

# Voyager™ M310P

## USB Protocol Analyzer and Exerciser System for USB 3.1, 3.0, 2.0 and Power Delivery 2.0 and 3.0



### Key Features

- **Capture / Analyze USB 2.0/3.1 and PD traffic concurrently** - Record 2.0 / 3.1 to see end-to-end host, hub and dock operation
- **Integrated 3.1 analyzer / exerciser (single box)** - Multifunction system with 2.0 & 3.1 device or host traffic generation
- **USB Type-C & PD analyzer / exerciser** - Generate and record all Type-C and Power Delivery protocol messages and state changes
- **CATC Trace Analysis Software** - Expand / Collapse transfer layer for faster interpretation of USB traffic
- **16GB Recording Capacity** - Capture long recording sessions for analysis and problem solving
- **Raw bit Recording / 10-bit error detection** - View and correlate low-level 10-bit symbols to higher-level packet structures
- **Detects over 50 USB Link & Protocol errors** - Critical link and timing errors are automatically detected and flagged in the trace
- **800ps timing resolution** - Extremely accurate timing resolution allows precise measurement of link layer handshaking
- **External Trigger In / Out** - Use the Teledyne LeCroy Voyager to identify any packet and toggle a scope or logic analyzer (via SMA connectors)
- **Hardware Triggering** - Trigger on 2.0, 3.0, and 3.1 protocol events to isolate important traffic, specific errors or data patterns
- **Comprehensive Device Decoding** - SCSI Mass Storage, Hub, PTP/Still Image, Printer, PictBridge, Media Transfer Protocol (MTP), and all popular USB device classes
- **Gbe or USB 3.0 Upload** - Sustained transfer rates of 600Mbps over Gbe provide instant access to captured data
- **Link Training State Views** - LTSSM flow diagram and chronological views linked to trace display
- **Compliance Test option** - Voyager is a certified Link Verification System (LVS) for performing Link, Hub, PD and USB Type-C compliance testing

With comprehensive support for USB Type-C™, 3.1 and Power Delivery specifications, Teledyne LeCroy's legendary Voyager analyzer platform provides the industry's most accurate and reliable capture of SuperSpeed USB and PD protocol for fast debug, analysis and problem solving. Featuring the de facto standard CATC Trace™ display and loaded with innovative features that help uncover elusive protocol errors, the Voyager platform is the intelligent choice for any USB validation needs.

The M310P is available with an integrated exerciser capable of emulating host and endpoint behaviors for USB 2.0, 3.1, in addition to PD Source, Sink and Dual-Role devices. Highly configurable, this single platform supports the broadest range of official USB-IF Compliance tests including USB Type-C, PD 2.0/3.0, USB 3.1 Hub and Link Layer. Now enhanced to support all the latest Type-C compliance checks including the Power Delivery eye-diagram tests, the M310P is the 'one-stop' solution for USB certification.

### Unmatched Accuracy

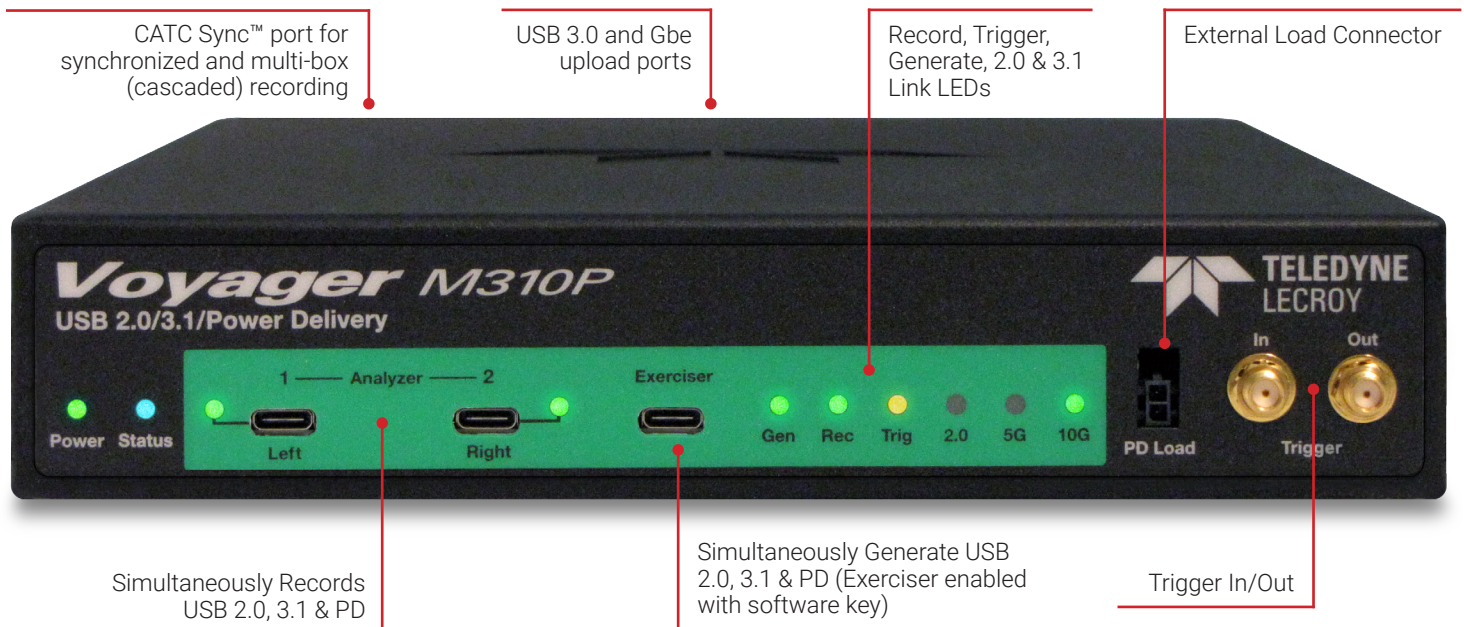
The Voyager M310P features the industry's highest fidelity probe design and provides unmatched reliability when testing devices at USB 2.0 or the latest generation USB 3.1 Gen-2 (10Gb/s) speeds. Designed to non-intrusively record both 5 and 10 Gbps SuperSpeed links, the analog front-end in the M310P is fully compatible with systems that use Alternate Modes including two-lane and four-lane DisplayPort.

Hot plug any combination of USB host and device and the Voyager system will transparently follow speed negotiation and lock to the established rate. While in line, it will detect and seamlessly recover from electrical idle and low power modes while accurately showing all U1/U2/U3 state transitions.

## Flexible Hardware

The front-end of the Voyager analyzer features standard USB Type-C connectors that support USB 2.0 and 3.0/3.1 signals to provide loss-less capture of traffic from all active links simultaneously. Concurrent recording of legacy USB, SuperSpeed+ and PD messages, allows end-to-end viewing of USB 3.1 Type-C bridge and dock configuration requests (legacy USB devices are fully supported using the included adapter cables). The Voyager M310P platform includes 16GB of recording memory plus USB 3.0 and Gbe links for uploading recorded traffic to the host PC.

The heart of the Voyager analyzer is Teledyne LeCroy's revolutionary BusEngine technology. This state-of-the-art protocol-processing core incorporates a real-time recording engine and configurable tools to selectively monitor and record SuperSpeed USB traffic. Field upgradeable firmware allows the BusEngine to evolve and support new features or future changes to the USB specification.



The built-in triggering provides unprecedented flexibility with virtually every possible frame type and state change configurable as a trigger event. In spooled recording mode, the Voyager uploads continuously and provides real-time display of captured traffic allowing fast access and extended recording sessions.

In addition to compliance verification and error injection, the exerciser can emulate a USB endpoint and intelligently respond to host enumeration or Power Delivery requests. When acting as source or sink, the system provides programmatic control of power levels including the full range of VBUS and CC voltages. Any combination of PD messages and power transitions can be defined allowing corner-case testing of role swaps and power save states.

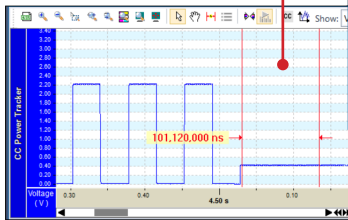
## Analysis Software

The Voyager utilizes the legendary CATC Trace - the industry's de facto standard since the inception of USB 1.0 technology. The trace viewer software uses colors and patterns to train the eye to understand information faster. When recording mixed traffic upstream from a SuperSpeed hub, Legacy 2.0 and 3.1 packets are labeled and interleaved in a single display.

Link Tracker™ provides chronological upstream / downstream display of all ordered sets

Power Tracker™ measures VBUS and CC voltages for PD and Type-C debug

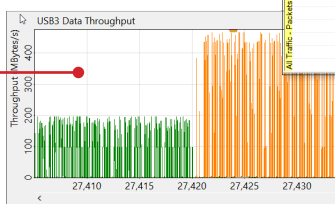
Create complex triggers with timers, loops and event sequences



The screenshot shows the main software interface. At the top, there's a 'Trace View' window displaying a list of packets and transactions. Below it, the 'USB3 Link States Tim...' window shows 'Vbus Power Tracker' and 'CC Power Tracker' graphs. To the right, there are several data tables including 'Logical Block Addr', 'SCSI CDE', and 'Command U'. At the bottom right, there's a state transition diagram for 'Sequence 0' with states 1, 2, and 3, and a 'TRIGGER' event.

De-facto standard CATC Trace™ hierarchical display

Bus Utilization histograms show throughput over time



LTSSM Viewer makes it easy to follow logical state transitions

Traffic Summary reports show event metrics for each trace

Each event is shown on a separate row with every field labeled and color-coded. Traffic from the logical 2.0 & 3.1 channels can be individually filtered, searched or exported from the trace. The USB Transfer level can be expanded and collapsed to show the packet layer including all link commands and flow control primitives.

## Intelligent Triggering

The Voyager provides hardware triggering to pinpoint protocol events of interest. Trigger events can be specified at the lowest levels including bus states and ordered sets (Link up, SKP, etc...) or header fields including address or packet types (ACK, Data, etc...). Voyager's graphical drag-and-drop interface makes setup easy. Using the Advanced mode, users can define trigger logic that monitors multiple sequential events including Control or Bulk transfers, VBUS & CC voltages, state changes or protocol errors.

## Real Time Filtering

The M310P can selectively filter unwanted traffic from the buffer in real-time by discarding redundant patterns such as SKPs, idles, and training sequences. Filtering logic can also include transaction layer packets with added criteria like direction or address.

The screenshot shows the 'Event Properties' dialog box. It has tabs for 'Header Pattern' and 'Actions'. The 'Header Pattern' tab shows a bit-level pattern for a data word (Dw0, Dw1, Dw2, Dw3) with fields like 'Reserved1', 'Link Speed', 'SubType', 'Type', 'Reserved4', 'Tiebreak...Re...Dir...', 'Reserved2', 'Nm HP Bits', 'Reserved5', 'CRC5', 'D,DHDepth Rsvd', 'Hseq', and 'CRC-16'. The 'Actions' tab shows a state transition diagram for 'Sequence 0' with states 1, 2, and 3. State 1 has an 'All Link Comm...' event leading to 'FILTER-OUT'. State 2 has an 'LGO\_U1' event. State 3 has a 'Timer: 100ms' event leading to 'TRIGGER' and an 'LFPS (U2 Exit)' event.

Advanced recording options can specify trigger patterns at the bit-level; the sequencer can track multiple events with loops and timers

# Compliance Suite Options

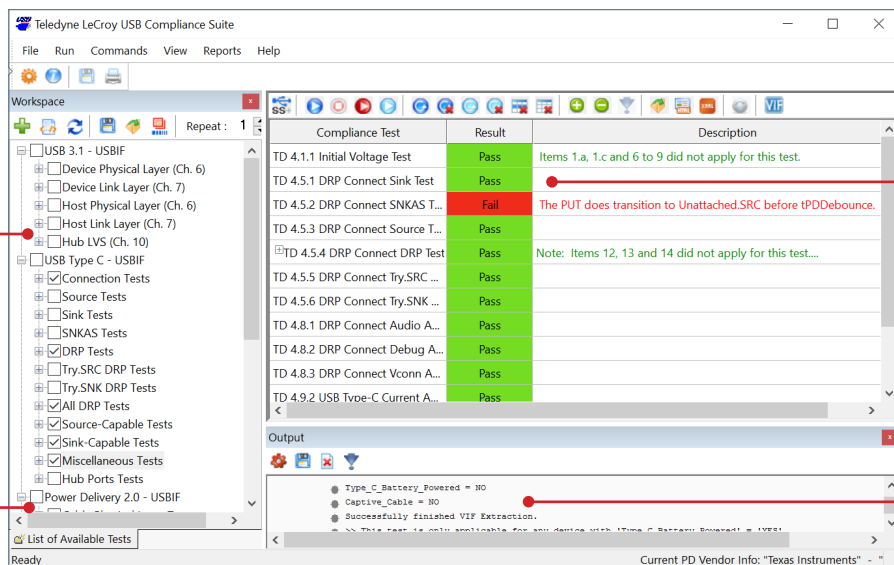
The Voyager USB 3.1 Compliance Suite provides comprehensive support for Type-C, PD, Link Layer and hub compliance testing. Integrated with Teledyne LeCroy's Voyager exerciser platform, the Compliance Suite is certified by the USB-IF for Type-C, Power Delivery, Link Layer (Ch. 6 & 7) and Hub (Ch.10) testing.

## One-button Compliance Testing

Fully automated, the compliance suite utilizes emulation scripts to mimic USB, PD, and Type-C link behaviors. The application allows point-and-pick selection of individual test cases. The exerciser system is used to initiate and respond to USB and PD commands like a real device while analyzing the response from the DUT. It communicates directly over Type-C cabling, records and analyzes every protocol exchange, and generates a pass/fail report.

## Power Delivery and Type-C Test Suites

The Power Delivery (PD) and Type-C test beds are the newest additions to the Compliance Suite and allow developers to verify functionality, error recovery, and compliance for PD and Type-C devices. The M310P PD Compliance suite conforms to the USB-IF's "Communications Engine" MOI and fully supports both PD 2.0 and PD 3.0. The test suite now provides 100% coverage of the PD and Type-C Functional Verification specifications. Passing the Teledyne LeCroy test suite is required for PD and Type-C devices seeking USB-IF logo certification.



Comprehensive, turn-key, compliance test suite

## Includes Source Code

Built on the same open architecture, all the Compliance Suite options include full source code for each test case. This represents a comprehensive library of test scripts that can be easily re-purposed for custom test development. Both the exerciser and verification scripts can be modified without recompiling. As the test specifications are revised and compliance tests are updated, customers will receive all maintenance releases at no additional cost.

## PD Compliance: **100% Coverage**

Built on the M310P's automation framework, the PD Compliance suite also uses emulation scripts to mimic real CC messages and verify PD operations. To initiate test execution, Vendor Info Files (VIFs) are parsed and the appropriate tests are run automatically. Together the PD 2.0 and PD 3.0 test cases cover every aspect of the BMC interface and PD protocol. This includes specific checks for PHY Layer (Ch-5); message and procedures (Ch-6) plus power source / sink behaviors (Ch-7). The M310P now supports all the latest Type-C and PD compliance checks including the eye-diagram tests.

## Type-C Compliance: **100% Coverage**

The Type-C Functional Verification test specification is fully supported by the M310P. The Type-C tests running on the M310P utilize a comprehensive library of high-level commands to emulate Type-C source, sink and DRP behaviors. Flexible control for resistor voltages ( $R_p$  /  $R_d$  /  $R_a$ ), as well as programmable VCONN and vBUS settings, allow precise testing of cable orientation, initial power roles, and all Type-C source / sink operating modes. The M310P is the only reliable solution for verifying the Type-C tests that require USB 2.0 & 3.1 traffic synchronized with Type-C state changes. Many Type-C tests specify this requirement and generating USB 10Gbps data traffic while synchronously changing Type-C link states is a critical capability (for Type-C devices that also support USB data).

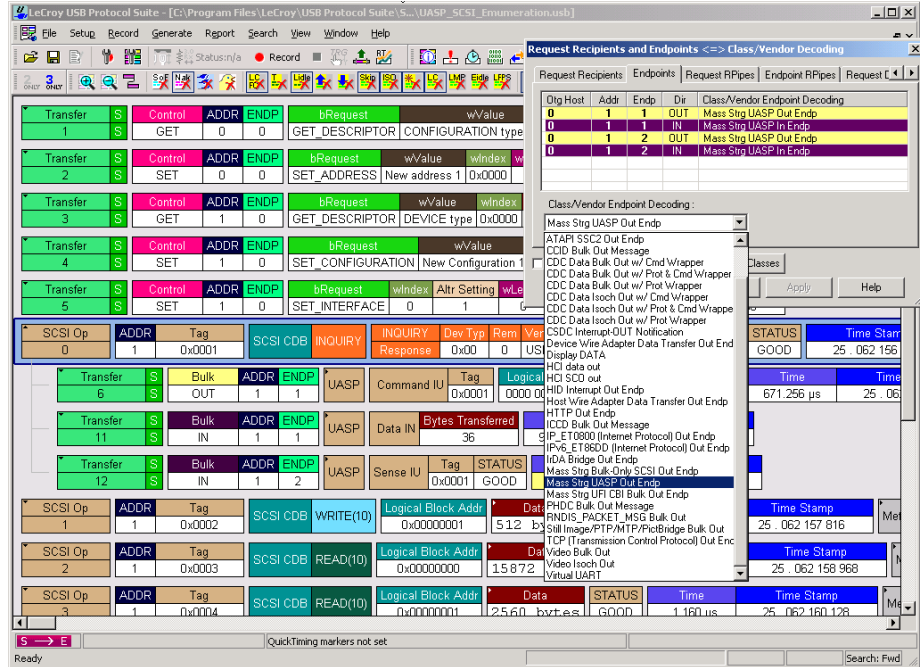
## Hub and Link Layer: **100% Coverage**

With the Hub and Link Layer compliance options, the exerciser emulates UFP or DFP traffic and verifies every aspect of the logical MAC layer for both USB 3.1 Gen1 and Gen 2. Considered one of the best ways to verify lower layer functionality, the Compliance suite covers hundreds of test points (chapter 7) including link initialization, header acknowledgement, link recovery and power management behaviors. It also addresses several PHY layer test cases (chapter 6) to verify LFPS and SKIP assertions also defined in the Link Layer Test Specification. USB Type-C devices and hubs can be certified with the M310P (standard A & B devices can also be tested using the supplied adapter cables). The Link and Hub scripts are also provided in full source code for easy derivative tests. This allows users to see first-hand how to use the exerciser to programmatically alter the SuperSpeed link layer to force framing, flow control, timing and hand-shake errors.

Compliance Spec:	Required Line Items:	Description:	QTY:	Supported on Voyager models:
USB Power Delivery 2.0 & 3.0 Compliance	USB-AC16-V06-X	Voyager Power Delivery Compliance Suite option	1	Must have: Voyager M310P Models: (USB-TZP3-V07-X, USB-TOP3-V07-X, USB-T0A3-V07-X, USB-TZA3-V07-X, or USB-TZC2-V07-X)  Voyager M310C* Models: (USB-TZP3-V06-X, USB-TOP3-V06-X, USB-T0A3-V06-X, or USB-TZA3-V06-X) *M310C Supports all PD assertions except Eye-Diagram tests
	USB15CAB-X	Cable, Voyager M310C Power Delivery external load cable	1	
	USB16CAB-X	Cable USB3.1 Special un-Marked Ra Cable (Use in analyzer mode to avoid two E-Marked cables in the link-under-test)	1	
	USB19CAB-X	Cable MiniDB to dual flying lead; 5m (Load Box External Trigger-out)	1	
	USB17CAB-X	Cable USB3.1 Type C Functional Verification cable (Vconn Thru)	1	
	USB18CAB-X	Cable USB 3.1 C to C E-Marked 200mm	1	
USB-AC04-V01-A	Power Tracker option	1		
USB Type-C Functional Verification	USB-AC20-V06-X	Voyager USB Type-C Functional Verification Suite option	1	Must have: Voyager M310P Models: (USB-TZP3-V07-X, USB-TOP3-V07-X, USB-T0A3-V07-X, USB-TZA3-V07-X, or USB-TZC2-V07-X)  Voyager M310C Models: (USB-TZP3-V06-X, USB-TOP3-V06-X, USB-T0A3-V06-X, or USB-TZA3-V06-X)
	USB17CAB-X	Cable USB3.1 Type C Functional Verification cable (Vconn Thru)	1	
	USB-AC04-V01-A	Power Tracker option	1	
USB 3.1 Gen-1 & Gen-2 Link Layer Compliance (5Gbps & 10Gbps)	USB-AC05-V01-A	Voyager USB 3.0 Compliance Suite option (Gen 1)	1	Must have: Voyager M310P Models: (USB-TZP3-V07-X, USB-TOP3-V07-X, USB-T0A3-V07-X, USB-TZA3-V07-X) or Voyager M310C* Models: (USB-TZP3-V06-X, USB-TOP3-V06-X, USB-T0A3-V06-X, or USB-TZA3-V06-X)
	USB-AC15-V01-A	Voyager USB 3.1 Compliance Suite option (Gen 2)	1	
USB 3.1 Gen-1 Link Layer Compliance (5Gbps Only)	USB-AC05-V01-A	Voyager USB 3.0 Compliance Suite option (Gen 1)	1	Must have: Voyager M310P Models: (USB-TZP3-V07-X, USB-TOP3-V07-X, USB-T0A3-V07-X, USB-TZA3-V07-X); or Voyager M310C Models: (USB-TZP3-V06-X, USB-TOP3-V06-X, USB-T0A3-V06-X, or USB-TZA3-V06-X); or Voyager M310 models: (USB-TZP3-V04-X, USB-TOP3-V04-X, USB-TZA3-V04-X, USB-T0A3-V04-X) or Voyager M3x models: (USB-TZP3-V03-X, USB-TOP3-V03-X, USB-T0S3-V03-X) or Voyager M3i models: (USB-TZP3-V02-X, USB-TOP3-V02-X, USB-T0S3-V02-X)
USB 3.0 Hub LVS Compliance Suite (5Gbps Only)	USB-AC05-V01-A	Voyager USB 3.0 Compliance Suite option (Gen 1)	2	*Hub LVS Tests only operate on "Exerciser" enabled Voyager Systems (ie. TZP3...)  Must have: Voyager M310P Models: (USB-TZP3-V07-X, USB-TZA3-V07-X); or Voyager M310C Models: (USB-TZP3-V06-X, USB-TZA3-V06-X); or Voyager M310 models: (USB-TZP3-V04-X, USB-TOP3-V04-X, USB-TZA3-V04-X, USB-T0A3-V04-X) or Voyager M3x models: (USB-TZP3-V03-X, USB-TOP3-V03-X, USB-T0S3-V03-X) or Voyager M3i models: (USB-TZP3-V02-X, USB-TOP3-V02-X, USB-T0S3-V02-X)
	USB-AC08-V01-A	Voyager USB 3.0 Hub LVS Compliance Suite option	2	
	USB-AC04-V01-A	Power Tracker option	2	
	Sync Cable AC030CA-X	Cable, Assy, MicroD - MicroD Sync (for M310P, M310C, M310, M3x)	1	
ACC-EXP-002-X	Platform Expansion SYNC card*	2	*Sync card required for Voyager M3i systems only	

## USB Device Decoding

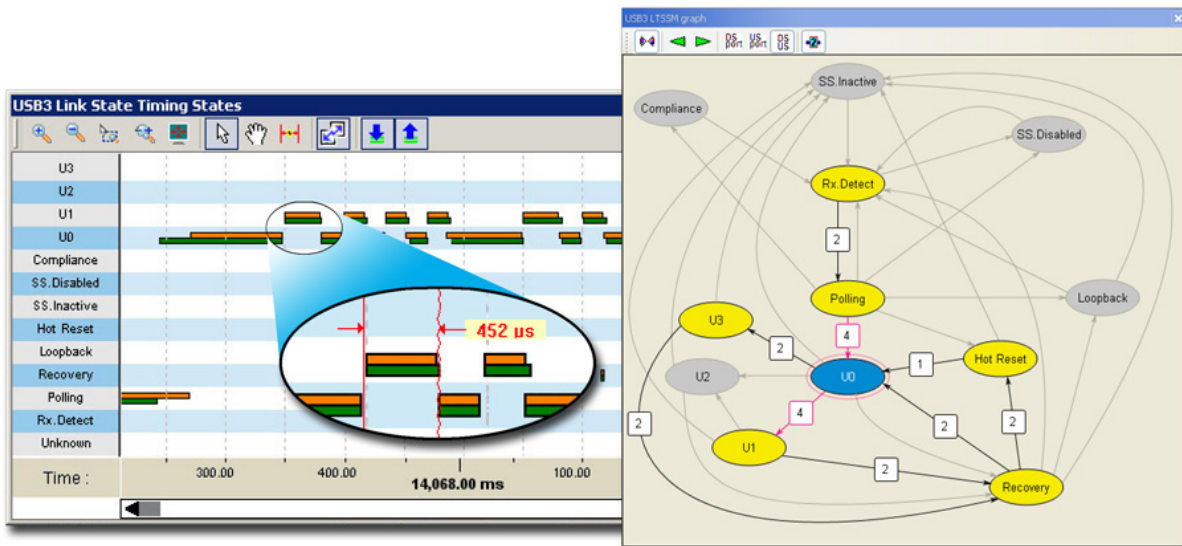
The Voyager software performs full decoding of USB device class traffic with both automatic and manual assignment of decodes to individual endpoints. From MTP, to CCD, to Video class, the Voyager provides the most comprehensive decoding available. It offers full support for the newest device types including Audio 3.0, Type-C Bridge, Content Security and USB Attached SCSI. It also supports vendor specific decoding for developers interested in automatically showing proprietary commands in the trace view.



Assigns device class decodes automatically or manually for each endpoint

## Find the Issues Fast

The Voyager software provides many mechanisms to measure and report on PD and USB 2.0/3.1 protocol. With the Traffic Summary display, users can evaluate statistical reports at a glance or navigate to individual events. Users may select transaction packets to view ACK/NAK or Device Notification events, then jump to each occurrence with a single keystroke. Higher-level events are also tracked and reported at the logical USB Transfer level. Reports are available showing link throughput, latency and efficiency metrics. Error events are also reported showing 50 different protocol violations - from invalid CRCs to framing errors to incomplete PD contracts. The LTSSM View provides an interactive USB 3.0/3.1 state machine diagram.

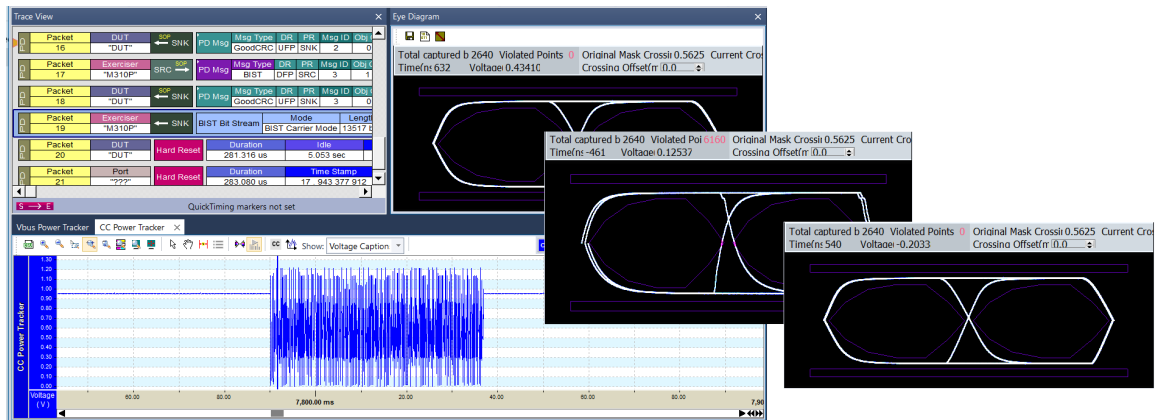


Each LTSSM state change is shown graphically and is hyperlinked to the trace display. The Link State timing view shows the same information in a time-line format.

## Measure and verify VBUS and CC voltages with PowerTracker

The Voyager M310P Power Tracker option offers a unique monitoring capability for vBus power and current. Power information is sampled and displayed graphically in a time-line format with the industry's best timing resolution (20µs). The voltage and current displays are synchronized to trace events allowing users to verify power state transitions at the protocol and electrical layers. Separate power graphs are provided for CC and VCONN voltages making it easy to visualize logical Type-C state transitions. Fully compatible with the higher voltages in USB Power Delivery, the Power Tracker automatically

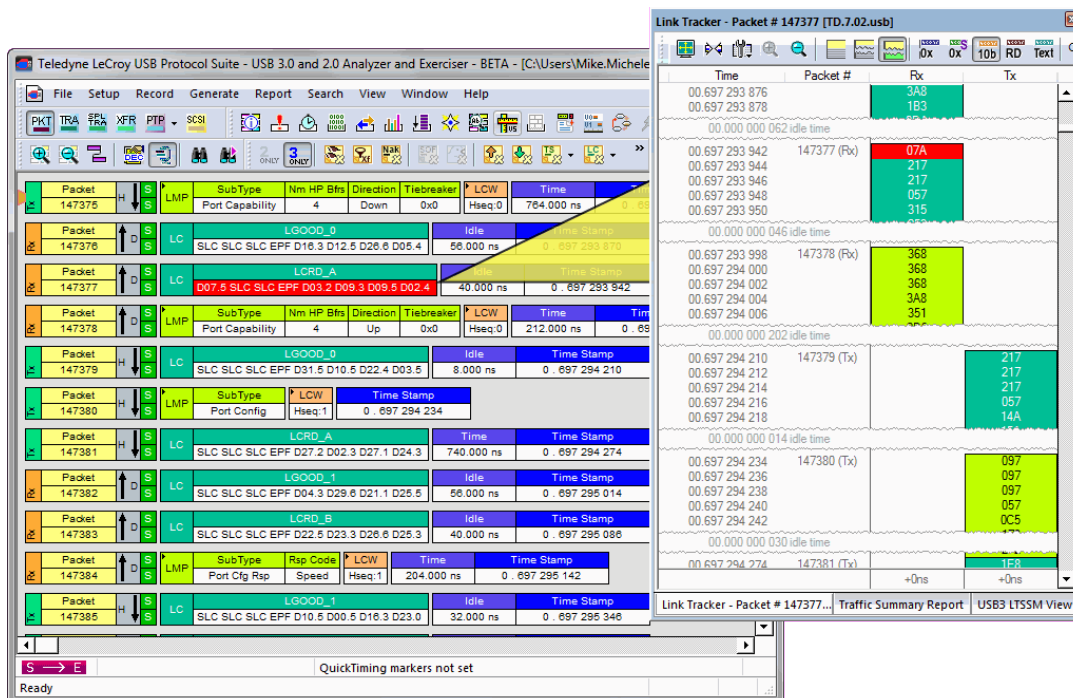
calculates the voltage change and slew rate for a selected area. The Eye Diagram View is part of the PD Compliance Suite and allows quick verification of CC signal integrity.



Analyze PD communications (CC) for protocol, timing and signal integrity

## Raw Debugging Power

The Voyager is the only analyzer on the market that captures every transition at the 5 and 10 Gbps link rates including idles, inter-packet symbols, corrupt 10-bit codes and 128-bit data blocks. The Link Tracker provides a chronological upstream / downstream display of all ordered sets with timing resolution of 800ps. Designed to assist with low-level debugging, all symbols including training sequences can be displayed in raw 10-bit, 8-bit, scrambled, and unscrambled Hex format.



The Link Tracker provides sequential view of ordered sets including invalid symbols

Symbol-to-symbol measurements are possible with a single click.

The Bus Utilization graphs show data and packet length, bus usage by device in a histogram format. Fast Search and Find options allow users to navigate to specific packets, errors and any data type within a trace file. The Bandwidth calculator automatically calculates the time delta between two points in the trace.

## Integrated Exerciser Option

A comprehensive exerciser capability with support for PD 2.0/3.0 and USB 2.0/3.1 traffic generation is built-in to the Voyager platform. The exerciser option allows users to transmit any arbitrary sequence of USB or PD packets to the device-under-test over native Type-C connectors (legacy USB devices are fully supported using the supplied adapter cables). The Exerciser is seamlessly integrated with the protocol analyzer, making the Voyager system a complete test and development solution for engineers validating USB protocol.

### Smart Emulation with ReadyLink™ and Transaction Engine™

For SuperSpeed testing, the M310P provides complete control over headers, payloads, timing, and link states. Featuring ReadyLink™ and Transaction Engine™, the exerciser includes a full-function link and transaction layer state machine that automatically handles all USB 3.1 LTSSM states and protocol handshakes for easier test script development. ReadyLink performs link synchronization, flow control and header acknowledgements in hardware. Overrides allow these behaviors to be altered such as shortening LFPS intervals, link training, or LMP handshake timing.

The Transaction Engine manages NRDY retry conditions allowing the Voyager to operate at full line-rate and correctly respond to the DUT as defined by the specification. At the packet level, users have the freedom to send customized data payloads anywhere within the stream making it easy to verify device specific behavior.

### PD Emulation

The PD exerciser supports traffic generation, including both provider and consumer device emulation. A flexible script-based authoring environment provides pre-defined templates for all Power Delivery packet types with overrides to allow low-level control of headers, payloads, timing, or logical PD protocol errors. Advanced functions including “If/Else”, “Wait”, and “Do Case” allow emulating complex PD behaviors including contract negotiation, capability mismatch and role swaps.

The PD exerciser also automatically handles transaction layer handshaking. The Exerciser will automatically link up as source or sink, track MessageID fields, and perform correct GoodCRC handshaking. Operating as a Source, the M310P can negotiate and supply the full range PD voltages with a single command (up to 21V). Using an attached load generator, the M310P can pull current like a real PD Sink.

### Error Injection

For validating the logical USB protocol, ReadyLink emulation can be customized per test script to include various error scenarios during link up. The Power Delivery exerciser can also override standard behaviors to insert protocol errors, marginal timing or illegal requests.

- 8B10B / CRC Error
- Running Disparity Error
- Corrupt Link Commands
- Corrupt Flow Control (Wrong L\_CRD\_x, Wrong L\_GOOD\_n, etc...)
- Corrupt Header Packet acknowledgement (Send LBAD, LRTY)
- Corrupt Packet Framing (SHP, SDP, END, SOP or SOP')
- Invalid Requests (5A current over 3A cable)



## Exerciser Control Environment

The exerciser software provides a flexible script-authoring environment that supports a powerful set of parser preprocessor features. For SuperSpeed applications, the Exerciser framework includes pre-defined templates for all USB 3.1 packet types allowing a single procedure call to complete an operation (ie: Host\_SetConfiguration). A comprehensive library of sample scripts is included and illustrates how these techniques can be used to create efficient, reusable generation blocks.

```
59: # Host sends DPH
60: MyDP_OUT( )
61: {
62:     SeqNum = out_seq_num
63:
64:     Data = { 55 53 42 43 C8 81 4F 81 24 00 00 00 80 00 06 1
65:             00 00 00 24 00 00 00 00 00 00 00 00 00 00 00 }
66: }
67: out_seq_num = (out_seq_num + 1) % 32
68: set
69:
70: # DisableLPMA
71: # DPPEndFramingErrRtryCnt
72: # DPPStartFramingErrRtryCnt
73: # ErrCorruptLinkCm
74: # ErrCorruptLMP #####
75: # ErrDisparity #####
76: # ErrLBAD #####
77:
78: # ErrLostLCRD
79: # ErrLostLGOOD
80: # ErrLRTY
81: {
82:     SeqNum = in_seq_num
83:     NumP = 1
84: }
```

*Text-based editor includes pop-up shortcuts for easy adjustments to traffic generation scripts*

The USB 2.0 exerciser can create test scripts by exporting the host or device traffic stream from a captured analyzer trace file. These scripts can be played back using the Exerciser to recreate problems or test specific functionality.

## Error Detection

The Teledyne LeCroy Voyager can detect and flag real protocol errors including more than 50 different USB issues and 15 unique PD error conditions. At the lower layers, training sequences, header fields, link layer handshakes and timing parameters are automatically verified. At the SCSI and USB transaction layers, individual exchanges are checked for completeness. The Spec-View displays header fields in hex or binary and also marks errors in red.

With best-in-class features including non-intrusive probing, 16GB recording memory, and SuperSpeed 3.0 data upload ports, the Voyager system features countless innovations in data analysis to help reduce time-to-market for USB systems and software.

Specifications	
Protocols Supported	USB 1.0, 1.1, 2.0, 3.0, 3.1 and Power Delivery 2.0 + 3.0 (Baseband)
Host Machine Minimum Requirements	Microsoft Windows® 10, Windows 8.1, Windows 7, Windows Server 2012, Server 2008R2; 2 GB of RAM; storage with at least 600 MB of free space for the installation of the software and additional space for recorded data; display with resolution of at least 1024x768 with at least 16-bit color depth; USB 2.0 port and/or 100/1000 Mbps Ethernet network interface. For optimal performance, please refer to our recommended configuration in the product documentation.
Data Rates Supported	1.5 Mb/s–10 Gb/s
Data Bus Interface	Half Duplex differential (USB 2.0); Dual Simplex differential (USB 3.1)
Front Panel Connectors	Two USB Type-C (for analyzer), separate Type-C port (for exerciser), PD Load (from DUT), External Trigger IN and OUT
Front Panel Indicators	Power, Status, Analyzer/Generator, Recording, Trigger Detect, 3 Data Rate LEDs: 2.0 (High Speed 480 Mb/s), 10G (SuperSpeed 5 Gb/s), 10G (SuperSpeed+ 10Gb/s)
Rear Panel Connectors	Sync/Data, 1000BASE-T Ethernet, USB 3.0 (to host machine), 24V 6.67 ADC Power In, Power Switch
Dimensions (W x H x D)	215 x 43 x 304 mm (8.5" x 1.7" x 12.0")
Weight	3.4 lbs
Environmental	Operating Temperature: 0°C to 50°C (32°F to 122°F) Non-Operating Temperature: -10°C to 80°C (14° Temperature: Operating 0 °C to 55 °C (32 °F to 131 °F) Humidity: 10% to 90% RH (non-condensing)
Power Requirements	External 120-220V AC Power
Warranty	12 Month Hardware Warranty

## Ordering Information

### Product Description

Voyager M310P USB 3.1 Analyzer Exerciser System  
 Voyager M310P USB 3.1 Analyzer System  
 Voyager M310P USB 3.0 Analyzer Exerciser System  
 Voyager M310P USB 3.0 Analyzer System  
 Voyager M310P USB 2.0 PD Compliance Bundle  
 Voyager M310P USB Type-C Compliance Bundle

### Options

Voyager M310C / M310P USB Type-C Functional Verification Suite & Cable  
 Voyager M310P Power Delivery Compliance Suite and cables  
 Voyager USB 3.0 (Gen 1) Link Layer Compliance Suite  
 Voyager USB 3.1 (Gen 2) Link Layer Compliance Suite  
 Voyager M3x / M310 / M310C / M310P Power Tracker option  
 Voyager USB 3.0 Import Option  
 Voyager USB 3.0 Hub LVS Compliance Suite option

### Product Code

USB-TZP3-V07-X  
 USB-T0P3-V07-X  
 USB-TZA3-V07-X  
 USB-T0A3-V07-X  
 USB-TZA2-V07-X  
 USB-TZC2-V07-X

USB-AC20-V06-X  
 USB-AC16-V06-X  
 USB-AC05-V01-A  
 USB-AC15-V01-A  
 USB-AC04-V01-A  
 USB-AC03-V01-A  
 USB-AC08-V01-A



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 Visit our website to find the most convenient location.  
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