

Temperature (-25 °C to 110 °C) DT029



The Temperature sensor (-25 °C to 110 °C) can be connected to the Nova5000, MultiLogPRO or TriLink data loggers.

The Temperature sensor is a simple, durable, stainless steel sensor. It connects directly to the data logger using a standard mini-din cable. The Temperature sensor is covered with isolating material ensuring protection and is more durable than the classical glass thermometer, which it is designed to replace.

Due to the sensor's wide range (-25 °C to 110 °C), it can be used as a thermometer for experiments in Chemistry, Physics, Biology, Earth Science, Environmental Science and is mostly suitable for water and other chemical solution temperature measurements.

Typical Experiments

- Specific heat experiments
- Measuring freezing and boiling points
- Monitoring endothermic and exothermic reactions
- Investigating the Combined Gas Law
- Exploring loss of heat through sweat on the human body

How it Works

The Temperature sensor (-25 °C to 110 °C) connects directly to the data logger. The temperature sensing element receives an input voltage of 5 V and returns output voltage proportional to the measured temperature and between 0 to 5 V, which is the range accepted by the data logger Analog-Digital converter. The data logger then records the value into its memory.



Sensor Specification

Range for Nova5000:	- 25 °C to 110 °C - 13 °F to 230 °F 263 K to 383.15 K
Range for MultiLogPRO or TriLink:	- 25 °C to 110 °C - 13 °F to 230 °F
Accuracy:	±2 % over entire range
Resolution (12-bit):	0.03 °C
Default Sample Rate:	10 samples per second
Response Time (for 90% change in reading):	20 seconds in liquid 40-60 seconds in air
Sensing Element:	Located inside the sensor's tip
Recommended Sensor Usage:	Use only in mild chemical solutions. Do not place the sensor's cable in liquid. Do not place the sensor in a flame or on a hot plate.

Calibration

The Temperature sensor (-25 °C to 110 °C) requires no calibration.

Technical Notes

The Temperature sensor was designed only for educational purposes and shouldn't be used for industrial, medical, or research applications.

Using the Temperature Sensor with the Nova5000 and MultiLab Software

1. Launch the MultiLab CE software.
2. Connect the Temperature sensor to the Nova5000's sensor input (starting from I/O-1). The sensor is automatically recognized by the MultiLab software.
3. 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 Units

MultiLab displays the data in °C. To change the display to °F or to K:


1. Click **Logger** on the main MultiLab toolbar and then click **Preferences**.
2. Click the desired unit in the **Temperature unit** menu and then click **OK**.

Using the Temperature sensor with the MultiLogPRO or TriLink and MultiLab Software

1. Launch the MultiLab software.
2. Connect the Temperature sensor to the data logger's sensor input (starting from I/O-1). The sensor is automatically recognized by the MultiLab software.
3. 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 units

MultiLab displays the data in °C. To change the display to °F:

1. Click **Setup** on the main toolbar.
2. Click **Properties**  next to the Temperature sensor input.
3. Select the checkbox next to the desired temperature unit and click **OK**.

An Example of using the Temperature Sensor

Endothermic Reaction

An endothermic process is a chemical reaction in which heat is absorbed. When we perform an endothermic reaction in a flask, heat from the surroundings flows to the flask until temperature balance is established.

An example of measuring temperature changes occurring during endothermic reaction between citric acid solution and baking soda:

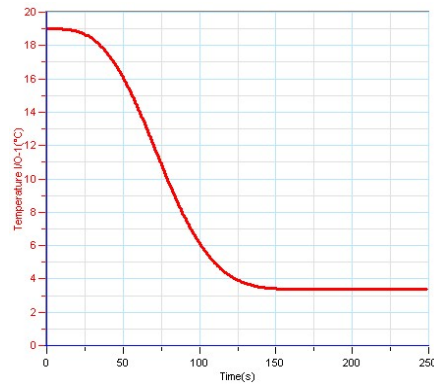


Figure 1: Graph of endothermic reaction

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.