

Go Direct[®] Temperature

(Order Code GDX-TMP)



Go Direct Temperature can be used as a thermometer for experiments in chemistry, physics, biology, Earth science, environmental science, and more.

Note: Vernier products are designed for educational use. Our products are not designed nor are they recommended for any industrial, medical, or commercial process such as life support, patient diagnosis, control of a manufacturing process, or industrial testing of any kind.

What's Included

- Go Direct Temperature
- Micro USB Cable

Compatible Software

See www.vernier.com/manuals/gdx-tmp for a list of software compatible with Go Direct Temperature.

Getting Started

Please see the following link for platform-specific connection information:

www.vernier.com/start/gdx-tmp

Bluetooth Connection

1. Install Graphical Analysis 4 on your computer, Chromebook™, or mobile device. See www.vernier.com/ga4 for software availability.
2. Charge your sensor for at least 2 hours before first use.
3. Turn on your sensor by pressing the power button once. The Bluetooth[®] LED will blink red.
4. Launch Graphical Analysis 4.
5. Click or tap Sensor Data Collection.
6. Click or tap your Go Direct sensor from the list of Discovered Wireless Devices. Your sensor's ID is located near the barcode on the sensor. The Bluetooth LED will blink green when it is successfully connected.
7. Click or tap Done to enter data-collection mode.

USB Connection

1. Install Graphical Analysis 4 on your computer or Chromebook. If using LabQuest 2, make sure LabQuest App is up to date. See www.vernier.com/ga4 for software availability or www.vernier.com/downloads to update LabQuest App.
2. Connect the sensor to the USB port.
3. Launch Graphical Analysis 4 or turn on LabQuest 2. You are now ready to collect data.

Charging the Sensor

Connect Go Direct Temperature to the included Micro USB Cable and any USB device for two hours.

You can also charge up to eight Go Direct Temperature Probes using our Go Direct Charge Station, sold separately (order code: GDX-CRG). An LED on each Go Direct Temperature indicates charging status.

Charging	Blue LED on steady while sensor is connected to the Charging Cable or Charge Station.
Fully charged	Blue LED is off when charging is complete.

Providing Power

Turning on the sensor	Press button once. Red LED indicator flashes when unit is on.
Putting the sensor in sleep mode	Press and hold button for more than three seconds to put into sleep mode. Red LED indicator stops flashing when sleeping.

Connecting the Sensor

See the following link for up-to-date connection information:

www.vernier.com/start/gdx-tmp

Connecting via Bluetooth

Ready to connect	Red LED flashes when sensor is awake and ready to connect via Bluetooth.
Connected	Green LED flashes when sensor is connected via Bluetooth.

Connecting via USB

Connected and charging	Blue and Green LED solid when sensor is connected to Graphical Analysis via USB and unit is charging. (Green LED is obscured by the blue one.)
Connected, fully charged	Green LED solid when sensor is connected to Graphical Analysis via USB and the unit is fully charged.
Charging via USB, connected via Bluetooth	Blue LED is solid and green LED is flashing, but the green flashing LED looks white because it is overwhelmed by the blue.

Identifying the Sensor

When two or more sensors are connected, the sensors can be identified by tapping or clicking Identify in Sensor Information.

Using the Product

Connect the sensor following the steps in the Getting Started section of this user manual.

- Do not put directly into flames.
- Always wash the probe thoroughly after use.

Videos

View videos related to this product at www.vernier.com/gdx-tmp

Calibrating the Sensor

Go Direct Temperature cannot be calibrated by the user. It is custom calibrated before it ships.

Specifications

Range	-40 to 125°C (-40 to 257°F)
Maximum temperature that the sensor can tolerate without damage	150°C
Accuracy	±0.25°C
Resolution	0.01°C
Handle range	-10 to 45°C
Response time (time for 90% change in reading)	10 seconds (in water, with stirring)
USB specification	2.0
Wireless specification	Bluetooth 4.2
Maximum wireless range	30 m
Dimensions	18.5 cm tall, 2 cm wide, 11.5 cm shaft length
Battery	300 mA Li-Poly
Battery life (single full charge)	~24 hours
Battery life (long term)	~500 full charge cycles (several years depending on usage)

Care and Maintenance

Overheating the sensor is the most common cause for this sensor to break. When used in chemistry labs, students will sometimes lay the sensor on a hot plate and

effectively "cook" the unit.

Unfortunately, these causes of breakage are considered misuse and are not covered by our warranty. In our experience, repair is not possible for this type of damage.

The Go Direct Temperature Probe body is constructed from grade 316 stainless steel¹, which provides a high level of corrosion resistance for use in the science classroom. Here are some general guidelines for usage:

- The probe handle is constructed of molded plastic. While this material is chemically resistant, we recommend that you avoid submerging the probe beyond the stainless steel part into anything but water.
- The stainless steel portion of the probe can be left continuously in water at temperatures within the range of -40 to 125°C. Continuous usage in saltwater will cause only minor discoloration of the probe, with no negative effect on performance.
- You can leave the probe continuously in most organic compounds, such as methanol, ethanol, 1-propanol, 2-propanol, 1-butanol, n-hexane, lauric acid, paradichlorobenzene, phenyl salicylate, and benzoic acid. The probe should not be left in n-pentane for more than one hour.
- The probe can be left in strong basic solutions, such as NaOH, for up to 48 hours, with only minor discoloration. We do not recommend usage in basic solutions that are greater than 3 M in concentration.
- The chart provides the maximum length of time recommended for probe exposure to some common acids. Probes left in an acid longer than these times may bubble and/or discolor, but will still be functional. We do not recommend probes be left to soak in any acid longer than 48 hours.

¹) Grade 316 stainless steel has a composition of 0.08% carbon, 2.0% manganese, 0.75% silicon, 0.04% phosphorus, 0.03% sulfur, 16–18% chromium, 10–14% nickel, 2–3% molybdenum, and 0.1% nitrogen.

Maximum acid exposure time	
1 M HCl	20 min
2 M HCl	10 min
3 M HCl	5 min
1 M H ₂ SO ₄	48 hours
2 M H ₂ SO ₄	20 min
3 M H ₂ SO ₄	10 min
1 M HNO ₃	48 hours
2 M HNO ₃	48 hours
3 M HNO ₃	48 hours
1 M CH ₃ COOH	48 hours
2 M CH ₃ COOH	48 hours
3 M CH ₃ COOH	48 hours
1 M H ₃ PO ₄	48 hours
2 M H ₃ PO ₄	48 hours
3 M H ₃ PO ₄	48 hours

Battery Information

Go Direct Temperature contains a small lithium-ion battery in the handle. The system is designed to consume very little power and not put heavy demands on the battery. Although the battery is warranted for one year, the expected battery life should be several years. Replacement batteries are available from Vernier (order code: GDX-BAT-300).

Storage and Maintenance

To store Go Direct Temperature for extended periods of time, put the device in sleep mode by holding the button down for at least three seconds. The red LED will stop flashing to show that the unit is in sleep mode. Over several months, the battery will discharge but will not be damaged. After such storage, charge the device for a few hours, and the unit will be ready to go.

Exposing the battery to temperatures over 35°C (95°F) will reduce its lifespan. If possible, store the device in an area that is not exposed to temperature extremes.

Water Resistance

The Go Direct Temperature Probe can be submerged in water for limited periods of time. It has been tested to a depth of one meter for up to 30 minutes.

However, submerging the sensor impacts the radio operation by absorbing much of the energy. This may make it difficult or impossible to connect to the sensor

while submerged, particularly if there are electrically noisy signals nearby, such as pumps or motors.

Troubleshooting

For troubleshooting and FAQs, see www.vernier.com/tit/3986

Repair Information

If you have watched the related product video(s), followed the troubleshooting steps, and are still having trouble with your Go Direct Temperature, contact Vernier Technical Support at support@vernier.com or call 888-837-6437. Support specialists will work with you to determine if the unit needs to be sent in for repair. At that time, a Return Merchandise Authorization (RMA) number will be issued and instructions will be communicated on how to return the unit for repair.

Accessories/Replacements

Item	Order Code
Micro USB Cable	CB-USB-MICRO
Go Direct 300 mAh Replacement Battery	GDX-BAT-300
USB-C to Micro USB Cable	CB-USB-C-MICRO

Warranty

Vernier warrants this product to be free from defects in materials and workmanship for a period of five years from the date of shipment to the customer. This warranty does not cover damage to the product caused by abuse or improper use. This warranty covers educational institutions only.

Disposal

When disposing of this electronic product, do not treat it as household waste. Its disposal is subject to regulations that vary by country and region. This item should be given to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring that this product is disposed of correctly, you help prevent potential negative consequences on human health or on the environment. The recycling of materials will help to conserve natural resources. For more detailed information about recycling this product, contact your local city office or your disposal service.

Battery recycling information is available at www.call2recycle.org

Do not puncture or expose the battery to excessive heat or flame.



The symbol, shown here, indicates that this product must not be disposed of in a standard waste container.

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference and
- (2) this device must accept any interference received, including interference that may cause undesired operation

RF Exposure Warning

The equipment complies with RF exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

IC Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Industry Canada - Class B This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada. Operation is subject to the following two conditions: (1) this device may not cause interference, and

- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that permitted for successful communication.

RF exposure warning: The equipment complies with RF exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'appareil doit accepter toute interférence radioélectrique, même si cela résulte à un brouillage susceptible d'en compromettre le fonctionnement.

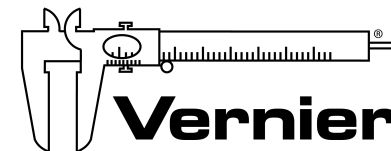
Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel interférent-brouilleur: "Appareils Numériques," NMB-003 édictée par Industrie Canada. L'utilisation est soumise aux deux conditions suivantes:

- (1) cet appareil ne peut causer d'interférences, et
- (2) cet appareil doit accepter toutes interférences, y comprises celles susceptibles de provoquer un dysfonctionnement du dispositif.

Afin de réduire les interférences radio potentielles pour les autres utilisateurs, le type d'antenne et son gain doivent être choisis de telle façon que l'équivalent de puissance isotrope émise (e.i.r.p.) n'est pas plus grand que celui permis pour une communication établie.

Avertissement d'exposition RF: L'équipement est conforme aux limites d'exposition aux RF établies pour un environnement non supervisé. L'antenne (s) utilisée pour ce transmetteur ne doit pas être jumelée ou fonctionner en conjonction avec toute autre antenne ou transmetteur.

Note: This product is a sensitive measurement device. For best results, use the cables that were provided. Keep the device away from electromagnetic noise sources, such as microwaves, monitors, electric motors, and appliances.



MEASURE. ANALYZE. LEARN.™

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