing the instrument, check the black tile for scratches and dust. Significant scratches that result in a hazy appearance to the finish may cause standardization to be in error. If the black tile is scratched, call the HunterLab Order Processing Department, or contact your local HunterLab representative to order a replacement.

Diagnostics on the MiniScan EZ

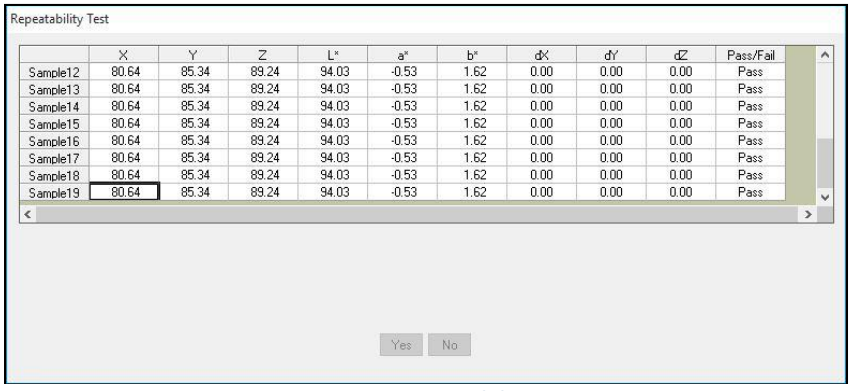
Running the Repeatability Test

You may test the repeatability of your instrument as follows:

1. Turn the MiniScan EZ on and allow it to warm it up for 2 hours. Meanwhile, clean the white tile as described on the next page and allow the tile to return to room temperature.

2. Follow the instructions given in the **SENSOR MENU > DIAGNOSTICS** section to run the repeatability test that is built into EasyMatch QC.

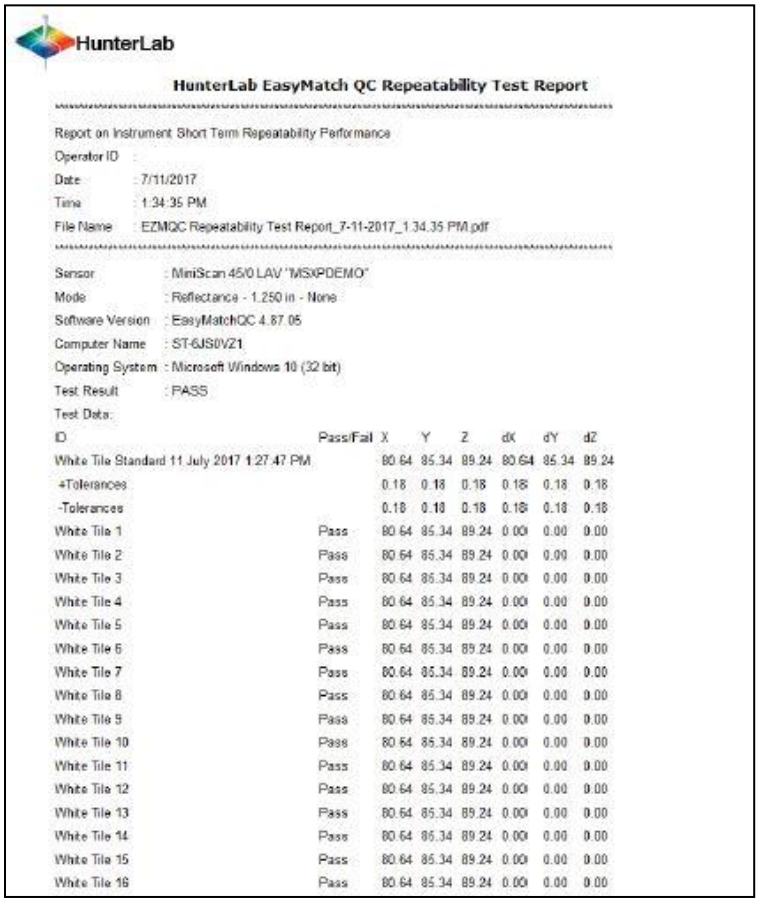
3. Standardize the instrument. Place the white tile flush at the port and read 20 times by pressing ***YES***.



	X	Y	Z	L*	a*	b*	dX	dY	dZ	Pass/Fail
Sample12	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample13	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample14	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample15	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample16	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample17	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample18	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass
Sample19	80.64	85.34	89.24	94.03	-0.53	1.62	0.00	0.00	0.00	Pass

Figure 29. In Progress Repeatability Test

4. When the test is completed, a report is generated as shown in the next Figure.



HunterLab

HunterLab EasyMatch QC Repeatability Test Report

Report on Instrument Short Term Repeatability Performance
Operator ID :
Date : 7/11/2017
Time : 1:34:35 PM
File Name : EZMQC Repeatability Test Report_7-11-2017_1.34.35 PM.pdf

Sensor : MiniScan 45/0 LAV "MSXPDEMO"
Mode : Reflectance - 1.250 in - None
Software Version : EasyMatchQC 4.87.05
Computer Name : ST-6JS0VZ1
Operating System : Microsoft Windows 10 (32 bit)
Test Result : PASS
Test Data:

ID	Pass/Fail	X	Y	Z	dX	dY	dZ
White Tile Standard 11 July 2017 1:27:47 PM		80.64	85.34	89.24	80.64	85.34	89.24
+Tolerances		0.18	0.18	0.18	0.18	0.18	0.18
-Tolerances		0.18	0.18	0.18	0.18	0.18	0.18
White Tile 1	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 2	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 3	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 4	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 5	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 6	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 7	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 8	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 9	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 10	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 11	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 12	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 13	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 14	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 15	Pass	80.64	85.34	89.24	0.00	0.00	0.00
White Tile 16	Pass	80.64	85.34	89.24	0.00	0.00	0.00

Figure 30. Repeatability Report

Recharging/Replacing the Batteries

When the battery level indicator on the MiniScan EZ screen has decreased to outline only, you should replace the batteries with fresh or recharged ones.

Note: The MiniScan EZ can use six standard AA alkaline batteries or six rechargeable AA NiMH batteries. Do not mix battery types in the instrument. It is best to use the rechargeable AA NiMH batteries that come with the instrument. To recharge the NiMH batteries, remove them from the instrument and recharge them using the supplied charger.

Replacing the Lamp

Lamp replacement requires a trained technician. Contact HunterLab Technical Support to arrange for lamp replacement. Please read **WHEN YOU NEED ASSISTANCE** prior to contacting HunterLab.

Cleaning the MiniScan EZ

Clean the outside surfaces of the MiniScan EZ using a soft cloth. Do not spray liquids directly on the instrument.

MiniScan EZ Specifications

The specifications and characteristics of your instrument are given in this section. For best performance, your instrument should be placed where there is ample work space with medium or subdued illumination and no drafts. The operating conditions (temperature and humidity ranges) are given in the Operating Conditions section below.

Operating Conditions

MiniScan EZ can be stored in an area with a temperature range of-20°C to 65°C (-5°F to 150°F) for up to 3 weeks and can be operated under temperature conditions of 10°C to 40°C (50°F to 104°F). For specification-level performance, the recommended temperature range is 21-28°C (70-82°F). It may be operated under relative noncondensing humidity conditions of 10% to 90%. Do not leave MiniScan EZ in an area where temperature or humidity extremes are possible.

Physical Characteristics

Weight	1 kg (2.25 lb.)
Dimensions (HxWxD)	14 cm x 11 cm x 26.7 cm 5.5 in x 4.3 in x 10.5 in
Communications Interface	USB to computer or printer
RFI Compliance	FCC Class A (Commercial), IEC, or equivalent
Safety Compliance	UL, CSA, IEC, or equivalent

Conditions of Illumination and Viewing

Light Source	Pulsed xenon
Source UV content	Match to D65 with CIE rating of CC or better
Lamp Life	>1 million flashes
45°/0° Illumination	Annular, using a cylindrical mirror
Integrating Sphere	63.5 mm (2.5 in) diameter, coated with SpectraFlect; (diffuse/8° instruments only)
Detection	2-channel polychromator with 256-element scanned array (half for sample channel, half for monitor)
Port Diameters/View Diameters	**45°/0° LAV model:** 31.8 mm (1.25 in)/ 25 mm (1.0 in) **45°/0° SAV model:** 6 mm (0.25 in)/ 5 mm (0.20 in) **Diffuse/8° LAV model:** 25 mm (1.0 in)/ 20 mm (0.8 in) **Diffuse/8° SAV model:** 14.3 mm (0.6 in)/ 8 mm (0.3 in)

System Power

Power Input	Disposable or rechargeable AA batteries
Battery Life	>4,000 readings per charge

Instrument Performance

Spectral Data	Range: 400-700 nm Reporting Interval: 10 nm
Bandwidth at Half-height	10 nm
Wavelength Accuracy	≤0.75 nm
Photometric Range	0-150% reflectance
Photometric Resolution	0.01% reflectance
Measurement Speed (at 23°C)	≤1.5 seconds
Measurement Storage Capacity	800 spectral readings 100 product setups

Note: Every attempt at accuracy is made, but specifications are subject to change without notice.

Note: Use of this equipment in a manner not specified by the manufacturer may impair the protection afforded by the equipment. Danger of electric shock if liquids are spilled and fire if volatile or flammable liquids are spilled. Use care when measuring liquid samples.

Regulatory Notice

A copy of the Declaration of Conformity per ISO/IEC Guide 22 and EN 45014 follows on the next page.

HunterLab
ISO 9001 Certified

Declaration of Conformity

Application of Council Directive:	**2004/108/EC (EMC)** **2006/95/EC (LVD)**
Standards to which Conformity is Declared:	**EN 61326-1:2013** **EN 61010-1:2010**
Manufacturer:	**Hunter Associates Laboratory, Inc.** **11491 Sunset Hills Rd, Reston, VA, USA**
European Representative:	**Christian Jansen**
Representative's Address:	**Christian Jansen, Griesbraeustrasse 11, 82418 Murnau, Germany**
Type of Equipment:	**Spectrophotometer**
Model No.:	**MiniScanEZ**

I, the undersigned, hereby declare that the equipment specified above conforms to the Directive(s) and Standard(s) above

Place: *Reston, VA, USA*

Date: *August 31, 2014*

Signature: Tim Barrett

Full Name: *Tim Barrett*

Position: *Systems Engineer*

When You Need Assistance

If you need for technical or sales assistance on applications, troubleshooting, , service, warranty, accessory pricing and more, please contact the office nearest you:

For the Americas, Support@hunterlab.com

For Asia, AsiaSupport@hunterlab.com

For Europe, EuropeSupport@hunterlab.com

For India, Middle East and Africa, IMEASupport@hunterlab.com

For all other regions, Support@hunterlab.com

Additionally, our global support website offers 24/7 assistance with a library of information on various color measurement and appearance topics such as applications, instrument operation, and troubleshooting. The HunterLab global support website is located at **support.hunterlab.com**.

For personalized assistance, go to support.hunterlab.com and locate the **Create A Ticket** button on the menu. A subsequent form gathers information on your request for response from our Customer Experience Teams around the globe.

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