Granite River Labs

Addendum

GRL-C2-DP-AUX-SNIF Addendum For Hardware & Software Setup with GRL-C2-DP-AUX-SNIF DisplayPort Auxiliary Sniffer Board and GRL USB Type-C® Power Delivery Tester and Analyzer (GRL-USB-PD-C2 / C2-EPR)

This material is provided as a reference to set up the hardware and software and perform DisplayPort Auxiliary (DP-AUX) transactions using the Granite River Labs DisplayPort Auxiliary Sniffer Board (GRL-C2-DP-AUX-SNIF) and GRL-USB-PD-C2 / C2-EPR test controller as main equipment via the GRL USB Type-C Power Delivery Tester and Analyzer (GRL-USB-PD-C2 / C2-EPR) Browser Application.

For user support or information, contact support@graniteriverlabs.com.

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1 Scope of this Addendum

This Addendum serves as a supplementary documentation to connect the GRL-C2-DP-AUX-SNIF Board to the GRL-USB-PD-C2 / C2-EPR USB Type-C Test Controller and DisplayPort Source & Sink devices for decoding of DisplayPort sideband AUX messages. This will be followed by procedures to perform automated testing using the GRL-USB-PD-C2 / C2-EPR Browser Application.

Below describes the GRL-C2-DP-AUX-SNIF Board test fixture:

- **GRL-C2-DP-AUX-SNIF Board** – Extension fixture for the GRL-USB-PD-C2 / C2-EPR test controller, used for sniffing DisplayPort Standard Auxiliary traffic.

2 Test/Equipment Requirements

For purchase or information of the following items, contact info@graniteriverlabs.com.

- GRL-C2-DP-AUX-SNIF Board test fixture
- GRL-USB-PD-C2 / C2-EPR USB Type-C test controller
- USB Type-C based DisplayPort Sink device
- USB Type-C based DisplayPort Source device
- DisplayPort or Thunderbolt dock
- GRL Special (GRL-SPL / GRL-SPL-EPR) Type-C VCONN passthrough test cable (GRL-USB-PD-STC)
- 2 x Full featured USB Type-C cable

3 DisplayPort Auxiliary (DP-AUX) Channel Test Setup

This section describes the connection diagrams and procedures to set up the equipment and fixture for decoding DP-AUX channel communication between the DisplayPort Source and Sink. Below are two different types of test setups:

- DisplayPort Source and Sink test setup
- DisplayPort Source and Sink with DisplayPort/Thunderbolt Dock test setup

Make sure to follow all the steps as described below before running tests using these setups.

For details on using the GRL-USB-PD-C2 / C2-EPR Browser App, refer to the GRL-USB-PD-C2 / C2-EPR Browser App user documentation in http://graniteriverlabs.com/download-center/.

3.1 Connect and Set Up GRL-USB-PD-C2 / C2-EPR Browser App

1. Open the GRL-USB-PD-C2 / C2-EPR Browser App and connect to the GRL-USB-PD-C2 / C2-EPR test controller.

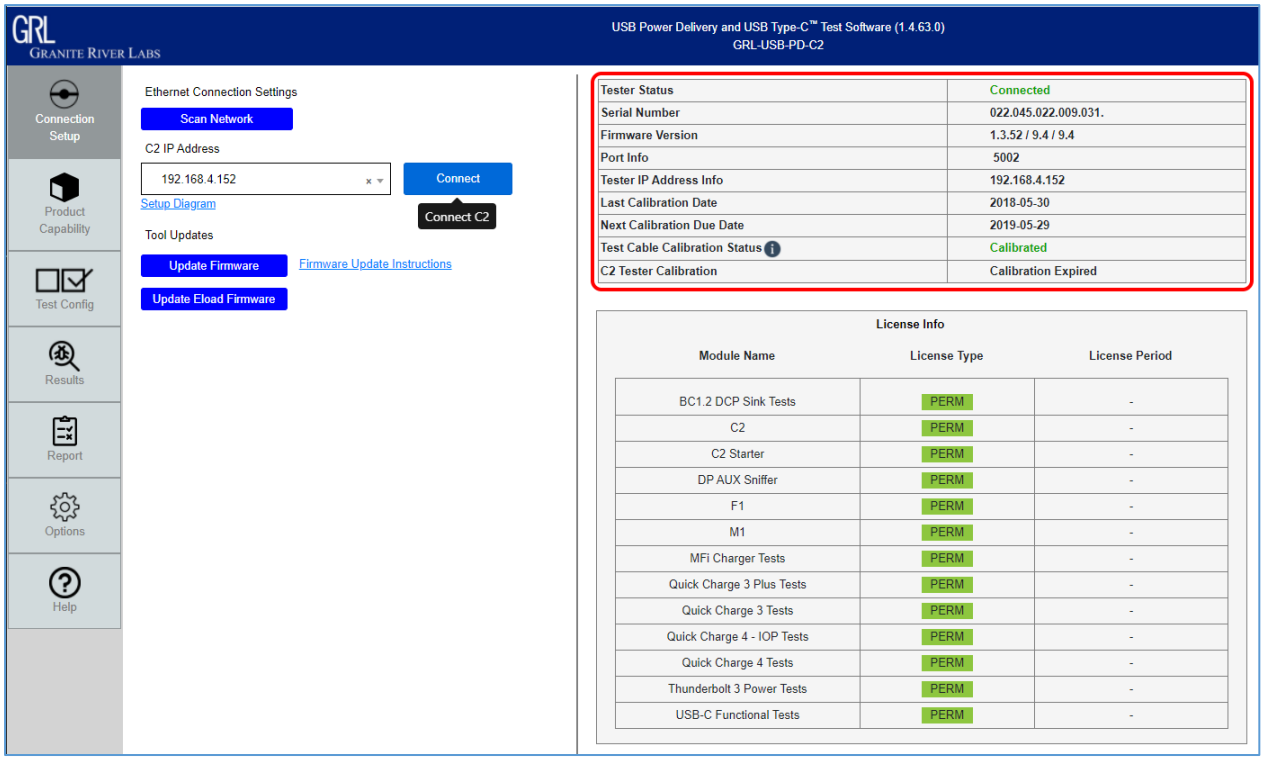

FIGURE 3.1: CONNECTION CONFIGURATION SCREEN AFTER SUCCESSFUL CONNECTION BETWEEN GRL-USB-PD-C2 / C2-EPR BROWSER APP AND GRL-USB-PD-C2 / C2-EPR TEST CONTROLLER

2. Check the "License Info" panel in the *Connection Setup* screen to make sure that the "DP AUX Sniffer" license is active on the GRL-USB-PD-C2 / C2-EPR test controller.

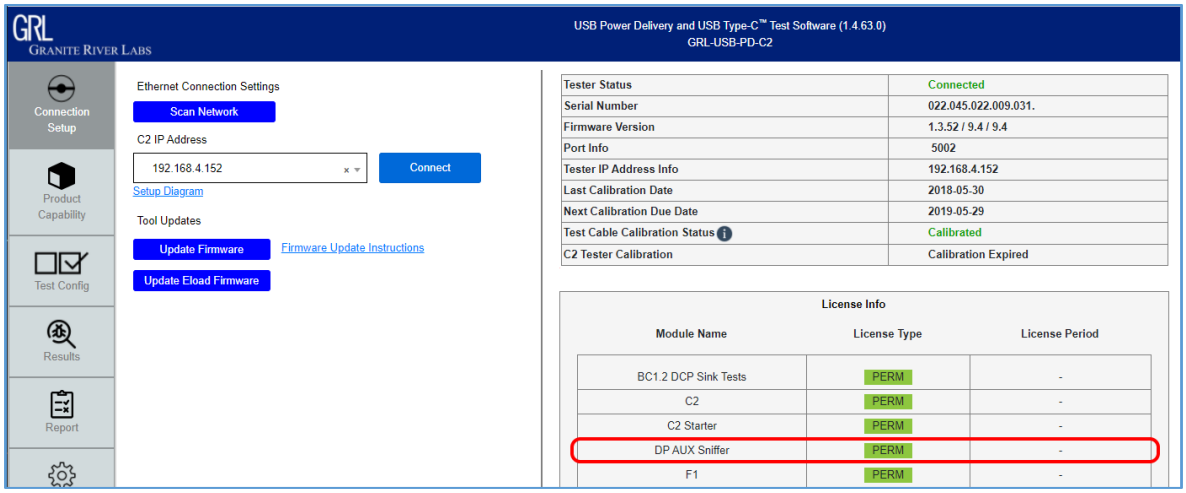

FIGURE 3.2: CHECK DP-AUX SNIFFER LICENSING

3. Go to the *Options* screen and select the **Config Controller** tab at the top of screen. Set the configuration as shown in the Configure panel below. Once configured, click on the **Apply** button.

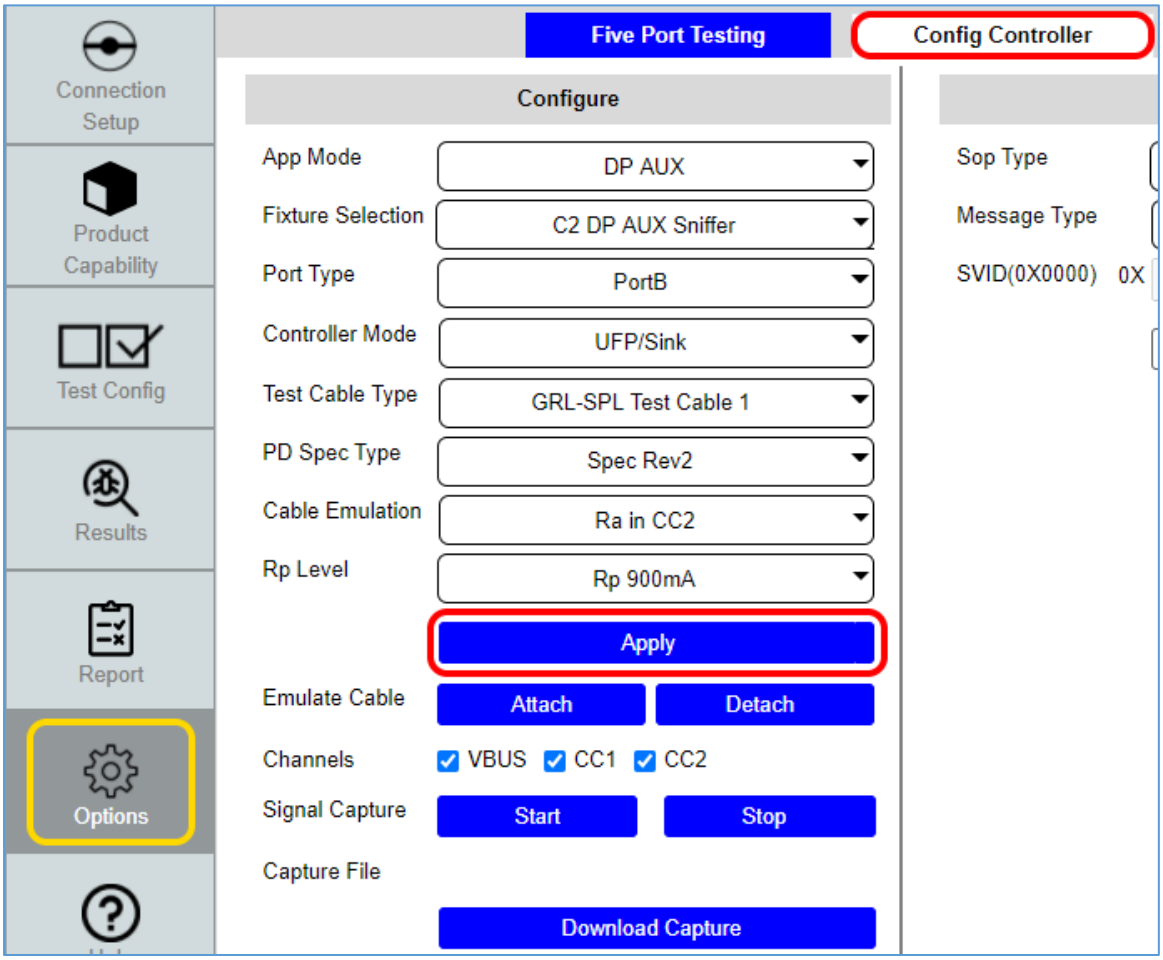

FIGURE 3.3: SET AND APPLY DP-AUX CONFIGURATION

4. At the "Signal Capture" field, click on the **Start** button 

to start running signal acquisition in the *Results* screen as shown in Figure 3.4 example.

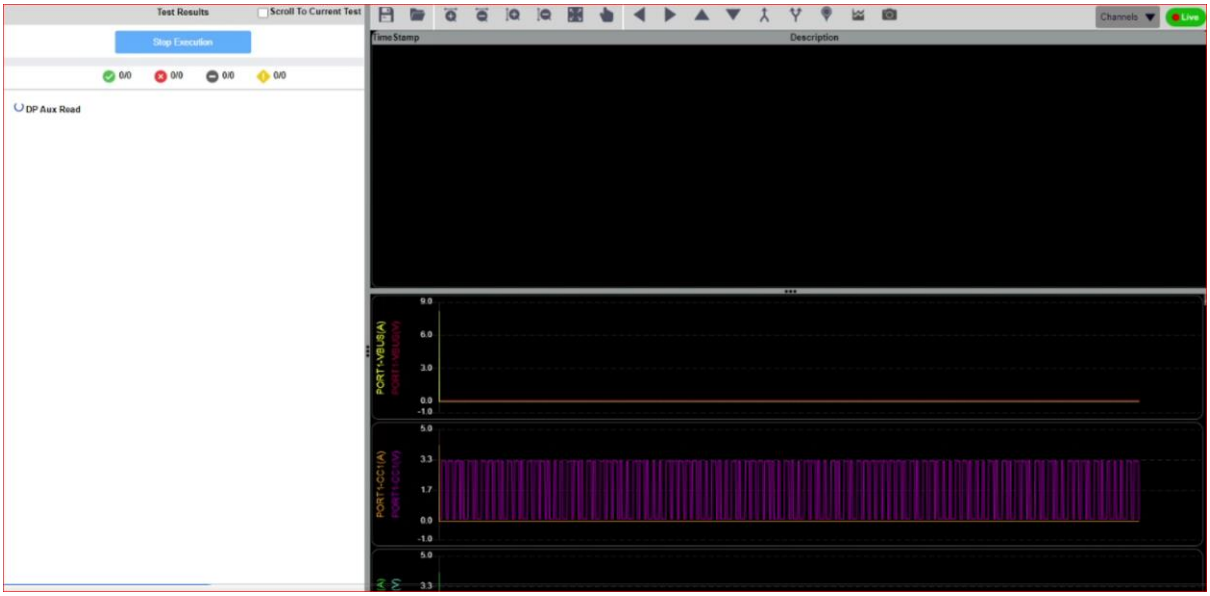

FIGURE 3.4: START SIGNAL CAPTURE IN RESULTS SCREEN EXAMPLE

3.2 Set Up Hardware Connections

After setting up the GRL-USB-PD-C2 / C2-EPR Browser App as described in Section 3.1, proceed to set up the following hardware connections.

3.2.1 DisplayPort Source and Sink Test Setup

Note: The DisplayPort Source and Sink connection in this setup are interchangeable.

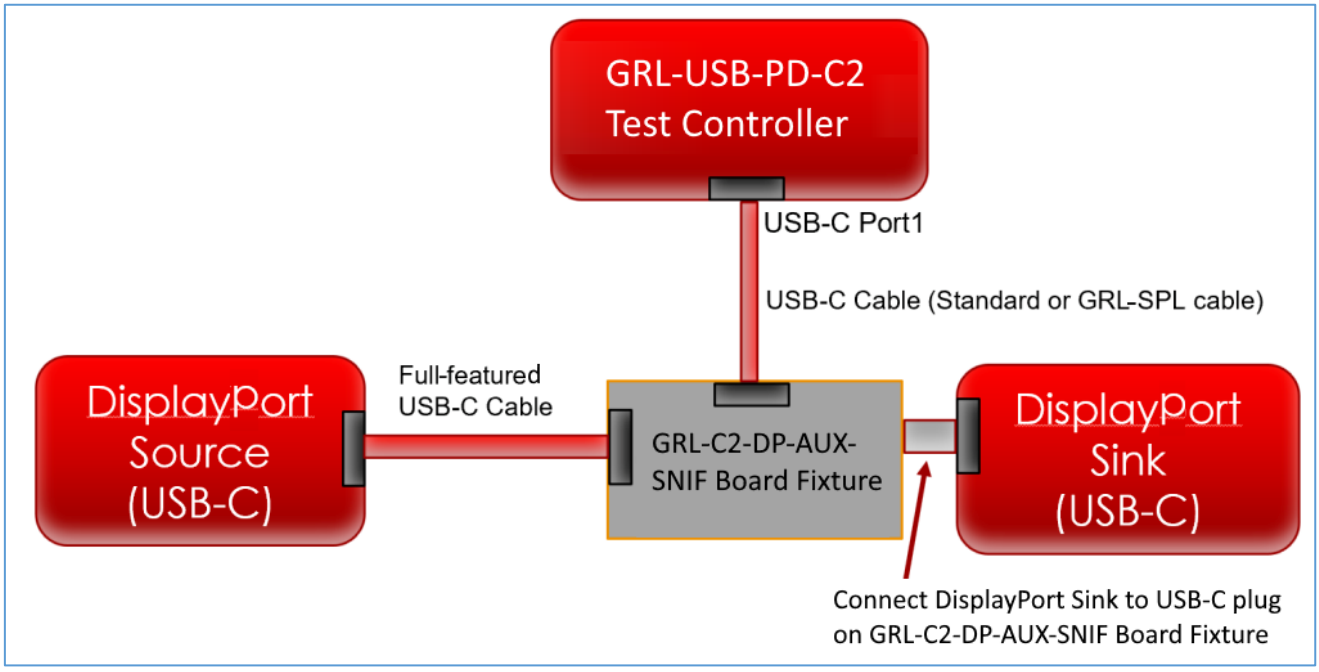

FIGURE 3.5: DISPLAYPORT SOURCE & SINK TEST SETUP CONNECTION DIAGRAM

As shown in Figure 3.5 above, connect the equipment as follows:

1. Connect Port 1 of the GRL-USB-PD-C2 / C2-EPR test controller using the GRL-SPL / GRL-SPL-EPR cable to the “Port1” connector on the GRL-C2-DP-AUX-SNIF Board test fixture.
2. Connect a USB Type-C based DisplayPort Source device using a full-featured USB Type-C cable to the “Device” connector on the GRL-C2-DP-AUX-SNIF Board test fixture.
3. Finally, attach the USB Type-C plug of the GRL-C2-DP-AUX-SNIF Board test fixture to a USB Type-C based DisplayPort Sink device.
4. If the Browser App screen does not extend or if the DisplayPort AUX packets are not captured, flip the USB Type-C standard cable connected to the DisplayPort Source of the DisplayPort Sink side (or) interchange the DisplayPort Source and Sink connected to the test fixture sides.

FIGURE 3.6: CLOSE-UP OF GRL-C2-DP-AUX-SNIF BOARD TEST FIXTURE

The following photos show some samples of the actual equipment connection for extending the screen’s display with and without the GRL-C2-DP-AUX-SNIF Board test fixture connected:

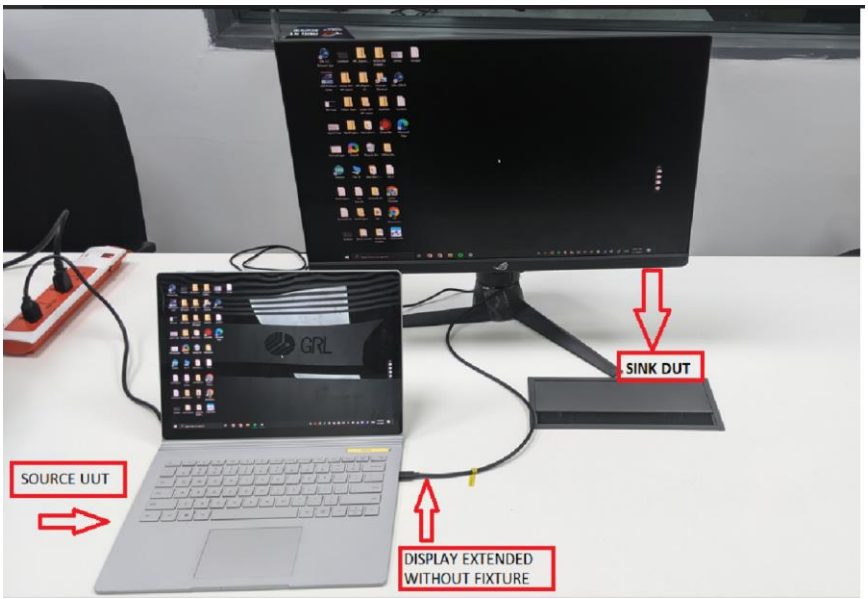

FIGURE 3.7: DISPLAY EXTENDED WITHOUT CONNECTING GRL-C2-DP-AUX-SNIF BOARD TEST FIXTURE

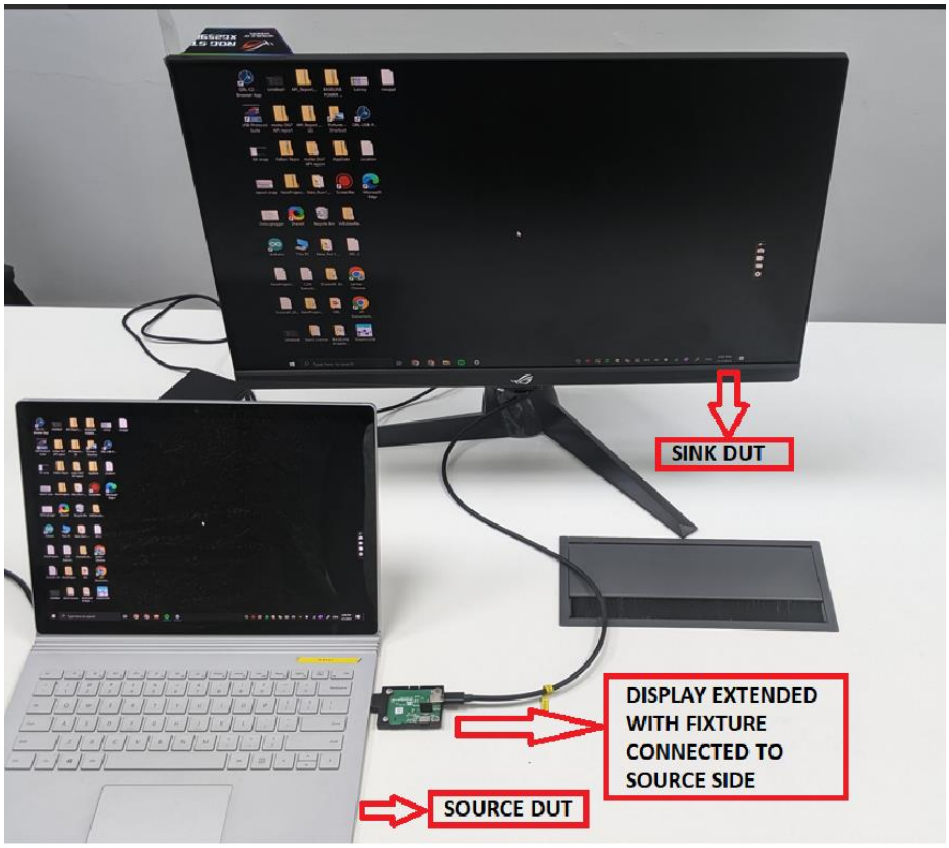

FIGURE 3.8: DISPLAY EXTENDED WITH GRL-C2-DP-AUX-SNIF BOARD TEST FIXTURE CONNECTED TO THE SOURCE SIDE

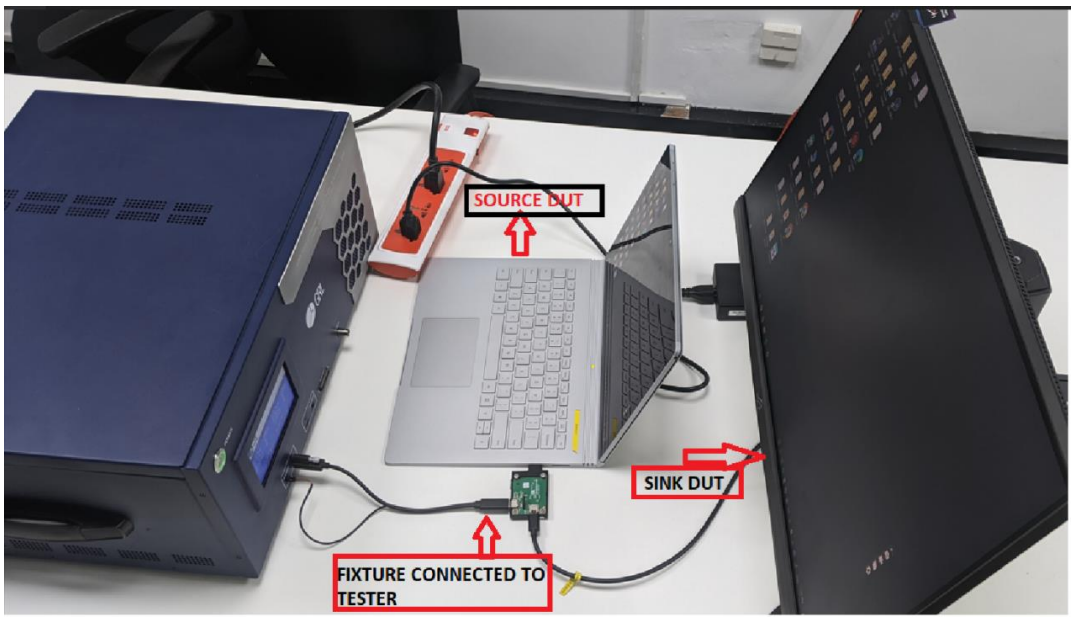

FIGURE 3.9: DISPLAY EXTENDED WITH GRL-C2-DP-AUX-SNIF BOARD TEST FIXTURE CONNECTED TO THE SOURCE SIDE AND GRL-USB-PD-C2 / C2-EPR TEST CONTROLLER USING GRL-SPL-EPR CABLE

3.2.2 DisplayPort Source and Sink with DisplayPort/Thunderbolt Dock Test Setup

Note: The DisplayPort Source and Sink connection in this setup are interchangeable.

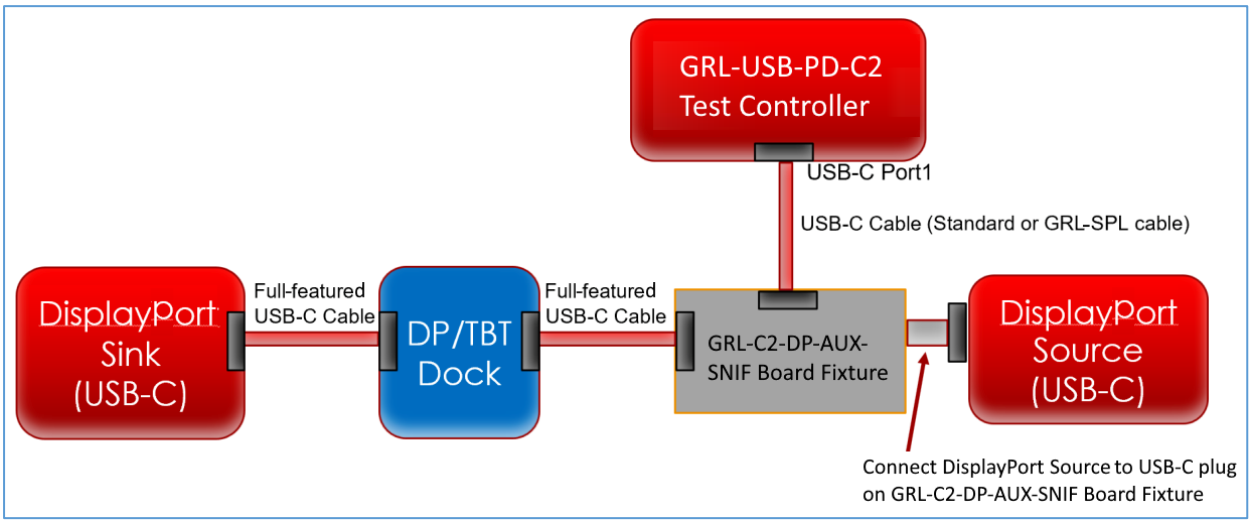

FIGURE 3.10: DISPLAYPORT SOURCE & SINK WITH DISPLAYPORT/THUNDERBOLT DOCK TEST SETUP CONNECTION DIAGRAM

As shown in Figure 3.10 above, connect the equipment as follows:

1. Connect Port 1 of the GRL-USB-PD-C2 / C2-EPR test controller using the GRL-SPL / GRL-SPL-EPR cable to the “Port1” connector on the GRL-C2-DP-AUX-SNIF Board test fixture.
2. Attach the USB Type-C plug of the GRL-C2-DP-AUX-SNIF Board test fixture to a USB Type-C based DisplayPort Source device.
3. Connect a DisplayPort/Thunderbolt dock using a full-featured USB Type-C cable to the “Device” connector on the GRL-C2-DP-AUX-SNIF Board test fixture.
4. Finally, connect a USB Type-C based DisplayPort Sink device using a full-featured USB Type-C cable to the DisplayPort/Thunderbolt dock.

4 DP-AUX Channel Test Procedure

The following procedure explains how to perform DP-AUX channel test automation using the GRL-USB-PD-C2 / C2-EPR Browser App.

1. Once the equipment for the test setups as described in Figure 3.5 and Figure 3.10 (whichever applies) have been connected, and connection has been established between the DisplayPort Source and Sink devices, the USB Power Delivery protocol communication followed by the DP-AUX transactions can be seen initially on the *Results* screen of the GRL-USB-PD-C2 / C2-EPR Browser App, as shown in below examples.

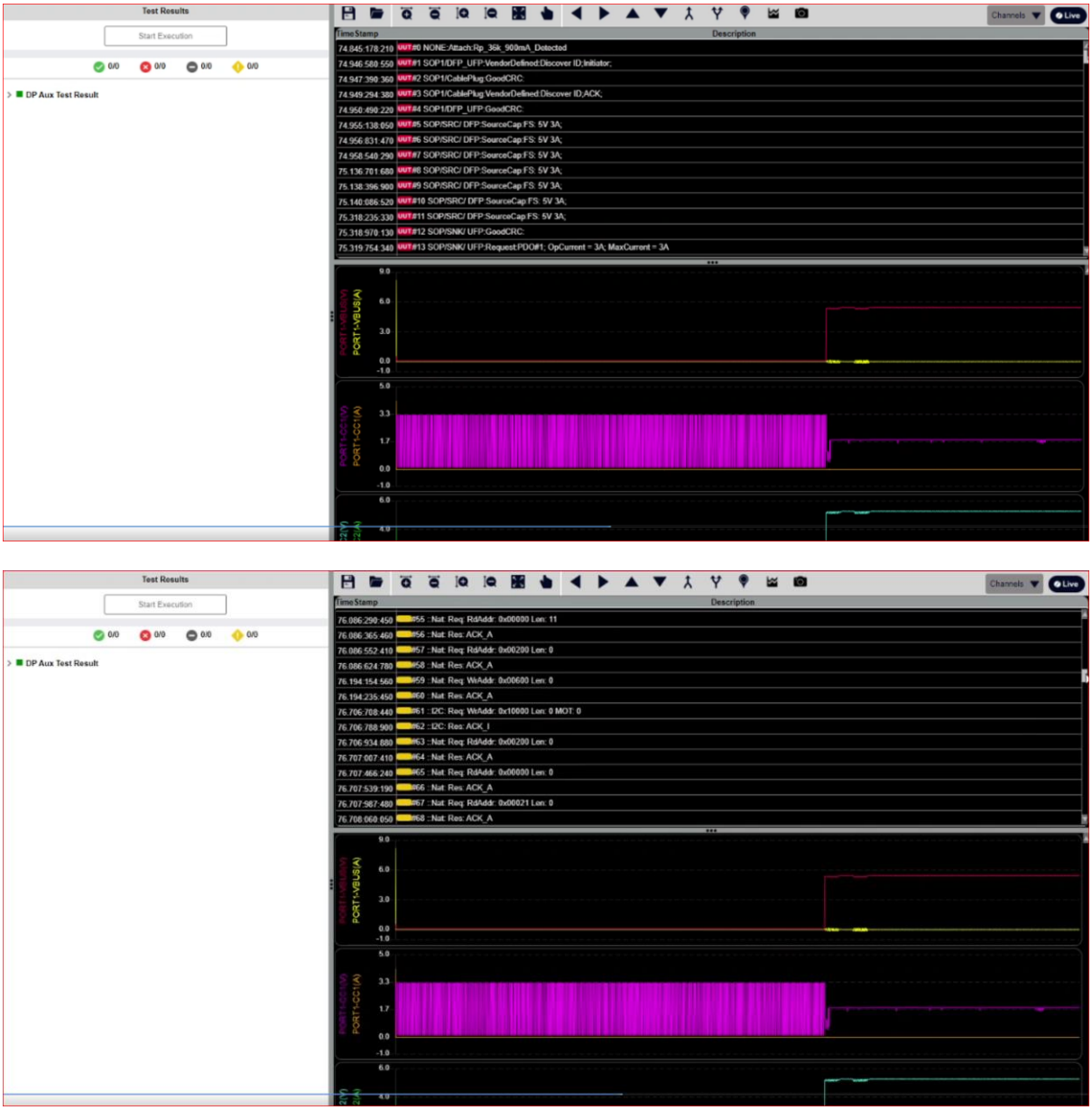

FIGURE 4.1: INITIAL DISPLAY OF DP-AUX TEST EXECUTION ON RESULTS SCREEN

2. More details on the DP-AUX test protocol and Pass/Fail descriptions can be seen by expanding the test results drop down as shown in Figure 4.2 example.

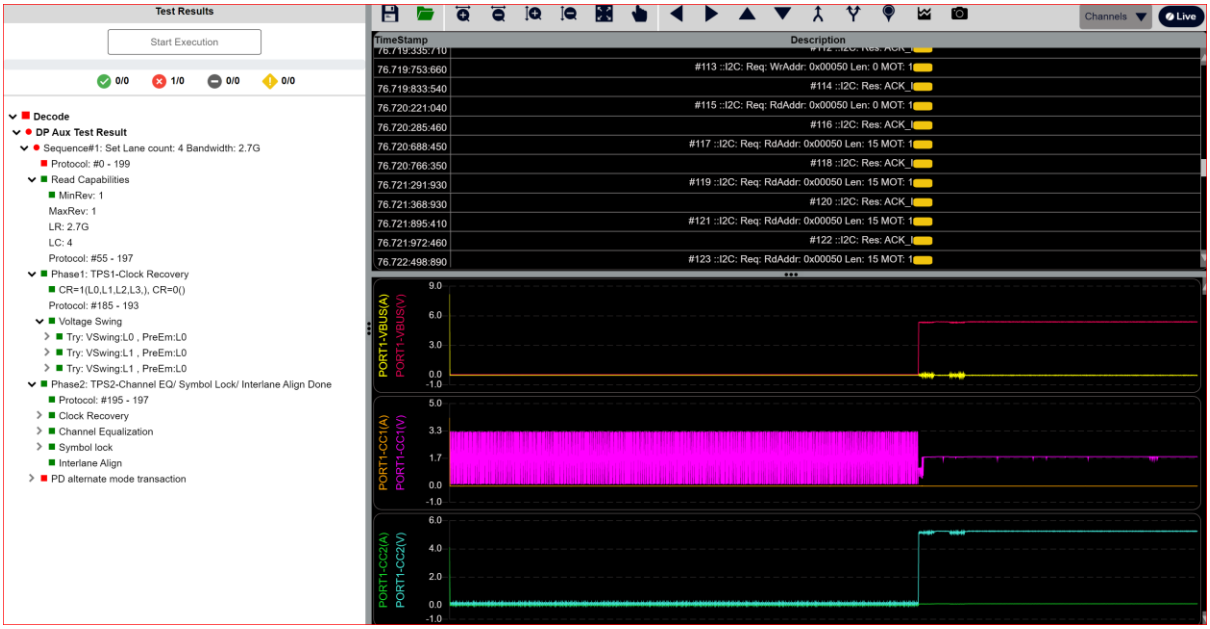

FIGURE 4.2: VIEWING MORE DETAILS ON DP-AUX TEST RESULTS

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