

# USB Embedded Probe *Quick Start*

## 1 Introduction

The Teledyne LeCroy USB Embedded Probe is a portable pod and cable assembly that allows probing of low speed, full-speed, and high-speed USB protocols in setups that do not expose external USB connectors and cables. The probe can capture either HS/FS/LS at normal USB voltages, or ICUSB Low and Full speed signaling.



Supported protocols are:

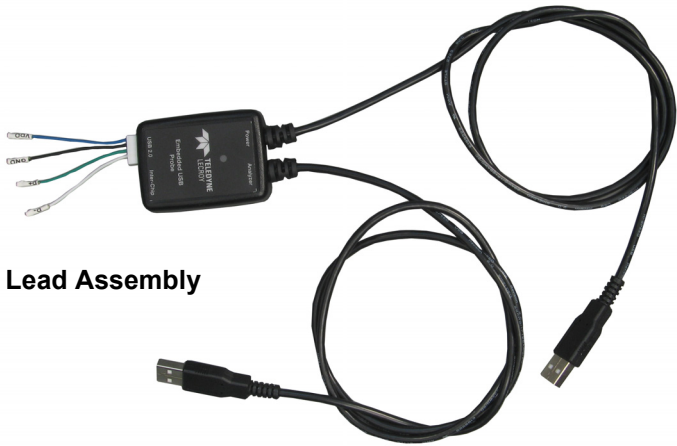
- Low-speed and Full-speed USB 1.1 protocols
- Low-speed, Full-speed, and High-speed USB 2.0 protocols
- Low-speed and Full-speed Inter-chip USB protocols

The probe can be used with any Teledyne LeCroy analyzer that supports USB 1.1 and USB 2.0 capture, including both CATC- and Catalyst-based products.

## 2 Components

USB Embedded Probe components are:

- Teledyne LeCroy USB Embedded Probe with non-removable USB “A” cables
- Probe Lead Assembly (2)
- Solder-in resistors (10) for probe tips, 45.3 ohms
- Solder-in header pins (10)
- Flying-lead micrograbber (6)  
[hooks probe tips to header pins on DUT PCB]
- High-speed USB-B terminator

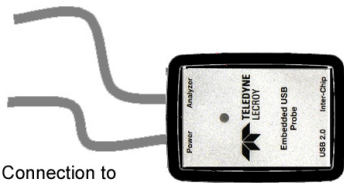


Probe and Lead Assembly

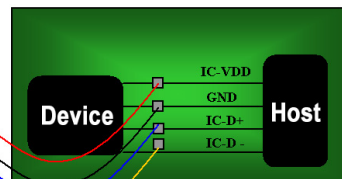
## 3 Description

The USB Embedded Probe allows Teledyne LeCroy PSG Protocol Analyzer systems to capture Low-, Full-, and High-speed USB protocols. An LED indicates whether the probe is powered.

Connection to  
USB Analyzer (Port A)



Connection to  
USB Port on Host Machine  
(for power only)



Solder-in Probe Tips

**USB:** The interface uses standard USB type A plug connectors (USB Mobile uses mini-A to Standard-A adapter). Connect Power Supply “A” plug to USB “A” Port on the computer or to USB power supply. Connect the other “A” probe plug to the Teledyne LeCroy USB protocol analyzer “A” receptacle.

**Leads:** For low- and full-speed use, the lead set may be connected directly to the USB device using a header pin or may be soldered directly to the device pins.

For high-speed use, 45.3-ohm resistors must be used to isolate the lead set from the USB D+ and D- signals. These resistors may be pressed into the end of the lead set and soldered to the device.

The micrograbber probe tips may be used to connect to ground, VDD IO, and low- or full-speed USB D+ and D- signals. The micrograbber may not be used to connect to the high speed USB D+ and D- signals.

For the Inter-Chip USB application, connect the lead set to the Inter-Chip connector on the USB probe. Connect the D+ lead to the D+ signal, the D- lead to the D- signal, the GND lead to device ground, and the VDD lead to the device IO voltage pin (1.0 V to 3.3 V).

For the USB 2.0 application, connect the lead set to the USB 2.0 connector on the probe. Connect the D+ lead to the D+ signal, the D- lead to the D- signal, and the GND lead to device ground. **Note:** For high-speed mode, the D+ and D- leads must be connected through the 45.3-ohm resistors.

**Terminator:** For high-speed mode only, connect USB-B terminator to analyzer “B” port.

**Capture:** After the Probe is set up, the analyzer should be able to capture USB traffic as if it were tapping a normal cable connection between host and device.

**USB Speed:** For standard USB level signals, the five-pin connector labeled “USB 2.0” is used. For Inter-Chip Low-Speed and Full-Speed, the connector labeled Inter-Chip is used.

## **Teledyne LeCroy Customer Support**

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