

D25[®] NC

Supplemental Manual for EasyMatch[®] QC



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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.

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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.

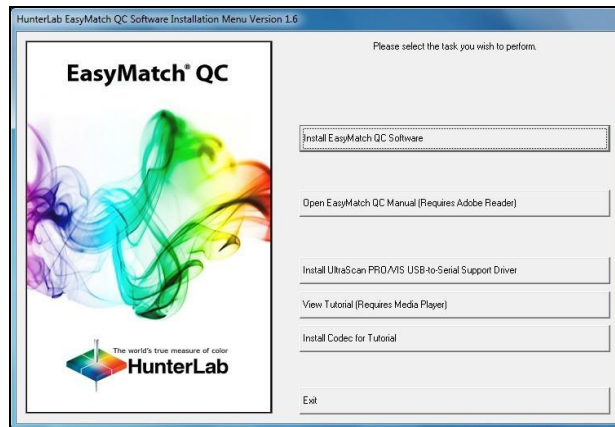


Figure 2. EasyMatch QC Installation

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.

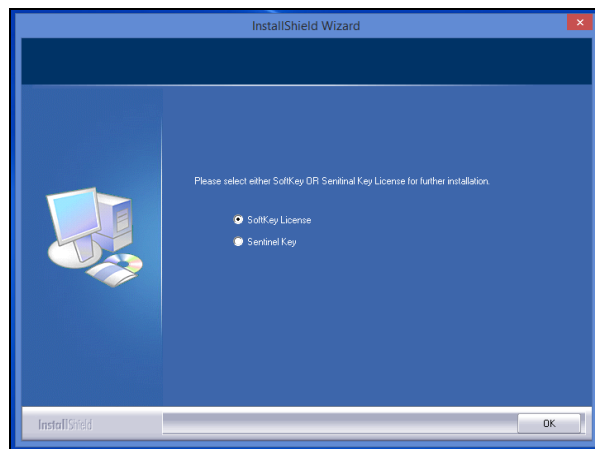


Figure 3. Software Key License

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.

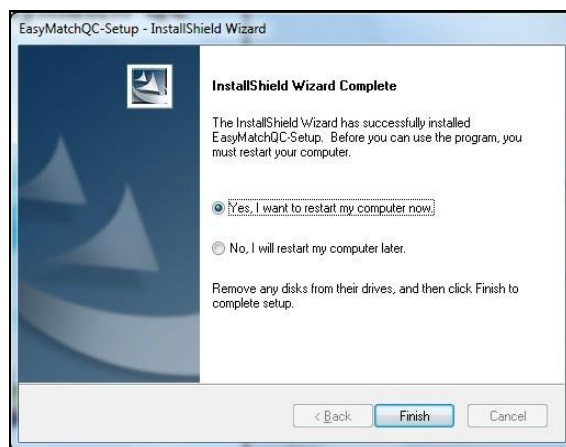


Figure 4. Completed Install

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.

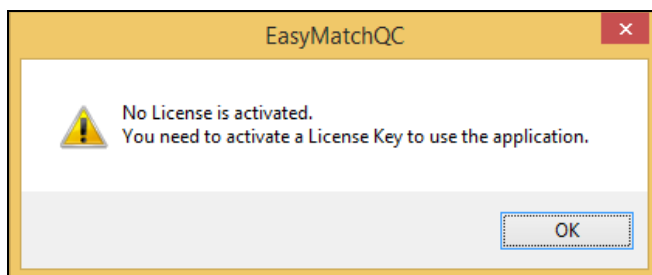


Figure 5. No License Warning

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**.

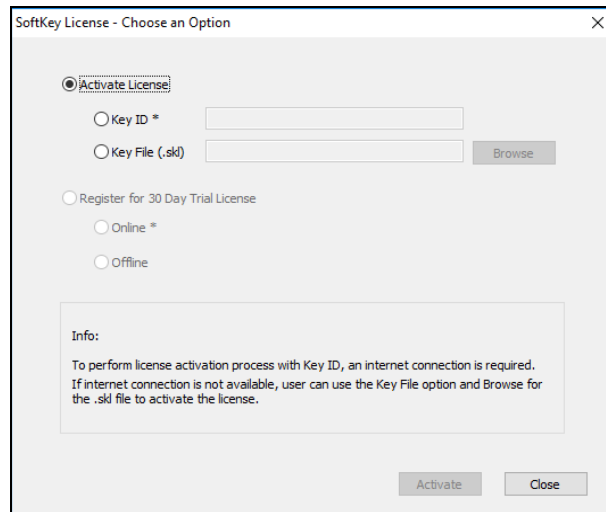


Figure 6. Activate License

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.

License Registration (Online) X

Customer

Company *

Address

City State

Country * Zip

E-mail ID *

Mobile Phone

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.

Name	Serial Number	Status
D25NC	251125	Available
D25NC	251174	Available

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.

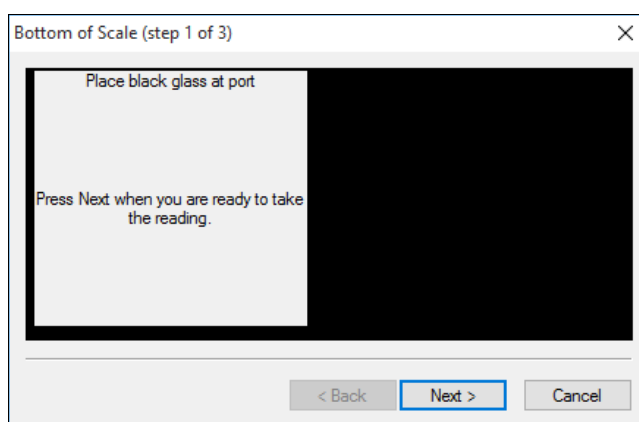


Figure 12. Read Bottom-of-Scale

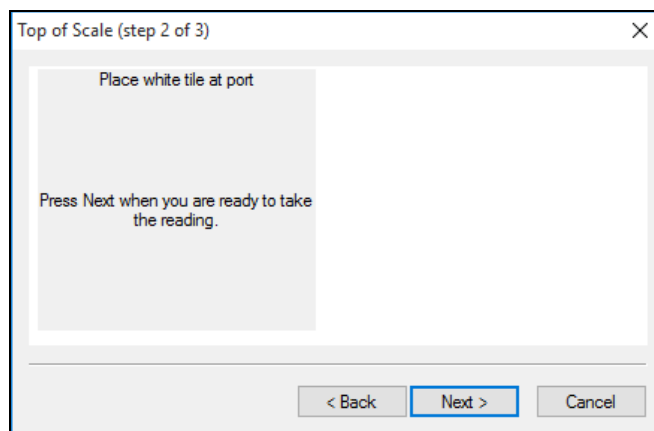


Figure 13. Read Top-of-Scale

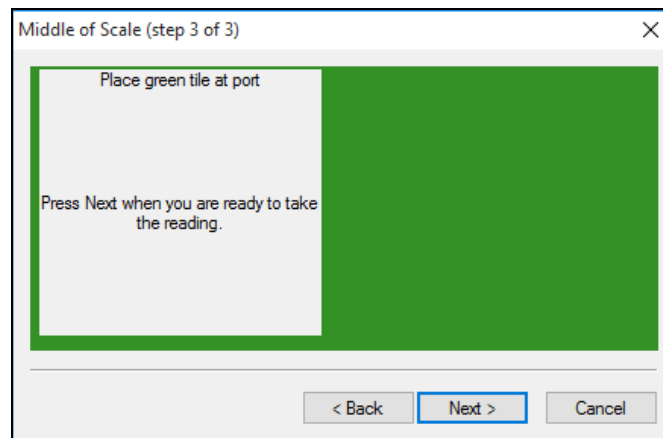


Figure 14. Read Green Tile

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.

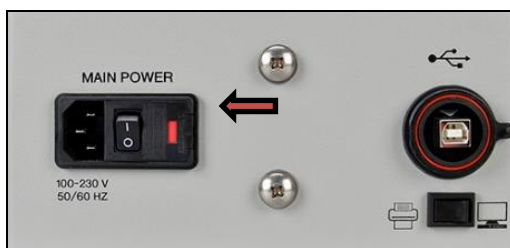


Figure 15. Fuse is located beside I/O rocker switch.

- 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.

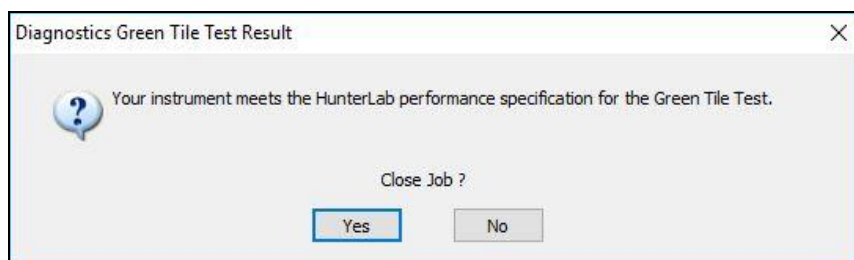


Figure 16. Screen Display for Test Results

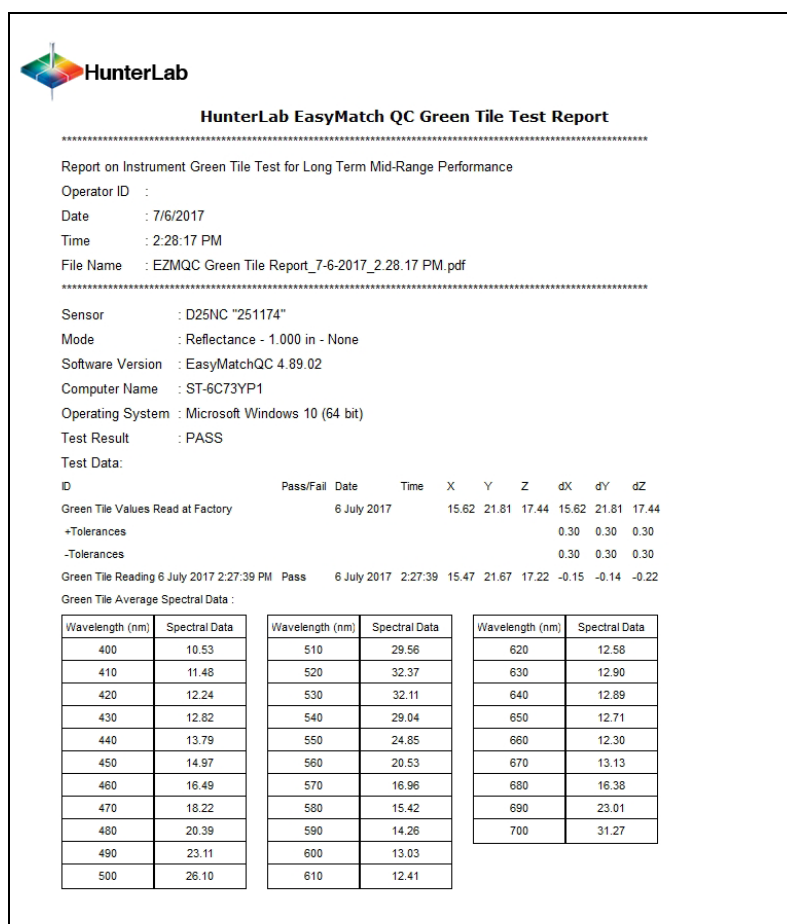


Figure 17. Green Tile Test Results

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.

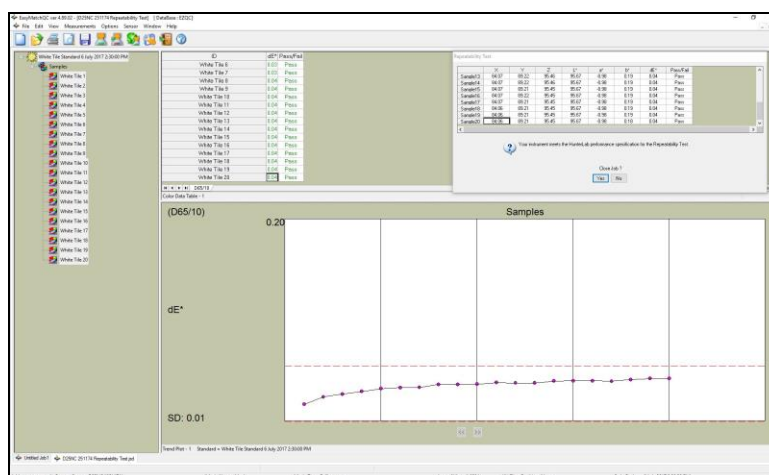


Figure 19. Repeatability Screen Results

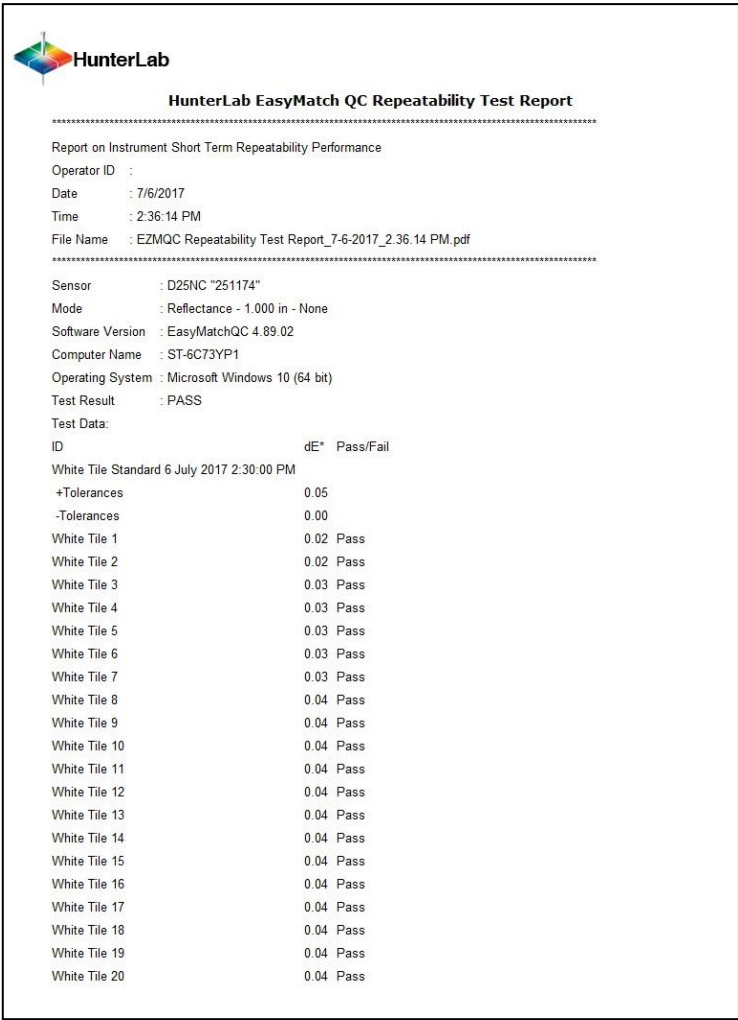


Figure 20. Repeatability Report

Hardware Check

This tests the signal level values for the sample and monitor as shown in the figure below.

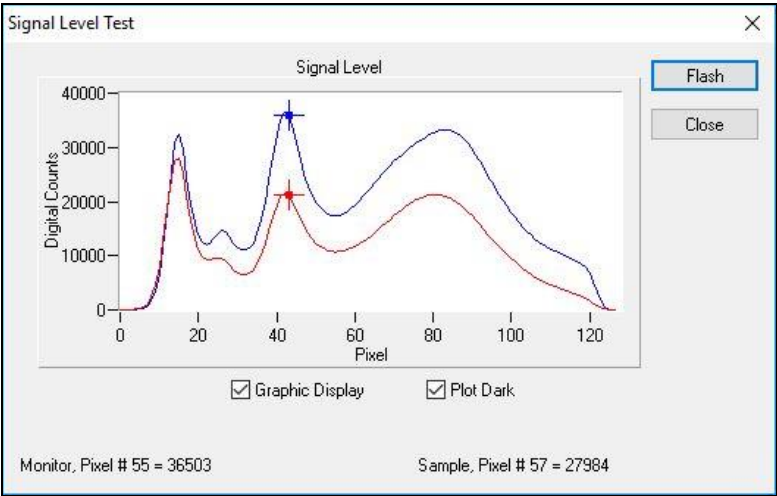


Figure 21. Signal Level Test

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.

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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