Go Direct® Melt Station
(Order Code GDX-MLT)



The Go Direct Melt Station is a sensor used to measure the melting temperature of solid substances.

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 Melt Station
- 100 standard capillary tubes
- AC power supply
- Micro USB Cable

Compatible Software

See **www.vernier.com/manuals/gdx-mlt** for a list of software compatible with the Go Direct Melt Station.

Quick Start: Vernier Graphical Analysis® and Bluetooth®

1. Turn on your sensor by plugging in the AC power and turn the temperature knob to the cooling fan. The LED will blink red.
2. Launch Graphical Analysis, then click **Sensor Data Collection**.
3. Select your sensor from the list. The sensor ID is located on the sensor label near the bar code. **Note**: If you don't see a list of available sensors, click **WIRELESS**. After selecting your sensor, click **Pair**.
4. Click **DONE**. You are now ready to collect data.

Using other Vernier data-collection apps or connecting via USB?

Visit **www.vernier.com/start-go-direct**

Note: This sensor also works with LabQuest 2 and LabQuest 3; it does not work with the original LabQuest.

Connecting the Sensor

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

www.vernier.com/start/gdx-mlt

Using the Product

Prepare the sample and device

1. Set Up the Sensor

Connect the sensor as described in the Quick Start section of this manual.

2. Load the Sample

Place a small amount of solid into a capillary tube.

3. Insert the Tube

Carefully insert the tube into one of the three slots in the aluminum heating block.

4. Adjust Viewing Angle

Tilt the Melt Station up or down, as needed, to clearly view the sample through the lens.

Run the Experiment

5. Begin Data Collection

a. In your software, click or tap Collect.
b. Turn the Melt Station's control knob to Rapid Heat.
c. The red LED will turn on, indicating heating at a rate of >10°C/min.

6. Monitor Temperature

- Watch the temperature vs. time graph.
- When the temperature is within ~10°C of the sample's expected melting point, adjust the control knob to that temperature to slow the heating rate to ~1.5°C/min.

Record the Melting Range

In Graphical Analysis Pro

a. Observe the sample carefully.
b. When the sample begins to melt, click or tap **MARK** to record the temperature.
c. Click **MARK** again when the solid is completely melted.
d. Click the text box to label each **MARK** point.

Note: The **MARK** feature is not available in the free version of Graphical Analysis. Use text annotations instead if desired.

In LabQuest App

a. Observe the sample.
b. When the sample begins to melt, tap Keep to record the temperature.
c. Tap Keep again when the solid is completely melted.
d. Tap the box to the right of the graph label box to add text.

Wrap Up

7. Stop Data Collection

- Click or tap Stop in Graphical Analysis.
- In LabQuest App, tap the File Cabinet to save the run.

8. Cool Down

Turn the knob to Fan/Cooling. The blue LED will turn on.

9. Repeat as Needed

Prepare a new sample. Once the heating block has melted (check the temperature on the meter), you can load a new sample and begin the next trial.

Care and Maintenance

Cleaning Outside Surfaces

Clean the outside metal surfaces of the Melt Station with a cloth dampened with a mild detergent solution. Do not use organic solvents to clean the Melt Station.

Removing Broken Capillary Tubes

Follow the steps below to remove a broken capillary tube from the Melt Station. **Caution:** Do not handle a broken capillary tube with your fingers. Wear safety glasses or safety goggles.

1. Turn off the Melt Station and allow it to cool to room temperature. Unplug the power cord from the device.
2. Place the Melt Station unit on its back side so the capillary tube slots are as close to horizontal as possible. This will make it easier to safely remove the glass shards.
3. Remove the two threaded screws holding the lens panel in place. Set the screws and the viewing lens aside.
4. Use a 3/32 inch hex key to remove the two screws holding the metal spring fingers in place. Set the screws and spring fingers aside. Use the same hex key to loosen the screw holding the glass window in place. Slide the glass window up to remove it, and set it aside. **Caution:** The edges of the glass may be sharp.
5. Use an appropriate tool to carefully remove the broken capillary tube from its slot and deposit it in a glass waste container. If the capillary tube is loose in the slot, you can very carefully tip the Melt Station over to slide the tube into a waste container.
6. Replace the glass window, metal fingers, and viewing lens. Carefully tighten the screws to be snug rather than extremely tight. Remember that you may want to remove these pieces again in the future.

Safety

The Melt Station is designed for use in an academic laboratory. Its intended purpose is to determine the melting temperature of a solid substance in the temperature range between ambient and 260°C. The safety guidelines listed below must be followed strictly during the operation of this device. Failure to comply with these guidelines violates the standards of safety set forth in this document and the standards expected as good laboratory practice.

- Always wear safety goggles or safety glasses when using the Melt Station.
- Do not use the Melt Station for any purpose other than its intended use, which is to measure the melting point of a solid substance.
- Use the Melt Station under the supervision of a qualified chemistry instructor.
- Place the Melt Station on a clean, level surface.
- Make sure the Melt Station is a safe distance from solvents, containers of liquid or gaseous substances, and sources of water.
- Do not use the Melt Station with flammable liquids or gases.
- Do not allow the device to become wet. If it does, disconnect power to the device immediately and allow it to thoroughly dry.
- Do not leave the device unattended while heating; monitor temperature at all times.
- Turn off the Melt Station immediately after all testing is completed.
- Do not alter or remove the protective metal walls that surround the heating block of the Melt Station.
- The Melt Station is designed to operate in an upright position.
- Do not touch the heating block while it is hot.
- Check the temperature of the heating block before inserting a capillary tube of solid sample.
- The heating block can remain hot for a short period of time after use, even when off.
- Use the Melt Station in a well-ventilated room.
- The Melt Station is not designed for liquids or wet environments.
- The Melt Station is not designed or intended for use with samples that could explode or ignite by heat, friction, or spark.
- While some routine maintenance can be performed on the Melt Station, these tasks should be performed only by qualified personnel.
- Do not use the Melt Station if any malfunction is suspected.
- Do not modify or install additional parts to the Melt Station.
- Unplug the Melt Station before storing.

Safety Automatic Shut Off

An important safety feature of the Melt Station is the Automatic Shut Off. After you turn the control knob to heating, an internal timer starts. After 50–60 minutes have elapsed, the Melt Station will automatically turn off the heating element and the yellow LED will come on. To reset the Melt Station, simply turn the control knob to the cooling position or the Off position.

Specifications

Dimensions	Base–13 cm × 15 cm × 1.5 cm Body–9 cm × 9 cm × 24 cm
Weight	1.0 kg (2.2 lbs.) Melt Station + AC adapter weight: 1.2 kg (2.6 lbs.)
Range	Ambient to 260°C
Resolution	0.10°C
Accuracy	±0.31 + 0.0006T, where T is the temperature in Celsius
Typical	±0.4°C (<200°C); ± 0.5 deg C (>200°C)
Safety shut down	The heating block is automatically powered down after approximately 60 minutes of heating.
Capillary tubes	1.4–1.8 mm outside diameter, 100 mm length
Capillary tube slots	3
Viewing lens	27 mm diameter (functional), 30 mm (actual)
Lighting of capillary slots	3 white LEDs
Lighting of control dial	Red LED (indicates heating mode), Blue LED (indicates cooling mode with cooling fan running), Yellow LED (safety shut off activated)
Temperature sensor	Class A, Platinum Resistance Temperature Detector (RTD)
Calibration	Factory calibrated
Power	24VDC to unit, universal AC adapter 100–240 VAC 50–60 Hz input
Power consumption	40W max., < 0.5A @ 110V

How the Sensor Works

The Melt Station contains an aluminum heating block. There are three slots for capillary tubes in the heating block. A capillary tube containing a solid substance is placed in the heating block and the block is heated by an embedded element. An RTD-based temperature sensor, also embedded in the heating block, measures the temperature of the heating block and therefore the capillary tube of substance. The temperature sensor connects to Vernier data-collection software. The substance to be melted is viewed through a 6X lens.

The temperature control on the Melt Station is divided into three regions.

- The first area, next to the Off position, is for cooling the heating block after you have completed a melting temperature run. When you turn the control knob to the cooling position, the fan and the blue LED will come on.
- The second area is divided into specific temperature settings. These temperatures correspond to the expected melting temperature of the substance. You will choose one of these settings when the Melt Station has warmed to within about 10°C of the expected melting temperature of your solid sample. The warming rate will slow to ~1.5°C/min at each of these settings.
- The third area is Rapid Heat. In Rapid Heat, the Melt Station will warm at a rate of >10°C/min.

Calibration

The temperature sensor embedded in the aluminum heating block of the Melt Station will never need to be calibrated. The sensor is carefully calibrated before it ships, and this unique calibration is stored on a smart chip in the sensor.
Note: There is no method to perform a calibration of this sensor in any of our software programs.

Troubleshooting

For troubleshooting and FAQs, see **www.vernier.com/til/3852**

Repair Information

If you have followed the troubleshooting steps and are still having trouble with your Go Direct Melt Station, 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

Accessory

Item	Order Code
Mini USB Cable	CB-USB-C-MINI
Melt Station Capilllary Tubes (package of 100)	MLT-TUBE

Replacement Part

Item	Order Code
Micro USB Cable	CB-USB-MICRO
Replacement Melt Station Power Supply	MLT-PS

Warranty

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

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.

 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 interférant-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 disfonctionnement du dispositif.

Afin de réduire les interférences radio potentielles pour les autres utilisateurs, le type d’antenne et son gain doivent être choisie de telle façon que l’équivalent de puissance isotrope émis (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 jumelés 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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