D25® NC
Supplemental Manual for EasyMatch® QC

The world's true measure of color
HunterLab

Hunter Associates Laboratory
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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

D25 NC Features

The D25 NC is a continuous, automated, non-contact color measurement instrument with height detection and color compensation. For use in laboratory environments, the D25 NC uses LED illumination technology to measure samples and monitor color on a rotating tray. Pour, place and measure single or multiple samples on the tray, with easy cleanup and maintenance.

D25 NC makes real-time color measurements of products with irregular shapes, and in industries as diverse as paint, food, building products and industrial minerals. This instrument is designed to work as a stand-alone unit with an easy-to-read display or connected to EasyMatch QC software on a personal computer.

Figure 1. Front of D25 NC

The D25 NC possesses the following features:

Standard Accessories:

- Calibrated instrument white tile

- Certificate of traceability

- Black glass

- Green diagnostic tile

- Calibration box

- 12 in and 6 in sample dishes

- Power cord

- D25 NC User's Manual on CD

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.

D25 NC Options and Sample Devices

For the latest information, please refer to support.hunterlab.com and D25 NC.

D25 NC Installation

Note: The D25 NC should be lifted from under the base plate, near the center of the unit. It should not be carried by grasping any part of the plastic housing.

The D25 NC is simple to set up and attach to your computer. The following instructions guide you through the initial installation of your D25 NC system.

1. Unpack all cartons and remove wrappings and cable ties. Inspect for damage and notify the carrier and HunterLab immediately if any is discovered. Save the packing material in case it becomes necessary to return the instrument to the factory.

2. Place the D25 NC on a flat working surface where the measurements will be made. Place the computer near the sensor.

3. Ensure that the on/off switch on the back of the sensor is set to off.

4. Connect the power cord to the sensor and plug it into a power outlet.

Note: Refer to the D25 NC Specifications section of this chapter for recommendations concerning the power line and its conditioning.

CAUTION: Use only the power cord included with this instrument or a replacement obtained from HunterLab. Be certain that the power cord is in good condition before connecting it. The D25 NC is grounded using the grounding portion of this power cord. Only plug this cord into a properly grounded power outlet. Do not use an inappropriate adapter to plug the instrument into an ungrounded outlet or electric shock may occur. More information on the wiring of the power cord can be found in the D25 NC Specifications section of this chapter.

Note. Since the D25 NC uses a USB cable to communicate with the computer, select the highest number COM Port No. offered.

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.
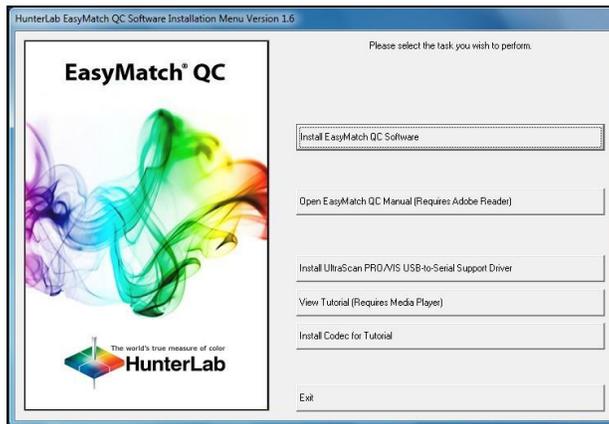
Figure 2. EasyMatch QC Installation

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.
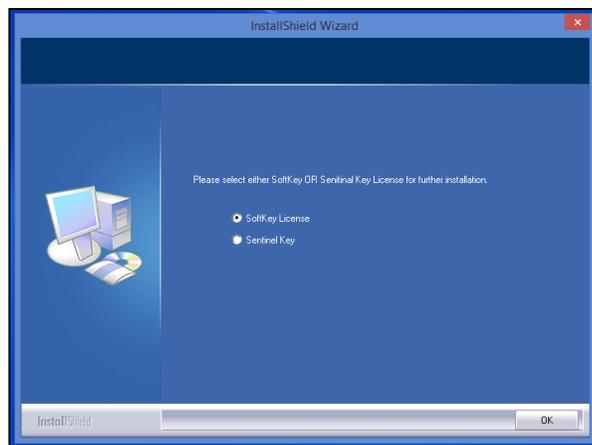
Figure 3. Software Key License

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.
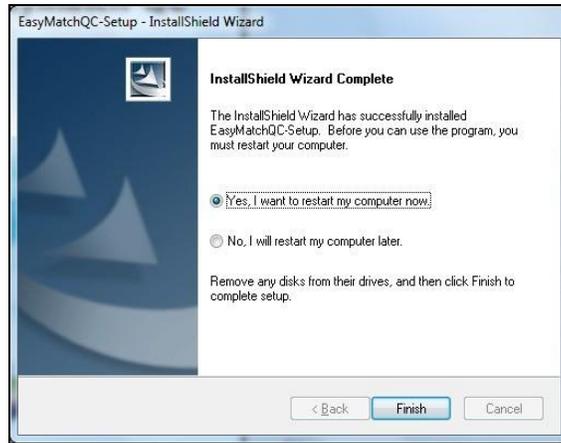
Figure 4. Completed Install

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 in Figure 5.

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*.
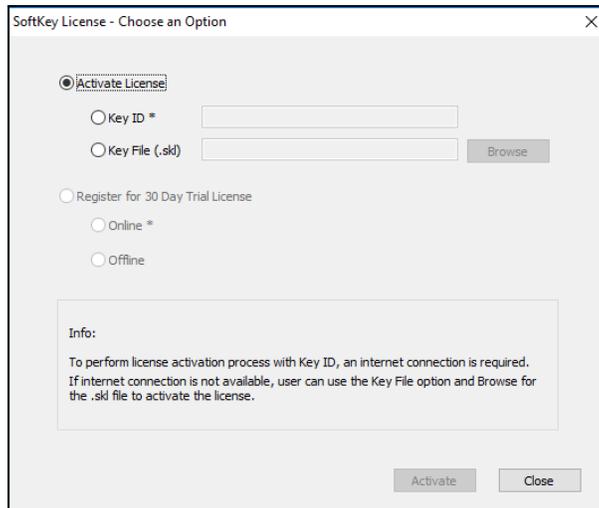
Figure 6. Activate License

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 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 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.
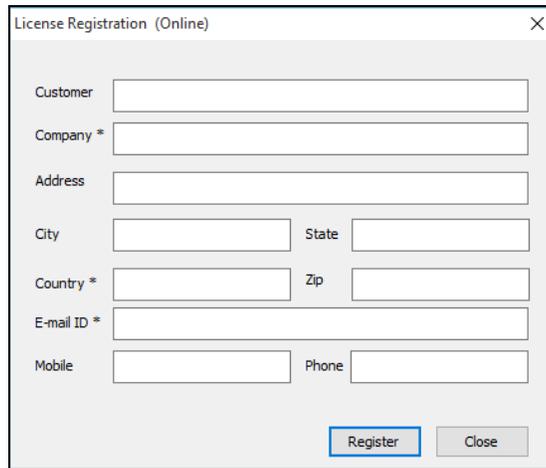
Figure 7. Request 30-day Trial

D25 NC Standardization

The D25 NC must be standardized on a regular basis to keep it operating properly. Standardization sets the top and bottom of the photometric scale. During standardization, the bottom of the scale is set using a black tile read on the D25 NC. The top-of-scale is set using a white tile.

It is recommended that the instrument be standardized at least once every eight hours.

Connecting D25 NC to EasyMatch® QC and a Computer

EasyMatch QC and EasyMatch QC-ER Version can connect with D25 NC through a USB printer cable.

Connect D25 NC to the computer via a USB cable.

1. Connect both the D25 NC and the computer with EasyMatch QC via a USB cable 2.0 (A male to B male).

2. Locate the toggle switch below the USB port on the back of the instrument, and select the computer by toggling right.

Figure 8. USB Port

3. Open EasyMatch QC in the computer.

4. From the **Sensor Menu**, select **Add Sensor**.
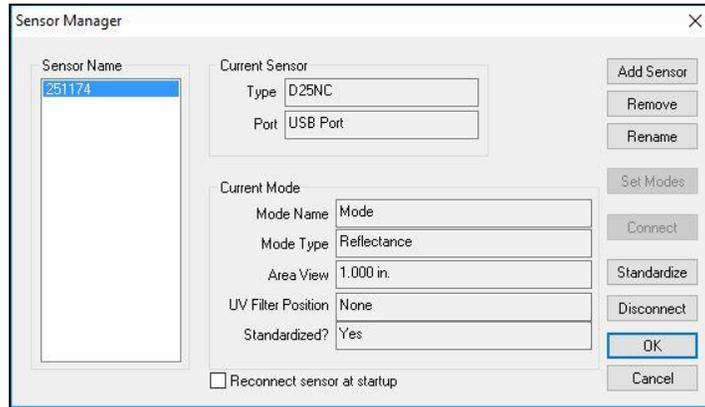
Figure 9. Add D25 NC Sensor

5. Select **D25 NC** as the Sensor Type and use the USB (selected as default) to connect D25 NC with EasyMatch QC. Click **Next** to search available D25 NC.
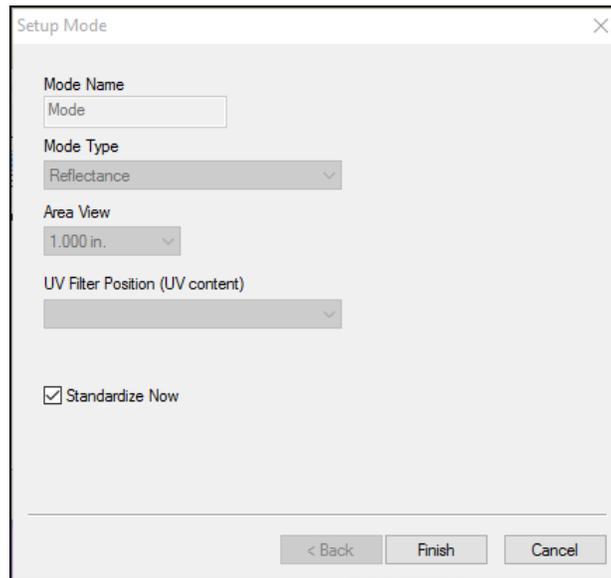
Figure 10. Setup Sensor in EasyMatch QC

6. If there are multiple D25 NC units, then a list of available sensors and ports are shown.
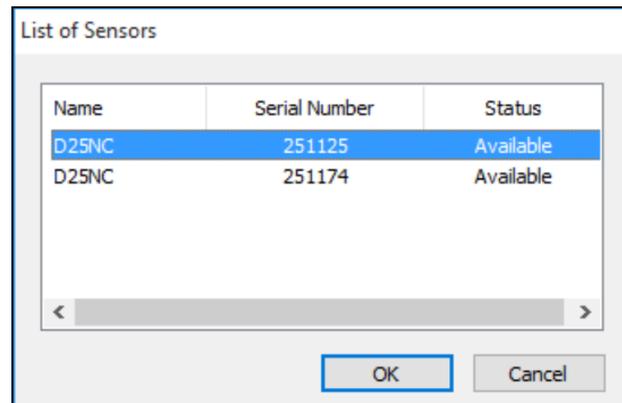
Figure 11. Multiple Sensor Select

7. Select **Next** to standardize.

8. You are now ready to use EasyMatch QC with the D25 NC.

Standardization Mode

Only reflectance is available on the D25 NC.

The instrument can be standardized at any time by selecting **Sensor Menu >** or by clicking the **Standardize** button on the default toolbar. You are first prompted to indicate the instrument configuration.

To standardize, read the Bottom-of-Scale, Top-of-Scale and Green Tile.
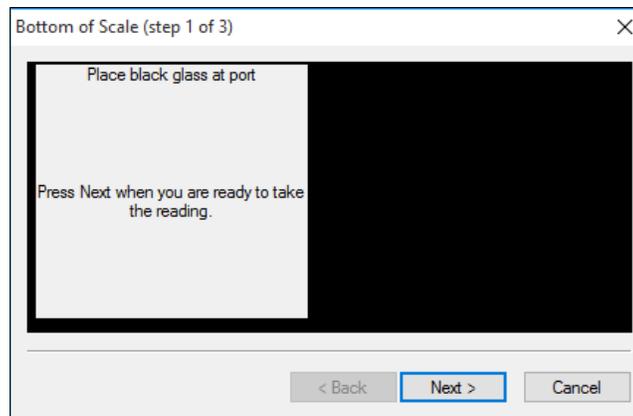
Figure 12. Read Bottom-of-Scale
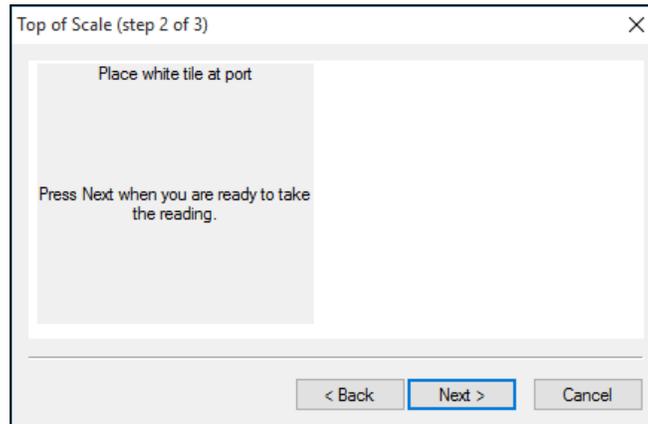
Figure 13. Read Top-of-Scale
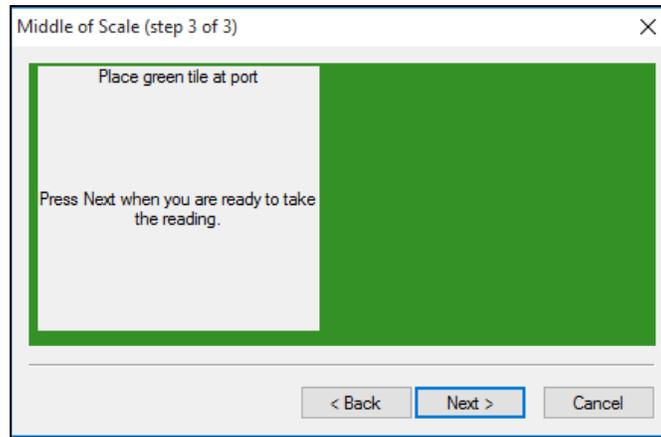
Figure 14. Read Green Tile

D25 NC Maintenance and Testing

The D25 NC is engineered to be virtually maintenance free. This section outlines the few parts of the sensor that are to be maintained for the instrument to function properly.

Routine Maintenance

The following schedule outlines recommended maintenance procedures for the D25 NC. The actual frequency of maintenance required will be determined by the measurement application and plant operating conditions.

Daily (or once per shift)
Check and wipe the sensor viewing window clean with mild cleaning solution and then a dry soft cloth.

Weekly
Clean the exterior of the sensor and mounting. The D25 NC is NOT waterproof, but the exterior of the case may be wiped with a damp cloth. Standardize the sensor.

Monthly
Clean the standards (slide-on calibrator and sensor window monitor) using a laboratory-grade detergent and a nylon brush. Wipe dry with a lint-free paper towel containing no FWAs. If a Hitch Standard has been used, then compare hitch standard values for the D25 NC to those of the off-line colorimeter. Re-hitch the D25 NC if necessary or desired.

As Needed
Replace the sensor window.
Replace the fuses.
Perform the 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. If power to the support unit has been turned off, a 30-minute warm-up period is required for sensor temperature stabilization. If power to the support unit has been turned off for more than an hour, a two-hour warm-up period is required.

When restoring power to system components:

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

Cleaning the Viewing Window

To ensure proper operation of the sensor it is recommended that the abrasion-resistant LUCITE® viewing window of the sensor be wiped clean with household glass cleaner on a soft lens tissue or lintless cloth at the start of each shift.

Cleaning the Instrument Standards

It is extremely important that the standard tile (the slide-on calibrator) be treated with great care. It should be protected from physical damage and dirt at all times.

Be sure the standards are clean before using it for standardization. Once a month, use a soft nylon brush and a Sparkleen (Fisher Scientific Catalog Number 4-320-4) in water solution (1 tablespoon per gallon), followed by a running hot water rinse. Wipe dry with a clean, lint-free paper towel manufactured without fluorescent whitening agents (FWAs) to remove water marks.

Replacing the Fuses

If unusual electrical line activity should ever cause the fuse in the D25 NC Workstation to fail, it can be replaced.

To replace a fuse:

- Turn off the power and disconnect it from the power source.

- The fuse is a pair of 2 Amp Slow Blow fuses (HL# S2338) supplied by HunterLab or equivalent.

- Flip up the plastic fuse holder and open the cover panel.

Figure 15. Fuse is located beside I/O rocker switch.

- Using a fuse removal tool, lift the faulty fuse out of its fuse holder and discard it.

- Snap a replacement fuse into the operational fuse holder.

  Note: Use only the fuse specified above for your instrument or one which is identical in type, voltage rating, and current rating. Otherwise, there may be a risk of fire.

- Replace the plastic cover panel and flip the fuse holder back into the original position.

- Close the support unit cover.

- Restore power to the support unit.

- Allow the sensor and support unit to warm up for five minutes.

- Standardize the instrument and proceed with measurements.

- Order additional spare fuses for potential future use.

Diagnostics on the D25 NC

Diagnostics are included with the D25 NC Easy Match QC. To initiate, select *Diagnostics* from the *Sensor Menu. The Green Tile Test, Repeatability Test* and *Hardware checks* are the available tests.

Green Tile Test

To begin the Green Tile Test, standardize the instrument and leave the Green Tile at the port. The instrument will read the green tile.
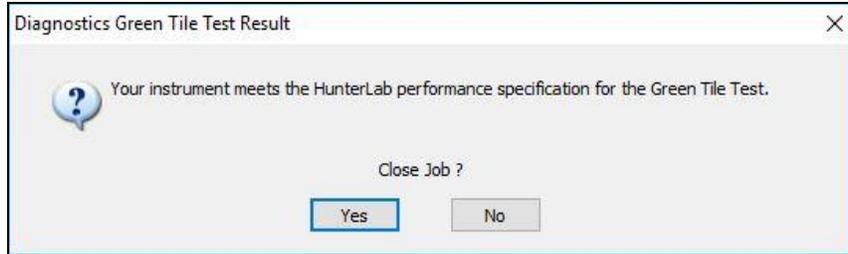
Figure 16. Screen Display for Test Results

Figure 17. Green Tile Test Results

Repeatability Test

The repeatability test is initiated by standardizing and leaving the white tile in view. Each white tile reading is reported along with a pass/fail evaluation.

	X	Y	Z	L*	a*	b*	dE*	Pass/Fail
Standard	84.13	89.29	95.55	95.70	-1.00	0.18		
Sample1	84.11	89.27	95.51	95.69	-1.00	0.19	0.02	Pass
Sample2	84.10	89.25	95.49	95.68	-0.99	0.19	0.02	Pass
Sample3	84.09	89.24	95.48	95.68	-0.99	0.19	0.03	Pass
Sample4	84.09	89.24	95.47	95.68	-0.99	0.19	0.03	Pass
Sample5	84.08	89.23	95.47	95.68	-0.99	0.19	0.03	Pass

Figure 18. Repeatability Readings

When the test is complete, results are shown in several screens.
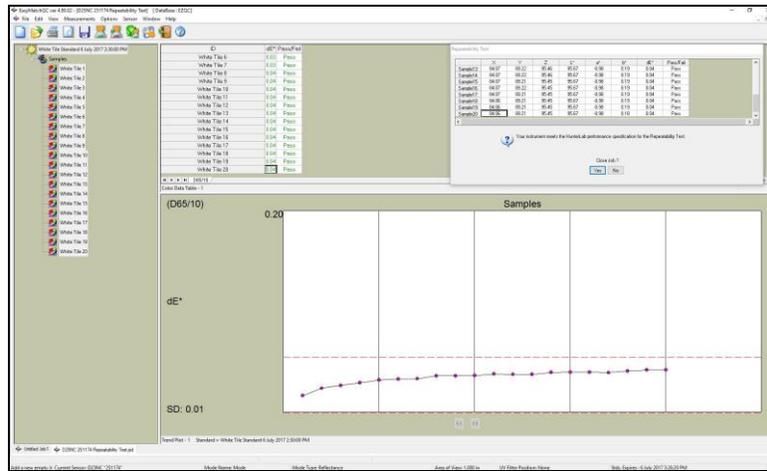
Figure 19. Repeatability Screen Results
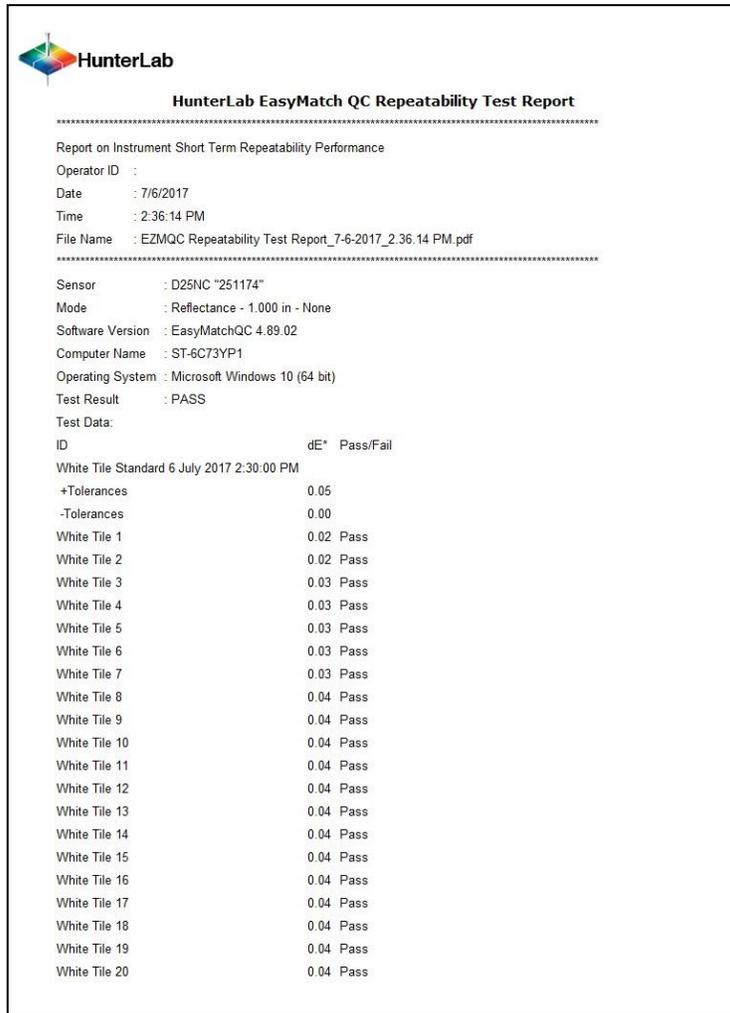
Figure 20. Repeatability Report

Hardware Check

This tests the signal level values for the sample and monitor as shown in the figure below.
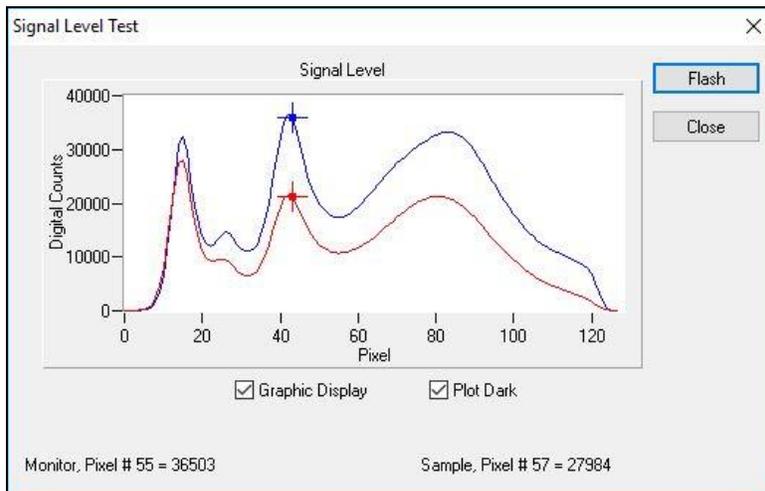
Figure 21. Signal Level Test

D25 NC 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 instrument should be connected to a stable, instrument-grade power line. If other equipment is connected to the same power line, a transient power surge may be produced when the other equipment is turned on. If this happens, restandardize the instrument before making measurements. HunterLab recommends using a line conditioner with a minimum 600 VA rating and a battery back-up system.

Physical/ElectricalPhysical/Electrical

Weight:	13.6 kg (30 lbs)
Dimensions: (Height x width x depth)	48 cm x 36 cm x 48 cm (19 in x 14 in x 19 in)
Communications Interface	Ethernet to EasyMatch QC
System Power	100-240 VAC/1.5A, 47-63 Hz

Environmental Requirements

Operating Ambient Temperature	0 to 50 degrees Celsius (32-122°F)
Operating Relative Humidity	10% to 90% (non-condensing)
Storage Temperature	- 20to 65 degrees Celsius (5-150°F)

Conditions of Illumination and Viewing

Light Source	Full spectrum, balanced solid-state LED system
LED Life:	Nominally 5 years
Area of illumination:	18 to 30 mm
Illumination:	Monodirectional illumination at 0°
Distance to Product	65 – 140 mm (2.5 to 5.5 in) from the front surface of the sensor window
Viewing area:	25.4 mm (1 in) at 3.5 in from sensor window

Instrument Performance

Measurement Principle	Dual-beam spectrophotometer
Spectral Range	400 nm – 700 nm
Spectral Resolution	< 3 nm
Effective Bandwidth	10 nm equivalent triangular
Reporting Interval	10 nm
Photometric Range	0 to 150%
Measurement Speed	5 seconds per cycle
Number of Avg Flashes per Cycle	25 flashes per cycle
Inter-instrument Agreement (BCRA II Tile Set)	$\Delta E^* < 0.30$ CIE L*a*b* Avg $\Delta E^* < 0.50$ CIE L*a*b* Max
Colorimetric Repeatability (White tile on 20 readings)	$\Delta E^* < 0.05$ Max CIE L*a*b* $\Delta E^* < 0.03$ CIE L*a*b* Avg

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 for the D25 NC 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.:	D25nc

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

Per 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 HunterLab Service 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 HunterLab Service. 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 from the website page. Please include the following information when cooresponding with HunterLab.

1. The type of sensor you are using.

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 **About** from the **Help** menu), 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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