User's Manual for Agera® and EasyMatch® Essentials

The world's true measure of color
HunterLab

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A60-1018-812 Version 2.3
For EasyMatch Essentials 1.07.0105 and Above

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Safety Notes

Caution: If the equipment is used in a manner not specified by the 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 Agera, 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**.**

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Setting Up the Agera

The Agera is a dual beam 0-degree illumination and 45-degree circumferential detection spectrocolorimeter with a wavelength range from 400 to 700 nanometers (nm). It is designed for use with the sample port facing up or forward.

The optical delivery and collection system combined with port openings of nominally 51 mm (2 in), 25.4 mm (1 in), and 16.9 mm (0.625 in) delivers measurement of semi non-homogenous samples such as pellets, granules, and textured flat samples including textiles, plastics, paper. The multiple viewing area accommodate powders, opaque and semi-opaque sauces and liquids.

Standard Accessories

- Calibration Box with calibrated Agera white tile, calibrated Agera black glass and Agera green diagnostics tile
- Area of View Port Plates - Set of 3
- Certificate of Traceability
- Power Supply
- Agera Quick Start Guide
- USB Flash Drive

Selecting A Space for the Agera

The Agera can be setup in a laboratory setting with controlled, consistent temperature and humidity. A laboratory bench is recommended with easy access to the rear connectors.

Unlocking the Shipping Bolt

Before measurements can be taken, the shipping bolt must be unlocked. Located on the underside of the instrument, a Phillips screw driver is needed to turn the bolt counterclockwise.

Note: The shipping bolt has been recently added to the instrument. Please ignore this step if there is no shipping bolt in Agera.

If the instrument is to be shipped, then the go to Essentials ***WORKSPACE MENU > DIAGNOSTICS > ADVANCED DIAGNOSTICS***. Then select ***PARK FOR SHIPPING*** to move carousel to the parked position. Then lock the shipping bolt, and power off the Agera.

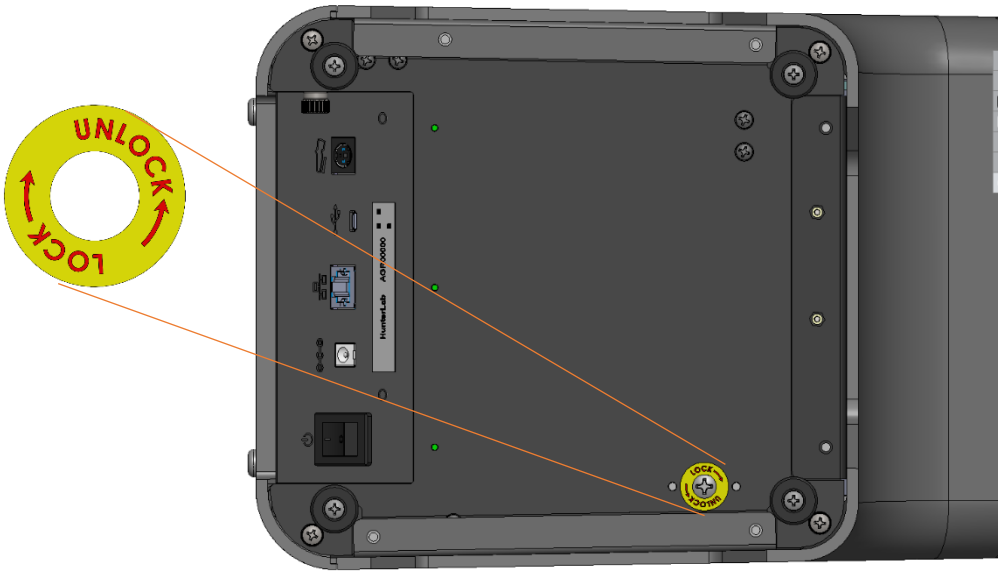


Figure 1. Shipping Bolt

Power Jack

- The instrument is supplied with a 24 VDC (3.75A) power supply. The power supply is plugged into the back of the instrument as shown along with the Ethernet port and the USB port.

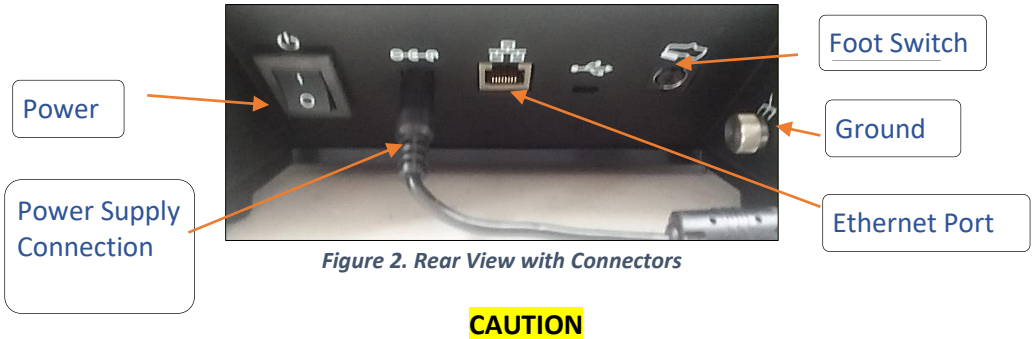


Figure 2. Rear View with Connectors

CAUTION

Note: 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.

Power Switch

- To turn the instrument on, press the rocker switch on the back of the instrument.

Port Forward Orientation

- The Essentials screen is default setup for port up Agera. If port forward orientation is required, then go to ***Workspace > Preferences*** and check ***REVERSE SCREEN ORIENTATION*** and click ***APPLY***. Power off/on Agera to get the screen orientation changed.

Keyboard and Mouse

- The Agera works with the following keyboard and mouse:
    - L02-1017-434 Wireless keyboard and mouse kit.
- To use this accessory, turn the power off. Plug in the micro USB adaptor into the instrument and then attach the nano-receiver for the keyboard into the USB port. Install the batteries into the keyboard/mouse and turn the power back on.

Front and Rear USB Connectors

- There are two USB connectors on the Agera. The one in the front is typically used to connect a printer or a keyboard to the Agera. If the user wants to connect multiple devices at the same time, a USB hub can be plugged in to the front of the instrument. Either port can be used for exporting jobs and workspaces, backing up the instrument and updating software

Figure 3. USB Port on Front of Instrument

Ethernet Port

- This port is used to connect the Agera to:
    - Computer or to a network with the purpose of sending data (ASCII) to a server
    - Connect with EasyMatch QC and EasyMatch QC Electronic Records
    - Remote Support
    - Network printer
    - Email data

Navigating the Essentials Screen

The EasyMatch Essentials Tools and Status features are shown below.

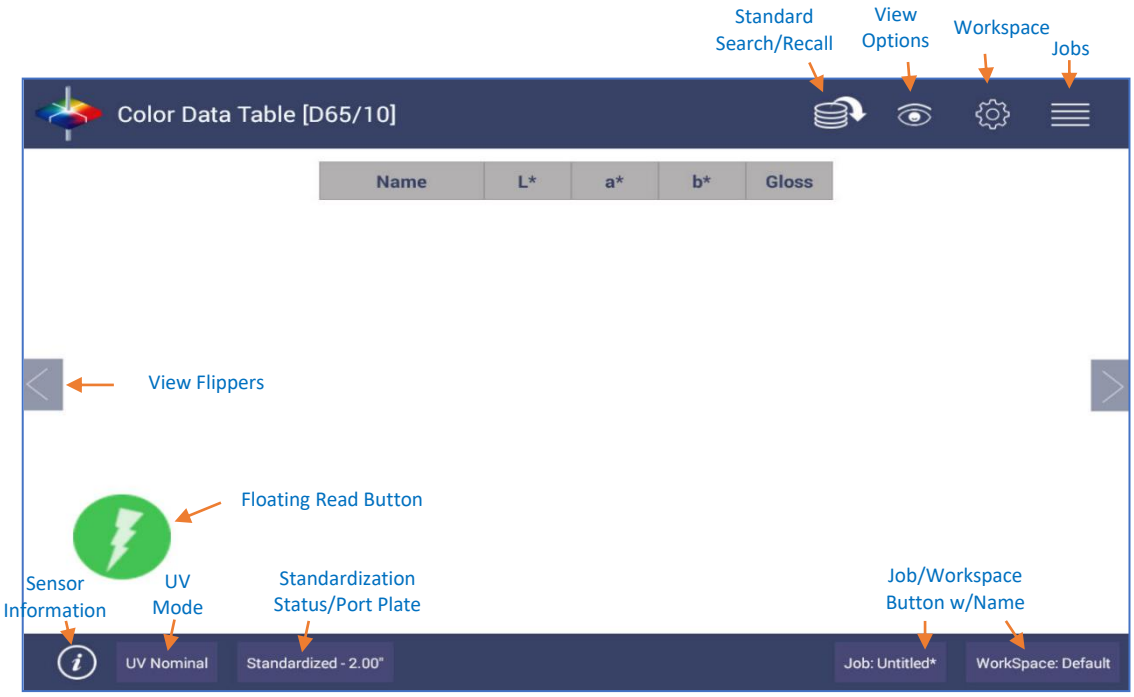


Figure 4. User Interface Screen for Agera & Essentials

Tools: Status Bar

This area shows the current mode settings.

- ***UV STATUS*** – To change the UV mode, press this button.
- ***STANDARDIZATION*** – To re-standardize, press this button. The standardization status and current port plate size will be shown.
- ***WORKSPACE*** - To open a new Job, press this button. The software will prompt to select a Workspace for a new Job. Workspace Name is reported on this button.
- ***JOB*** – To open an existing Job, press this button. Job Name is reported on this button.

Tools: Read

Read Measurement Icon

- Samples are read using this key.
- This tool can be moved around the screen by pressing and moving the icon.

Tools: View Flippers

View Flippers Icon

- Switching between Views can be accomplished by using the semi-transparent ***NEXT*** and ***PREV*** buttons placed at the side edges of the screen or by swiping left or right with two fingers on the screen.

Tools: Information

Sensor Information Icon

- The sensor type and serial number is shown at the bottom left side of the System Bar when the ***i*** is pressed. When application security is enabled and the user logs into Essentials, the User Account will also be shown in the Information box.

Figure 5. Sensor Serial Number

- The ***INFO*** button can also show warnings and error messages as a dot. If the dot is red, it means that error(s) exists. If the dot is yellow, it means that no error while have warning(s). When any error or alert message occurs, see ***PREDICTIVE DIAGNOSTICS*** to export data for HunterLab to check.

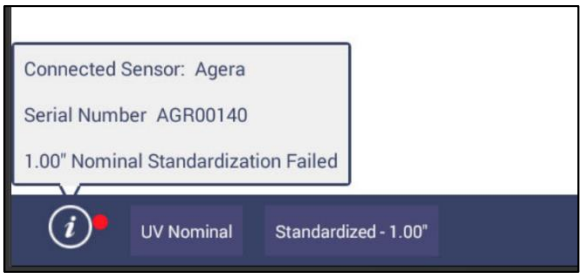


Figure 6. Error Message Dot

Tools: Standard Recall

Search/Recall Icon

- This menu option provides a selection of saved standards to recall a standard from the database for use in measuring samples**.**

Tools: View Options

View Options Icon

- This menu shows the configuration options for the active view A total of six views are available. Each view shows a different option. Views can be added or removed in ***WORKSPACE > VIEWS***. .

Tools: Workspace & System Settings

Workspace/Systems Settings Icon

- The Workspace menu sets up the data screen with measurement color scales, read options, standards, tolerances and views.
- Systems Settings initiates Standardization, Diagnostics, Preferences, and the User Manager for System Security.

Tools: Jobs

Jobs Icon

- A job is a collection of all the sample measurements and a workspace used for a task, product, or customer. Jobs are the 'readings' of EasyMatch Essentials. Jobs can be created for many different reasons, such as to hold data for a certain customer or a specific product line. Each operator may maintain their own job with preferences or create separate jobs for different operations. A workspace is a collection of the measurement parameters for a job along with tolerances and the standard, i.e. analogous to word processing documents containing text and formatting. Each job has only one workspace.

Taking a Simple Measurement

What is HunterLab Agera & EasyMatch Essentials?

Agera is a multi-purpose 0/45° color and appearance measurement system that provides users with 400-700 nm reflectance color, ASTM 60-degree gloss, and sample imaging capabilities in either a port up or port forward configurations. UV controlled LED illumination provides superior color accuracy and repeatability on standard and fluorescent samples. An internal camera provides on-screen 45/0° sample viewing during the measurement preparation and will capture and save a sample image for retrieval with the sample data. All measurement results are simultaneously displayed on a 7" high resolution touch screen interface via the embedded EasyMatch Essentials quality control software, which includes most color scales, indices and Illuminant/observer combinations desired for industrial applications. With Ethernet, wireless and USB connectivity, data results can be saved, emailed directly from the Agera instrument, printed to local or networked printers, and streamed to LIMS and SPC systems.

Connecting the Sensor and Taking a Measurement

After unpacking and setting up the instrument, turn on the power using the rocker switch on the back of the instrument base.

- Once inside the software, the main measurement screen is displayed – Color Data Table (D65/10).

Figure 7. Measurement Screen

- The instrument is automatically connected, and this is reported on the status bar. Next, the unit must be Standardized.

Standardization

- Configure **UV MODE**: The UV mode is shown in the status bar. To change the mode, click the ***UV BUTTON*** and select a UV mode. Then click ***APPLY***.
- Press the ***STANDARDIZATION BUTTON*** on the status bar to initiate standardization. The port plate size and UV mode is shown in the standardization dialog. To change the port plate, place the new port plate on Agera and click ***BACK*** to update the port plate information.

- **Read Black Glass**: Place the Agera black glass at the sensor port and press ***READ***. Make sure that the line on the tile matches the port plate white line.

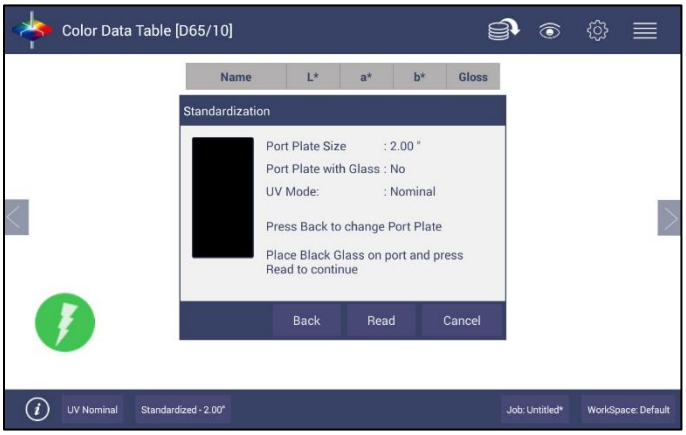


Figure 8. Read the Black Glass for Bottom-of-Scale

- **Read White Tile**: Remove the black glass and place the Agera white tile at the port. Press ***READ*** to continue.

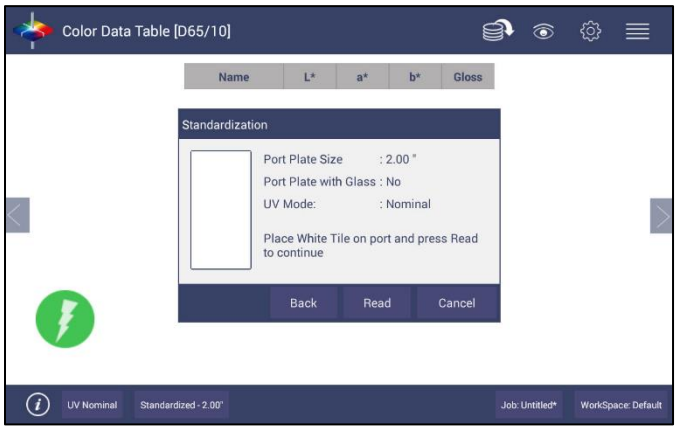


Figure 9. Read the White Tile for Top-of-Scale

- Remove the calibrated white tile when standardization is completed. Click ***OK***.
- Standardization is updated and reported as **STANDARDIZED** in the bottom status bar along with UV Mode and Port Plate Size.

Note: Agera supports multiple UV modes allowing for switching among different valid UV modes after standardization.

Figure 10. Standardization Status Bar

- To update Standardization Status for a new port plate, place the new port plate on the instrument and click the ***READ*** button. The standardization status will be updated. If the standardization of this new mode is valid, then the sample will be read. If the standardization is not valid, a dialog box will be shown so prompt for new Standardization.

Create a Workspace

From the **WORKSPACE MENU**, press ***NEW WORKSPACE*** and ***ENTER A NAME*** for this Workspace

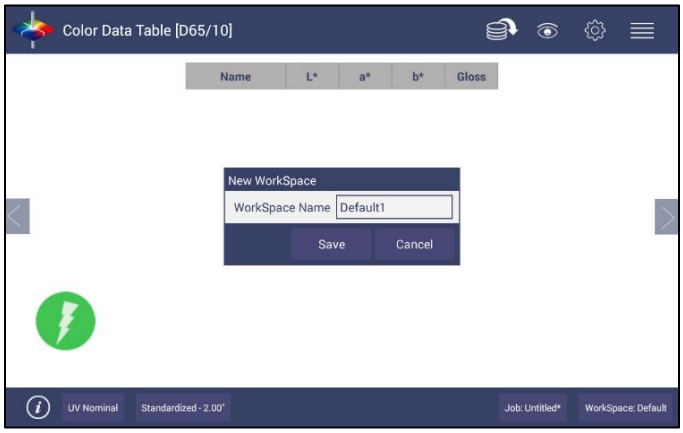


Figure 11. Name New Workspace

Note: The active Workspace name is displayed in the lower right corner of the screen.

- **Default Workspace Settings**: The default settings for a new Workspace are shown in the Table below:

Table 1. Workspace Parameters

Parameter	Selection
Color Scales	CIE L*a*b*
Illuminant	D65/10
Indices	None
Differences	None
Read Options > Options	Prompt for Sample Name, Auto Save Job
Read Options > Measurement Config	UV Nominal
Standard and Tolerances	None
Views	Color Data Table only
View Options for Color Data Table	Latest Data First selected, Precision = 2

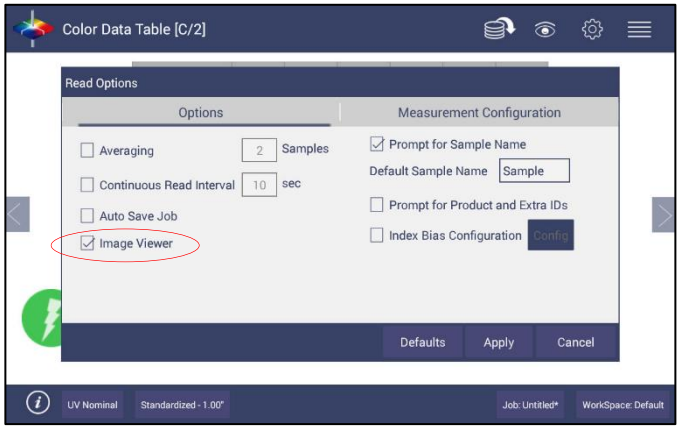
- **Configure the New Workspace**: With this new workspace open, you can start to change the following settings:

  To change measurement scales, select ***WORKSPACE > COLOR SCALES***. This configures the desired color scales, indices, and differences.
  To change measurement procedure, select ***WORKSPACE > READ OPTIONS***.
  To add tolerances, select ***WORKSPACE > STANDARDS & TOLERANCES***.
  To select the view screens, go to ***WORKSPACE > VIEWS***. To configure each view screen, click ***VIEW OPTIONS*** in the toolbar.

  - Now your instrument is ready to read your product under this new workspace. If you'd like to start a new job for this product, you can press ***NEW JOB*** and load this configured workspace to continue.

Read Sample

- **Prepare Sample**: Place the sample at the port. The ***IMAGE VIEW*** on ***READ OPTIONS*** and ***VIEW OPTIONS*** can assist in the placement of your sample. .Use the ***READ MEASUREMENT*** button to read samples.
- If **IMAGE VIEWER** is enabled, the camera preview dialog will be prompted before color measurement. To see the Image on the screen, go to ***READ OPTIONS*** and check the Image



Viewer selection. Press ***APPLY*** to continue.

Figure 12.Read Options > Image Viewer

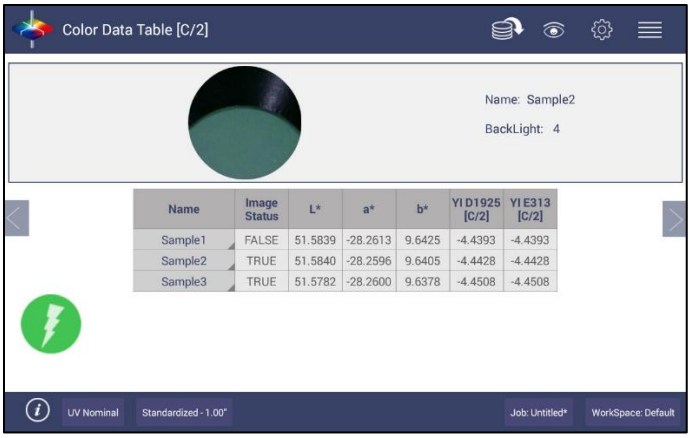


Figure 13. Image Viewer with Sample Reading

- **Main Measurement Screen**: The Color Data Table view shows the configured Color Scale results for the standard and sample measurements in the job. The configured tolerances can be applied to the Job and Pass/Fail results will also be displayed.

Note: Agera includes a built-in 60-degree gloss meter with a single LED illumination (filtered to C/2°)/detector pair in conformance with ASTM D523 and located right below the sample port plate. Gloss is measured for each sample and standard measurement. To show the Gloss value, please select Gloss index in WORKSPACE > COLOR SCALES > INDICES.

- To output data, select the ***JOBS*** icon from the upper right corner. Under Jobs, data can be saved, sent to a printer, emailed to the network or exported to a flash drive.
- **Sample Name:** The default sample name is Sample + numerical increment. To customize the sample name, go to ***WORKSPACE > READ OPTIONS > PROMPT FOR SAMPLE/STANDARD NAME***. Select the **PROMPT for SAMPLE NAME** to manually input the name during the measurement cycle. Or change the default Sample Name to another name for numerical sequence. Press ***APPLY*** when done.

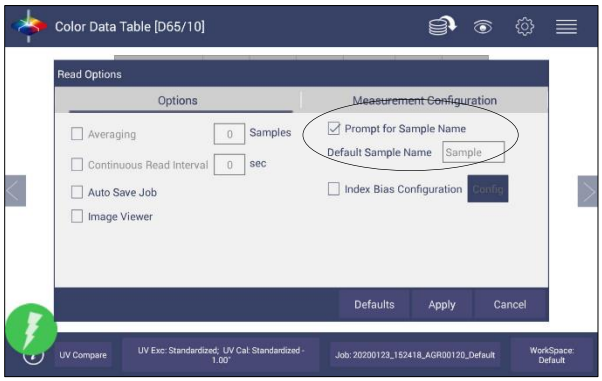


Figure 14. Prompt for Sample (Standard) Name

Note: The standard/sample name in Essentials should not be empty and should not contain any of the characters , : ; ' " + = ? * < > \ /.

- A long press on the Sample name will show a menu with the following options:
  - ***SET AS STANDARD*** – to set the sample as Standard
  - ***RENAME*** – to rename the sample

  - ***DELETE*** – to delete the sample.

Figure 15. Changing, Renaming or Deleting a Sample

- A long press on the Standard name will show a menu with the following options:
  - ***EDIT*** – to edit the standard. If Edit is selected, the ***WORKSPACE > STANDARD AND TOLERANCES*** dialog box is presented to allow for editing the name, assigning tolerances or changing the type of standard.
  - ***DELETE*** – to delete the standard. The deleted Standard is reverted into the samples list with its original name.

Figure 16. Edit/Delete a Standard

Toolbar: Search/Recall Standards

Allows for efficient recall of standards from the main screen. Each standard is shown with color scale values based on current configured Ill/Obs and rendering color. If a standard is selected, the details are shown on the right side of the screen. Details include:

- Standard Name,
- Category, Type (Numeric Or Hitched),
- Time Created,
- Sensor Type,
- Sensor Serial Number,
- Sensor Mode,
- Illuminant/Observer.

Customer can filter standard search by CATEGORY and/or by STANDARD NAME.

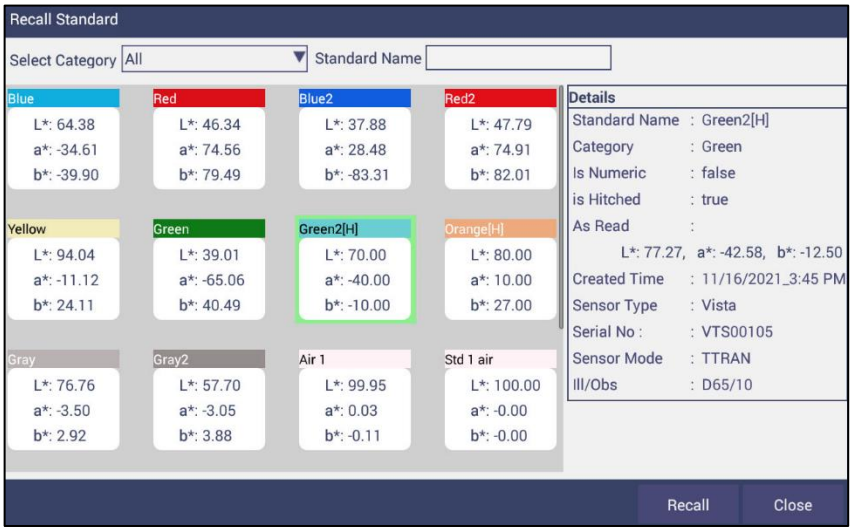


Figure 17. Recall Standard

CHAPTER FIVE

Toolbar: View Options

View Options Icon

Views are selected using a dialog box under Workspace. Simply check on the box of the screen needed. Press ***APPLY*** to save one or all of the screens. The default screen is the Color Data Table. To navigate between screens once the selections have been applied, use the ***VIEW FLIPPERS*** on the left and right of the screen.

Figure 18. Workspace > select Views

Once the views have been selected, then ***VIEW OPTIONS*** are available to configure the views on the screen. Each screen has a unique set of view options associated with it.

Views: EZ View

This view provides a simple display of **STANDARD** vs**. SAMPLE** and **PASS/FAIL** results.

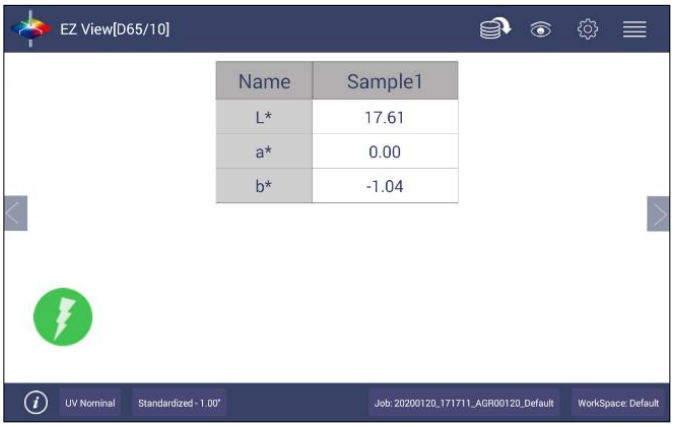


Figure 19. EZ View Display

- **VIEW OPTIONS** includes the selection of **NO COLOR SCALE**, **PASS/FAIL, IMAGE VIEW, PRECISION** and **FONT SIZE**.

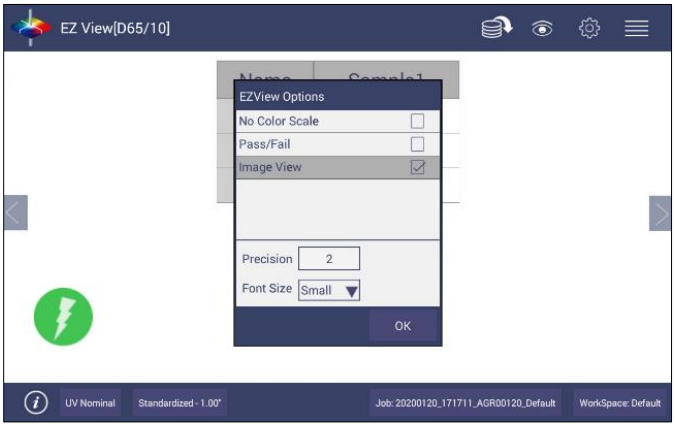


Figure 20. EZ View Options

Views: Color Data Table

The **COLOR DATA TABLE** view shows **COLOR SCALE**, **COLOR DIFFERENCE**, and **INDICE** data for the

STANDARDS and **SAMPLES** in the job.

Figure 21. Color Data Display

- Options such as **UV MODE, UV COMPARE DIFFERENCES, IMAGE STATUS, PORT PLATE SIZE, TOLERANCES**, **DATA ORDER, USER NAME, NO COLOR SCALE, DATE, IMAGE VIEW, SENSOR NUMBER, TIME** and **PASS/FAIL** can be selected for viewing using the **VIEW OPTIONS**.

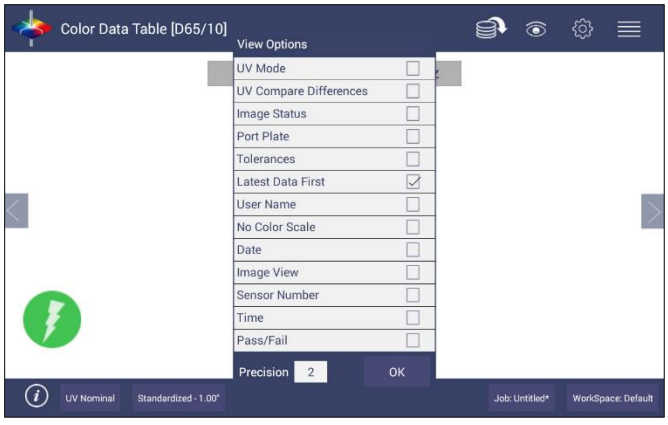


Figure 22. Color Data Screen: View Options

IMAGE STATUS is reported as you read a sample. This means that the image is saved (True)

or not saved (False).

Figure 23. Image Status

IMAGE VIEW is used to show the picture of samples and standards. A long press on the **SAMPLE** can enable the user to make the sample into a standard, change the name or delete the reading.

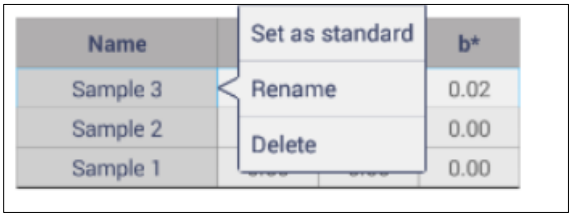


Figure 24. Changing a Sample into a Standard

- To delete a sample (or standard), select ***DELETE*** and then confirm the action.

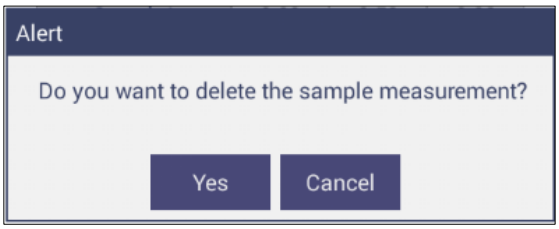
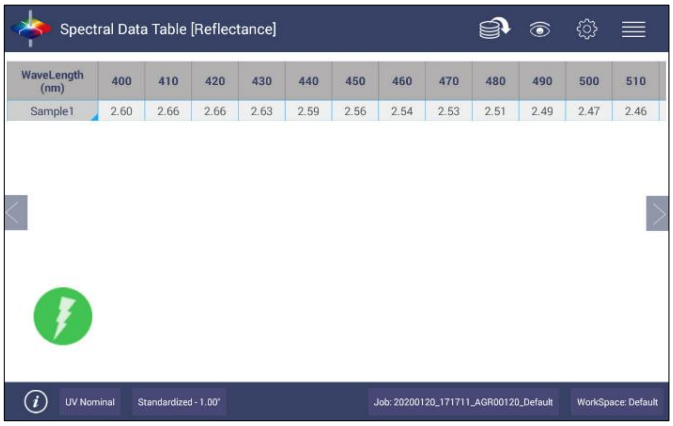


Figure 25. Delete the Sample Measurement

- A long press on the **STANDARD** will enable the user to edit or delete the standard. Edit opens the Standard and Tolerances dialog box. Delete will delete the standard from the current workspace.

Views: Spectral Data Table

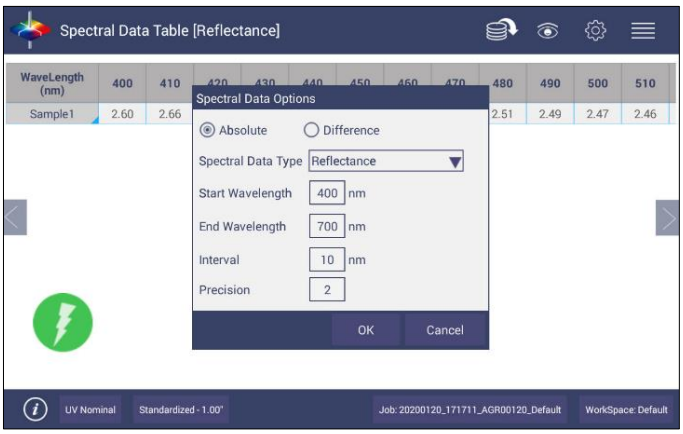
The **SPECTRAL DATA TABLE** displays percent reflectance or absorbance values for each selected



measurement at the wavelengths being measured.

Figure 26. Spectral Data Table

- Selections include **ABSOLUTE** or **DIFFERENCE for REFLECTANCE, STRENGTH** or **K/S**. Enter the



start and stop wavelength, the interval and the precision and press ***OK*** to continue.

Figure 27. Spectral Data Table Options

Views: Spectral Plot

This view provides a plot of wavelength vs. spectral measurement parameter.

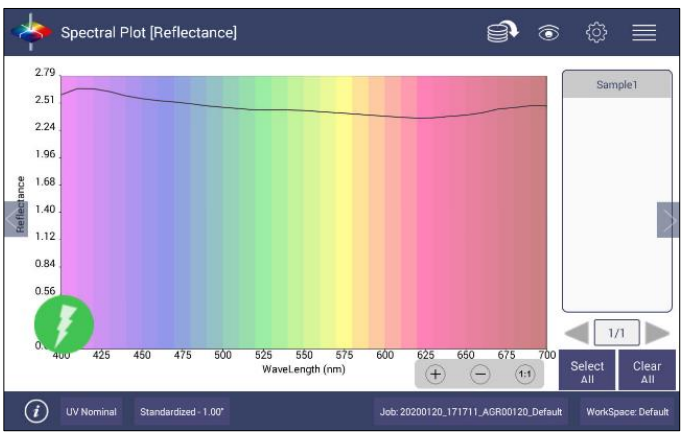
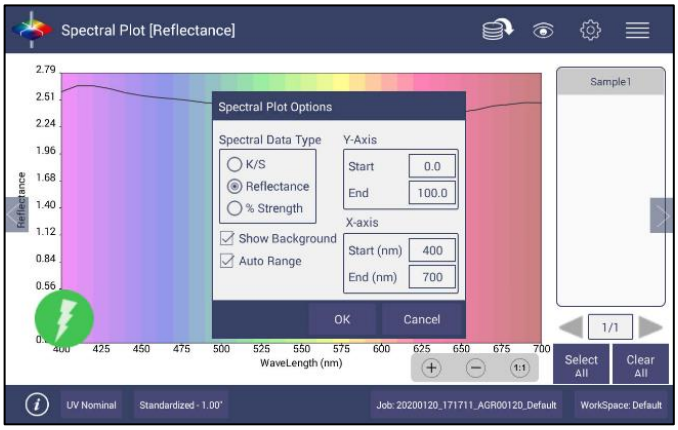


Figure 28. Spectral Plot View

- Press ***CLEAR ALL*** to remove all the samples to display. Press ***SELECT ALL*** to enable display of all samples. To select an individual sample, click on the respective Sample in the list located on the right edge of the screen.
- The Sample List is paginated. Click the left and right arrow buttons below the samples list to navigate between pages.
- Press and hold on the left/right ***PAGE NUMBER ARROWS*** under the sample list to show a small dialog box. This dialog allows you to select the number of records per page to display



and the page number to display.

Figure 29. Spectral Plot Options

- **SPECTRAL PLOT OPTIONS**: There are three choices for spectral plot options:
  - **K/S** – mathematical calculation based on reflectance and determined at each wavelength for the standard and sample.
  - **REFLECTANCE** - Displays the reflectance value at each wavelength.
  - **% STRENGTH –** Percentage of the ratio of the K/S of the sample to the K/S of the standard.
- Uncheck the ***OPTIONS***: ***SHOW BACKGROUND***, to display the plot with white background color.
- Check ***OPTIONS: AUTO RANGE*** to automatically scale the contents to fit. If **AUTO RANGE** is not selected, then enter the ***Y***-and ***X***-axis range to display.

Views: Trend Plot

This tool can be used to study the trends in production and identify color variations. There are four parameters of color measurement (three scale values and optional indice) which can be represented in four traces. If a sample point is selected in one of the four traces, it is highlighted in the other 3 traces in blue. The name is shown at the bottom right hand corner of the View. The ***AVERAGE*** and ***STANDARD DEVIATION*** can be shown as per the view configuration settings. XE "Trend Plot"

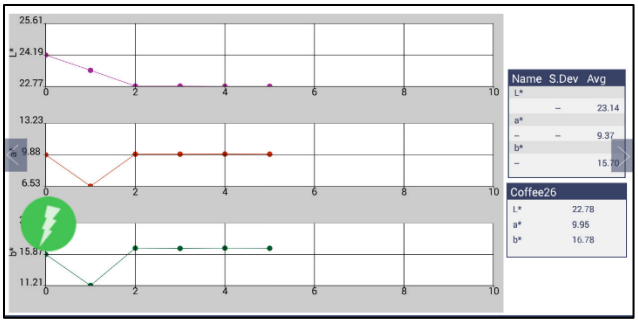


Figure 30. Trend Plot

- **VIEW OPTIONS** for the Trend Plot include the **TYPE OF DISPLAY**, the **STATISTICS** and the **NUMBER OF READINGS** per display.

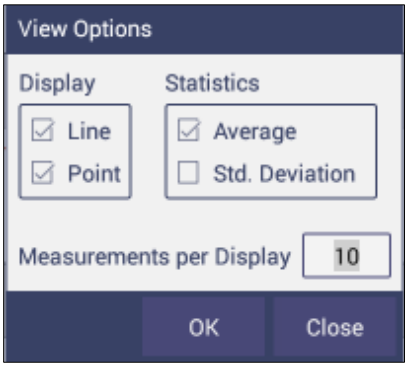
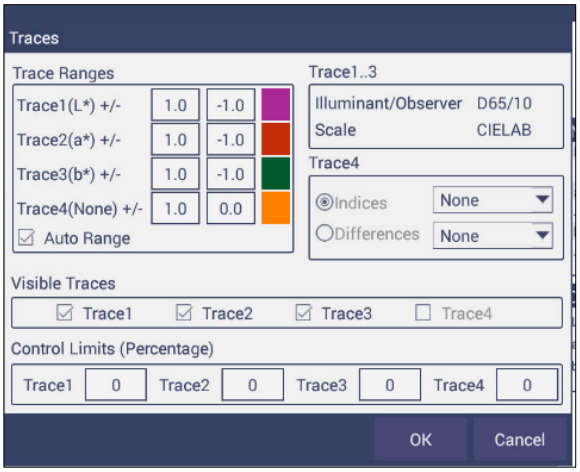


Figure 31. Trend Plot Options

- ***VIEW OPTIONS > TRACES*** set the ranges for the traces or allow selection of **AUTO RANGE**. Trace 1 to 3 uses the current Color Measurement Scale and Trace 4 will allow for measurement of differences or an index. The user can select which Traces to view and set



control limits as a percent.

Figure 32. Trend Plot Traces

Views: Color Plot

This shows the sample location in two-dimensional Color Space with respect to the standard for difference measurements or the samples in absolute measurement. For differences, the standard is the center point of the plot and the samples are plotted separately on the graph.

- The displayed samples are shown in a list box on the right of the screen. The Color Plot can be zoomed, and the data points can be viewed in detail.
- Press and hold on the left/right ***PAGE NUMBER ARROWS*** to show a small dialog box. This dialog allows you to select the number of records per page to display and the default page number to display.

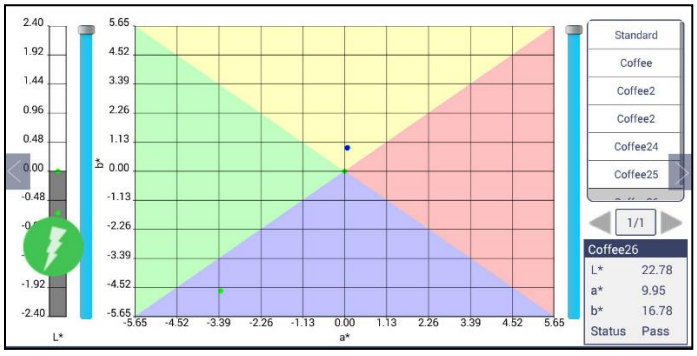


Figure 33. Color Plot View

Figure 34. Color Plot View Options

- The Tolerance Plot is available in rectangular and elliptical color space. The **PASS/FAIL** sample points are shown in green and red when in difference mode, respectively. In Absolute Mode, they are shown in green.

Tool Bar: Workspace & System Settings

Workspace Icon

Under the **WORKSPACE & SYSTEMS SETTINGS**, the following tasks can be accomplished:

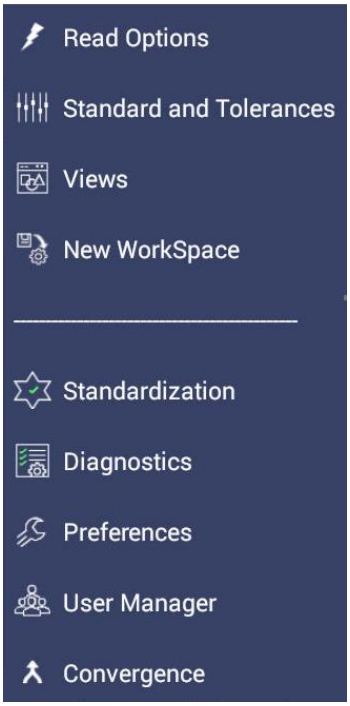


Figure 35. Workspace Parameters

Workspace > Color Scales

Color Scales provide four tabs in which the **SCALES**, **INDICES**, **DIFFERENCES** AND **ILLUMINANT/OBSERVER** (**ILL/OBS)** can be configured.

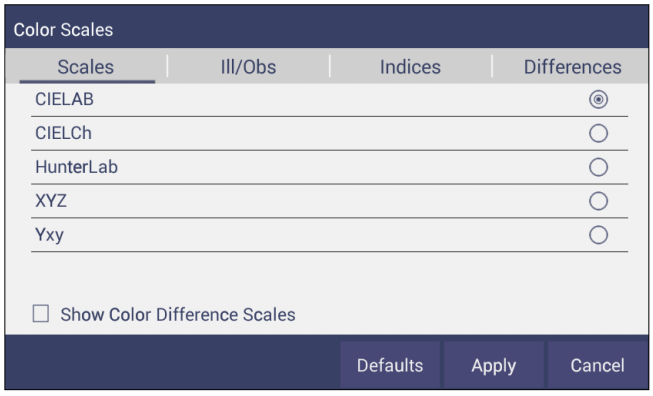


Figure 36. Color Measurement Scales

- The **SCALES** Tab shows the five scales available for measurement. Select the absolute scale or color difference scales (if a standard is selected). Press ***APPLY*** and begin to read your samples.
- The **ILLUMINANT/OBSERVER** tab displays combination selections for these parameters. To see all of the choices, you can scroll through the selections by viewing the screen.

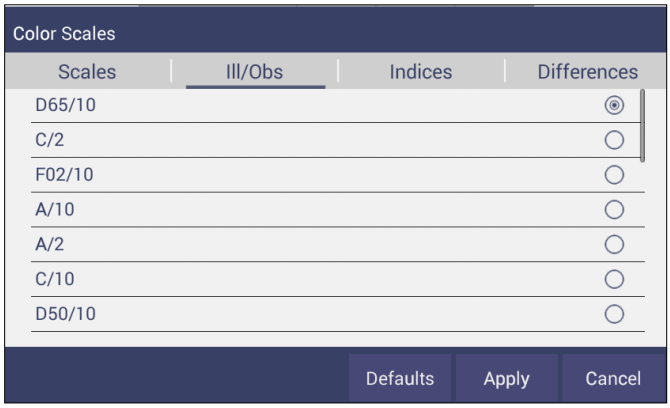


Figure 37. Illuminant/Observer Configuration

- To select indices, go to the **INDICES** tab and check the corresponding box on the right side. Multiple selections are available. To remove all selections, press ***CLEAR ALL***. To see more choices, the screen can be scrolled. Custom Indices allows the user to input a %R at a wavelength as an indice.
- The Bias configuration in **READ OPTIONS** can then be used to adjust the value of any index by applying a slope and gain to the measured value. Press ***APPLY*** to continue.

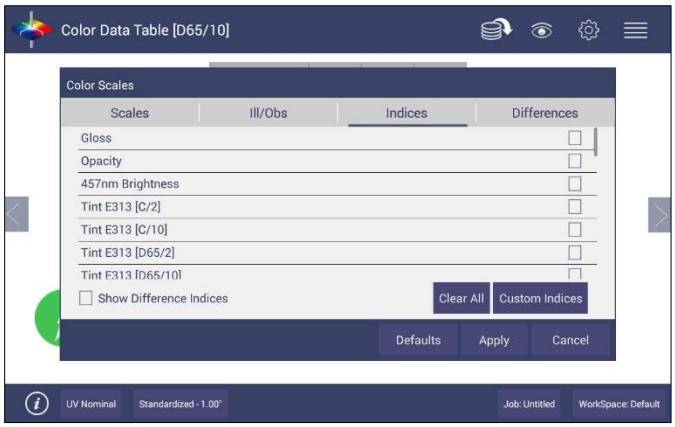


Figure 38. Index Configuration

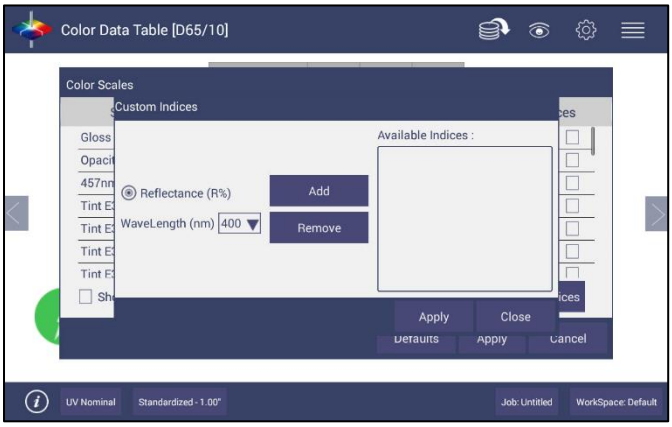


Figure 39. Custom Indices

- To select differences, go to the **DIFFERENCES** tab and check the corresponding box on the right side. Press ***APPLY*** to continue.

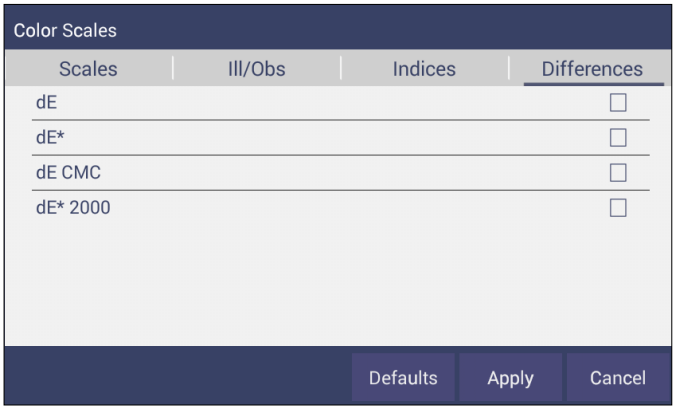


Figure 40. Color Measurement Differences

Table 3. Overview of Color Measurement Parameters for EZ View, Color Data Table, Trend Plot & Color Plot

Illuminant	Observer	Scales	Differences	Indices	View Options
D65	2/10	CIE Lab	dL*a*b*	457nm Brightness	Pass/Fail[1]
C	2/10	CIE LCh	dL*C*h	Tint E313	Tolerances
F02	2/10	Hunter Lab	dLab	WI E313	Time[3]
D50	2/10	XYZ[1]	dXYZ	WI Ganz	Date[3]
D55	2/10	Yxy[1]	dYxy	Tint Ganz	Port Plate
D75	2/10	Rdab	dE	Y Bright	Image Status
F07	2/10		dE CMC	YI D1925	UV Mode
F11	2/10		dE* 2000	YI E313	Image View
TL84	2/10		dE*	Z%	Latest Data First
ULT 30	2/10			SCAA/C	Trace Range 1[2]
ULT 35	2/10			SCAA/G	Trace Range 2[2]
	2/10			HCCI	Trace Range 3[2]
				BCU	Trace Range 4[2]
				Gloss	Auto Range[2]
				Opacity	Display: Line[2]
				Tomato Scores[4]	Display: Point[2]
				Tomato Dice Score	Zoom
				My, Mc, dM	Average[2]
					Std. Deviation[2]
					Meas per Display[2]

[1]Not Available on Color Plot, [2]Trend Plot Only, [3]Color Data Table Only

[4]Tomato Scores available with option: Fresh Tomato Color Index (C/2), Tomato Paste (C/2), Ketsup (C/2), Tomato Sauce (C/2), Tomato Juice (C/2), Tomato a/b Ratio (C/2)

Workspace > Read Options

Read Options > Options

Shows a dialog box to configure **AVERAGING, CONTINUOUS READ INTERVAL, AUTO SAVE, IMAGE VIEWER, INDEX BIAS CONFIGURATION, SAMPLE NAME,** and **STANDARD NAME**. The Read command performs the operation based on the configured options.

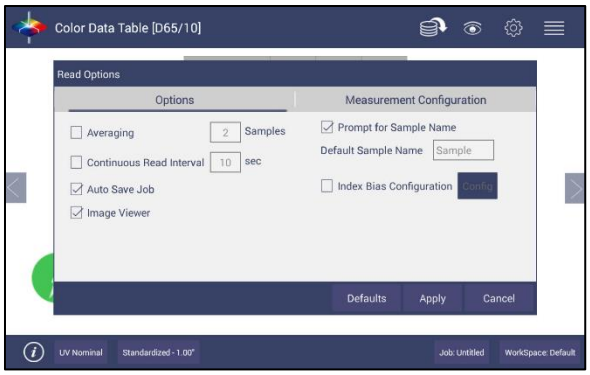


Figure 41. Read Options

- **AVERAGING**

  Select the number of readings to average to produce the final measurement. The total number of readings to be averaged can be no less than two. Press ***APPLY*** to close the screen and press Read to initiate Readings.

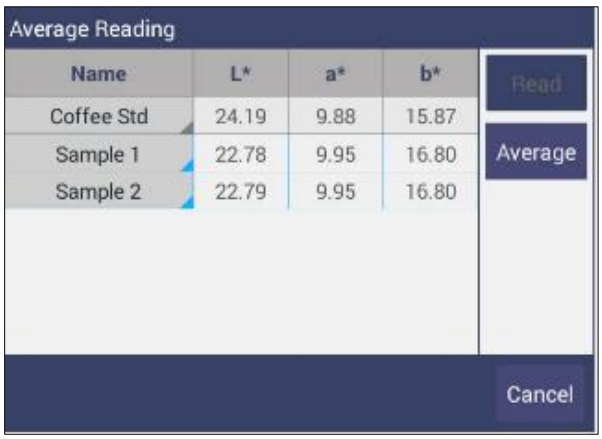


Figure 42. Reading and Averaging

Once the **READ** button is pressed, the instrument will display a unique dialog box to ***READ*** and ***AVERAGE*** the readings. The second reading is taken using the dialog box button, Read. Once all the readings are taken, press ***AVERAGE*** to obtain the results. Average and Continuous Read are mutually exclusive.

- **CONTINUOUS READ INTERVAL**

  This feature performs measurements continuously. In **CONTINUOUS READ** mode, measurements are initiated and stopped using the ***READ*** Button. The minimum value of the Read interval is 5 seconds and it will read as fast as it can update. When in **CONTINUOUS READ** mode, the Read Button is enhanced with a checkmark.

When taking measurements, the Read button is greyed out. When waiting to take the next measurement, the Read button turns green.

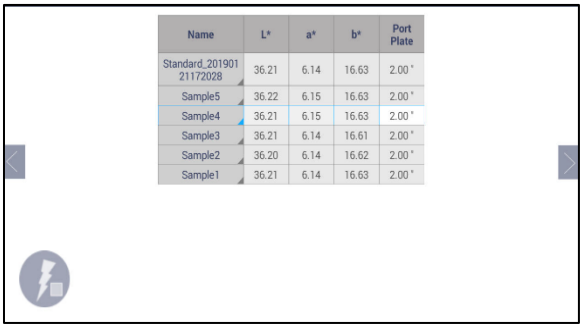


Figure 43. Continuous Read

To stop the Continuous Read, press the ***READ*** button when the button is green.

- **AUTO SAVE JOB**

  This selection will automatically save a job. Once this feature is selected, a dialog box will be displayed to name the job. If there is no name for a job yet, the file name will be default with the date, time, instrument and workspace.

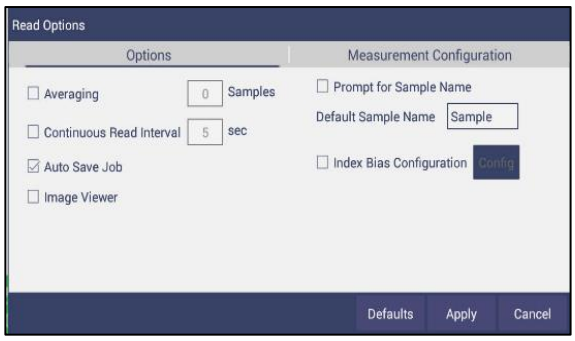


Figure 44. Auto Save Job

- **IMAGE VIEWER**

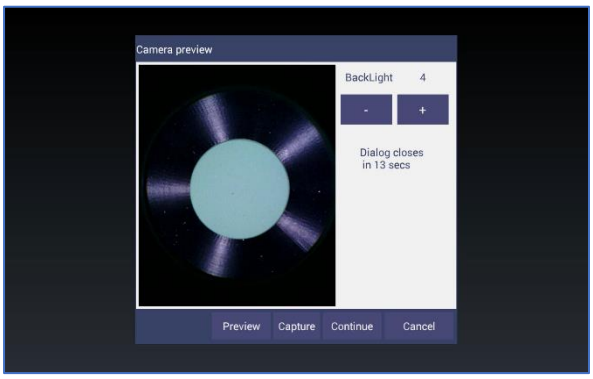
  To preview/capture an image of each sample prior to measurement, go to ***WORKSPACE > READ OPTIONS > IMAGE VIEWER.*** Check the ***IMAGE VIEWER*** and press ***APPLY.***

  When this option is checked, the camera will look on sample before taking each measurement. You can just view the sample's area without any capture or capture an image and save it together with a measurement. Note that the box is unchecked by default.

Note: When Averaging or Continuous Read is selected with Image Viewer, the camera will only view the sample once at the first measurement.

Note: The Camera preview dialog can only last 30 seconds maximum each time. This dialog will automatically close and take sample measurement once it passes 30 seconds.

- To take an image of a sample, place the sample on the port plate, and click the ***READ***



button. A **CAMERA PREVIEW** dialog will be prompted in your screen.

Figure 45. Camera Preview

- If the image shown in your screen appears to be fuzzy, tap on the image to perform auto-focus.
- Set the back-light level by adjusting the ***-/+*** button and position your sample in the right place. Then, click on ***CAPTURE*** to save an image.

Note: To fix the camera's auto focus, we use a sample with a sharp image (for example a paper with characters). Do not use the white tile or black glass for auto focus.

- ***INDEX BIAS CORRECTION***

This option allows the user to input a custom slope and intercept correction for indices. To begin, select the indices ***WORKSPACE > COLORSCALES > INDICES***. Then go to ***WORKSPACE > READ OPTIONS*** and select ***INDEX BIAS CORRECTION***. Select ***CONFIG*** and check the indice to modify and then input the desired ***GAIN and BIAS*** values. Press ***APPLY*** to save the selected Indices values and update the Views accordingly. The Bias-corrected Indices will be marked with * (e.g.: HCCI *) in the respective view display.

To calculate the slope and bias correction, read a series of samples around the target values of interest. Three methods can be used to provide corrected values:

1. **One standard data point**: In this case, the single data point is compared to the expected value. The Gain remains at 1.0 and the Bias is corrected:

   Bias = Expected Value- Measured Value

2. **Two data points**: In this case, the two readings are compared to the expected values.

   Bias Correction=Expected Value 1-(Measured Value 1*Gain)

   Gain Correction= (Expected Value 1-Expected Value 2)/ (Measured Value 1- Measured Value 2)

3. **Linear regression**: Create a y=mx + b relationship comparing actual readings to target values, where target values is on the Y-axis and actual readings are on the x-axis. Enter the slope correction under Gain and the intercept correction under Bias.

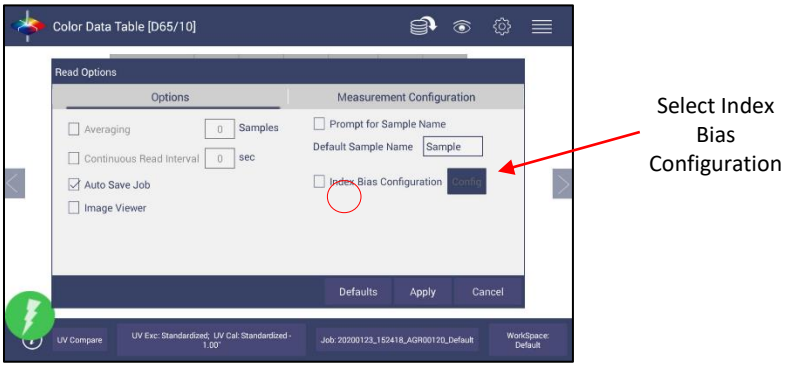


Figure 46. Slope & Bias Correction

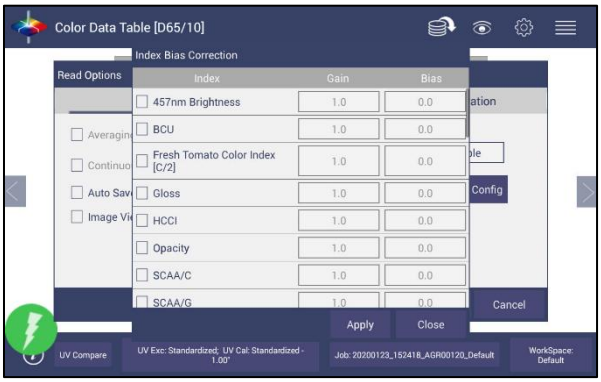


Figure 47. Input Gain & Bias

The indices with bias correction include: 457nm Brightness, BCU, HCCI, SCAA/C, SCAA/G, Tint E313, WI E313, Y Brightness, YI D195, YI E313, Z%.

- **PROMPT FOR SAMPLE/STANDARD NAME**

  Select this feature to input the Sample (or Standard) name manually during the measurement cycle so that the Sample measurement will be inserted with the specified name. If this option is not selected, the Samples will be inserted with the specified default sample name suffixed with the auto incremented index number. Press ***APPLY*** when done.

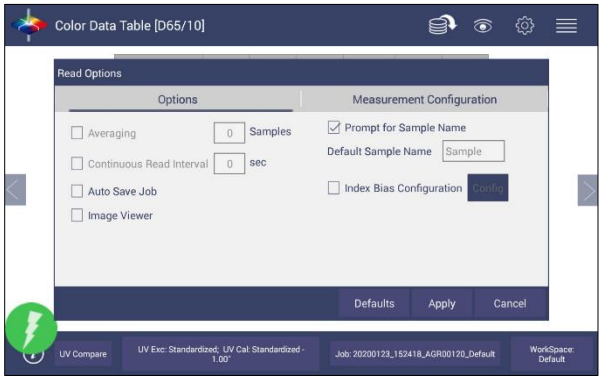


Figure 48. Prompt for Sample (Standard) Name

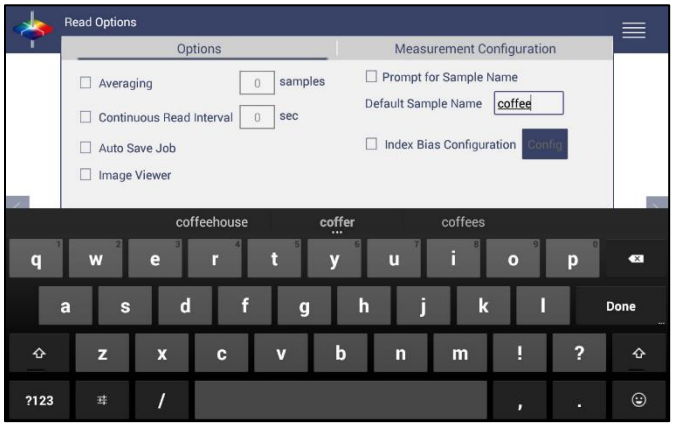


Figure 49. Input Sample Name

Read Options > Measurement Configuration

- **UV Mode**

  Agera uses LEDs to determine UV-nominal, UV-excluded and UV-calibrated content. UV compare will take two measurements automatically: one by UV-excluded mode and UV-calibrated mode for one sample. Both measurements will be saved with the same name. If the Image View is captured, the sample image will be saved for both measurements. The procedure is to standardize in 2 modes – one with the UV-excluded and one with the UV-calibrated. In this way, a numerical value for the ultraviolet contribution can be documented. To begin, select ***UV STATUS*** from the Status bar or go to ***WORKSPACE > READ OPTIONS > MEASUREMENT CONFIGURATION***.

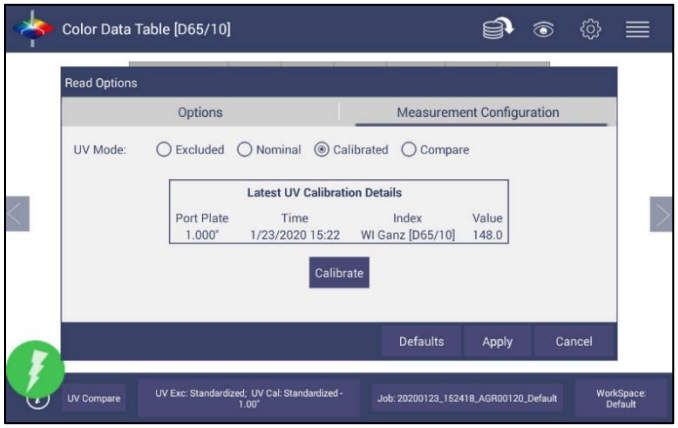


Figure 50. UV Mode Settings

  - ***UV-Nominal*** **-** This mode includes UV. The UV for this mode can only be calibrated/updated at HunterLab.
  - ***UV-Excluded*** - This option allows the user to negate the effect of optically-brightened agents or when used in multi-mode with UV-nominal or UV-calibrated, determines the amount of optical brightening agents present.

- ***UV-Calibrated*** - This UV calibration procedure optimizes the UV content to match D65 Daylight over time using a Fluorescent Standard with an assigned whiteness index value such as WI Ganz [D65/10] and WI E313 [D65/10]. When UV calibration is done correctly (i.e. the measurement is <0.5 from the calibration value), it will show port plate size, calibrate date and Whiteness index in this dialog as a stamp. If the measurement is >0.5, then the user will be asked to re-standardize and re-read the fluorescent standard. If the tolerance is not met, then this procedure will repeat 2 more times.

Figure 51. UV Calibration

- ***UV-Compare –*** This UV procedure automatically takes two measurements for one sample: one by UV-excluded and one by UV-calibrated. On the View Options Screen select UV Mode and UV Compare.

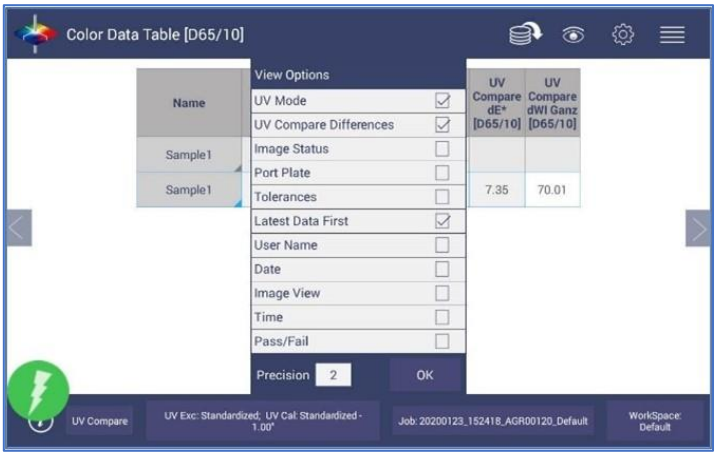


Figure 52. Select UV Compare

- Read the sample for results UV-excluded and UV-calibrated.

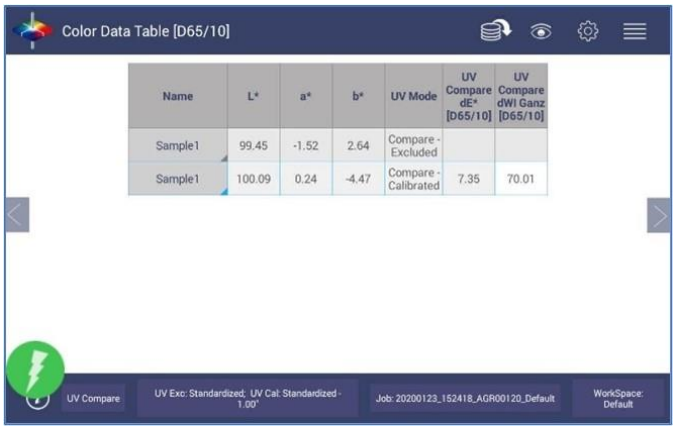


Figure 53. UV-compare Measurement

Workspace: Standard and Tolerances

Standard and **Tolerances**. Standards can be one of four types: retrieved from database, physical (measured), and ad hoc and numeric. A standard that is retrieved from Database has been previously stored. A physical standard is one that has been read as a sample and made into a standard. An Ad Hoc (or working) standard is one that is read at the beginning of a job and becomes the standard for a run. In this case, auto tolerances are recommended. A numeric standard is one that has color measurement values but is not present and cannot be read. A subset of this is the Hitch Standard. All types of standards can apply Hitch.

- A Standard is saved with standard name, standard color value and standard tolerances to the database by pressing the button at the bottom of the screen. When there is a standard applied in a job, you must delete it first if you want to change the standard type (Recall. Physical, Adhoc and Numeric). You can click the ***CALC AUTO TOLERANCES*** here to calculate the tolerances of standards.

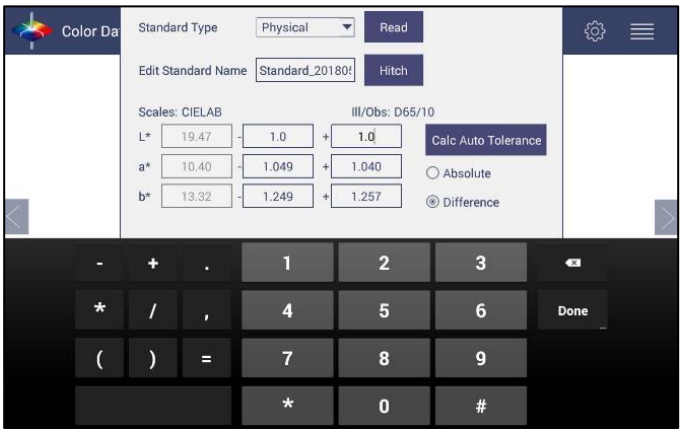


Figure 54. Tolerances Configuration

- **Tolerances** can be entered manually for a selected scale, index and difference.

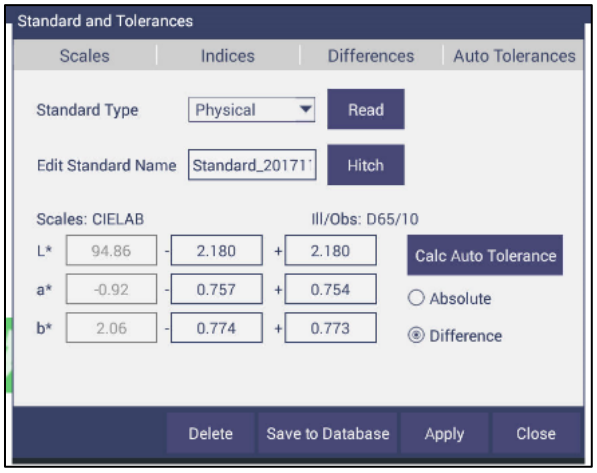


Figure 55. Enter Tolerances

- Tolerances will be displayed on the measurement screen if enabled under VIEW OPTIONS for the Color Data and the Color Plot Screens.

Name	L*	a*	b*	Distance (mm)	Height (mm)	Turntable	BCU	dBCU	HCCI	dHCCI	SC
tandard_201805 03164247	19.47	10.40	13.32	83.04	20.40	On	0.19		6.18		46.
+ Tolerance	0.89	1.04	1.26	0	0	0	1.2	0	8.5	0	0
- Tolerance	0.89	1.05	1.25	0	0	0	1.2	0	8.5	0	0
Coffee58	29.52	4.82	3.32	82.90	20.54	On	1.27	1.08	8.37	2.20	70.
Coffee57	29.51	4.81	3.32	82.34	21.10	On	1.27	1.08	8.37	2.19	70.
Coffee56	29.51	4.82	3.31	82.35	21.09	On	1.27	1.08	8.37	2.19	70.
Coffee5	29.47	4.83	3.32	82.35	21.09	On	1.27	1.07	8.35	2.17	70.
Coffee4	29.34	4.87	3.36	82.67	20.78	On	1.26	1.06	8.30	2.13	69.
Coffee3	27.36	6.72	5.63	81.79	21.65	On	1.06	0.87	8.21	2.04	65.
Coffee2	18.28	9.11	10.95	84.37	19.07	On	0.05	-0.15	5.29	-0.88	42.
Coffee	19.47	10.40	13.32	83.04	20.40	On	0.19	0.00	6.18	0.00	46.

Figure 56. Indices & Tolerances on CDT

- **PASS/FAIL** based on these tolerances can be used on the EZ View as well as Color Data View.
- Hitch Standardization
  - **Hitch Standardization** is a process by which two or more instruments of similar design can be made to read the same color values on a group of specimens. This process is very useful in expanding the communications of color around the world or between vendor and customer.
  - The process of Hitch Standardization (also known as transfer standardization) involves assigning one instrument to be the reference, or master, unit and mathematically adjusting the secondary, or slave, unit(s) to read the same values. In this way, two or more instruments can be hitched together. Hitching a secondary unit to a reference instrument requires that a specimen be read on both units and the values compared and adjusted accordingly. This specimen, known as the hitch standard, is first read on the reference instrument and its values recorded as spectral data or colorimetric (tristimulus) data. The hitch standard is then physically moved to the secondary instrument where it is reread and the values from the reference unit are input into the secondary instrument's processor.

- Steps for Hitch Standardization:
  - Read a standard.
  - Go to ***WORKSPACE > STANDARD AND TOLERANCES*** and select ***HITCH.***
  - The Standard is displayed under ***AS READ***. Enter the ***TARGET VALUES***.
  - Check the ***APPLY HITCH*** box and press ***OK***.

Figure 57. Hitch Standardization

Table 4. Hitch Standardization by Additive or Ratio Application

	Hitch Standard		Calculate Additive	Calculate Ratio		Apply Hitch Additive	Apply Hitch Ratio
	Target	Measured	Hitch	Hitch	New Read	New Read	New Read
X	80.27	78.29	= +1.98	=*1.025	70.84	72.82	72.63
Y	81.00	79.21	= + 1.79	=*1.022	72.25	74.04	73.88
Z	50.71	47.76	= +2.95	=*1.061	46.07	49.02	48.91
			Hitch Factor	Hitch Factor		Hitch Calc	Hitch Calc
			1.98	1.025290586		70.84+1.98	=72.84*1.025
			1.79	1.022598156		72.25+1.79	=72.25*1.022
			2.95	1.061767169		46.07+2.95	=46.07*1.061

AutoTolerances Setting

Using Tab 4, AutoTolerances are calculated for a Color Scale using CMC. The default values of l:C – 2:1 with auto correction factor = 0.75 and commercial factor = 1. However, these ratios can be modified as

needed.

Figure 58. AutoTolerance Configuration

Note: If AutoTolerances are selected, the user cannot manually enter tolerances.

Tolerances

Tolerances can be manually entered for Scales, Indices and Differences. Tolerances will be displayed on the measurement screen if enabled under ***VIEW OPTIONS*** for the Color Data and EZ View Screens. Pass/Fail based on these tolerances can also be viewed on these screens.

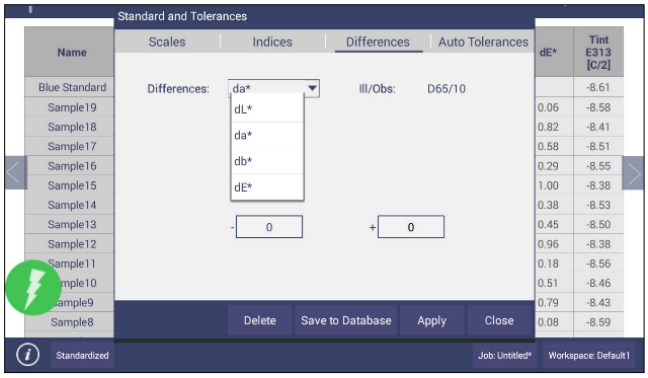


Figure 59. Difference Tolerance Configuration

Figure 60. Indices Tolerance Configuration

Workspace: Views

This option can be used to select the screen views to be used. Simply check on the box of the screen needed. Press ***APPLY*** to save one or all of the screens. The default screen is the **COLOR DATA TABLE**. To navigate between screens once the selections have been applied, use the ***VIEW FLIPPERS*** on the left and

right of the screen.

Figure 61. Workspace Views

Workspace: New Workspace

This allows the user to create a new workspace. A warning is shown to make sure that the current Job is saved. All settings in the previous workspace will be loaded in the new workspace.

Figure 62. New Workspace

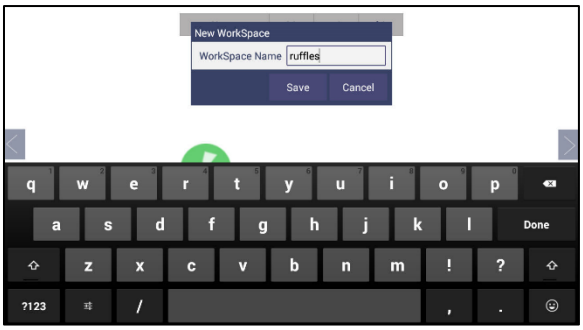


Figure 63. Name the New Workspace

System Settings: Standardization

From the ***WORKSPACE*** menu, select ***STANDARDIZATION***. You can also press the Standardization button in the Status bar as a shortcut. The instrument can report the current port plate and UV Mode on the

status bar. Agera can save multiple modes contains different UV settings (nominal, excluded and calibration) and Area of View (xLAV1, LAV, and MAV).

Each Agera has a specific set of Black Glass and White Tile unique to the instrument. These are not interchangeable with other instruments. Position the standard tiles on the instrument with the white line matching the white line on the port plate.

- ***READ BLACK GLASS***: Place the Agera black glass on the sensor port. Press ***READ*** to continue.

Figure 64. Read Black Glass

- ***READ WHITE TILE***: Remove the black glass and place the Agera white tile at the port. Press ***READ*** to continue.

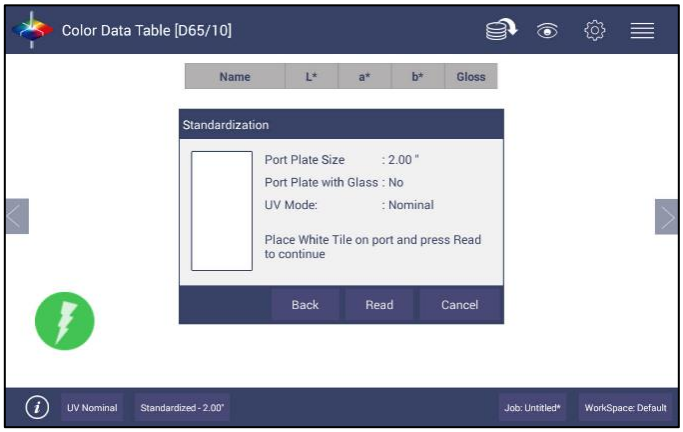


Figure 65. Change to White Tile

- Remove the calibrated white tile when standardization is complete. The instrument is ready to Read Samples.

Multi-Standardization Mode

Agera can save multiple modes with UV Modes and Area of View (Port Plate Settings). Based on the UV-status and the port plate standardization, the nine modes can be stored and recalled for measurement.

Table 5. Multiple Modes

Mode	UV	Port Plate
1	Nominal	xLAV: 51mm (2.0 in)
2	Nominal	LAV: 25.4mm (1.0 in)
3	Nominal	MAV: 16.9mm (0.625 in)
4	Calibrated	xLAV: 51mm (2.0 in)
5	Calibrated	LAV: 25.4mm (1.0 in)
6	Calibrated	MAV: 16.9mm (0.625 in)
7	Excluded	xLAV: 51mm (2.0 in)
8	Excluded	LAV: 25.4mm (1.0 in)
9	Excluded	MAV: 16.9mm (0.625 in)

To update Standardization Status for a new mode, place the new port plate on the instrument and/or change UV status by UV button and click the ***READ*** button. The standardization status will be updated. If the standardization of this new mode is valid, then the sample will be read. If the standardization is not valid, a dialog box will be shown so prompt for new Standardization.

When using **UV COMPARE**, there are two standardization modes associated – one for **UV-CALIBRATED** and one for **UV-EXCLUDED**. Both modes must be valid before measurements can be taken.

Standardization and Port Plate/Area of View

Each Agera can determine the port plate in view and adjust accordingly. The sizes are as follows:

- xLAV - 54 mm (2.125 in) illumination; 51 mm (2.0 in) measured
- LAV - 28.6 mm (1.125 in) illumination; 25.4 mm (1.0 in) measured
- MAV - 17.46 mm (0.6875 in) illumination; 16.9 mm (0.625 in) measured

Gloss Standardization

Gloss standardization is automatically done while performing instrument color standardization and uses the Black Glass as the reference.

Agera includes a built-in 60-degree gloss meter with a single LED illumination (filtered to C/2°)/detector pair in conformance with ASTM D523and located right below the sample port plate.

Gloss measurement works with all three port plates. Agera reports gloss when selected as an index in ***WORKSPACE > COLOR SCALES > INDICES > GLOSS***.

System Settings: Diagnostics

Diagnostics in the Agera are grouped as **PERFORMANCE, ADVANCED** and **PREDICTIVE diagnostics**. The performance diagnostics includes Repeatability, Green Tile, Gloss Tile Test and Validation using EasyCal™. All performance diagnostics tests use the 1.00'' port plate and UV nominal.

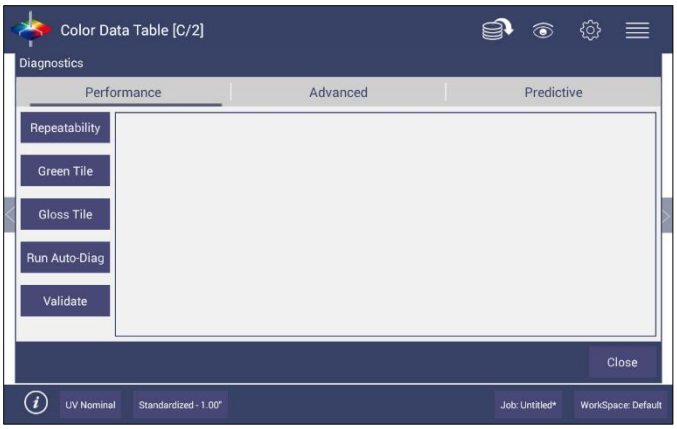


Figure 66. Performance Diagnostics Menu

Performance Diagnostics

Colorimetric Repeatability

The Repeatability Test assesses how consistently the instrument can measure color. To begin the sample pan should be free of samples and obstacles. Click ***NEW*** button to start the repeatability test and the user is prompted to press ***OK*** to standardize. All sample readings must be within the tolerances to pass the test.

READ the Agera black glass and then the Agera white tile.

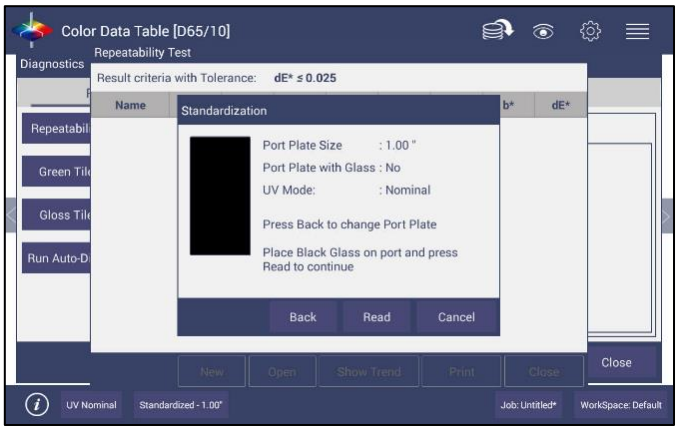


Figure 67. Standardize the Instrument

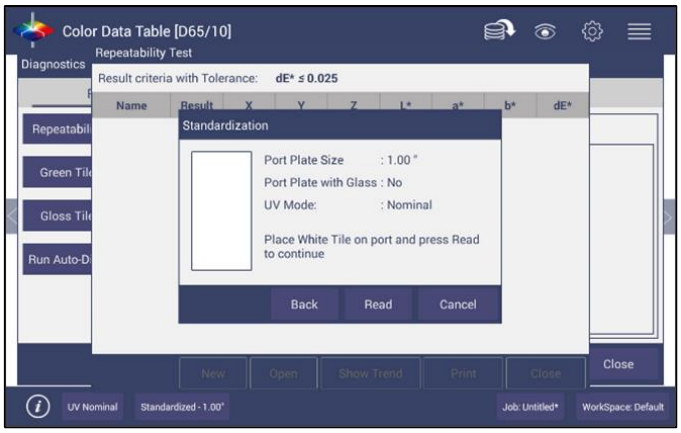
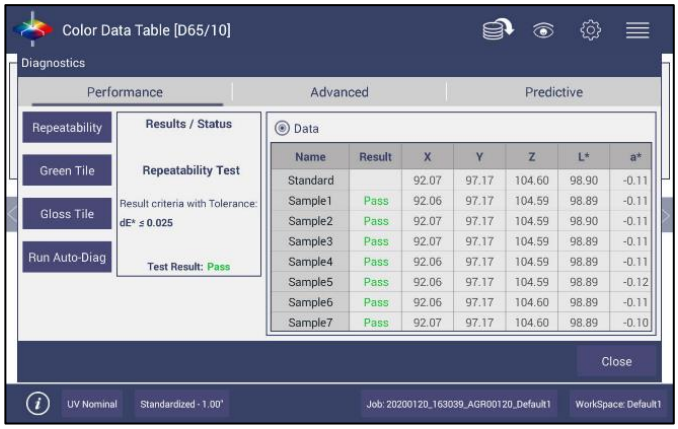


Figure 68. Read White Tile

Leave the white tile at the port and press ***OK*** to initiate the repeatability readings. The white tile is read 30 times and the individual results reported. A table of the difference between the current reading and Standard is shown after every measurement. By comparing each reading to the tolerance, a Pass/Fail assessment is shown.

Figure 69. Repeatability Readings with Pass/Fail

When all 30 readings have been made, the final test result is shown and saved automatically. To print the results, press the ***PRINT*** button or click to open the file and then



Print.

Figure 70. Diagnostics Repeatability Test Results

Reading the Green Tile

This test requires entry of the target values for the green tile.

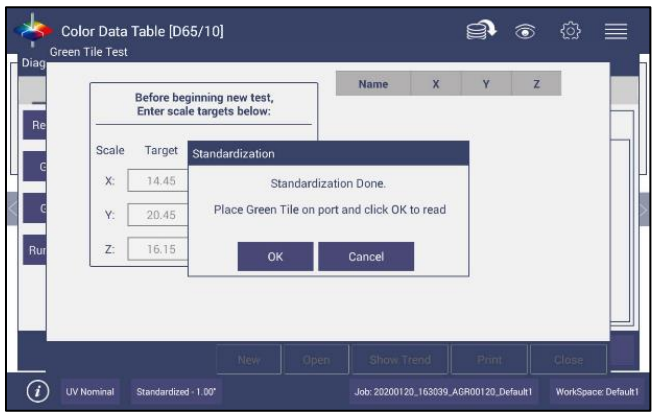


Figure 71. Input Target Values for Green Tile

Once the target values have been entered, press ***NEXT***. Standardize the instrument and attach the Green Tile. Press ***OK*** to continue.

Ten readings are taken and compared to the tolerance as an average. This test is then automatically saved and can be printed by pressing ***PRINT***.

Figure 72. Green Tile Readings

Gloss Test

This test can read a gloss standard 10 times and compare the tile value to an averaged value. To begin, select 1" port plate and then enter the target value found on the back of the gloss standard.

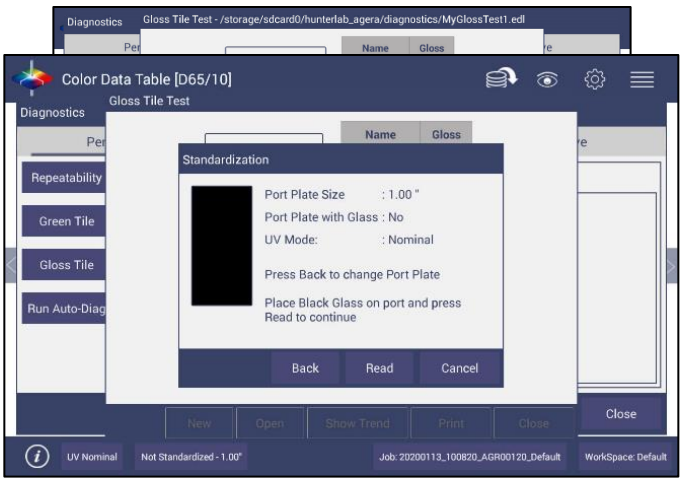


Figure 73. Insert Target Value

Press ***DONE*** and the software will then prompt the user to standardize using the Black Glass and then the White Tile.

Figure 74. Standardize with Black Glass

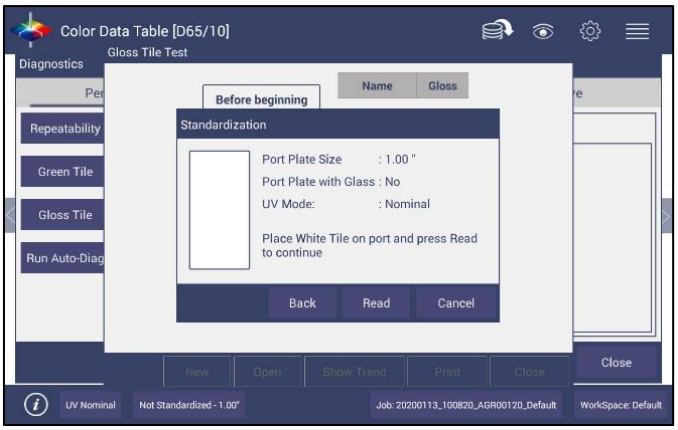


Figure 75. Standardize with White Tile

Then place the standard at the port and press ***OK*** to measure. Ten readings will be taken and compared to the input value.

Figure 76. Place Gloss Tile at Port

Figure 77. Gloss Tile Results

When all readings have completed, choose ***PRINT*** to output results, ***SHOW TREND*** to view a graph of results and press ***CLOSE*** to finish.

Note: If the green tile XYZ differences equal 0.25 to 0.3, then a warning will be displayed.

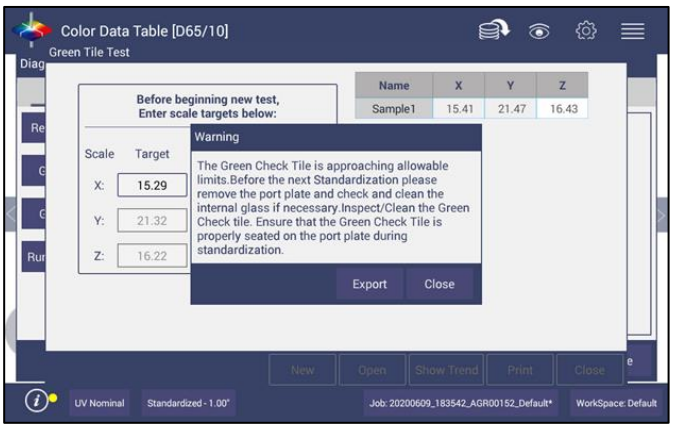


Figure 78. Warning on Green Tile Readings

Run Auto Diagnostics

Auto Diagnostics is for use by the service department at HunterLab and not recommended for customer use. It runs all tests and detailed readings for **SHORT TERM REPEATABILITY**, and **GREEN TILE PERFORMANCE** are available by opening the CSV file.

EasyCal™ Qualification

EasyCal programs allows users to:

- Qualify new and existing color measurement equipment
- Verify instrument performance
- Document instrument performance to support compliance audits
- Calibrate instrument with industry specific standards

Instrument qualification standards are available in individual or three-sample sets, representative of the end user's working color range. Each standard is supplied with a Certificate of Analysis with traceable values and uncertainties.

The EasyCal Qualification Standards Kits Include:

- Software & License
- Measurement Accessories (if needed)
- Certification Label

The detail of EasyCal processes can be found in their specific EasyCal User's Manual.

Advanced Tests

Advanced Tests are primarily for use by HunterLab's Service Department. The Service Department might find it useful to diagnose a problem using the Performance tests of **READ, CAROUSEL, SAMPLE DETECTION, AND LOG FUNCTIONS**. Each of these tests can be shown in **DATA VIEW** or in **CHART VIEW**. **SIGNAL/DARK/ZERO** can be exported in CSV format. Under the System menu, you can **STANDARDIZE, MEASURE, UPLOAD PRINTER DRIVERS, RESTART COMM** with a computer, **RESTORE TILE DATA, PARK FOR SHIPPING** and **RESET TO DEFAULT**.

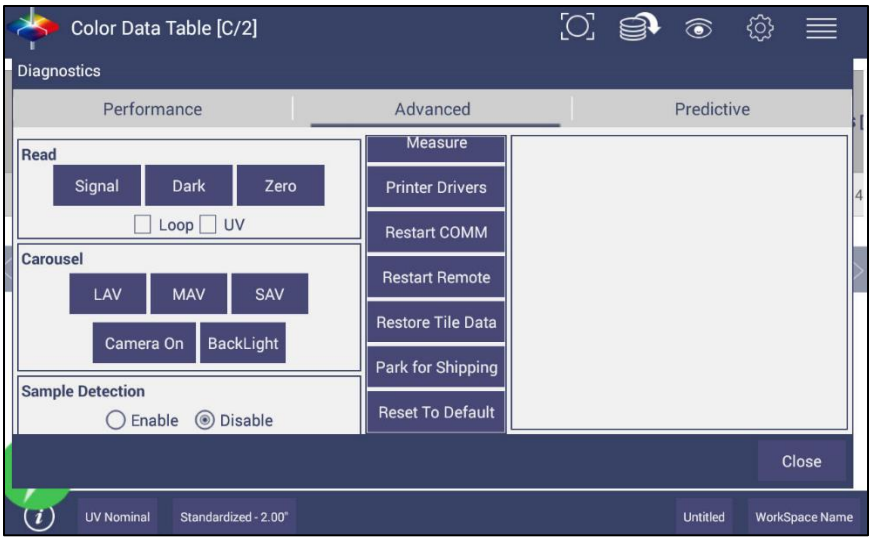


Figure 79. Advanced Menu

Read Signal, Dark, Zero: This function will enable the Service Department to determine proper performance of the instrument. The **SIGNAL DATA** and **CHART** for the white tile are shown in the next figure. These measurements can be put on a continuous **LOOP**. Also, the UV LEDs can be included/excluded in the measurement by checking/unchecking the **UV OPTION**.

Figure 80. Read Signal

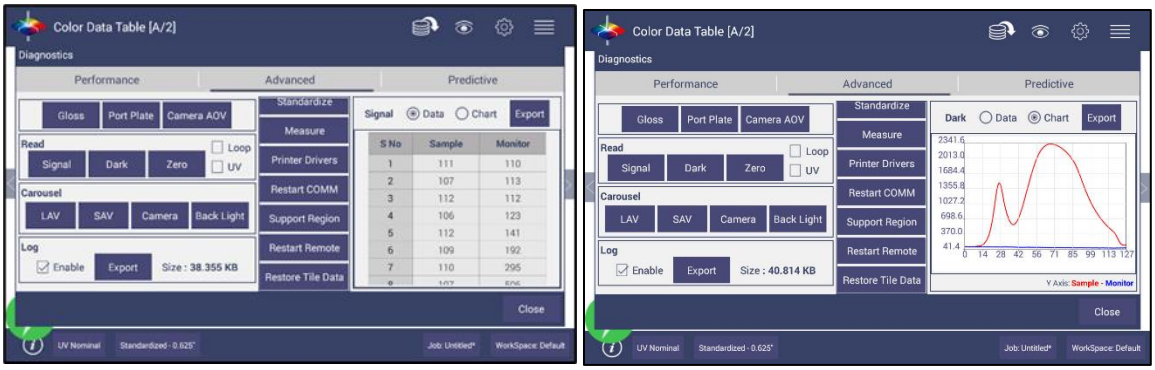


Figure 81. Dark Data and Chart

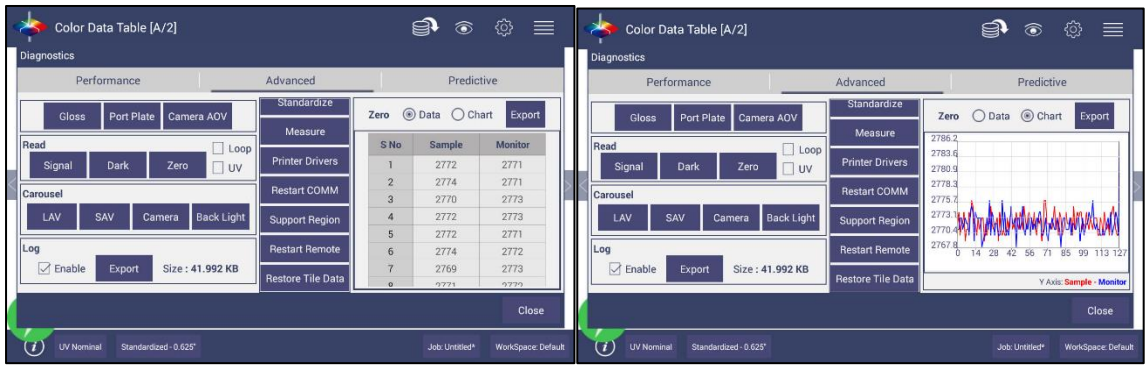


Figure 82. Zero Data and Chart

Carousel: Provides the current **PORT PLATE INDEX** and size in the **DATA VIEW**. Each port plate has a unique index. If the port plates are being read incorrectly, please contact the Service Department.

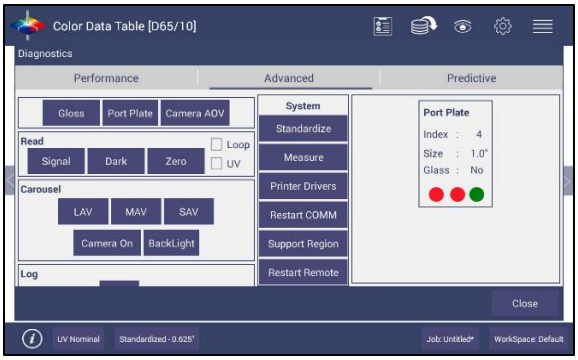


Figure 83. Port Plate Code

Camera On is used to calculate the sampling area of each port plate. To use this feature each port plate should be read with a white translucent sample at the plate.

Note that the new sampling area will be updated right after clocking Camera AOC in the following dialog.

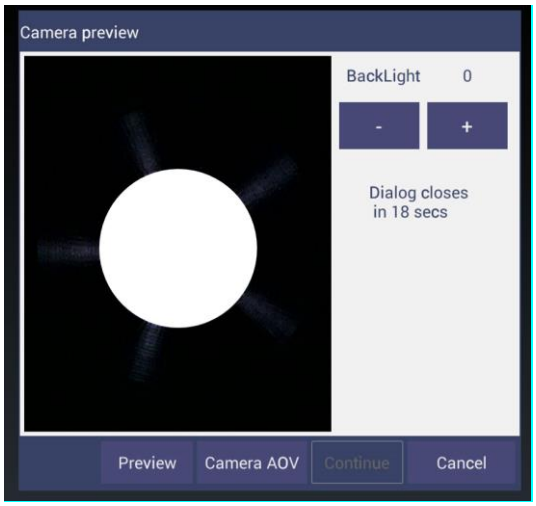


Figure 84. Camera AOV Dialog

Carousel*:** Moves the carousel to **LAV LENS/MAV LENS/CAMERA** position. For example, if you click on ***LAV, it will move to the LAV lens. The Backlight is used to check if the **MAV/LAV LENSES** are aligned correctly.

Log*:** After enabling Log feature, all the commands and response will be recorded here. User can attach the thumb drive to the instrument and click ***EXPORT here to get the log file (.txt) exported.

***Standardize*:** Initiates **STANDARDIZATION** from the Diagnostics screen.

***Measure*:** Initiates the measurement of a sample from the Diagnostics screen. The reflectance spectra data will be showed in this Data View.

Printer Drivers*:** To upload a new print driver or apk file, download the apk file needed from the internet onto a flash drive. Place the flash drive into the instrument (front port) so that it can access the list of apk files. Select the driver to upload and press ***OK.

Figure 85. Insert USB with Printer Driver

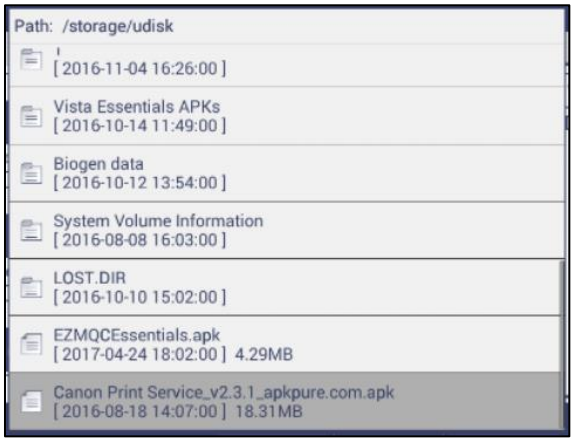


Figure 86. Select Printer Driver

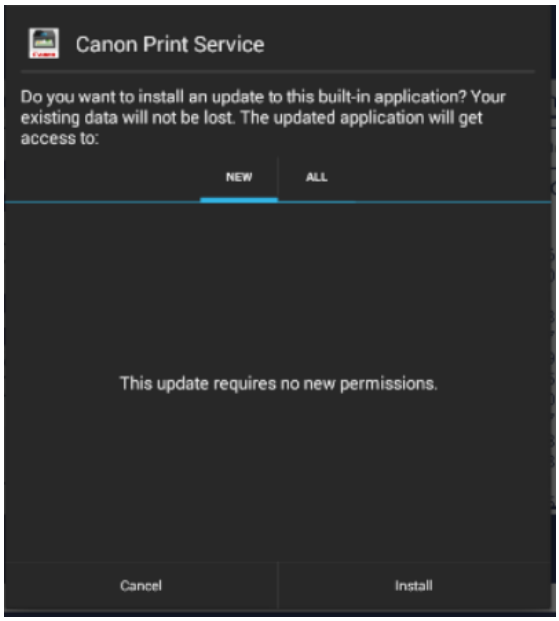


Figure 87. Updating Printer Drivers

The Agera will install the new printer driver.

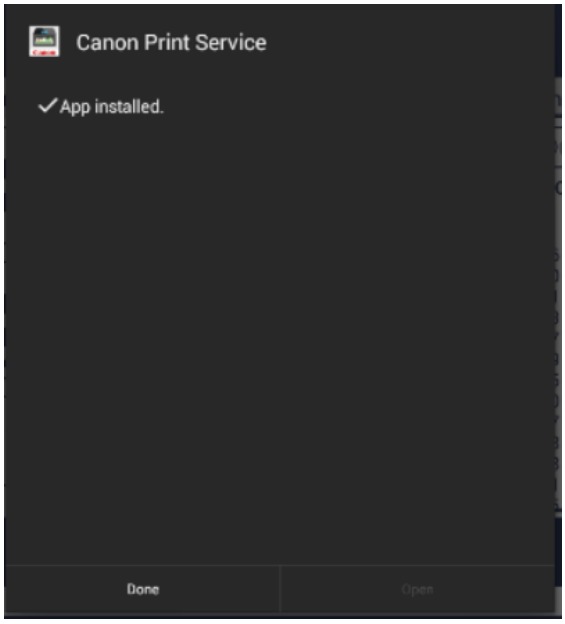


Figure 88. Printer Driver Installed

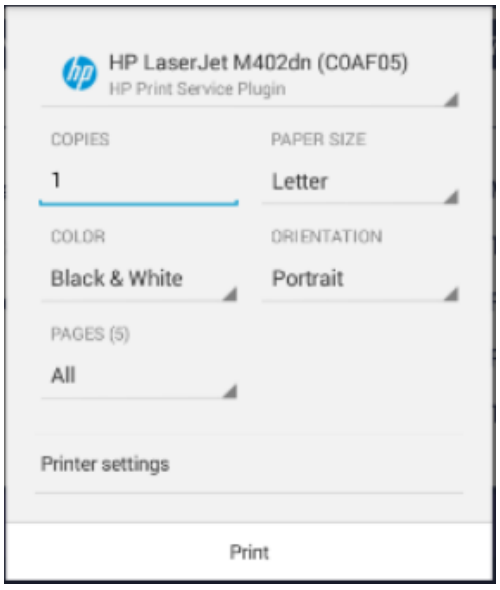


Figure 89. Printer Page

Restart Comm can be used to reset the ethernet communications for EasyMatch QC.

Support Region**:** Select ***SUPPORT REGION***. A dialog is displayed with three options for region selection. Select the region (from ***USA, EUROPE OR ASIA PACIFIC)*** and then press ***OK***. To apply this change, please restart support using the method below.

Note: Your instrument must be connected to the internet.

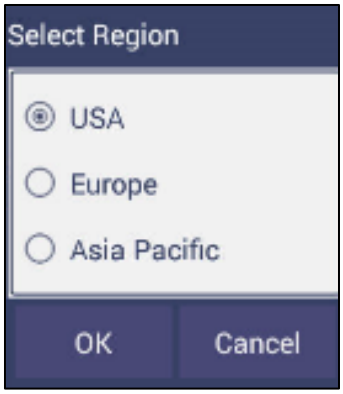


Figure 90. Select Region

Restart Remote*:** Click ***RESTART REMOTE to view the Netops Host Screen. From the top right side of the Netops Host screen, select the 3 dots. From the list menu, select ***RESTART.***

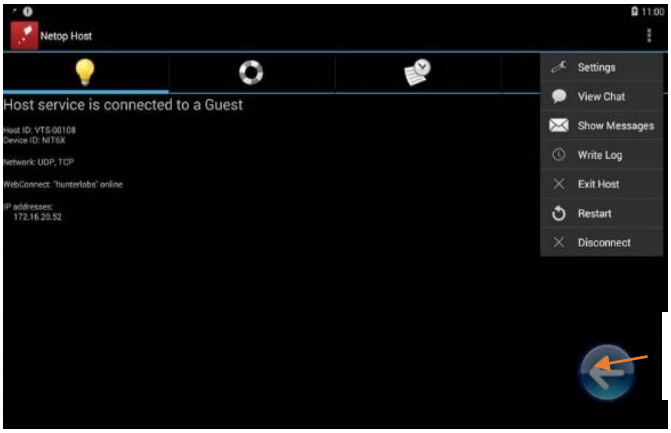


Figure 91. Remote Access Screen

- To ensure that **REMOTE SUPPORT** is successfully restarted, make sure that you see the message ***WebConnect: 'hunterlabs' online***. If this message does not appear, please contact our support team. To exit press the floating back button.

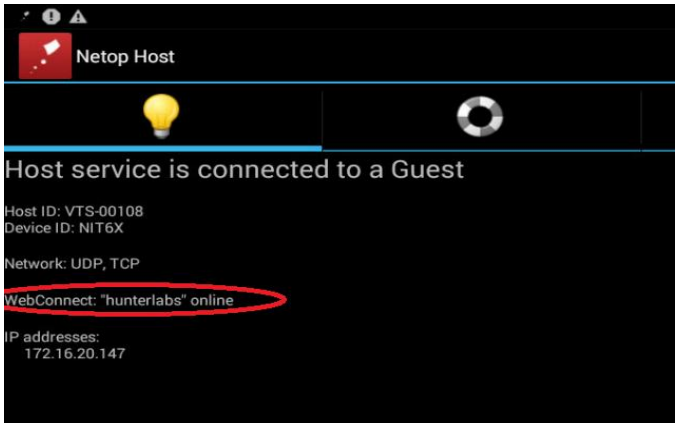


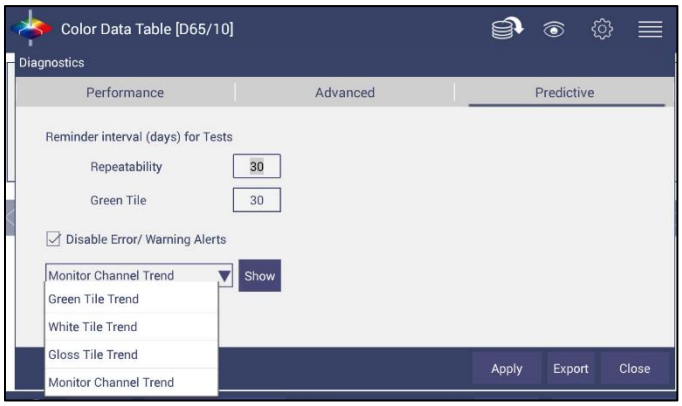
Figure 92. Web connect to HunterLab

***Restore Tile Data*:** This button is used to upload the new white tile data from the attached Thumb drive into Agera sensor. The new white tile data will be sent together with the white tile to an end user.

Predictive Tests

HunterLab Predictive Diagnostic is designed to monitor the software and hardware components of the Agera. Predictive Diagnostic is used to capture different low-level and user-initiated data during normal operation. Following are predictive diagnostics features that have in Agera 1.03.0084 and above.

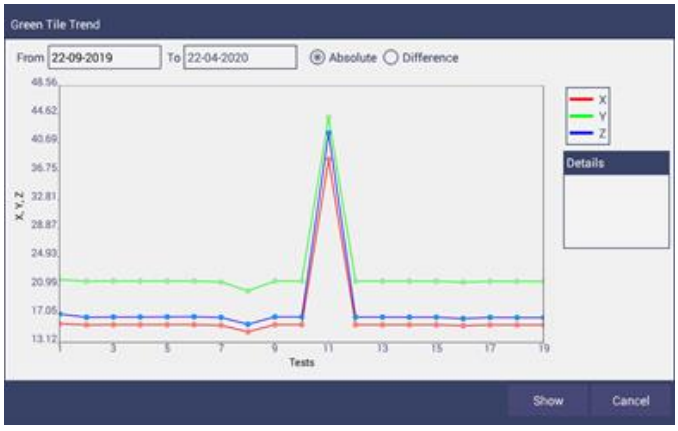
1. In ***WORKSPACE MENU > DIAGNOSTICS > PREDICTIVE***.
2. Select a trend and press ***SHOW*** to display the data trend for repeatability, green tile, gloss tile or monitor channel**.** Press ***APPLY*** to view the data trends over time. Export the predictive



diagnostics data in csv files to thumb drive.

Figure 93. Predictive Diagnostics

3. Set up Reminder intervals for the white tile (repeatability) and green tile test. Select the number of days for the reminder**.** Select to ***DISABLE/ENABLE*** the **TEST EXPIRY ALERT**.
4. View trend plots of repeatability diagnostics tests (white tile), green tile diagnostics, gloss tile diagnostics and monitor channel (TOS) collected from each standardization. In each trend plot, select the time range, then select the ***SHOW*** button to display the data. In the



plot, select each data point to get the details showing on the right side.

Figure 94. Green Tile Trend

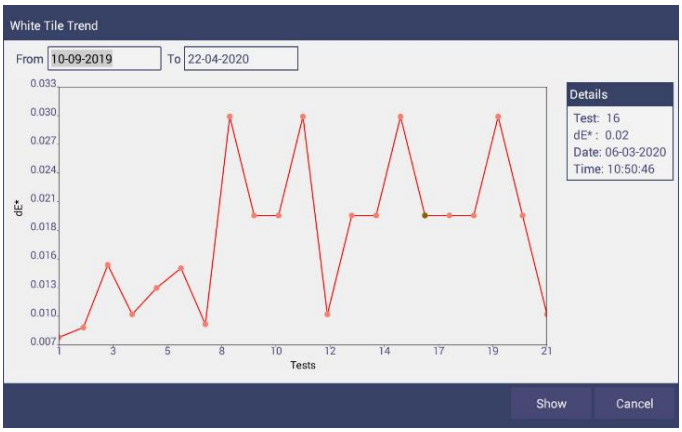


Figure 95. White Tile Trend

5. Select ***EXPORT*** to send the predictive diagnostics data to a thumb drive. It is recommended to share the predictive diagnostic files when users contact support@hunterab.com with instrument issues. There are three types of predictive diagnostic files.

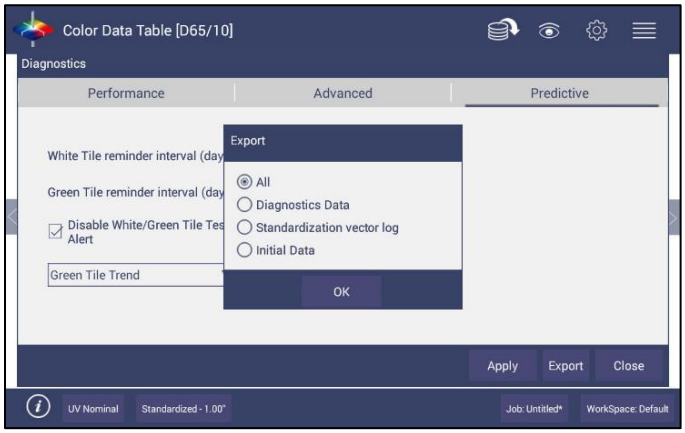


Figure 96. Predictive Test Options

Diagnostics Data: Records all of the diagnostics tests (i.e. White Tile Repeatability, Green Tile test and Gloss Tile tests.

Standardization Vector Log: Records raw data from the sample and monitor channel during each standardization.

Initial Data: The original raw data from the sample and monitor channel. This data should not be modified by users.

Test	Sample to Measure	Warning alert
Gloss Data	Black Glass	Gloss value is below 20000
Sample channel signal Data	Black Glass	Max BOS is above 700.
Monitor Channel Signal Data	White Tile	Max monitor data from pixel 32-96 is below 21500.
Sample Channel Signal Data	White Tile	Max monitor data is below 20000
XYZ Difference	Green Tile	Between 0.25 – 0.3
Service Date	Green Tile	Within 1 month

6. Warning Messages – Collect the following raw data:

Once the Disable Error/Warning Alerts is unchecked and applied in Workspace Menu > Diagnostics > Predictive, the info button in the tool bar will list all of the existing warning and error messages. It will be labeled with a different colored dot – Red dot for errors, a yellow dot for warnings and no color for no error or warning,

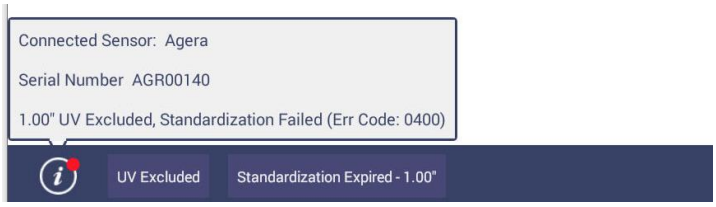
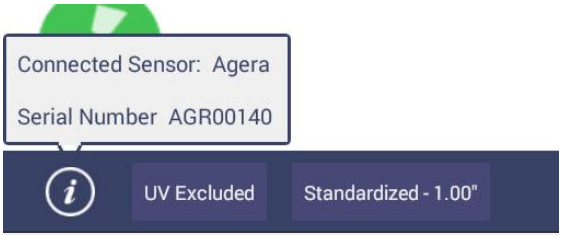


Figure 97. Red Dot for Errors

Figure 98. Yellow Dot for Warning

Figure 99. No Error or Warning

System Settings: Preferences



Preferences: General

This allows the user to set preferences to:

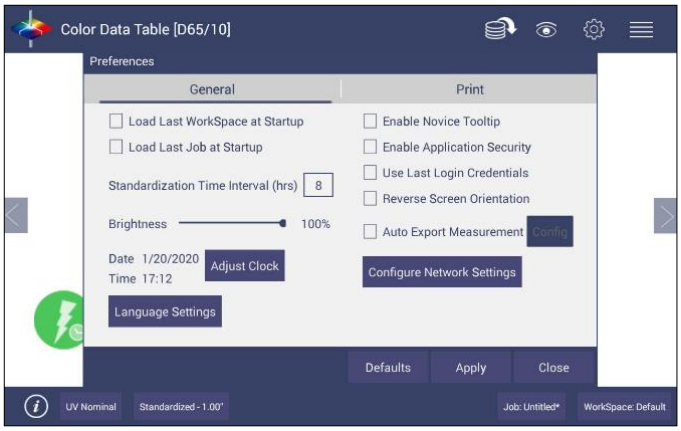


Figure 100. System Settings > Preferences > General Page

- To Load the **LAST WORKSPACE AT STARTUP** check this box and press ***APPLY***.
- To Load the **LAST JOB AT STARTUP**, check this box and press ***APPLY***.
- The **STANDARDIZATION TIME INTERVAL** is a useful reminder to re-standardize. Press ***APPLY*** to set the new interval. When the time has lapsed, a prompt to re-standardize will be displayed before measurements can be taken.
- Set the screen **BRIGHTNESS** using a sliding scale and press ***APPLY***.
- Use **LANGUAGE SETTINGS** to select Chinese, Japanese and German as alternate languages.
- Set the Date and Time, time zone, and format use the ***ADJUST CLOCK*** feature.

- ***ENABLE NOVICE TOOLTIPS*** by checking on the box. Once enabled, on screen tips are displayed for 3 seconds. To display again, roll over the **LIGHTBULB ICON** on the lower right part of the screen.

Figure 101. Enable Novice Tool Tips

Figure 102. Example of Novice Tool Tip

- **ENABLE APPLICATION SECURITY**. This selection is available after the User Manager has been set up. Please refer to the ***SYSTEM SETTINGS > USER MANAGER*** for more information.
    - When this is selected, the application will require valid login credentials at startup. On successful login, the user name will be shown in the status bar. If **USE LAST LOGIN CREDENTIALS** is checked, the user will be automatically logged in on subsequent startups.
- ***REVERSE SCREEN ORIENTATION.*** The Essentials screen is default setup for port up Agera. If port forward orientation is required, then go to ***WORKSPACE > PREFERENCES*** and check ***REVERSE SCREEN ORIENTATION*** and click ***APPLY***. Power off/on Agera to get the screen orientation changed.
- To ***CONFIGURE AND ENABLE THE NETWORK DATA EXPORT***, the Configuration menu is presented.

  For direct connection to a computer, ***CONNECT AS CLIENT.*** Enter the **SERVER IP ADDRESS**, **PORT NUMBER** and **DELIMITER** and press ***APPLY***.

  For connection to a network, select ***ACT AS SERVER***. Enter the Port number and delimiter and press ***APPLY***.

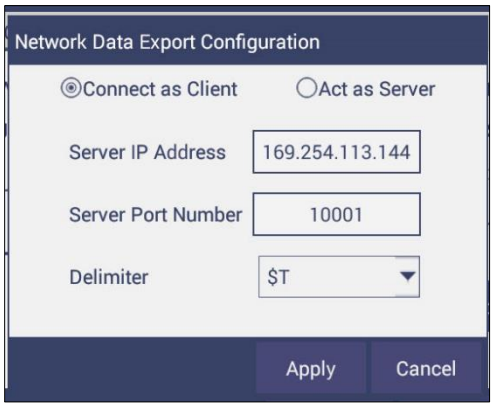
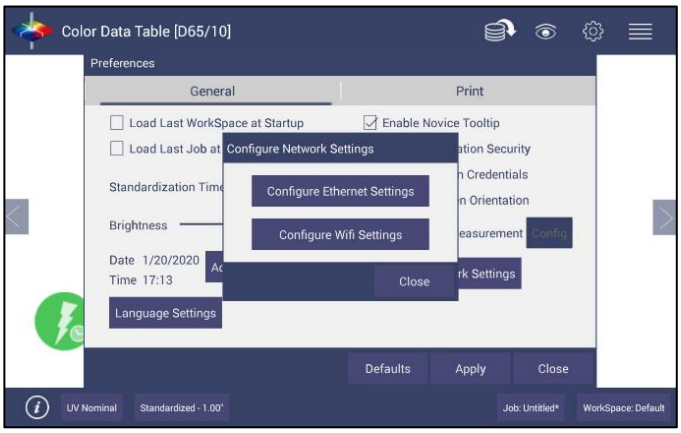


Figure 103. Data Export Configuration



- In Network settings, one can use an Ethernet cable.

Figure 104. Network Settings

Preferences: Print

The Print page allows the user to configure:

- Enter a **TITLE** for the printout.
- Select **PORTRAIT OR LANDSCAPE** orientation.
- Select **LAST MEASUREMENT** or **ALL READINGS** for the job.
- The option to **PREVIEW** before print.
- Select the **VIEW** to print, i.e. **EZ VIEW, COLOR DATA TABLE, SPECTRAL DATA TABLE, SPECTRAL PLOT, TREND PLOT** and **COLOR PLOT.**
- Select **LOGO.** To apply a logo, import the logo first and then **BROWSE** to select. This logo can be used as a **DEFAULT LOGO** for all printouts or selected for each printout using the **SELECTION BOX TO PRINT** the Logo.

- To save changes, press ***APPLY***. To use a default setup, press ***DEFAULTS***.

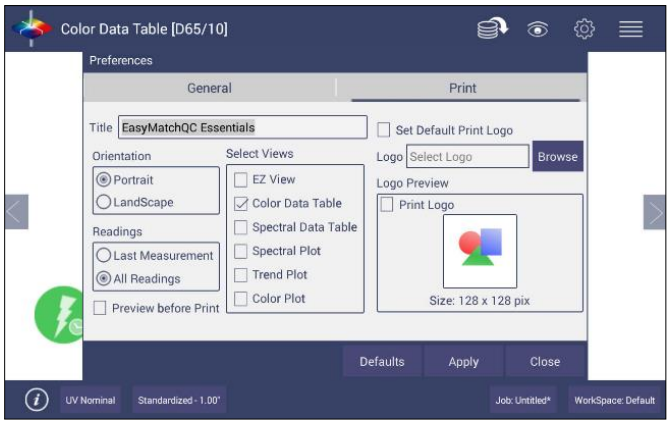


Figure 105. System Settings > Preferences > Configure Print Page

System Settings: User Manager

Security can be enabled on the Agera to ensure that operators cannot modify/delete folders or files and limit their functionality. An administrator is identified to set up the users/groups with selected privileges.

- To begin, go to ***WORKSPACE > USER MANAGER*** to set up Create Administrative Groups first followed by Create User Groups***.***

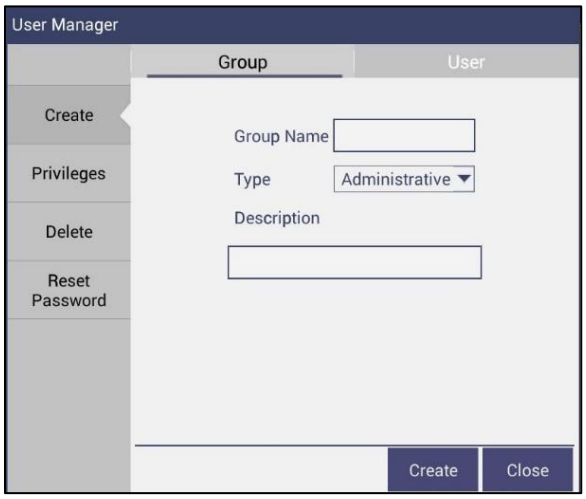


Figure 106. Create a Group

- Once the groups have been established, then individual users with **USER NAMES** and **PASSWORDS** can be setup for both Administrator and User Groups***.***

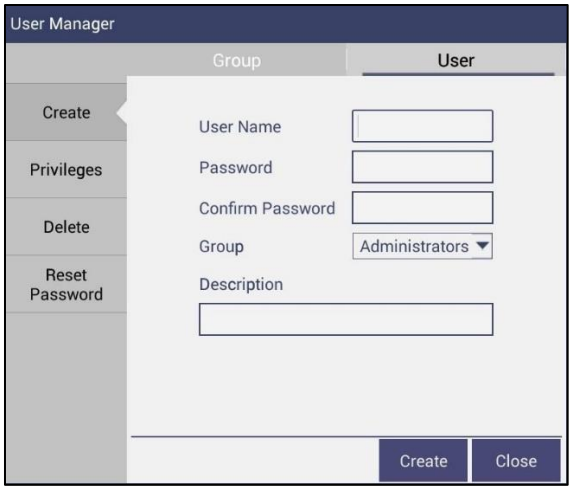


Figure 107. Setup Administrative & General Users

- Users in Administrative Groups have all features enabled. For Users in User Groups, Privileges can be setup as shown below. Press ***UPDATE PROFILE*** to complete.

Figure 108. User Privileges

- If a printer is attached, you can ***PRINT*** a list of Privileges selected.
- To complete enabling security, go to ***WORKSPACE > PREFERENCES*** and ***ENABLE SECURITY*** on the right side.

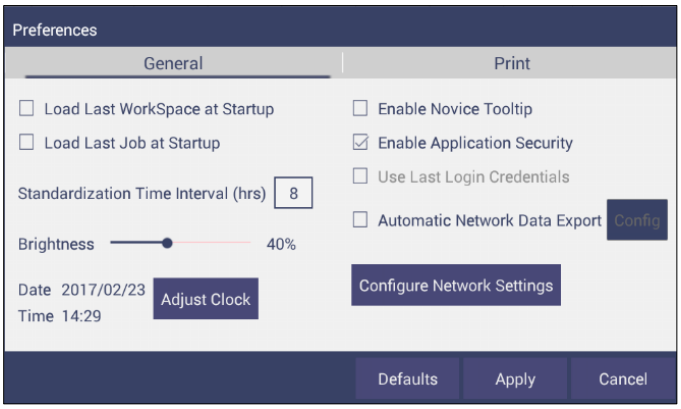


Figure 109. Enabling Security

- After enabling security, each user must enter a name and password when logging into the Agera. For convenience, the user can check the box under ***WORKSPACE > PREFERENCES >***

GENERAL to use the **LAST LOGIN CREDENTIALS**.

Figure 110. Login Credentials

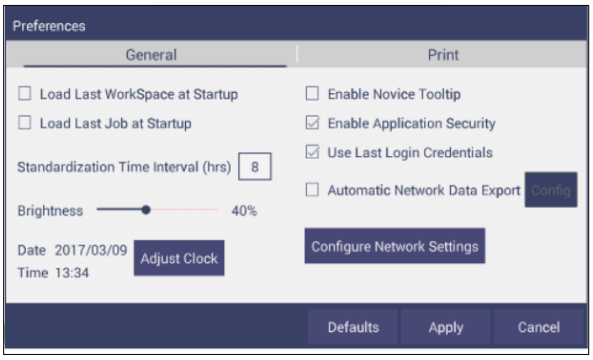


Figure 111. Enable Last Login Credentials

- If needed, the administrative user can delete groups / users and reset passwords of all Groups & Users.

System Settings: Convergence

Currently, the **ESSENTIALS** and **EZMQC** applications use independent data storage formats and database locations. With Convergence, the measurements performed by either Essentials or EasyMatch QC will be saved to a common database. This database will be updated to both Essentials and EasyMatch QC in parallel upon measurement completion. This feature is very helpful if the user takes measurements in Essentials but later wants to use EasyMatch QC to analyze data.

The Common Data Storage is updated as measurements are taken from both connected applications.

1. Whenever a measurement is performed from any connected application, a Data Update notification is sent to both the connected applications.
2. The operation can be carried out only when the system status changes to 'active'. A 'busy' status is shown when any operation is in process.

3. Once convergence is setup, EZMQC and Agera Essentials can talk to each other: If both software packages are open, the measurement data is shown at the same time. All data measured from two software packages will be saved into the Common SQL Database. Both software packages can recall data from the Common DB.
4. Convergence is currently only available in English.

To begin, enable the Convergence feature in ***ABOUT > INFO > CMR***. Select ***WORKSPACE > CONVERGENCE*** to display the below options as shown in the below list of options

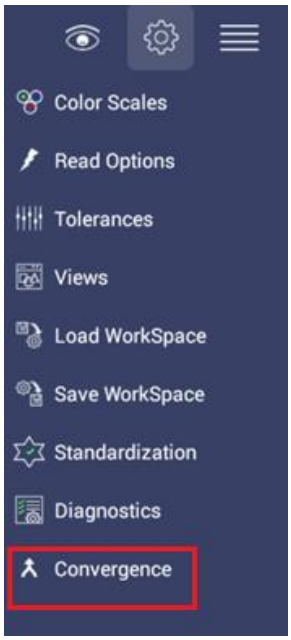


Figure 112. Select Convergence

- Common DB Settings
- Recall
- Connected Clients

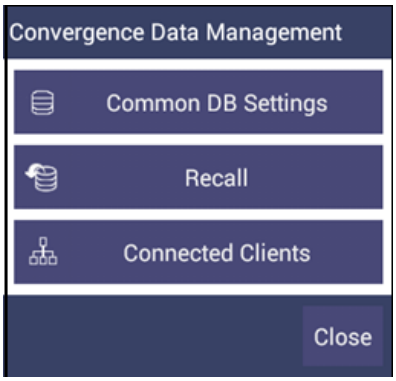


Figure 113. Convergence Sub-menu

Convergence > Common DB Settings

Select type as ***LOCAL DATABASE*** or ***NETWORK DATABASE***. The Local DB option can be selected to save the measurement records on the instrument side.

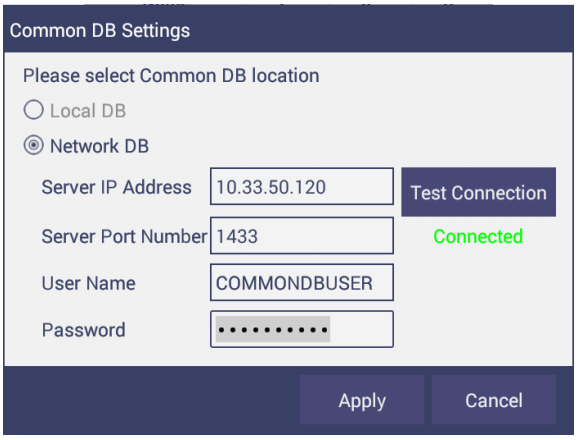


Figure 114. Select Database Type

The ***NETWORK DB*** option can be used to configure the network information (**IP ADDRESS, SERVER PORT NUMBER, USERNAME, PASSWORD**) and save the measurements. Click ***TEST CONNECTION*** to verify the Database connection then click ***APPLY*** to save the configuration settings.

Note: Please use Server Port number as 1433 (for below SQL Server 2012). For SQL Server 2012 and above, please follow the below steps to find the port number to be used.

- Run ***SQL SERVER CONFIGURATION MANAGER*** on the ***SQL SERVER*** system.
- Click on ***PROTOCOLS FOR SQLEXPRESS*** item and open the ***TCP/IP*** Properties dialog.
- Now, use the port number mentioned in **TCP DYNAMIC PORTS** under **IPAll** section.

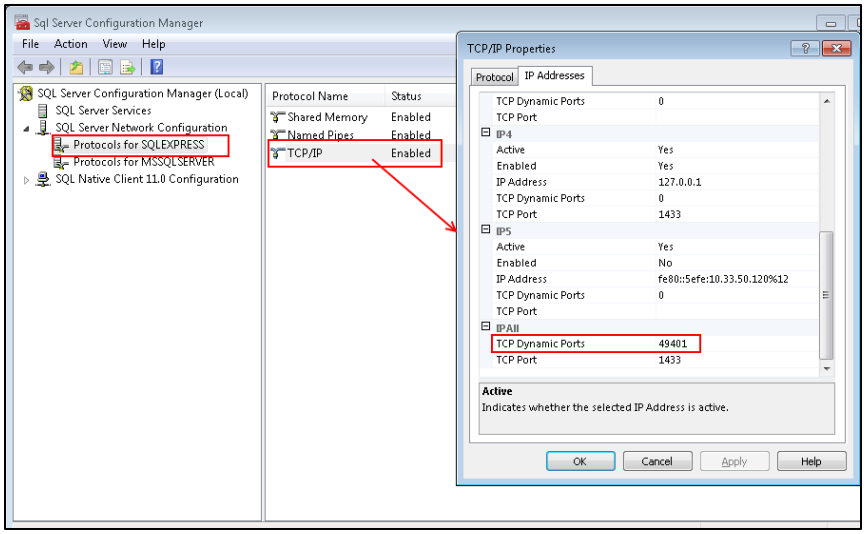


Figure 115. SQL Configuration Manager

Convergence > Recall Measurements

Click ***RECALL*** to select the Samples/Standards from the Common DB. Select individual samples using the radio buttons next to the sample name or type the text in the ***FILTER BY NAME*** text box and filter the list of the populated list of measurement records whose names matching to the text typed as shown below.

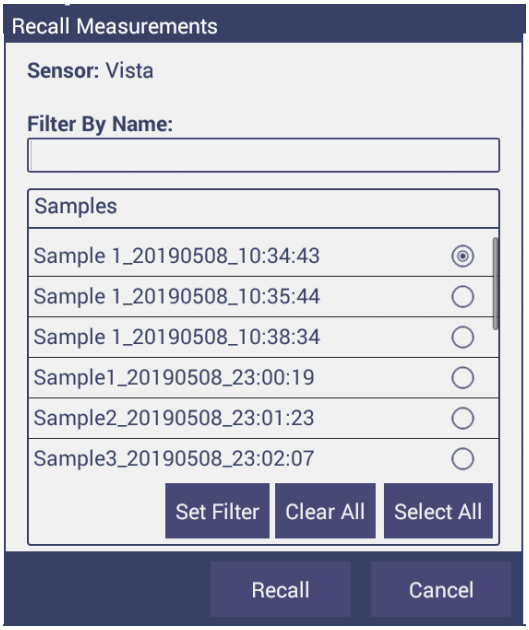


Figure 116. Recall Measurements

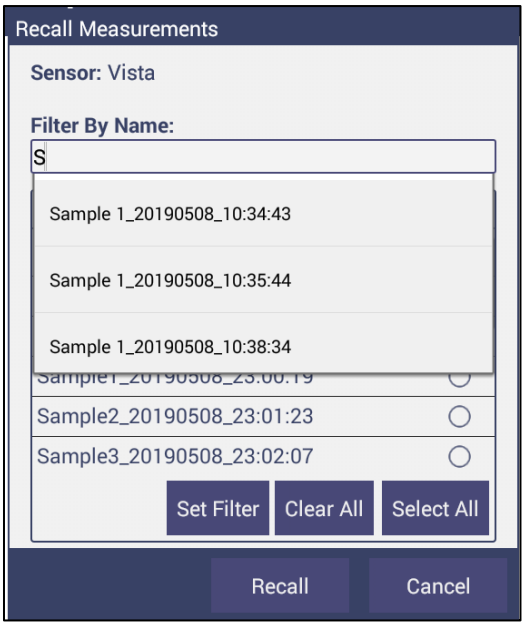


Figure 117. Filter by Name

To ***SET FILTER***, press this option on the bottom of the dialog box. Then select the type of measurements (i.e. Standard or Sample) or specify the dates. Then press ***OK*** to continue.

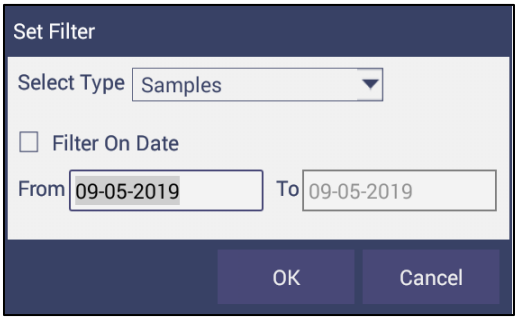


Figure 118. Set Filter

After selecting the records from the populated list, press ***RECALL*** to bring the selected measurements into the current Job.

Convergence > Connected Clients

CONNECTED CLIENTS is used to display the list of the current connected active clients using the convergence service.

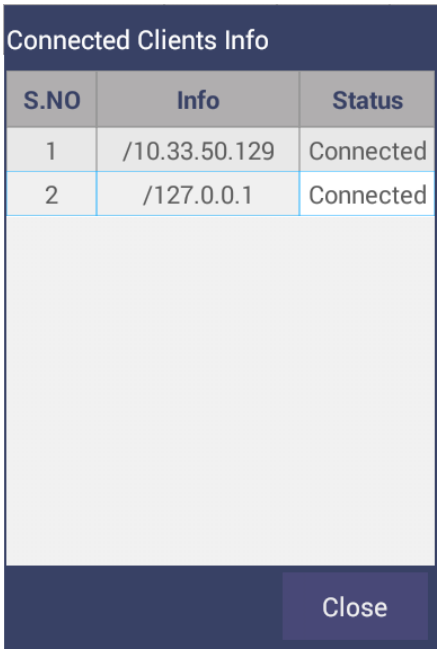


Figure 119. Connected Clients Info

Measurement data is shown in both connected clients when they are connected to the sensor. When reading samples, both clients are updated with data and both can recall data from the common database.

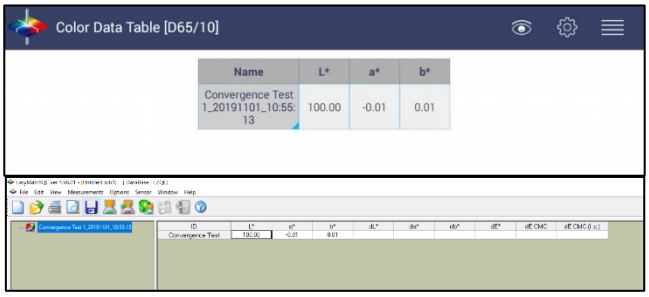


Figure 120. Convergence Showing Data in Essentials and EasyMatch QC

Tool Bar: Jobs Function

Jobs Icon

Under the Job function, the following tasks can be accomplished:

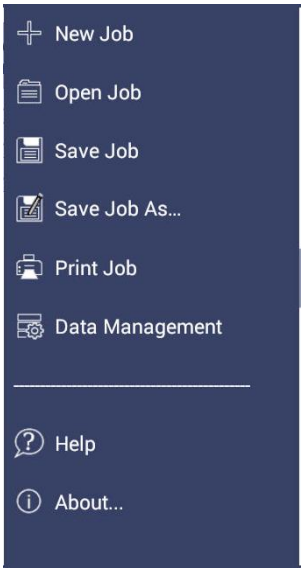


Figure 121. Job Menu

Jobs

Jobs vs. Workspace: A job consists of samples measured according to a specific workspace. A workspace is a template with measurement conditions such as standard & tolerances, color scale, index, illuminant, etc. There can be only one workspace associated with a job. The main tool bar provides the options to create a new job, open an existing job and save a job.

Jobs > New

- When click ***NEW JOB (Shortcut:*** press Workspace name in the lower right status bar***)***, the Load Workspace dialog will pop out. The default selected workspace is the current workspace. User can change the workspace and click ***LOAD***. Then the selected Workspace is opened in the **NEW JOB**. Once the Workspace has been loaded to the New Job, the Workspace name associated with this job cannot be edited.

Jobs > Open

- ***OPEN*** a saved Job: A list of available jobs under the current path are displayed for selection. If the job that is needed exists in another folder, then it is an option to change the folder. When the job to be opened is displayed select the file and press ***OPEN***.
- **Shortcut:** press job name in the status bar on the lower right.

Figure 122. Open A Job

Jobs > Save & Save As

- ***SAVE*** the Job under the desired name: To save a job, select the folder, name the Job and save the Job contents into a file. These files have an '.ezm' extension. There will be a default name filled in Filename box as date&time&instrument#&workspace. You can edit it if needed.

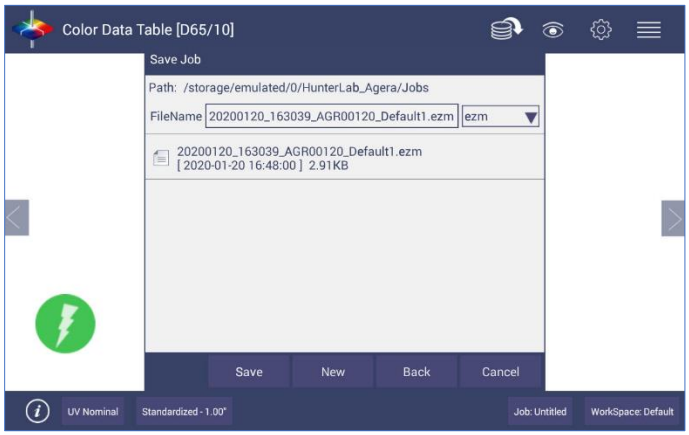


Figure 123. Save A Job

Jobs > Print

- ***PRINT*** an open Job using the parameters set up under ***WORKSPACE & SYSTEMS SETTINGS > PREFERENCES***.

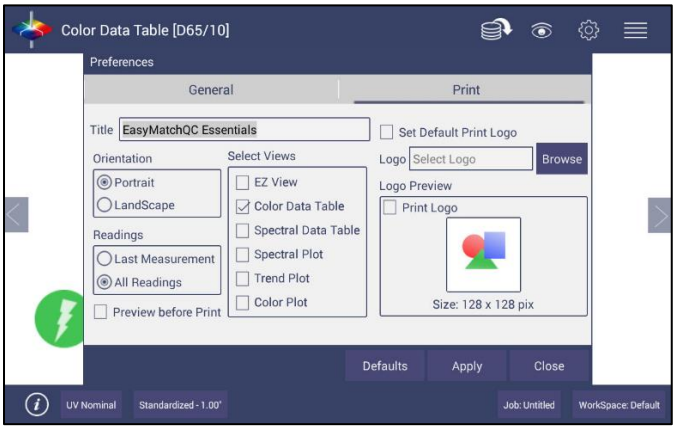


Figure 124. Workspace & System Settings > Preferences > Print

- Drivers included in the Agera are shown below. Additional printer drivers can be added under ***WORKSPACE > DIAGNOSTICS > ADVANCED***.

Table 2: Printer Drivers Included

Printer	Driver
Canon	Canon Print Service 4.4+
HP	HP Print Service Plugin 4.1+
Epson	Epson Print Enabler 4.4+
Konica Minolta	Konica Minolta Print Service Plugin 4.4+
Kyocera	Kyocera Print Service Plugin 4.4+
Lexmark	Lexmark Print Service Plugin 4.4+
Sharp	Sharp Print Service Plugin 4.4+
Xerox	Xerox Print Service Plugin 4.4+

- Printing can be downloaded to a pdf file by selecting**, *SAVE AS PDF***. Once this is selected, the parameters for the output are presented. Please save the file to the download folder. To access these files, see ***DATA MANAGEMENT > EXPORT > OTHERS***.

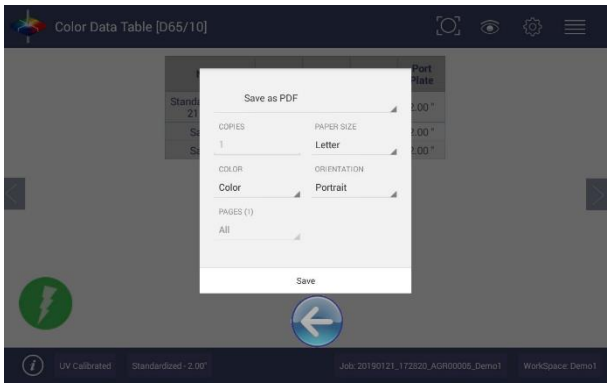


Figure 125. Save as PDF

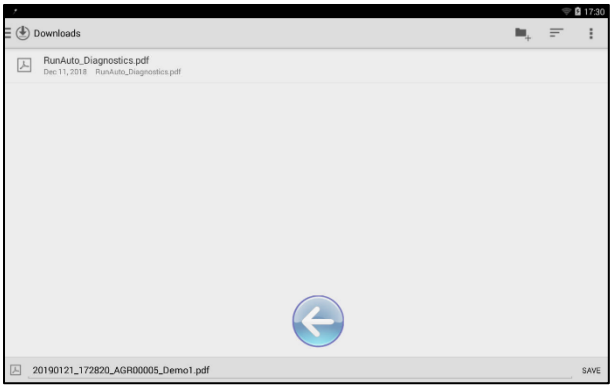


Figure 126. Save PDF to Downloads File

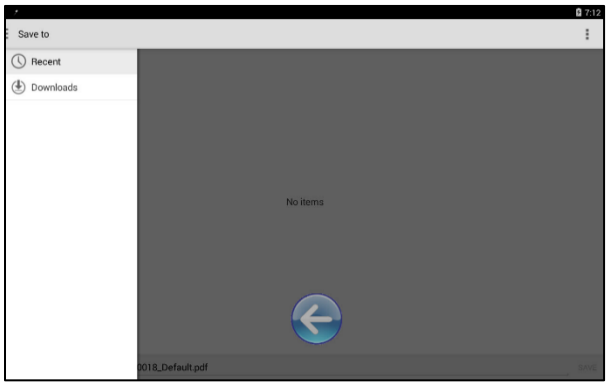


Figure 127. Download File Contents

Jobs > Data Management

Standard(s) and sample measurements are saved in Job files and database along with the sensor information. The saved measurements are also associated with a respective Workspace and Job.

- ***DATA MANAGEMENT*** contains the features to Recall, Import, Export, Email a Job and Backup/Restore**. RECALL** the measurements from the database.
  - **IMPORT** a selected Job(s), Standard(s), Workspace(s)Diagnostics, photos for logo print setup and others from a USB flash drive.
  - **EXPORT** the Job(s), Standard(s), Workspace(s), Diagnostics, pdf reports and others to a USB flash drive.
  - **EMAIL** the selected Job(s), pdf reports and other files.
  - **DELETE** Job(s), Standard(s), Workspace(s), Diagnostics, pdf reports and others.
  - **BACKUP** the HunterLab folder (all jobs, database and user manager settings) into a USB Flash drive.
  - **RESTORE** the Hunterlab folder (all jobs, database and user manager settings) from a USB flash drive.

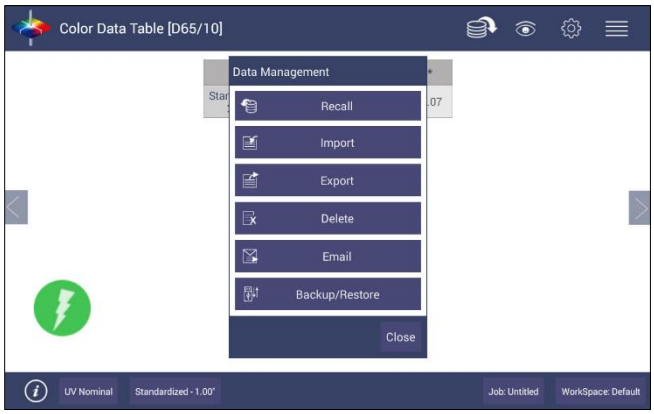


Figure 128. Data Management Menu

- ***JOBS > DATA MANAGEMENT > RECALL***

  Recall measurements that have been stored to a job.

  Since the Recall standard feature is available, the Recall Measurement dialog is used to recall samples only.

  Users can enter sample name or use the filter by workspace or job to search for a specific sample.

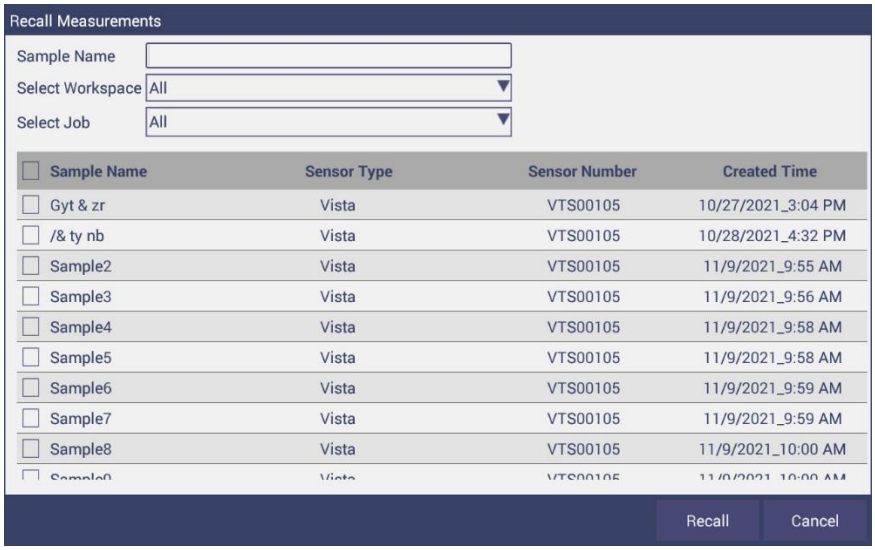


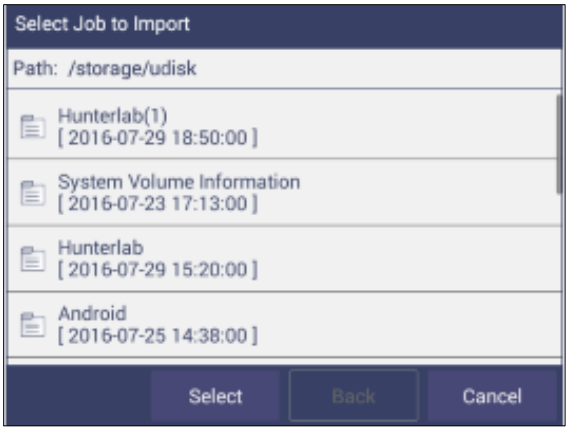
Figure 129. Recall Measurements

- ***JOBS > DATA MANAGEMENT > IMPORT***

  This feature allows the user to import the below data from a USB flash drive into the instrument. Data can be one file or multiple files. All selected files should be in the same file path location. The following data can be imported:

  - Job
  - Standard
  - Workspace
  - Diagnostics

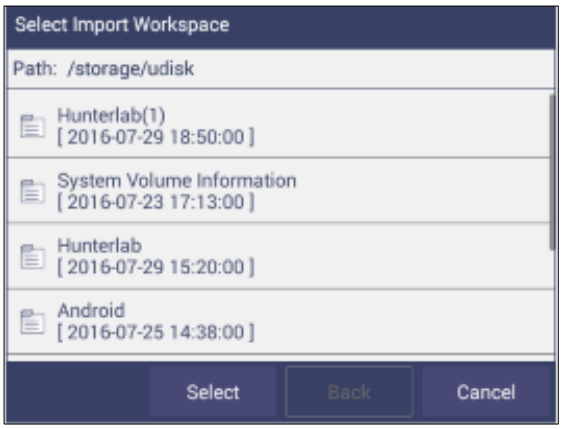
- Others
- **IMPORT JOB**



This option allows the user to browse and select a Job file(s) (.ezm) from the USB flash drive and import into the instrument. If a file name already exists, then the name will be incremented numerically.

Figure 130. Import Job

- **IMPORT STANDARD**
  This option allows the user to browse and select a Standard(s) (extension *.std*) from the USB flash drive and import into the database. If required, the Standard Name can be changed.
- **IMPORT WORKSPACE**



This option allows the user to browse and select a Workspace(s) (extension *.wsp*) from the USB flash drive and import into the database. If the workspace already exists, then the user is prompted to specify a different name.

Figure 131. Import Workspace

To use the above functions, a USB flash drive must be present in the port.

- **IMPORT DIAGNOSTICS*:*** This option allows the user to browse and select a Diagnostics file from the USB flash drive for import into the instrument database.
- **IMPORT OTHERS**: This function is available to import other items such as a logo for the printed report. Once the logo is imported, go to ***WORKSPACE & SYSTEM SETTINGS > PREFERENCES > PRINT*** to add the logo to a report.

- ***JOBS > DATA MANAGEMENT > EXPORT***. This feature allows the user to export the below data from instrument into a USB flash drive. Data can be one file or multiple files. All selected files should be in the same file path location. The following data can be exported:
  - Job
  - Standard
  - Workspace
  - Diagnostics
  - Others (e.g. all files in HunterLab folder, and all pdf reports in Download folder)
  - **EXPORT JOB:** This option allows the user to browse and select an existing Job(s) (*.ezm*) or the current active Job data and copy into a USB flash drive either in ***CSV*** or ***EZM*** file format. While exporting into EZM format, the current active Workspace settings can be applied. The color data shown in the Color Data View and the Spectral Data is saved in a CSV file.

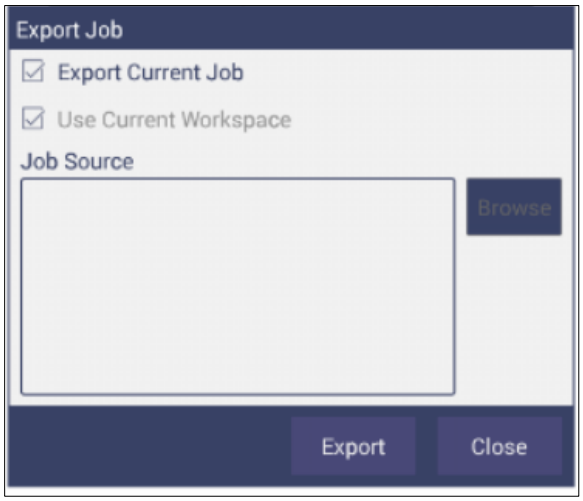


Figure 132. Export Current Job

- **EXPORT STANDARD**
  This option allows the user to browse and select an existing Standard(s) in the database and copy into the USB flash drive as a file (*.std*).

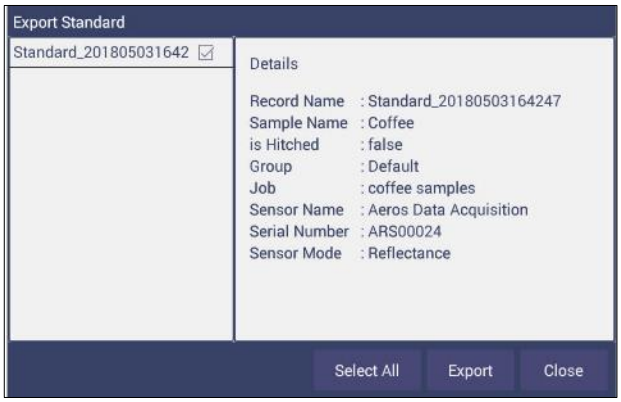


Figure 133. Export Standard

- **EXPORT WORKSPACE**
  This option allows the user to browse and select an existing Workspace(s) in the database and copy into the USB flash drive as a file (*.wsp*). To use the above functions, a USB flash drive must be present in the port.

- **EXPORT PDF**
  This allows the user to select a PDF file from the Downloads folder to export. Switch to the Download folder in the dropdown list and then select the pdf files to export.

Figure 134. Select Download Folder for PDF File Export

- ***JOBS > DATA MANAGEMENT > EMAIL*.** Saved Jobs can be emailed if there is an active internet connection. When the ***EMAIL*** option is clicked, the following screen is shown prompting the user to browse and select a user and enter the recipient mail address. Data can be one file or multiple files. All selected files for one email should be in the same file path location. You can email any file in HunterLab folder as well as in the downloads folder.

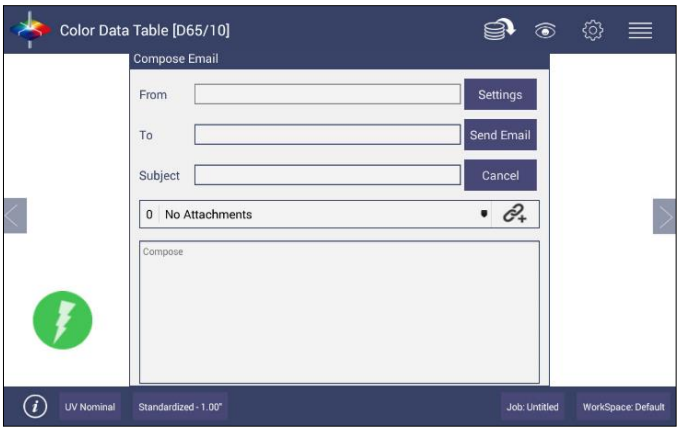


Figure 135. Enter an Address to Email a Job

- **MAIL SETTINGS**

  Click ***MAIL SETTINGS*** button to configure the SMTP mail server configuration (Port, Server) as shown below. The mail settings configuration is mandatory to enable the mail job feature in the application. When done, press ***SEND***.

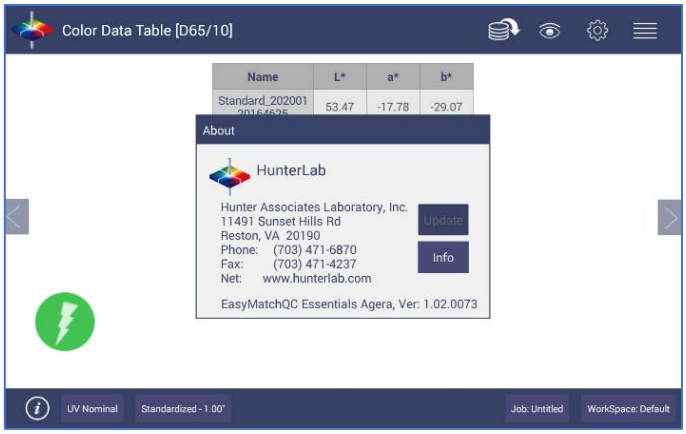
Figure 136. Enter SMTP Mail Server Information

- ***JOBS > DATA MANAGEMENT > DELETE***. The Delete function will allow deletion of Jobs, Standards, Workspace, Diagnostics and others. Data can be one file or multiple files. All selected files must be in the same file path location. In addition, one can delete PDF files from the Downloads folder.
- ***JOBS > DATA MANAGEMENT > BACKUP/RESTORE***. The Backup function will copy the entire HunterLab folder to a thumb drive. Restore enables the user to copy the backup folder of a thumb drive and upload to the Agera.

Jobs > Help

To access the onboard manual, use ***JOBS > HELP.*** Novice Help can also be enabled under ***PREFERENCES > GENERAL.***

Jobs > About

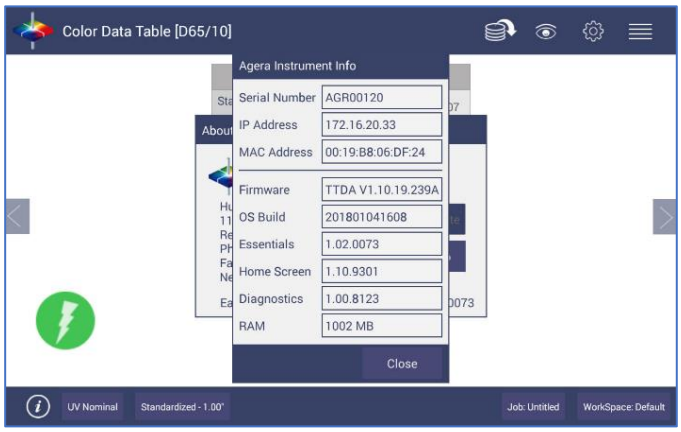


The **ABOUT** menu provides information about HunterLab and the current software version.

Figure 137. Job > About the Software

To update the software version from a USB flash drive, insert the USB flash drive into the port on the front of the instrument. Open the ***JOBS > ABOUT*** menu and press ***UPDATE*** to continue. After update, open Essentials and it will prompt to enter or create an Administrator Account. If needed, you can edit this account in User Manager later.

For detailed information on firmware and more, please press the ***INFO*** button on the screen. To add a CMR option, insert the software update on a flash drive and press the button on the screen below to



access the update.

Figure 138. Instrument Info

Electronic Records (ER only)

HunterLab's EasyMatch Essentials Electronic Records allows communication with the Agera to measure samples and standards, while providing electronic signature capabilities and an audit trail. The special software considerations are described below.

Login Feature

EasyMatch Essentials-Electronic Records contains a login feature. The EasyMatch Essentials Electronic Records login feature has several benefits that may be helpful to some companies.

Once a user logs into EasyMatch Essentials Electronic Records, a user ID is stored as an Operator ID and may be displayed and printed as desired. These actions are also recorded in the Audit Log.

By assignment of individual user accounts and configuration of EasyMatch Essentials-Electronic Records menu items may be configured to allow and disallow specific EasyMatch Essentials Electronic Records software functions.

Storing Data/Permanent Records

Creating Job Files

Job files store the measurements made using EasyMatch Essentials-Electronic Records. While individual sample measurements are saved within EasyMatch Essentials-Electronic Records jobs, these readings are considered work in progress, not end products.

Storing

In EasyMatch Essentials-Electronic Records, users cannot delete job files. Further, they do not have access to the android operating system to delete the folder.

Altering

Modification of job files beyond adding measurements, configuring the screen display, and signing is not allowed by EasyMatch Essentials Electronic Records. The raw data behind stored measurements may not be altered in any way within the software. EasyMatch Essentials-Electronic Records alerts the user if a job has been modified from outside the software and then disallows opening of the job, in which case it should be considered invalid and restored from an earlier back-up, if available.

Deleting

The EasyMatch Essentials Electronic Records job files are retained (and backed up) for the period indicated by predicate rule. The job and database files in EasyMatch Essentials Electronic Records. are protected from deletion.

Displaying

EasyMatch Essentials Electronic Records jobs may be displayed on screen from within the software and e-mailed to other users with the same software version of EasyMatch Essentials Electronic Records.

Printing

EasyMatch Essentials-Electronic Records jobs and/or displays may be printed to any installed printer.

Standardization

EasyMatch Essentials Electronic Records prompts for standardization at intervals set by the system administrator and will not allow measurements to be made unless the instrument has been successfully standardized.

Signatures and Audit Trail

Each job will be electronically signed with the name of the signer, date and time of signing, and the meaning of the signature. The electronic signatures applied to the jobs are linked to the jobs, may not be deleted, and are always available for display or printing. Only a user with e-signature access can sign a job file.

IQ/OQ/PQ Protocols for EasyMatch Essentials-Electronic Records

The following steps define the IQ/OQ/PQ process.

IQ – Installation Qualification of Hardware and Software is accomplished by verifying that Administrative group can log in and standardize the sensor indicating that power and communications have been established.

OQ – Operation Qualification occurs after a member of the Administrative group can operate the instrument and run all sensor diagnostic tests with a ***PASS*** rating.

PQ – Performance Qualification is defined by establishing a measurement method for the application and successfully measuring the client's samples – typically transparent and translucent liquids.

Installing Essentials ER

If the Agera was ordered with EasyMatch Essentials ER, then the instrument will be ready to go. HunterLab will load the software at the factory and create a User Name and Password. These will ship with the sensor and are needed to access the software when it is first started. HunterLab recommends changing these as soon as possible.

Figure 139. Initial Login for Admin

To upgrade or install the software, place a thumb drive with the software upgrade into the front USB on the Agera. Go to ***JOBS > ABOUT > UPGRADE*** to install ER.

If the upgrade is from a non-ER version, passwords of all previous accounts will become expired. Users must change their password. When the software has finished the update, please ***RESTART*** the instrument by powering off and then powering on.

If the upgrade is from an older ER version, all user accounts are saved and applied. There is no need to restart the instrument.

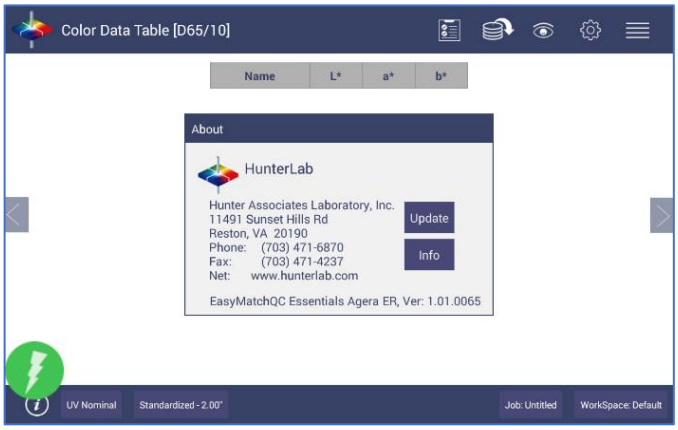


Figure 140. Jobs > About

The initial screen will require entry of a ***PASSWORD*** and ***CONFIRMATION*** of this password for the Administrator. You can enter an existing administrator account or create a new administrator account in this dialog.

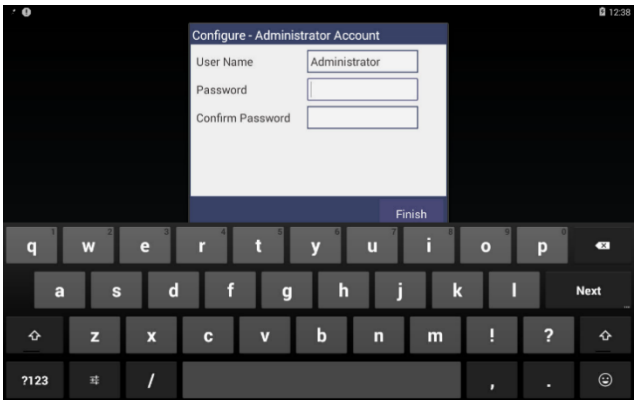


Figure 141. Opening Screen Requiring an Administrator Password

A new ER menu will be shown on the tool bar. Under the ***ER MENU***, the following functions can be accomplished:

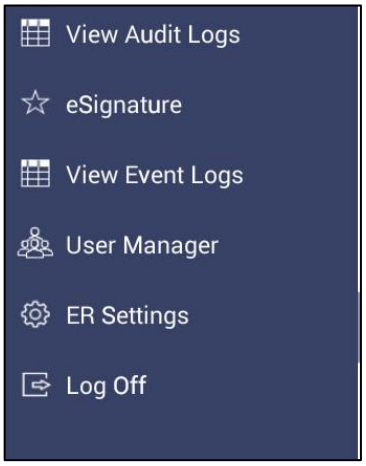
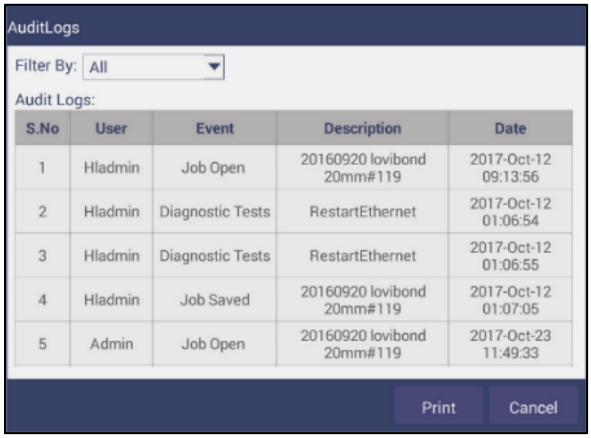


Figure 142. ER Menu

ER: View Audit Logs

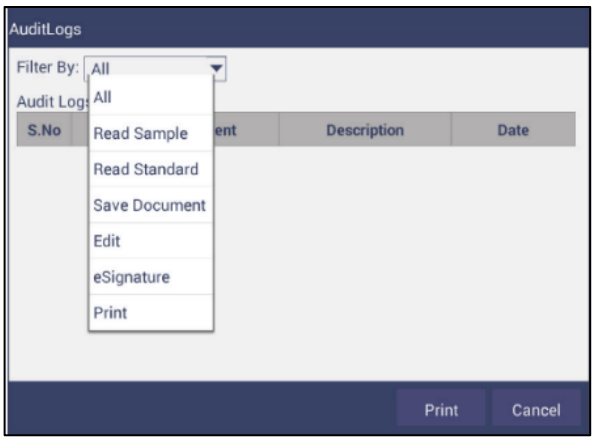
The audit log can be used to monitor activity on the instrument along with User, type of activity and date/time. Steps taken within a Job such as naming a standard or sample are stored with each Job in the order taken with the description. A data filter can be used to isolate Sample and Standards, Save, Edits,



e-Signatures and Printing.

Figure 143. Audit Log

Figure 144. Audit Filter



ER: e-Signature

All users with access to ***e-SIGNATURE*** can create an e-Signature for a job. Enter the ***USER NAME***, ***PASSWORD*** and ***COMMENT***. The latest e-Signature information can be printed in the job report.

Note that e-Signatures cannot be deleted.

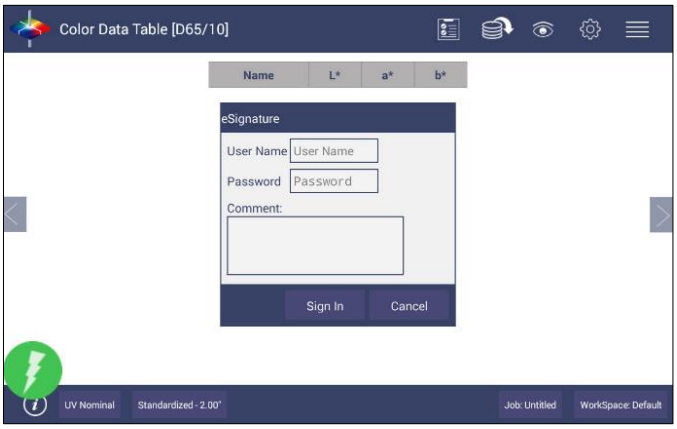
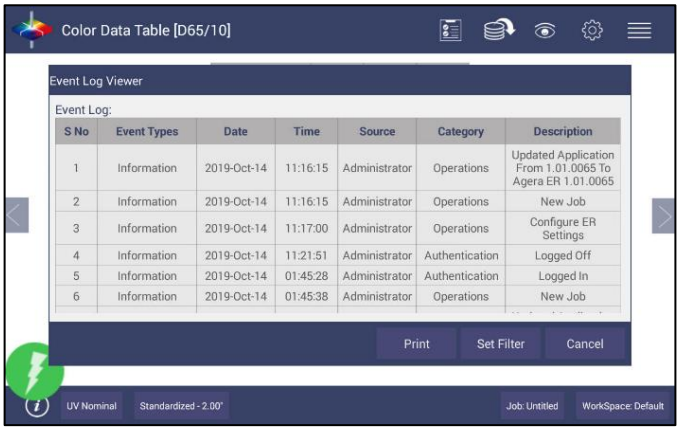


Figure 145. Adding e-Signature

ER: View Event Logs

The ***EVENT LOG*** provides a list of **ACTIVITIES** with **DATE** and **TIME, USER TYPE (EVENT SOURCE)** and



CATEGORY that are recorded. This list can be filtered and printed.

Figure 146. Event Log

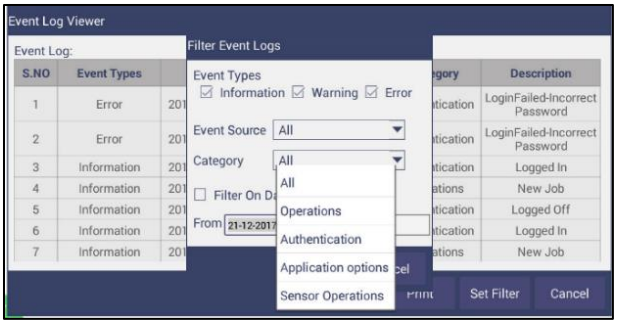


Figure 147. Event Log Category

ER: User Manager

Create

For Essentials ER, the User Manager is moved from the Job menu to the ER menu. Select ***ER MENU > USER MANAGER > CREATE*** to set up **GROUPS.** All users of EasyMatch Essentials Electronic Records software must be assigned to a Group as either an Administrative Type or a User type to define their level of privilege within EasyMatch Essentials Electronic Records.

- Enter the ***GROUP NAME***, then select the ***GROUP TYPE*** (Administrative or User).
- There can be multiple Administrative and User Groups.
- Groups can be changed, added or deleted by a System Administrator at any time.

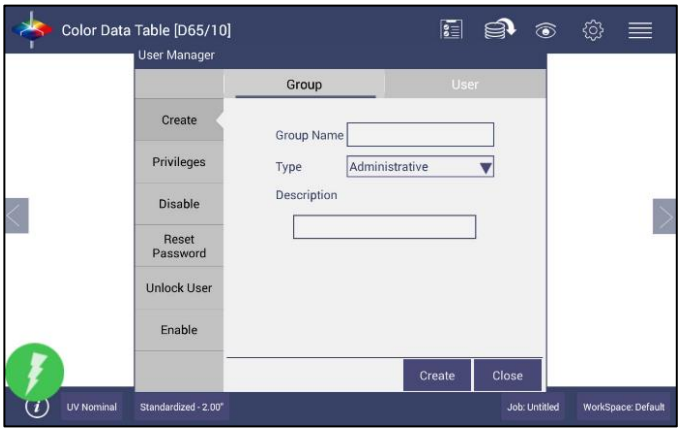


Figure 148. Administrative Groups

Once the Groups have been defined, users can be added with passwords through the User tab. Select ***USER MANAGER > USER TAB*** and ***NAME THE USER, SELECT A PASSWORD*** and ***ASSIGN THE USER GROUP***. Click ***CREATE*** to continue.

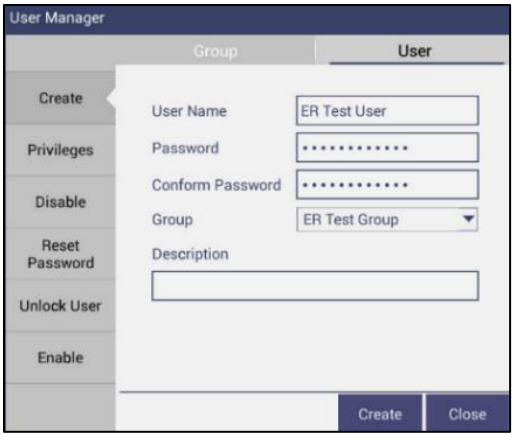


Figure 149. Adding a User

Privileges

For each **USER GROUP**, go to ***ER MANAGER > USER MANAGER > PRIVILEGES*** to assign the functions. Check a box next to each allowable function.

Note that Administrative Groups have all privileges which cannot be edited.

When all Privileges have been selected press ***UPDATE PROFILE*** to continue.

Figure 150. Assign Privileges

Disable/Enable

A Group or List of Users or a single User can be **DISABLED** or **ENABLED** as needed by the Admin. To Disable a user or group, select the ***GROUP > LIST THE USER*** to identify and then press ***DISABLE***. These accounts can no longer be used while still saved in the database. If needed, admin users can enable them again through ***USER MANAGER > ENABLE***.

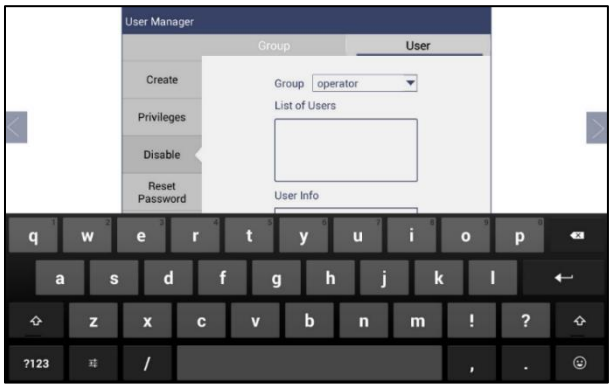


Figure 151. Disable a Group or Users

Reset Password

To reset a password, ***IDENTIFY THE GROUP*** and the ***USER*** and then ***ENTER THE NEW PASSWORD*** with confirmation of the new password

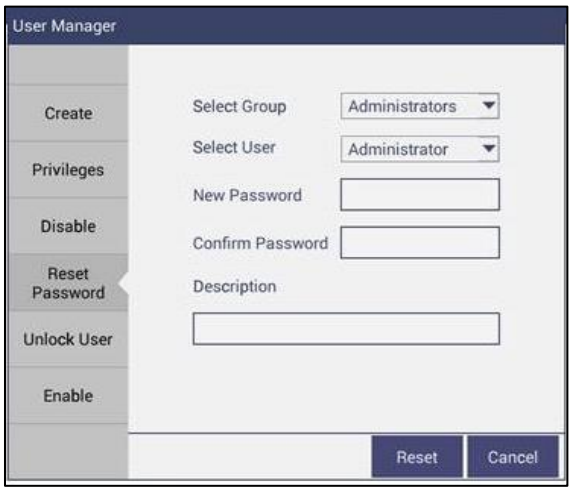


Figure 152. Reset Password

Unlock User

User accounts can be locked when they failed to login more than configured maximum attempts times. Admin users can unlock these users if needed through ***USER MANAGER > UNLOCK.***

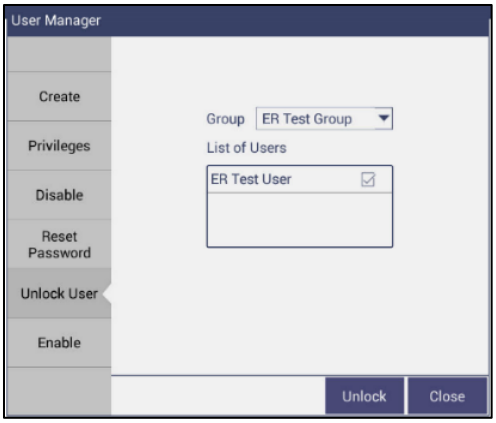


Figure 153. Unlock User

ER: Settings

From the ***ER MENU > ER SETTINGS*** to set **PASSWORD AGE, LENGTH, LOCKING THRESHOLD** and **AUTO LOG-OFF DURATION**.

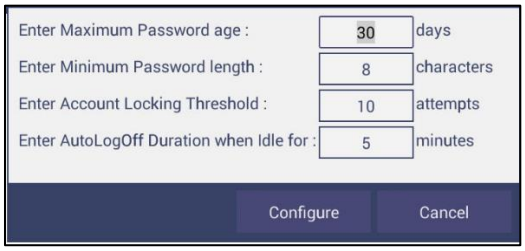


Figure 154. ER Settings

MAXIMUM PASSWORD AGE can be set to the desired length of time from 1 to 365 between required password changes (determined by company policy). Set the **MINIMUM PASSWORD LENGTH** to the desired minimum password length (determined by company policy) from 8 and up to 15. Set the **ACCOUNT LOCKING THRESHOLD** to the desired allowable number of password entry attempts from 3 to 100 before account lockout (determined by company policy).

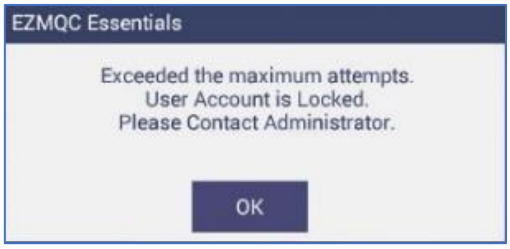


Figure 155. Locking Threshold Exceeded

Set the **ACCOUNT LOCKING DURATION** to the desired length of time between 5 and 30 minutes (determined by company policy).

CHAPTER EIGHT

Special Functions

Auto-Exporting Data through a Network Connection

Connect Agera to a network. You can connect Agera to a network hub using the Ethernet cable . The computer must be connected to the same network as the Agera.

Option A: Connect to a network hub using an Ethernet

- Hardware needed: Ethernet cable plugged into the back of the Agera and the other end to a network hub.

Figure 156. Ethernet Cable

- To connect Agera to network, go to ***WORKSPACES > PREFERENCES*** and Select ***CONFIG NETWORK SETTINGS***.

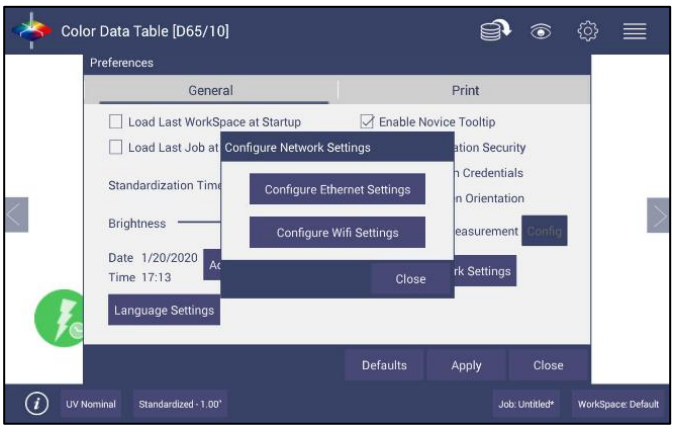


Figure 157. Preferences (General) > Network Settings

- Select **CONFIGURE ETHERNET SETTINGS**.
- Check **USE DHCP FOR ETHERNET CONFIG**. Please write down the IP address showing in the Ethernet Setting dialog. You can also check the IP address of Agera in ***JOBS > ABOUT > INFO***.

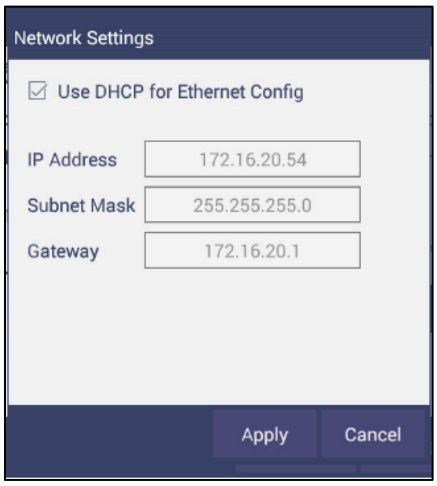
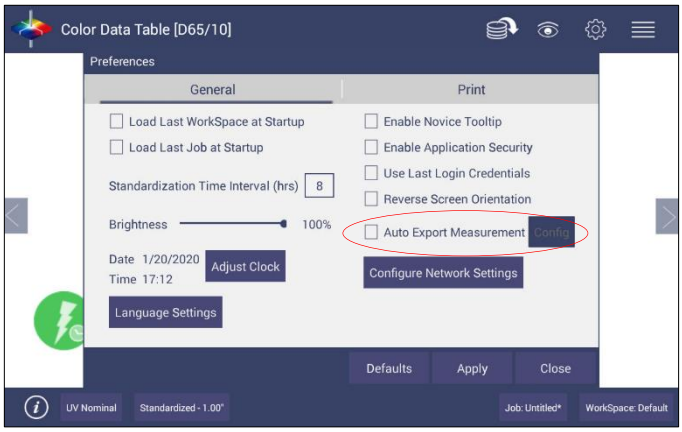


Figure 158. Select DCHP

- Go to ***WORKSPACE > PREFERENCES*** and select **AUTO NETWORK DATA EXPORT MEASUREMENT** using a check and select Config. Choose **ACT AS SERVER** and **PORT**

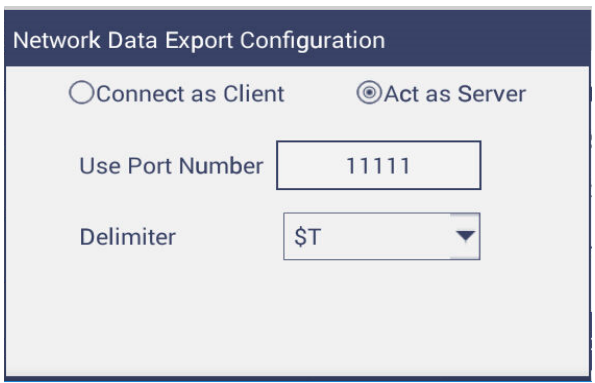


NUMBER AS 11111. You can also choose a delimiter to mark your data.

Figure 159. Auto Export Measurement

Figure 160. Network Data Export

- Configure the computer with the following settings:
  - Set **COMPUTER AS CLIENT**.
  - Enter the **IP ADDRESS** of Agera as recorded above.
  - Set the **PORT NUMBER** as 11111.
  - After all have been set, the data is ready to be exported from Agera to the



computer.

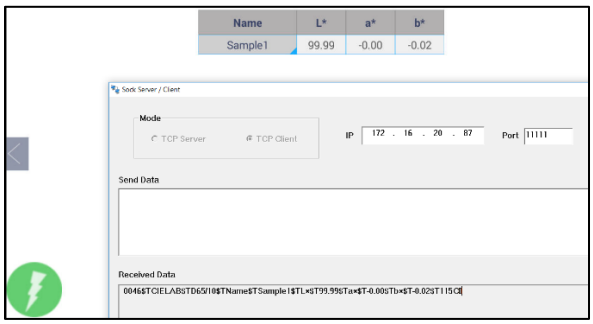


Figure 161. Data Export

Auto-Exporting Data via Direct Connection between Agera and a Computer

Ethernet cable is plugged into the back of the Agera and the other end is connected to the computer. Ethernet adapter USB can be applied here if the computer does not have available Ethernet port.

- **Materials needed**: Ethernet cable and Ethernet adapter to USB can be applied here if the computer does not have available Ethernet port. **Hardware needed**: Ethernet cable and Ethernet adapter to USB can be applied here if the computer does not have available Ethernet port.

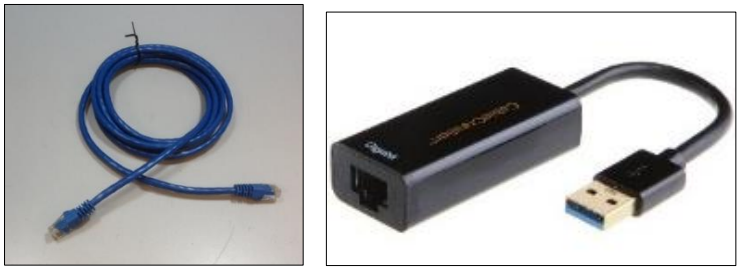


Figure 162. Ethernet Cable & Ethernet to USB Adapter

Connect Agera to Computer:

- Plug Ethernet cable into RJ-45 Ethernet connection at rear of Agera.

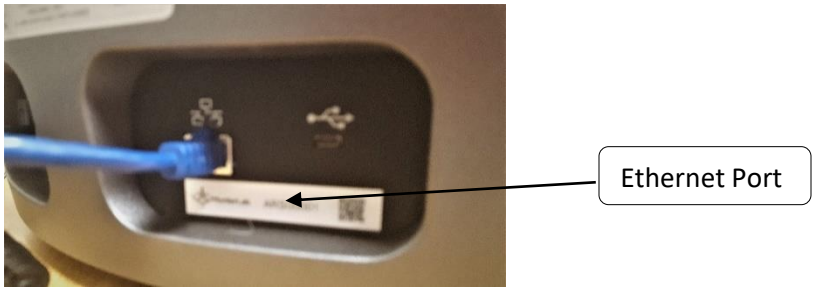


Figure 163. Rear View of Agera

- Plug the other end into the computer or into the Ethernet adapter

Open Command Prompt in the PC

- Type in ***IPCONFIG*** to find the right ethernet (in this case, it is **ETHERNET ADAPTER ETHERNET**) and write down **AUTOCONFIGURATION IPV4 ADDRESS** as well as the **SUBNET MASK**.

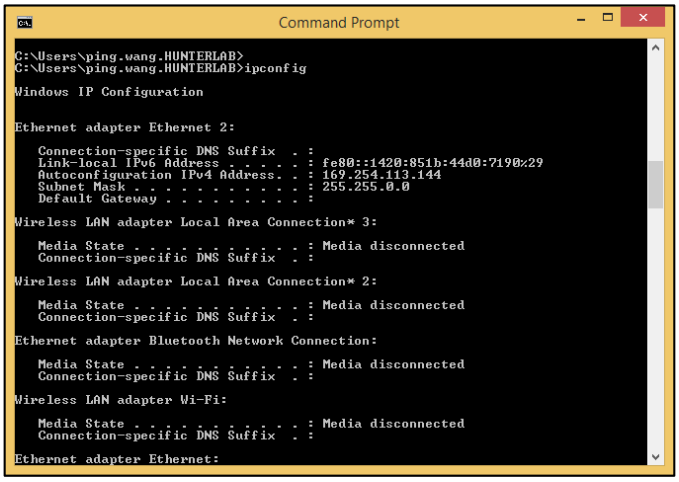
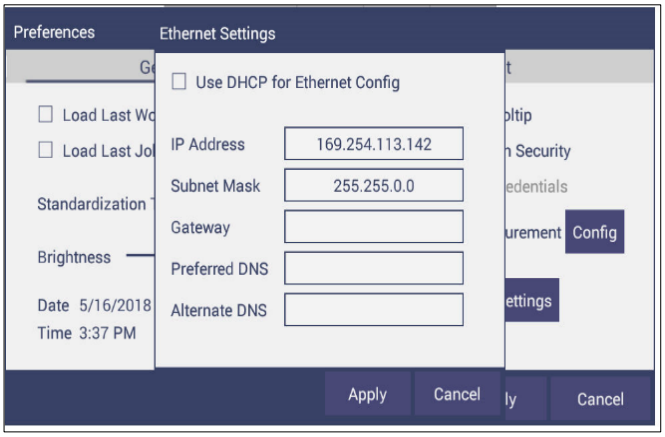


Figure 164. Command Prompt ipconfig

Configure the Agera

Open Agera Essentials, go to ***WORKSPACES > PREFERENCES > CONFIGURE NETWORK SETTINGS***. First, select the **ETHERNET CONFIGURATION**. Uncheck **USE DHCP FOR ETHERNET CONFIG.** Type in **IP ADDRESS** and **SUBNET MASK** manually. The IP address here should be same as the autoconfiguration IPv4 Address in the PC, except changing the last number. The Subnet Mask is the exact same. Restart



Agera to get network setting applied.

Figure 165. Configuration Parameters for Ethernet

- Press ***APPLY*** on the Ethernet Configuration and then ***APPLY*** on the Preferences Page to complete.
- Turn the instrument off and then back on.
- Go to ***PREFERENCES > AUTO NETWORK DATA EXPORT***.

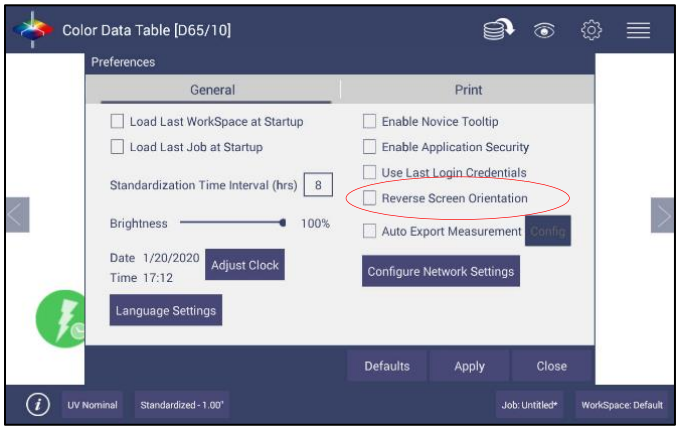


Figure 166. Read Options> Auto Export Measurements

- For a direct connection between Agera and data collection computer, set up the Agera as a **CLIENT**.
- Enter the computer IP address here, in this case 169.254.113.144 and the PORT as 11111. Press ***APPLY*** on the screen to continue.

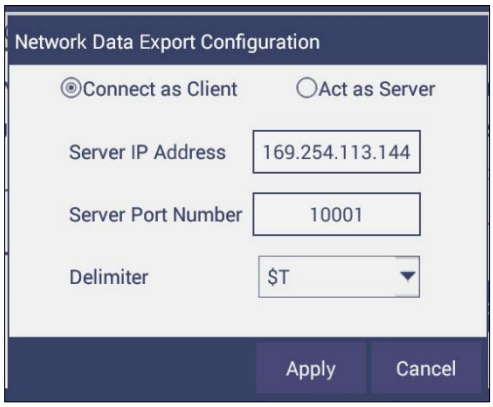


Figure 167. Read Options Export

  - Agera is now ready to send data.

Configure the Computer

- Connection configurations differ depending on data collection software. The data collection computer will be set up as a Server.
- Connect as follows:
  - Set computer as **SERVER.**
  - Enter the computer IP address **169.254.113.144.**
  - Put the port number as **11111.**

Send Data from the Agera:

- **CONFIGURE THE COLOR DATA TABLE** with the color scale and parameters to be measured.

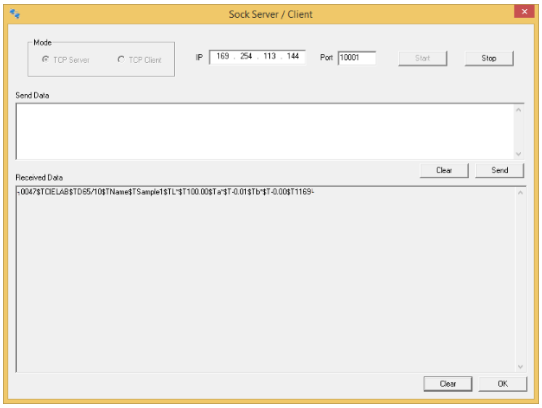


Figure 168. Data Output

Tips & Tricks: Recover Unsaved Measurement Data

In the case where the application is closed unexpectedly, the data is temporarily stored in a table along with the Job details. When the application restarts, a prompt allows the user to recover the data.

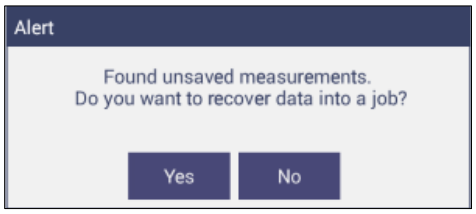


Figure 169. Recover Data

If the user answers ***YES***, all measurements are recovered into a new job or appended to a saved job.

HunterLab File Service Package

The HunterLab File Service is a customized background service which provides the network storage facility for Essentials-AGERA to back up a File or Folder to a networked PC. This package contains:

- HunterLab File Service Installer (FileServiceInstaller.exe)
- A package file ***HLFSPACKAGE.PKG***.

To Install the File Service Package

- Copy the above installation package files into a networked PC.
- Run the executable ***FILESERVICEINSTALLER.EXE*** and follow the guided steps to complete the installation process.
- After installation a shortcut for ***HUNTERLAB FILE SERVICE CONFIG TOOL*** will be

created on Desktop**.** Double click on the shortcut ***HUNTERLAB FILE SERVICE CONFIG TOOL***.

Figure 170. File Service Tool

- Select the **ROOT FOLDER** by clicking on the ***BROWSE*** button. The Essentials Backup will be stored in the configured Root Folder path. Enter the ***PORT NUMBER*** for the network File service. Click on the ***APPLY*** button. The File service will be restarted with the new settings.

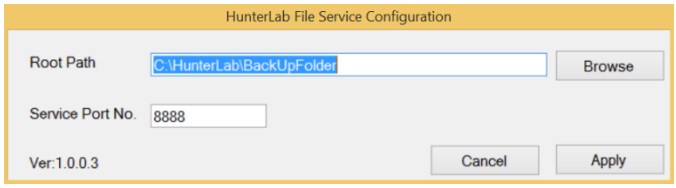


Figure 171. Select Root Folder

Note: Make sure that the configured port number is added to Exceptions in the firewall. The configured port number in the server must be same at the client side (Essentials-AGERA).

Setting up File Storage from Agera (Client) Side

In Agera Essentials, navigate to ***JOBS > DATA MANAGEMENT > BACKUP (or RESTORE).*** The ***SELECT ACTION*** dialog will be displayed. The user can choose between **USB DRIVE** or **NETWORK STORAGE**. When ***USB DRIVE*** option is selected, the Backup and Restore operations will be performed into the USB flash drive plugged into the system.

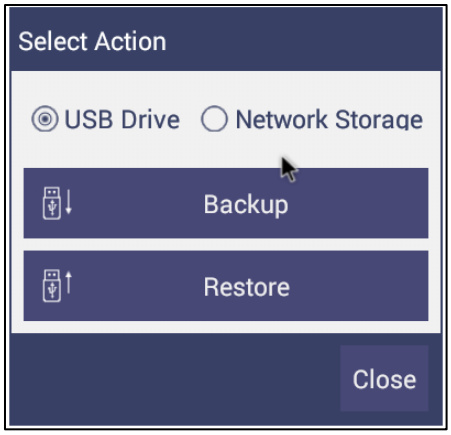


Figure 172. Select USB Option

When ***NETWORK STORAGE*** is selected, the Backup and Restore operations are performed into a network folder of the specified system where the HunterLab File Service is installed. Click on ***NETWORK STORAGE SETTINGS*** Button

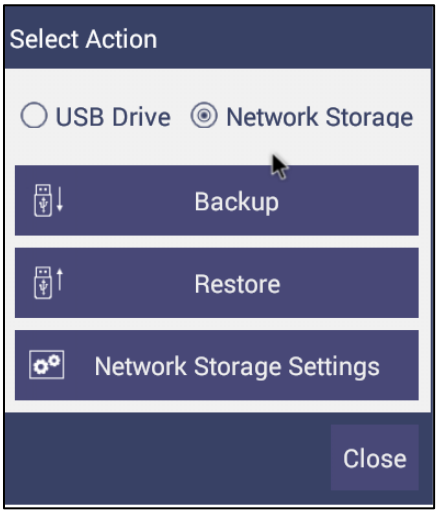


Figure 173. Network Storage Settings

In the next screen enter the **IP ADDRESS** and **PORT NUMBER**. Click on ***TEST CONNECTION*** button to verify the connectivity. Click ***APPLY*** to save the settings. The saved network settings will be used for the Network Backup and Restore operations.

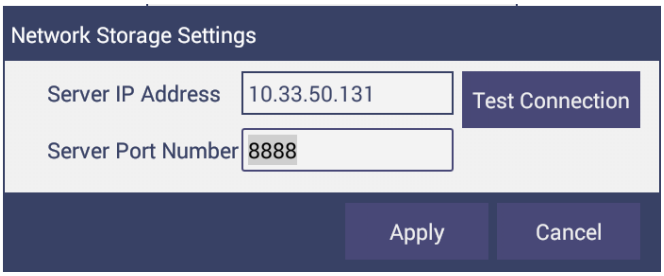


Figure 174. Network Storage Settings

After successful configuration of network settings, click ***BACKUP*** (or ***RESTORE***) to perform the complete backup of ***HUNTERLAB*** folder in Essentials-Agera to the specified network server's folder.

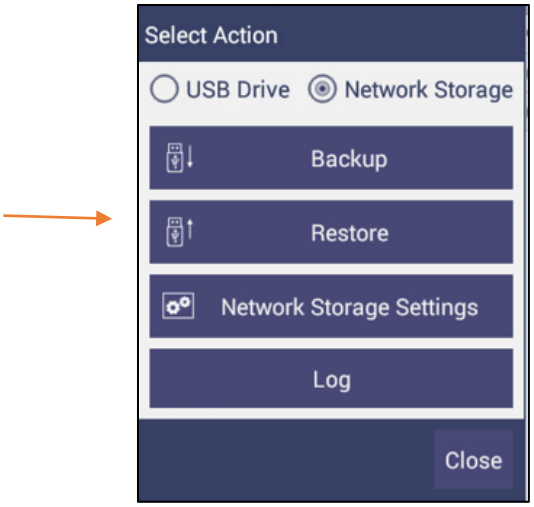
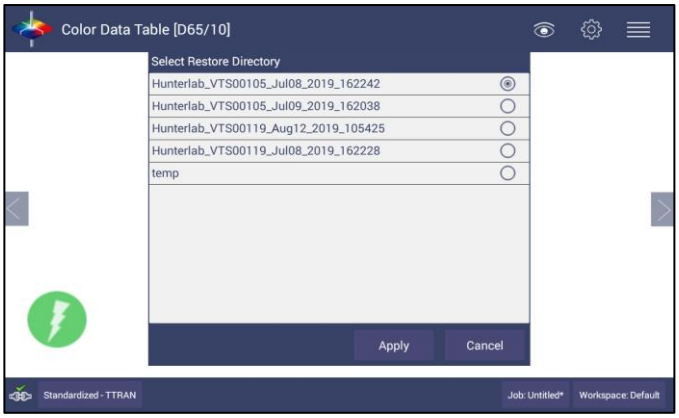


Figure 175. Select Restore



Select the files to be restored.

Figure 176. Select Files to be Restored.

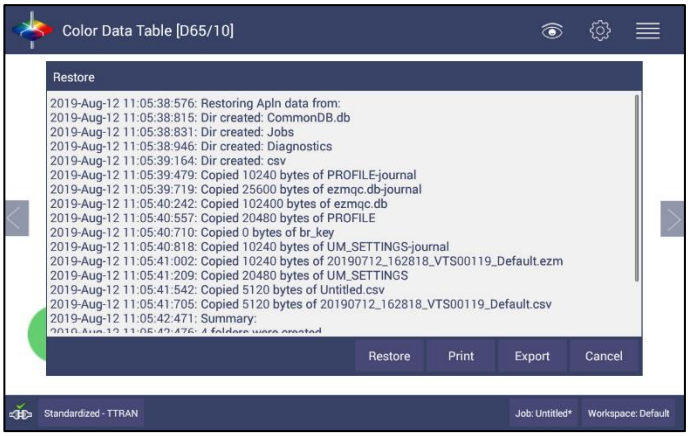


Figure 177. Files Restored

Specifications

The specifications and characteristics of the instrument are given in this chapter. For best performance, the 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.

Note: Do not leave Agera in an area where temperature or humidity extremes are possible.

Operating Conditions

Storage Temperature (3weeks)	-20°C to 65°C (-5°F to 150°F)
Operating Temperature	4°C to 38°C (40°F to 100°F)
Noncondensing Humidity	10% to 85%
Standard Accessories	Calibrated instrument White Tile with Certificate of Traceability, Black Glass Standard, Green Diagnostic Tile, Standards Box, Port Plates of xLAV, LAV and MAV, Power Supply, Quick Start Guide, Agera User's Manual on USB

Physical Characteristics

Weight	6.35 kg (14.0 lbs.)
Dimensions (Height x width x depth)	28 cm x 21.6 cm x 31 cm (11.0 in x 8.75 in x 12.25 in)
Communications I/O: USB Ethernet RJ45 Remote Access Support External Inputs:	 Connectivity to thumb drive, printer, keyboard, mouse, and other peripherals. Print directly to standalone or network printers; email directly from the instrument; stream data to LIMS and SPC systems. Enabled via internet-based support tool Computer, Wireless Mouse & Keyboard Remote footswitch or similar closed contact switching device.
System Power	100 – 240 VAC, 47 – 63 Hz to universal power supply @ 24 VDC/3.75A
Display	Touch screen, high resolution 1280x800
External PC Software	Compatible with HunterLab EasyMatch QC and EasyMatch QC-Electronic Records Quality Control Software

Conditions of Illumination and Viewing

Light Source	Full spectrum balanced LED system array; 5 year typical LED life
Dual Beam Spectrophotometer	256 element diode array and high resolution, concave holographic grating Sealed optics,
Geometry	0°/45° circumferential ASTM E1164
Measurement Conditions	Port Forward, Port Up

Instrument Performance

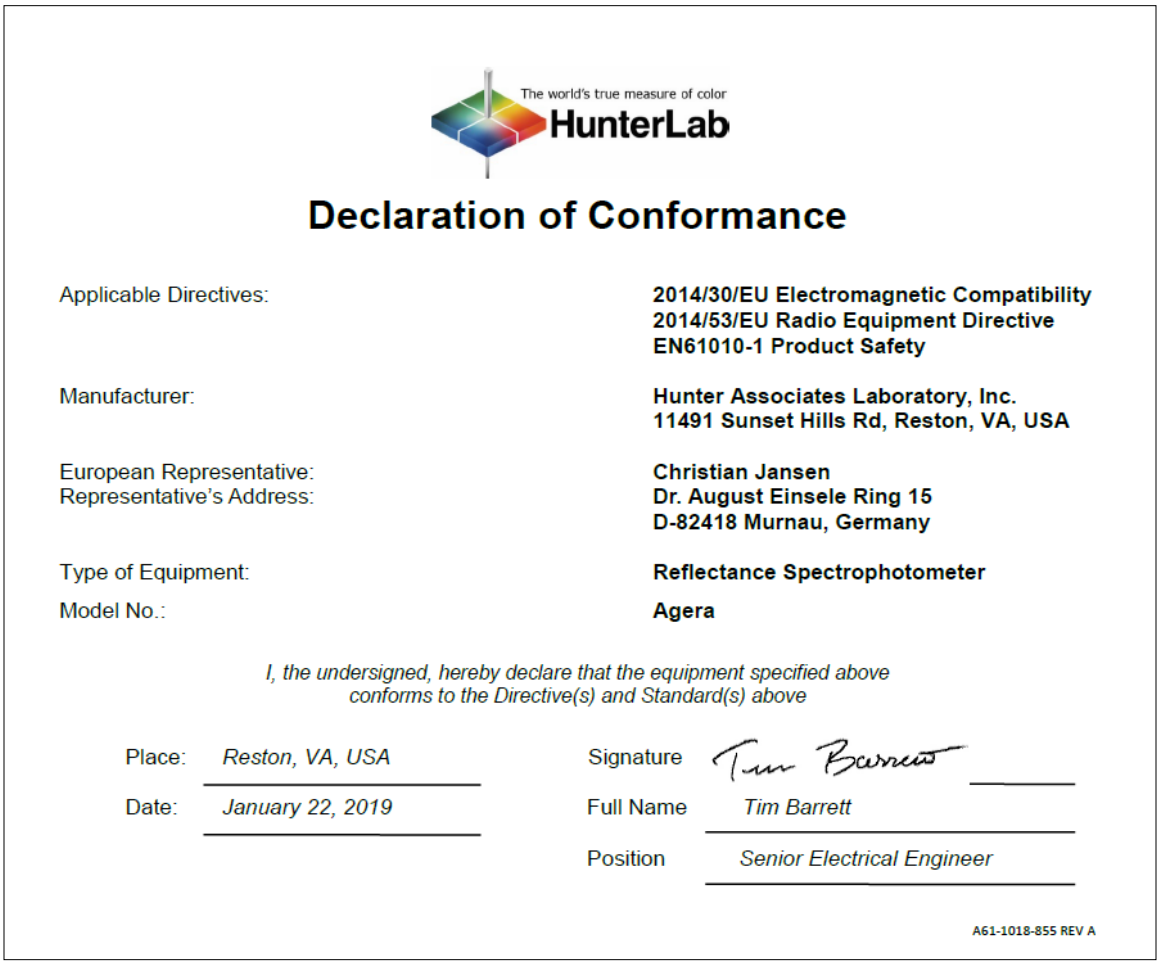
Spectral Data	Range: 400 nm -700 nm; Reporting Interval (nm): 10 nm
Illumination Range	360 nm – 700 nm
Spectral Resolution	<3 nm
Effective Bandwidth	10 nm equivalent triangular
Photometric Range	0 to150%
Measurement Duration	<3 second; <5 sec interval
LED life	5 years typical
Inter-instrument Agreement	Color: ΔE 2000 < 0.15 CIE L*a*b* (Avg) on BCRA II Tile Set Gloss: 0-100; ≤ 0.5 GU
Colorimetric Repeatability	Color: ΔE 2000*< 0.03 CIE L*a*b* (Max) on White Tile Gloss: 0-100 GU: ≤0.1 GU
UV Control	UV Nominal, UV-Calibrated; UV-Excluded; UV-Compare

Measurement

Image Capture	High-resolution, D65 illuminated, 0°/45° image viewing, image capture and image recall
Area Measured	xLAV - 54 mm (2.125 in) illumination; 51 mm (2.0 in) measured; LAV - 28.6 mm (1.125 in) illumination; 25.4 mm (1.0 in) measured; MAV - 17.46 mm (0.6875 in) illumination; 16.9 mm (0.625 in) measured
Data Views	Color Data, Spectral Plot, EZ View, Tristimulus Color Plot, Trend Plot; Pass/Fail Color indication, time and date stamp, aut-naming, auto-saving, data backup and recovery.
Illuminants	A, C, D50, D55, D65, D75, F02, F07, F11,
Observers	2° and 10°
Color Scales	CIE L*a*b*, Hunter Lab, CIE L*C*h, CIE Yxy, CIE XYZ and Differences
Color Difference Indices	ΔE*, ΔC*, ΔE, ΔE CMC, ΔE 2000
Indices and Metrics	Gloss (ASTM D423, ASTM D2457, ISO 2813, ISO 7668, JIS 28741), E313 Yellowness, E313 Whiteness, YI D1925, Y Brightness, Z%,

	457nm Brightness, Baking Contrast Units, Tint, HCCI, SCAA/G, SCAA/C, Custom Indice, ASTM E1349
Gloss	60° Gloss conformance to ASTM D523 and ISO2813
Data Storage	1 million Records max; 8 GB
Languages	English, Japanese

Regulatory Notice



The world's true measure of color
HunterLab

Declaration of Conformance

Applicable Directives:	**2014/30/EU Electromagnetic Compatibility** **2014/53/EU Radio Equipment Directive** **EN61010-1 Product Safety**
Manufacturer:	**Hunter Associates Laboratory, Inc.** **11491 Sunset Hills Rd, Reston, VA, USA**
European Representative: Representative's Address:	**Christian Jansen** **Dr. August Einsele Ring 15** **D-82418 Murnau, Germany**
Type of Equipment:	**Reflectance Spectrophotometer**
Model No.:	**Agera**

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

Place: *Reston, VA, USA*
Date: *January 22, 2019*

Signature: Tim Barrett
Full Name: *Tim Barrett*
Position: *Senior Electrical Engineer*

A61-1018-855 REV A

Features, Accessories & Maintenance

Agera Maintenance & Safety

The Agera 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.

- **Cleaning the Agera**: The Agera is NOT waterproof, but the exterior of the case may be wiped with a damp cloth.
- **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 very durable, care should be taken to prevent contaminants such as finger oils from contacting the material's surface. 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. Always keep tiles in the Standards box when not in use
- **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 in 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 Kim wipe. 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.
- **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 LED's 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.

Options and Sample Devices

There are many options and devices available for positioning samples at the measurement port of the Agera and for making the instrument easier to use. Any or all of the following options and sample devices may be purchased for use with the Agera. HunterLab part numbers are provided for convenience in ordering.

- EasyMatch Quality Control Software
- Ring and Disk Set
- Disk Assembly
- Ring Only
- Glass Sample Cup
- Sample Cup Opaque Cover
- Agera Sample Cup Set
- Skein/Swatch Holder
- Footswitch Assembly
- Sample Clamp
- 50% Gloss Check Tile

Easy Match Quality Control Software (EZMQC-OPT)

Used on: CFEZ/MSEZ/Vista/Aeros/Agera EZMQC-OPT should be purchased as an option. Easy Match QC is a Window's based color quality control package. EZMQC interfaces directly with your HunterLab instrument for instrument control and data collection. Product features include simple operation with standard vs samples and Pass/Fail displays for quick QC analysis and automatic Pass/Fail tolerancing based on color standard. Advanced features include multiple configurable data views, customized templates for color data and display, customizable print job reports, data records stored to data base with standard and user defined search fields, automatic data output to Microsoft Excel, and data protection with definable user and supervisor access privileges.

Disk Assembly (02-4522-00)

From Ring and Disk set.

Figure 178. Disk Assembly

Ring and Disk Set (02-4579-00)

For use in the glass sample cup (purchased separately). Used for transparent and translucent liquids or semi-solids where the sample path length must be fixed. The minimum sample volume required for the ring and disk in the sample cup is 25ml.

Figure 179. Ring and Disk Set

Sample Cup Opaque Cover (04-4000-00)

Provides a light trap to exclude the interference of external ambient light on the sample.

Figure 180. Sample Cup Cover

Ring Only (04-4230-00)

From Ring and Disk set (92-4579-00) to hold light inside sample cup.

Figure 181. Ring Only

Glass Sample Cup (04-7209-00)

Optically clear glass cup for sample presentation of liquids, powders, granules and pellets. The sample cup measures 64mm (2.5 inch).

Figure 182. 64mm Glass Sample Cup

Sample Cup Set (Agera-SC-Assy)

Consists of a 2.5 inch glass sample cup, sample cup opaque cover, ring and disk set and port insert.

Figure 183. Sample Cup Set

Skein/Swatch Holder (02-7396-00)

Sample Presentation Device used for measuring swatches, yarns and string skeins.

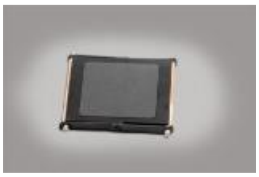


Figure 184. Skein/Swatch Holder

Foot switch Assembly (D02-1010-327)

The footswitch is used to initiate sample measurement without the use of hands.

Figure 185. Foot Switch

Sample Clamp (D02-1018-462)

Used to hold sample in place in standard and port-forward orientation.

Figure 186. Sample Clamp

Gloss Check Tile (D02-1018-997)

Nominal 50 Gloss Units Check tile for Agera.

Tomato Option (Agera-Tomato)

This features the measurement of Tomato Scores: Fresh Tomato Color Index (C/2), Tomato Paste (C/2), Catsup (C/2), Tomato Sauce (C/2), Tomato Juice (C/2), Tomato a/b Ratio (C/2). This option includes: HunterLab Tomato Tile (L02-1014-594), (2) 64 mm (2.5 in) OD Glass Sample Cups (04-7209-00), (Port for Sample Cup (D02-1018-615) and Sample Cup Cover (04-4000-00).

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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