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Turbidity Sensor

Product Number: ENTRB-A095



Overview

Water and other fluids contain small suspended particles of solid material, microscopic organisms and plankton, causing cloudiness. This is called Turbidity and is often used to determine the quality of water. The Turbidity Sensor measures the cloudiness of water.

The Turbidity Sensor can be connected to all types of einstein™ data loggers.

Typical experiments



Water Quality

- Comparing several water sources
- Studying water quality



Chemistry

- Measuring the formation of a precipitate

How it works

The material causing turbidity also interferes with light flow through the water. The sensor shines infrared light into the water. A detector is placed at a 90 degree angle from the light source and measures the amount of light deflected 90 degrees. This angle of deflection indicates that the light has hit a solid and therefore the more light hitting the detector, the greater the turbidity. The level of turbidity is measured in Nephelometric Turbidity Units or NTUs.

Sensor specification

Range:	0 – 200 NTU	1.
Accuracy:	20% over entire range	
Resolution (12-bit):	0.25 NTU	
LED Wavelength:	875 nm	
Standard:	Formazin 100 NTU	
Default Sample Rate:	10 samples per second	

Equipment List

The Turbidity Sensor comes equipped with:

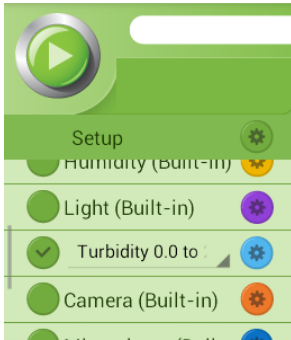
- The Turbidity Sensor
- Cuvettes
- DT-to-einstein™ sensor adaptor

The cuvettes hold the samples for the Turbidity Sensor. Lift the rubber flap on the back of the sensor and insert the cuvette. Then close the flap to ensure no outside light will interfere with readings. Now you're ready to run the experiment.

Data logging and analysis

MiLAB™

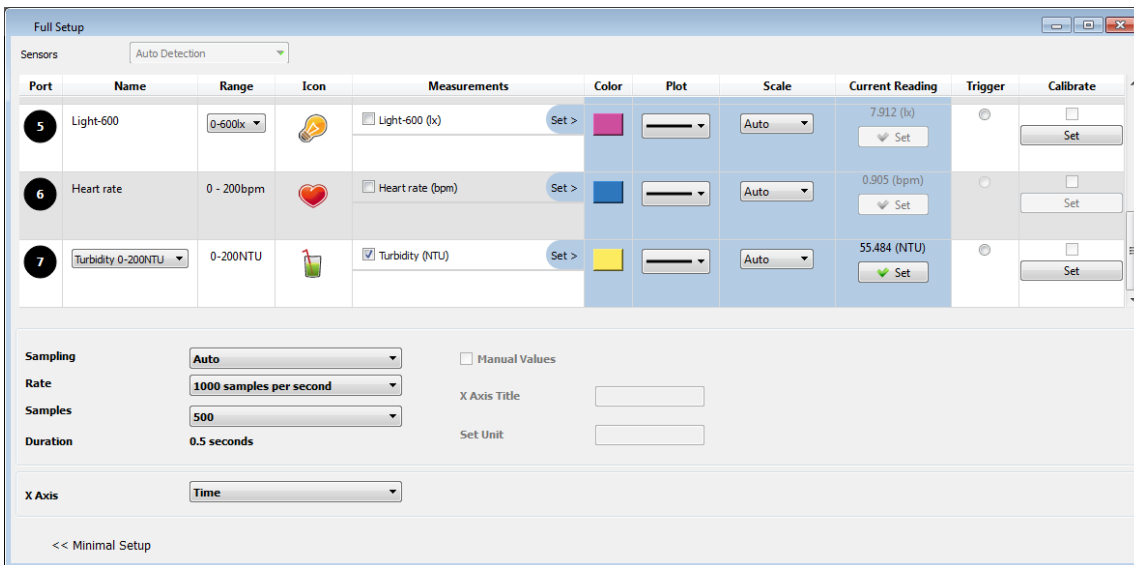
1. Take your einstein™ Tablet or pair your einstein™ LabMate™ with your Android or iOS tablet via Bluetooth
2. Insert the sensor cable into one of the sensor ports via the DT to einstein™ sensor adaptor
3. Launch MiLAB
4. In Launcher View, tap the box marked "Empty" and select Turbidity from the dropdown list




5. Make sure the sensor is selected () to enable it for logging

MiLAB™ Desktop

1. Pair your einstein™ LabMate with your PC, MAC, or Linux machine via Bluetooth, or connect it via the USB cable (found in the einstein™ LabMate™ box).
2. Insert the sensor cable into one of the sensor ports via the DT to einstein™ sensor adaptor
3. Launch MiLAB Desktop
4. Click on Full Setup in the Current Setup Summary Box
5. Scroll down to the box marked “Empty” and select Turbidity from the dropdown list



6. Click the Run button () on the main toolbar to start logging

Calibration

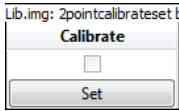
The Turbidity Sensor is shipped fully calibrated.

For more accurate measurements, recalibrate the sensor before measuring each sample:

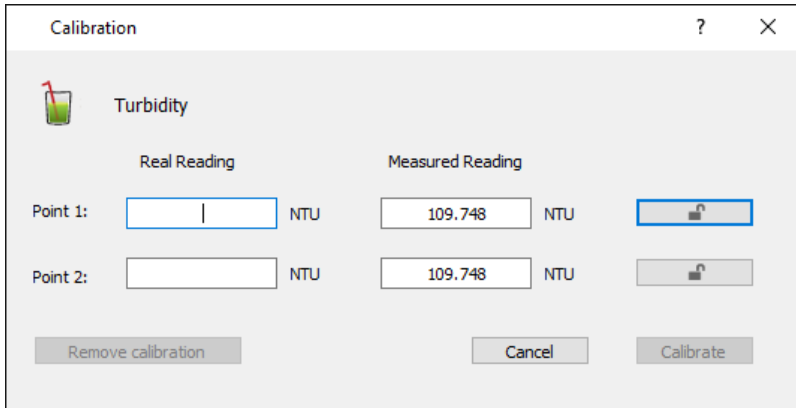
In order to calibrate the Turbidity sensor you will need at least two different Turbidity Standards (stocked by many suppliers of scientific equipment). The best Turbidity Standards range between 0 to 200 NTU.

Calibration – MiLAB™ Desktop

1. Go to the Full Setup window and in the Calibrate column click Set



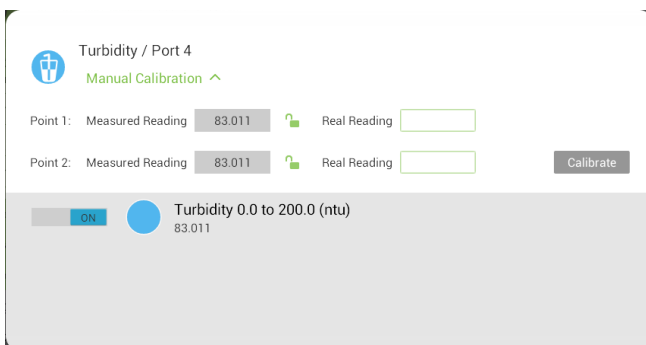
2. The Calibration window will appear




3. Fill a cuvette with one of the Turbidity Standards and enter the known value (e.g. 50 NTU) in the Point 1, Real Reading field
4. Insert the cuvette into the Turbidity Sensor.
5. Let the reading stabilize in the Point 1 Measured Reading field and click the lock icon
6. Fill a cuvette with a different Turbidity Standard and enter the known value (e.g. 100 NTU) in the Point 2, Real Reading field
7. Insert the cuvette into the Turbidity Sensor.
8. Let reading stabilize in the Point 2 Measured Reading field and click the lock icon
9. Click Calibrate

Calibration – MiLAB™

1. Tap the Setup button next to the sensor’s name
2. Tap Manual Calibration



3. Fill a cuvette with one of the Turbidity Standards and enter the known value (e.g. 50 NTU) in the Point 1, Real Reading field
4. Insert the cuvette into the Turbidity Sensor.
5. Let the reading stabilize in the Point 1 Measured Reading field and tap the lock icon
6. Fill a cuvette with a different Turbidity Standard and enter the known value (e.g. 100 NTU) in the Point 2, Real Reading field

7. Insert the cuvette into the Turbidity Sensor.
8. Let the reading stabilize in the Point 2 Measured Reading field and tap the lock icon 
9. Tap Calibrate

Note: For the most accurate results try to calibrate the sensor with one Real Reading under the expected results and one Real Reading over the expected results.

Note: Always fill the cuvette

Note: Always wipe down the outside of the cuvette with a lint-free cloth before inserting into the Turbidity sensor.

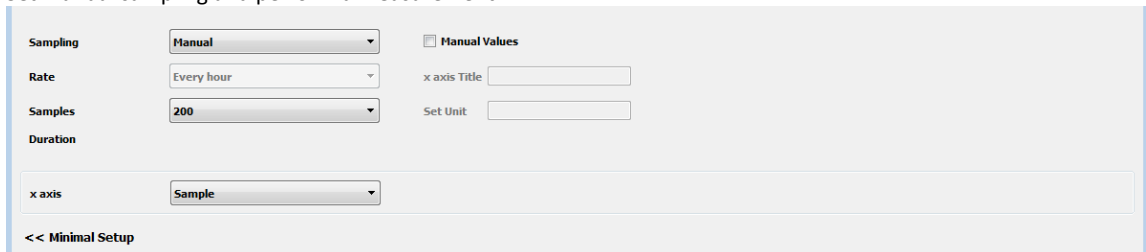
Note: Before measuring a sample, gently turn the cuvette over 4 times, do not shake the cuvette.

Example of using the Turbidity Sensor

Comparing Two Water Sources

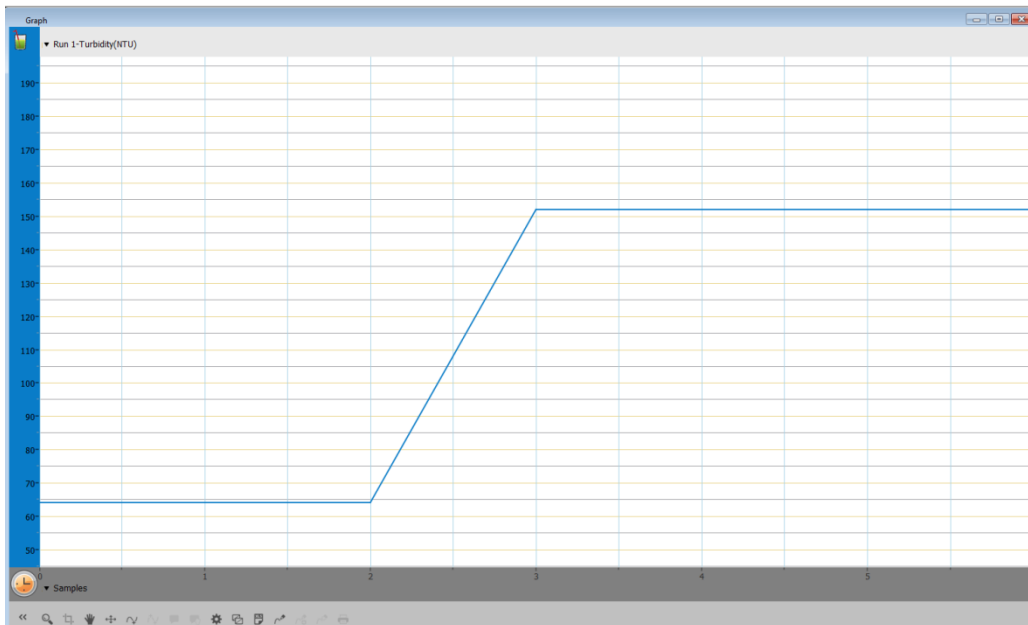
In this experiment we will compare the Turbidity of two different sources.

1. Calibrate the sensor as described above
2. Fill one cuvette with tap water
3. Insert the cuvette into the Turbidity Sensor
4. Set manual sampling and perform a measurement.



Sampling: Manual Values
 Rate: x axis Title:
 Samples: Set Unit:
 Duration:
 x axis:
 << Minimal Setup

5. Insert the cuvette into the Turbidity Sensor
6. Fill a cuvette with water from another source
7. Insert the cuvette into the Turbidity sensor and perform a measurement.



Technical support

For technical support, you can contact the Fourier Education's technical support team at:

Web: www.einsteinworld.com/support

Email: support@fourieredu.com
Phone (in the US): (877) 266-4066

Copyright and Warranty

All standard Fourier Systems sensors carry a one (1) 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.

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