TELEDYNE LECROY
Everywhereyoulook™

USB Test Solutions
QPHY-USB

Key Features

- **Compliant with all real-time oscilloscope tests specified by the USB-IF procedures**
- **Support for host, device, and hub testing**
- **Simple and easy-to-use automated testing**
- **Support for High-speed, Full-speed, and Low-speed testing included**
- **QualiPHY report generation — incorporates all oscilloscope and DVM tests**
- **SMA cables used for high-speed upstream signal quality**
- **Supports 12 Loads for higher port hubs**
- **Two boards for ease of connection**
- **No dangling cables**

High-speed upstream signal quality test result.

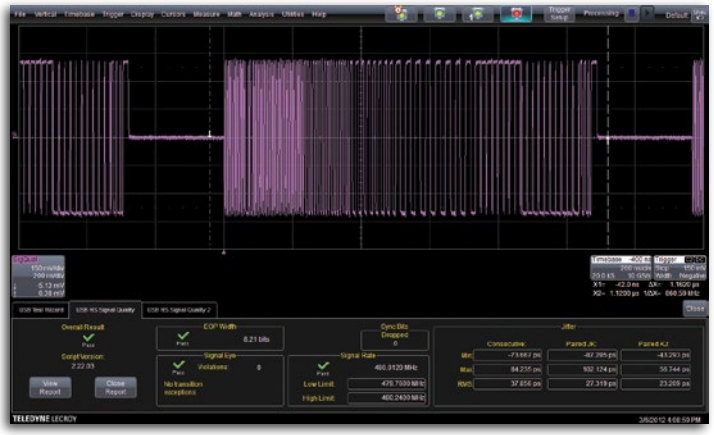
The USB package provides a complete acquisition and analysis system for USB 2.0 devices, hosts, and hubs, as specified in the USB-IF USB 2.0 Electrical Test Specification. The test software implements a full set of electrical tests for USB 2.0, including High-, Full-, and Low-speed tests and is supported by Teledyne LeCroy's QualiPHY automated test and reporting software.

QualiPHY's connection diagrams provide a visual representation of probe and cable connections making it easy to ensure that the correct connections are made the first time.

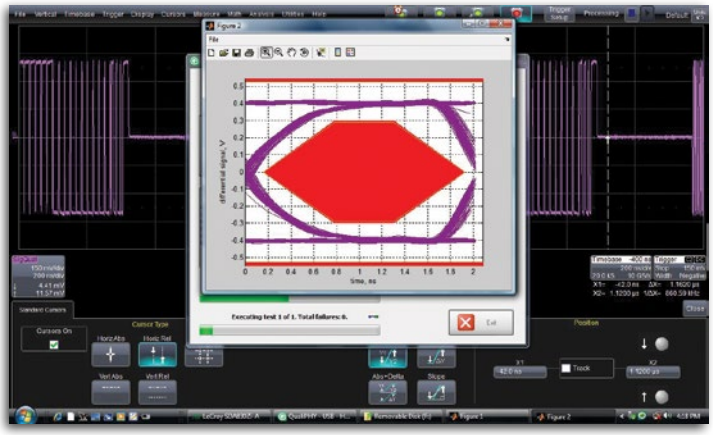
The user is prompted when to change the test conditions and as how to interpret the test results. Each measurement is indicated by its designation within the specification, and the allowed values for each parameter are shown, as well as a pass/fail indication.

Teledyne LeCroy's TF-USB-B fixture provides sections for Signal Quality (Device & Host), Receiver Sensitivity, TDR (Device & Host), Disconnect, Inrush, Droop and 12 Loads to accommodate higher port hubs. High-speed, Full-speed, and Low-speed tests are all supported.

QualiPHY™

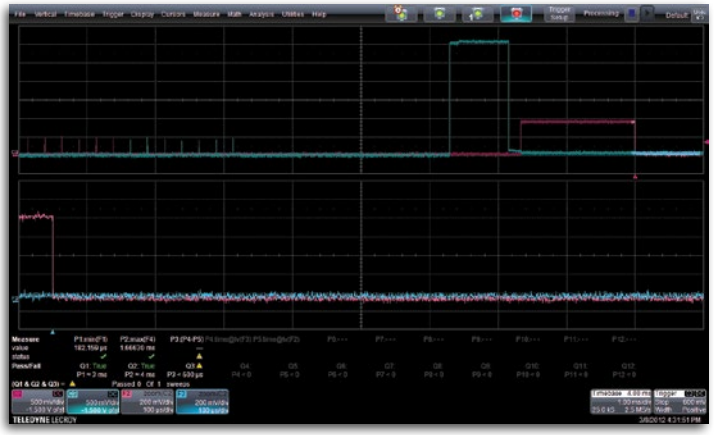


High-speed upstream signal quality test result.

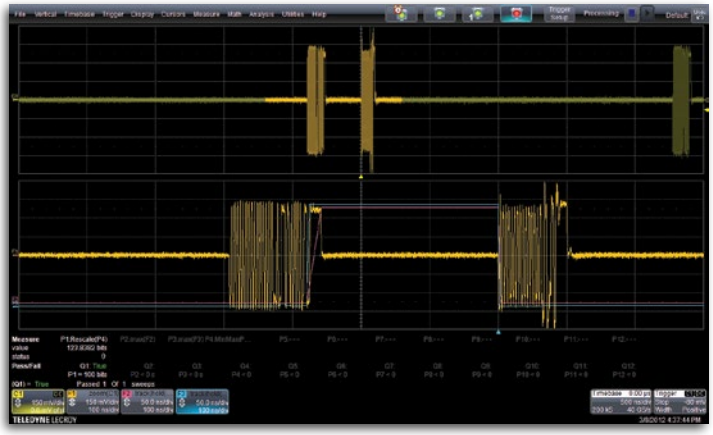


Eye diagram created using the integrated USB-IF MATLAB® test scripts.

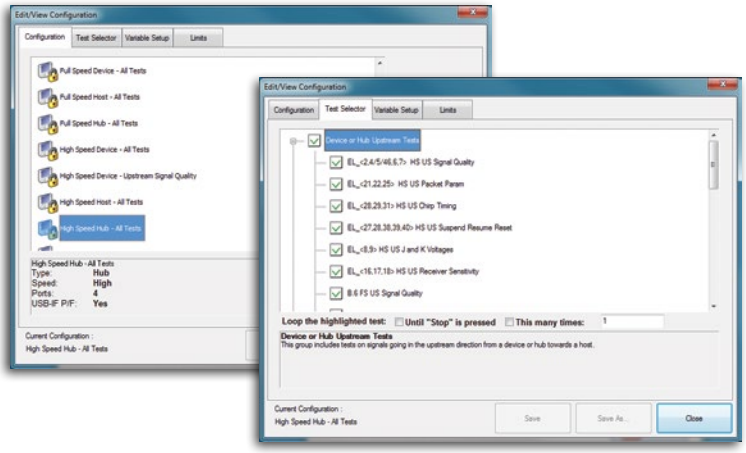
In addition to QualiPHY, the QPHY-USB option also has easy to use step-by-step instructions embedded in the menu system of the application. These simple, step-by-step instructions lead the user through the selected test. The user is directed as to the proper connection of probes as well as how to properly use the USB-IF High-speed Electrical Tool. Results, indicating pass or fail, are displayed on the screen. This enables the solution to help with both compliance testing and debug. All High-speed, Full-speed and Low-speed compliance tests are supported in debug mode for Devices, Hosts and Hubs.



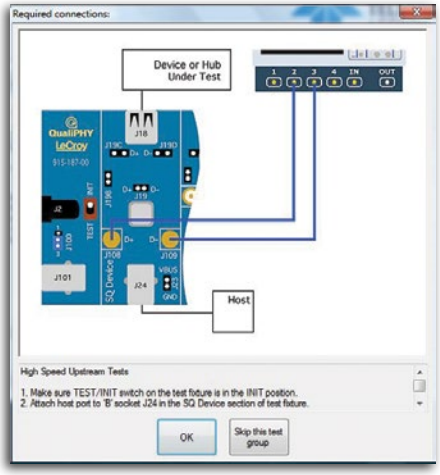
High-speed chirp timing test.



High-speed packet parameter test.



QualiPHY has many preset compliance configurations but also enables users to create their own test and limit sets.



Connection diagram for high-speed signal quality.

QualiPHY has many predefined configurations that allow users to run complete compliance test. (All High-speed Device Tests, All Full-speed Hub Tests, etc.) In addition, users can create their own custom test groups and limit sets. When the tests are complete, QualiPHY will generate a full test report in PDF, HTML, or XML formats (including eye diagrams and other screenshots).

Host Tests

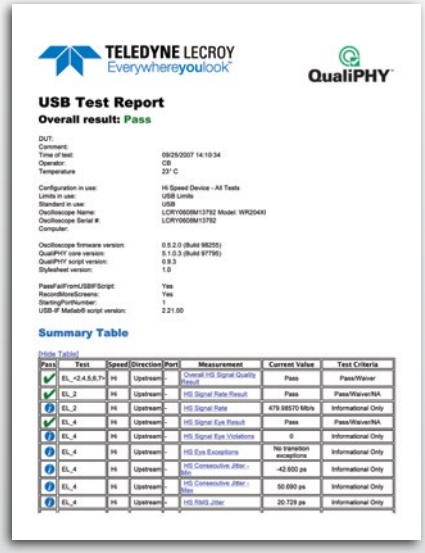
- HS signal quality
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS disconnect
- FS downstream signal quality
- LS downstream signal quality

Device Tests

- HS signal quality
  - HS far-end for tethered devices
  - HS near-end for untethered devices
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS receiver sensitivity
- FS upstream signal quality
- LS upstream signal quality
- Inrush current

Hub Tests

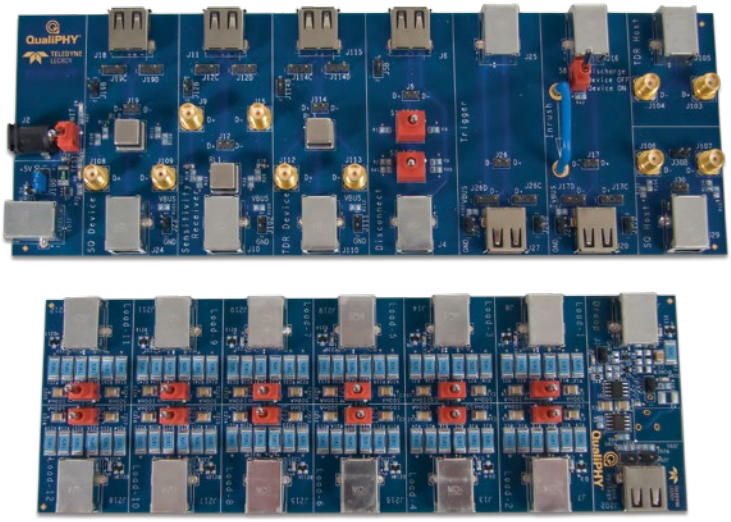
- HS signal quality (upstream/downstream)
  - HS far-end for tethered hubs
  - HS near-end for untethered hubs
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS receiver sensitivity
- HS downstream repeater
- HS upstream repeater
- FS signal quality (upstream/downstream)
- LS signal quality (upstream/downstream)
- Inrush current



SPECIFICATIONS AND ORDERING INFORMATION

TF-USB-B

TF-USB-B is required to test High-, Full-, and Low-speed Devices, Hosts, and Hubs. The accessories include two matched SMA cables, two SMA-BNC adapters, two SMA terminators, USB-A Male to Mini-B Male adapter, USB-A Female to B Female adapter, USB-A Male to Micro B Male adapter, one 6' USB-A to USB-B cable, and five 6" USB-A to USB-B cables. TF-USB-B contains 12 Loads for higher port hubs. These Loads are on a separate board to allow for easy connections.



***TF-USB-B**: Signal integrity board and load board are separate to ease connections.*

Ordering Information

Product Description	Product Code
USB Application Software Package	QPHY-USB*
USB 2.0 Testing Compliance Test Fixture	TF-USB-B

**TF-USB-B required*

Recommended System Configuration

High-speed / Full-speed / Low-speed Tests (≥ 2 GHz)

LabMaster 9 Zi-A Series
SDA/DDA/WaveMaster 8 Zi-A Series
SDA/DDA/WavePro 725Zi-A and higher bandwidth oscilloscopes
WaveRunner 620Zi and higher bandwidth oscilloscopes

Full-speed / Low-speed Tests (≥ 400 MHz)

SDA/DDA/WavePro 715Zi-A
WaveRunner 610Zi, 606Zi, 604Zi, 104 Xi-A, 64Xi-A, 44Xi-A

Note: Any of the oscilloscopes listed in the section to the left can be used for FS and LS Testing

Recommended Accessories

Two x 2.5 GHz, 0.9 pF, 1 Ω, High Impedance Active Probe	ZS2500
WaveLink 4 GHz 2.5 V p-p Differential Amplifier Small Tip Module*	D410-PS
Single Ended Probe (Passive or Active)	Oscilloscope Dependent
30 A; 50 MHz Current Probe – AC/DC; 30 A_{rms}; 50 A_{peak} Pulse	CP030
USB 2.0 Testing Compliance Test Fixture	TF-USB-B

* *A second differential probe is required for Hub testing*

Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

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**Local sales offices are located throughout the world.
Visit our website to find the most convenient location.**