



QUICK START GUIDE

PV2 Universal Active Probe

Probing Solution with 8 GHz Bandwidth

C SERIES



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Introduction

OVERVIEW

The PV2 Universal Active Probe is a signal measurement solution for high-speed links carrying low voltage, high speed signals with a bandwidth of 8 GHz. By providing a completely non-proprietary instrument interface, it facilitates the attachment of a wide range of instruments to any given device under test (DUT) while minimizing circuit loading and maintaining signal integrity. This means that it can be attached to any oscilloscope brand, and it can also be attached to spectrum analyzers, protocol analyzers, and digital capture systems.

QUICK START DOCUMENTATION

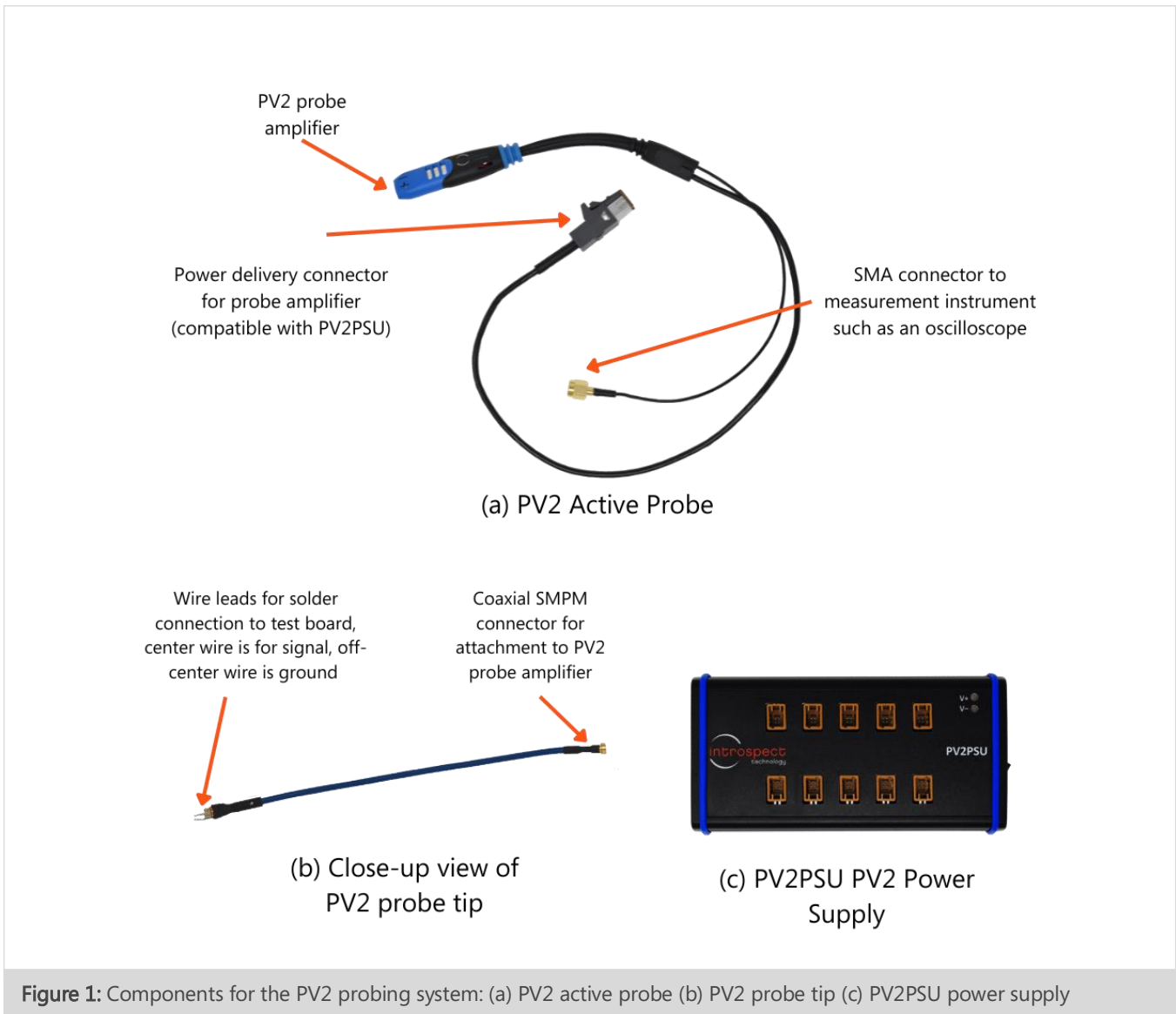
This Quick Start Guide will provide the relevant information for a user to set up and perform measurements using PV2 Active Probes. Basic hardware connection instructions are provided as well as a step-by-step procedure.

REQUIREMENTS

The full list of hardware requirements for this Quick Start Guide is provided below:

- (Minimum QTY=1) PV2 active probes (Introspect Item Number 4854)
- (Minimum QTY=1) PV2 solder-down probe tips
- (QTY=1) PV2PSU PV2 power supply (Introspect Item Number 4855)
- (QTY=1) 12V DC voltage adapter (part number CUI SDI65-12-U-P5)
- (QTY=1) SV5C-CPRX MIPI C-PHY Analyzer (Introspect Item Number 5783) or similar Introspect analysis instrument
- (QTY=1) 12V DC power supply for SV5C (part number XP Power AHE220PS12)
- (QTY = 1) MXP to SMA cable, 12 inch, SMA male (part number Huber+Suhner MF53/2x8A_21MXP/11SK/305)
- (QTY = 1 each) USB2 and USB3 cables for connection of the SV5C-CPRX C-PHY Analyzer to a user PC

The individual elements of the PV2 active probe system are shown in detail in Figure 1 below, and guidelines for attaching the PV2 solder-down probe tips to a device under test are provided in the section which follows.



GUIDELINES FOR ATTACHING THE SOLDER-DOWN PROBE TIPS

Figure 2 provides guidelines of soldering PV2 probes to high-speed signal traces on test boards, interposers, or test fixtures. A photo of a typical probe attachment is shown in Figure 2(a). The wire on the left (from the center of the PV2 probe tip) attaches to the signal under test, while the wire on the right attaches to the ground, as outlined in the diagram in Figure 2(b). PV2 probe tip wires can be readily attached to footprints with pad sizes and spacing matching 0201 surface mount components dimensions, shown in Figure 2(c). To maximize the mechanical stability of probe attachments, it can be useful to add simple adhesives such as hot glue, as shown in Figure 2(d) or Kapton tape (see Error! Reference source not found.) to firmly hold probe tips in place.

Care should be taken to ensure that the attachment wires of the PV2 probe tips are properly soldered to test boards, with leads trimmed to be as short as possible, for both the signal and ground wires. Where possible, probe tips should be mounted at an angle of 45 degree (or more) to the board as shown in the figure.

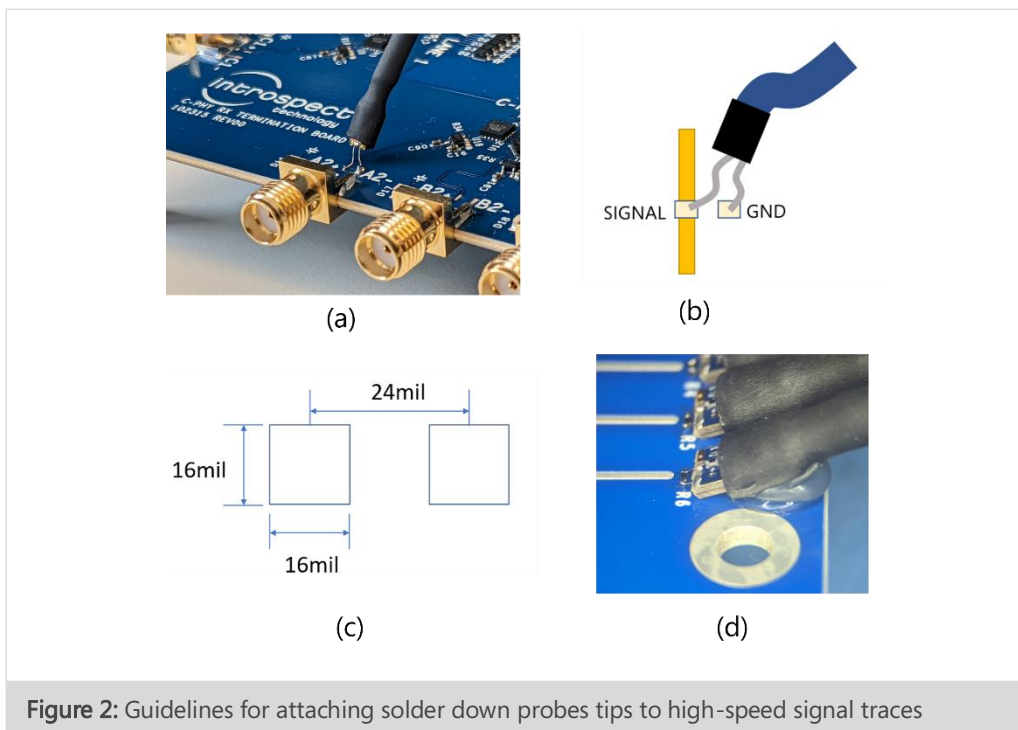
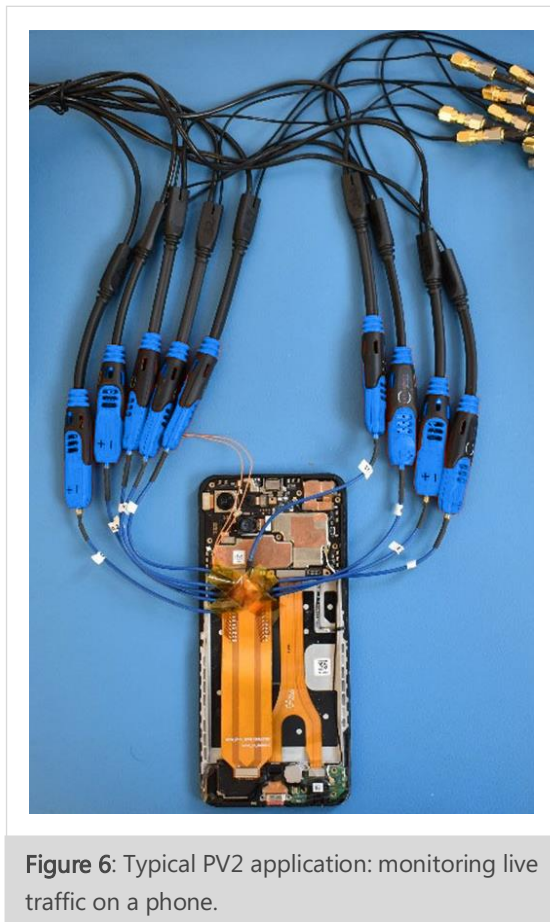


Figure 2: Guidelines for attaching solder down probes tips to high-speed signal traces

Application Example

Error! Reference source not found. demonstrates a typical application for PV2 probes: monitoring live traffic on a phone. In the figure, the high-speed bus between the phone's processor and the display module is laid out on an orange flex-PCB with probing points available. A small rigid test fixture has been created to sit under the test points of interest, and PV2 solder-down probes have been attached to the fixture as shown. The high-speed bus being monitored here is comprised of 3 trios of C-PHY data (requiring nine single-ended PV2 probes).



STEP-BY-STEP PROCEDURE FOR USING THE PV2 ACTIVE PROBES

The fully assembled setup with all required components is shown in Figure 4 below. The full list of required components is given on page 3 of this document. The steps below provide the outline for connecting the setup and making measurements with the PV2 probes. Note that physically connecting the PV2 probe amplifiers to the PV2 probe tips may be left until the last step (step 6 below).

1. Create the test fixture and solder required PV2 probe tips to the test board or interposer, as appropriate for the required test setup. Probe tip attachment guidelines are given in the previous section, and a photo of a test fixture attachment to a phone is shown in Error! Reference source not found. and below.

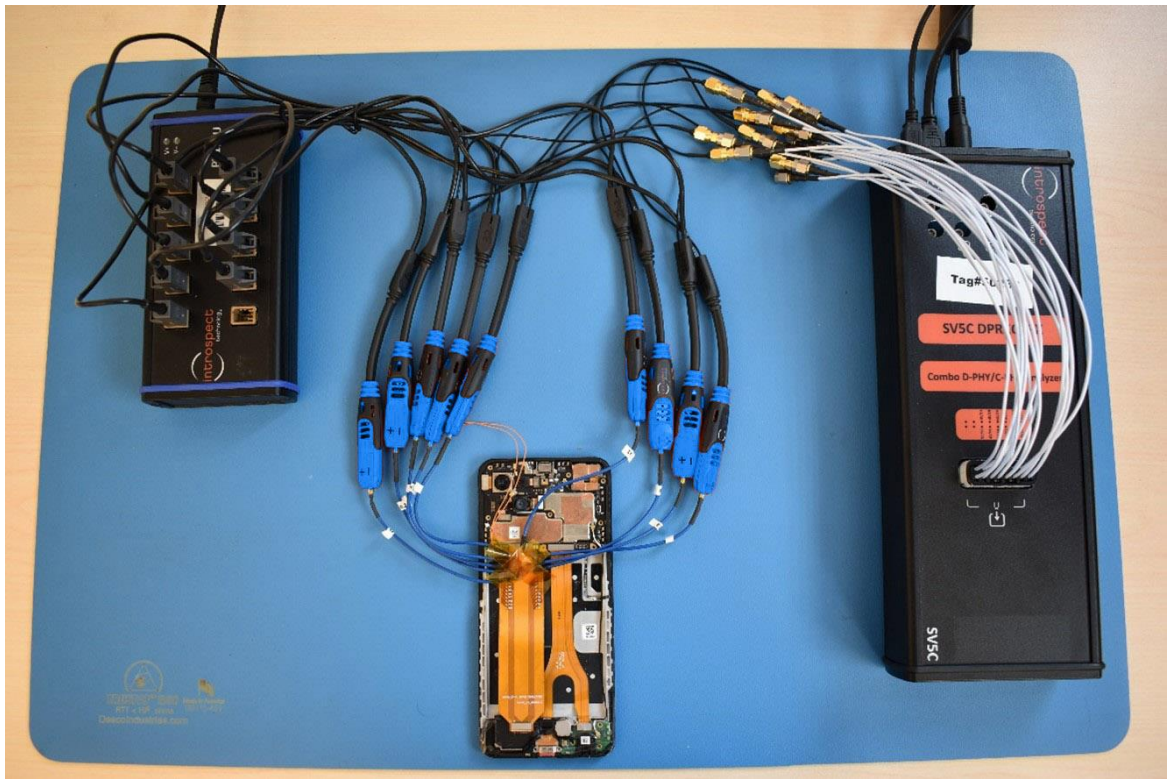


Figure 3: Fully assembled test setup for the PV2 probe application example

2. Connect the PV2PSU power supply to its 12V DC voltage adapter and plug the DC voltage adapter into a suitable AC outlet.
3. Connect all PV2 active probe power cables to the PV2PSU. The power supply unit can accommodate up to 10 active probes simultaneously.
4. Connect the SV5C-CPRX MIPI C-PHY Analyzer to its 12V DC voltage adapter and plug the DC voltage adapter into a suitable AC outlet.
5. Connect the PV2 Active Probe signal cable (SMA connector) to the Huber+Suhner MXP to a SMA cable assembly, which can then be connected to the SV5C-CPRX MIPI C-PHY Analyzer. For pinout information for the MXP connector of SV5C MIPI C-PHY Analyzer, please refer to the Introspect SV5C MIPI C-PHY Analyzer datasheet.
6. Connect the PV2 probe amplifiers to the PV2 probe tips soldered to the test fixture. This connection is made with the miniature coaxial connector, as shown previously in Figure 1(b).
7. Power up the PV2PSU (and observe V+ and V- LEDs on the upper right-hand corner of the PV2PSU will turn on).
8. Power up the SV5C MIPI C-PHY Analyzer and connect the SV5C-CPRX MIPI C-PHY Analyzer to a PC via USB2 and USB3 cable connections. All control of the SV5C-CPRX MIPI C-PHY Analyzer is handled through the Pinetree software environment.

The setup is now ready to perform measurements. Figure 5 shows data that was captured from live traffic on the high-speed bus using the PV2 active probes, the SV5C-CPRX, and Pinetree. HS bursts, LP states, DSI packets and full captured image frames can be measured and analyzed through the Introspect GUI, as in the examples in the figure.

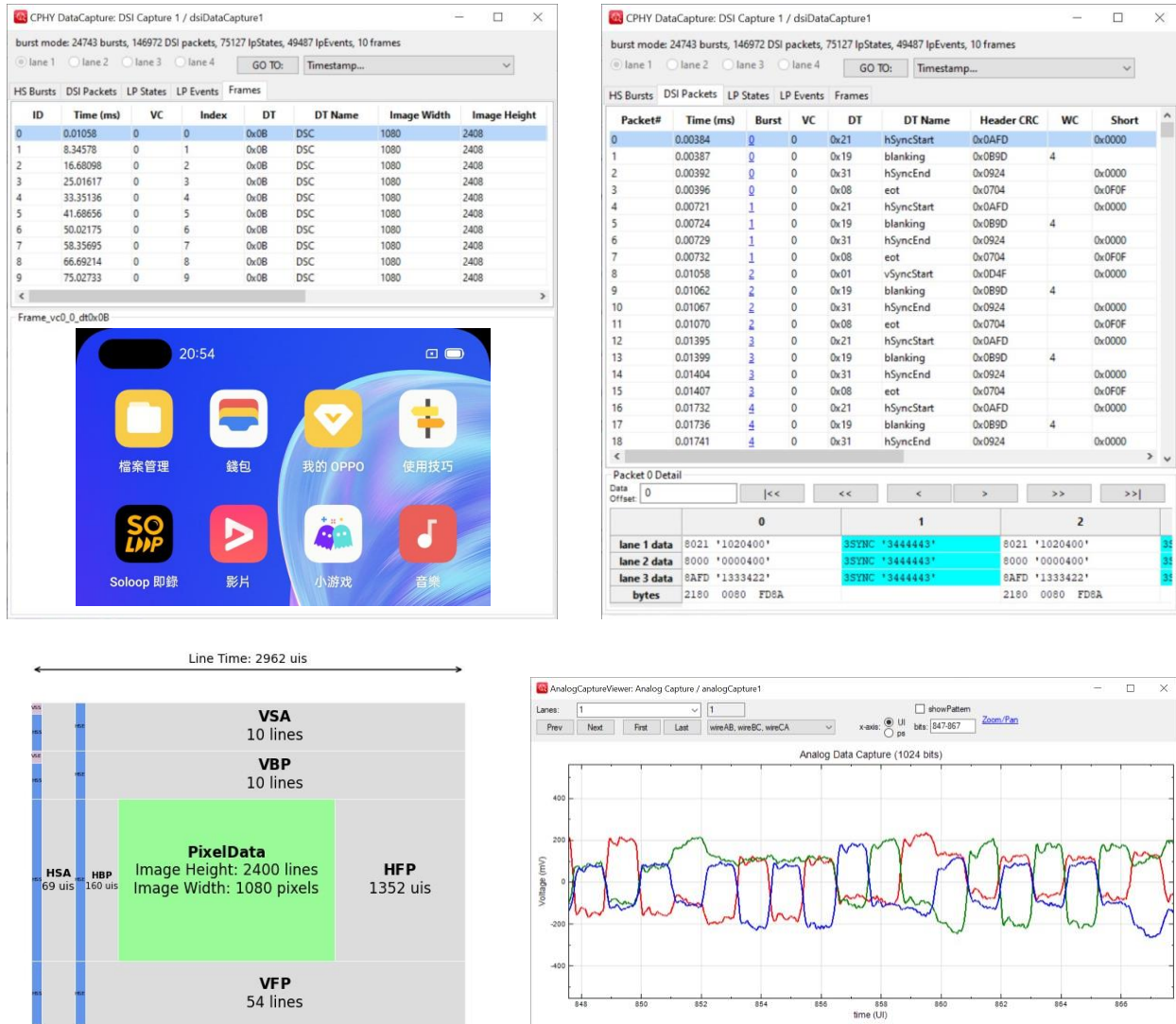


Figure 4: Examples of image frames, packets and analog signal captures made from live phone traffic and viewed in Pinetree



REVISION NUMBER	HISTORY	DATE
1.0	Document Release	September 28, 2021
1.1	Updated Figure 2; photos of the PV2	December 13, 2023

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