

Heart Rate (Exercise) Sensor DT298A



The Heart Rate (Exercise) sensor can be connected to the Nova5000, MultiLogPRO or TriLink data loggers.

The Exercise Heart Rate Sensor is ideal for determining the heart rate of active people by measuring the heart rate **before, during and after exercise**.

The sensor is comprised of a wireless transmitter belt and a Pulse Receiver module that plugs into the Nova5000, MultiLogPRO or TriLink data loggers. Similarly to the EKG, the Exercise Heart Rate Sensor, specifically the transmitter belt, senses the electrical signals generated by the heart. Every heart beat sends an electrical signal to the Receiver module, enabling the heart rate to be determined.

Typical Experiments

- Comparing and evaluating heart rates of different individuals
- Comparing and evaluating the heart rate of athletes versus inactive individuals
- Monitoring the heart rate before, during and after brief vigorous activity (e.g. push ups)
- Monitoring the speed at which the heart rate returns to normal following exercise (recovery rate)

How it Works

The transmitter belt is worn just below the chest and held in place by an elastic strap. As mentioned, the plug-in receiver connects to the Nova5000, MultiLogPRO or TriLink. Two electrodes sense the electrical signals detected by the transmitter. Using a low frequency electromagnetic field, at ECG accuracy, the information is then transmitted to the plug-in pulse receiver wirelessly. The receiver then passes a 5 Volt pulse for each heart beat detected to the data logger. The reception range of the plug-in receiver is 80 cm or about 3 feet.



Sensor Specification

Range for MultiLogPRO or TriLink	
Waveform:	0 – 5 V
Pulse:	0 – 200 bpm (beats per minute)
Range for Nova5000	
Pulse:	0 – 200 bpm (beats per minute)
Transmitter Range:	80 cm
Waveform Resolution (12-bit):	1.25 mV
Max. Sampling Rate:	100 samples/sec
Data Logger Input Type:	Digital

Technical Notes

- The transmitter belt contains a non-rechargeable and replaceable battery, for up to 2,500 hours of wear or use.
- Ensure that the receiver is no more than 80 cm from the Heart Rate Monitor belt.
- To optimize signal reception, keep the receiver in a vertical orientation on the front of the body.
- The receiver must point to the transmitter in the Heart Rate Monitor belt.
- Remain calm with no talking or erratic breathing to obtain accurate readings.
- Using the sensor or belt around metal or electrical devices may interfere with measurement accuracy.
- Erratic measurements, or large reading fluctuations, such as a drop to 0 bpm or sudden increase to 200 bpm, indicate signal loss. The most common causes of signal loss are belt movement, inadequate electrode contact, improper sensor orientation, or the distance between the receiver and transmitter is larger than 80 cm.
- If signal loss occurs, rewet the electrodes, check electrodes contact (tighten the belt) and move the receiver closer to the transmitter.
- The Heart Rate Exercise sensor has to be connected only to the data logger's digital inputs which are the first or the second input for the MultiLogPRO or TriLink and all of the Nova5000's inputs.



Equipment List

Exercise Heart Rate complete set (transmitter, receiver and strap)	DT298A
Pulse Receiver only	DT298
T31 transmitter belt only	11634
Elastic strap only	11633

Calibration

The Heart Rate (Exercise) ships fully calibrated. No further calibration is needed.

Using the Heart Rate (Exercise) Sensor with the Nova5000 and MultiLab Software

1. Launch the MultiLab CE software.
2. Connect the egg-shaped Receiver module of the Pulse Receiver to the Nova5000's input (starting from I/O-1). The sensor is automatically recognized by the MultiLab software.
3. Attach one plastic end of the elastic strap securely to the transmitter belt.
4. The two electrode strips with a zigzag pattern on the back side of the belt must be made wet using four drops of saline solution.
5. Place the transmitter belt over the base of the rib cage. The belt should be directly on your skin. Be sure that the belt is in the right place by checking that the POLAR logo of the belt is centered. Pull the elastic strap to make sure it is fitted tightly.
6. Click **Setup** on the main toolbar and program the data logger's sample rate and number of samples. Click **Run** on the main toolbar to start the measurement.

Using the Heart Rate Sensor with the MultiLogPRO or TriLink and MultiLab Software



By default the MultiLab displays the Heart Rate graph in beats per minute (bpm).

1. Launch the MultiLab software.
2. Connect the Pulse Receiver to the MultiLogPRO or TriLink's input (starting from I/O-1). The sensor is automatically recognized by the MultiLab software.
3. Attach one plastic end of the elastic strap securely to the transmitter belt.
4. The two electrode strips with a zigzag pattern on the back side of the belt must be made wet using four drops of saline solution.

5. Place the transmitter belt over the base of the rib cage. The belt should be directly on your skin. Be sure that the belt is in the right place by checking that the POLAR logo of the belt is centered. Pull the elastic strap to make sure it is fitted tightly.
6. Click **Setup** on the main toolbar and program the data logger's sample rate and number of samples. Click **Run** on the main toolbar to start the measurement.

Selecting Waveform Graph

By default the MultiLab displays the Heart Rate graph in beats per minute (bpm). To display the waveform graph, use the Sensor Properties dialog:

1. Click **Setup Wizard**  on the main toolbar.
2. Click **Properties**  next to the Heart Rate sensor input.
3. Check the checkbox next to the desired option to select it.
4. Click **OK**.

Transmitter Belt Maintenance

- The transmitter belt can be washed with mild soap and a gentle brush. If the electrodes appear discoloured, the transmitter needs to be washed. Do not use any alcohol or a solvent based detergent. Salt that remains on the belt for long periods can cause an electrical short and reduce battery life.
- The transmitter's textile strap is removable and machine washable.
- The transmitter belt contains a non-rechargeable and replaceable battery, for up to 2,500 hours of wear or use.

An Example of using the Heart Rate Sensor

Monitoring both Heart Rate in bpm and Waveform

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

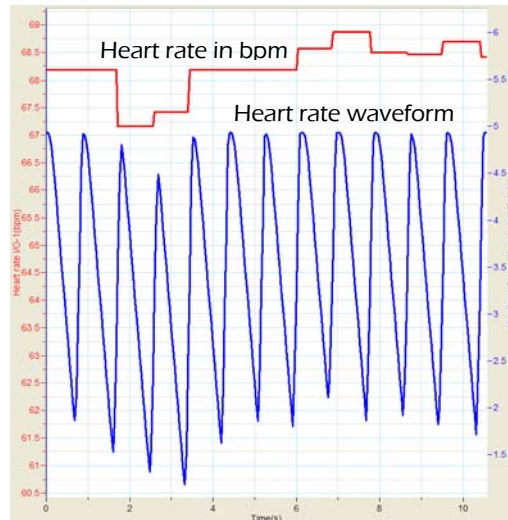


Figure 1: Monitoring both heart rate in bpm and waveform

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.