



284 Main Street, Suite 400

Wilton, Maine 04294-3044

Tel: 207.645.3600

Fax: 207.645.3633

www.microptixtech.com



Quick Start Users Guide

Version 1.73 -May 2010



QUICK START TABLE OF CONTENTS:

Definitions..... 3

Pictures of i-LAB[®] Adapters and Base Unit 6

Using the i-LAB[®] Spectrometer 8

Solid Surfaces 11

Liquids..... 13

Surface Reader Usage 15

Measuring Solid Surfaces with Lab XYX Method.. 17

Transferring Log Data to the Computer 17

Measuring Solid Surfaces with QA Method 18

Measuring Liquid with Lab XYX Method 21

Measuring Liquid with RGB Method 22

Measuring Liquid with Cuvette Adapter 24

****Please read this guide before operating your i-LAB[®] Unit.***

Your ***i-LAB*** system includes the following items:

- ***i-LAB*** Hand Held Analyzing Spectrophotometer with Protective Cap
- 10" mini USB cable for computer to ***i-LAB*** Interface
- Phillips Head Screwdriver for ***i-LAB*** battery Installation
- 3 AA batteries
- User's Guide

i-LAB® Definitions:

Please get familiar with the terms before using the unit; the parts are generally listed from top to bottom of the unit. The more you know the terms, the easier using the i-LAB will be.

Adapter– An accessory added to the unit to make color measurements for surface reflectance or liquid transmittance. The adapters snap into place onto the top of the unit, over the neck. Note that when the word “i-LAB” is present on the adapter, that side should face front.

Adapter, Cuvette– Consists of three pieces that are used to determine color measurements of liquids using a 10 mm cuvette. The pieces are: 1) a black cover- needed for measurements, 2) a cuvette holder, where a cuvette goes in, and 3) a holder piece (which is also a round vial adapter) that snaps onto the i-LAB neck. The holder piece also has “legs” that may be extended.

Adapter, Round Vial– Consists of two pieces that are used to determine color measurements of liquids using a standard 25 mm round vial. The pieces are: 1) a black cover- needed for measurements, and 2) a holder piece (which is also a round vial adapter) that snaps onto the i-LAB neck. The holder piece also has “legs” that may be extended.

Adapter, Surface Reader– Consists of a cylinder with a 5 mm lens on one side and an opening holding the prism on the other side. The open side snaps onto the i-LAB neck;. Be sure to have “i-LAB” logo facing front.

Spectral Window– Is located at the top neck of the i-LAB unit; clear optical piece showing LEDs and sensor. Usually the spectral window is covered with a protective black i-LAB logo cap when adapters are not attached.

Neck– Is the neck of unit, where all adapters snap onto.

Eject Clip– Is the silver oblong piece with the flat side facing forward. Typically one lines up the adapter with the “U” cut outs positioned over the handles of the eject clip and then pushes (snaps) it into place.

When done using the adapter the user presses down on the eject clip tongue to pop off the adapter.

Screen– The screen is the illuminated area where the user can see the instructions for the i-LAB or to view initial results or to see if the unit is plugged into a computer.

OK/ON/OFF Button- The center top button or key, that is initially used to turn on the unit (pressing for a few seconds) or turning off the unit (again pressing for a few seconds), or to select OK for the unit to perform a method or go through screens.

Menu Button– The top left button that says “MENU”. The Menu button shows the first level of commands including Method, Scan (not used anymore), Log (data and memory log), and Setup. When pressed it also may act as a previous or back screen.

Delete Button– The bottom left button that says “DEL” is the delete button. The delete button only can delete measurement files in the Log-View Log storage.

Scroll Down Button- The bottom right button with the triangle pointing up is the scroll down button. It is used to scroll down to go to different files or methods.

Battery Door- On the back of the i-LAB is the battery door. Three “AA” batteries are used, 2 outside ones facing (+) up, with the center battery facing (+) down. A small Phillips head screw driver can be used to remove/attach the battery door.

sRGB_CV – Measures sample and outputs it in terms of Red, Green, and Blue values. This method uses **BackgLAB_CV** calculated values and Blank reference spectrum. For this method to operate properly the method **Backg_CV** and **BackgLAB_CV** must have been previously run.

QAStd_CV – Measures and saves up to 5 library spectra that can be used by **QASmp_CV**. This method used the reference Blank and Black samples generated from the method **Backg_CV**.

QASmp_CV – Measures a sample, compares with library spectra generated by **QAStd_CV** and gives best fit with R^2 correlation. For this method to operate properly the method **Backg_CV** and **QAStd_CV** must have been previously run.

Liquids- using the Cuvette Adapter:

Backg_CV – Measures and save background color for the Blank reference sample and the Black reference sample.

CIEBackg_CV – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_CV**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.

CIEXYZ_CV – Measures sample and compares with background sample (Blank sample). The background method **CIEBackg_CV** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_CV** and **CIEBackg_CV** must have been previously run.

(CIE uses a D65 light source and 10° observer angle for the CIE-LAB calculations)

BackgLAB_CV – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_CV**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.

LabXYZ_CV – Measures sample and compares with background sample (Blank sample). The background method **BackgLAB_CV** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_CV** and **BackgLAB_CV** must have been previously run.

(Lab uses a C light source and 2° observer angle for the CIE-LAB calculations)

USB Port- A USB port is at the bottom back of the unit. It is used with a USB cable to tether or attach the i-LAB to a computer to transfer data or methods.



i-LAB® is a registered trademark of Microptix Technologies, LLC

Pictures of Adapters and Base Unit:

Adapter

(Holder piece used for both Cuvette & Round Vial)



Holder piece "legs"



Black Cover (Needed for Measuring)



Cuvette Holder



Surface Reader



10. Press of the OK button.
11. The results data will not be saved to the log until all the results have been responded with a Press of the OK button and the screen stays on saying i-LAB Ready and **sRGB_RV** is highlighted.
12. The log is saved under a number in the upper right hand screen and will have the time and date, too. The measurements and spectra numbers from 400 nm to 700 nm are saved.
13. Transfer data to Datalog software as described under the CIE_LAB method.

Note that the output to the i-LAB's Log will be these values, in this order:

X Spectrum
Y Spectrum
CIE X Sample
CIE Y Sample
CIE X Sample
Red
Green
Blue

Measuring a Liquid with RGB Method using the Round Vial Adapter:

Note that the output to the i-LAB view screen will be these values, in this order:

Red =

Green =

Blue =

Instructions:

1. Calibrate the instrument and obtain a proper background for the measurements by using steps 1-20 above as described under the CIE_LAB method. These discuss the flow of running Methods **Backg_RV** and **BackLAB_RV**.
2. If the display is not highlighting a method – With the top of the screen displaying “METHOD”, then press MENU button and scroll (with scroll up and down buttons) to “Method” and Press OK button to access the Methods Menu.
3. In the Methods Menu, scroll (with scroll up and down buttons) until on **sRGB_RV**
4. Press OK button- “Scan Sample” will appear with **OK** highlighted
5. Place the sample in the adapter to be measured.
6. Press OK button.
7. The i-LAB will start to acquire data and the LEDs will turn on and off- the screen will be dark with occasional flashes of light. Measurement is completed when the screen stays on and it has **RED= XXX.XXX** Color with **OK** highlighted.
8. Hit the OK button and **Green= XXX.XXX** Color will appear with **OK** highlighted.
9. Hit the OK button and **Blue= XXX.XXX** Color will appear with **OK** highlighted.



Using the i-LAB spectrometer:

Turn On- To turn on the i-LAB, simply **press the OK button** for a few seconds. The unit's screen will light up. The time should be displayed in the upper right corner, a battery power level (three dots close to full charge, two dots about 2/3 the life, one dot about 1/3 the life) in the upper left corner, and the latest method will be displayed.

Going through the i-LAB buttons and programs:

Next press the **MENU button** to get to the menu.

You'll see **Method, Scan, Log,** and **Setup** under **MENU**. Click the "OK" button to see your methods.

Use the up and down scroll buttons to go up and down the Methods. If your light goes off after a while, simply press the "OK" button again.

Methods are the programs that direct the i-LAB as to how to measure. Depending on your unit and its capabilities- it may have background, surface reader (SR) methods using CIEXYZ programs, or cuvette (CV) or round vial (RV) methods using LABXYZ programs, samplette (SM) for liquids using Lab programs, or even customized methods. Clicking the "OK" button two or three times will cause a method to start. We'll discuss that later.

Next press the **MENU button** to get to the menu.

Scroll down to **Scan**. The Scan button was initially made to get a quick scan of a specific method. The Scan button was written for earlier software and it may or may not refer to the method you want. Pressing the OK button will get you in the SCAN mode.

Measuring a Liquid with LAB XYZ Method:

Please follow the same instructions as the Solid to perform the liquid methods. The methods used for liquids are:

Backg_RV (and Backg_CV) – The round vial (and cuvette) LABXYZ method for calibration of the instrument. This method is the equivalent to the CIE_LAB method **Backg_SR**, except it is using the C-illumination and 2° observer.

BackgLAB_RV (and BackgLAB_CV) – The round vial (and cuvette) LABXYZ method for background of the instrument. This method is the equivalent to the CIE_LAB method **CIEBackg_SR**, except it is using the C-illumination and 2° observer.

LABXYZ_RV (and LABXYZ_CV) – The round vial (and cuvette) LABXYZ method for analyzing the sample. This method is the equivalent to the CIE_LAB method **CIEXYZ_SR**, except it is using the C-illumination and 2° observer.

sRGB_RV (and sRGB_CV) – The round vial (and cuvette) LABXYZ method for analyzing the sample. The method is used to produce RGB values based on using the C-illumination and 2° observer.

QAStd_RV (and QAStd_CV) – The round vial (and cuvette) LABXYZ method for background of the instrument. This method is the equivalent to the CIE_LAB method **QAStd_SR**, except it is using the C-illumination and 2° observer.

QASmp_RV (and QASmp_CV) – The round vial (and cuvette) LABXYZ method for analyzing the sample. This method is the equivalent to the CIE_LAB method **QASmp_SR**, except it is using the C-illumination and 2° observer.

**Measuring a Solid Surface with LAB XYZ Method:
The output to the i-LAB's Log will be these values, in this order:**

X Spectrum
Y Spectrum
CIE X Sample
CIE Y Sample
L* Sample
a* Sample
CIE Z Sample
b* Sample
CIE X Blank
CIE Y Blank
L* Blank
a* Blank
CIE Z Blank
b* Blank
Delta E
C*ab Sample
Saturation Sample
Delta H*ab
Yellowness
Whiteness
Tint Index

Note: You may not have all of these parameters

Scroll down to Log. Press the "OK" button to open the LOG mode. You'll see **View Log, View Memory, and Clear Log**. Click on "OK" button and you can see if there are any logs of measurements. If there are, you can scroll down to see what they are. Some limited data is available. Logs are generally saved as 2-digit month, two digit day, sample number (sequential). Click **MENU** (back) button.

Scroll down to **View Memory**. Click "OK" button. If you had no logs the **Available memory** is 100%. If you have 1, 2 or even hundreds of logs, the Available memory is listed as 12% or 13%. Click "OK".

Scroll down to **Clear Log**. Click "OK" will prompt you to "Erase ALL stored results?" with two responses **Cancel** or **Erase all**. Click Cancel. Other ways to remove stored logs is to open logs with View Logs and press the **DEL** delete button on the lower left. Pressing the **DEL** button will show a Delete: log name with a **Cancel** or a **Delete record** prompt. The other way to delete logs is actually with **Datalog** software, where that program asks to transfer and delete the logs.

Next press the **MENU button** to get to the menu; you may have to do it more than once to get to MENU.

Scroll down to **Setup** and hit the OK button. In SETUP mode you'll see: **Backlight Timer (XXs), Auto-off Timer (On); Method Prompt (On); Autosave (On);** and scrolling down with down scroll button you'll see: **Sound (on); Time/Date;** and **About**.

Scroll up to the **Backlight Timer**- you can set the time to turn off the screen light- Off, 15, 30 or 45 seconds are the choices. Scroll to the choice and hit the OK button to save. The mode puts you in the SETUP mode with the saved item. Likewise, you can: set the **Auto-off** from 1, 2, or 3 minutes ; set the **Methods Prompt s** On or Off- typically On; **Auto-save** On or Off- usually On; **Sound** can be adjusted to On or Off; **Time/Date** may be set; and then there is the **About** Command.

Click OK to open **About** . You will see the Serial number of your i-LAB unit. Often a Visible unit will start with V have some 0's and then a number. You'll also see your Model number and the Spectral range. Scroll down and you will see the firmware revision and date, and hardware revision.

Please spend some time going through the commands. Note that you can delete any methods from the i-LAB unit by doing this.

Turn Off- Press the OK button for three seconds and the unit will turn itself off. The other way to turn a unit off is the Auto off timing out, but this may not work if in a method mode.

Important words of advice– *When using an i-LAB with an adapter make sure you initially do a proper background. Sometimes this background may be obtained via previously run program. Whenever you change an adapter, such as from cuvette to surface reader, you will need to do a new background/Blank.*

Initially *run a background__xx for your general method (where xx = sr, cv, rv or sm). This “calibrates” the unit. Next run a background ** for your solvent or solid (ex. **CIE backg_SR**). After that run your sample with the appropriate method (ex. **CIEXYZ_SR CIEXYZ_SR**)

* = **Only run on set up**

** = **Do not need to redo if “Blank” stays the same.**

Analyzing Samples:

12. If the display is not highlighting a method – With the top of the screen displaying “METHOD”, then press MENU button and scroll (with scroll up and down buttons) to “Method” and Press OK button to access the Methods Menu.
13. In the Methods Menu, scroll (with scroll up and down buttons) until on **QASmp_SR**
14. Press OK button- “Scan Sample” will appear with OK highlighted.
15. Place the adapter directly onto the sample. Take care to keep sample flat with adapter, not allowing any stray light to enter. Press OK button.
16. The i-LAB will start to acquire data and the LEDs will turn on and off- the screen will be dark with occasional flashes of light. Measurement is completed when the screen stays on and it gives the reading “HQI nQA_Lib#_SR Corr value:0.XXXXXX”.
17. This is describing the Pearson correlation between the best fit QA standard (library) and the R² number.
18. The log is saved under a number in the upper right hand screen and will have the time and date, too. The measurements HQI results are saved to the log.
19. Transfer data to Datalog software as described under the CIE_LAB method.

Measuring a Solid Surface with QA (Color Matching) Method:

Note that the output will be these values, in this order:

(Best fit) QA Lib = Pearson R2 Correlations

Instructions:

1. Calibrate the instrument and obtain a proper background for the measurements by using steps 1-13 above as described under the CIE_LAB method. These discuss the flow of running Methods **Backg_SR**.
2. If the display is not highlighting a method – With the top of the screen displaying “METHOD”, then press MENU button and scroll (with scroll up and down buttons) to “Method” and Press OK button to access the Methods Menu.
3. In the Methods Menu, scroll (with scroll up and down buttons) until on **QAStd_SR**
4. Place adapter over the reference sample #1 to be measured. Take care to keep sample flat with adapter, not allowing any stray light to enter.
5. Press OK button – “Scan Sample#1” will appear with **OK** highlighted.
6. The i-LAB will start to acquire data and the LEDs will turn on and off- the screen will be dark with occasional flashes of light. Measurement is completed when the screen stays on it “Menu or Scan Sample#2”.
7. If this is the last sample to be added to the Reference Library, Press the Menu button
8. If an additional Library reference sample is desired, place the adapter on the sample and Press OK button. Take care to keep sample flat with adapter, not allowing any stray light to enter.
9. The i-LAB will start to acquire data and the LEDs will turn on and off- the screen will be dark with occasional flashes of light. Measurement is completed when the screen stays on it “Menu or Scan Sample#3”.
10. Repeat steps 7-9 until all the 5-samples (the desired number – up to five) has been added to the Reference Library.
11. Measurement is completed when the screen stays on and it says i-LAB Ready and **QAStd_SR** is highlighted.

TYPICAL METHODS:

Many methods exist, and it is easy to get confused. In all methods spectra are generated from 400 nm to 700 nm. Although it may not show on the screen- you can see and transfer that data with DATALOG software. The following was put together to help simplify things and make sure you are using the right method and the right adapter.

Solid Surfaces - Using the Surface Reader:

Methods What it does

- Backg_SR** – Measures and save background color for the Blank reference sample and the Black reference sample.
- CIEBackg_SR** – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_SR**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.
- CIEXYZ_SR** – Measures sample and compares with background sample (Blank sample). The background method **CIEBackg_SR** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_SR** and **CIEBackg_SR** must have been previously run.

(CIE uses a D65 light source and 10° observer angle for the CIE-LAB calculations)

- BackgLAB_SR** – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_SR**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.

LabXYZ_SR – Measures sample and compares with background sample (Blank sample). The background method **BackgLAB_SR** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_SR** and **BackgLAB_SR** must have been previously run.

(Lab uses a C light source and 2° observer angle for the CIE-LAB calculations)

sRGB_SR – Measures sample and outputs it in terms of Red, Green, and Blue values. This method uses **BackgLAB_SR** calculated values and Blank reference spectrum. For this method to operate properly the method **Backg_SR** and **BackgLAB_SR** must have been previously run.

QAStd_SR – Measures and saves up to 5 library spectra that can be used by **QASmp_SR**. This method used the reference Blank and Black samples generated from the method **Backg_SR**.

QASmp_SR – Measures a sample, compares with library spectra generated by **QAStd_SR** and gives best fit with R^2 correlation. For this method to operate properly the method **Backg_SR** and **QAStd_SR** must have been previously run.

Measuring a Solid Surface with CIE XYZ Method:

The output to the i-LAB view screen will be these values, in this order:

CIE X
CIE Y
L*
A*
CIE Z
B*
Delta E
Chrona
Saturation (internal)
Delta H*ab
Yellowness vs. reference
Whiteness vs. reference
Tint Index

Note: You may not have all of these parameters

Transferring log data to the computer for storage and further analysis:

1. Initially insert the Datalog CD software into your computer and follow instructions to download it.
2. Open Datalog software.
3. Attach USB cable to i-LAB port and computer.
4. Allow Windows to find the new device and install if this is the first time that it has been used on the computer
5. Click on Datalog and Result Data.
6. You can then import your data from the i-LAB to the computer. The data comes in a *.csv (comma space variable) file that is compatible with many programs. This data is initially stored in the file "iLabResultsData.csv" in you MyDocuments folder.
7. You may also find it valuable to save the data in an MS Excel or other format to further analyze.
8. It is recommended that you transfer the data at least once per day for organizational purposes.

14. Scroll (with scroll up and down buttons) until on **CIEBackg_SR**
15. Press OK button- “Scan Blank” will appear with **OK** highlighted
16. Place adapter on the sample to be measured. This sample should be a “Blank” sample. Take care to keep sample flat with adapter, not allowing any stray light to enter.
17. Press OK button.
18. The i-LAB will start to acquire Calibration data (Calibrating) and the LEDs will turn on and off- the screen will be dark with occasional flashes of light.
19. Measurement is completed when the screen stays on and it says i-LAB Ready and **CIEBackg_SR** is highlighted.
20. The instrument is now calibrated to analyze samples with this Surface Reader Adapter.

Analyzing Samples:

21. In the Methods Menu - Scroll up or down to get to **CIEXYZ_SR** and press the OK button.
22. Response will be “Scan Sample” with OK highlighted.
23. Place the adapter directly onto the sample. Take care to keep sample flat with adapter, not allowing any stray light to enter. Press OK button.
24. The i-LAB will start to acquire data and the LEDs will turn on and off- the screen will be dark with occasional flashes of light. Measurement is completed when the screen stays on and presents the CIE measurements results to the screen.
25. Respond to each output result seen on the screen with a Press of the OK button.
26. The results data will not be saved to the log until all the results have been responded with a Press of the OK button and the screen stays on saying i-LAB Ready and **CIEXYZ_SR** is highlighted.
27. The log is saved under a number in the upper right hand screen and will have the time and date, also recorded. The measurements and spectra numbers from 400 nm to 700 nm are saved.

Liquids- using the Round Vial Adapter:

Backg_RV – Measures and save background color for the Blank reference sample and the Black reference sample.

CIEBackg_RV – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_RV**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.

CIEXYZ_RV – Measures sample and compares with background sample (Blank sample). The background method **CIEBackg_RV** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_RV** and **CIEBackg_RV** must have been previously run.

(CIE uses a D65 light source and 10° observer angle for the CIE-LAB calculations)

BackgLAB_RV – Measures and saves the Blank reference sample. This method used the spectra obtained using **Backg_RV**. This method also performs and stores the CIE-LAB calculations on the Blank reference sample.

LabXYZ_RV – Measures sample and compares with background sample (Blank sample). The background method **BackgLAB_RV** is first used to generate the background spectrum and CIE calculations for this Blank reference sample. For this method to operate properly the method **Backg_RV** and **BackgLAB_RV** must have been previously run.

(Lab uses a C light source and 2° observer angle for the CIE-LAB calculations)

sRGB_RV – Measures sample and outputs it in terms of Red, Green, and Blue values. This method uses **BackgLAB_RV** calculated values and Blank reference spectrum. For this method to operate properly the method **Backg_RV** and **BackgLAB_RV** must have been previously run.

QAStd_RV – Measures and saves up to 5 library spectra that can be used by **QASmp_RV**. This method used the reference Blank and Black samples generated from the method **Backg_RV**.

QASmp_RV – Measures a sample, compares with library spectra generated by **QAStd_RV** and gives best fit with R^2 correlation. For this method to operate properly the method **Backg_RV** and **QAStd_RV** must have been previously run.

Instructions for Surface reader Usage:

1. Remove the i-LAB protector cap. Place surface reader adapter onto i-LAB neck with “i-LAB” logo facing forward. Firmly, snap into place.

Getting a Calibration and Background:

2. Turn i-LAB on (center top OK button)
3. If the display is not highlighting a method – With the top of the screen displaying “METHOD”, then press MENU button and scroll (with scroll up and down buttons) to “Method” and Press OK button to access the Methods Menu.
4. In the Methods Menu, scroll (with scroll up and down buttons) until on **Backg_SR**
5. Press OK button- i-LAB Ready should display with highlighted **Backg_SR**.
6. Press OK button- “Scan Blank Sample” will appear with **OK** highlighted
7. Place adapter on the sample to be measured. This sample should be a “White” sample. Take care to keep sample flat with adapter, not allowing any stray light to enter around the contact area.
8. Press OK
9. The i-LAB will start to acquire Calibration data (Calibrating) and the LEDs will turn on and off- the screen will be dark with occasional flashes of light.
10. The program will stop and request that you change samples. It will ask you to “Scan Black Sample” with **OK** highlighted. Place the Surface reader adapter head into the “Black Hole” end of the Adapter accessory that was supplied with the Surface Reader Adapter. This is the totally Black sample that is used for this calibration step.
11. Press OK button.
12. The i-LAB will start to acquire data (Acquiring) and the LEDs will turn on and off- the screen will be dark with occasional flashes of light.
13. Measurement is completed when the screen stays on and it says i-LAB Ready and **Backg_SR** is highlighted.