

Vernier Products for Science with TI-Nspire Technology

All software and laboratory interfacing hardware required for the experiments contained in this book are available from Vernier Software & Technology and can be found in this appendix.

	Computer s	TI-Nspire handhelds
Multi-Sensor Data-Collection Interfaces		
TI-Nspire Lab Cradle The TI Interface is a low-cost data-collection interface that connects to the USB port of a computer or slide onto the back of a TI-Nspire handheld. The Lab Cradle has five sensor ports – three analog and two digital.	✓	✓
Single-Sensor Data-Collection Interfaces		
EasyLink EasyLink is a single channel interface that connects to the USB port of the TI-Nspire handheld. It supports over 40 analog sensors, including Gas Pressure, pH, and Conductivity.	Requires Mini-USB adapter*	✓
Go! Link Go! Link is a single channel interface that connects directly to the USB port on a computer. It supports over 40 analog sensors, including Gas Pressure, pH, and Conductivity.	✓	Requires USB-Mini adapter*
Direct Connect USB Sensors		
EasyTemp EasyTemp is a temperature probe with a mini USB connector that allows you to connect it directly to the USB port of a TI-Nspire handheld. It has stainless steel housing and a temperature range of -20°C to 110°C .	Requires Mini-USB adapter*	✓
Go! Temp Go! Temp is a temperature probe with a USB connector that allows you to connect the probe directly to a USB port of computer. It has stainless steel housing and a temperature range of -20°C to 110°C .	✓	Requires USB-Mini adapter
CBR 2 The CBR 2 motion detector collects distance, velocity, and acceleration data while connected directly to a TI-Nspire handheld. It can also be connected to TI-Nspire Lab Cradle (using MDC-BTD cable*). Range: 15 cm to 6 m	Requires Mini-USB adapter*	✓
Go! Motion The Go!Motion motion detector collects distance, velocity, and acceleration data while connected directly to the USB port of a computer. It can also be connected to TI-Nspire Lab Cradle (using MDC-BTD cable*). Range: 15 cm to 6 m	✓	Requires USB-Mini adapter

* Sold separately

Data-Collection Software

Computers

The Vernier DataQuest™ Application for TI-Nspire technology found in the TI-Nspire computer software running version 3.0 or newer.

TI-Nspire Handheld

The Vernier DataQuest™ Application for TI-Nspire technology is found in TI-Nspire handhelds running operating system 3.0 or newer.

Vernier Products for Science using TI-Nspire Technology

Item	Order Code
TI-Nspire Lab Cradle	TI-NSLABC
Vernier EasyLink	EZ-LINK
Vernier Go! Link	GO-LINK
CO ₂ Gas Sensor	CO2-BTA
Colorimeter	COL-BTA
Conductivity Probe	CON-BTA
Differential Voltage Probe	DVP-BTA
Dissolved Oxygen Probe	DO-BTA
Dual-Range Force Sensor	DFS-BTA
Gas Pressure Sensor	GPS-BTA
Hand-Grip Heart Rate Monitor	HGH-BTA
Light Sensor	LS-BTA
Low-g Accelerometer	LGA-BTA
Magnetic Field Sensor	MG-BTA
Microphone	MCA-BTA
Motion Detectors	
CBR 2	CBR2
Motion Detector	MD-BTD
Go! Motion	GO-MOT
pH Sensor	PH-BTA
Temperature Probes	
Easy-Temp	EZ-TMP
Go! Temp	GO-TEMP
Stainless Steel Temperature Probe	TMP-BTA
Vernier Circuit Board	VCB
USB-Mini Adaptor	USB-MINI
Mini-USB Adaptor	MINI-USB
CBR or Go!Motion to Lab Cradle cable	MDC-BTD

Vernier Sensors for Science with TI-Nspire Technology

CO₂ Gas Sensor	The CO ₂ Gas Sensor measures gaseous carbon dioxide levels. It has two settings: low range (0–10,000 ppm) and high range (0–100,000 ppm). This probe is great for measuring changes in CO ₂ levels during plant photosynthesis and respiration. With this sensor, you can easily monitor changes in CO ₂ levels occurring in respiration of organisms as small as crickets or beans! A chamber with probe attachment is included for running controlled experiments with small plants and animals.
Colorimeter	The four-wavelength (430 nm, 470 nm, 565 nm, and 635 nm) Vernier Colorimeter allows you to study the light absorption of various solutions. It is great for Beer's law experiments, determining the concentration of unknown solutions, or studying changes in concentration vs. time. Fifteen 3.5 mL cuvettes are included.
Conductivity Probe	This probe is great for environmental testing for salinity, total dissolved solids (TDS), or conductivity in water samples. Biology students can use it to investigate the difference between ionic and molecular compounds, strong and weak acids, salinity, or ionic compounds that yield different ratios of ions. The Conductivity Probe can monitor concentration or conductivity at three different sensitivity settings: 0–200 $\mu\text{S/cm}$, 0–2000 $\mu\text{S/cm}$, and 0–20,000 $\mu\text{S/cm}$.
Differential Voltage Probe	Use the Differential Voltage Probe to monitor voltages in low-voltage DC and AC circuits. The differential voltage range is $\pm 6\text{ V}$. This sensor works well for most “battery and bulb” circuits, or to explore series and parallel circuits.
Dissolved Oxygen Probe	Use the Dissolved Oxygen Probe to determine the concentration of oxygen in aqueous solutions in the range of 0–14 mg/L (ppm). It has built-in temperature compensation and a fast response time. This probe is great for water quality, biology, or ecology. Included with the probe is a zero-oxygen solution, two membrane caps, a 100% calibration bottle, and electrode filling solution. Replacement membranes are available (order code MEM).
Dual-Range Force Sensor	This low-cost force sensor has two ranges: –10 to +10 N and –50 to +50 N. It can be easily mounted on a ring stand or dynamics cart, or used as a replacement for a spring scale. Use it to study friction, simple harmonic motion, impact in collisions, or centripetal force.
Gas Pressure Sensor	The Gas Pressure Sensor can be used for a variety of experiments in biology where gases, such as oxygen and carbon dioxide, are either produced or consumed in a reaction. The pressure range is 0 to 2.1 atm (0 to 210 kPa). It comes with a variety of pressure-sensor accessories, including a syringe, plastic tubing with two Luer-lock connectors, two rubber stoppers with Luer-lock adapters, and one two-way valve.

Hand-Grip Heart Rate Monitor	The Hand-Grip Heart Rate Monitor is ideal for determining a person's heart rate while mobile or stationary. With this sensor, heart rate can be monitored during, as well as after exercise. The sensor consists of wireless hand grips and a receiver module that plugs into any of our data-collection devices. The hand grips sense the electrical signals generated by the heart, much like an EKG. For each pulse detected, a signal is transmitted to the receiver module, and the individual's pulse rate is calculated. The Hand-Grip Heart Rate Monitor includes one transmitter and one receiver.
Light Sensor	The Vernier Light Sensor approximates the human eye in spectral response and can be used over three different illumination ranges, selected with a switch. It can be used for inverse square law experiments or for studying solar energy.
Low-g Accelerometer	The Low-g accelerometer can be used to study one-dimensional motion in a car (real or toy), elevator, pendulum bob, or amusement park ride. The range is $\pm 50 \text{ m/s}^2$ or $\pm 5 \text{ g's}$
Magnetic Field Sensor	This sensor, which uses a Hall Effect transducer, is sensitive enough to measure the Earth's magnetic field. It can also be used to study the field around permanent magnets, coils, and electrical devices.
Microphone	The Vernier Microphone housed in a wand, with an electret microphone on one end. Use it to display and study the waveform of sounds from voices, musical instruments, or tuning forks.
Motion Detector	The Go!Motion, TI-CBR 2, and Vernier Motion Detector 2 function like sonar. This device emits ultrasonic pulses at a rate up to 50 times per second. The time it takes for the reflected pulses to return is used to calculate distance, velocity, and acceleration. The range is 0.15 to 6 meters.
pH Sensor	Our pH Sensor is a Ag-AgCl gel-filled combination electrode and amplifier. It includes a convenient storage solution container that can be attached directly to the electrode. Range: 0 to 14 pH units
Stainless Steel Temperature Probe	The Stainless Steel Temperature Probe is an accurate, durable, and inexpensive sensor for measuring temperature. Range: -40°C to $+135^\circ\text{C}$