

Go Direct[®] Wide-Range Pressure

(Order Code GDX-WRP)



Go Direct Wide-Range Pressure measures absolute gas pressure. It can be used to monitor pressure changes in gas-law experiments in chemistry and physics. Vapor pressure of various liquids can be monitored using this sensor. Its metal fittings provide for versatile, airtight connections. The following is a partial list of activities and experiments that can be performed using this sensor:

- Investigate the relationship between pressure and volume, Boyle's law.
- Measure vapor pressure of liquids.
- Study the effect of temperature on gas pressure, Gay-Lussac's law.
- Study the effect of temperature and concentration on the rate of decomposition of H₂O₂.

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 Wide-Range Pressure with Chrome-plated Brass Quick Disconnect Tube Fitting with 1/8" NPT thread insert attached
- Micro USB Cable
- Chrome-plated Brass Quick Disconnect Tube Fitting with 1/8" hose barb insert
- Plastic tubing (2-foot section)
- Plumber's tape (to ensure a tight seal)

Compatible Software

See www.vernier.com/manuals/gdx-wrp for a list of software compatible with Go Direct Wide-Range Pressure.

Getting Started

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

www.vernier.com/start/gdx-wrp

Bluetooth Connection

1. Install Vernier Graphical Analysis™ on your computer, Chromebook™, or mobile device. If using LabQuest®, make sure LabQuest App is up to date. See www.vernier.com/ga for Graphical Analysis availability or www.vernier.com/downloads to

USB Connection

1. Install Graphical Analysis on your computer or Chromebook. If using LabQuest, make sure LabQuest App is up to date. See www.vernier.com/ga for software availability or www.vernier.com/downloads to update LabQuest App.

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 or turn on LabQuest.
5. If using Graphical Analysis, click or tap Sensor Data Collection. If using LabQuest, choose Wireless Device Setup > Go Direct from the Sensors menu.
6. Select 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.

Note: This sensor does not work with the original LabQuest. It works with LabQuest 2 or LabQuest 3.

Charging the Sensor

Connect Go Direct Wide-Range Pressure to the included Micro USB Cable and any USB device for two hours.

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

Charging	Orange LED next to the battery icon is solid while the sensor is charging.
Fully charged	Green LED next to the battery icon is solid when the sensor is fully charged.

Powering the Sensor

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 LEDs stop flashing when sleeping.

Connecting the Sensor

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

www.vernier.com/start/gdx-wrp

Connecting via Bluetooth

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

Connecting via USB

Connected and charging	Orange LED next to the battery icon is solid when the sensor is connected to Graphical Analysis via USB and the unit is charging. LED next to Bluetooth icon is off.
Connected, fully charged	Green LED next to the battery icon is solid when the sensor is connected to Graphical Analysis via USB and fully charged. LED next to Bluetooth icon is off.
Charging via USB, connected via Bluetooth	Orange LED next to the battery icon is solid when the sensor is charging. Green LED next to the Bluetooth icon flashes.

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.

To switch quick disconnect fittings, simultaneously press the metal tab on the quick fitting adapter that is on the pressure sensor side of the connection while pulling the attachment away from the adapter. Once the desired attachment is

removed, snap the replacement attachment into the adapter until you hear a click sound.

If you wish to purchase different quick disconnect inserts or replacements, many are available and compatible with the sensor. For several options, visit www.vernier.com/til/13798

Calibration

You do not have to perform a new calibration when using the Go Direct Wide-Range Pressure. The sensor is calibrated prior to shipping. If you would like to perform your own calibration, follow the steps described here. A one-point calibration at atmosphere is adequate for most applications.

To perform a one-point calibration,

1. Connect Go Direct Wide-Range Pressure to a device and launch the software.
2. Initiate the calibration procedure.
3. Enter the actual pressure as the known value.
4. When the relative stability reading stabilizes, click Keep.
5. Click Apply to complete the calibration process. This calibration is automatically saved to the sensor. To restore the default calibration, click Reset to Defaults.

Go Direct Wide-Range Pressure has been calibrated to read station pressure. *Station pressure* is the true atmospheric pressure at your location, or station. If you prefer it to read sea level pressure for conducting weather studies, you can perform a one-point calibration to correct for elevation, using the sea-level corrected pressure value for your location obtained from a reputable source (NOAA, Weather Underground, etc.). Sea level pressure is the pressure after the station pressure has been adjusted to its equivalent pressure at sea level. This is commonly done to normalize pressures at various altitudes for weather forecasts.

Pressure in Liquids: Depth Measurements

If you measure the pressure at the end of a long plastic tube forced underwater, you can indirectly measure depth. Connect the tubing to the stem of Go Direct Wide-Range Pressure and then put the end of the tube under water. The pressure reading will increase 8.105 kPa (0.0800 atm or 60.79 mmHg) for every meter below the surface of the water. **Note:** If you measure depth in this way, the depth you are measuring is to the top of the water in the tubing.

Specifications

Pressure range	0 to 690 kPa (0 to 100 psi, 0 to 6.8 atm, 0 to 5171 mmHg)
Maximum pressure that the sensor can tolerate without permanent damage	900 kPa
Compatibility	Dry gases only

Accuracy using factory calibration	±2 kPa
Accuracy using one-point custom calibration at atmosphere	±1 kPa
Internal volume of sensor with 1/8" NPT thread insert attached	0.786 mL
Internal volume of sensor with 1/8" hose barb insert attached	0.623 mL

Care and Maintenance

Clean sensor with a soft, damp cloth.

Battery

Go Direct Wide-Range Pressure contains a small lithium-ion battery. The sensor 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

To store Go Direct Wide-Range Pressure 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

Go Direct Wide-Range Pressure is not water resistant and should never be immersed in water.

If water gets into the device, immediately power the unit down (press and hold the power button for more than three seconds). Disconnect the sensor and charging cable, and remove the battery. Allow the device to dry thoroughly before attempting to use the device again. Do not attempt to dry using an external heat source.

How the Sensor Works

The active sensor in this unit is a pressure transducer that has a membrane that flexes as pressure changes. This sensor is arranged to measure absolute pressure. One side of the membrane is a vacuum, while the other side is open to the atmosphere. The sensor produces an output voltage that varies in a linear way with absolute pressure. It includes special circuitry to minimize errors caused by changes in temperature.

Included with the sensor are accessories to allow you to connect it to a reaction container or instrument. Check to be sure that each of these items is included:

- Chrome-plated Brass Quick Disconnect Tube Fitting with 1/8" NPT thread insert
- Chrome-plated Brass Quick Disconnect Tube Fitting with 1/8" hose barb insert
- Two-foot section of plastic tubing: This soft tubing is designed to fit over the hose barb connector. Its standard size allows you to connect to a variety of third-party instrumentation or adapters.
- Plumber's tape: This 1/2" sealing tape should be wrapped around the threading on the pressure sensor. Wrap only once and to the right, as the threading runs. This will help ensure an airtight seal.

Troubleshooting

For troubleshooting tips and FAQs, see www.vernier.com/til/13798

Repair Information

If you have followed the troubleshooting steps and are still having trouble with your Go Direct Wide-Range Pressure, 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
USB-C to Micro USB cable	CB-USB-C-MICRO
Go Direct 300 mAh Replacement Battery	GDX-BAT-300

Warranty

Warranty information for this product can be found on the Support tab at www.vernier.com/gdx-wrp

General warranty information can be found at www.vernier.com/warranty

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 tout interférence radioélectrique, même si cela résulte à un brouillage susceptible d'en compromettre le fonctionnement.

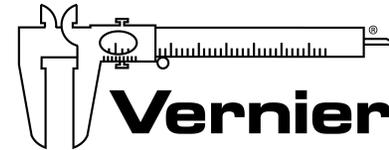
Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel interférent-brouilleur: "Appareils Numériques," NMB-003 édictée par Industrie Canada. L'utilisation est soumise aux deux conditions suivantes:

- (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.



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