ColorFlex® EZ
Supplemental Manual for EasyMatch® QC

The world's true measure of color
HunterLab

Hunter Associates Laboratory
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Reston, Virginia 20190 USA
www.hunterlab.com

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Copyrights and Trademarks

EasyMatch QC and ColorFlex are registered trademarks for Hunter Associates Laboratory, Inc.

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

Duraflect, Spectraflect, and Spectralon are trademarks of Labsphere, Inc.

Teflon is a registered trademark of Dupont.

Caution: If the equipment is used in a manner not specified by the HunterLab, the overall safety 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.

Contents

ColorFlex EZ Features

The ColorFlex EZ spectrophotometer is a versatile color measurement instrument that can be used for reflectance measurement of products in industries such as paint and textiles. Although the instrument is AC-powered, the small footprint of the ColorFlex EZ allows for portable operation.

Figure 1. ColorFlex 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. This is an objective means of quantifying a sample's color.

ColorFlex EZ is available in one geometry – 45° illumination/0° viewing. The label on the back of the instrument provides information on the serial number.

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

ColorFlex EZ Accessories

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

- Black glass - placed at the sample port during standardization of 45°/0° instruments.
- White calibrated tile - placed at the sample port during standardization.
- Diagnostic Green tile - used to check instrument performance.
- Standards care card - gives instructions on how to clean the standards.
- Lens wipes.
- Certificate of traceability for the calibrated white tile.
- USB computer interface cable.
- AC adapter, 2 A/9V.
- ColorFlex EZ User's Manual
- USB Flash disk for Datalog Export

ColorFlex Options and Sample Devices

There are many options and devices available for positioning samples at the measurement ports of the ColorFlex 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***.

ColorFlex EZ Installation

The ColorFlex EZ is simple to set up and attach to your computer. Before operating the ColorFlex EZ with EasyMatch QC, you need to 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. Plug the USB cable into the USB port on back left of the ColorFlex EZ.
3. Plug the flat end of the USB cable into the appropriate USB port on the computer.

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 5. Otherwise, continue with Step 3.
3. Select the Easy Match QC Icon or from Windows, go to ***Start > Run >EZMQC_Menu*** and ***Open***. The following screen will be shown.

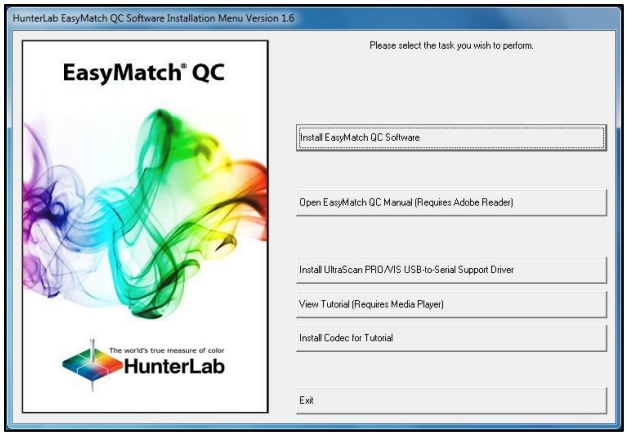

Figure 2. EasyMatch QC Installation

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.

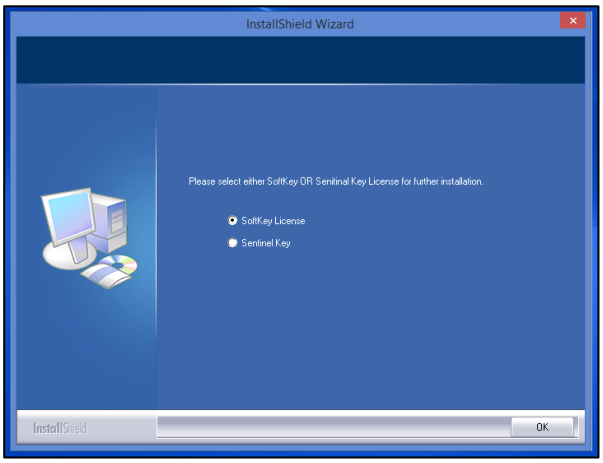

Figure 3. Software Key License

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.

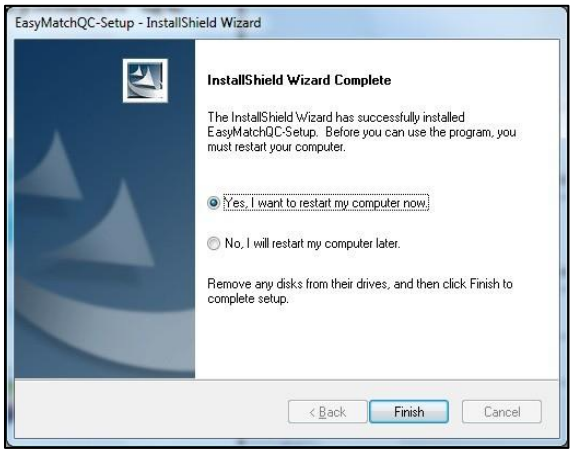

Figure 4. Completed Install

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.

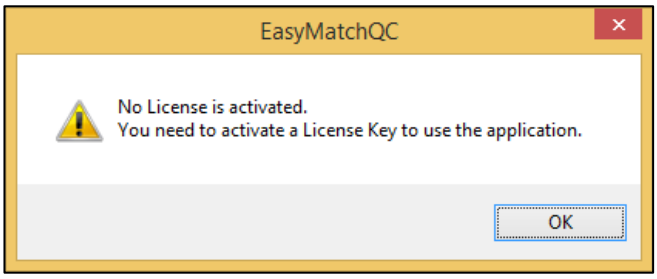

Figure 5. No License Warning

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***.

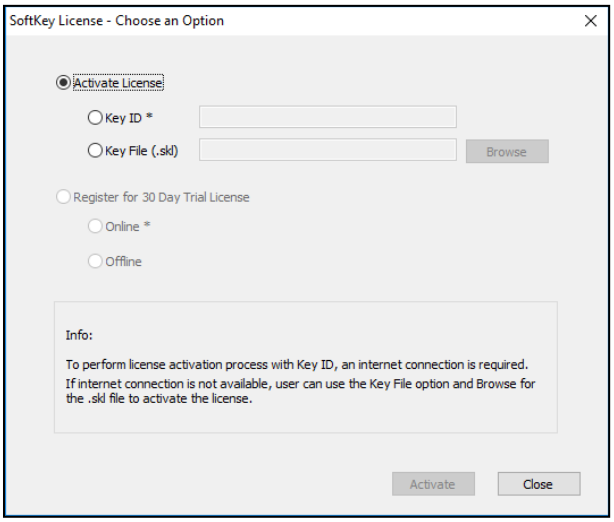

Figure 6. Activate License

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 5), 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 6), 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, Step 5 (Figure 3) and select the ***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.

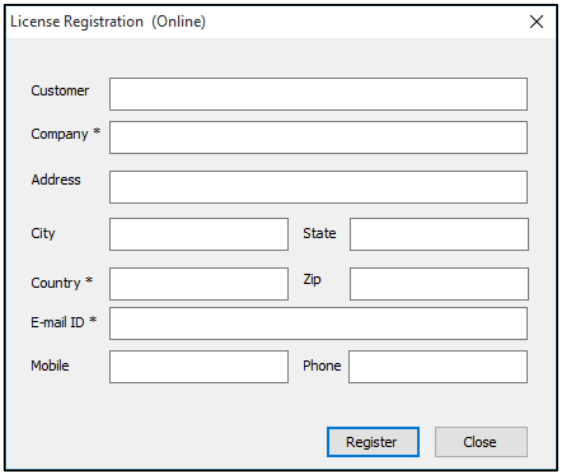

Figure 7. Request 30-day Trial

Add the 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 ***Sensor Menu > Install > Configure*** command and install a new sensor.
2. The Sensor Manager appears first:

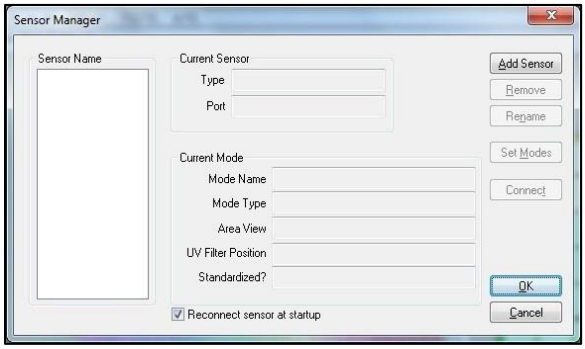

Figure 8. Sensor Manager

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.

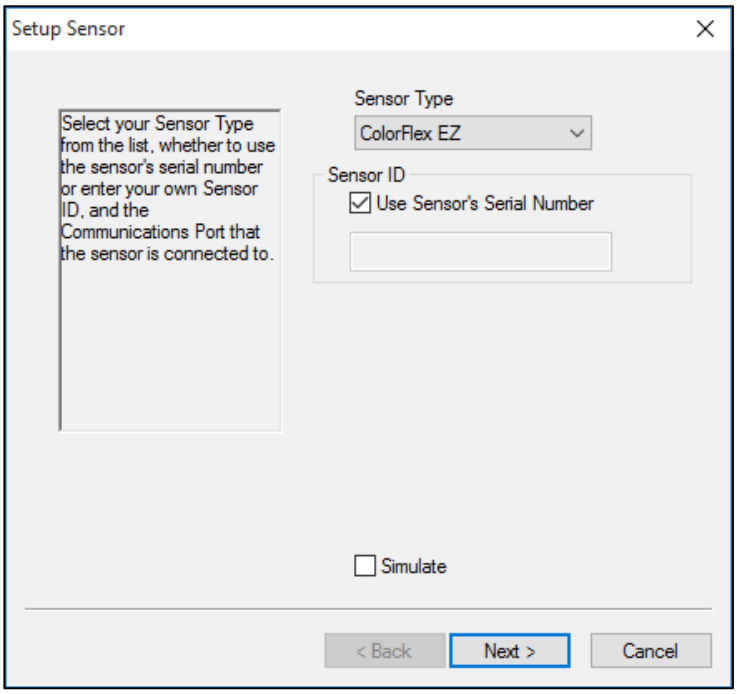

Figure 9. Setup Sensor

4. Connect the instrument using the USB communications port on the instrument to the computer with EasyMatch QC.
5. Remove the tape covering the reflectance port.
6. Place the desired port plate at the reflectance port and snap it into place.
7. Turn on the ColorFlex EZ by pressing and holding the Read Button. Allow the instrument to warm up for two hours prior to standardizing and making measurements.

ColorFlex EZ Standardization

The ColorFlex EZ must be standardized on a regular basis to keep it operating properly.

Standardization on a ColorFlex EZ model with 45°/0° geometry requires reading of the black glass and the calibrated white tile that are contained in the standards box. Standardization can be done through EasyMatch QC (by selecting ***Sensor Menu > Standardize*** or by clicking the ***Standardize*** button on the default toolbar) or directly through the ColorFlex EZ firmware.

It is recommended that the instrument be standardized at least once every four hours (***Sensor > Set Interval***). Then proceed with sample measurement.

ColorFlex EZ Maintenance and Testing

The ColorFlex EZ requires minimal maintenance. This chapter describes cleaning of the instrument and tiles and running diagnostic tests as part of normal instrument maintenance.

Cleaning of the ColorFlex EZ

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

Diagnostic Test #1: Running Short Term Repeatability

Short Term Repeatability of your instrument may be tested using the calibrated white tile as follows:

1. Turn the ColorFlex EZ on and allow it to warm up for 2 hours. Meanwhile, clean the calibrated white tile as described and allow the tile to return to room temperature.
2. Follow the instructions given in the ***Sensor Menu > Diagnostics*** section to run the short repeatability test that is built into EasyMatch QC.

Diagnostic Test #2: Running Long Term Repeatability

Long Term Repeatability is measured using the Green Tile as follows:

1. If needed, clean the diagnostic green tile and allow the tile to return to room temperature.
2. Follow the instructions given in the ***Sensor Menu > Diagnostics*** section to run the long-term repeatability test that is built into EasyMatch QC.

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.

ColorFlex 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

ColorFlex 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 ColorFlex EZ in an area where temperature or humidity extremes are possible.

Physical Characteristics

Weight	4.5 kg (9.9 lb.)
Dimensions	Height: 16 cm (6.3 in) Width: 13 cm (5.1 in) Depth: 36 cm (14.2 in)
Communications Interface	3 USB 2.0 ports
RFI Compliance	FCC Class A (Commercial), IEC, or equivalent
Safety Compliance	UL, CSA, IEC, or equivalent
System Power	100 to 240 VAC, 47 to 63 Hz

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
Geometry	Directional annular 45° Illumination/0° Viewing
Detector	Sealed optics; 256-element scanned array & high-resolution concave holographic grating
Port Diameters/Sample View Diameters	31.8 mm (1.25 in)/25 mm (1.0 in)

Instrument Performance

Spectral Data	Range: 400-700 nm Reporting Interval: 10 nm
Bandwidth at Half-height	10 nm
Photometric Range	0-150% reflectance
Measurement Speed (at 23°C)	≤1.5 seconds
Measurement Storage Capacity	2000 spectral readings as sample 250 spectral or tristimulus standards with Pass/Fail Tolerances 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 according to ISO/IEC Guide 22 and EN 45014 follows:

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.:	**ColorFlexEZ**

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*

Instrument Replacement, Repair, Problems, and Questions

The following HunterLab policies are described in this chapter:

- Warranty
- Claims
- Returns/Service
- Technical Assistance.

Warranty

HunterLab warrants that all instruments it manufactures are free from defects in material and workmanship under normal use. This warranty is limited to repairing or replacing any defective hardware or software that may cause the instrument to perform outside of its specified tolerances. This warranty is one year from date of shipment of new instruments and two months from the date of shipment of repaired instruments.

Note that printers and computers are covered under the original manufacturer's warranty.

The warranty is void if the user has made unauthorized repairs, improperly installed, operated, or subjected the instrument to conditions outside of the specifications in the product documentation.

The HunterLab warranty does not cover consumable items such as lamps, fuses, batteries, etc. An instrument registration card is shipped with each HunterLab instrument. It is important that the instrument owner returns this card promptly upon receipt of equipment.

Questions concerning operation, maintenance, or repair of your equipment can be directed to the Service Department at Service@hunterlab.com. Additional information can be obtained at http://support.hunterlab.com.

Shipping Claims

All materials are sold F.O.B. from Reston, Virginia (unless otherwise specified) and HunterLab responsibility ends upon delivery to the first carrier. All claims for loss or damage must be rendered by the consignee against the carrier within fifteen days of receipt of goods. A copy of this notice must also be forwarded to HunterLab within five days of its receipt.

Breakage or Damage

According to the contract terms and conditions of the carrier, the responsibility of the shipper ends at the time and place of shipment. The carrier then assumes full responsibility. Perform the following procedures if your instrument arrives broken or damaged.

Freight or Express

1. Notify your local carrier.
2. Hold the damaged goods with their container and packaging for inspection by the examining agent. Do not return any goods to HunterLab prior to inspection and authorization of the carrier.
3. File a claim against the carrier. Substantiate this claim with the examining agent's report. A certified copy of our invoice is available upon request. The original B/L is attached to our original invoice. If the shipment is prepaid, write for a receipted transportation bill.
4. Advise HunterLab regarding replacement.

Parcel Post Shipment

1. Notify HunterLab at once in writing, giving details of the loss or damage. This information is required for filing a claim.
2. Hold the damaged goods with their container and packaging for possible inspection by postal authorities.
3. Advise HunterLab regarding replacement.

United Parcel Service

1. Contact your local UPS office regarding damage and insurance claim. Each UPS office has a different method of handling these occurrences and yours will advise you of its procedures.
2. Retain the container and packaging.
3. Notify HunterLab at once for replacement.

Shortage

Perform the following procedure if your order appears to be missing items.

1. Check the packing list notations. The apparent shortage may be a back ordered item and may be marked as an intentional short-ship.
2. Re-inspect the container and packing material, particularly to locate smaller items.
3. Ascertain that the item was not removed by unauthorized personnel prior to complete unpacking and checking.
4. Notify HunterLab immediately of the shortage in writing.

Incorrect Shipment

Perform the following procedure if material received does not correspond with your order.

1. Notify HunterLab immediately, referencing order number and item.
2. Hold incorrect items until return shipping instructions are received.

Returns

A service request order (SRO) number is required before any items can be returned to HunterLab. Contact HunterLab's Order Processing Department to obtain an SRO for damaged or incorrect parts, or the HunterLab Service Department to obtain an SRO to return an instrument for service.

Do not return any damaged or incorrect items to HunterLab until all shipping instructions are received.

Note: HunterLab must be notified within fifteen days or we cannot accept responsibility for damaged or incorrect items.

HunterLab offers complete repair service for all instruments it manufactures. Call HunterLab for the service facility nearest your location. If your equipment is not functioning properly, contact the HunterLab Service Department for maintenance or repair instructions. Many times, this on-the-spot diagnosis is all that is required.

If repair is required, HunterLab offers two means of servicing. Instruments may be returned to a HunterLab service facility for repair or a HunterLab Service Department technician can come to your location to perform on-site repair. For schedule and terms for on-site repairs by trained service technicians, call the HunterLab Service Department. Please read "When You Need Assistance" prior to contacting HunterLab.

The customer is responsible for incoming and outgoing freight charges for instruments being returned to HunterLab for all repairs, including warranty repairs.

Packing and Shipping Instruments for Repair

Please regard the following instructions when packing your instrument to return it to HunterLab for repair. **Proper packing is crucial.** These instructions do not replace the recommended professional packaging for your instrument, but may assist in eliminating the need for a shipment claim due to faulty packaging. Purchasing freight insurance does not guarantee a successful damaged shipment claim if the carrier determines the instrument was not packaged properly.

- All instrument tiles, the didymium filter (if included), black glass or light trap, power supply, power cords, and cables for the instrument should be included in your shipment. **Your repair estimate will be delayed if the instrument tiles are shipped separately later.**
- Remove the sample clamp (if you have one) from the instrument before packing.
- Cover the measurement port. If applicable, also cover the transmission port and tape the transmission compartment door closed. **Do not use duct tape.** "Painter's tape" is preferred, as it will not leave residue on the instrument.
- Insert the instrument into an anti-static or plastic bag prior to placing it in the carton. The bag will aid in keeping packing material out of the instrument.
- Place the bag-wrapped instrument into a new carton which includes, at a minimum, **6 inches of packing material** (preferably foam) around the instrument. Styrofoam peanuts should not be used as packing material for instruments, as they can suspend items weighing

only up to 5 pounds. Observe the information listed on the bottom of most cartons with regard to burst strength and gross weight limits. Single wall cardboard cartons should not be used. (A proper packing carton with packing material may be purchased from HunterLab, if desired.)

- Insure the shipment.
- Provide an itemized packing list of all contents of the shipment.
- Label the carton(s) as follows:

Hunter Associates Laboratory Inc.
Attn: SRO #_____
11491 Sunset Hills Road
Reston, VA 20190
U.S.A.

When You Need Assistance

When you have a problem with an instrument or software or need technical advice concerning a specific application, you may consult the support website (support.hunterlab.com). There are numerous articles on applications, operations, instrument accessories, troubleshooting and more. This is available 24/7. If you don't find the information that you require, then you can open a support request on the website. Please include the following information when corresponding with HunterLab.

1. The type of sensor in use.
2. The serial number of the instrument (usually found on a tag on the back or bottom of the sensor, or inside the transmission compartment).
3. The type of software you use to access the sensor output (EasyMatch QC), the version of the software (seen after choosing ***Help > About***), the operating system, and the brand and type of computer.
4. The specific nature of the problem, including the exact error message received or the number of units the sensor reads "off" from the standard tiles.
5. The steps performed prior to the start of the problem.
6. Steps already performed to reconcile the problem and/or results of any diagnostics.
7. The type of product being measured.
8. Operating environmental conditions under which the instrument is normally used, such as temperature, humidity, dust, fumes, etc.
9. Whether the instrument has recently been moved or the computer reconfigured.
10. The name(s) of any HunterLab personnel with whom you have previously discussed the problem.

To place an order, for prices on instruments, software, or replacement parts, or to return damaged or incorrect parts, ask for the Order Processing Department. For applications advice or for help in correcting instrument or software problems, ask for Technical Support . To return instruments to

HunterLab for service, or to ask questions about the servicing or recalibration of instruments, ask for the HunterLab Service Department. To speak with HunterLab, please call 703-471-6870.

The mailing address for HunterLab headquarters is given below. Customers outside the United States should contact their HunterLab distributor for initial assistance.

Hunter Associates Laboratory, Inc.
11491 Sunset Hills Road
Reston, Virginia 20190 U.S.A.

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