

Heart Rate/Pulse Sensor DT155A

(for EcoLog XL)



The easiest way to measure heart rate is using the Heart Rate sensor.

Heart Rate sensor monitors the light level transmitted through the vascular tissue of the fingertip and the corresponding variations in light intensities that occur as the blood volume change in the tissue.

The ease of use makes it possible to measure everyone's heart rate, even in larger classes.

The Heart Rate sensor measures heart rate between 0 and 200 bpm (beats per minute).

The sensor consists of Fourier Systems sensor case (DT155) and an ear clip (DT159).

Note: This product is to be used for educational purposes only. It is not appropriate for medical or research applications. **Specifically, it should not be used for patient diagnosis.**

Typical Experiments

- Comparing the heart rate of different individuals
- Comparing the heart rate of athletes and sedentary people
- Checking a person's heart rate before and after brief vigorous activity (such as doing jumping jacks)
- Checking a person's heart rate before and after caffeine consumption

How it Works

Unlike an electrocardiograph (EKG) which monitors the electrical signal of the heart, the Heart Rate sensor measures heart rate by monitoring the change in infrared transmittance through blood vessels. As the heart forces blood through the blood



vessels, the amount of blood changes with time and the corresponding variation in light intensities changes.

By plotting this signal, the heart rate can be determined, and some details of the pumping action of the rate can be seen on the graph. A sample graph is shown later in this data sheet.

Sensor Specification

Range:	0 – 5 V
Waveform resolution:	5 mV
Max. Sampling Rate:	50 samples/sec
Data Logger Input Type:	Digital

Technical Notes

- Best measurements are done on a fingertip.
- Reposition the Heart Rate clip until you see a smooth heart rate pattern or an approach pulse graph.
- Remain calm with no talking or erratic breathing to obtain accurate readings.
- To meaningfully measure heart rate, the user should wait approximately five seconds to allow the sensor to settle.
- Don't use the sensor in very bright light surroundings.

Equipment List – DT155A

Heart Rate sensor and Ear Clip DT155A

Heart Rate sensor DT155

Ear Clip DT159


Calibration

The Heart Rate sensor requires no calibration.



How to use the Heart Rate sensor

- Plug the ear clip into the sensor's case
- Connect the clip to the earlobe or to a fingertip

Using the Heart Rate/Pulse Sensor with EcoLog XL and EcoLab Software


1. Connect EcoLog XL to the computer.
2. Connect the Heart Rate/Pulse sensor to the EcoLog XL's sensor input (starting from I/O-1). The sensor is automatically recognized by the EcoLab software.
3. If EcoLog XL is running in one of its stand-alone modes, press the **Stop**  button on the EcoLog XL front panel.
4. Launch EcoLab.
5. In the **Setup** window deactivate the internal sensors by clicking the button next to the sensors' icon and program the EcoLog XL's sample rate and the recording time.

To begin online recording


1. Click **Run**  on the main toolbar.
2. EcoLab automatically opens a graph window displaying the data in real-time, plotting it on the graph as it is recorded.
3. You can stop recording at any time by clicking **Stop**  on the toolbar.

To conduct remote recording

For remote logging it is necessary to send the setting to EcoLog XL before disconnecting from the computer.

1. In the Setup window deactivate the internal sensors by clicking the button next to the sensors' icon and program the EcoLog XL's sample rate and the recording time.
2. Click **Send Setup**  on the main tool bar, wait until you will see the following message on the EcoLog XL screen:


Remote logging
Waiting for Go

3. Disconnect the EcoLog XL from the computer, place the EcoLog XL at the desired recording location and press the **Go**  button on the EcoLog XL front panel.


To download data that was recorded offline

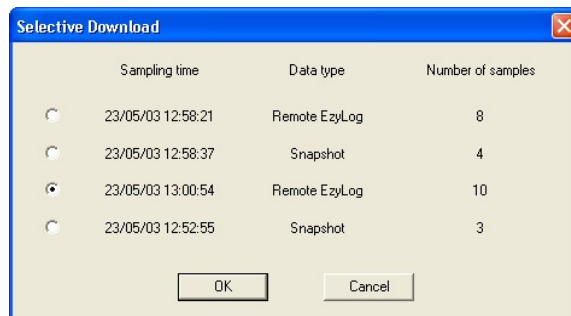
EcoLog XL always stores the last four experiments. To download data that was recorded offline, or while EcoLog XL was not connected to the computer:

1. Connect the EcoLog XL to the computer and if EcoLog XL is collecting data,

click **Stop**  to end collecting and to return to the main menu.

2. Launch EcoLab.

3. Click **Download**  on the main toolbar to open the **Selective Download** dialog:



The dialog contains details of the stored experiments: the starting time and date, the logging mode and the number of samples taken.

4. Click an option to select the experiment you wish to download, and then click **OK**. This will start the Post-experiment Data Transfer communication mode. Once the transfer is complete, the data will be displayed automatically in the graph window and in the table window.

An Example of using the Heart Rate Sensor

Monitoring heart waveform

Below is a typical graph showing data obtained using a Heart Rate sensor:

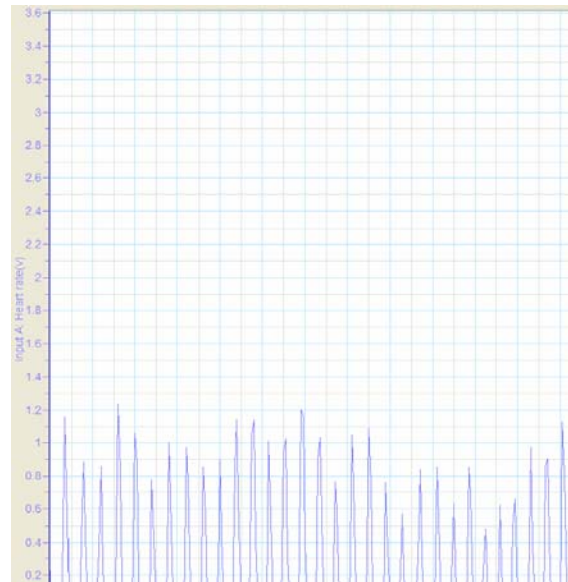


Figure 1: Monitoring heart rate waveform

Technical Support

Please contact Fourier technical support as follows:

Web: http://www.fourier-sys.com/support_support.html

Email: support@fourier-sys.com

Consult the FAQs before contacting technical support:

http://www.fourier-sys.com/support_faq.html

Copyright and Warranty

All standard Fourier Systems sensors carry a one-year warranty, which states that for a period of twelve months after the date of delivery to you, it will be substantially free from significant defects in materials and workmanship.

This Warranty does not cover breakage of the product caused by misuse or abuse.

This Warranty does not cover Fourier Systems consumables such as electrodes, batteries, EKG stickers, cuvettes and storage solutions or buffers.