



USB Explorer™ 350

Multi-function USB Type-C®, USB 3.2 x1,
and Power Delivery Protocol Test Platform

Compact ■ Accurate ■ Versatile

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Revolutionary protocol analyzer and traffic generator supporting USB 3.2 x1, USB 2.0, USB Power Delivery 3.0, and USB Type-C.

Overview

The revolutionary Ellisys USB Explorer 350 (EX350) is a super-compact yet sophisticated and comprehensive protocol test and analysis system for USB 3.2 x1 Gen 1 (5Gbps) and Gen 2 (10Gbps), USB 2.0, and USB Power Delivery 3.0. Full support of USB Type-C (including CC and Vconn) is provided with an adapter and cables.

With many innovative and exclusive features, the USB Explorer 350 meets the demands of today's technology developers by providing unmatched coverage for protocol analysis, traffic generation, and compliance testing for emerging USB technologies.

The hardware is economically optimized to perform analysis, active emulation of port traffic, and automated compliance testing.

Protocol Analysis

Protocol analysis is accomplished non-intrusively, using next-generation hardware capture technology, including the use of adaptive equalization and precision impedance matching. The hazards of signal retiming are eliminated.

The powerful EX350 concurrently captures USB 2.0 traffic, USB 3.2 x1 traffic (Gen1 and Gen2), USB Power Delivery 3.0 traffic, as well Vbus characteristics and logic signals. The integrated logic analysis provides developers with a new dimension enabling them to efficiently visualize external digital signals such as outputs of their FPGA/ASIC in addition to their USB traffic.

Captured traffic is presented real-time by sixth-generation Ellisys application software, intuitively detailing concurrent traffic, protocol sequences, performance criteria, error conditions, electrical characteristics, timing details, USB standard/class decoding, and more.



Traffic Generation

Emulation of USB host, device, and hub traffic as well as USB Power Delivery sink and source traffic is accomplished using dedicated applications that simplify these complex tasks. Sophisticated software stacks drive the emulation using ultra-fast processors specially designed for these tasks.

A wide array of features are provided for error injection scenarios in order to test software and hardware corner cases and margins. Performance characterization is provided by specialized hardware that is optimized to stress receiver buffer management, credit logic, and application software.

Compliance Testing [Option]

Ellisys participates closely in USB-IF compliance groups and is dedicated to provide best-of-breed compliance testing solution for USB 3.2 x1, USB Power Delivery 3.0, and USB Type-C.

This sold-separately compliance software embeds hundreds of test cases covering various aspects of the physical layer, link layer, protocol layer, and electric layer. The same setup is used at compliance workshops, making it the perfect tool for pre-compliance testing.

Test results are pass/fail, annotated with descriptive detail, and are summarized in a convenient HTML-formatted summary report upon completion of testing. Protocol traces from each test can optionally be captured automatically with the protocol analyzer, providing for quick and in-depth analysis of test results.

Examiner is an essential tool for IC, IP, or device manufacturers preparing for certification. Examiner is not only useful at the end of the development cycle, but from the beginning to the end for ensuring non-regressions with new improvements.

USB Type-C Configurations

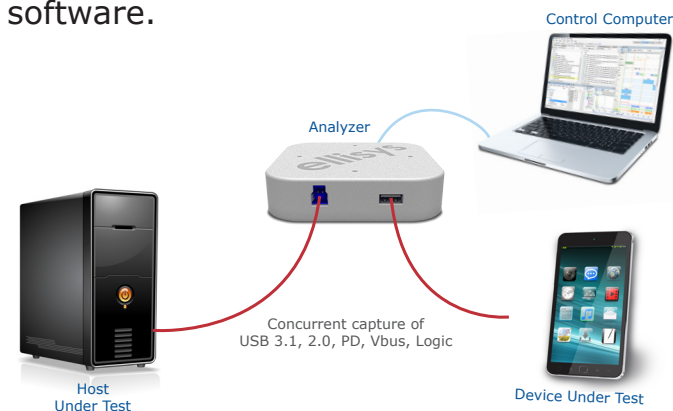
Full support of USB Type-C is added with an adapter board and cables. In analyzer mode, the Ellisys EX350 supports the capture of CC traffic and tracks as well CC and Vconn voltage, to ease debugging of attachments and detachments.

Powerful Ellisys Features

- **Broad Specifications Support:** USB 2.0 (1.5, 12, 480 Mbps), USB 3.2 x1 Gen 1 (5 Gbps) and Gen 2 (10 Gbps), USB Power Delivery 3.0 and USB Type-C 1.3
- **Multi-function:** Same unit can operate as protocol analyzer, host/device/sink/source emulator, as well as compliance tester, enabling flexible allocation of units depending project evolution
- **Compact:** The unit can be placed optimally even in the busiest environments, which is particularly critical with tight margins of USB 3.2 at 10 Gbps
- **Perfect Accuracy:** High precision clocking components coupled to Ellisys' protocol analysis engine provides industry's unmatched accuracy
- **Unequaled Software:** Ellisys powerful yet easy to use multi-protocol analysis software offers the most complete feature set in the industry, including essential features such as Instant Timing for precise timing analysis and Instant Throughput for performance characterization
- **Integrated Logic Analysis:** Logic signals analysis concurrently to traffic capture opens a new debugging dimension to development engineers by visualizing outputs of their FPGA or ASIC
- **Free Maintenance:** Free lifetime updates as well as free fully-featured viewer software with unlocked hardware that can be used on any computer, supported from engineers to engineers

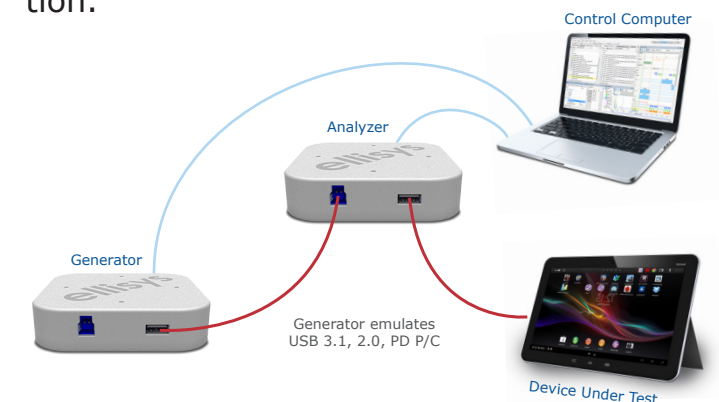
Analysis Setup

The USB Explorer 350 is connected in a logically passive mode to record traffic and bus events passing between host and device. The analyzer provides same-link concurrent support for USB 3.2 x1, USB 2.0 and USB PD, as well as concurrent Vbus tracking and logic analysis, all perfectly synchronized and presented in the Ellisys analysis software.



Host Emulation Setup

An USB Explorer 350 acts as generator while the second unit acts as passive protocol analyzer. The generator emulates a USB host with PD dual-role Provider/Consumer support, while allowing the user full control the behavior, including arbitrary packet and error injection. The analyzer records all traffic and gives real-time traffic information.



Technical Specifications

Connectors

- Link under test: USB 3.2 STD-A and STD-B
- Support of Type-C via custom cable
- Logic: 2 x 8 inputs/outputs with configurable level and threshold
- Control: Optimized USB 3.0 connection to the PC
- Power: 9-24VDC, min 12W

Supported Protocols

- Power Delivery 3.0
- USB 2.0 (1.5, 12 Mbps and 480 Mbps)
- USB 3.2 x1 Gen 1 (5Gbps) and Gen 2 (10Gbps)
- The availability of the protocols depends on the edition and options

Supported Modes

- Analyzer: non-intrusive protocol analyzer
- Generator: traffic generator for emulating host, device, sink, source
- Examiner: compliance tester
- The availability of the modes depends on the edition and options

Analyzer Capabilities

- Concurrent capture of USB 2.0, USB 3.2 x1, Power Delivery, Vbus and logic signals
- Automatic termination detection
- Pre-capture traffic filtering
- Non-intrusive probing

Generator Capabilities

- Simulate USB host or device
- Simulate PD sink or source
- Precise and reproducible timings
- Ability to emulate low-level issues as well as high-level behaviors

USB 2.0 Capabilities

- Support of Low-speed, Full-speed and High-speed
- Automatic speed detection
- Precise tracking of line states
- Non-intrusive probing
- Timing resolution of 16.7 ns

USB 3.2 Capabilities

- USB 3.2 x1 Gen 1 (5Gbps) and Gen 2 (10Gbps)
- Automatic speed detection
- Automatic termination detection
- Non-intrusive signal reshaping
- Flexible front-end with adaptive equalization and configurable emphasis and swing
- Timing resolution of 400 ps

Vbus Capabilities

- Measurement of Vbus from 0 to 25V
- Measurement of Ibus from -5 to +5A
- Generation of Vbus from 4 to 20V

Logic Capabilities

- 16 inputs/outputs
- Configurable level and threshold (2 banks of 8 signals)
- Timing resolution of 400 ns
- Bandwidth of 50 MHz

Power Adapter

- Universal 100-240 VAC, 50-60 Hz
- 24 VDC, 18 W

Enclosure

- 96 x 96 x 16 mm (3.8 x 3.8 x 0.6")
- 0.3 kg (0.6 lbs)

Maintenance and Licensing

- Free lifetime updates
- Free full-featured viewer application
- Use Ellisys hardware on any computer

Product Warranty

- Two years limited warranty

Minimum Requirements

- Pentium 4, 1 GHz or compatible processor
- 1 GBytes of RAM
- 1280 x 1024 display resolution with at least 65,536 colors
- USB 2.0 host controller
- Windows® Vista SP2 or higher

Ordering Information

Description	Code
Ellisys USB Explorer 350 Analyzer for PD Protocol analyzer supporting USB 2.0 and Power Delivery	EX350-PD-A
Ellisys USB Explorer 350 DUO for PD Two analyzer/generator units supporting USB 2.0 and Power Delivery	EX350-PD-DUO
Ellisys USB Explorer 350 Analyzer for SSP Protocol analyzer supporting USB 2.0, USB 3.2 x1 and Power Delivery	EX350-SSP-A
Ellisys USB Explorer 350 DUO for SSP Two analyzer/generator units supporting USB 2.0, USB 3.2 x1 and Power Delivery	EX350-SSP-DUO

Configurations

Edition	PD	SSP
Power Delivery	X	X
USB 2.0 (1.5, 12, 480 Mbps)	X	X
USB 3.2 x1 (5 Mbps and 10 Gbps)		X

Configuration	A	DUO
Provided Units	1	2
Protocol Analyzer	X	X
Traffic Generator		X

More information at: www.ellisys.com/ex350

