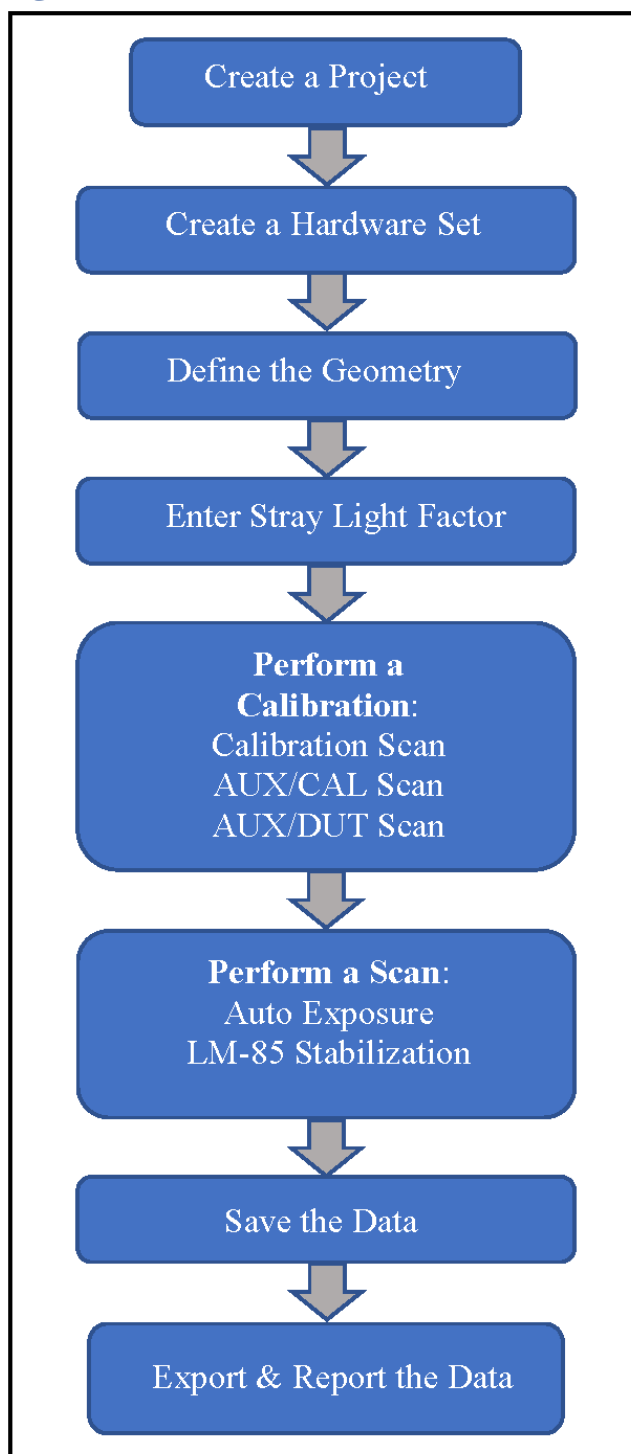Labsphere

Integral Application Guide for LM-85 (illumia®Pro3)

This guide covers the fundamentals of the Labsphere Integral software and guides the user through a standard measurement sequence. For complete information, refer to the Labsphere illumia hardware manual and the Integral software manual AQ-81000-100 included in the Labsphere USB flash drive.

1. MEASUREMENT FLOW CHART

Create a Project

↓

Create a Hardware Set

↓

Define the Geometry

↓

Enter Stray Light Factor

↓

Perform a Calibration:
Calibration Scan
AUX/CAL Scan
AUX/DUT Scan

↓

Perform a Scan:
Auto Exposure
LM-85 Stabilization

↓

Save the Data

↓

Export & Report the Data

2. INITIAL SETUP

The most recent project will be shown in the user interface when Integral opens. The user may modify this, or create a new Project as described below. The basic steps of performing a measurement are shown in the flow chart below.

1. **Create a Project:** Each Project defines a specific hardware configuration. Within that project, there can be multiple calibrations and measurements. Click on the new tab icon to create a new project. Enter the Project name and click "Create".
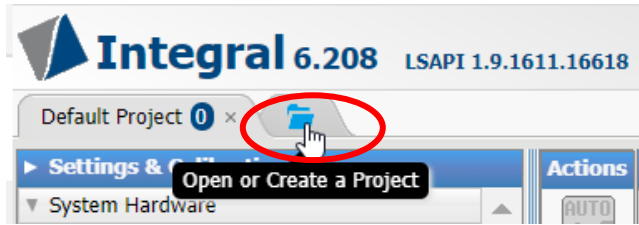

2. **Create a Hardware Set:** Click the "Choose" button which will open the Select Hardware Set window. Click "Refresh" to connect to any new hardware. Click "Create", and then assign the devices to the sphere components.
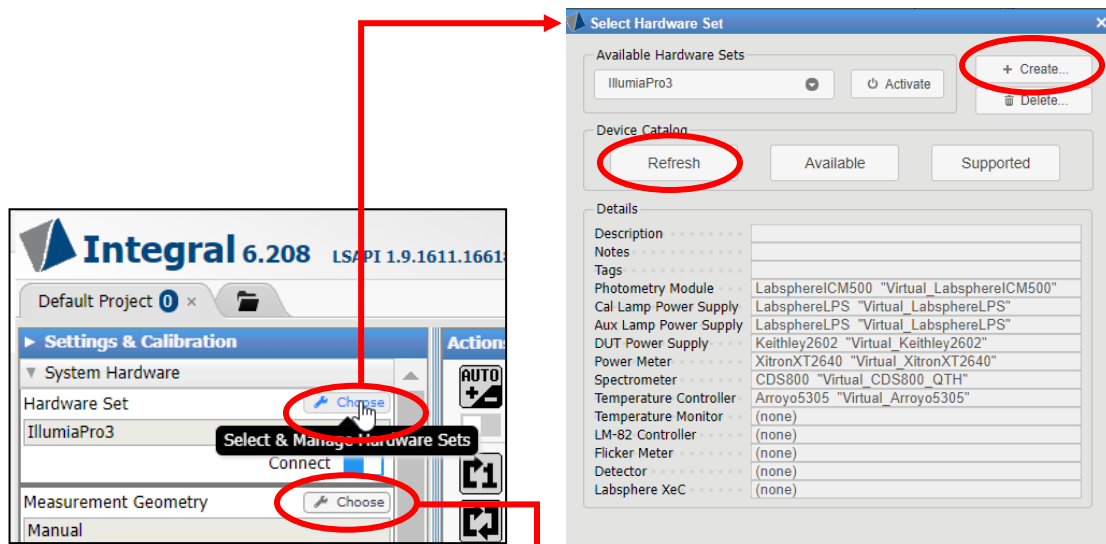

3. **Define the Measurement Geometry:** Click the "Choose" button and then pick one of the seven measurement geometries for the measurement at hand. Use the horizontal scrolling bar to view all options.

Horizontal Scrolling Bar
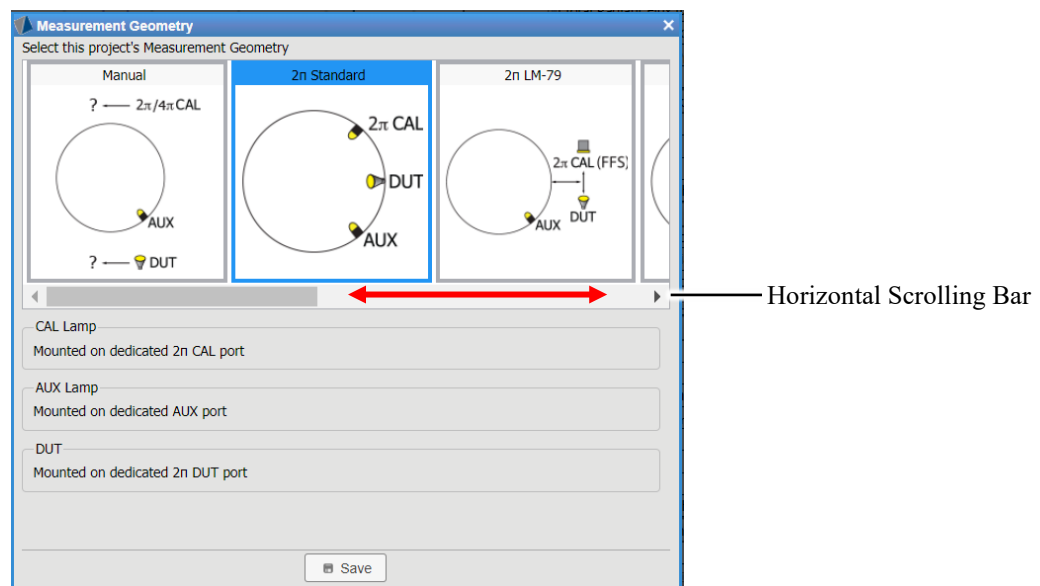
4. **Enter the Stray Light Factor:** Go to: Main Menu>Settings>Hardware>Manage Stray Light Factors and click "+ New". Choose the spectrometer in the system from the dropdown menu. Locate the spectrometer's calibration certificate. Enter the stray light factor stated in it (typed in red) into the "Factor" window, then click "Update". Re-calibrate the spectrometer at the prompt if necessary.
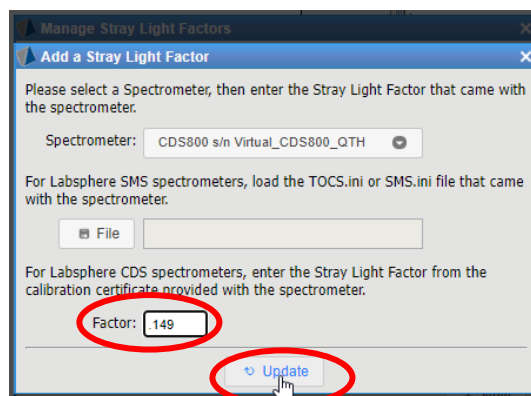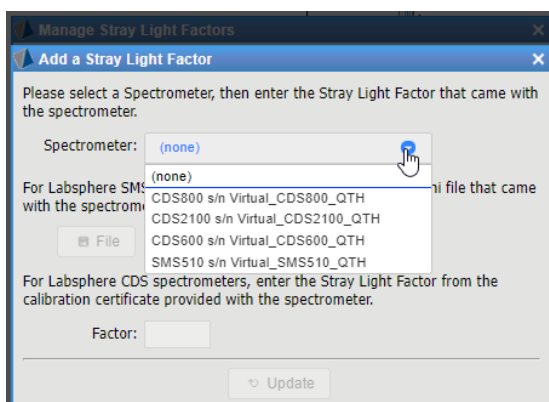

5. **Perform a Calibration:** Expand the System Calibration column on the left side of the screen and click "Choose" to perform a calibration. Then click "Create Calibration" in the Manage Calibrations window.
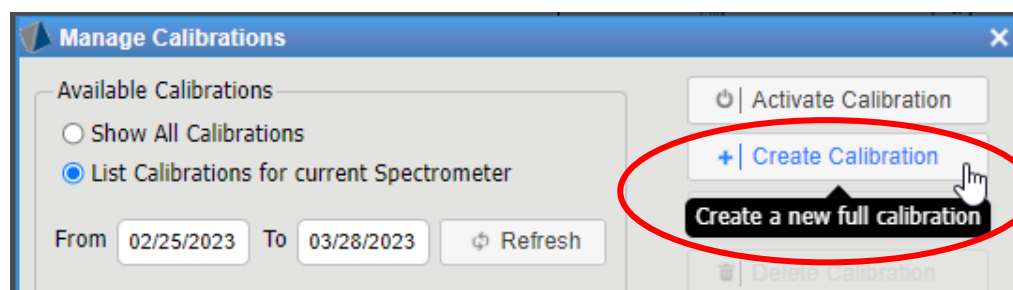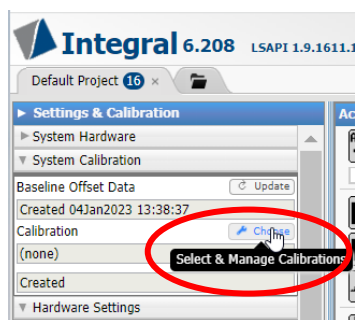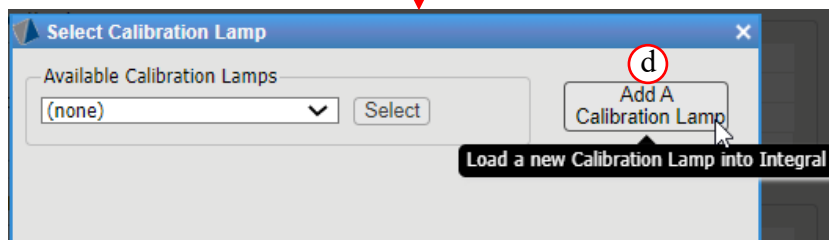

Insert the Labsphere flash drive from the calibration lamp case into a USB port in the host computer and copy the calibration file to the desired location.
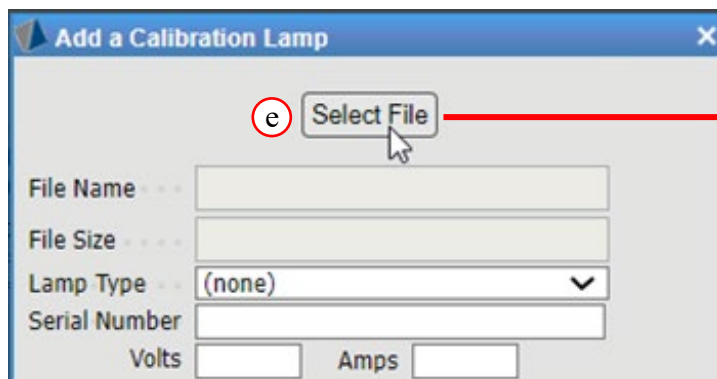
a. Enter the Calibration Name.
b. Click "Choose" to create a Hardware Set.
c. Click "Choose" to add a Calibration Lamp.
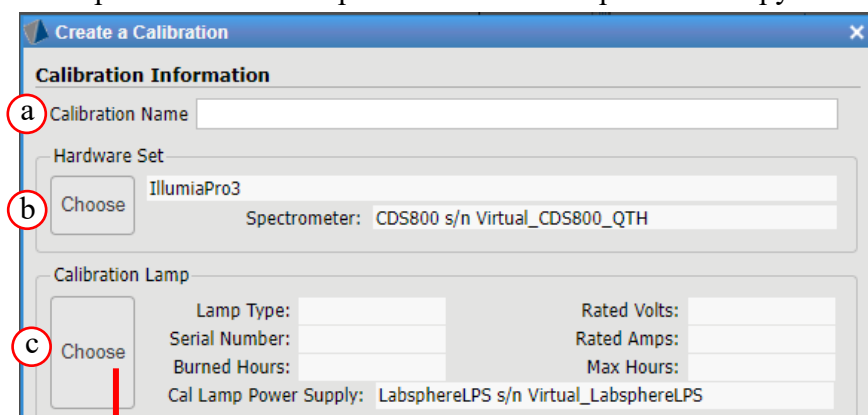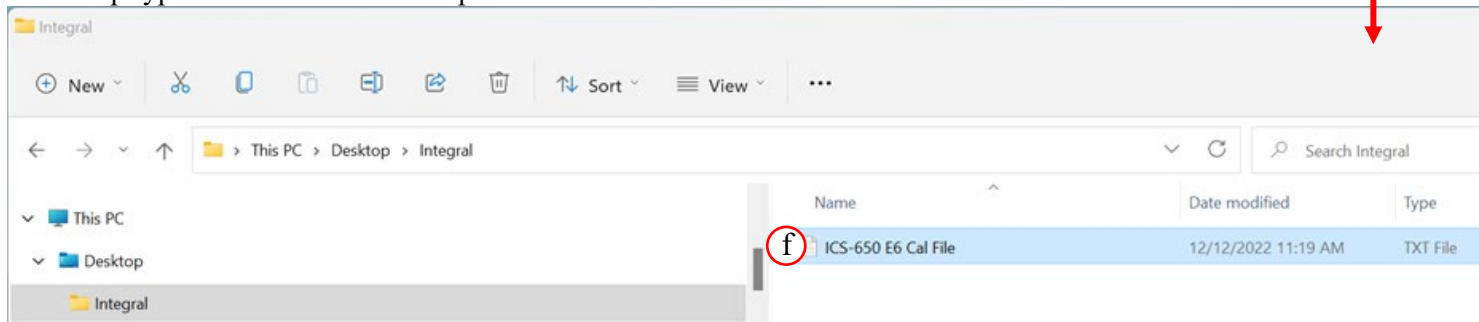

d. Click "Add A Calibration Lamp" in the next screen.
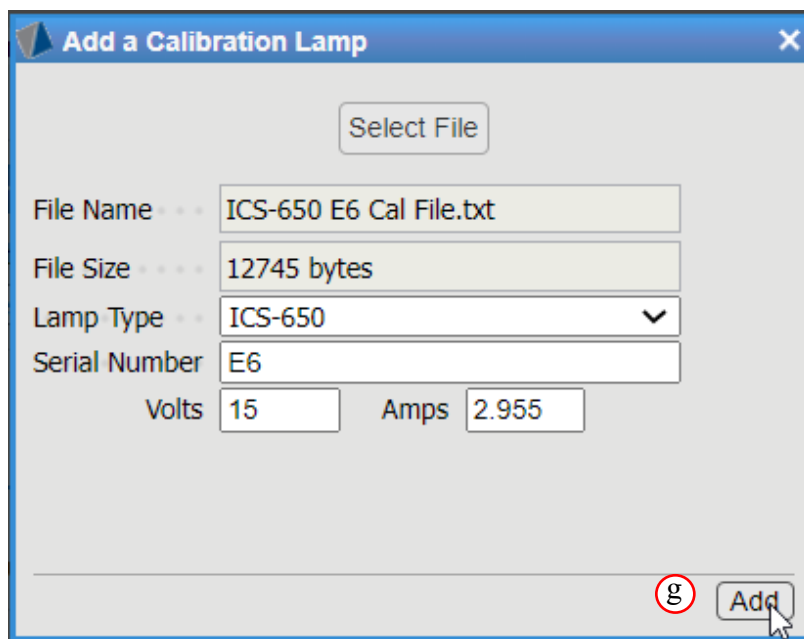
e.   Click "Select File" in the next screen.

f.   Navigate to the calibration file on the host computer or flash drive. The correct file has the form: "LampType SN CalFile.txt." Example: `ICS-650 E6 CalFile.txt.`"

g.   Click "Add' when the chosen calibration file has loaded in the next screen.
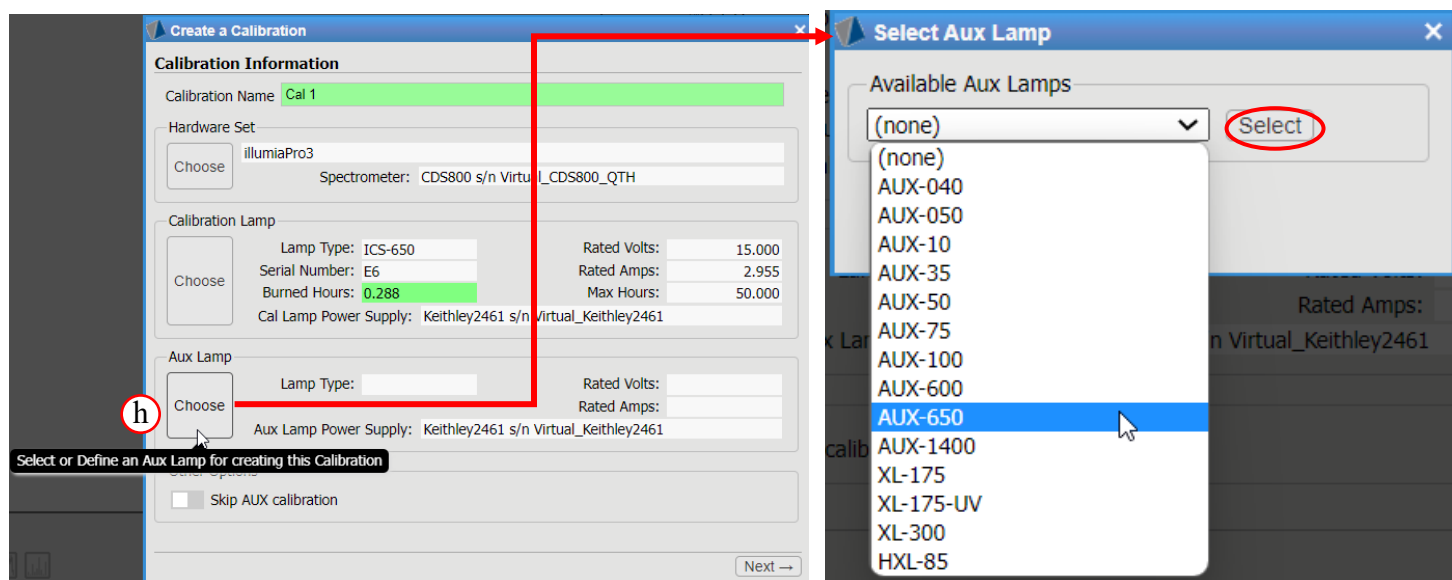
h. Click "Choose" to open the Select Aux Lamp window. Open the dropdown menu, select the aux lamp that came with the system, then click "Select".


i. With the aux lamp information entered in the Calibration Information screen, click "Next" to bring up the Calibration Options screen.
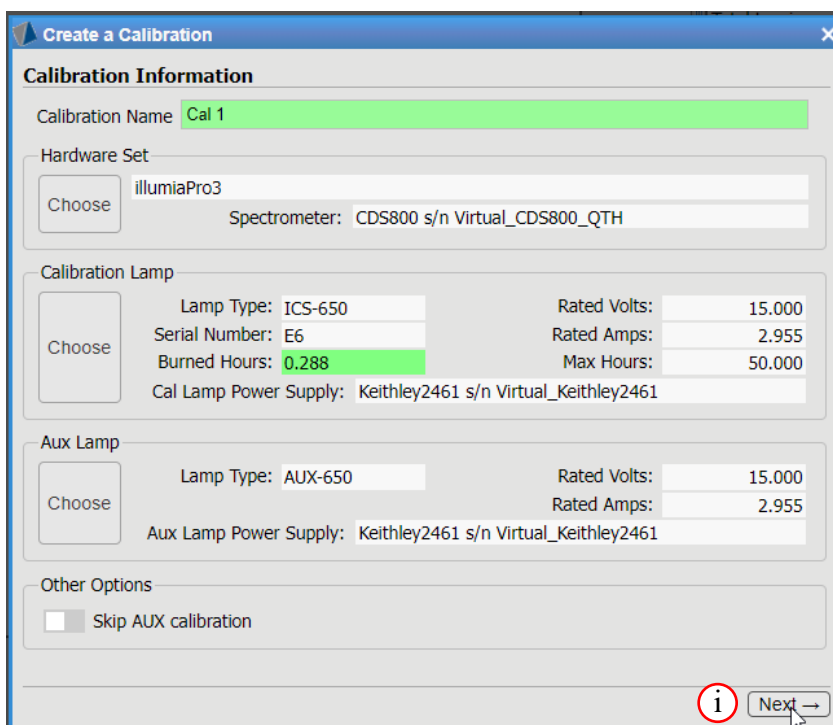
j. Make adjustments in the Calibration Options window as necessary and click "Next" to open the Prepare Calibration Lamp window. Click "Next" in that window to start the calibration and aux lamp scan routines.
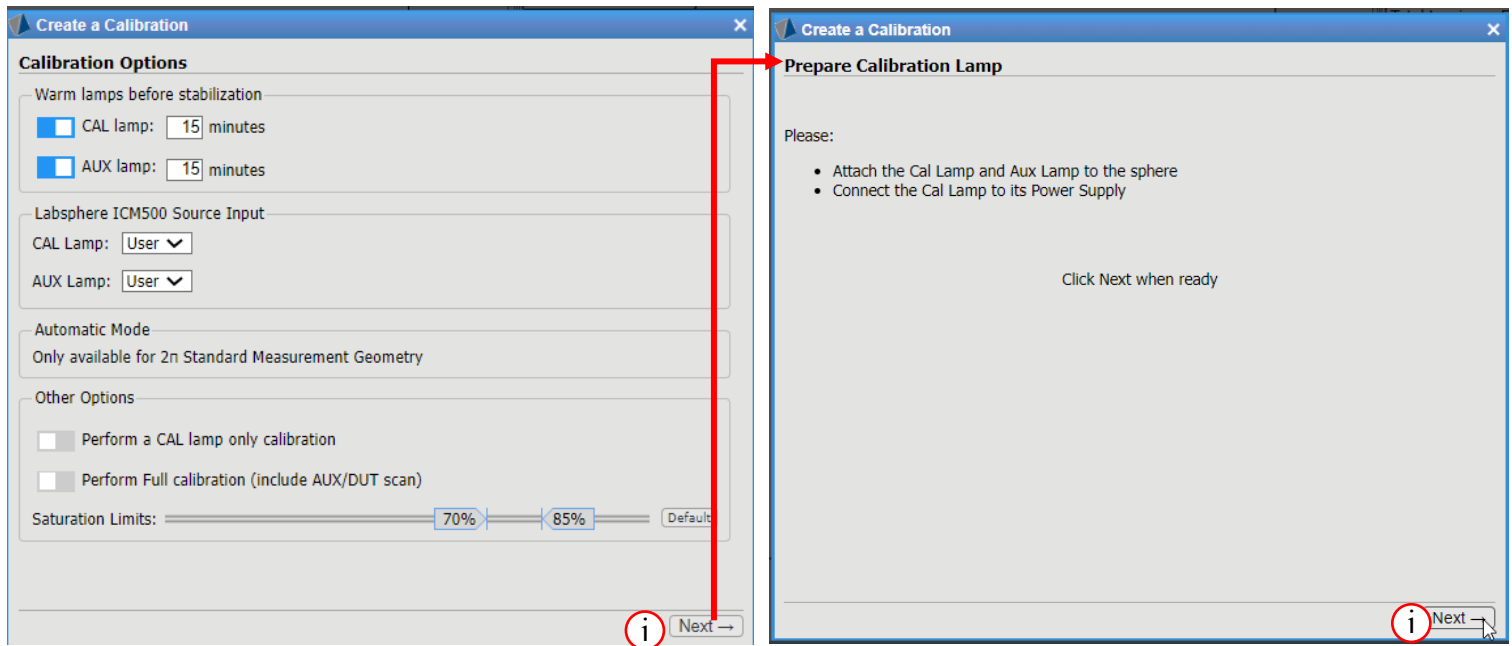
k. Click the green "Activate Calibration" button after the calibration and aux lamp scan routines have completed.
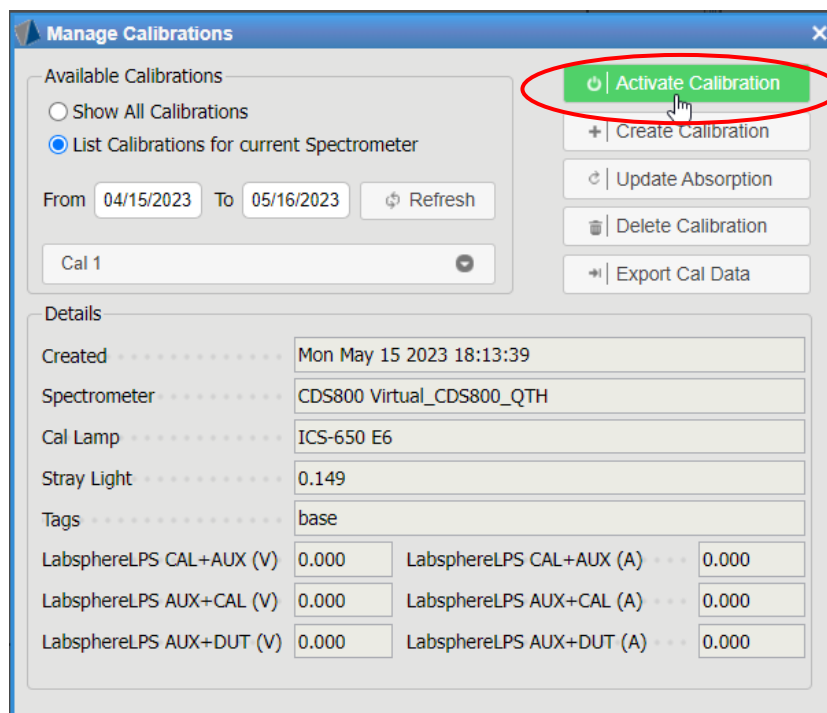
3. ANSI/IES LM-85 REFERENCE

Refer to the latest release of the IES LM-85-20 procedures specification.

| LM-85-20 Measurement Mode, Standard Section	Integral Software Feature	Integral Manual Section
Single-Pulse Mode, Section 5.2	Soak Trigger Measure	Trigger Functions
Continuous Pulse Mode, Section 5.3	Pulse Trigger Measure	Trigger Functions
DC-Mode, Section 6	LM-85 Routine	LM-85 DUT Stabilization

4. PERFORM A SCAN:

1. Install the device under test (DUT) in the 2π or 4π fixture based on test geometry. Refer to the illumia hardware manual for details.

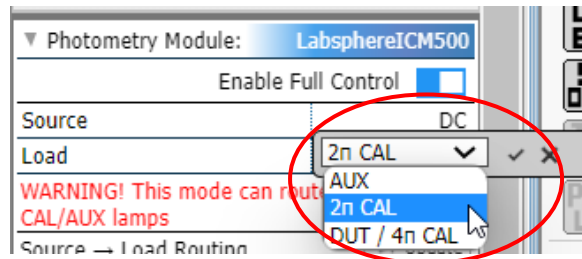2. Click the Hardware Set "Connect" toggle switch to the ON position.
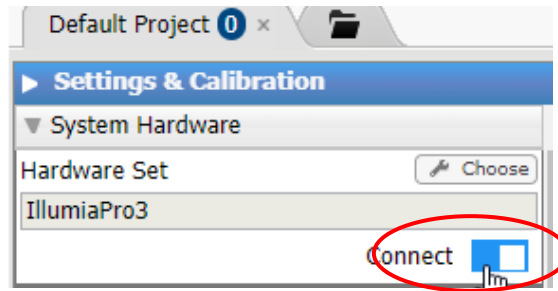
3. Click the Photometry Module "Enable Full Control" toggle switch to the ON position.
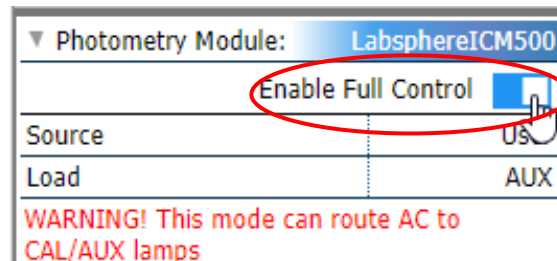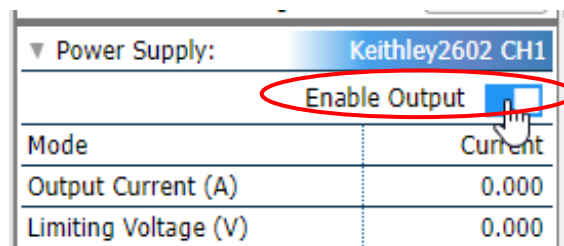

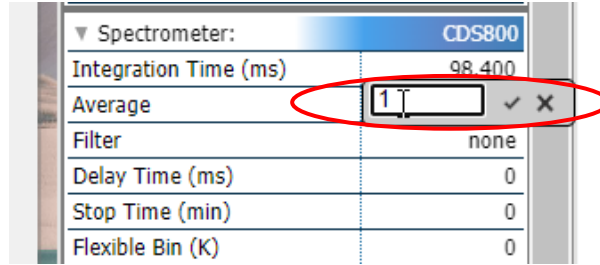4. Select the Photometry Module Source and click the ✓.
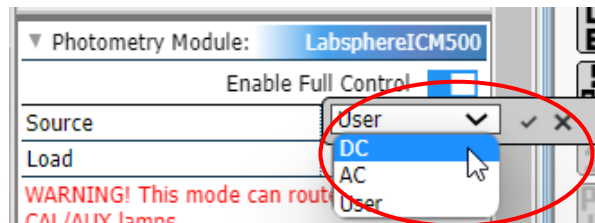
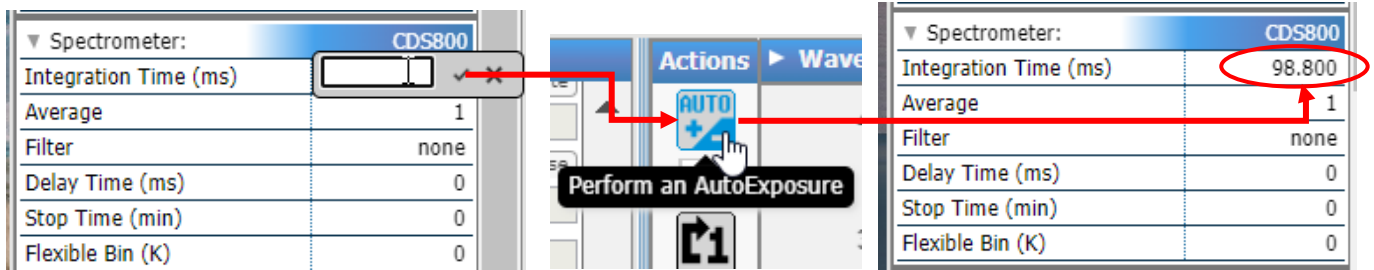5. Set the Photometry Module Load and click the ✓.

6. Click the Power Supply "Enable Output" toggle switch to the ON position.
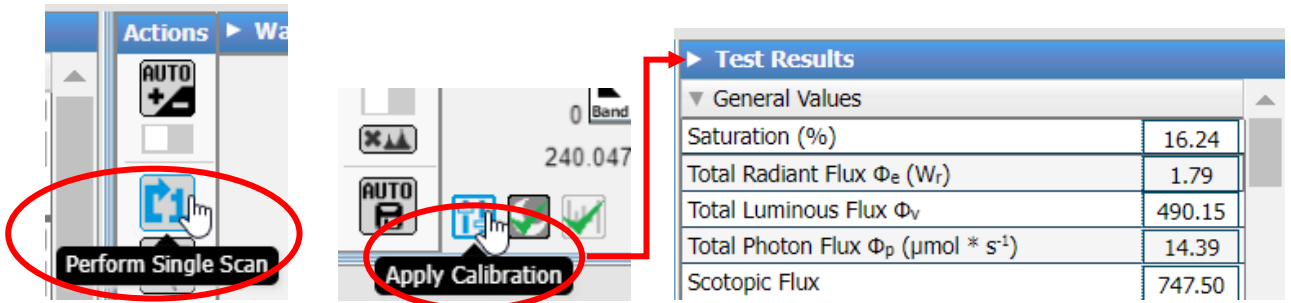
7. Set the Spectrometer "Average" to 1.

8. Click the Spectrometer "Integration Time" field, then click the autoexposure action icon to determine the optimal integration time.

9. Set the number of averages for the measurements (the appropriate number can be estimated by the smoothness of the curve for an increasing number of averages).
10. Click the Single Scan icon to take a single scan. The spectral flux of the device will show in the plot window. Click the Apply Calibration icon at the bottom of the screen to display the calculated parameters in the Test Results table.


▶ Test Results	
▼ General Values	
Saturation (%)	16.24
Total Radiant Flux Φ_e (W$_r$)	1.79
Total Luminous Flux Φ_v	490.15
Total Photon Flux Φ_p (μmol * s^{-1})	14.39
Scotopic Flux	747.50

11. Click the LM-79 stabilization icon and choose the source for the electrical stabilization measurements. A table will appear that indicates the measurements of Flux, Current, and Voltage over time. Click "Start" to open the next window and begin the LM-79 Stabilization process.
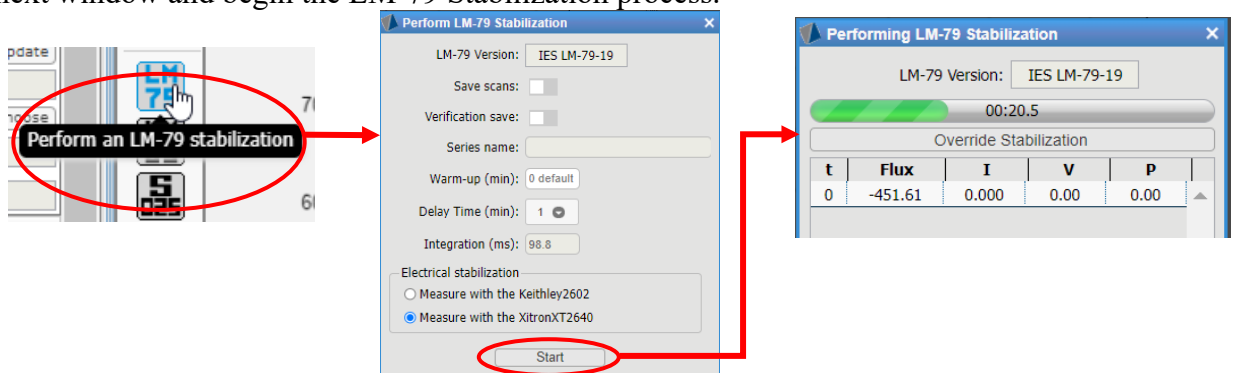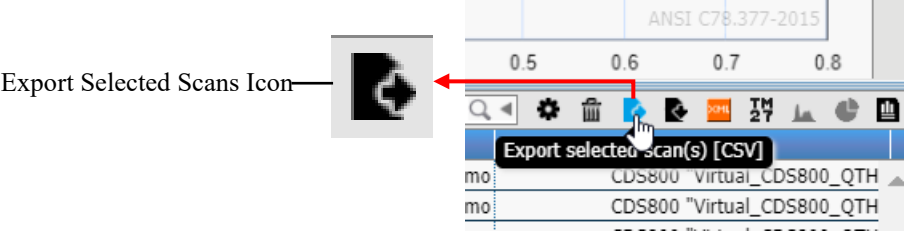
5. EXPORT AND PLOT THE DATA

1. Select the desired files from the table of scans by clicking the scan row checkbox. Use shift-click or ctrl-click to select multiple files or click the select all box at the top of the table.
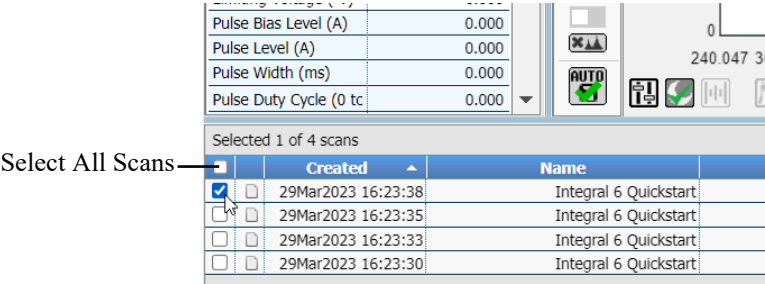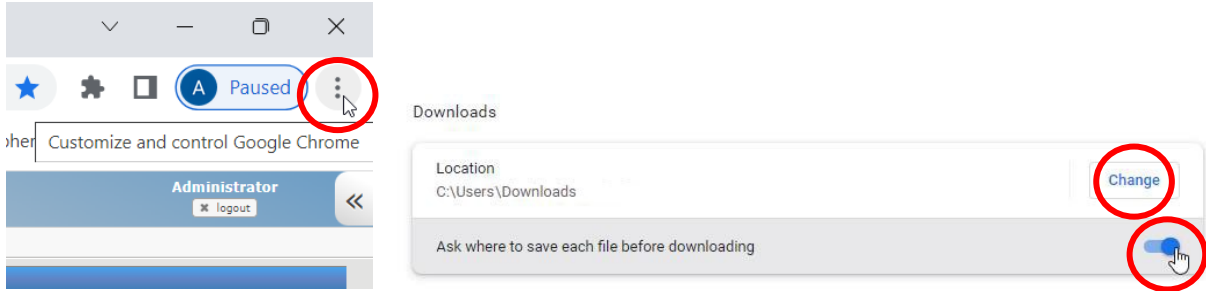

2. Click the Export selected scans icon. Data will be saved in CSV format.

NOTE: The Chrome browser will automatically save files to the Downloads directory. To change this:
   a. Click on the Chrome customize icon on the right end of the address bar.
   b. Select Settings
   c. Select Downloads on the left of the screen.

   d. Set the download location, or check "Ask where to save each file before downloading".

3. Plot the data by clicking anywhere in the row to be plotted to highlight it. Use shift-click or ctrl-click to select multiple files.

4. Multiple scan plots are color-coded to correspond to the data in the Test Results window.