

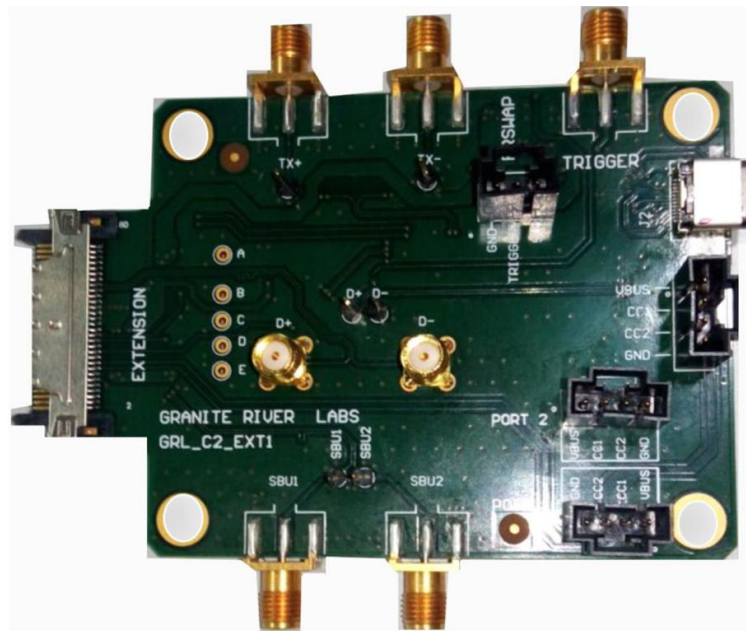


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GRL Platform Solutions

Addendum

**GRL-USB-PD-DPC Addendum for Hardware Setup with
GRL-USB-PD-DPC Fixture and GRL Platform Solutions
USB Type-C® Power Delivery Tester and Analyzer (GRL-
USB-PD-C2-EPR)**



This material is provided as a reference to set up the hardware for DisplayPort over Type-C (DPoC) Source testing using the GRL Platform Solutions GRL-USB-PD-DPC fixture and GRL-USB-PD-C2-EPR test controller.

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

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1 Scope of this Addendum

This Addendum serves as a supplementary documentation to connect the GRL Platform Solutions DisplayPort over Type-C PHY Tx Automation Test Board (GRL-USB-PD-DPC) to the GRL-USB-PD-C2-EPR USB Type-C Test Controller. The GRL-USB-PD-DPC extension fixture can be used for DisplayPort Alt Mode over Type-C automated testing and for controlling Low Frequency Periodic Signaling (LFPS) sequences in USB 3.0 system when connected to the GRL-USB-PD-C2-EPR controller.

The GRL-USB-PD-DPC Board consists of a DP PHY extension fixture as follows:



- **GRL-C2-EXT1 DisplayPort Fixture, LFPS Control Board** – EXT1 extension fixture for the GRL-USB-PD-C2-EPR test controller, used to provide support for DP PHY automation.

The GRL-USB-PD-DPC fixture interfaces with the GRL-USB-PD-C2-EPR controller using the GRL-C2-EXT1 Extension Module for controlling the SBU lines and Side-band signals (GND, CC1, CC2, Vbus).

- The GRL-USB-PD-C2-EPR hardware can be used as a DisplayPort over Type-C Source PHY test controller. It is designed to be used with DisplayPort Approved PHY test fixtures such as the GRL-C2-EXT1 DisplayPort fixture that attach to high performance oscilloscopes for automated PHY testing.
- The GRL-USB-PD-C2-EPR hardware can also be ordered as GRL-USB-PD-C2-CTRL, which is a version of the hardware that only provides PHY controller capability with USB Power Delivery features disabled.
- The GRL-USB-PD-C2-EPR hardware has an integrated DisplayPort AUX Controller with access provided over the SBU1/SBU2 lines for changing the PHY Data Rate, Swing and Pre-Emphasis levels using DPCD (DisplayPort Configuration Data) control.
- The GRL-USB-PD-C2-EPR hardware also has available (through its SS USB Tx lines) LFPS Control signals for USB Tx PHY testing.

Refer to the GRL-USB-PD-C2-EPR user documentation in <https://www.grlps.com/en-us/download-center> for details on the GRL-USB-PD-C2-EPR software and available test cases.

2 DPoC Test Setups with GRL-C2-EXT1 DisplayPort Fixture

Below are some test setup examples using the GRL-C2-EXT1 DisplayPort extension fixture as well as the Wilder-Tech or LS-ICT and the Keysight PHY test fixtures.

2.1 DPoC Test Setups Using GRL-C2-EXT1 and Wilder-Tech or LS-ICT Test Fixtures

The following shows the setup for DisplayPort 4-Lane testing using the GRL-USB-PD-C2-EPR test controller, GRL-C2-EXT1 fixture and Wilder-Tech plug fixtures.

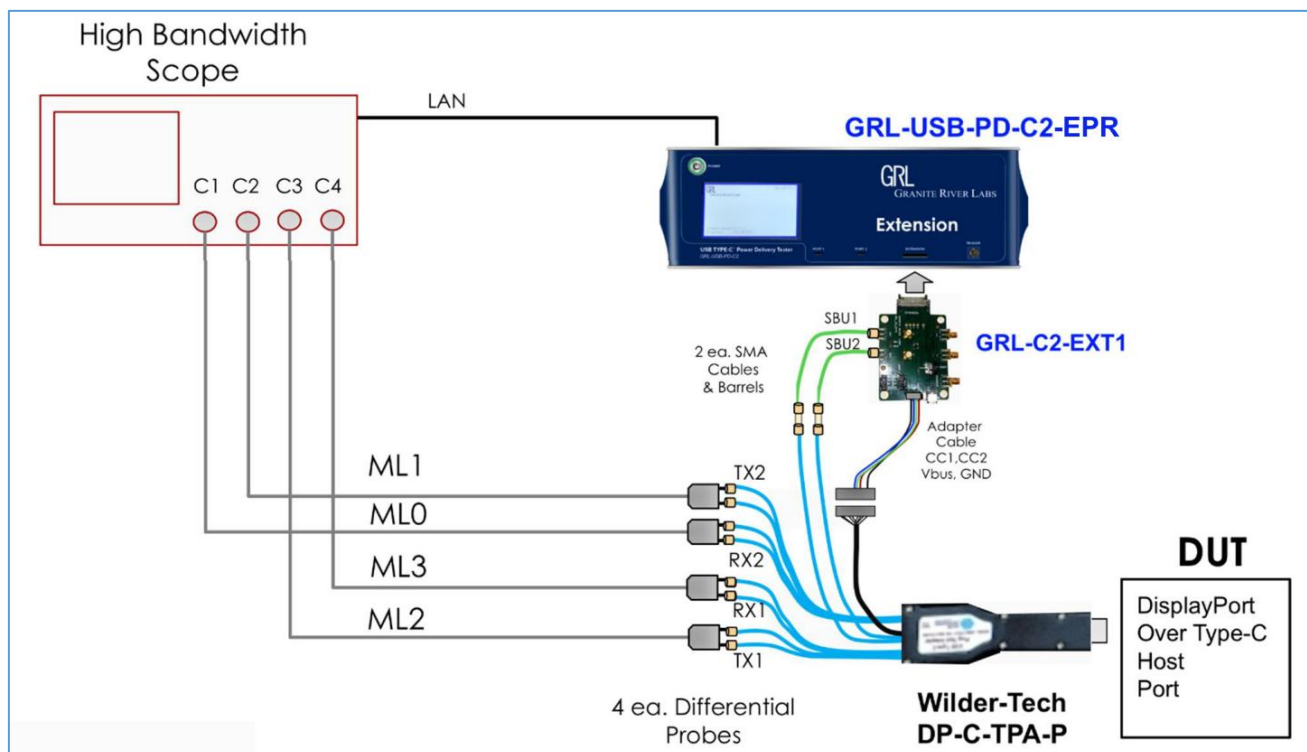


Figure 1. DisplayPort 4-Lane Testing Using GRL-USB-PD-C2-EPR, GRL-C2-EXT1 and Wilder-Tech Plug Fixtures

The following shows the setup for DisplayPort 2+2 testing using the GRL-USB-PD-C2-EPR test controller, GRL-C2-EXT1 fixture and Wilder-Tech fixtures. A SMA breakout fixture and SS USB thumb drive are used to create crosstalk between the USB Link and DisplayPort Main Link signals.

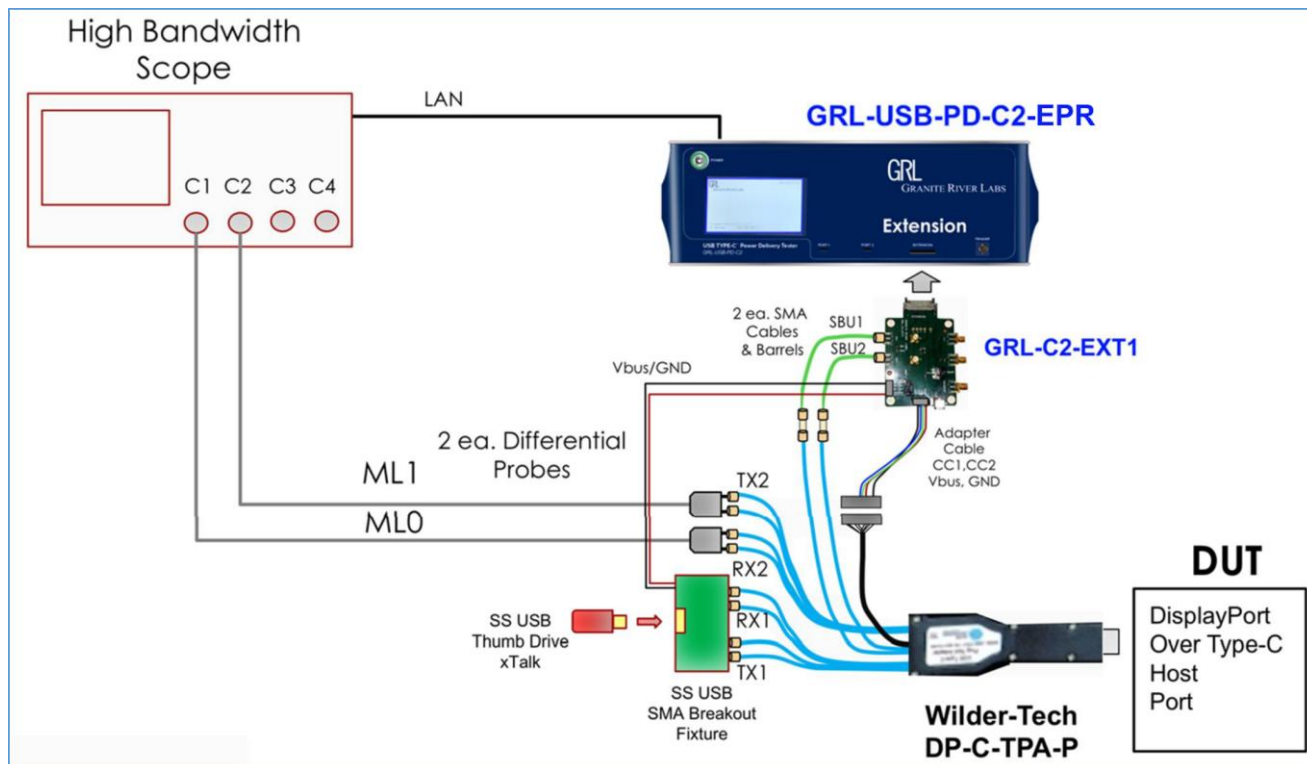


Figure 2. DisplayPort 2+2 Testing Using GRL-USB-PD-C2-EPR, GRL-C2-EXT1 and Wilder-Tech Plug Fixtures and Crosstalk

The test setup for the LS-ICT Plug fixture is similar except the GND, CC1, CC2, VBUS are on a 4-pin header instead of a 8-pin connector.

2.2 DPoC Test Setups Using Keysight PHY Test Fixtures

Below show the setups for DisplayPort 4-Lane and 2+2 testing using GRL-USB-PD-C2-EPR, GRL-C2-EXT1 fixture and Keysight PHY fixtures.

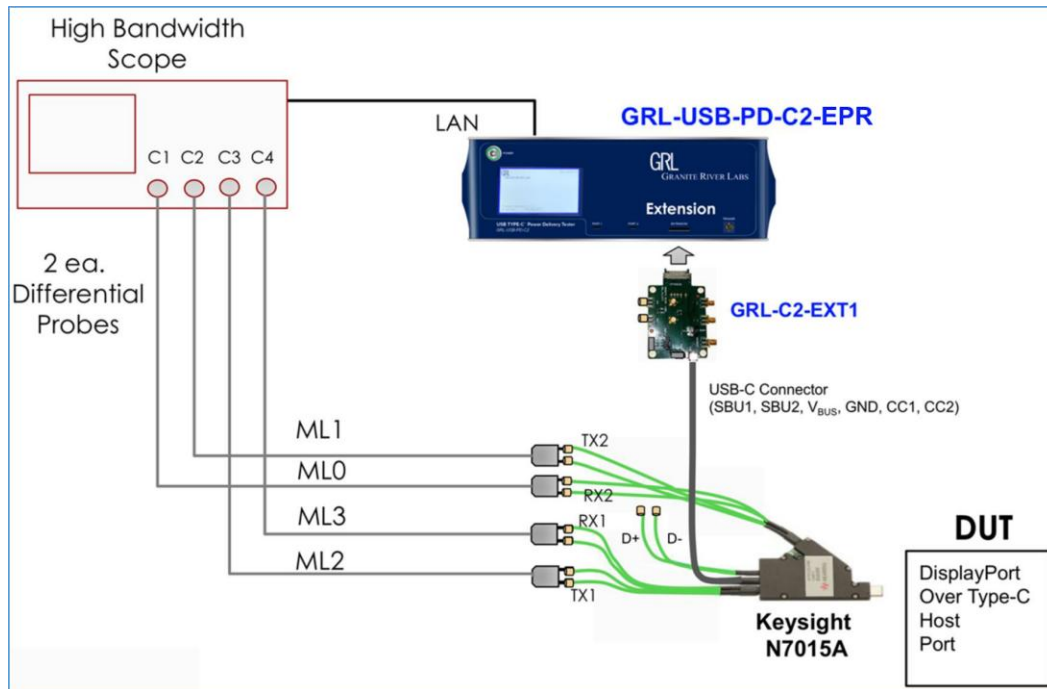


Figure 3. DisplayPort 4-Lane Testing Using GRL-USB-PD-C2-EPR, GRL-C2-EXT1 and Keysight Plug Fixtures

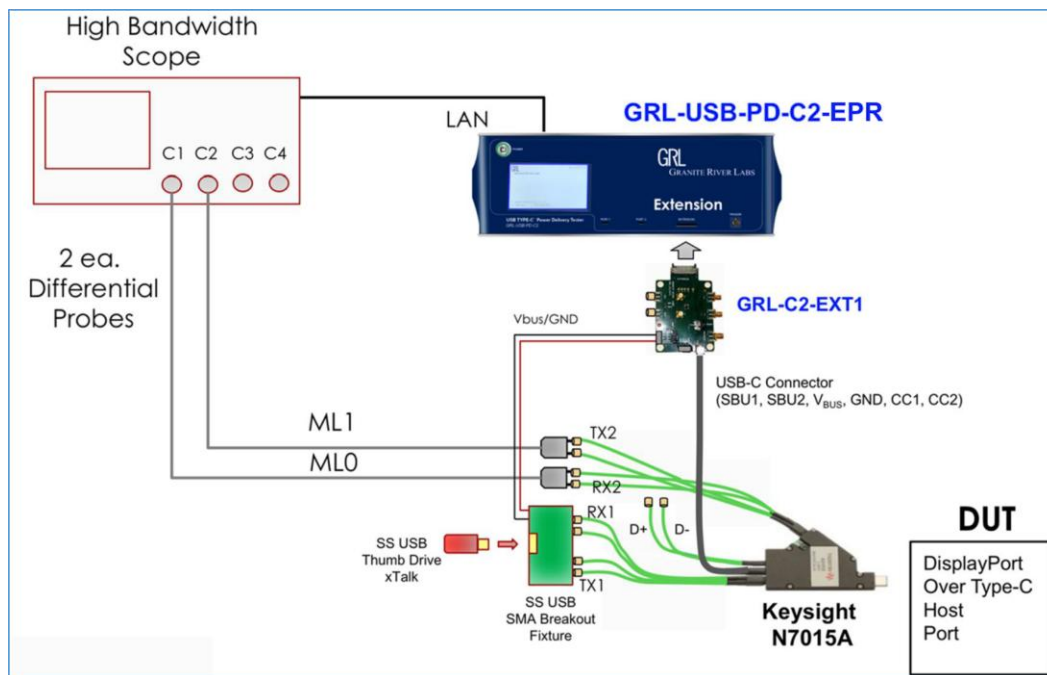


Figure 4. DisplayPort 2+2 Testing Using GRL-USB-PD-C2-EPR, GRL-C2-EXT1 and Keysight Plug Fixtures and Crosstalk

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