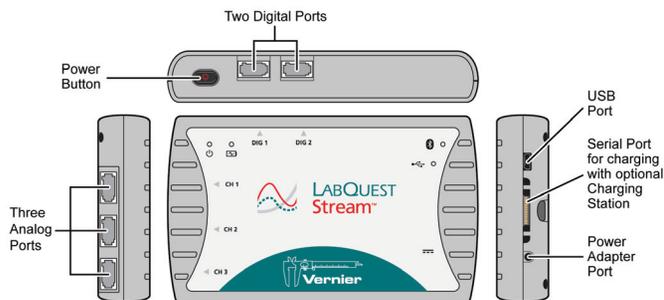


LabQuest Stream

(Order Code: LQ-STREAM)

LabQuest Stream™ is a multi-channel, data-collection interface that can be used to collect data from Vernier sensors on various platforms, such as iOS® and Android™ devices, Windows® and Mac® computers, and Chromebooks™. LabQuest Stream supports both wired (USB) and wireless (Bluetooth®) connections. The type of connection you can use depends on the data-collection platform.

The LabQuest Stream interface contains three analog ports (CH 1–CH 3), two digital ports (DIG 1 and DIG 2), a mini-USB connection, a power adapter port, and a serial power port (for use with the optional Charging Station).



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

- LabQuest Stream interface
- Rechargeable battery (in unit)
- Power adapter
- USB cable

Before Using the Interface

1. Remove the pull tab, which protects the battery, from the back of the unit.
2. Connect the power adapter.
3. Charge for at least 8 hours.

Compatible Platforms, Software, and Sensors

See www.vernier.com/manuals/lq-stream for a list of platforms, software, and sensors compatible with LabQuest Stream.

Getting Started

Follow these general procedures when using LabQuest Stream. For instructions on getting started with a specific sensor, see www.vernier.com/start/lq-stream

Wired Data Collection (via USB)

Computers and Chromebooks

1. Install software appropriate for the data-collection platform you are using.
2. Turn on LabQuest Stream and connect a supported sensor. The Power LED, , will glow green and the Bluetooth LED, , will flash blue.
3. Connect the small end of the USB cable to the USB port on LabQuest Stream.
4. Connect the other end of the cable to a USB port on your computer or Chromebook. The USB LED, , will glow orange.



5. Start the software. The USB LED will change to green and the Bluetooth LED will be off. You are now ready to continue your experiment.

Wireless Data Collection (via Bluetooth)

iOS and Android devices

1. Install software appropriate for the data-collection platform you are using.
2. Turn on LabQuest Stream and connect a supported sensor. The Power LED, , will glow green and the Bluetooth LED, , will flash blue.
3. Launch Graphical Analysis app and tap New Experiment, +, to display the Experiments dialog.
4. Choose LabQuest Stream, then select your device from the list of discovered devices. The LabQuest Stream serial number, shown on the back label, is the device name.



5. When connected, the Bluetooth LED will glow blue (no longer flashing). You are now ready to continue your experiment.

Wireless Data Collection (via Bluetooth)

Computers and Chromebooks

Wireless data collection with computers and Chromebooks is not yet available. Future software updates to *Logger Pro* and *Graphical Analysis for Chrome* will support wireless data collection on these platforms.

Providing Power

Power for LabQuest Stream is supplied by the rechargeable lithium-ion battery included with the unit. LabQuest Stream can also be powered without the battery by the following methods:

- Using the AC power adapter
- Using the USB port of a computer or Chromebook
- Using a USB power outlet or power adapter

Note: There may be configurations that limit how much power is available from the USB port on a computer or Chromebook. Such configurations may include having other devices that require USB power connected to the computer or Chromebook at the same time. In these situations, we recommend you use the battery or AC power adapter to provide power to LabQuest Stream.

Charging the LabQuest Stream battery

Use the supplied AC adapter, USB cable, or optional Charging Station (order code LQ2-CRG) to charge the battery. The battery cannot be overcharged and can be safely recharged after a partial discharge.



The Charging LED, , flashes red when the battery level is low. The LED is orange when the battery is charging and green when the battery is fully charged.

For safety reasons, the charging circuitry on LabQuest Stream will turn off after about 10 hours, even if the battery is not fully charged. When this happens, the charging LED will glow red. To continue charging the battery, disconnect then immediately reconnect the power source.

The following are approximate time durations required to fully charge a dead battery:

AC adapter: ~8 hours

Charging Station: ~8 hours

USB port: ~10 hours

Note: LabQuest Stream will not charge while connected via USB to a computer or Chromebook that is in a suspended state.

Turning the unit on

Press the power button located on the top of LabQuest Stream to turn the unit on.

The Power LED, , will be green when the unit is on. Note that the unit will

automatically turn on when it is connected to the USB port on a computer or Chromebook.

Turning the unit off

Press and hold the power button for 3 seconds to turn the unit off. The Power LED, , will be off when the unit is off. LabQuest Stream will automatically turn off after 10 minutes when not connected to a Bluetooth or USB host.

Connecting Sensors

LabQuest Stream supports two types of sensors—analogue and digital. Connect sensors to the appropriate port on LabQuest Stream.

Analog Sensors

Analog sensor examples include temperature probes, pH sensors, and force sensors. Up to three analog sensors can be connected to LabQuest Stream. The three ports for analog sensors (CH 1–CH 3) are located on the left side of the unit. These ports accept British Telecom-style plugs with a right-hand connector.



Digital Sensors

Digital sensor examples include motion detectors, photogates, and rotary motion sensors. Up to two digital sensors can be connected to LabQuest Stream. The two ports for digital sensors (DIG 1 and DIG 2) are located on the top side of the unit. These ports accept British Telecom-style plugs with a left-hand connector.



Note: Most sensors will automatically identify allowing the software to set up a default experiment. If you are using a sensor that does not auto-ID, you will need to manually identify the sensor in the software.

LED Behavior

Power LED

State	Meaning
Off	Unit is off
Green	Unit is on

Charging LED

State	Meaning
Off	Sufficient battery charge for normal use or unit is not charging
Orange	Unit is charging
Green	Charging is complete; battery is fully charged
Red (Flashing)	Battery level is low
Red (Solid)	Charging circuit timeout (~10 hr), battery fault, or no battery found

Bluetooth LED

State	Meaning
Off	Bluetooth connection not available
Blue (Flashing)	Available for Bluetooth connection
Blue (Solid)	Connected to host via Bluetooth; ready for data collection
Red	Bluetooth system failed

USB LED

State	Meaning
Off	Not connected to USB host or no power from USB host
Orange	USB connected; not communicating with software
Green	Connected to host via USB; ready for data collection
Red	USB host failed to enumerate or USB port underpowered

Specifications

Resolution	12 bit
Battery	High-capacity, lithium-ion rechargeable battery
Battery life (single full charge)	~24 hours (varies depending on sensors used)
Battery life (long term)	~500 full charge cycles (several years depending on usage)
USB specification	2.0 full speed
Wireless specification	Bluetooth v4.1
Maximum wireless range	30 m (unobstructed)
Maximum sample rate (Computers via USB)	100,000 samples per second (one sensor) 10,000 samples per second (two or more sensors)
Maximum sample rate (Wireless or Chromebooks via USB)	10,000 samples per second
Minimum sample rate (USB or wireless)	0.00125 samples per second (800 seconds/sample)
Dimensions	8.8 cm × 15.4 cm × 2.5 cm
Weight	220 g
Safe-use temperatures (operating)	0°C to 45°C (32°F to 113°F)
Safe-use temperatures (storage)	-30°C to 60°C (-22°F to 140°F)

Care and Maintenance

Battery

LabQuest Stream uses a high-quality lithium-ion battery. This is the same chemistry used in premium laptop and cell phone batteries, and you can expect similar performance.

Use the supplied AC adapter, USB cable, or optional Charging Station (order code LQ2-CRG) to charge the battery. The battery takes 8 to 10 hours to fully charge. The battery cannot be overcharged, and it can be safely recharged after a partial discharge. It is safe to leave the battery charging indefinitely, and there is no need to fully discharge the battery before needing to charge it.

The discharge time for a fully charged battery will depend on the sensors used. In most cases, you can obtain 24 or more hours of use before recharging. We recommend charging LabQuest Stream overnight to start the next day with a full charge.

The long-term life of the battery will vary, but you can expect about 500 full charge/discharge cycles before the battery will need to be replaced. In this count, a charge from half charged to a full charge counts as half of a charge cycle. In typical school use, the battery can last three years or more. Exposure to temperatures over 35°C (95°F) will significantly reduce battery life.

As a battery reaches the end of its functional life, the discharge time for a fully charged battery will become shorter. Eventually the discharge time will be too short for your application, and you will want to replace the battery. Rechargeable batteries are considered a consumable, and as such, are warranted for one year. A replacement battery can be ordered from our website (order code LQ2-BAT). Recycling information is available at www.call2recycle.org

Use only the supplied battery for this device. Do not puncture or expose the battery to excessive heat or flame.

Temperature considerations

Safe operating temperatures for LabQuest Stream are from 0°C to 45°C (32°F to 113°F). Storage temperatures are –30°C to 60°C (–22°F to 140°F). Exposures to low or high extreme temperatures will temporarily reduce the discharge time for a fully charged battery. Exposure to temperatures over 35°C (95°F) will significantly reduce long-term battery life.

Avoid rapid temperature changes as condensation may form inside the device. Do not leave it in a car, as temperatures can exceed the maximum storage range.

Water Resistance

LabQuest Stream is not water resistant and should never be immersed in water. If water gets in the device, immediately remove the USB cable and turn the unit off by holding down the power button for at least 3 seconds. Disconnect all sensors and cables and remove the battery. Allow the unit to dry thoroughly before restarting it. Do not attempt to dry it using an external heat source.

Storage

Do not store LabQuest Stream in a chemical closet or in areas of concentrated chemical gases.

Safe storage temperatures are –30°C to 60°C (–22°F to 140°F). Exposing the battery to temperatures above 35°C (95°F) will reduce its lifespan. If possible, store LabQuest Stream in an area that is not exposed to temperature extremes.

To store LabQuest Stream for extended periods of time, turn the unit off and remove the battery. Over several months, the battery will discharge but will not be damaged. After such storage, charge LabQuest Stream (a full charge can take 10 hours), and the unit will be ready for use.

How the Interface Works

The LabQuest Stream interface is more than just a physical adapter between two different connectors. It is hardware that allows Vernier sensors to interact with computers, Chromebooks, and mobile devices. LabQuest Stream contains dedicated electronics for precise sampling of sensor events. LabQuest Stream timestamps these events so measurements from multiple sensors can be analyzed

simultaneously. To allow data to flow smoothly, LabQuest Stream manages the communication link between the sensors and the computing platform.

Troubleshooting

For troubleshooting tips and frequently asked questions regarding LabQuest Stream, see www.vernier.com/til/3656

Repair Information

If you have followed the troubleshooting steps and are still having trouble with your LabQuest Stream, 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
Charging Station (Charge up to four LabQuest Stream units)	LQ2-CRG
Vernier Lanyard	LQ-LAN
Battery	LQ2-BAT
Power Adapter	LQ-PS
USB Cable	LQ-CB-USB

Warranty

LabQuest Stream

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.

LabQuest Stream Battery

Vernier warrants this product to be free from defects in materials and workmanship for a period of one year from the date of shipment to the customer.

This warranty does not cover damage to the products 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 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.

Japanese Technical Regulations Conformity Certification

当該機器には電波法に基づく技術基準適合証明等を受けた特定無線設備を装着している。

This equipment contains specified radio equipment that has been certified to the Technical Regulations Conformity Certification under the Radio Law.

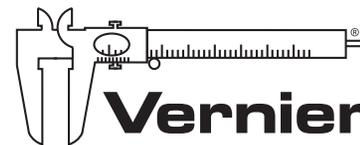
Acknowledgments



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Rev. 6/6/16

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