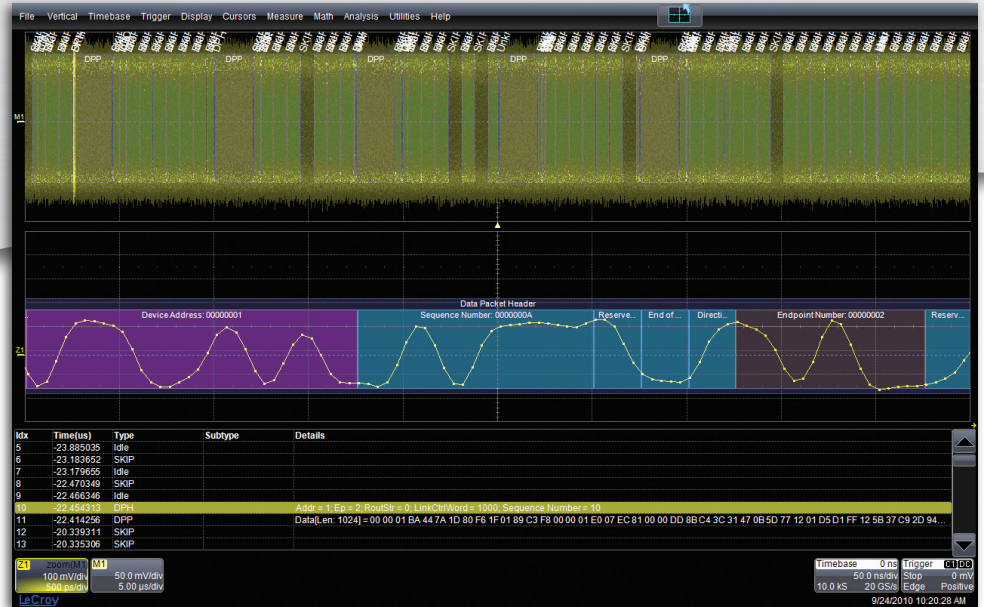


USB 3.0 Link Layer Protocol Decode

Key Features

- USB 3.0 compatible
- Supports USB 2.0 and 1.x
- Link layer protocol decode
- Recognizes scrambled or unscrambled data
- Color-coded decode overlaid on the waveform is intuitive and easy-to-read
- Decode information expands as the time base is adjusted or zoomed
- Convenient table display with quick “zoom to message” capability
- Quick search capability for specific link layer frames



Add USB 3.0, 2.0 and 1.x protocol awareness to your oscilloscope physical layer tool to speed debug of complicated issues.

Protocol Awareness in Your Physical Layer Tool

Oscilloscopes are the preferred tool for the hardware engineer, but have been of limited utility in interpreting serial data protocols. Protocol Analyzers are powerful, but don't show physical layer waveforms. The USB 3.0 decode option for LeCroy oscilloscopes provides link layer decode information annotated on the USB 3.0 physical layer waveform. This provides the ability to view protocol traffic on the oscilloscope and verify that the link is alive and transmitting properly. It also aids in debugging problems that are not solely analog or digital in nature, such as interoperability issues, uncertain error causes, and physical layer issues not evident with a Protocol Analyzer.

Intuitive Decode Annotation

Various sections of the protocol are color-coded to make it easy to understand. Decode annotation

information condenses or expands depending on the time base/zoom ratio setting. Additionally, 8b/10b decode annotation (a separate option) may also be applied for symbol level debugging. The decode operation is fast—even with long acquisitions.

Convenient Table Display and Search

Long oscilloscope acquisition memory provides long capture times of USB 3.0 transmissions. Decoded information is conveniently shown in a table format, and specific frame types may be searched for. In addition, table data may be exported as a .csv file.

Support on Multiple Oscilloscope Platforms

To support the range of users, from USB 3.0, the option is available on a wide range of oscilloscope models with real-time bandwidths from 2.5 GHz to 30 GHz.

SPECIFICATIONS AND ORDERING INFORMATION

USB 3.0		USB 1.0, 1.1, 2.0
Definition		
Protocol Setup	Selection for source channels Support Single-ended or differential probing	Selection for USB protocol type (1.0, 1.1, 2.0) Selection for source channels Support Single-ended or differential probing
Decode Capability		
Format	USB 3.0 Link Layer Protocol Decode	Hexadecimal, Binary
Decode Setup	Probe Status: One Differential Probe or 2 Single-ended Probes Data Scrambling ON/OFF Detect LFPS ON/OFF	Threshold definition required. Default is to Percent amplitude Choose to Decode address values including/not including the R/W bit in address value
Decode Input	Any analog Channel, Memory or Math trace. Clock channel may be turned OFF and data will still decode (reduces screen clutter)	
# of Decode Waveforms	Up to 4 buses may be decoded at one time In addition, zooms can be displayed (with decoded information)	
Location	Overlaid over DATA waveform, on Grid. (Note: Use multi-grid if there is more than one decoder ON)	
Visual Aid	Color Coding for LMP, TP, DPH, ITP, DPP, Link Command, TS1, TS2, TSEQ, SKIP, Idle, E.Idle, LFPS, Protocol Error. Decode information is intelligently annotated based on time base setting	Color Coding for FRAME, START/ReSTART bit, ADDR, R/W, DATA, ACK, and STOP bit. Decode information is intelligently annotated based on time base setting
Capability		
Pattern Search	Search by LMP: Set Link Function, U2 Inactivity Timeout, Port Capability, Port Configuration, Port Config Response, Unknown TP: ACK, NRDY, ERDY, Status, Stall, Device Notification, Ping, Ping Response, Unknown DPH, ITP, DPP, Link Command: LGOOD_0, LGOOD_1, LGOOD_2, LGOOD_3, LGOOD_4, LGOOD_5, LGOOD_6, LGOOD_7, LBAD, LCRD_A, LCRD_B, LCRD_C, LCRD_D, LRTY, LGO_U1, LGO_U2, LGO_U3, LAU, LXU, LMPA, LUP, LDN, Unknown TS1, TS2, TSEQ, SKIP, Idle, E. Idle, LFPS: Polling, Ping, U1Exit, U2Exit, U3Exit, Reset, Unknown Protocol Error: CRC5 Error, CRC16 Error, CRC32 Error, Mismatched LinkCtrl Words	Search by: Events: any, Idle, Resume, Reset, Suspend, KeepAlive, Glitch, Unknown Packet: any, Token Out, Token In, Setup, SOF, Data0, Data1, Data2, Mdata, ACK, NAK, Stall, Nyet, Preamble, ERR, Split, Ping, Unknown Packet Transaction: any, Trans In, Trans Out, Trans Setup, Trans Ping, Trans SSplit In, Trans SSplit Out, Trans SSplit Setup, Trans CSplit In, Trans CSplit Out, Trans CSplit Setup Protocol Error: CRC5 Error, CRC16 Error, Bit Stuff Error, PID and Check Mismatch Error, Packet Length Error
Other Search		
Compatible With...	Compatible with WaveMaster® 8 Zi/Zi-A, WaveMaster® 8000, WavePro® 7 Zi, WavePro® 7000 Bandwidth recommended to be equal to or greater than the USB 3.0 Gb/s rate, with a minimum oscilloscope sample rate requirement of 4x the data rate	Compatible with WaveMaster® 8 Zi, WaveMaster® 8000, WavePro® 7 Zi, WavePro® 7000, WaveRunner® 6000, WaveRunner® Xi/Xi-A, WaveSurfer® Xs/Xs-A

Ordering Information

Product Description

USB 3.0 Decode Option for WavePro Zi	WPZi-USB3bus D
USB 3.0 Decode Option for WaveMaster 8 Zi/Zi-A	WM8Zi-USB3bus D

Additional Products

QualiPHY Enabled USB 3.0 Software Option	QPHY-USB3-Tx-Rx
Decode Annotation and Protocol Analyzer Synchronization Option for WM8Zi/Zi-A, WP7Zi, WM8000, WP7000, and WaveRunner Xi/Xi-A	ProtoSync
Oscilloscope and Protocol Analyzer + BitTracer Synchronization Option for WM8Zi/Zi-A, WP7Zi, WM8000, WP7000, and WaveRunner Xi/Xi-A	ProtoSync-BT

Customer Service

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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