



DataLight III Software Manual

Windows

Meter Application



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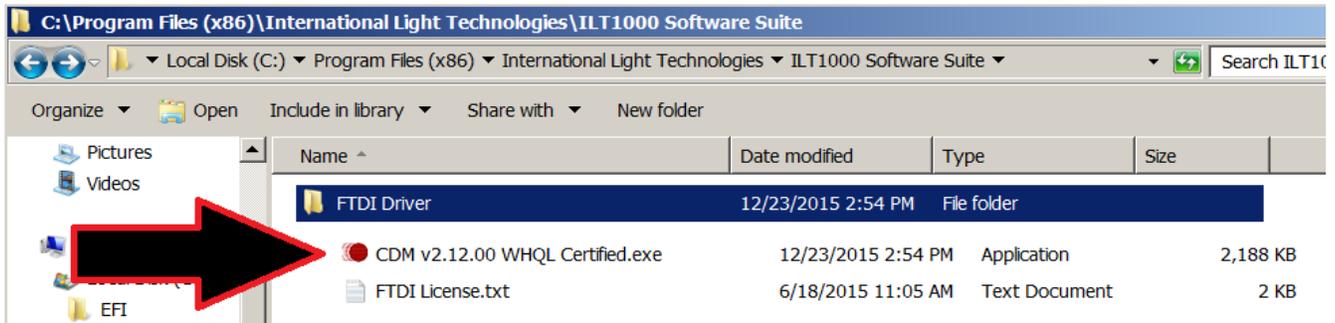
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1. Quick Start, Short Form Instructions

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/light-meter-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: Device drivers are located in C, Program Files (x86), International Light Technologies, Datalight III, FTDI Driver. Double click on the CDM executable file. (in most computers the FTDI Drivers are not already present)



(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 version of software are running the connected device. Check the computer com ports list to assure the device is registered properly. Assure ILT2400 and ILT2500 internal displays are set to the home screen. Then click Settings, Re-scan devices to try again.

1.3. Running Meter for multiple Devices: Multiple devices can be connected to individual USB ports, or by use of a hub connected to one USB port.

1.3a Configuring for multiple units. Once all units that have COM ports assigned they can all be plugged in simultaneously or singularly, as preferred. The connected device list is found in the select active device window.

1.3a1 Multiple Meters Apps Connect all devices. Click on the meter app in the Datalight folder once for each connected device. Each meter app will connect to one device (settings should be set to Discovery Type “USB First”). Click re-scan devices in settings as needed.

1. 3a2 Multiple Devices on a single instance of Meter: Connect all devices. Click on the meter app. Open settings. Change Discovery Type to “USB All”. Click “”Re-Scan Devices”. All units will be listed in the drop down menu of Select Active Device and can be toggled between.

1.3b. Displaying readings from all devices in one graph. When “USB All” is selected, All connected devices and be shown on one graph. Click on the green chart tab at the bottom of the Meter app to open a the graph.

1.4. Readout Display: The readout display can be set to two formats Scientific Notation **on** (1.23e-2) or Scientific Notation **off** (.0123)

1.4a Display units: The display does not include the units. Depending on user settings the units may be noted above the display such a OD, %, Current (A), or calibrated light levels such as lux, fc, W/cm², W etc.

1.4b Display resolution: To change the resolution, click on left resolution 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 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 which can only be accessed by ILT.

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.

1.6. Buttons Overview

1.6a Display Units: Select from calibrated light level, Current, % Transmission, or Optical Density.

1.6b Integrate: Located below Display Units. When **Integrate** is selected the display is 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, but not displayed. For example; lux becomes lux*seconds, W/cm² becomes W/cm²*sec (J/cm²).

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

1.6c Min/Max: Displayed value changes only when the new level is higher than (max) or

lower than (min) the displayed value.

Peak (Firmware- Fast) Changes the Int 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 the Zero button.

1.6e Hold is a toggle on/toggle off button that freezes the value on numerical display. (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: 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, and changes to a Stop Record which is used to end the session.

1.6g2 Capture saves a single reading and adds it to the “single_sample_file.csv” file by appending the existing file.

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. For additional advise see full operations manual.

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:

The screenshot shows the 'Meter' application window. The main display shows 'Light Level #01' with a large readout of '2316.000'. Below the readout are navigation buttons: '<-.000' and '->.00'. A 'Select Active Device:' dropdown menu is set to 'COM4'. The interface includes a grid of function buttons: 'Display Units', 'Zero', 'Integrate', 'Hold', 'FW Peak', '100%', 'Record', and 'Capture'. At the bottom are 'Settings', 'Info', 'Chart', and 'CLI' buttons. Colored lines connect these UI elements to a list of descriptions on the right.

- Display units/cal factor** (points to 'Display Units' button)
- Readout** (points to the large number '2316.000')
- Increase/decrease resolution** (points to '<-.000' and '->.00' buttons)
- Device selection list** (points to the 'COM4' dropdown)
- Changes displayed units** (points to 'Display Units' button)
- Creates base for zero level** (points to 'Zero' button)
- Sums dosage/exposure** (points to 'Integrate' button)
- Freezes readout display** (points to 'Hold' button)
- FW peak or Min/Max on off selection** (points to 'FW Peak' button)
- Creates the 100% baseline** (points to '100%' button)
- Record/on/off and single sample capture** (points to 'Record' and 'Capture' buttons)
- CLI- Command line interface** (points to 'CLI' button)
- Chart On/Off control** (points to 'Chart' button)
- Info view settings** (points to 'Info' button)
- Settings Opens setting control box** (points to 'Settings' button)

3. Settings:

Setting 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: Selects from per-programmed factors. See 3Q for creating calibration factors.

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 values.

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.

The settings window is titled 'settings' and has a 'Close' button. It is divided into two sections: 'Radiometer Settings - Active Device' and 'Radiometer Settings - All Connected Devices'.

Radiometer Settings - Active Device:

- Meter Factor: 1 (dropdown)
- Desc: (empty)
- Sensitivity: (empty)
- Units: (empty)

Radiometer Settings - All Connected Devices:

- Sample Time: Auto (dropdown)
- Auto Gain Range: ON (checkbox)
- Gain Range: 1mA (dropdown)
- Min/Max Mode: Min/Max (dropdown)
- Integrate Mode: Standard (dropdown)
- 5V Bias: OFF (checkbox)

3E. Gain Range: Allows the end user to fix the range of the feedback resistor limiting the meter to about 3 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 5V bias is used to increase the sampling speed of **silicon sensors** when measuring rapidly changing/ pulsed/flashing light sources. The ILT2400, ILT2500, ILT6000 and ILT5000 provide all necessary bias for powering all ILT sensors when the bias is off. **Warning: The 5V bias can cause a decrease in sensor stability and possibly damage other sensor material. ILT silicon sensors include: SED033, SED100, SCD110, XSD140B, XSD340B, XSD140A, and XSD340A.**

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

Recording to File Settings	
Recording Interval	1m ▼
Recording Mode	Active Device ▼

3J. Recording Mode:

3J1. Active Device: Records date/time, Reading, min, max and Average,

3J2. Chart Data To record the chart data, First open a chart by clicking on the chart button, then click record.

Chart Settings

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

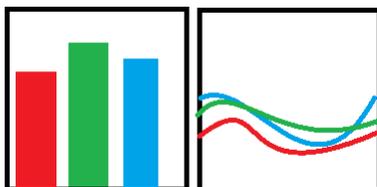


Chart Settings	
Chart Type	Bar ▼
Update Interval	0.10 sec ▼
Y-Axis Settings	

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, or manually select from the available units in the drop down menu. See section 3P 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

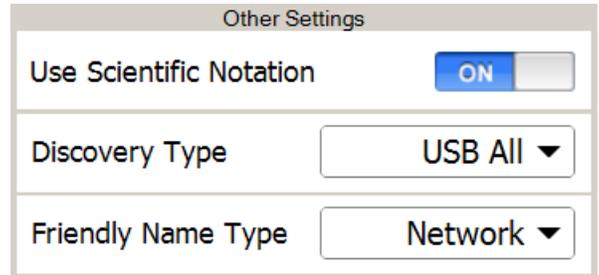
Scientific notation uses an exponent to show the decimal place, when off, a prefix is used

examples:

On (1.35 e-3 W/cm2), Off (.135 mW/cm2)

On (4.78e-6 W/cm2) Off (4.78 uW/cm2)

On (8E+2 lux) Off (800 lux)



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 to 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.

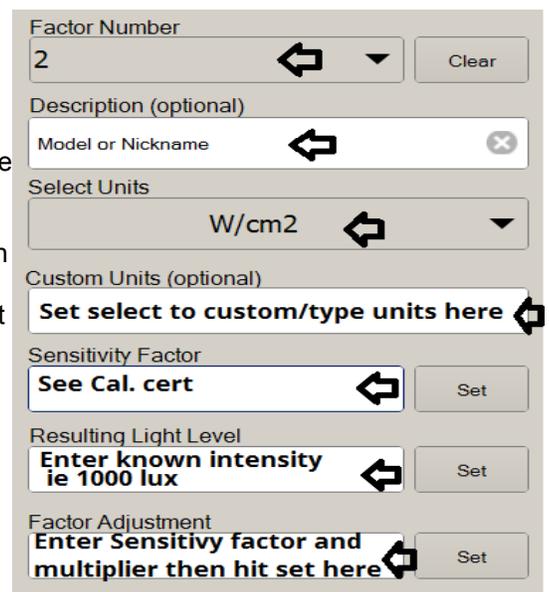
3Q.3 Select Units: Select from a list pre-programmed units ie lux, W/cm2 etc. Or select custom to add your own units and cal factor.

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 the factor adjustment of 10 to change cal factor.



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

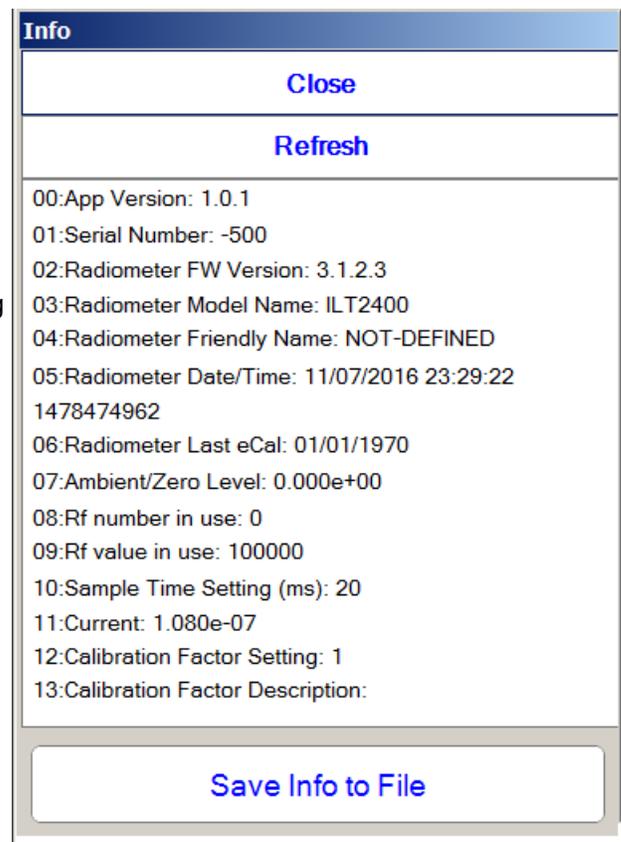
4. Info

Displays the current settings.

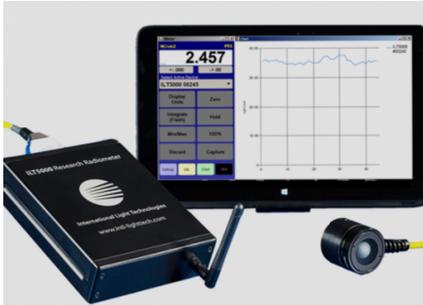
Close, Closes the info window.

Refresh will update based on the most recent settings

Save info to file will create a .txt file of tall 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: opens a new window with a graph displaying the measurement results. It is possible to connect multiple devices in one graph, as well as to open a separate graphs for each device. Chart settings are edited by opening the settings window and selecting chart settings including update speed, line/bar graph type, and number of devices.



6. CLI (Command Line Interface)

Close will close the window

ID line will show the com port or system ID

Auto clear Previous result can be set to On or OFF.

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

Command:

The command window is where the commands from the API are typed, IE gc for get current

Send Applies the command typed in the command box

Clear Results Empties the data in the results box

Results window Shows the response to the sent command
 ie gc 1.234e-5 (get current)
 or -500 and -999 indicate an error.

