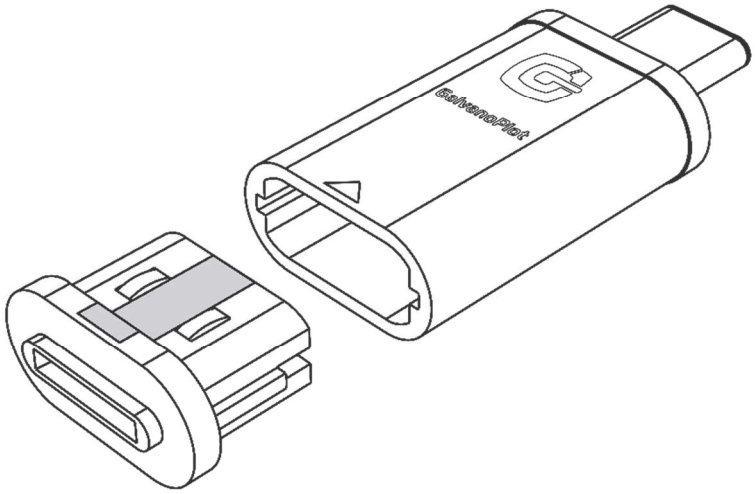
GalvanoPlot



Quick Start User Manual

Contents

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1. Package Content

When unpacking your GalvanoPlot Equipment, check for any damage on the packing and its content (Figure 1). A package typically includes the following:

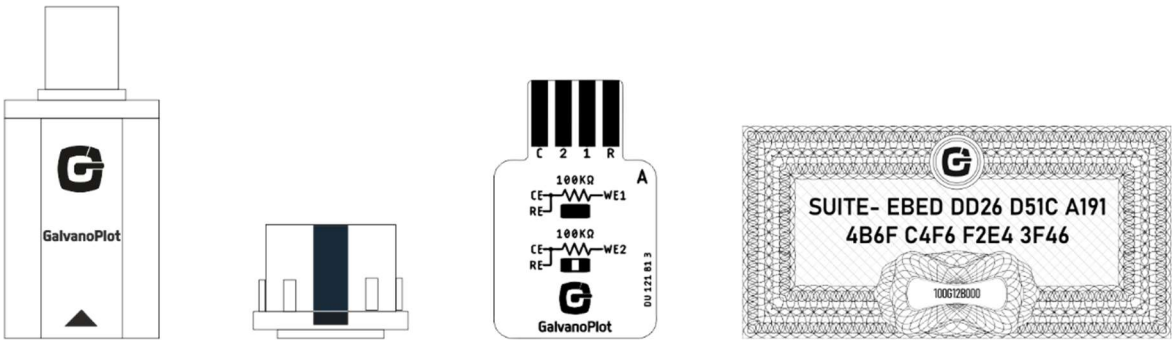
- GalvanoPlot Equipment (A)

If it is purchased with a sensor interface, it also includes:

- GalvanoPlot Sensor Interface (B)
- Dummy Cell (C)

If it is purchased as an Equipment - Software Pack, it will also include:

- GalvanoPlot Software License (D)



(A) (B) (C) (D)

Figure 1. Package Content

If your package arrives as anything missing or damaged, immediately contact your reseller or GalvanoPlot support team at support@galvanoplot.com.

Do not use any damaged parts.

2. Software Installation

2.1. Downloading the Software

The latest version of GalvanoPlot Suite is always the version on the website. To download the software;

- On an online computer, open a web browser and navigate to www.galvanoplot.com .
- Go to **SUPPORT → Downloads** .
- Download **GalvanoPlot SUITE** .
- Run the downloaded Autoinstaller file on a compatible computer and follow the steps as prompted by the installer. Click Finish when installation is completed.

GalvanoPlot SUITE is compatible with **Windows (10 or higher)** and **64-bit systems** only.

2.2 Device Registration & Licensing

Each GalvanoPlot potentiostat equipment comes with 100 TRIAL runs. To use the GalvanoPlot equipment with GalvanoPlot SUITE software after the Trial credits are consumed, a registration is required (Figure 2).

- Run **GalvanoPlot SUITE** PC application. Registration can be performed only while the equipment is connected to the computer. So, plug in the equipment to be registered to a USB port on the computer.
- You can log in as a **Guest** or create a personal account.
- Go to **Settings > Register & Upgrade** .
- Find the GalvanoPlot potentiostat you want to register in the list of the connected devices.

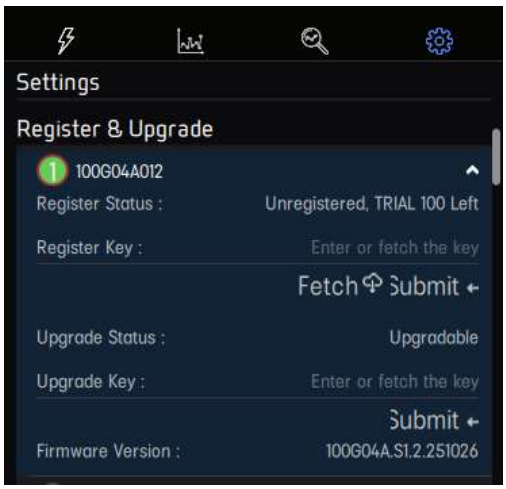


Figure 2. Device Registration Screen in GalvanoPlot SUITE

- **Fetch** the registration key from the server. The computer has to be online to complete this step. If you prefer not to go online, you can manually enter the software license **Register Key** provided in the package (Figure 3).

Figure 3. GalvanoPlot SUITE Software License

When the key is entered or automatically fetched from the server, the device will be registered for your GalvanoPlot SUITE and will be available for unlimited use.

If you are not able to fetch the Key from the server and you also do not have a reach to your Register Key provided in the package, contact your reseller or GalvanoPlot support team at support@galvanoplot.com with the Serial Number of the equipment, to obtain one.

3. Connecting the Device

3.1. USB Connection

3.2. Plug in the USB-C connector of your GalvanoPlot potentiostat into your PC or Android device and run GalvanoPlot SUITE or GalvanoPlot TOUCH, respectively. When you open GalvanoPlot SUITE, the device should be recognized automatically and instantly. Alternatively, you may run the software first and plug in the equipment later.

If your computer does not have a USB-C port, an adapter is required. You can use a USB-A to USB-C Adapter (ACC.310) available on GalvanoPlot Online Store.

- It is possible to connect multiple equipment to same computer, and all equipment will be controlled over the same screen.

It is recommended to use a powered USB-Hub when connecting multiple devices.

3.3. LED Indicator Status

The LED on the device shows the current operating status (Figure 4):

- **Green** – Ready. Equipment is recognized by software and ready for operation.
- **Red** – Inactive. Equipment is deactivated over software.
- **Orange** – Running. Equipment is currently running an electrochemical measurement.
- **Red (Blinking)** – Communication error. Software is not detecting the equipment
- **No Light** – No power. Equipment is not getting any power. (Alternatively, LED may have been disabled in the software under **GalvanoPlot SUITE > Device LED** .)

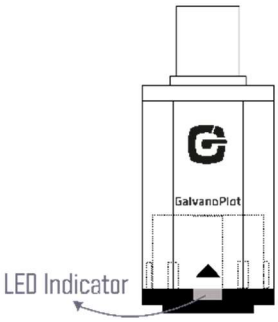


Figure 4. Position of LED indicator

4. Sensor Interfaces - Hardware Connections

4.1. Sensor Interface Port

Connections to the electrodes are possible through the sensor interface on the bottom side of the GalvanoPlot equipment (Figure 5).

It is very easy to replace the sensor interface adapter to use the equipment with different sensor types. Simply pinch the adapter on both sides and pull out strongly. After removal of the interface plug, you can plug in the other sensor interface adapter, paying attention to the orientation of LED optics to prevent upside down insertion.

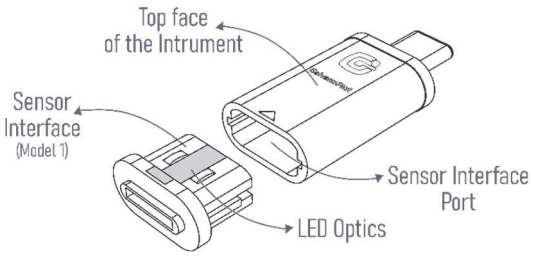


Figure 5. Replaceable sensor interface of GalvanoPlot equipment.

When installing the sensor interface, ensure that the optical LED indicator on the interface matches the LED direction on the device, facing upward toward the top of the instrument. Upside down insertion may harm the interface or the equipment.

A variety of sensor interfaces are available (Figure 6):

- The Screen-Printed Electrode (SPE) Interface; for direct insertion of SPE sensors into equipment. All popular screen-printed electrode brands and models are supported.
- The Banana Receptacle Interface; for accepting 2 mm banana cables. For best performance, use GalvanoPlot Banana Cables available on GalvanoPlot Online Store
- OEM/ Custom Interfaces; for custom needs. It is possible to order a custom interface for a tailored integration between GalvanoPlot equipment and a non-standard sensor.

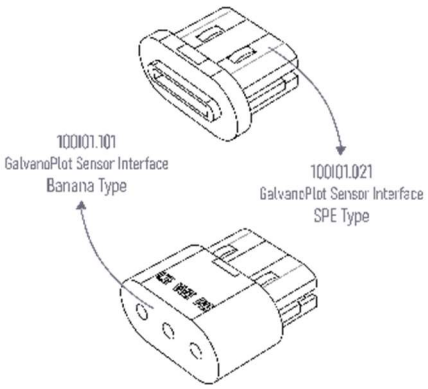


Figure 6. Interface adapters for Screen printed electrode (SPE) sensors and banana plugs.

5. Functional Test Using Dummy Cell

Before beginning actual measurements, a functional test with a dummy cell is recommended. This test confirms that the instrument and software are functioning as expected. A dummy cell simulates a stable electrochemical system with known resistance and capacitance (Figure 7).

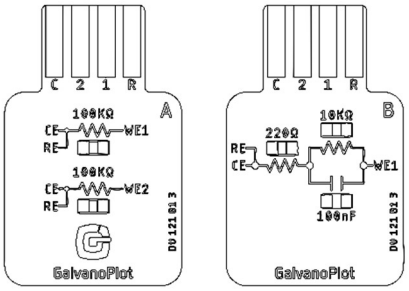


Figure 7. Diagrams of the double faced GalvanoPlot Dummy Cell. Face A (left) and Face B (right).

Dummy Cell includes two distinct electrical networks, labelled A and B, each designed to simulate different types of electrochemical behaviour. These circuits allow users to verify device performance, understand expected signals, and practice running experiments without using real electrodes or chemical solutions. It is recommended to prefer A for DC Voltammetric and Amperometric methods and B for Impedance based methods.

5.1. Basic Functional Test. Face A- 100 kΩ Resistive Loads

Figure 8. Dummy cell Side A inserted

Face A contains 100 kΩ resistors connected between the CE/RE terminals and the working electrode channels (WE1 or WE2) (Figure 8). This setup provides a stable, linear, and predictable resistive load that is ideal for initial device validation.

Components on Face A:

- Two (or one in a single channel equipment) 100 kΩ resistors, one for each working electrode channel (WE1 and WE2)
- Independent CE and RE points for each channel
- No capacitors or reactive components

Face A behaves like a purely resistive system:

- When a potential is applied, the current follows Ohm's Law (i = V/R).
- The response is linear, stable, and free from any redox-like peaks.

Expected Graph:

- In cyclic voltammetry, a straight diagonal passing from the zero point will be observed (Figure 10).

5.2. Advanced Dynamic Testing, Face B - RC Network for EIS Simulation

Figure 9. Dummy cell Side B inserted

Face B features a simplified Randles-type RC network that mimics realistic electrochemical interface behaviour (Figure 9). It includes simulation components for solution resistance, charge-transfer resistance, and double-layer capacitance, suitable for EIS validation, dynamic CV studies, and testing device response across a wide frequency range.

Components on Face B:

- 220 Ω resistor (Rs): Simulates solution/electrolyte resistance
- 10 kΩ resistor (Rct): Simulates charge-transfer resistance
- 100 nF capacitor (Cdl): Simulates double-layer capacitance
- Circuit forms a classic Rs–Rct–Cdl network connected to WE1

Equivalent Electrochemical Model of Face B:

The network mimics a simplified Randles circuit:

- Rs (220 Ω) → Rct (10 kΩ) || Cdl (100 nF)

This produces frequency-dependent behaviour like that found in real electrochemical systems.

Expected Graph:

Face B produces the classical Randles circuit–style response used in most EIS (Electrochemical Impedance Spectroscopy) measurements (Figure 11).

Expected Nyquist Plot

- Starting point near 220 Ω (solution resistance)
- One clean semicircle (diameter ≈ 10 kΩ → Rct)
- Slight downward tail at low frequencies (capacitive behavior)

This allows you to verify:

- Frequency response accuracy
- Real/imaginary component scaling
- Phase correctness
- Fitting of Rs, Rct, Cdl in EIS analysis
- Reproducibility of impedance scans

If Face B provides a clean semicircle, the EIS engine of the equipment is working as expected.

5.3. How to Perform a Dummy Cell Test

- Insert the dummy cell into the sensor interface.
- Select either Face A or Face B.
- Open GalvanoPlot SUITE.
- Choose CV, or EIS depending on the test.
- Run the scan.
- Compare the resulting graph with the expected behaviour described above.

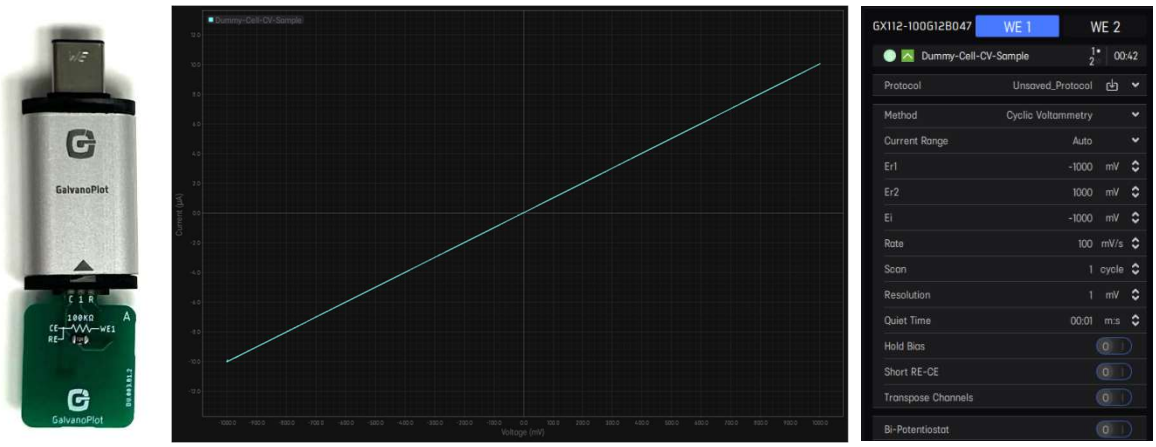


Figure 10. Cyclic Voltammetry Response of Dummy Cell Face A and Recommended Experiment Parameters

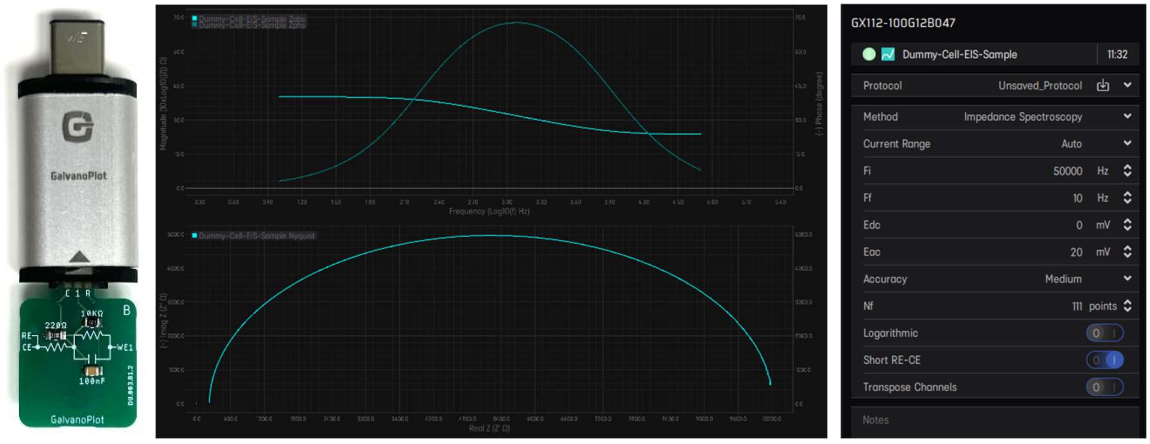


Figure 11. Electrochemical Impedance Spectroscopy (EIS) Response of Dummy Cell Face B and Recommended Experiment Parameters

A proper dummy cell response confirms that the device, sensor interface, cabling, USB communication, and measurement channels are all functioning correctly. An unexpected result has to be troubleshoot for exact origin of the malfunctioning.

5.4. Choosing Between Face A and Face B

Feature	Face A	Face B
Components	100 kΩ resistors	220 Ω + 10 kΩ + 100 nF RC network
Behaviour	Purely resistive	Electrochemical-like, frequency-dependent
Use Case	Basic functionality testing	EIS, dynamic CV, stability testing
CV Shape	Small resistive loop	Large capacitive loop
EIS Suitability	Not suitable	Fully suitable, Randles-like
Channels	WE1 + WE2 (dual test)	WE1 or WE2 only (single electrochemical model + transpose channels)

6. Screen-Printed Electrode (SPE) Connections

The Screen-Printed Electrode (SPE) Interface enables fast and convenient electrochemical measurements using disposable SPE sensors. This Sensor Interface is ideal for point-of-care diagnostics, small-volume chemical analysis, and field applications where minimal equipment is available.

The SPE Interface is specifically designed to ensure a low-resistance, reproducible electrical connection to the Working (WE), Reference (RE), and Counter (CE) electrode pads printed on commercial or custom SPE strips.

To perform a measurement using SPE sensors;

- Connect GalvanoPlot to an Android mobile device or a Windows PC (Figure 12) and run GalvanoPlot TOUCH or GalvanoPlot SUITE application. Alternatively, equipment can be connected after running the application.
- Insert the SPE into its dedicated sensor interface adapter; ensure the contact pads align properly with the connector and push it all the way until it is not moving any further.
- Apply your sample solution to completely cover all WE, RE and CE area.
- From Setup menu, select the desired electrochemical method and parameters. Run the experiment.
- The signal measured from the sensor will be plotted in real time to the Plot window.

A. B.

Figure 12. Connecting a SPE to the GalvanoPlot Instrument via PC USB Port.
A. On a mobile device, B. On a PC.

GalvanoPlot's interchangeable interface system allows you to work with all popular commercial and custom screen-printed electrode sensors.

6.1. Choosing the Correct Sensor Interface

Pad dimensions, strip width and thickness, and contact pitch of SPE may be different among different sensor brands offered by manufacturers. GalvanoPlot offers a solution to this variation by interchangeable tailored modules designed to match a specific SPE footprint. User can directly plug in the best interface into the GalvanoPlot device, and no extra wiring is needed. A variety of SPE interfaces are offered:

GX100 Sensor Interface, Model 1, SPE Type;		
100101.003	For Screen Printed Electrodes, RE-WE1-CE, 3 x 1,5 mm, 5 mm wide	Compatible with: S003 GalvanoPlot Linear Type Sensors, S101 Printed Single Sensors
100101.011	For Screen Printed Electrodes, RE-WE1-CE, 3 x 4 mm, 13 mm wide	Compatible with: VidaBio
100101.021	For Screen Printed Electrodes, RE-WE1-CE, 3 x 2,54 mm, 10 mm wide	Compatible with: S102 Printed Single Sensors, S103 Printed Single Sensors, DropSens, Sun Chemical, Zimmer Peacock (Standard), Rusens, Conductive Tech, OG Carbon
100101.121	For Screen Printed Electrodes, WE2-RE-WE1-CE, 4 x 2,54 mm, 10 mm wide	Compatible with: S202 Printed Dual Sensors, S203 Printed Dual Sensors, DropSens Dual Electrodes
100101.022	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 8 mm wide	Compatible with: BVT, Gamry
100101.522	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 8 mm wide, OEM	Compatible with: BVT TC6 Glass Cell
100101.023	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 8 mm wide	Compatible with: ItalSens
100101.024	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 10,8 mm wide	Compatible with: Gii-Sens
100101.025	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 12,5 mm wide	Compatible with: Quasense (CI17030R)
100101.026	For Screen Printed Electrodes, RE-WE-CE, 3 x 2,54 mm, 12 mm wide	Compatible with: Poten
100101.031	For Screen Printed Electrodes, CE-NC-WE-RE, 4 x 2,54 mm, 10 mm wide	Compatible with: MicruX
100101.131	For Screen Printed Electrodes, CE-WE1-WE2-RE, 4 x 2,54 mm, 10 mm wide	Compatible with: MicruX Dual Electrodes
100101.041	For Screen Printed Electrodes, CE-WE-RE, 3 x 3,5 mm, 13 mm wide	Compatible with: Zensor
100101.051	For Screen Printed Electrodes, CE-WE-RE, 3 x 2,54 mm, 10 mm wide	Compatible with: Nanoshel
100101.052	For Screen Printed Electrodes, CE-WE-RE, 3 x 2,54 mm, 8 mm wide	Compatible with: BST (3 pins)
100101.061	For Screen Printed Electrodes, CE-WE-NC-WE-RE, 5 x 2,54 mm, 15 mm wide	Compatible with: Pine Research
100101.071	For Screen Printed Electrodes, RE/CE-NC-WE, 3 x 2,54 mm, 8 mm wide	Compatible with: Basi
100101.081	For Screen Printed Electrodes, RE/CE-WE, 2 x 2,54 mm, 8 mm wide	Compatible with: BST (2 pins)
100101.082	For Screen Printed Electrodes, RE/CE-WE, 2 x 2,54 mm, 5 mm wide	Compatible with: GlucoDr
100101.091	For Screen Printed Electrodes, RE/CE-WE-RE/CE/Fill, 3 x 2,54 mm, 8 mm wide	Compatible with: Zimmer Peacock (Hyper Value sensor), Zimmer Peacock (C-ADGG-101-N sensor), Manias Sensors

GalvanoPlot also offers tailored solutions to custom electrode systems, that are not in the list for readily available sensors. Please contact support@GalvanoPlot.com for custom or non-standard sensor configurations.

7. Banana Cable Connections for Conventional Electrochemical Setup

The Banana Cable Interface allows GalvanoPlot to be used with conventional two or three-electrode laboratory setups such as glass electrochemical cells. This sensor interface provides maximum flexibility for advanced electrochemical experiments and long-duration measurements.

The following components are typically required when using the Banana Type Sensor Interface (Figure 13):

- **100I01.101** GalvanoPlot Sensor Interface, Banana Type (plugs into the device)
- **ACC.003** GalvanoPlot Sensor Cable, Banana Type (WE, RE, CE – colour coded)
- **ACC.093** Crocodile Clips (optional, for attaching to electrodes)
- **Three-Electrode Electrochemical Cell** *(Working Electrode (WE), Reference Electrode (RE), Counter Electrode (CE))*

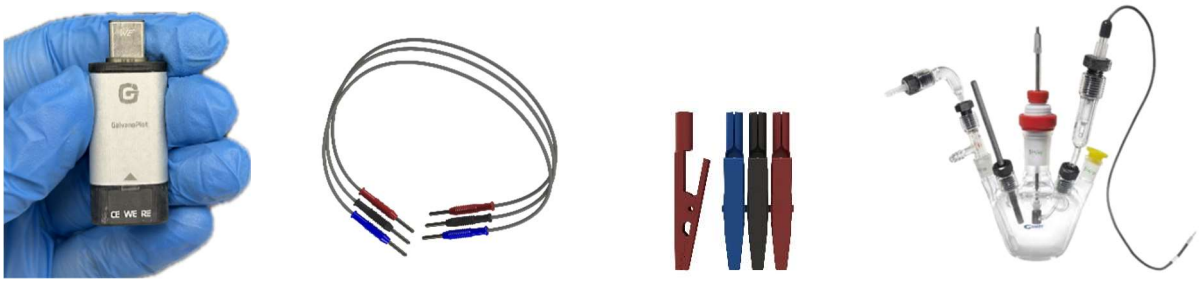


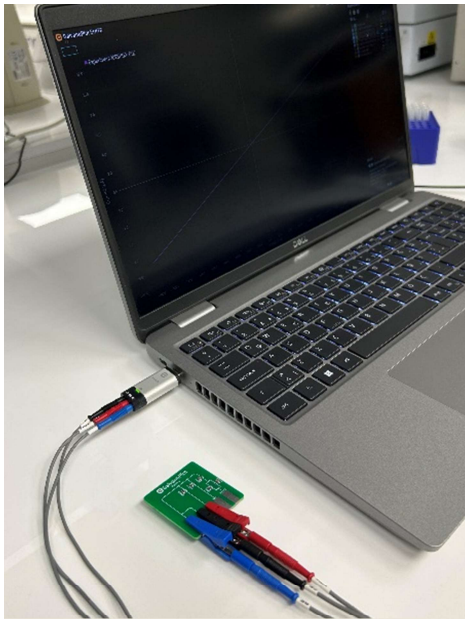
Figure 13. Components Required for Banana Cable Electrochemical Measurements

100I01.101 **ACC.003** **ACC.093** **Three-Electrode Electrochemical Cell**

To use the GalvanoPlot equipment with banana cable output (Figure 14):

- Insert the Banana Receptacle type Sensor Interface firmly into the Sensor Interface Port of GalvanoPlot Instrument.
- Insert plugs on one end of each Banana Cable completely into their respective WE, RE, and CE ports. For best performance, always use original GalvanoPlot cables.
- Connect the plugs on other end of cable to the Conventional Electrochemical Cell. If necessary, use crocodile clips.
- It is ready to Run the measurement in the software.

Banana Cables of a variety of lengths are available. GalvanoPlot recommends choosing the shortest length sufficient for your electrochemical cell setup to decrease noise.



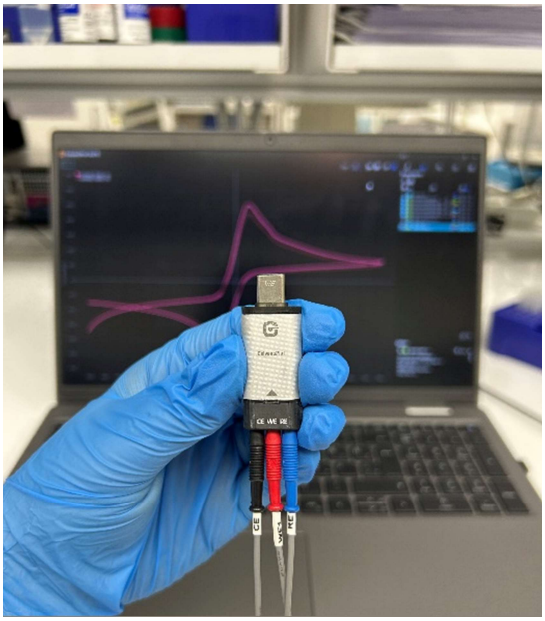


Figure 14. Connecting a Banana Interface to the GalvanoPlot Instrument via PC USB Port.

A variety of interfaces as Banana Receptacles are offered:

GX100 Sensor Interface, Model 1, Banana Type;	
100101.101	For Banana Plugs, CE/WE/RE, 3 x 2 mm Banana Receptacles
100101.102	For Banana Plugs, CE/WE1/RE/GND, 4 x 2 mm Banana Receptacles
100101.104	For Banana Plugs, CE/WE1/WE2/RE, 4 x 2 mm Banana Receptacles
100101.106	For Banana Plugs, CE/GND/WE1/GND/RE/GND, 6 x 2 mm Banana Receptacles

8. Decommissioning the Equipment

Never discard any GalvanoPlot equipment or its **accessories** to household litter.

Always use dedicated electronic waste (e-waste) disposal services as imposed by local laws.

support@galvanoplot.com
If you have any questions or recommendations
with the GalvanoPlot products, please contact us.

Solar Biyoteknoloji, Ltd.
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