DataLight III **METER** Software Manual for Windows
for ILT5000, ILT6000, ILT2400 and ILT1000 Meters
Rev 1, 1/2017

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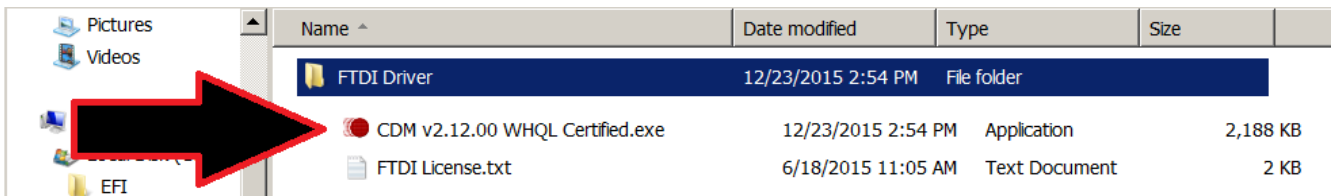## 1. Quick Start, Short Form Instructions

1.1 Initial Set up The software and drivers must be installed prior to use. Software can be downloaded from the ILT website: https://www.intl-lighttech.com/support/software

1.1A Install Datalight III: After installation a folder icon will appear on the desktop labeled Datalight III.

1.1B Install the FTDI drivers: In the majority of computers tested, the FTDI drivers were not found preinstalled. ILT includes a copy of the drivers with the software installation. Device drivers are located in C, Program Files (x86), International Light Technologies, Datalight III, FTDI Driver. Double click on the CDM executable file.

Name ▲	Date modified	Type	Size	
FTDI Driver	12/23/2015 2:54 PM	File folder		
CDM v2.12.00 WHQL Certified.exe	12/23/2015 2:54 PM	Application	2,188 KB	
FTDI License.txt	6/18/2015 11:05 AM	Text Document	2 KB	

(Note: in some cases the software and driver installation may prompt for approval stating the process requires elevation. You will need to accept the elevation and retry installation)

1.1C Assign a COM port for each device/meter. Must be done, one at a time, during initial installation. Power on your ILT device, then plug in one ILT device into a USB port on the computer or hub, wait while the computer assigns a com port. The ILT2400 can take the longest (approx 1 minute). Proceed to the next device.
(note: Each ILT device has to be assigned a com port. It is possible for windows computers that have been used with many USB devices to run out of COM ports to assign. ILT has used Ghostbuster to free up com ports successfully, consult your IT dept before proceeding.)

1.2 Running Meter:
Open the Datalight III folder on the desk top and double click on the Meter icon. A pop up will appear that says ***scanning for devices...*** Meter will then display the data for the first device found. If no devices are found an error message will appear. Read the message then click OK. The Display window will display Re-Scan-devices.

Assure the ILT device is powered on. Verify no other versions of software are running the connected device. Check the computer com ports list to assure the device is registered properly. Then click the Settings button, scroll down near the end of the settings options and click Re-scan devices to try again.

1.3 Running Meter for multiple Devices: Multiple devices can be connected directly to the USB ports, or through a hub. Each device can run its own instance of Meter, or All devices can be connected to a single Meter App.
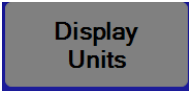
1.3A Configuring for multiple units. Once all units have COM ports assigned they can all be plugged in simultaneously or singularly, as preferred. To verify how many devices are connect, scroll through the device list found in the select active device window.

1.3A1 Running Multiple Apps(one Meter App per device). Setting for discovery type must be set to **"USB First"** or "**Wi-Fi First**" See Setting 3O for advice. Connect all devices. Click on the meter app in the Datalight folder once for each connected device. Each device will connect to a separate copy of the meter app. Click re-scan devices in settings as needed.

1.3A2 Running Multiple Devices on a Single Instance of the Meter App: Setting for discovery type must be set to "**USB All**" or "**Wi-Fi All**". See Setting 3O for advice. "**USB All**" or "**Wi-Fi All**". Connect all devices. Click on the meter app in the Datalight folder once to connect all devices. Verify all devices are noted in the drop down list using "Select Active Device". Click re-scan devices in settings as needed. Note only one device reading can be seen in the numerical display at a time. You can toggle between devices using "Select Active Device" or open Chart to see all devices.

1.3B Displaying Readings in a Graph. When "USB All or Wi-Fi All" is applied in settings, All connected devices will be shown on one graph. When "USB First or Wi-Fi First" is applied in settings, only one device will appear in the Active device list and in the chart. Click on the green Chart tab at the bottom of the Meter app to open the graph. A bar or line graph will open displaying the results based on chart settings.

1.4. Numerical Readout Display: The readout display can be set to two formats Scientific Notation **on** (1.23e-2) or Scientific Notation **off** (.0123). See settings on page 8 Section 3N.

1.4A Display Units: The display units are noted above the numerical display. `Current (A)          #01`
Each time the display units button is pressed the setting toggles between, OD, %, Current

`Display Units` (A), or calibrated light levels. (Note: Calibrated light levels such as lux, fc, W/cm2, W etc. require a pre-programmed calibration factor and units. See settings 3Q on page 8 to learn how to enter calibration factors and display units)

1.4B Display Resolution: To change the resolution, click on left resolution `<-.000` `->.00` button to decrease the number of decimal places or the right button to increase the number of decimal places.

1.5. Calibrated Units/Calibration Factor Verification The calibration `eff-W/cm2      ⇒  #07` factor number in use is noted above the readout display to the right. The nickname and/or units are noted to the left. **NOTE: Using the wrong calibration factor will cause erroneous readings.**

In most cases, when a single calibrated sensor is ordered with the meter/device, ILT will pre-program the calibration factor as factor # 1. It is always best to verify the calibration factor in use matches the value on your most recent optical calibration certificate.

Users with multiple sensor(s)/filter/optic/calibration combinations should pay close attention to which calibration factor is in use. **Each factor is unique to the exact detector, filter(s) and optic(s) that were used during calibration**. To learn more about sensor calibration factors see Settings section 3QW on page 8.

1.6. Buttons Overview

1.6A Display Units: Press repeatedly to toggle between calibrated light level, Current, % Transmission, or Optical Density.

1.6B Integrate 1/s: When **Integrate** is selected the numerical display and graph shows a sum of the total amount of light seen, often called the exposure or dosage. Display Units must be set to Calibrated Light Level. Note: While using integrate the readouts are changed ie lux becomes lux*seconds, W/cm2 becomes W/cm2*sec (= J/cm2), cd becomes cd*sec.

PLEASE NOTE: When starting in a dark condition and using Auto range, the device can take up to 3 seconds to go from the lowest to highest gain range. To prevent loss of data, use setting to **Set sample** time to .1 S. This allows the meter to auto-range quickly and accurately capture the first second of data. (see Settings 3C sample time)

1.6C Min/Max: Toggles from off (Min/Max) to Min to Max. When on, displayed value changes only when the new level is higher than (max) or lower than (min) the displayed value.

Note: Min/Max can also be set to **Peak (Firmware- Fast)** Changes the Min/Max button to a Peak Firmware button for rapid measurements of changes in intensity, or brief flashes of light.

1.6d Zero: When Zero is pressed, Meter will record a value and subtract that value from all future readings to create a zero baseline. Any reading at or below the recorded "zero" value will be equal to "0.00" A **Dark Zero** is performed by covering the sensor with an opaque object and **Ambient Zero** is performed by shutting off or covering the test source, and exposing the sensor to the environmental light. To determine the zero level in use, Use CLI and type "getambientlevel".(you can also "setambientlevel" and "eraseambientlevel") in place of using the Zero button.

1.6e Hold is a toggle on/toggle off button that freezes the value on the numerical display to allow recording of data or data comparisons. (Note: Hold does not impact recording to file, or chart readings which will continue to update.)

1.6f Set 100%: The Set 100% button takes a reading and stores the value as the baseline for use with % Transmission and OD.

1.6g Saving readings: Meter has two buttons for saving reading. Note: Files are saved in documents, ILT, Reports.
>   **1.6g1 Record/Stop Record.** Creates a new file each time Record is pressed. Starts recording when Record is pressed then the button changes to a Stop Record which is used to end the session.
>   **1.6g2 Capture** takes a single reading and adds it to the "single_sample_file.csv" file by appending the existing file.(Appends the list with the latest reading added)
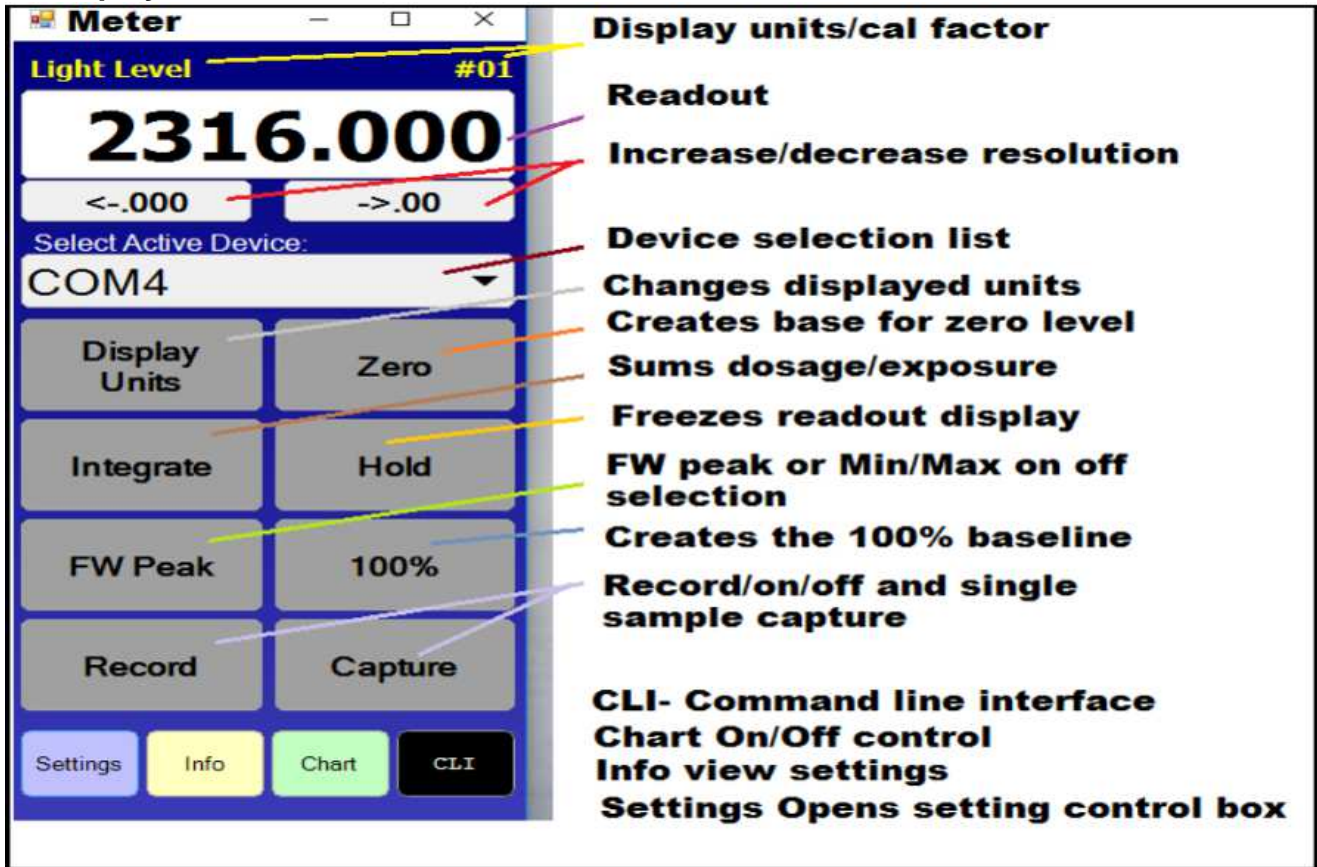
1.7. Settings: The settings button will open the settings control window with over 20 settings options available including selecting Cal factor and Managing calibrations, Changing sample and recording times, Modifying the chart type or quantity of devices displayed in a chart, and setting up Wi-Fi. Settings features are all clearly defined and should be fairly self explanatory.

1.8. Info: Provides meter and software settings data that can be viewed and saved. Save info can be used to reset systems or for trouble shooting.

1.9. Chart. Opens a bar or line chart for one or more devices based on user settings.

1.10 CLI is a command line interface that allows user to manually prompt for information or to change settings, IE gi, will return a single calibrated light level reading (gi=getirradiance), "erasestoreddata" will erase all readings in device memory. See full CLI manual and ILTs extensive API to learn more a bout using CLI.

2. Display Overview:

3. Settings: Includes 19 features that allow the user to self program everything from display and record times, to calibration factors and units. To open settings click on the settings button in the lower left of the active meters window**.**

3A. Close: Closes the settings window.

3B. Meter Factor: There are 20 channels for saving calibration sensitivity factors into memory. Calibrated systems will readout in empirical units such as W, W/cm2, lux etc. when a traceable calibration factor is entered and selected. Calibration factors are unique to the specific sensor/filter/optic noted on the cal cert. Care must be taken when changing cal factors.

      3B.1 Desc: Is the nick name entered for the device when programming a cal factor (ie SED033#2345)

      3B.2 Sensitivity: The calibration factor that is being used (ie 2.35e-4)

      3B.3 Units: Text that will be listed above display when measuring light level, ie lux.

      3B.4 Channel number selection box; used to select the channel and apply the calibration factor.
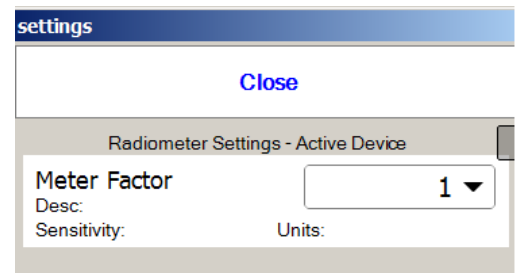
3C. Sample time: Allow the user to control how many readings are taken per second.

> 3C.1 Auto bases time on light level requirements (slower /more samples in low light/current levels, Faster/less samples in higher light/current levels.
>
> 3C.2 Fast sets the unit to sample at 100 samples per second, saving data to storage as quickly as possible. This typically results in around 40 samples/sec stored to flash memory.
>
> 3C.3 User selectable time ranges from 20 msec to 5 seconds.

3D. Auto Gain Range: When set to ON, allows the meter to change to the ranges based on light level. It can take up to 3 seconds to scan from low to high ranges. See 3E for use of OFF.

3E. Gain Range: Limits the working range of the meter in exchange for faster measurement speeds. Allows the end user to fix the range of the feedback resistor limiting the meter to approx 3.5 decades of light intensities. Often used for flash testing to assure the best sensitivity for quickly capturing the peak reading.

3F. Min-Max / FW peak Toggles between Min max mode and FW peak mode.

> 3F.1 Min-Max Updates the displayed readings when a larger value is read for max, or a smaller value is read for min.
>
> 3F.2 Peak (Firmware- Fast) is used for rapid measurements of changes in intensity, or brief flashes. It displays the largest value seen while scanning rapidly. This functionality will sample and integrate the signal approximately every 100us. Peaks of less than 100uS can be captured due to the feedback capacitor that extends faster signals for sampling. The display will only change to a new value when a higher level of exposure is measured. Reset by pressing on the Peak Firmware button once, each time a reset is needed.
>
> NOTE: Recommended settings for FW peak mode to ensure fastest capture:
>
> 1. Manual gain setting. Set to range of interest.
>
> 2. Sample time of 2 seconds. Note that the peak is being obtained by the FW every 100us, so sample time is simply the display update time.

3G. Integrate Mode: Toggles between Standard and Flash

> 3G.1 Standard. Standard integrate mode samples and integrates the light level every second. It is intended for integrating slow signals (typically DC), with a wide dynamic range over time, from seconds to days or months. Examples would include monitoring UV exposure every second over a 15 minute disinfection period
>
> 3G.2 Flash. Flash integrate mode samples and integrates the light level on the order of every 100us. It is intended for integrating momentary signals such as a flash grenade, or fast moving signals such as pulsed light sources, over seconds or minutes.

3H. 5V Bias: the ILT2400, ILT6000 and ILT5000 already supply 9V to the sensors. When the 5V bias is on, it adds an additional 5V required to power the Vacuum photo-tubes **only**. (ILT sensor/detectors part numbers SED240, SED220 and SED185). Please note: This bias can damage other detectors.

3I. Recording Interval:

> 3I.1 Sample, matches the recording period to the Sample time setting (See 3C)
>
> 3I.2 Time: ranges from 1 second to 1 hour

3J. Recording Mode:

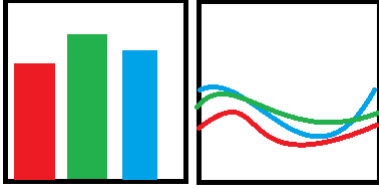> 3J1. Active Device: Records date/time, Reading, min, max and Average,
>
> 3J2. Chart Data To record the chart data, To open a chart, click on the chart button, then click record.

Chart Settings

3K. Chart Type: Bar or Trend graph type is selected

3L. Update Interval: Time between updating readings within the chart. Options range .5 seconds up to 1 hour.

3M. Y-Axis Settings
> 3M.1 Y Axis Label: chose from Light level, read from cal factor Units, or manually select from the available units in the drop down menu. See section 3Q for adding customer created calibration factors with the units of interest.
> 3m.2Y-Axis Scaling:
> Automatic: Will auto range to allow max intensities to be shown.
> Manual: Allows user to enter the min and max readings to be displayed.

Other Settings
3N. Use Scientific Notation: On or Off
examples: On (1.35 e-3), Off (.0013)
note: if the readings are below .0005(e-4) scientific notion is recommended or new calibration factor will need to be created with a prefix (ie. milli, micro, nano). For example ILT cal factor 1.234**E-4** (A)(cm2)(W-1) is changed to 1.234**E-7** (A)(cm2) (mW-1) with readout in mW/m2, or 1.234**E-4**(A)(cm2)(W-1) is changed to 1.234**E-10** (A)(cm2)(µW-1) with direct readout in µW/cm2. See chapter 3Q for adding calibration factors, and their units.

3O. Discovery Type:
> USB All (Opens all Devices and include all results in the same chart)
> USB First (Opens the first device not already in use, each device has its own chart)
> Wi-Fi All (Opens all Devices and include results in the same chart)
> Wi-Fi First (Opens the first device not already in use, each device has its own chart)

3P. Friendly Name Type: Toggles between Network name and Device nick name
> Network: Lists the COM PORT for each device, IE COM21, COM22
> Device: Applies the user created friendly name. See 3R for Setting Friendly Name.

Maintenance:

3Q. Manage Calibration Factors (Active Device)

NOTE: The ILT2400 uses the ILT factory programmed calibration factor to convert the incoming sensor current to Traceable Calibrated light level readings. Creating custom calibration factors is very easy using the ILT2400 but the accuracy of the readings can be greatly impacted by incorrectly adding and applying custom calibration factors. When multiple systems are attached, be sure to verify the COM port or Active Device Nick name when modifying calibration factors.

ILT takes no responsibility for incorrect results obtained using customer created calibration factors.

3Q.1 Factor number: 20 channels (ranges from 1-20)
3Q.2 Description: can be a nick name, Sensor/filter combo etc.
3Q.3 Select Units: Select from the list per-programmed units ie lux, W/cm2 etc. Or select custom to add your own units and cal factor.
3Q.4, Custom Unit Optional, if custom was selected above, type in the name of your units, ie. candlepower.
3Q.5 Sensitivity Factor. Typically this is obtained from the ILT sensor calibration certification, or a certified calibration lab. Enter the factor in scientific notation. Ie. 1.113e-3
3Q.6 Resulting Light Level: If you are applying a know amount of light to the sensor, enter the value, ie. 1000 lux and press set. Meter will calculate the correct calibration factor needed to achieve a 1000 lux reading.
3Q.7 Factor adjustments is used to modify the cal factor entered in Sensitivity factor by a known value. IE you want the Reading to be 10% higher, or you have added a neutral density filter with a known attenuation of 10. Enter your factor in Sensitivity factor, then enter the factor adjustment ie. 10 to change cal factor by 10.

3R. Set Friendly Name Allows user to enter a device name.
Click set friendly name, Enter the name in the selection box and click set. Click Close.
To apply the friendly name click Re-Scan Devices to apply.(see 3S below)

3S. Re-Scan Devices: Scrolls through all com ports to look for new or additional devices and/or device names and connects to them.
(applies USB all or USB first based on settings in 3O. Discovery Type)
After Re-Scan devices use the Select Active Device to verify all devices are listed in the drop down menu.

3T. Manage Wi-Fi Settings: Opens up a list of available networks. It is imperative that both the device(s) and the computer are on the same network. See NetConfig in the Datalight III folder to establish a network connection.

3U. Set Date and Time: Opens date/time settings which are used in the files names.

3V. Save Settings: Applies user settings and saves a record of all settings. Settings are then automatically applied.

3W. Restore Defaults: Restores factory settings

4. Info
Displays the current settings. This can be helpful when trouble shooting or setting up multiple systems. Refresh will update based on the most recent settings.
Save info to file will create a .txt file of all saved settings. This file can be printed and shared or emailed for configuring additional units or for future re-programming and trouble shooting.

5. Chart: When the chart button is activated, a new window with a graph displaying the measurement results opens. When the chart button is pressed again, the chart is closed. The chart options(selected in settings) are BAR and TREND. Bar shows the same light level readings as the Numerical Display. Trend provides a graph of readings over time.
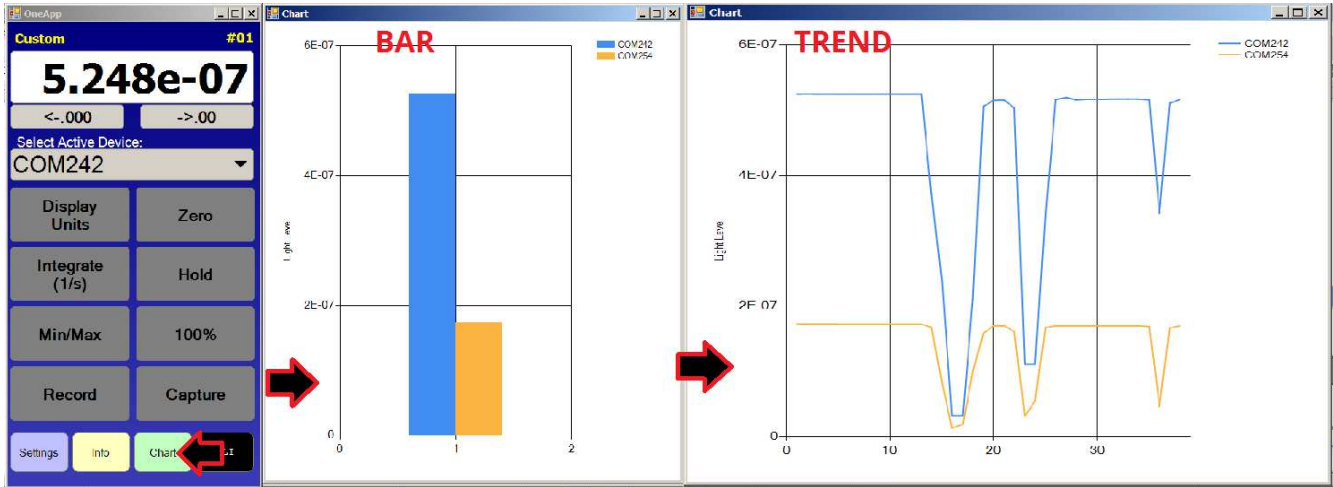
To run one app with multiple devices in the same graph, set discovery type to all (section 3O, on page 8)
To run Multiple instances of the app, with each graph containing only one device set discover type to First, and open multiple copies of Meter. Activate a chart for each device by clicking each chart button once in each copy of meter you have open.

Example two devices, one each graph
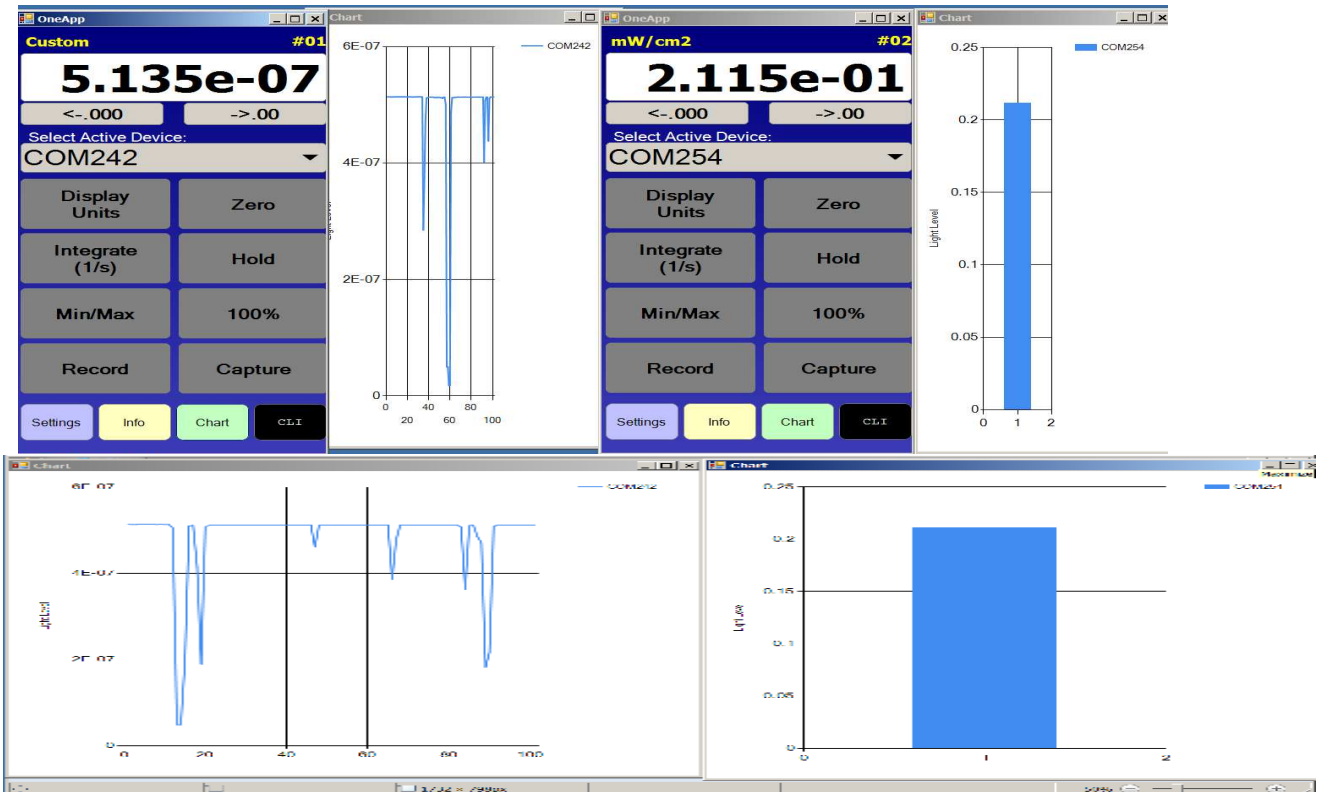
6. CLI (Command Line Interface)

6A. Close will close the window

6B. ID line will show the com port or system ID name

6C. Auto clear Previous result
If ON, will open with an empty result window each time
If OFF, will keep previous results in memory

6D. Save results to file: saves the information in the Results window.

6E. Command: The command window is where the commands from the API are typed, IE gc for get current, or gi for get irradiance(returns calibrated light level reading)
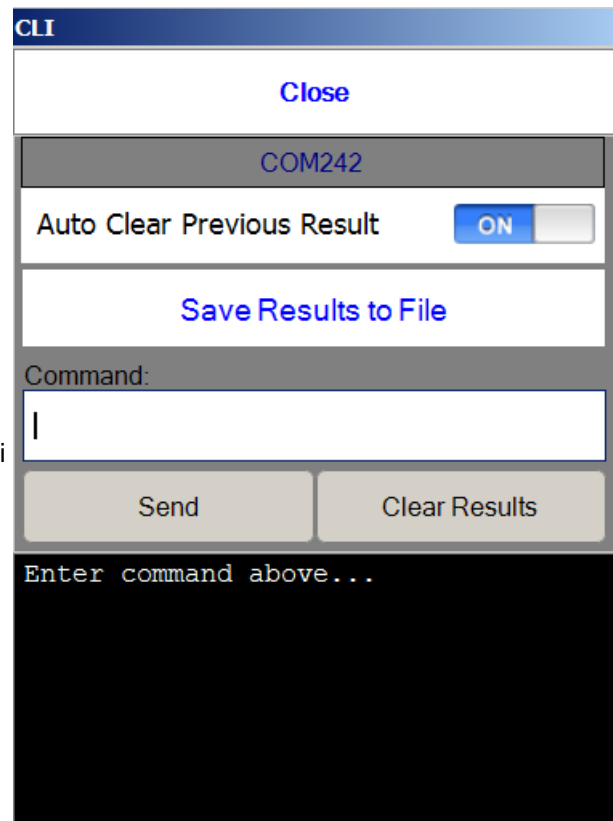
6F. Send: Applies the commands typed in the command box

6G. Clear Results: Empties the data in the results box

6H. Results window Shows the results
ie gc 1.234e-5 (get current)
or -500 and -999 indicate an error.

CLI

Close

COM242

Auto Clear Previous Result   ON

Save Results to File

Command:

|

Send   Clear Results

Enter command above...

7. Warranty and Support:

All internal and external versions of ILT Datalight Software and Firmware are supplied "as-Is" with no warranty.

Support:
Technical questions should be addressed to tech support at
ilsales@intl-lighttech.com or by phone **978-818-6180 x 216**

Before returning any equipment to ILT for service (including warranty evaluations) customer should visit the ILT website and obtain an RMA:
http://www.intl-lighttech.com/services/return-material-authorization/rma-form

8. Datalight for MAC

Most of the instructions for Datalight III windows also apply to MAC. The MAC version is simply a smaller version of Datalight.

Coming soon User manual and installation manual for Mac.