User's Manual for Aeros® and EasyMatch® Essentials

The world's true measure of color
HunterLab

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

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

Safety Notes

For your safety when using the Aeros, 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**.**
- This instrument sensor moves up and down during standardization and creating a measurement profile. Please keep fingers and other items out of the way of the sensor.
- The turntable will rotate if turned on in Read Options > Measurement configuration. Please take care to remove fingers, jewelry and clothing to prevent damage.
- The Aeros is for indoor use only at an altitude of up to 2000m and pollution degree 2.

Contents

Setting Up the Aeros

The Aeros system contains two major components – the sensor head and the turntable base. The sensor head contains the spectrophotometer with an LED light source, distance measuring components and a touch screen for Essentials. The turntable base provides the electronics and the mount for the sensor with automated vertical positioning and horizontal manual adjustment. The turntable rotates the product under the optical sensor.

Standard Accessories

- Calibration Box with calibrated white tile, black glass and green diagnostics tile
- Certificate of Traceability
- Power Supply
- Aeros Quick Start Guide
- 12-in and 6-in Sample Dishes
- USB Flash Drive

Figure 1. Calibration Box

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.

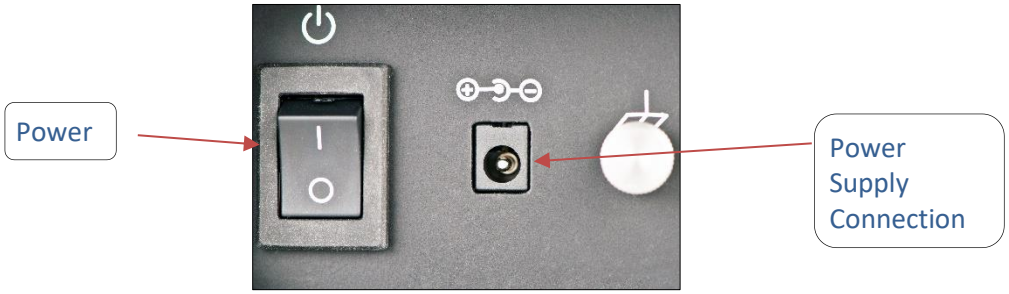


Figure 2. Rear View with Connectors

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.

Keyboard and Mouse

- The Aeros 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 to the rear of 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 Aeros. The one in the front is typically used for exporting jobs and workspaces, backing up the instrument and updating software. The USB port on the back of the instrument is typically used to connect a printer or a keyboard to the Aeros.

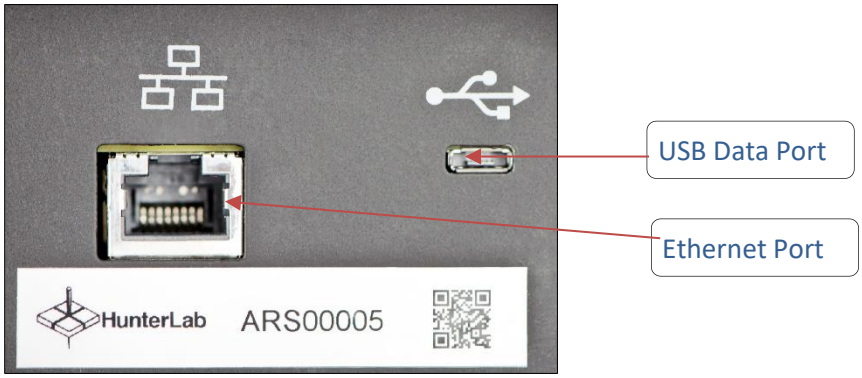


Figure 3. USB Port on Rear of Instrument

Ethernet Port

- This port is used to connect the Aeros to:
  - Computer or to a network with the purpose of sending data (ASCII) to a server.
  - Connect with EasyMatch QC and EasyMatch ER Validation and Compliance
  - Remote Support
  - Network printer.

Moving the Unit

- Use care in moving the instrument which weighs 50 lbs. Training on lifting heaving objects is recommended. To lift from the box, a two person lift is suggested. When moving it from a table to another location, balance this instrument by lifting from behind and by the base.
- If moving the Aeros any distance, please secure the optics using ***Diagnostics > Advanced > Park*** for Shipping.

Taking a Simple Measurement

What is HunterLab Aeros & EasyMatch Essentials?

Aeros is a reflectance-only color measuring instrument capable of measuring the color of irregularly shaped/textured products. All samples are measured by placement in a tray or container under the sensor head. With features like Auto Height Positioning, a rotating sample platform, large touch-screen display, and smart communications, the innovative Aeros can measure products like coffee beans, snack foods, plastic pellets, even industrial minerals.

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 4. Measurement Screen

- The instrument is automatically connected and this connection is reported on the status bar. Next, the unit must be Standardized.
- There are two ways to initiate Standardization.
  - Press the ***Workspace*** icon  and select ***Standardization***. User will be prompted to remove all samples from under the sensor.
  - Alternately, press the ***Standardization*** status area on the status bar to initiate Standardization.
- **Move sensor to Top**: Press ***OK*** to move the sensor to the highest position.

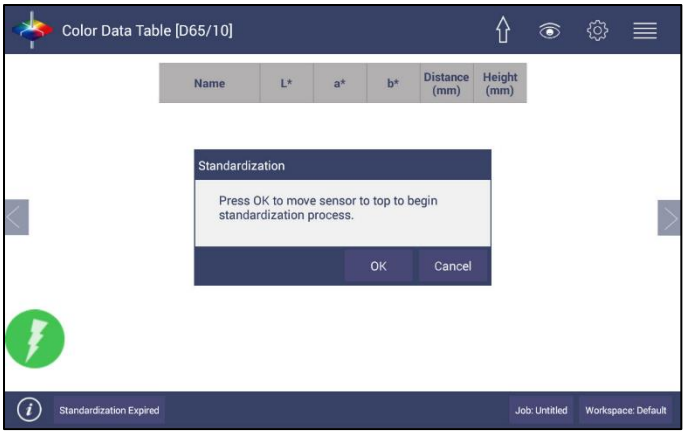


Figure 5. Sensor Moves to Top

- **Read Black Glass**: When the sensor stays at the top, attach the standardization box to the sensor. Then attach the black glass to standardization box and press ***Read***.

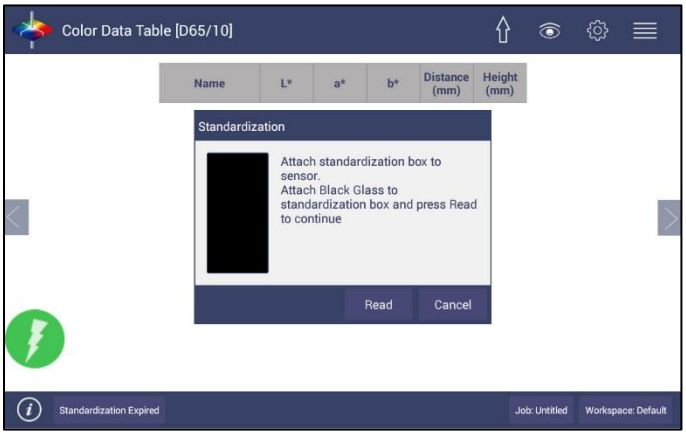


Figure 6. Read the Black Glass for Bottom-of-Scale

- **Read White Tile**: Remove the black glass and attach the calibrated white tile to standardization box. Press ***Read*** to continue.

Figure 7. Read the White Tile for Top-of-Scale

- Remove the calibration box when standardization is completed. Click ***OK***.

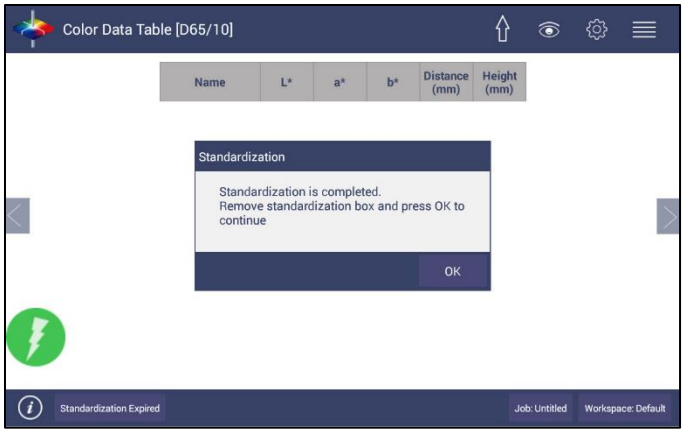


Figure 8. Completed Standardization

- Standardization is updated and reported as **Standardized** on the bottom of the screen.

Figure 9. Standardization Status Bar

- Create a workspace for your product
  - **Prepare sample**: Place sample/sample dish on the turntable.
  - To **Create A New Workspace.**
    1. From the ***Workspace Menu***, press ***New Workspace*** and enter a name for this Workspace. A new job will be opened together with this new workspace.

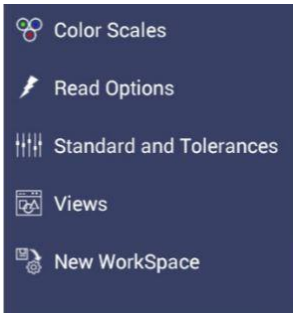


Figure 10. New Workspace

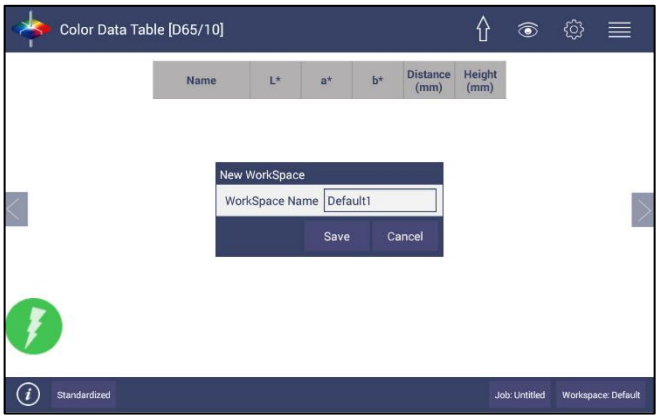


Figure 11. Name New Workspace

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

- **Configure the New Workspace**: With this new workspace open, you can start to change the settings in Color Scales, Read Options, Standard and Tolerances, Views and View Options. All these changes will be automatically saved in this new workspace.
- **Default Settings**: Following are the default settings for a new workspace:

Table 1. Workspace Parameters

Parameter	Selection
ColorScales	CIE L*a*b*
Illuminant	D65/10
Indices	None
Differences	None
Read Options > Options	Prompt for Sample Name, Auto Save
Read Options > Measurement Configuration	Turntable **ON**, Auto Height selected, Measurement time = 5 sec
Standard and Tolerances	None
Views	Color Data Table only
View Options for Color Data Table	Latest Data First selected, Precision = 2

- When Auto Height is selected as default, the sensor head will adjust its position automatically for each sample measurement. Users can also choose to read samples with the sensor head at a fixed distance. ***Create Sample Profile*** is covered in ***Workspace > Read Options > Measurement Configuration*** portion of this manual.

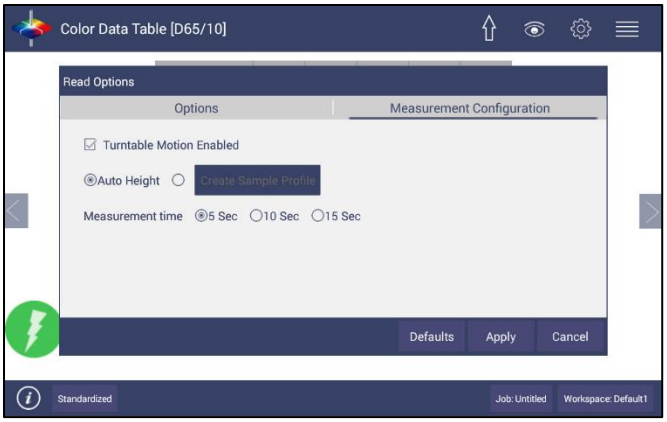


Figure 12. Read Options: Measurement Configuration

- 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.

- **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. To add the color differences, indices and tolerances to the Color Data Screen, see ***Workspace > Color Scales*** and ***Workspace > Standard and Tolerances.***
- To add a product standard and tolerances, see ***Standards and Tolerances***. To change the color scale, etc., see ***Workspace: Color Scales***. The setups are saved automatically in Workspace.
- 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 13. 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.

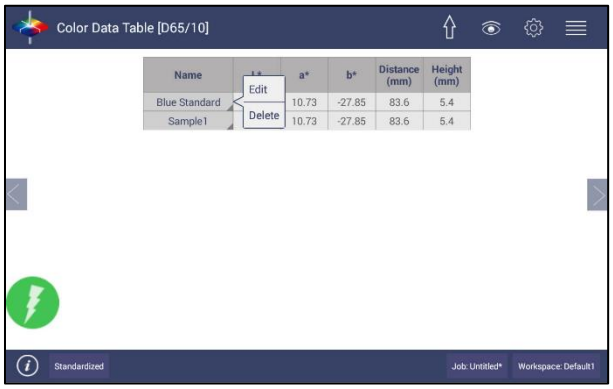


Figure 14. Edit/Delete a Standard

Navigating the Essentials Screen

The EasyMatch Essentials Tools and Status features are shown below.

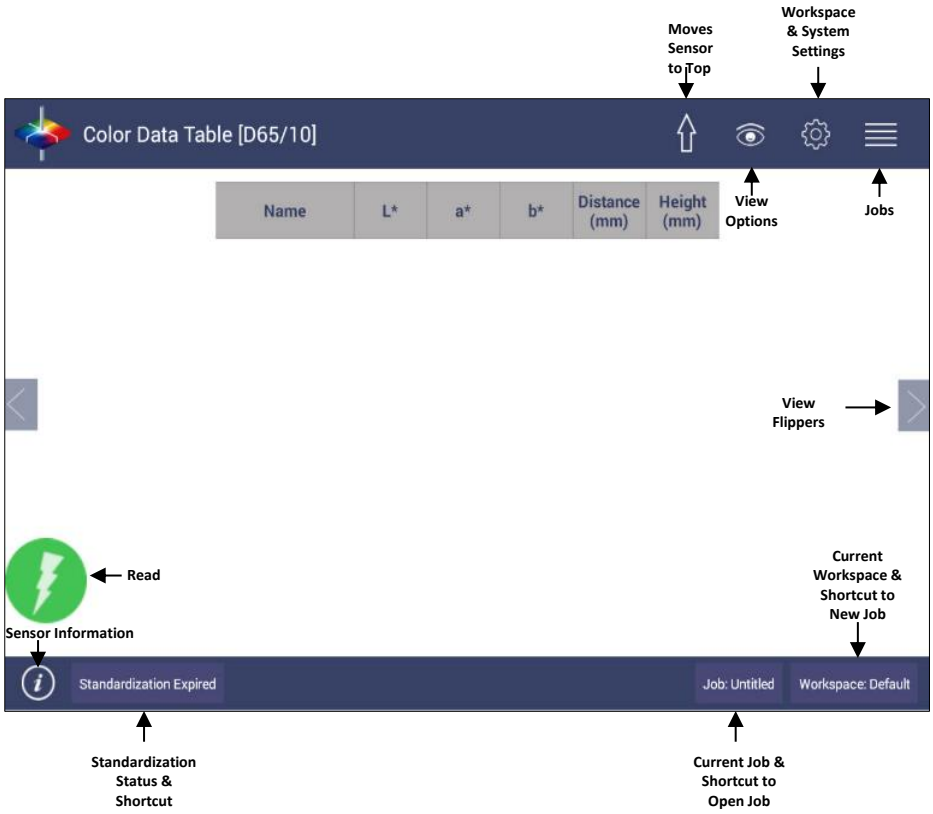
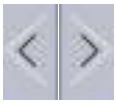


Figure 15. User Interface Screen for Aeros & Essentials

Tools: Read

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

Tools: View Flippers



- 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

- 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.

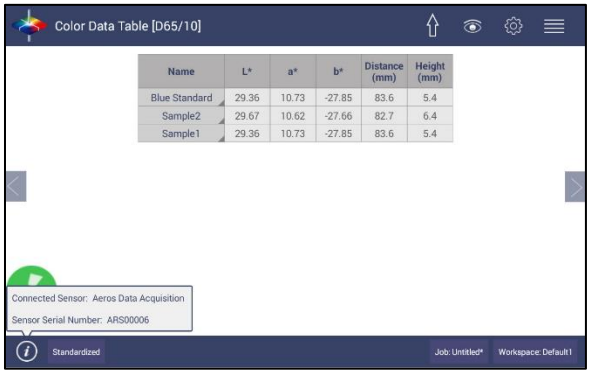


Figure 16. Sensor Serial Number

Tools: Jobs Status/Workspace Status

- ***Job > Workspace*** Status is reported on the bottom right side of the System Bar.

Tools: Move Sensor to Top

- This tool moves the sensor head to the top.

Tools: View Options

- 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

- The Workspace menu sets up the data screen with measurement scales, read options, standards, tolerances and views.

- Systems Settings initiates Standardization, Diagnostics, Preferences, and the User Manager for System Security.

Tools: Jobs

- 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.

Tool Bar: Jobs Function

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

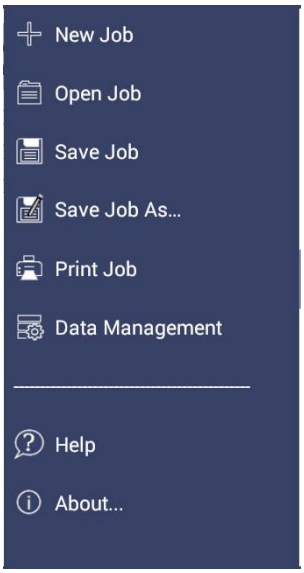


Figure 17. Job Menu

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***. We also provide a short cut for Jobs: Open in main tool bar.
- **Shortcut:** press job name in the status bar on the lower right.

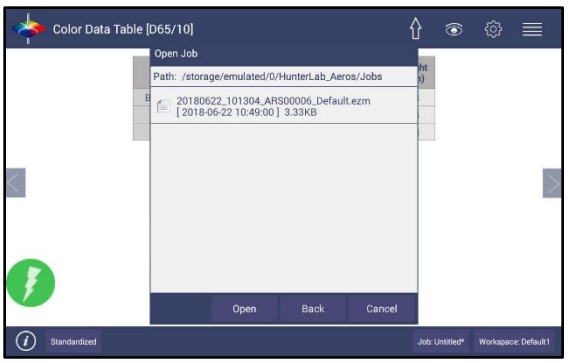


Figure 18. Open A Job

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.

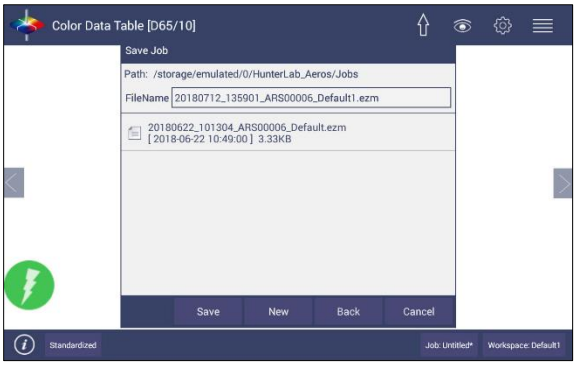


Figure 19. Save A Job

Jobs: Print

- **Print** an open Job using the parameters set up under Workspace & Systems Settings > Preferences.

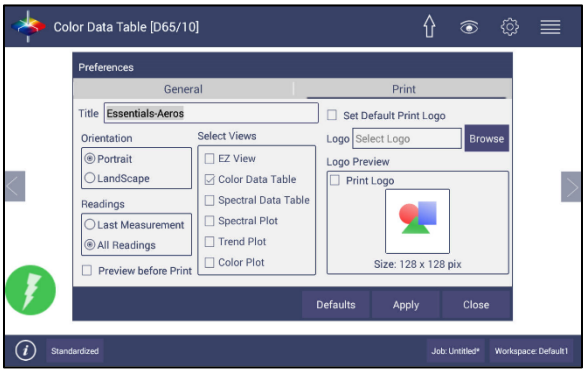


Figure 20. Workspace & System Settings > Preferences > Print

- Drivers included in the Aeros 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.

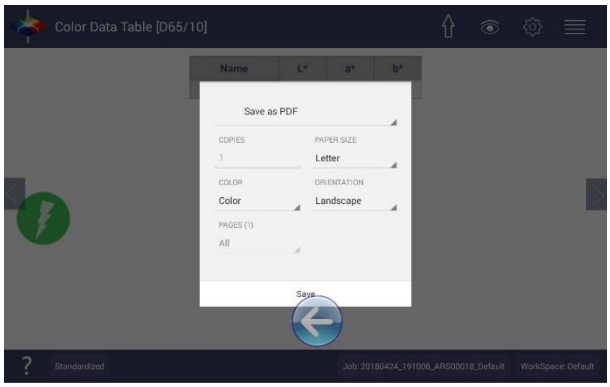


Figure 21. Save as PDF

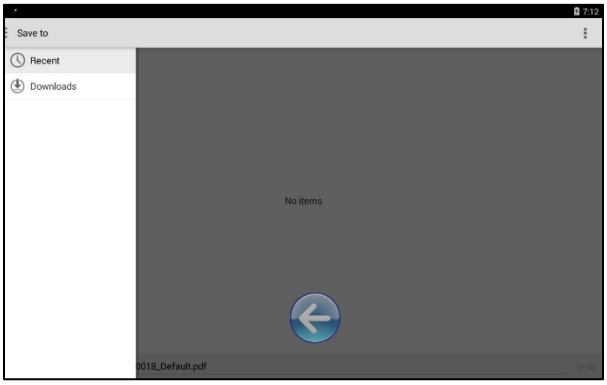


Figure 22. Save PDF to Downloads File

Figure 23. 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.

- The ***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 Hunter Lab folder (all jobs, database and user manager settings) into a USB Flash drive.
  - ***Restore*** the Hunter Lab folder (all jobs, database and user manager settings) from a USB Flash drive.

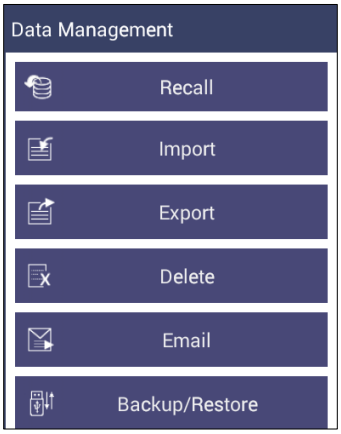


Figure 24. Data Management Menu

- ***Jobs: Data Management: Recall***
  Recall measurements that have been stored to a job.

  This feature enables the user to recall the Standard/Sample(s) stored in the Database into the current running Job.

  Click ***Recall*** option in Data Management, a dialog will be displayed where the user can recall the measurements from the database by ***Selecting the Type***:

  - **Show the Standard associated with a specified category**.
  - **Show all the measurements in the selected Job**
    When this option is selected, the standard and samples for that job are listed.
  - **Show the Standards/Samples in the Current Workspace**
    When this option is selected, the list is filled with the standards and samples associated with the current workspace. To narrow the sample list, the user can select the samples only associated with the selected standard.
  - **Show the Imported Standards**
    When this option is selected, the standards list is only filled with the standards imported into the database.

    After selecting the measurements click ***Recall*** placing them into the active Job.

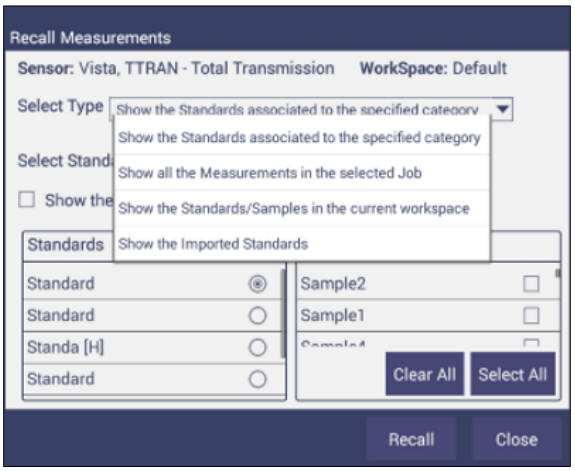


Figure 25. Recall Measurements

- ***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.

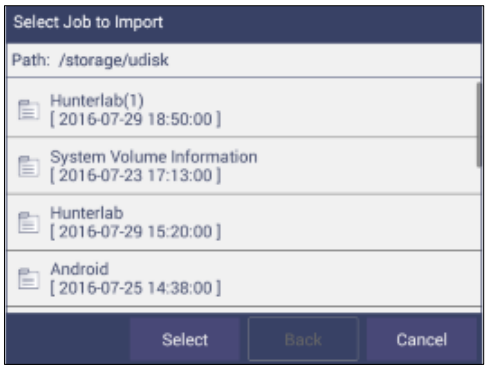


Figure 26. Import Job

- ***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.

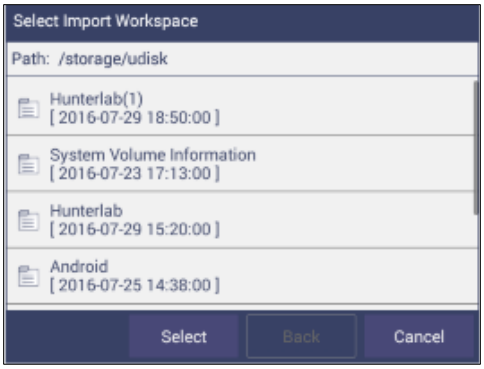


Figure 27. Import Workspace

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.

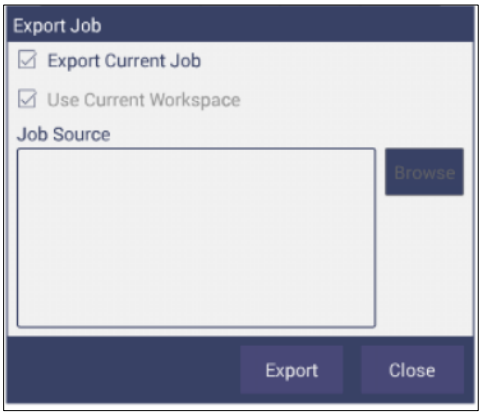


Figure 28. Export Current Job

  - ***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*).

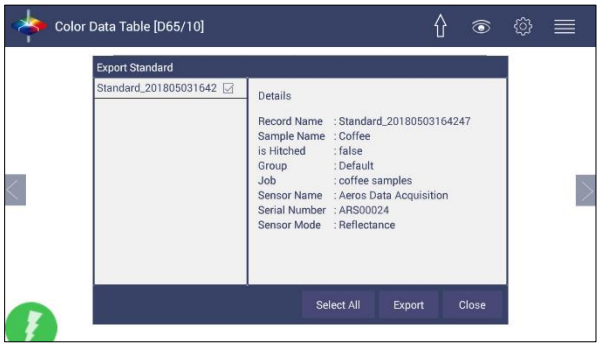


Figure 29. Export Standard

- ***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 30. 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.

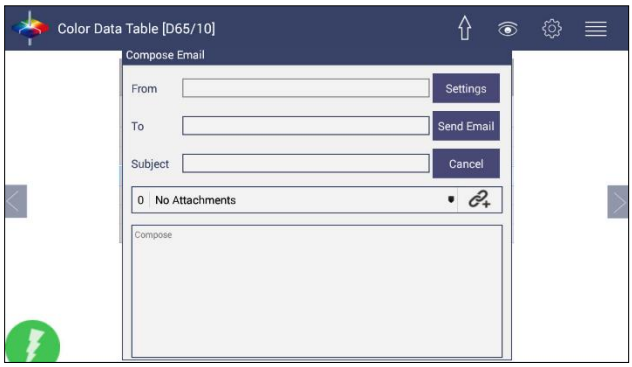


Figure 31. Enter an Address to Email a Job

- **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 32. 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 Hunter Lab folder to a thumb drive. ***Restore*** enables the user to copy the backup folder of a thumb drive and upload to the Aeros.

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.

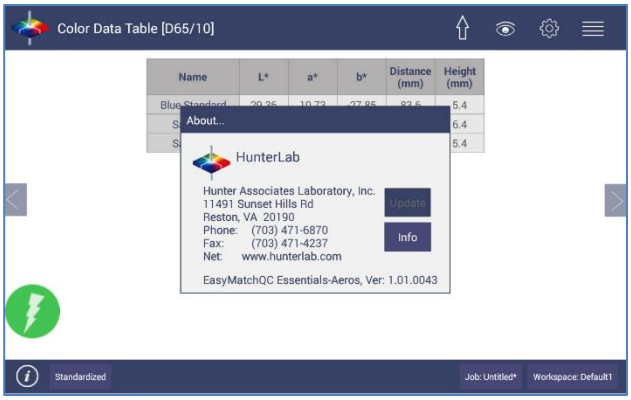


Figure 33. Job > About the Software

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.

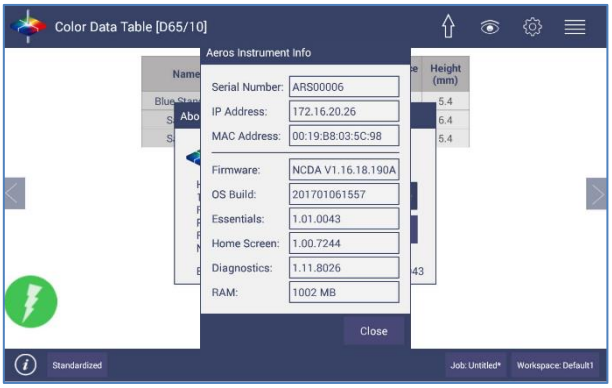


Figure 34. Instrument Info

Tool Bar: Workspace & System Settings

Under the ***Workspace & Systems Settings***, the following tasks can be accomplished:

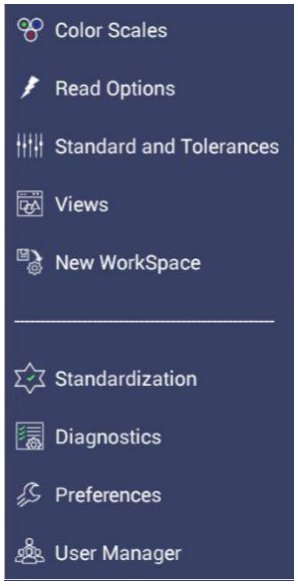


Figure 35. Workspace Parameters

Workspace: Color Scales

- Color Scales provide four tabs in which the **Scales**, **Indices**, **Differences** and **Illuminant/Observer** (**Ill/Obs)** can be configured.

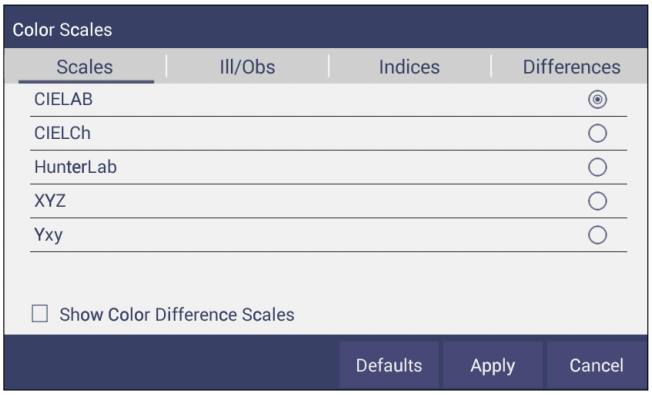


Figure 36. Color Measurement Scales

- The Scales Tab showsthe 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.

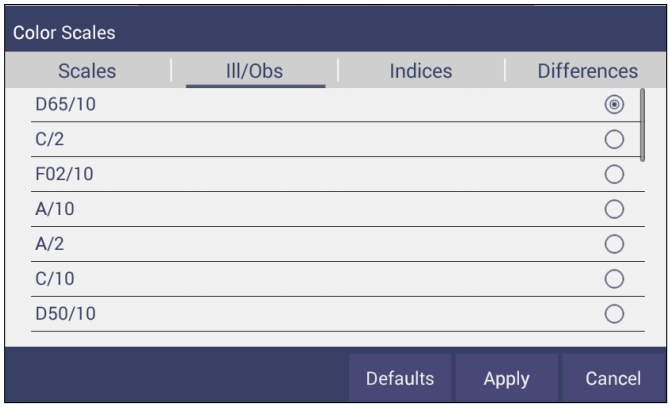


Figure 37. Illuminant/Observer Configuration

- To select indices, go to the **Indices Tab** and check the corresponding box on the right side. Multiple selections are avaible. To see more choices, the screen can be scrolled. Press ***Apply*** to continue.

Figure 38. Index Configuration

- To select differences, go to the **Differences Tab** and check the corresponding box on the right side. Press ***Apply*** to continue.

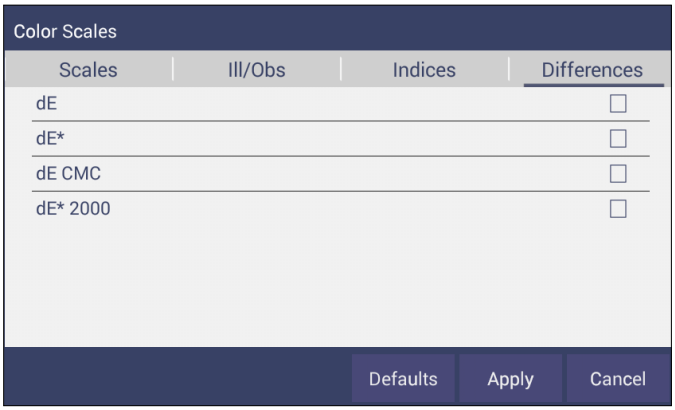


Figure 39. Color Measurement Differences

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	Y Bright	Date[3]
D55	2/10	Yxy[1]	dYxy	YI D1925	Trace Range 1[2]
D75	2/10		dE	YI E313	Trace Range 2[2]
F07	2/10		dE CMC	Z%	Trace Range 3[2]
F11	2/10		dE* 2000	SCAA	Trace Range 4[2]
TL84	2/10		dE*	HCCI	Auto Range[2]
ULT 30	2/10			BCU	Display: Line[2]
ULT 35	2/10				Display: Point[2]
	2/10				Zoom
					Average[2]
					Std. Deviation[2]
					Meas per Display[2]

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

Workspace: Read Options

Read Options: Options

- Shows a dialog box to configure ***Averaging, Continuous Read Interval, Auto Save, Index Bias Configuration, Sample Name, and Standard Name***. The Read command performs the operation based on the configured options.

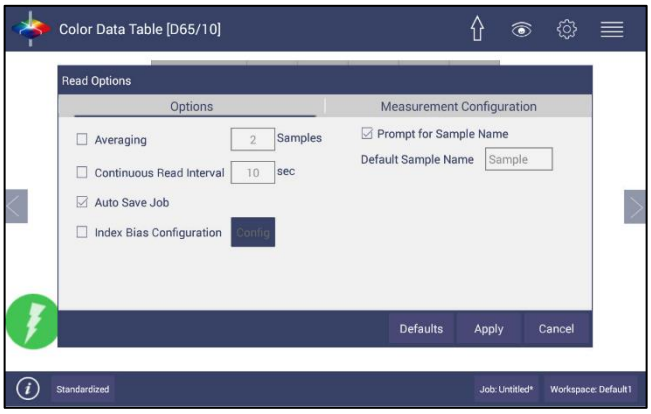


Figure 40. Read Options

- ***Average***
  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.

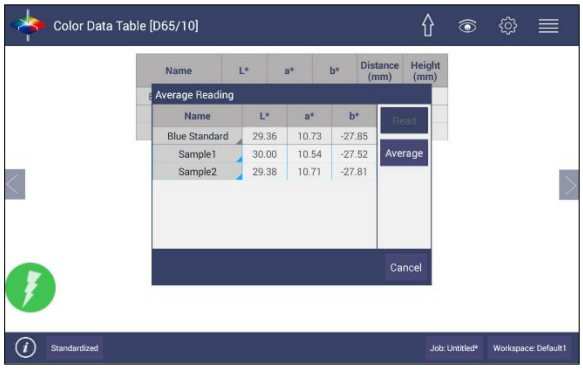


Figure 41. Reading and Averaging

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 3 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.

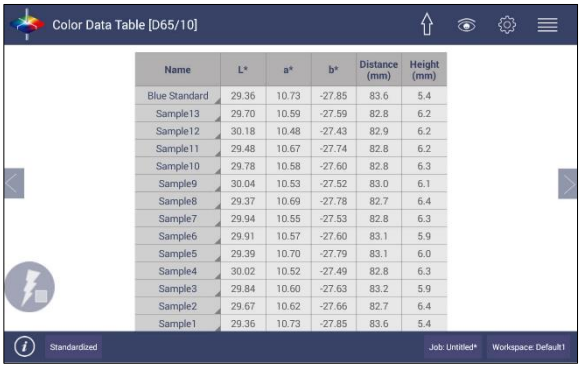


Figure 42. Continuous Read

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.

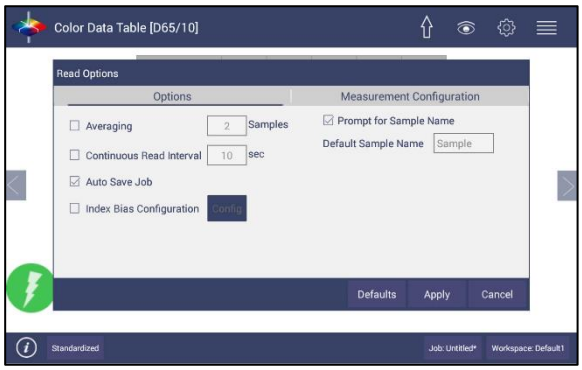


Figure 43. Auto Save Job

- ***Index Bias Correction***

  This option allows the user to input a custom slope and intercept correction for indices. The user can select any Index from the list of applicable indices and input the desired ***Gain*** **and** ***Bias*** values. After selecting the required Indices, select the ***Apply*** button to save the selected Indices values and update the Views accordingly. The Bias-corrected Indices will be marked with * (eg: 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.

Select Index Bias Configuration

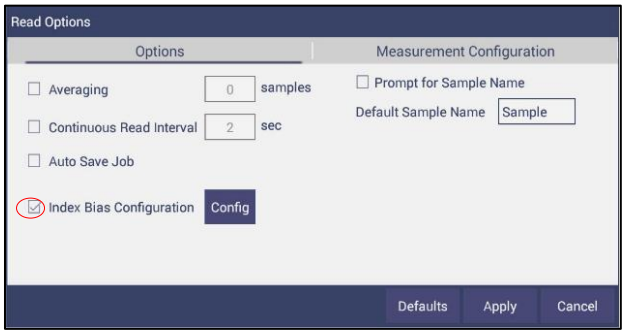


Figure 44. Slope & Bias Correction

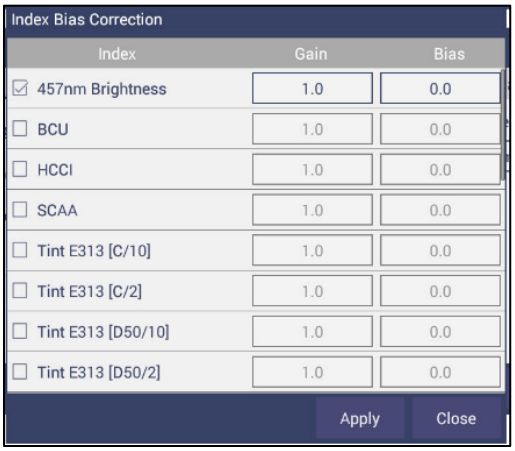


Figure 45. Input Gain & Bias

The indices with bias correction include: 457nm Brightness, BCU, HCCI, SCAA, 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.

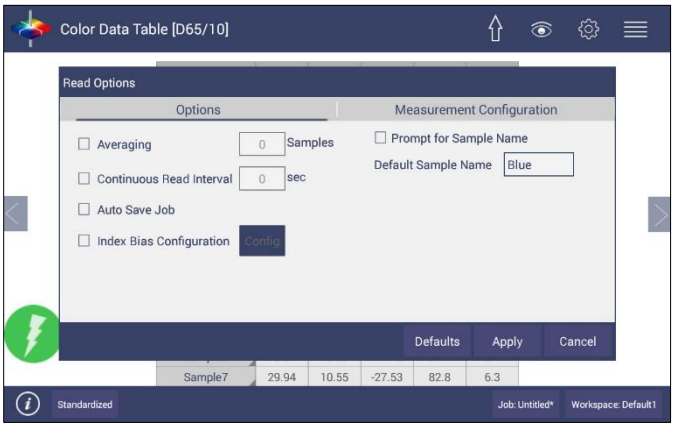


Figure 46. Prompt for Sample (Standard) Name

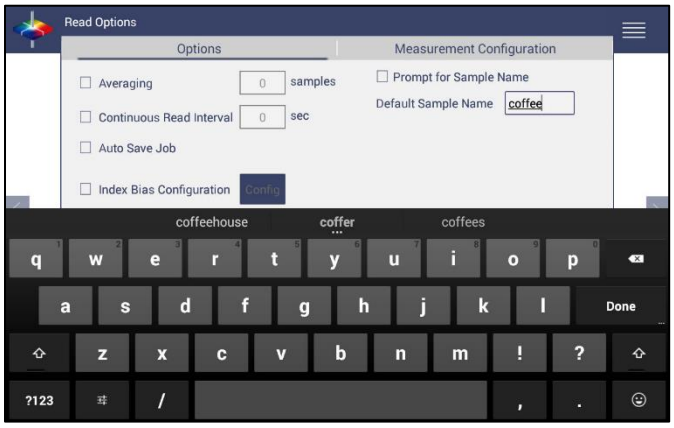


Figure 47. Input Sample Name

Read Options: Measurement Configuration

- Enables the motion of the turntable, selects the height of the measurement and measurement time.

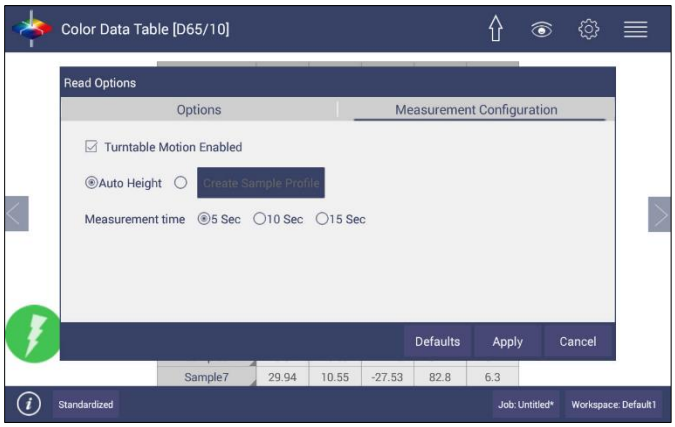


Figure 48. Measurement Configuration

Select ***Turntable motion*** to enable rotation. When ***Auto Height*** is selected as a default, the sensor head will adjust its position to read samples automatically for each sample measurement. The ***Create Sample Profile*** button will allow the Aeros to look at the specimen and select the optimum fixed distance from the turntable. When this is pressed, the Sensor will move to the Top position.

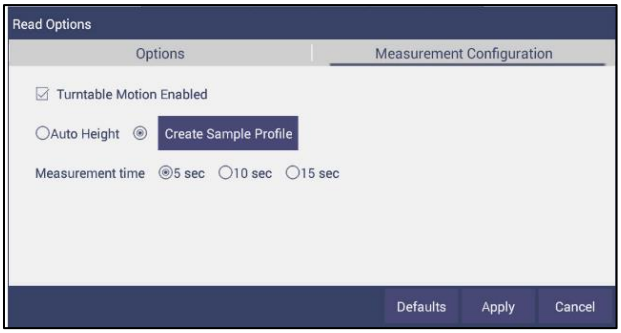


Figure 49. Creating a Sample Profile

Place sample on the turntable and press ***OK***.

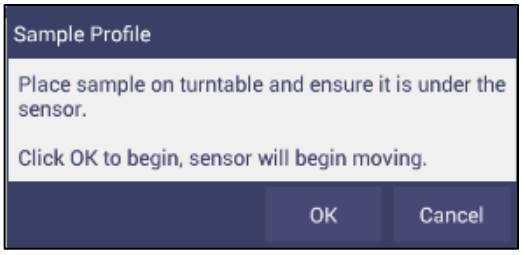


Figure 50. Place sample on Turntable

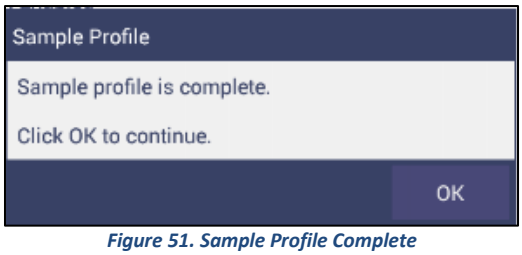


Figure 51. Sample Profile Complete

When profile is complete, press ***OK*** to continue. The sample height will be shown next to the ***Create Sample Profile*** button.

The ***Measurement Time*** is the amount of time used to average the readings together. The longer the time, the more the averaging.

Workspace: Standard and Tolerances

- This command can be used to specify the type of **Standard** and **Tolerances**. Standards can be one of four types: retrieved from database, physical, 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.

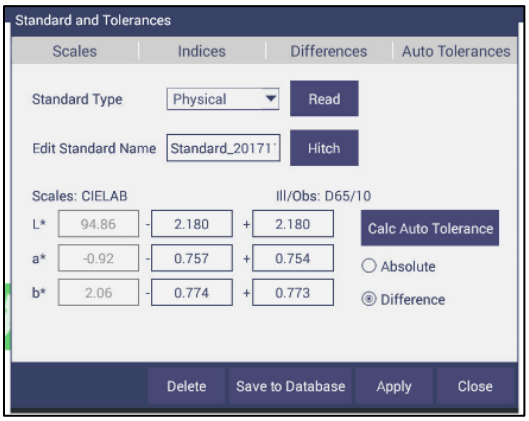


Figure 52. Tolerances Configuration

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

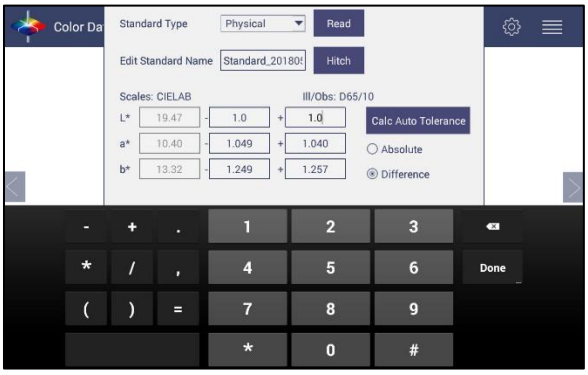
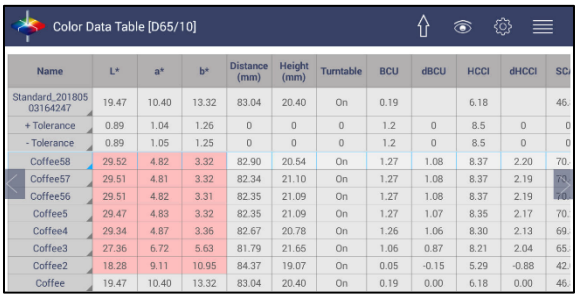


Figure 53. Enter Tolerances

Figure 54. Index Selection and Tolerances

- Tolerances will be displayed on the measurement screen if enabled under the ***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
Standard_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 55. 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:
    1. Read a standard.
    2. Go to ***Workspace > Standard and Tolerances*** and select ***Hitch.***

3. The Standard is displayed under **As Read**. Enter the **target values**.
4. Check the ***Apply Hitch box*** and press ***OK***.

Figure 56. 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.

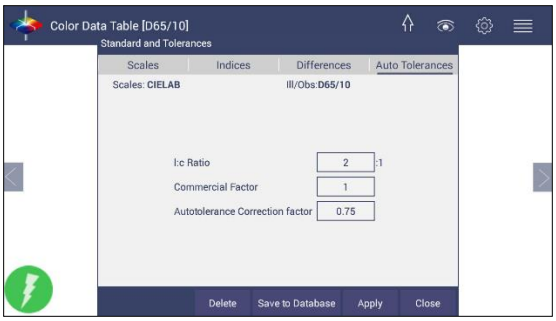


Figure 57. AutoTolerance Configuration

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

Tolerances

- Tolerances can be entered for Scales, Indices and Differences.

Figure 58. Difference Tolerance Configuration

Figure 59. Indices Tolerance Configuration

Workspace: Views

- ***Views***: This option can be used to select the views to be presented in the application. 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 60. 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.

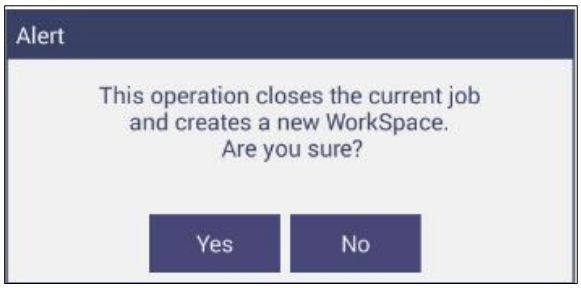


Figure 61. New Workspace

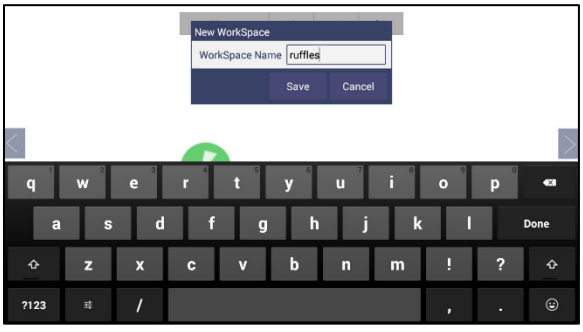


Figure 62. Name the New Workspace

System Settings: Standardization

- From the ***Tools*** menu select ***Standardization***. You can also press the Standardization key in the Status bar as a shortcut. The sensor will move to the top to begin.

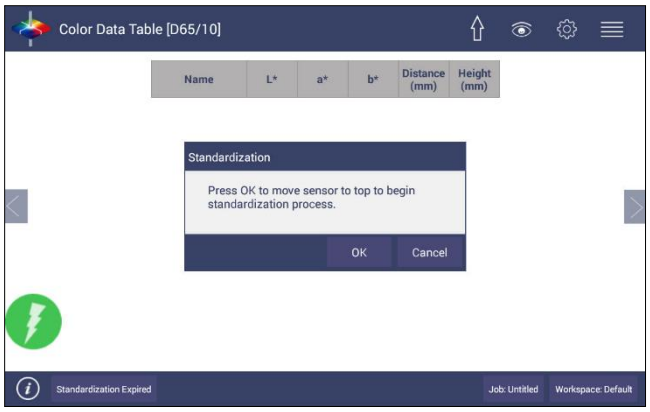


Figure 63. Begin Standardization

- ***Read Black Glass***: Attach the standardization box to the sensor. Then attach the black glass and press ***READ*** to continue.

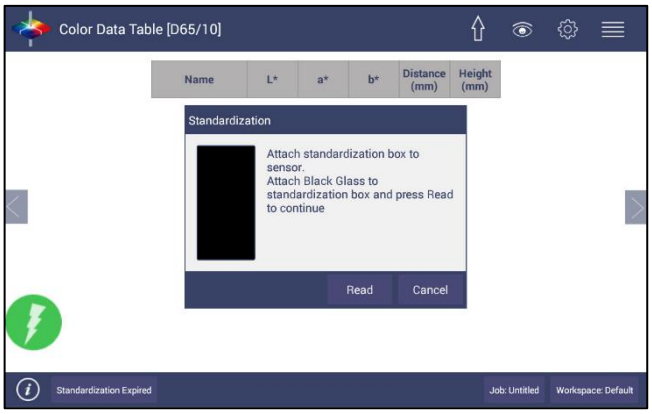


Figure 64. Attach Standardization Box with Black Glass

- ***Read White Tile***: Remove the black glass and attach the calibrated white tile to the standardization box. Press ***READ*** to continue.

Figure 65. Change to White Tile

- Remove the calibration box when standardization is complete. The instrument is ready to Read Samples.

Figure 66. Standardization is Complete

System Settings: Diagnostics

The performance diagnostics are Repeatability and a Green Tile Test.

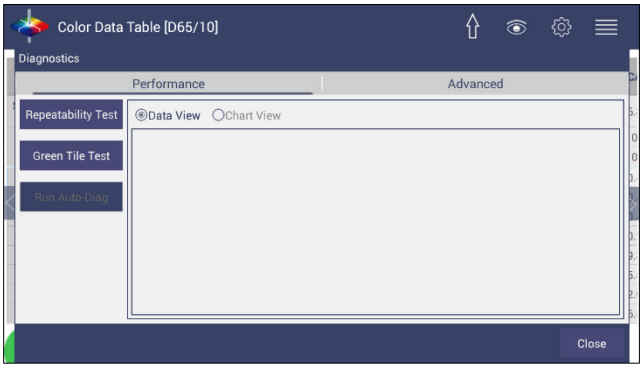


Figure 67. Performance Diagnostics Menu

Testing the Aeros for 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.

Figure 68. Set up for Colorimetric Repeatability

Figure 69. Standardize the Instrument

- Read the black glass and then the white tile.

Figure 70. Read White Tile

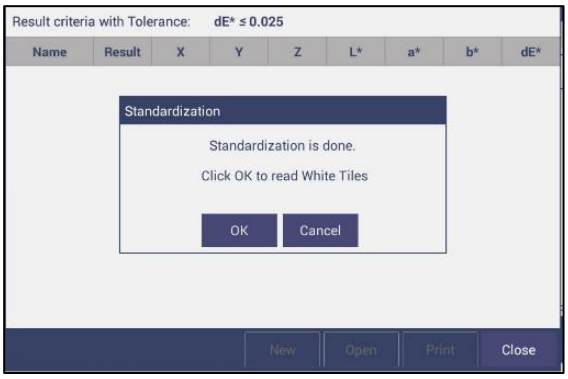


Figure 71. Begin Repeatability Readings on White Tile

- 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 72. 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.

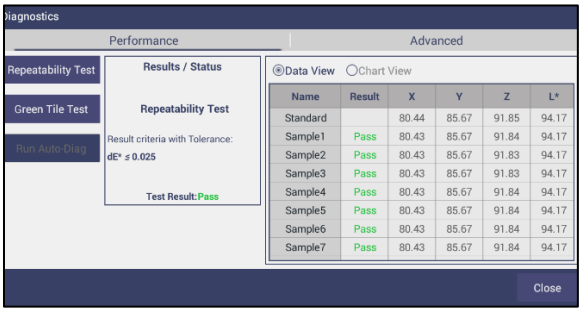


Figure 73. Diagnostics Repeatability Test Results

Reading the Green Tile

- This test requires entry of the target values for the Green Tile.

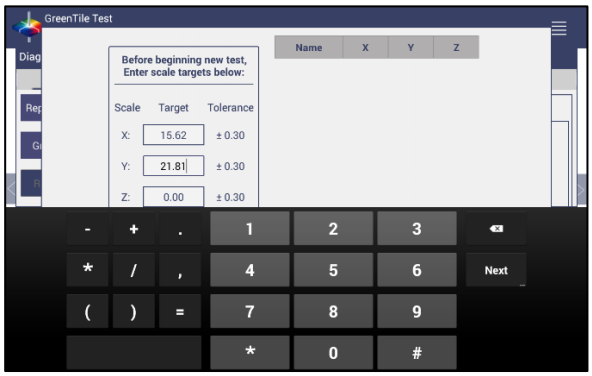


Figure 74. Input Target Values for Green Tile

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

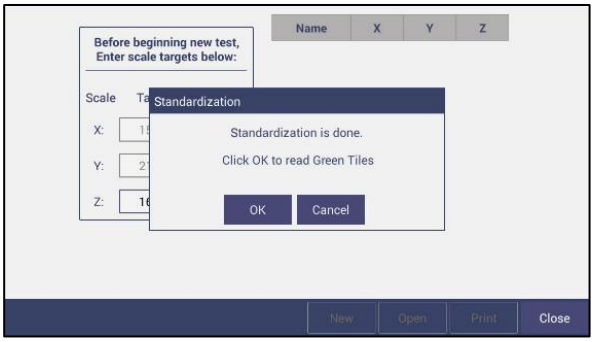


Figure 75. Attach the Green Tile

- 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 76. Green Tile Readings

Advanced Tests

Advanced Tests are primarily for use by HunterLab's Service Department. However, this menu supports the upload of Printer Drivers, Parking of the sensor for Shipping, and remote support setting.

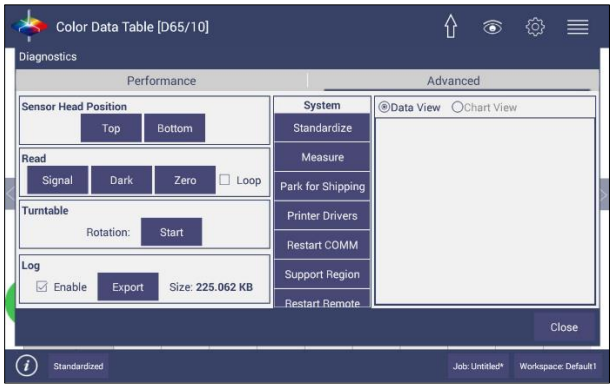


Figure 77. Advanced Menu

- ***Sensor Head Position***: To test the movement of the sensor head up or down. To prepare for shipping, use the ***Park for Shipping*** command under System.
- ***Read Signal, Dark, Zero***: This function will enable the Service Department to determine proper performance of the instrument.

- The ***Turntable*** can be tested next by pressing ***Start***. Press again to stop the turntable.
- ***Enable Log:*** Once check enabled, this feature **r**ecords the instrument actions for tracking purposes. When complete the user returns to this screen and exports the data to a thumb drive. Once the data export is completed the data size becomes '0' again.
- ***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 dialog.
- ***Park for Shipping: Move sensor down to*** secures the optics for transportation.
- ***Printer Driver:*** 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***.

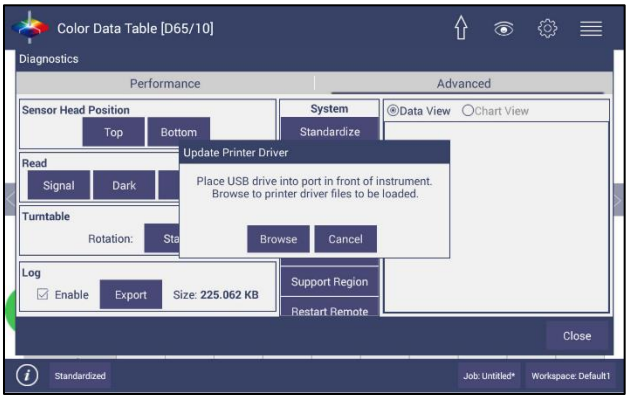


Figure 78. Insert USB with Printer Driver

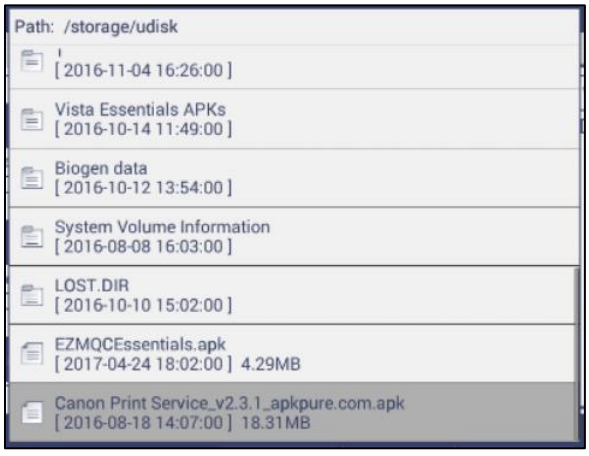


Figure 79. Select Printer Driver

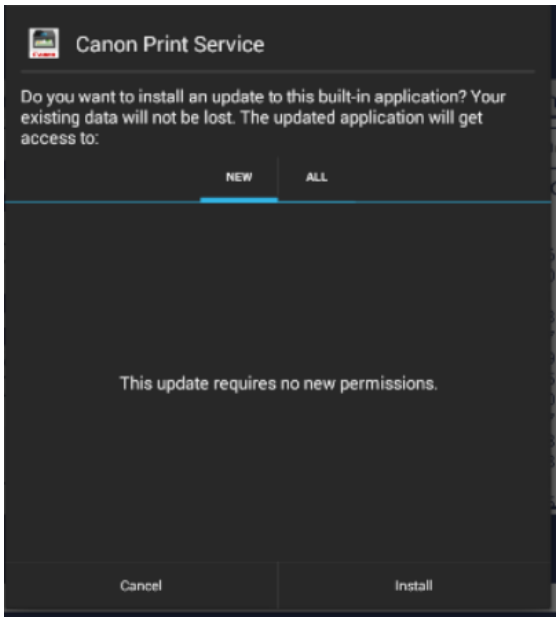


Figure 80. Updating Printer Drivers

- The Aeros will install the new printer driver and it will be then available to use.

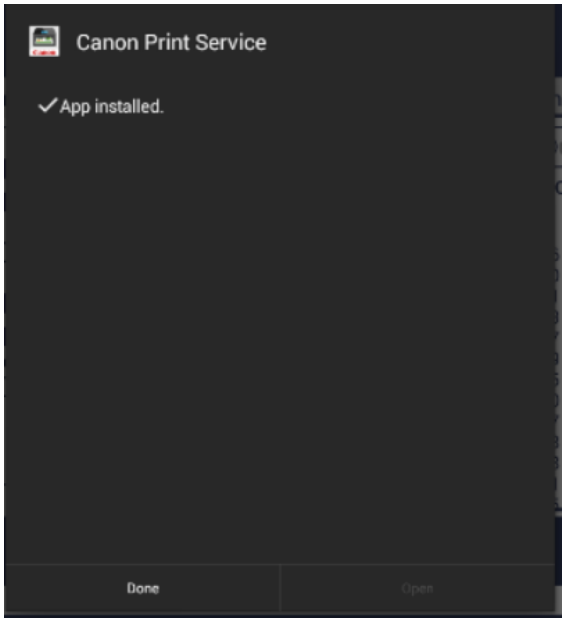


Figure 81. Printer Driver Installed

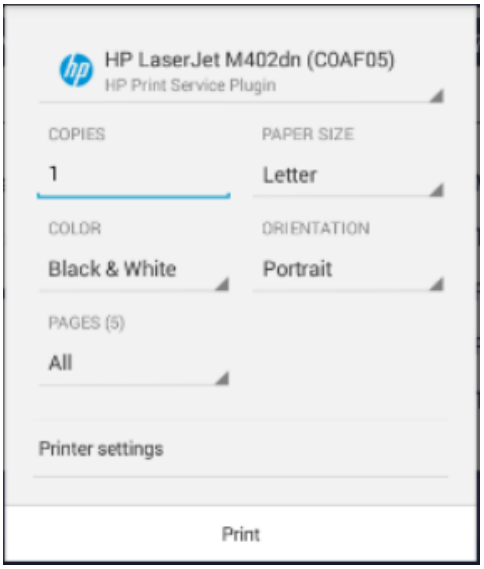


Figure 82. Printer Page

- ***Restart Comm*** can be used to reset the ethernet communications for EasyMatch QC.
- ***Support Region***

Note: Your instrument must be connected to the internet.

a. Select ***Support Region***. A dialog is displayed with three options for region selection. Select ***USA, Europe*** or ***Asia Pacific*** and the URL string is modified accordingly. Press ***OK*** to continue.

Figure 83. Select Region

b. Select ***Restart Support*** 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 84. Remote Access Screen

c. To ensure that your application 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 arrow at the bottom of the screen.

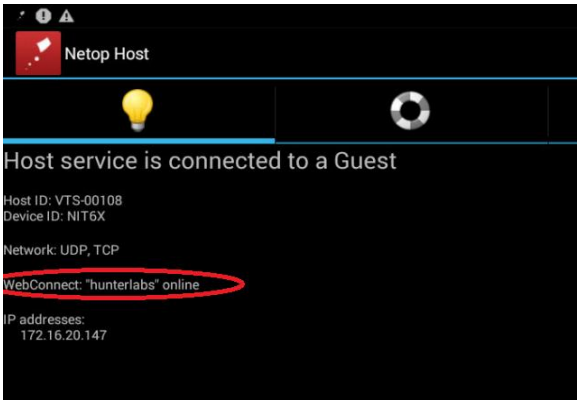


Figure 85. Webconnect to HunterLab

System Settings: Preferences

Preferences: General

This allows the user to set preferences to:

- Load the last used workspace and job
- Set standardization time interval
- Set screen brightness and date/time
- Enable novice tooltip
- Enable application security
- Use last login credentials
- Configure and enable network data export
- Configure network settings

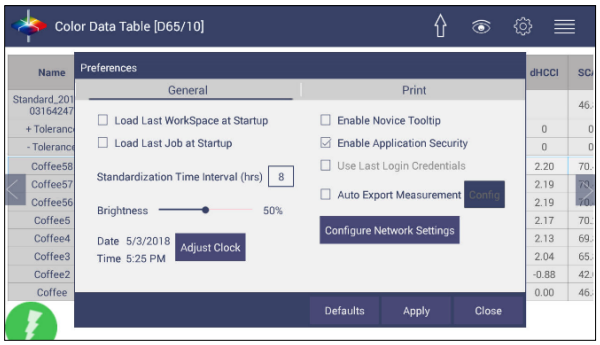


Figure 86. System Settings> Preferences> General Page

- 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 restandardize. Press ***Apply*** to set the new interval. When the time has lapsed, a prompt to restandardize will be displayed before measurements can be taken.
- Set the screen ***Brightness*** using a sliding scale and press ***Apply***.
- 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.

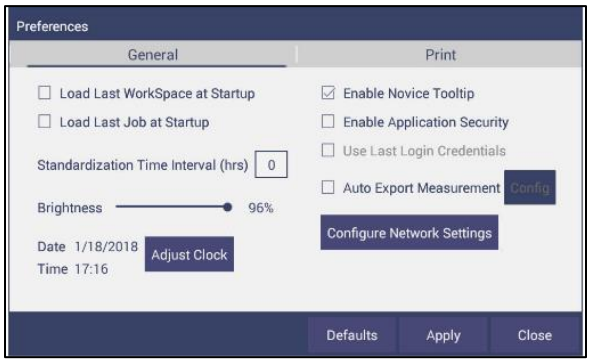


Figure 87. Enable Novice Tool Tips

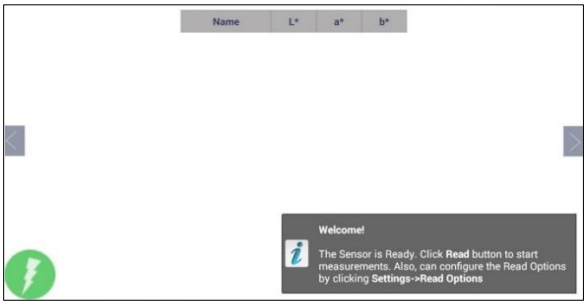


Figure 88. Example of Novice Tool Tip

- ***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.
- To ***Configure and Enable the Network Data Export*** and ***Network Settings***, please connect the Aeros to a computer as described in ***Special Functions*** (Chapter 7). In Network settings, one can use an Ethernet cable or setup a Wifi Connection.

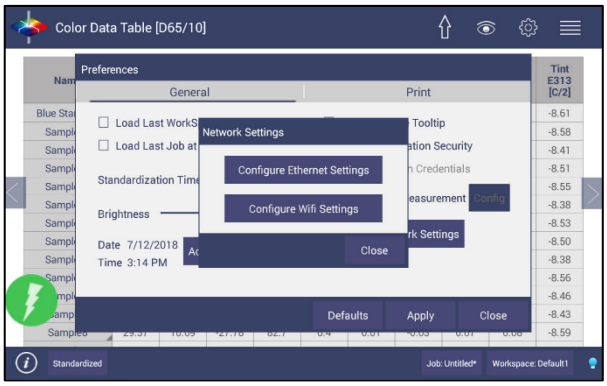


Figure 89. Network Settings

Preferences: Print

The **Print** page allows the user to configure:

- The ***Readings*** to print
- The option to ***Preview*** before print.
- ***Print report Title and Logo.*** To apply a logo, import the logo first to the HunterLab folder.
- Orientation of the report (**Portrait or Landscape**) orientation.
- To save changes, press ***Apply***.

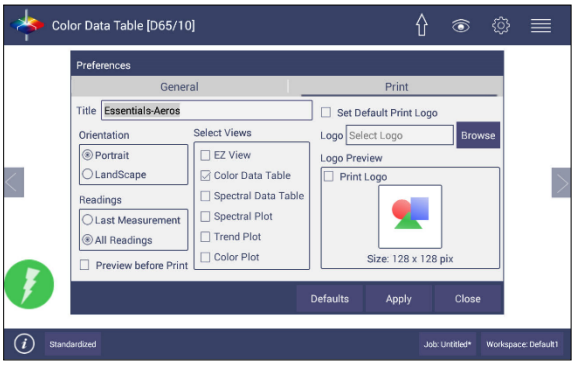


Figure 90. System Settings> Preferences> Configure Print Page

System Settings: User Manager

Security can be enabled on the Aeros 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.***

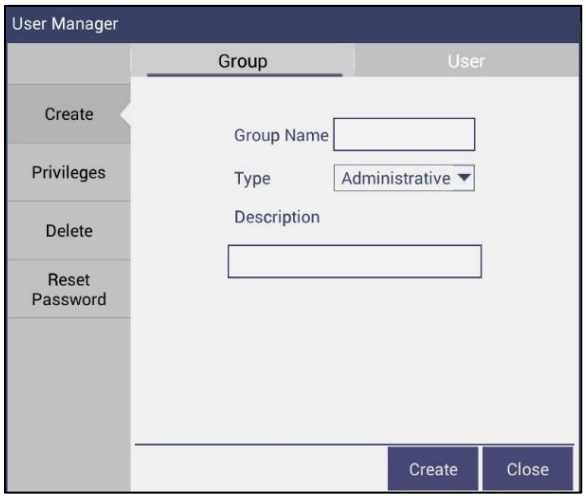


Figure 91. Create a Group

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

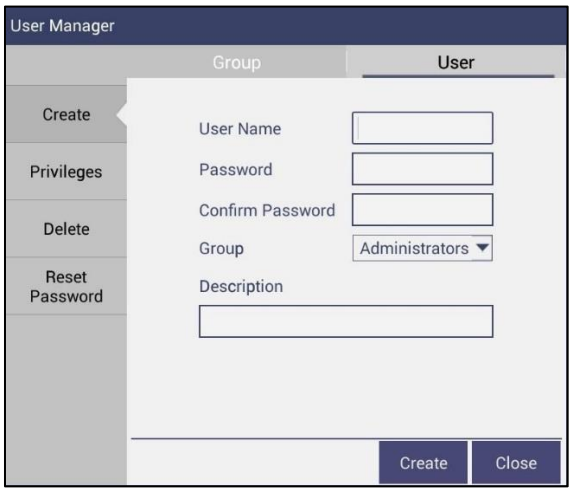


Figure 92. Setup Administrative & General Users

- 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.

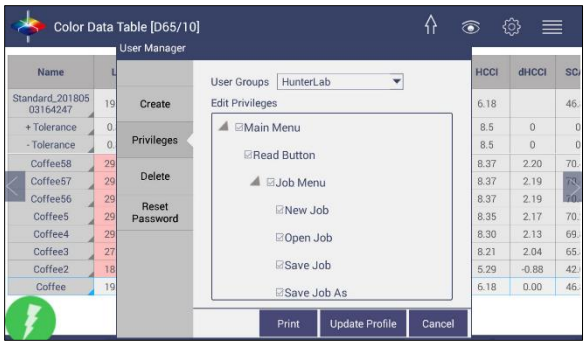


Figure 93. User Privileges

- 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.

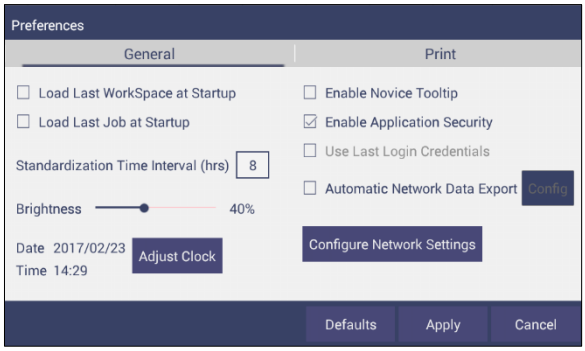


Figure 94. Enabling Security

- After enabling security, each user must enter a name and password when logging into the Aeros. For convenience, the user can check the box under ***Workspace > Preferences> General*** to use the 'last login credentials'.

Figure 95. Login Credentials

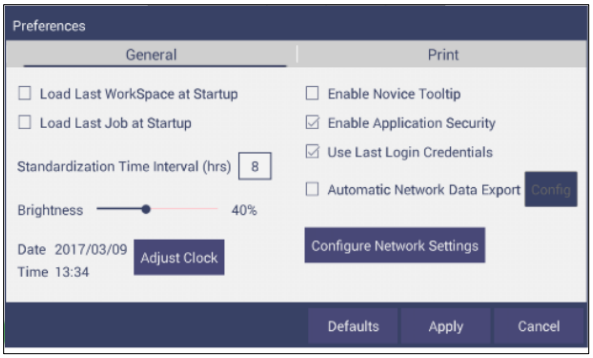


Figure 96. Enable Last Login Credentials

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

Toolbar: Options (Views)

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 97. Workspace > select Views

Once the views have been selected, then ***View Options*** are available to add additional information to the screen. Each screen has a unique set of options associated with it.

Views: EZ View

- This view provides a simple display of ***Standard*** vs***. Sample*** and ***Pass/Fail*** results.

Figure 98. EZ View Display

- ❖ **View Options** includes the selection of ***No Color Scale***, ***Pass/Fail, Precision*** and ***Font Size***.

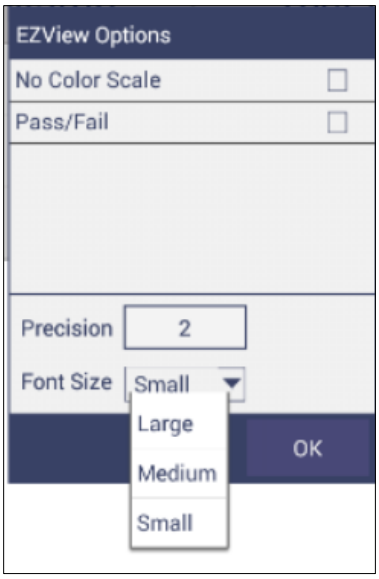


Figure 99. EZ View Options

Views: Color Data Table

- The **Color Data Table** view shows ***Color Scale***, ***Color Difference***, and ***Index*** data for the ***Standards*** and ***Samples*** in the job.

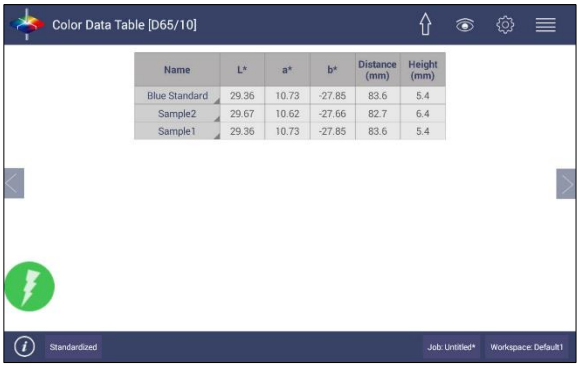


Figure 100. Color Data Display

- Options such as ***Tolerances***, ***Data Order, Interval, Date, Distance, Turntable Movement, Height, Time*** and ***Pass/Fail*** can be selected for viewing using the ***View Options***.

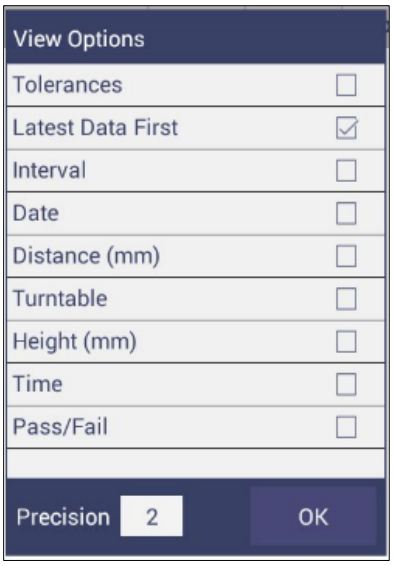


Figure 101. Color Data Screen: View Options

- A long press on the ***Sample*** can enable the user to make the sample into a Standard, change the name or delete the reading.

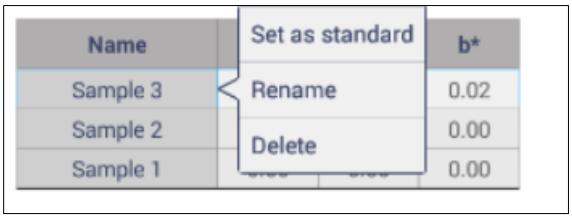


Figure 102. Changing a Sample into a Standard

❖ To delete a Sample (or Standard), select ***Delete*** and then confirm the action.

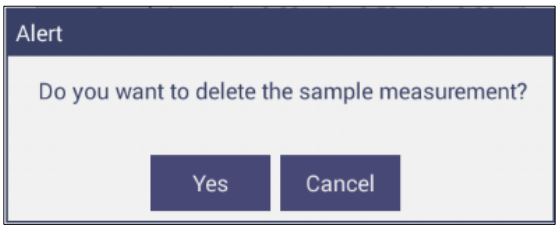


Figure 103. Delete the Sample Measurement

- 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.

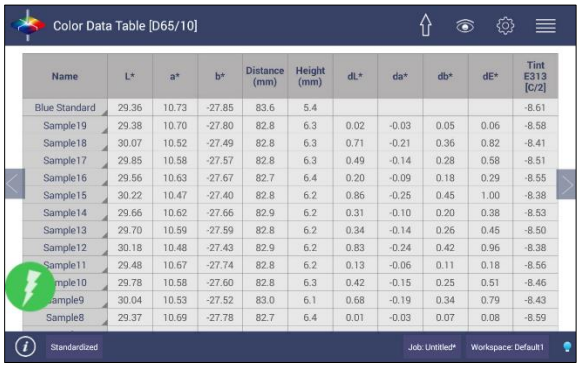


Figure 104. Spectral Data Table

- Selections include Absolute or Difference, Reflectance or K/S. Enter the start and stop wavelength, the interval and the precision and press ***OK*** to continue.

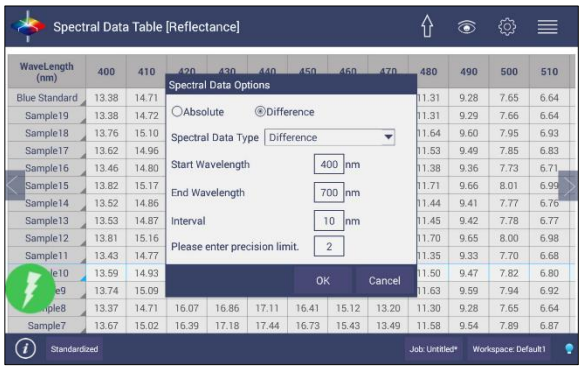


Figure 105. Spectral Data Table Options

Views: Spectral Plot

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

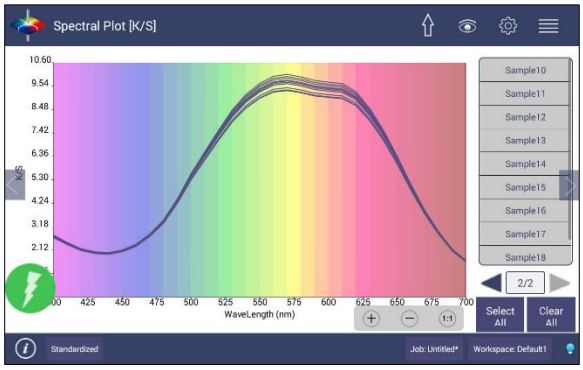


Figure 106. Spectral Plot View

- 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 Samples 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.

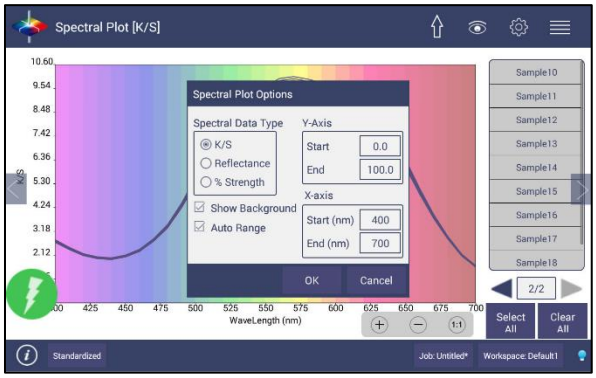


Figure 107. Spectral Plot Options

- ***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.

Figure 108. Trend Plot

  - ***View Options*** for the ***Trend Plot*** include the type of display, the statistics and the number of readings per display.

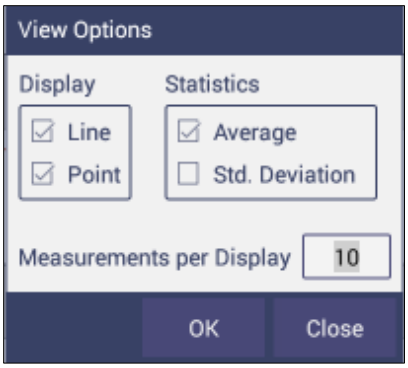


Figure 109. Trend Plot Options

- ***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.

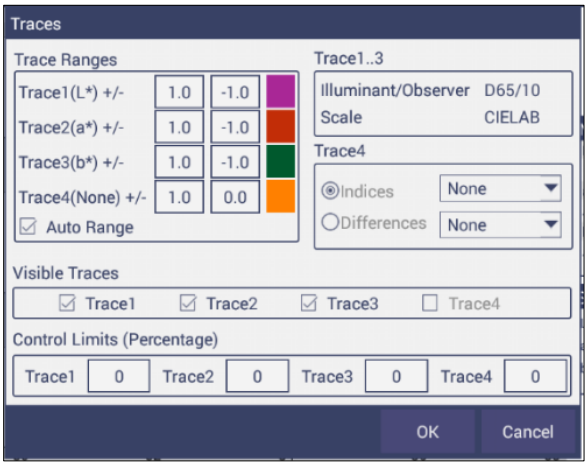


Figure 110. Trend Plot Traces

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 111. Color Plot View

Figure 112. Color Plot 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.

Special Functions

Auto-Exporting Data through a Network Connection

Connect Aeros to a Network. You can connect Aeros to a network hub using the Ethernet cable or connect Aeros to a network hotspot through a WiFi connection. The computer must be connected to the same network as the Aeros.

Option A: Connect to a network hub using an ethernet

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

Figure 113. Ethernet Cable

- To connect Aeros to network, go to ***Workspaces > Preferences*** and Select ***Config Network Settings***.

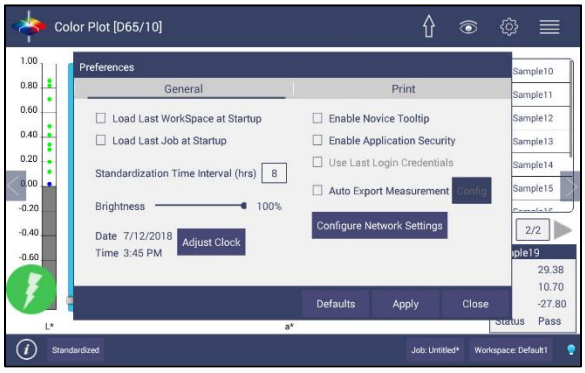


Figure 114. Preferences (General) > Network Settings

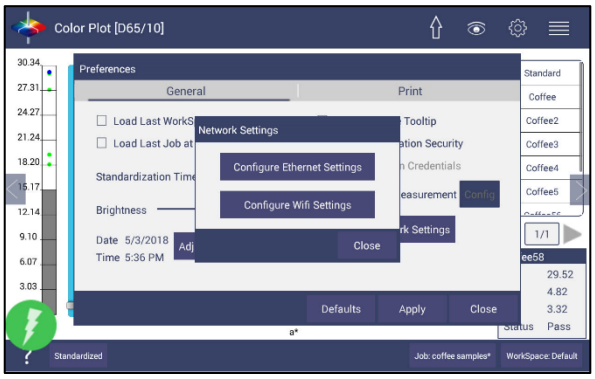


Figure 115. Configure Ethernet

- 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 Aeros in Jobs > About > Info.

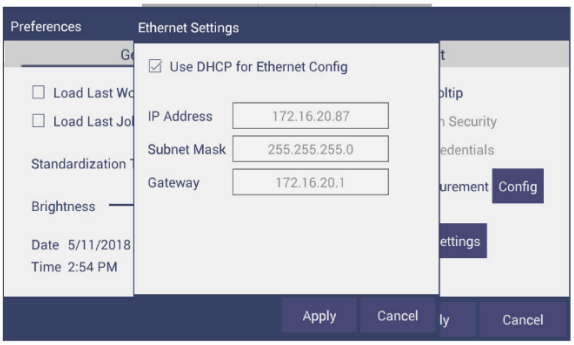


Figure 116. Select DCHP

- Go to ***Workspace > Preferences*** and select ***Auto Network Data Export*** Measurement using a check and select ***Config***. Choose Aeros as ***Server*** and ***Port number as 11111***. You can also choose a delimiter to mark your data.

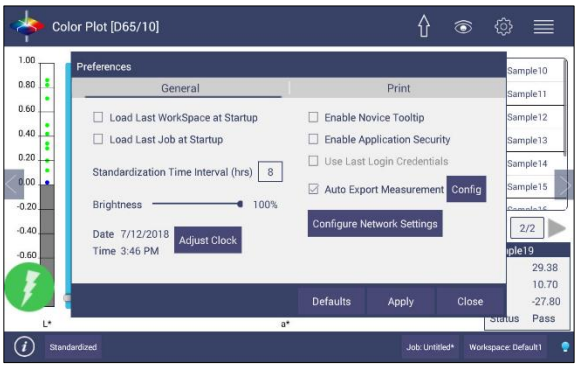


Figure 117. Auto Export Measurement

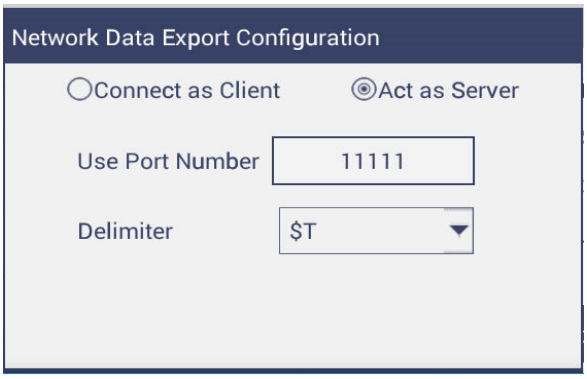


Figure 118. Network Data Export

- Configure the computer with the following settings:
  - ❖ Set computer as client.
  - ❖ Enter the IP address of Aeros as recorded above.
  - ❖ Set the port number as 11111.
- After all have been set, the data is ready to be exported from Aeros to the computer.

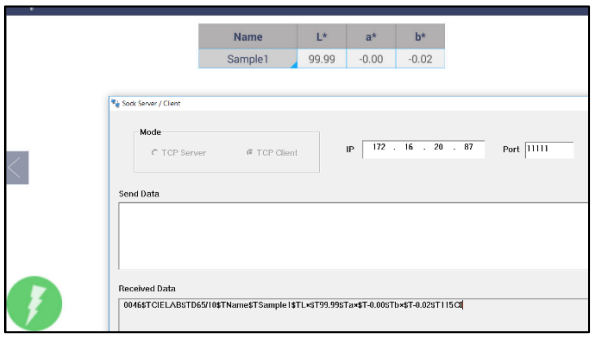


Figure 119. Data Export

Optional B: Connect to a hotspot through the WiFi connection

- To connect Aeros to network, go to ***Workspaces> Preferences*** and select ***Config Network Settings***.

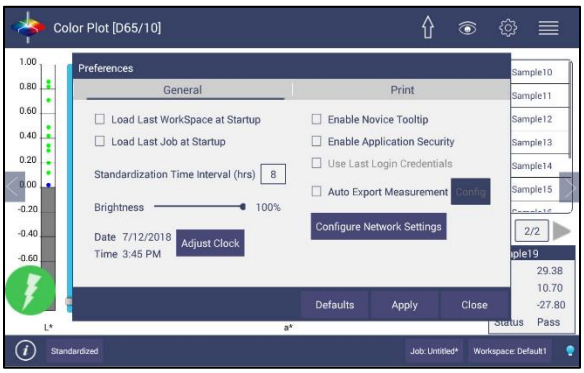


Figure 120. Configure Network Settings

- Select ***Configure WiFi Settings*** and the WiFi configuration dialog will be prompted.

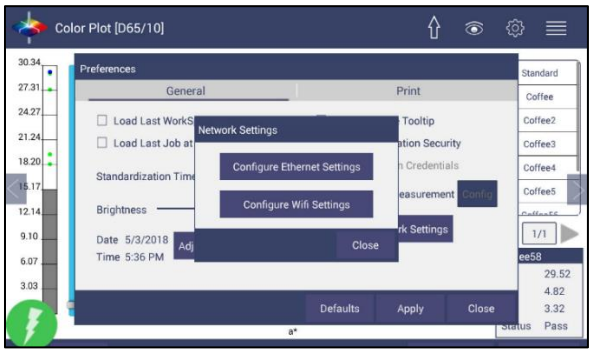


Figure 121. Configure WIFI settings

- Please search and connect to the available WiFi and write down the IP address showing in this dialog. After the WiFi configuration, please click the floating ***Back Button*** to go back to Essentials app.

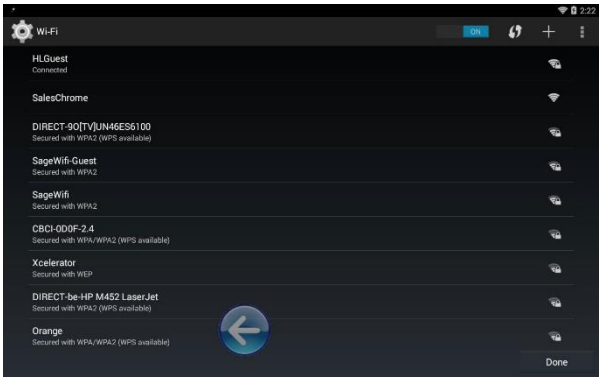


Figure 122. Find IP Address

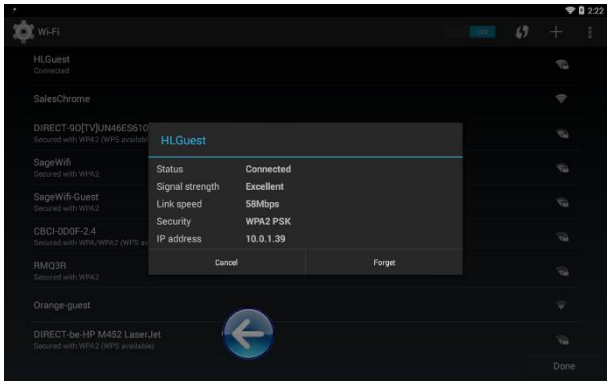


Figure 123. Find IP Address (Part2)

- Go back to ***Workspaces > Preferences > Auto Export Measurement*** and check ***'Config'***. Choose ***Act as Server*** and ***Port number as 11111***. You can also choose a delimiter to mark your data.

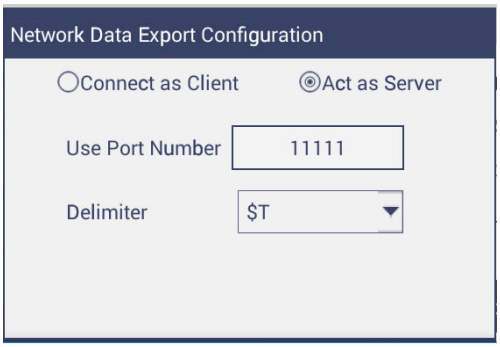


Figure 124. Network Data Export Config

- Configure the computer with the following settings:
  - ❖ Set computer as client
  - ❖ Enter the IP address of Aeros which is recorded in step 1 above
  - ❖ Put the port number as **11111**
- After all the setting, you should be ready to get the data exported from Aeros to the computer.

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

Ethernet cable is plugged into the back of the Aeros 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 125. Ethernet Cable

Figure 126. Ethernet to USB Adapter

- **Connect Aeros to Computer:**

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

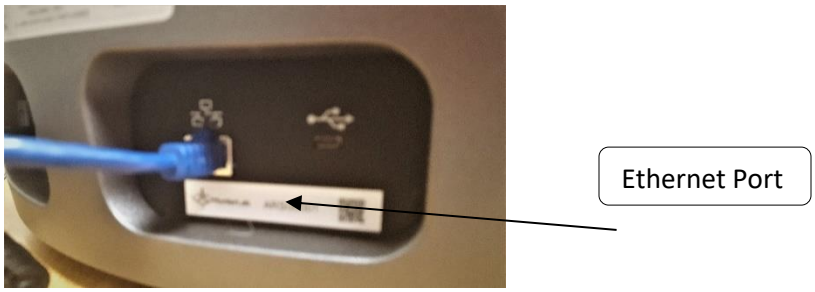


Figure 127. Rear View of Aeros

❖ Plug the other end into the Computer or into the Ethernet adapter

- **Open Command Prompt in the PC**.
  Type in ***ipconfig***, find the right ethernet (in this case, it is **Ethernet adapter Ethernet**) and write down **autoconfiguration IPv4 Address** as well as the **Subnet Mask**.

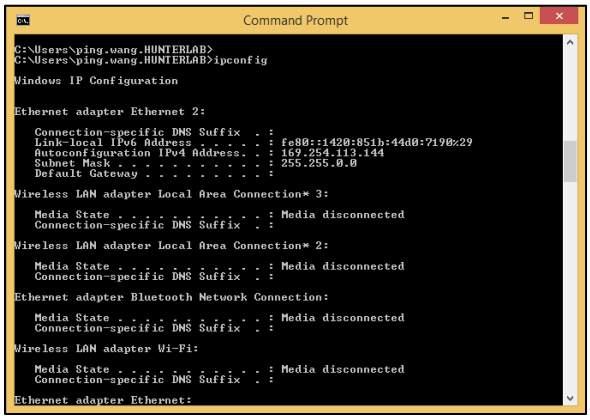


Figure 128. Command Prompt ipconfig

- **Configure the Aeros**
  Open Aeros 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.

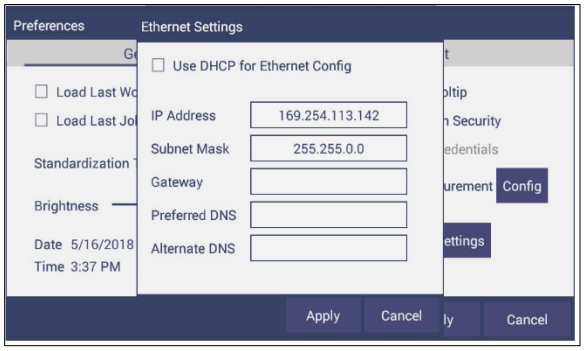


Figure 129. Configuration Parameters for Ethernet

- 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*** and select ***Auto Network Data Export***.

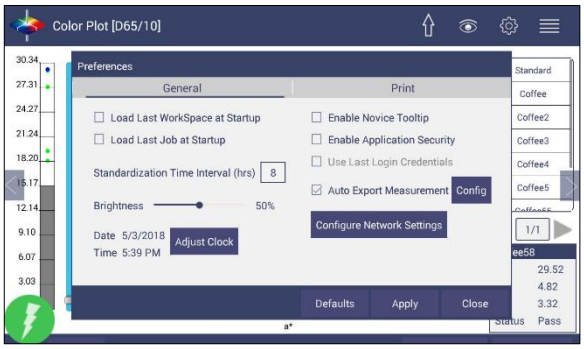


Figure 130. Read Options> Auto Export Measurements

- For a direct connection between Aeros and data collection computer, set up the Aeros as a ***Client***.
- Enter the computer IP address here, in this case ***169.254.113.144*** and ***the Port as 10001***. Press ***Apply*** on the screen to continue.

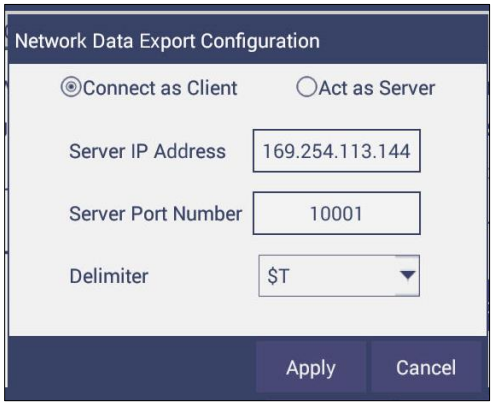


Figure 131. Read Options Export

- Aeros 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 ***10001***

- **Send Data from the Aeros:**
  - ❖ ***Configure the Color Data Table*** with the color scale and parameters to be measured.

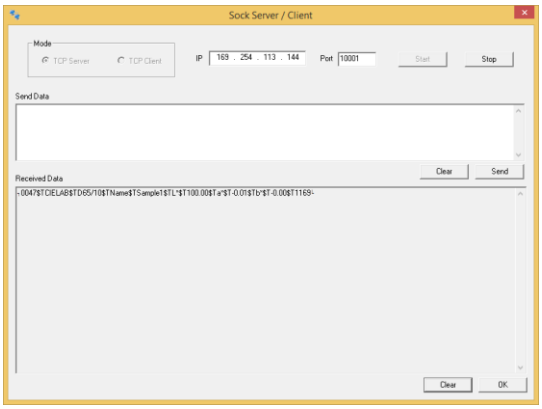


Figure 132. Data Output

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.

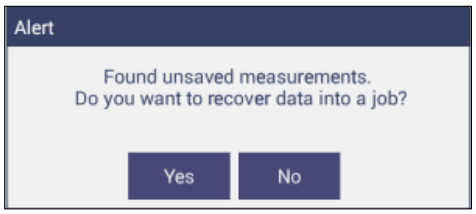


Figure 133. Recover Data

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

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 Aeros in an area where temperature or humidity extremes are possible.

Operating Conditions

Storage Temperature (3weeks)	-21°C to 66°C (-5°F to 150°F)
Operating Temperature	0°C to 50°C (32°F to 122°F)
Noncondensing Humidity	10% to 90%
Standard Accessories	Calibrated instrument White Tile, Certificate of Traceability, Black Glass Standard, Green Diagnostic Tile, Standards Box, 30.5 cm (12-in) and 15.2 cm (6 in) sample pans, Power Supply, Quick Start Guide, Aeros User's Guide on CD

Physical Characteristics

Weight	23.0 kg (50.0 lbs)
Dimensions (Height x width x depth)	56 cm x 38 cm x 51 cm (22.0 in x 15 in x 20 in)
Maximum Sample Height	65 – 140 mm (2.5 – 5.5 in)
Communications I/O: USB Front & Rear Panel Ethernet RJ45 Remote Access Support	 Connectivity to 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
System Power	100 – 240 VAC, 47 – 63 Hz to universal power supply @ 24 VDC/3.75A

Conditions of Illumination and Viewing

Light Source	Full spectrum balanced LED system array
Dual Beam Spectrophotometer	256 element diode array and high resolution, concave holographic grating
Measurement Principle	Dual-beam Non-Contact Reflectance Spectrophotometer
Measurement Method	Rotating platter @ 12 RPM
Area Measured per Rotation	177.25 cm^2 (27.5 in^2)

Instrument Performance

Spectral Data	Range: 400-700 nm Reporting Interval (nm): 10 nm
Spectral Resolution	<3 nm
Reporting Interval	10 nm
Sampling Rate	Continuous at 7 measurements per second
Photometric Range	0-150%
Measurement Duration	5 seconds (1 rotation)
Measurements per Rotation	35
Inter-instrument Agreement on BCRA II Tile Set	ΔE*L*a*b* < 0.30 (Avg) ΔE* (L*a*b*) < 0.50 (Max) on
Colorimetric Repeatability	ΔE*< 0.025 Max on White Tile

Measurement

Data Views	Color Data, Spectral Data, Spectral Plot, EZ View, Tristimulus Color Plot, Trend Plot
Illuminants	A, C, D50, D55, D65, D75, F02, F07, F11, TL84, ULT30, ULT35
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*, ΔE, ΔE CMC, ΔE 2000
Indices and Metrics	E313 Yellowness, E313 Whiteness, YI D1925, Y Brightness, Z%, 457nm Brightness, Baking Contrast Units, Tint, HCCI, SCCA
Data Storage	500,000 Records max

Regulatory Notice

HunterLab
ISO 9001 Certified

Declaration of Conformity

EU / EMC Directive:	**2014/30/EU**
Standard to which Conformity is Declared:	**IEC 61326-1: 2012 / EN: 2013**
Manufacturer:	**Hunter Associates Laboratory, Inc.** **11491 Sunset Hills Rd, Reston, VA, USA**
European Representative: Representative's Address:	**Christian Jansen** **Griesbraeustrasse 11, 82418 Murnau, Germany**
Type of Equipment:	**Reflectance Spectrophotometer**
Model No.:	**Aeros**

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

Place: *Reston, VA, USA*

Date: *December 14, 2017*

Signature: Tim Barrett

Full Name: *Tim Barrett*

Position: *Systems Engineer*

Features, Accessories & Maintenance

Aeros Maintenance & Safety

The Aeros 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 Aeros**
  The Aeros is NOT waterproof, but the exterior of the case may be wiped with a damp cloth.
- **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.

Instrument Replacement, Repair, Problems, and Questions

The following HunterLab policies are described in this chapter:

- Warranty
- Shipping claims
- Returns/service
- Technical assistance.

Warranty

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

Note: Printers and computers are covered under the original manufacturer's warranty.

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

The HunterLab warranty does not cover consumable items such as lamps, fuses, batteries, etc. An instrument registration card is available online at https://www.hunterlab.com/ras-registration.html. It is important that the instrument owner fills this out on receipt of equipment.

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

Shipping Claims

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

- **Breakage or Damage**
  Per the contract terms and conditions of the carrier, the responsibility of the shipper ends at the time and place of shipment. The carrier then assumes full responsibility. Perform the following procedures in the case that your instrument arrives broken or damaged.
  - ***Freight or Express***
    - ❖ Notify your local carrier.
    - ❖ Hold the damaged goods with their container and packaging for inspection by the examining agent. Do not return any goods to HunterLab prior to inspection by and authorization of the carrier.

- ❖ File a claim against the carrier. Substantiate this claim with the examining agent's report. A certified copy of our invoice is available upon request. The original B/L is attached to our original invoice. If the shipment is prepaid, write for a receipted transportation bill.
- ❖ Advise HunterLab regarding replacement.

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

- ***United Parcel Service***
  - ❖ Contact your local UPS office regarding damage and insurance claims. Each UPS office has a different method of handling these occurrences and yours will advise you of its procedures.
  - ❖ Retain the container and packaging.
  - ❖ Notify HunterLab at once for replacement.

Shortage

- Perform the following procedure if your order appears to be missing items.
  - Check the packing list notations. The apparent shortage may be a backordered item and may be marked as an intentional short-ship.
  - Re-inspect the container and packing material, particularly to locate smaller items.
  - Ascertain that the item was not removed by unauthorized personnel prior to complete unpacking and checking.
  - Notify HunterLab immediately of the shortage in writing.

Incorrect Shipment

- Perform the following procedure if material received does not correspond with your order.
  - Notify HunterLab immediately, referencing your order number and item.
  - Hold incorrect items until return shipping instructions are received.

Returns for Repair

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

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

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

If repair is required, the instrument may be returned to a HunterLab service facility. For schedule and terms for repairs, call HunterLab Service. Please read the next section, "When You Need Assistance," prior to contacting HunterLab.

Customers are responsible for incoming and outgoing freight charges for instrument returned to HunterLab for all repairs, including warranty repairs.

- **Packing and Shipping Instruments for Repair**
  Please regard the following instructions when packing your instrument to return it to HunterLab for repair. **Please save the original packing to use if needed.** These instructions do not replace the recommended professional packaging for your instrument, but may assist in eliminating the need for a shipment claim due to faulty packaging. Purchasing freight insurance does not guarantee a successful damaged shipment claim if the carrier determines the instrument was not packaged properly.
    - All instrument tiles, black glass, power supply, power cords, and cables for the instrument should be included in your shipment. **Your repair estimate will be delayed if the instrument tiles are shipped separately later.**
    - Cover the measurement port. **Do not use duct tape.** "Painter's tape" is preferred, as it will not leave residue on the instrument.
    - Place the instrument inside original box. Styrofoam peanuts should not be used as packing material for instruments, as they can suspend items weighing only up to 5 pounds. Observe the information listed on the bottom of most cartons about burst strength and gross weight limits. Single wall cardboard cartons should not be used. (A proper packing carton with packing material may be purchased from HunterLab, if desired.)
    - Insure the shipment.
    - Provide an itemized packing list of all contents of the shipment.
    - Label the carton(s) as follows:

      HunterLab
      Attn: SRO #_____
      11491 Sunset Hills Road
      Reston, VA 20190
      U.S.A.

When You Need Assistance

When you have a problem with an instrument or software, or need technical advice concerning a specific application, you may want to consult the **support.hunterlab.com** webpage. If you need to contact HunterLab for assistance, please have the following information available:

- The type of sensor for which you need assistance (Aeros).
- The serial number of the instrument (found on the back of the unit).
- The type of processor or software you are using to access the sensor output (such as EasyMatch QC), the version of the software, the operating system, and the brand and type of computer, if applicable.
- The specific nature of the problem, including the exact error message received or the number of units the sensor reads "off" from the standard tiles.
- The steps performed prior to the start of the problem.
- Steps already performed to reconcile the problem and/or results of any diagnostic tests.
- The type of product being measured.
- Environmental conditions under which the instrument is normally used (temperature, humidity, dust, fumes, etc.)
- Whether the instrument has recently been moved or the computer reconfigured.
- The name(s) of any HunterLab personnel with whom you have previously discussed the problem. The HunterLab address within the United States is available on the previous page. Customers outside the United States should contact their HunterLab distributor for initial assistance.

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