Go Direct® Constant Current System

(Order Code GDX-CCS)

The Go Direct Constant Current System is a DC power source with a built-in current probe designed for use in electrochemistry experiments. The user can set the current by tuning the dial. The system is capable of delivering up to 0.6 A. The following is a partial list of activities and experiments that can be performed using this sensor.

- Electroplating and Faraday's law
- Electrolysis
- Determining Avogadro's number

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 Constant Current System
- AC power adapter
- Micro USB Cable

Compatible Software

See **www.vernier.com/manuals/gdx-ccs** for a list of software compatible with the Go Direct Constant Current System.

Quick Start: Vernier Graphical Analysis® and Bluetooth®

1. Turn on your sensor by plugging it into the AC power adapter. The Bluetooth® 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 want to connect 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-ccs

Connecting via Bluetooth

Ready to connect	Red LED next to Bluetooth icon flashes when the sensor is awake and ready to connect. At the same time, the red LED next to the power icon is steady.
Connected	Green LED next to Bluetooth icon flashes when the sensor is connected via Bluetooth. At the same time, the red LED next to the power icon is on steady.

Connecting via USB

Connected	Red LED next to power icon on steady when sensor is connected to Graphical Analysis via USB. LED next to Bluetooth icon off.

Powering the Sensor

Turning on the sensor	Red LED is on steady when connected to AC power.
Putting the sensor in sleep mode	Red LED is off when disconnected from AC power.

Specifications

Range	0 to 0.6 A
Linearity	0.1%
Supply Voltage	5 VDC
Supply current (typical)	9 mA
Output voltage range	0 to 5 V
Transfer function	Vout=6.9(I) + 0
Power supply (input)	100–240 Volts AC 50/60 Hz 0.5 A 26–41 VA
Power supply (output)	5 V, 1.5 A
USB specification	2.0

Wireless specification	Bluetooth 4.2
Maximum wireless range	30 m
Dimensions	9 cm length, 6 cm height, 5 cm depth, leads: 60 cm long

How the Sensor Works

The Go Direct Constant Current System is a DC-coupled amplifier capable of delivering up to 0.6 A at 5 V DC. A current-sensing resistor allows monitoring of the output current by the data-collection software.

Current Conventions

The current will be indicated as positive if current flows from the positive (red) terminal to the negative (black) terminal as described by conventional current flow notation. Using electron flow notation, electrons flow out of the negative terminal through the circuit back to the positive terminal. The negative terminal is connected to ground via a power transistor and 0.1 Ω sensing resistor. The positive terminal connects to a 5 V power supply. The Constant Current System dial can be tuned to deliver up to 0.6 A with the voltage adjusting automatically (max 5 V). If the electrolyte resistance is too high, the 0.6 A may not be attained before the maximum of 5 V is reached.

Troubleshooting

For troubleshooting and FAQs, see **www.vernier.com/til/3851**

Repair Information

If you have followed the troubleshooting steps and are still having trouble with your Go Direct Constant Current System, 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
LabQuest Power Supply	LQ3-PS
Micro USB Cable	CB-USB-MICRO
USB-C to Micro USB Cable	CB-USB-C-MICRO

Warranty

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

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 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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