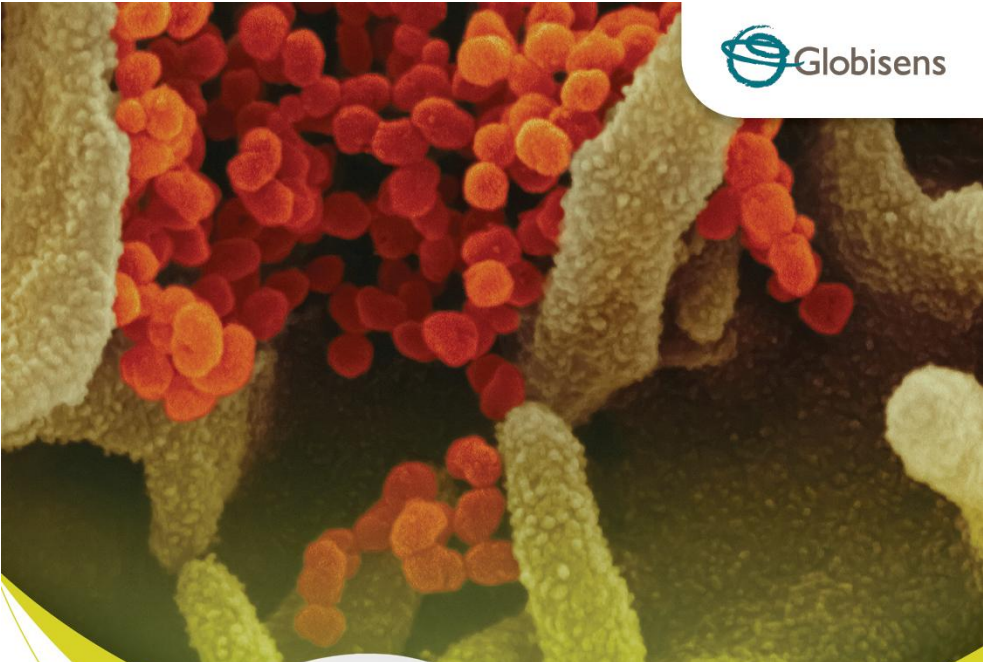
Globisens



Labdisc™ BIOCHEM

For biology, chemistry and biochemistry

LABDISC BIOCHEM
+ GLOBILAB SOFTWARE

QUICK START GUIDE

Contents

1. Labdisc Hardware Overview

1.1 What's in the Pack

① **Labdisc** data logger
② **Labdisc** AC charger
③ USB cable
④ Software flyer
⑤ Quick Start Guide
⑥ Air pressure tube
⑦ Temperature probe
⑧ Colorimeter 5 cuvettes set
⑨ pH electrode
⑩ Conductivity electrode
(Must be ordered separately)
⑪ Dissolved oxygen electrode
(Must be ordered separately)
⑫ Heart rate ear clip
⑬ Thermocouple

1.2 Ports and Controls

The picture below reviews the **Labdisc** ports, sensors, keypad and display:

① Select key

② On/Off and Escape key

③ Scroll key

④ Graphical display 128 x 64 pixels

⑤ Sensor selection keys

⑥ MS screw insert

⑦ Plastic leg

⑧ Rotating ring

⑨ USB port

⑩ GPS

⑪ Colorimeter & turbidity

⑫ Relative humidity

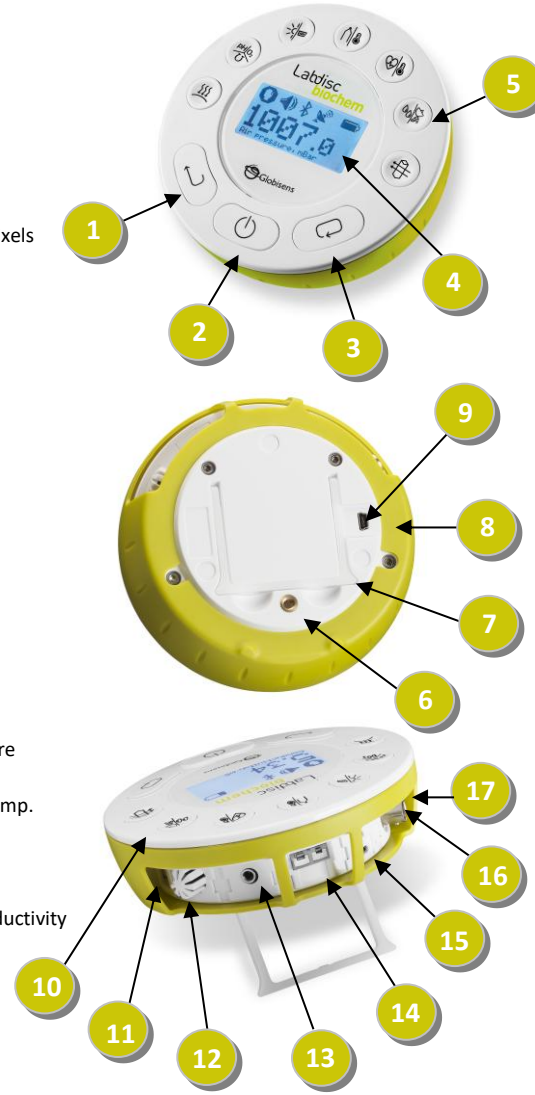
⑬ Heart rate & ext. temperature

⑭ Thermocouple & ambient temp.

⑮ Light & universal input

⑯ pH, dissolved oxygen & conductivity

⑰ Air pressure



1.3 Built-in Sensors

Icon	*Type*	*Range*	*Description*	*Max. Sample Rate*	*External Accessories (supplied with Labdisc)*
	Air pressure	10 to 300 kPa	Measuring air pressure	10/s	 Plastic tube
INT.	Ambient temp.	-10 °C to 50 °C	Measuring ambient temperature	1/s	Not required
	Barometric pressure	500 to 1100 mB	Measuring barometric air pressure	1/s	Not required
	Colorimeter	10 - 90 % transmittance (3 colors)	Measuring solution transmittance in 3-light wavelength: Red, Green, Blue	1/s	 Cuvette set
	Conductivity	0 to 20ms	Measuring solution conductivity	10/s	 Conductivity electrode
DO_2	Dissolved oxygen	0 to 14 mg/l	Measuring distance	10/s	 Dissolved oxygen electrode
	External temp.	-25 °C to 125 °C	General purpose stainless steel temperature probe	100/s	 Temp. probe

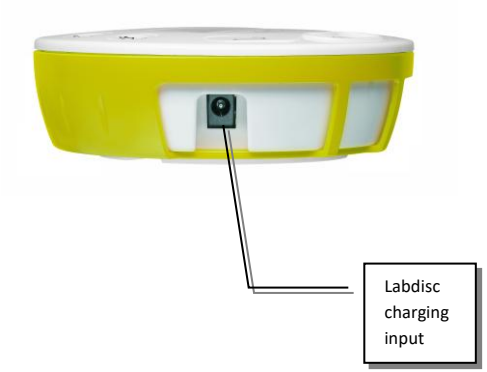
GPS	GPS	N/A	Measuring 6 different parameters: Longitude, latitude, course, speed, date and time	1/s	Not required
	Heart rate	0 to 200 bpm	Measuring heart rate	100/s	 Ear clip
	Light	0 to 55,000 lux	Measuring light level	1000/s	Not required
pH	pH	0 to 14 pH	Measuring pH level	10/s	 pH electrode
	Relative humidity	0 to 100% RH	Measuring relative humidity	1/s	Not required
	Thermocouple	-200 °C to 1,200 °C	Measuring a wide range of temperature	25/s	 Thermocouple K probe
	Turbidity	0 to 1000 NTU	Measuring water turbidity level	1/s	 Cuvette set
	Universal input	0 to 5 V	Connecting Fourier or Vernier analog sensors	100,000/s	Universal input adapter cable

1.4 Using the Labdisc

CHARGE THE LABDISC BATTERY BEFORE STARTING

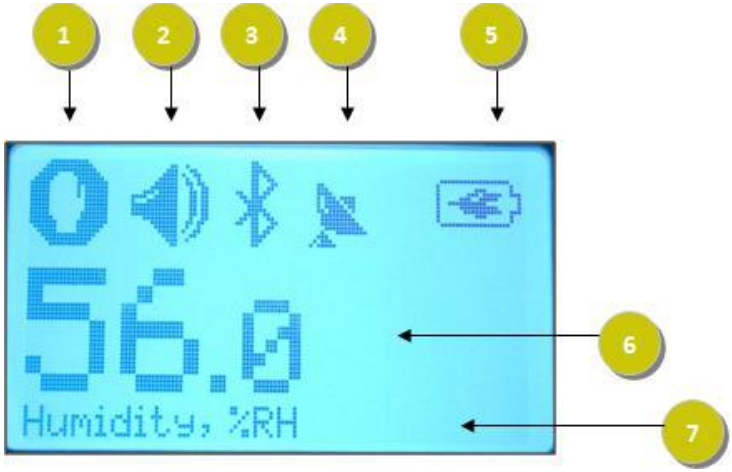
Before working with the **Labdisc** for the first time, the unit should be charged for six hours with the supplied 6 V charger. The **Labdisc** charging input is located to the left of the ***On/Off*** key. Simply rotate the orange ring until the charging input on the **Labdisc** is exposed and then connect the charger plug to the charging input.

The **Labdisc** charger will accept any input voltage ranging from 100 to 240 VAC 50/60 Hz, making it functional worldwide.



1.4.1 Labdisc display

The **Labdisc** LCD display allows users to see the different sensor readings and to setup or re-configure the Labdisc parameters.



① **Run/Stop icon** – shows  when the **Labdisc** is logging data, or  when the Labdisc is not logging sensor data.

② **Sound Status** – shows  active sound beep when the key is pressed and  when the sound beep is disabled.

③ **Communication Status** – shows  when Bluetooth communication is enabled, or  when the USB cable is connected from the host computer to the **Labdisc**.

④ **GPS Status –** shows  when the GPS is enabled,  when locked to GPS satellites and provides valid positioning parameters.

⑤ **Battery Level** – shows battery capacity at 3 levels  , or  when the **Labdisc** is connected to the external charger.

⑥ **Sensor Value** – shows the selected sensor value.

⑦ **Sensor Name and Unit** - shows the selected sensor name and unit.

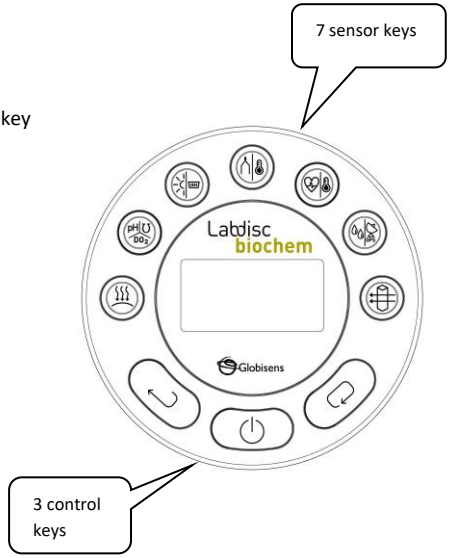
1.4.2 Labdisc keys

The Labdisc 10 keys are divided into 7 sensor keys and 3 control keys. Using the sensor keys users can select and view different sensor readings. The control keys are used to turn on/off the **Labdisc**, setup the device for the next logging session and cofigurate all its parameters. The 3 control keys are:

Select key

On/Off and ***ESC*** key

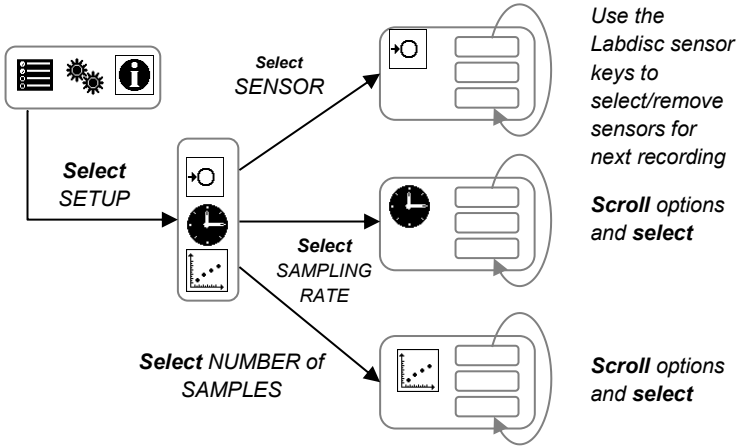
Scroll key



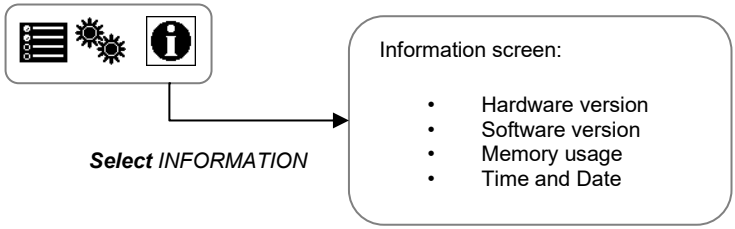
1.4.3 Labdisc menu

Press the ***scroll*** key to enter the Labdisc menu. Then use the ***scroll*** key to scan the menu options, the select key to choose a menu option and the ***ESC*** key to go one level up in the menu.

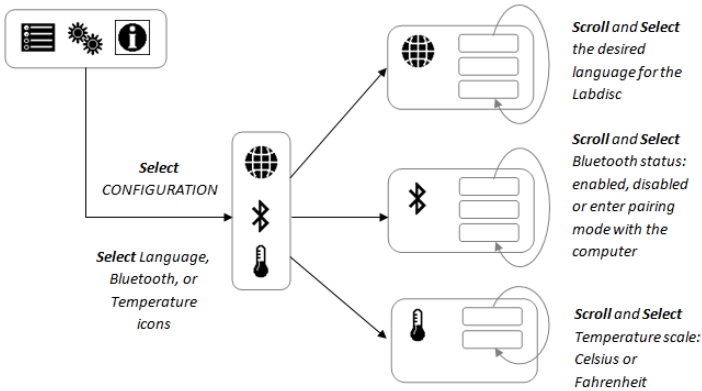
1.4.3.1 Setup the Labdisc for the next logging session



1.4.3.2 Labdisc information



1.4.3.3 Configuration of the Labdisc



2. Globilab X Analysis Software

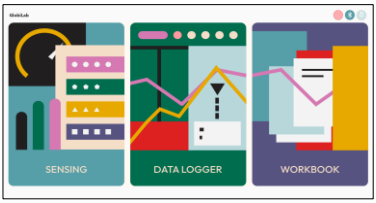
2.1 Software Installation

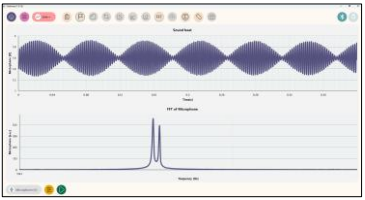
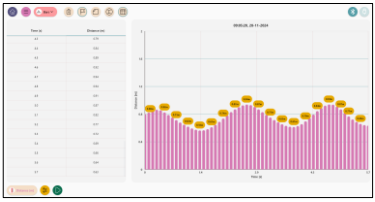
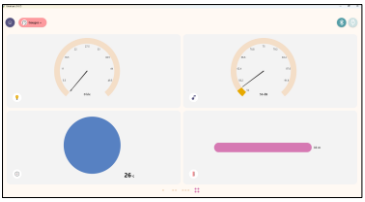
Our **GlobiLab X** software is available on Globisens website for free download. Simply go to: https://globisens.net/support/downloads/ and choose the software version you like to download.

- For PC: GlobiLab X MSI installation for WINDOWS
- For Mac: GlobiLab X installation for MAC

Alternatively, you may use GlobiLab X installation free web version at: www.globilab.com or the GlobiLab X iOs and Android versions in both App store and Google play store

2.2 Software Functions

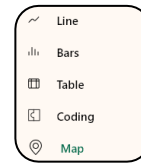


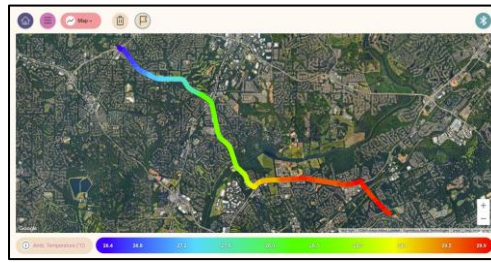
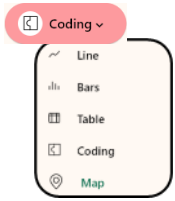
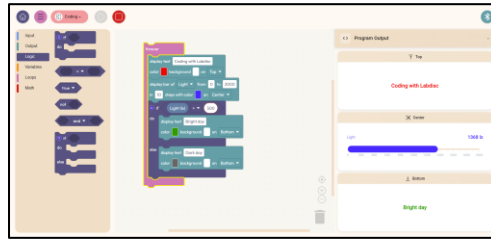




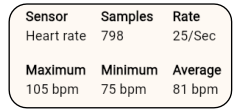
2.3 Software Icons and their Functions

	*GlobiLab X open screen – allowing users to navigate between:* • ***SENSING*** *– variety gauges display showing the current values of the Labdisc sensors.* • ***DATA LOGGER*** *– fully featured data collection and graphic analysis software.* • ***WORKBOOK*** *- a collection of experiment guides, divided into science subject: Biology, Chemistry and Physics.* 
	Communicating with the Labdisc is done either by Bluetooth or USB. ***USB*** *– connect the Labdisc to the computer and click on the GlobiLab X top right USB icon. The USB icon turns green and the Labdisc is connected.*  ***Bluetooth*** *- click Globilab X Bluetooth icon. A dialog box opens listing all near-by Labdisc units. Select your Labdisc, by clicking on* ***Labdisc_XXXX****, where XXXX represent the last 4 digits of your Labdisc Serial number. Bluetooth icons turns green and the Labdisc is connected.*  *For more details on communicating with the Labdisc – please refer to chapter 3 in this manual.*

	*Select **SENSING** to view Labdisc sensors as gauges or Bar graph. Use the display type icon*  *to switch between Gauges and Bar Graph.* ***Gauges** – clicking on any of the gauges to select different sensor or different gauge type for this display. Click on the bottom*  *to view 1,2,3 or 4 gauges.* ***Bar Graph** – use the bottom left icon*  *to select a sensor. Then click*  *to view a Bar graph for this sensor.*
	*Select the **DATA LOGGER** to collect sensors data, view them as graphs, tables, bar graphs and even as a layer of data over Google Map.* ***DATA LOGGER icons are explained below:***
	*Setting up the Labdisc is done by selecting the **SETUP** icon*  *at the bottom left of the DATA LOGGER screen. The software will open a dialog box, where you can select/remove sensors, set the sampling rate and the amount of samples for the next data recording.*
	Click the PLAY icon  to start data collection.
	Click the STOP icon  ends the current data collection session.
	Change *the Active Sensor*, sensor color, or choose between sample or line graph by using the bottom right ***Graph Setting*** icon  . Selecting an ***Active Sensor*** will set the Y axis for this sensor and have all graph analysis functions working on that sensor.

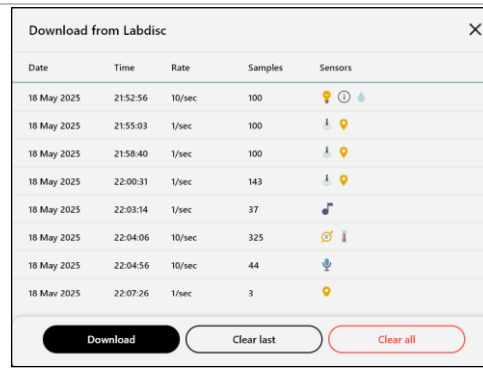
<table>
<tr>
<td> 
</td>
<td>Use the Display Type to alternate the graphic window between Line graph, Bar graph and Table views.
 

If GPS is one of the sensors used in the recording – the Display Type offers a 
 MAP view option – using Google MAPs. Selecting this option - opens Google MAPS and shows sensors data as a layer of color-coded icons over the map.
  </td>
</tr>
<tr>
<td> 
</td>
<td>The Coding window offers a set of Coding blocks – allowing users to build a set of commands – taking any of the Labdisc sensors and through a set of if/then, loops and other commands – create a code that displays text, sensor values or any other variable on the GlobiLab X screen. Use  to move between Blocks<->Python views.
  </td>
</tr>
</table>

	Use Markers to get the X,Y coordinates of any point on the graph.  Selecting the ***MARKER*** icon activates Marker mode. When in Marker mode – clicking on any point of the graph will place a graph marker. You may click and hold the Marker black point to drag it to a different graph point. It's possible to place up to two markers. Clicking on the Marker text box, allows you to delete it or have it pinned to a graph point. Click the marker icon again to leave this mode.
	Use annotation to annotate the graph with texts and pictures.  Selecting the ***ANNOTATION*** icon activates Annotation mode. When in Annotation mode – clicking on any point of the graph will place an annotation icon on the graph. Clicking the Annotation icon again exits the Annotation mode.
	Click the ***CROP*** icon  to cut the data outside the markers area. Crop function is active only when there are 2 markers on the graph.
	***STATISTICS*** provides useful information about the graph and the active sensor. Click Statistic icon to view the Sensor type, amount of samples, sampling rate and the min, max and average for that sensor. 

	Clicking any of these ***FUNCTIONS*** allows the user to apply the mathematical functions to the graph. All functions work between 2 graph markers:  Selecting the ***Linear regression*** will display the best linear line that fits the graph between the locations of two markers. Next to the line the software will open a small text box displaying the linear line equation: Y= aX+b.  Selecting the ***Quadric regression*** will display the best parabolic line (2nd degree) that fits the graph between the locations of two markers. Next to the line the software will open a small text box displaying the parabolic line equation: $Y= aX^2+bX+c$.  Selecting ***Derivative*** will create a derivative graph of the active sensor data.  Selecting the ***FFT*** will split the graphic display and show the original measurement on a time scale in the top graphic window, and its harmonics, on a frequency scale in the bottom graphic window.
	 Selecting ***Average*** will replace the graph with an average graph. Each point in the average graph is made from an average of X samples before and X samples after this point. This function is useful in case the graph is very noisy. A dialog box will allow you to select the X (between 3 to 11)
	 Using this ***TABLE*** icon will open a table to the left of the line graph or bar graph windows, allowing users to view simultaneously graphs and numeric data.

	Before running an experiment, you can add a ***PREDICTION*** line to your graph in Line Graph mode. To do so, click on this pencil icon  . • Check/change your Y-Axis to make sure it is at a range you would expect. • Go into your Experiment Setup and choose a number of samples corresponding to the length you want for the X-Axis. Then, select a point on the graph. Click a second point on the graph and a straight line will be drawn between them. As you add additional points, the line will smooth between all provided points. When you click play, your sensor readings will be added to the same screen so you can see your prediction and your actual data on the same graph.
	Clicking on the ***HUNBURGR*** icon  opens a dialog box allowing you to ***Save*** experiments, ***Open*** saved experiments and directly export all data to ***EXCEL***. In addition, with the ***Add*** option you may open an additional saved graph, in the same graphic window – allowing you to compare two or more measurements graphs.  Last but not least – you may access the Labdisc 1,000,000 measurements memory, by clicking the ***Download from Labdisc.*** This opens the below dialog box – allowing you to download any of the stored recording, clear the Labdisc last recording or all recordings.


Download from Labdisc
Date
Time
Rate
Samples
Sensors
18 May 2025 21:52:56 10/sec 100
18 May 2025 21:55:03 1/sec 100
18 May 2025 21:58:40 1/sec 100
18 May 2025 22:00:31 1/sec 143
18 May 2025 22:03:14 1/sec 37
18 May 2025 22:04:06 10/sec 325
18 May 2025 22:04:56 10/sec 44
18 May 2025 22:07:26 1/sec 3
Download
Clear last
Clear all

3. Labdisc – GlobiLab X Communication

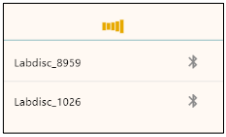
3.1 Connect the Labdisc through a USB cable

- Connect the USB cable between the Labdisc rare Mini-USB socket, and your computer.
- Open the GlobiLab X software and click the most right top icon .
- The Labdisc will make a beep sound and will connect to the software.
- The USB icon turns green indicating: successful connection with the Labdisc.

3.2 Bluetooth Wireless Communication

All Labdisc units produced in 2025 and after are using BLE (Bluetooth Low Energy) radio. Older units are using Classic Bluetooth radio. Note: the first 4 digits of every Labdisc Serial Number indicates the production year.

3.2.1 Connect a Labdisc BLE unit



- Open GlobiLab X software.
- Click the top right Bluetooth icon .
- A dialog box opens listing all near-by Labdisc.
- Select your Labdisc, by clicking the ***Labdisc_XXXX***, where ***XXXX*** represent the last 4 digits of your Labdisc Serial number.
- The Bluetooth icons turns green and the Labdisc is connected.

3.2.2 Connect Labdisc Bluetooth Classic unit

When using the **Labdisc** for the first time - it should be added as a Bluetooth device to the computer in a process called pairing. Pairing need be done only once for each **Labdisc**, after which the computer stores the connection information, including a unique name for each **Labdisc**.

Pairing steps:

- Turn on the Labdisc.
- Go to your computer Bluetooth Devices menu and click ***Add a Bluetooth device***.
- The computer opens the "add a device" dialog box and starts scaning for near-by Bluetooth devices.
- Your Labdisc will be displayed as "***Labdisc-xxxx***", where "***xxxx***" are the last four digits of the Labdisc serial number. Click on your Labdisc.
- On the Labdisc: Press and hold the Scroll key for 3 seconds.
- The Labdisc will produce a long "beep" while its screen shows "***BT pairing***"
- On your computer: enter the device pairing code: ***1234*** and click Next.
- Wait for the computer to finish the process and announce "***Your device is ready to use***"

Your Labdisc is now paired with your computer. From now on it can connect and communicate with the Globilab X software, using the same procedure as the BLE device (see paragraph 3.2.1)

3.2.3 Communicating with Globilab X web version

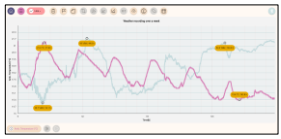
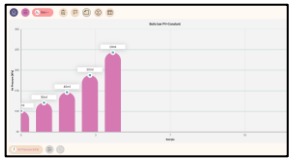
When using the Globilab X version at www.globilab.com users have to select the type of Bluetooth radio their Labdisc is using.

Selecting the radio type is done using the ***CONFIGURATION*** window. Click the Configuration icon  . A dialog box opens. You'll find the Bluetooth Radio at the bottom of the dialog box. Choose between ***Classic*** and ***BLE***.

GlobiLab default is ***BLE***.

4. Experiments samples

The GlobiLab software includes experiment samples, for teachers and students to view, analyze, modify or repeat. In this section some interesting GlobiLab recorded experiments are reviewed. To open a recorded experiment, simply click the Hamburger icon ☰, then Open.

	**Temperature over a week** Recording temperature and humidity over one week at the school yard. • ***Sensors selected:*** External temperature, relative humidity • ***Sampling rate:*** 1/min • ***Amount of samples:*** 10,000 • ***Experiment duration*:** one week • ***Communication:*** Offline, data down-loaded at recording's end • **Data Analysis:** Show temperature and humidity changes on a line graph
	**Boyle's Gas Law** Verifying the ideal gas law: P x V = CONSTANT. Using a 100ml syringe connected to the air pressure sensor. Manually recording air pressure while decreasing the syringe volume by 10ml at a time. • ***Sensors selected:*** Air pressure • ***Sampling rate:*** Manual • ***Amount of samples:*** 10 • ***Communication:*** Online, preferably via wireless Bluetooth • ***Data Analysis:*** Use ***Bar-Graph*** view to see air pressure values***.*** Use ***Annotation*** to add the volume for each bar and ***Export to Excel*** to calculate P x V multiplication.

The FCC Wants You to Know:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

a) Reorient or relocate the receiving antenna.
b) Increase the separation between the equipment and receiver.
c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
d) Consult the dealer or an experienced radio/TV technician.

FCC Warning

Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules.

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

INSTRUCTIONS CONCERNING HUMAN EXPOSURE TO RADIO FREQUENCY ELECTROMAGNETIC FIELDS

A distance of at least 20cm. between the equipment and all persons should be maintained during the operation of the equipment.

GlobiLab X supports Android versions 4.0 and up.

Made for iPad. iPad is a trademark of Apple Inc., registered in the U.S. and other countries.

“Made for iPad” means that an electronic accessory has been designed to connect specifically to iPod, iPhone, or iPad, respectively, and has been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards. Please note that the use of this accessory with iPod, iPhone, or iPad may affect wireless performance.