Keysight U4612A USB 3.0 Jammer

Bring your SuperSpeed USB systems to market quickly with the highest confidence

Data Sheet

- Quickly stress the device under test for increased confidence
- Reduce development schedule risk
- Intuitive GUI, with multiple viewing options integrated with Keysight USB SuperSpeed Analyzer software

KEYSIGHT TECHNOLOGIES

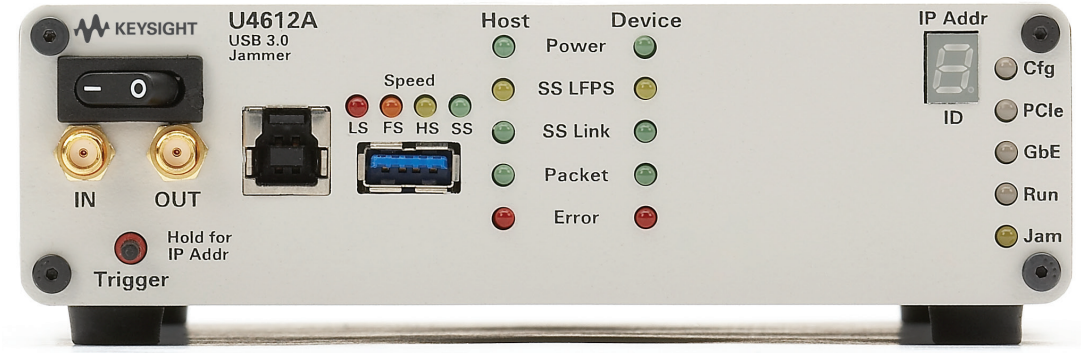
Overview

Developers and integrators of SuperSpeed USB technology verifying design robustness and error recovery of their systems are facing a challenging task. Getting to the root of a problem can be especially challenging when it is difficult to duplicate test cases and customer issues. Troubleshooting is further complicated by the wide range of devices encountered in an USB environment, ranging from HD video to human interface devices such as keyboards and mice. The Keysight Technologies, Inc. U4612A USB 3.0 Jammer gives developers the ability to insert a variety of errors into live data, testing the system's real-time error handling system recovery as well as the duplication of errors seen in the field.

The U4612A USB 3.0 Jammer provides the ability to create random and defined line errors such as CRC or 8b10b encoding errors, and modify or replace Link Commands, protocol packets, packet data, and ordered sets so that the system under test can be quickly stressed to its limits.

Used in conjunction with the Keysight U4611A/B USB 3.0 Protocol Analyzer, the system's response to the issues created by the jammer can easily be isolated and identified.

The GUI provided for the U4612A is integrated with the Analyzer's USB SuperSpeed Analysis software providing an integrated system seamlessly linking error generation with analysis of the system's response.



U4612A front panel

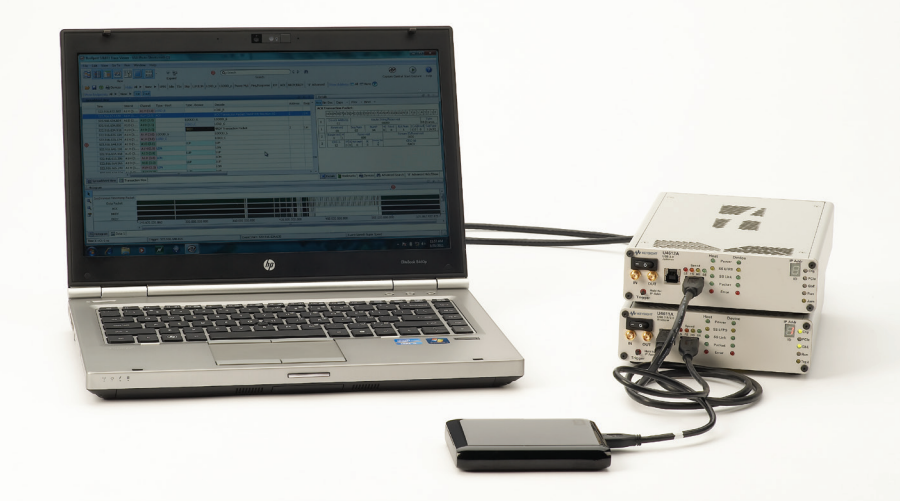
The Keysight U4612A USB Jammer front panel's activity and status LED indicators give the user confidence the jammer and DUT is set up correctly and functioning as desired.

Additional test equipment such as Keysight logic analyzers and mixed signal oscilloscopes expand the view of the total system under test by means of the U4612A trigger capabilities. For example, the jammer can be commanded to insert errors into the USB data at a specific point in the operation of the DUT by either the logic analyzer or oscilloscope, giving the user the ability to trace system operation across many phases of the DUT operation.

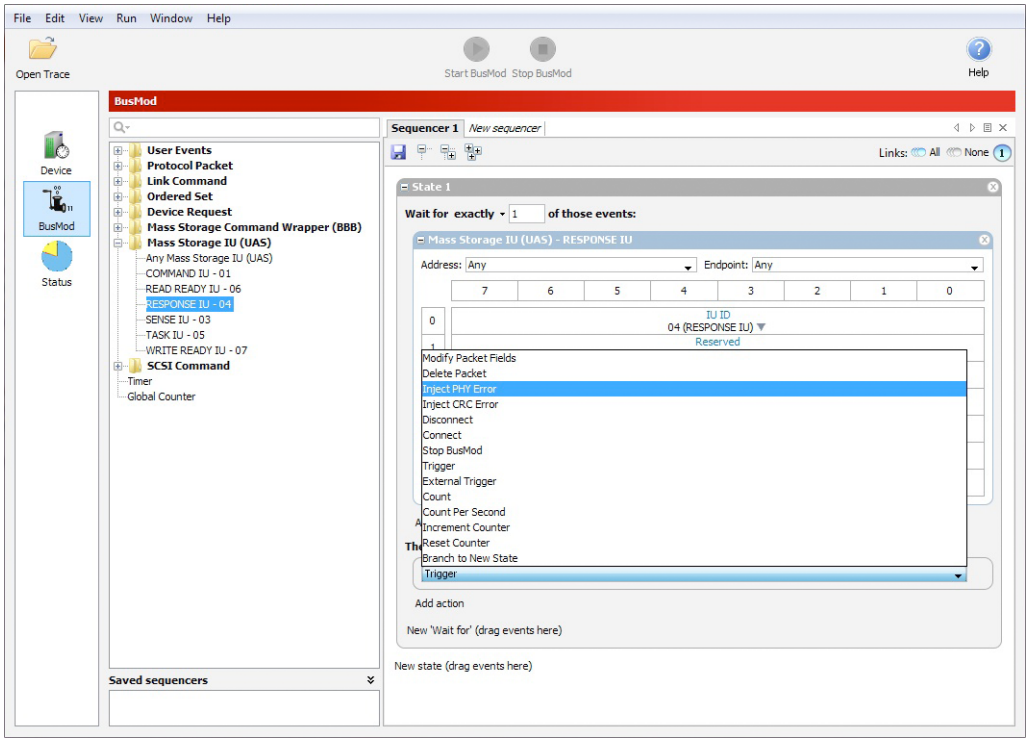
Overview (continued)

Typical analysis setup

The U4612A Jammer is connected in a pass-through mode while the Keysight U4611A/B USB analyzer records traffic being exchanged between the host and the device under test.

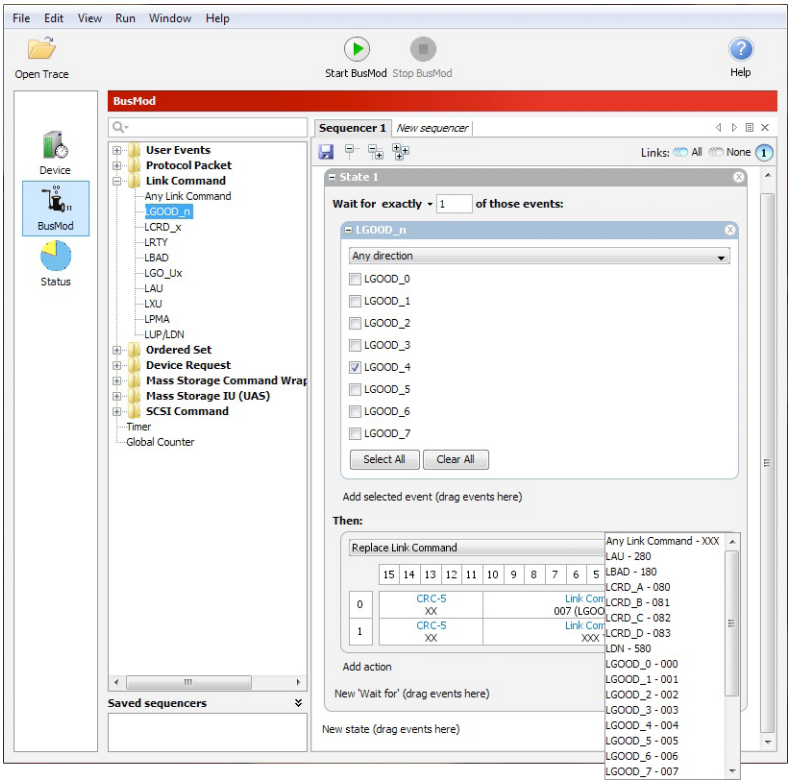


Typical USB test configuration with the U4611A/B analyzer and U4612A Jammer



U4612A Jammer GUI for configuration of error injection

U4612A USB 3.0 Jammer and U4611A/B Protocol Analyzer make up a test system for USB SuperSpeed development, giving developers high confidence by capturing, changing, and displaying traffic on the USB bus. Developers can modify and remove USB SuperSpeed traffic bidirectionally. Test cases such as specifying invalid field values in link management packets, causing Header Packet (HP) credit timeouts, removing ACKs from a sequence, and powering down the bus with outstanding Stream IDs can all be easily scripted and executed. Other types of errors, such as CRC, 8b10b, and disparity can be generated as well. Scripts are created via the Keysight USB SuperSpeed application software's GUI, allowing for one sequencer with up to 16 logic states with timers, counters, and the ability to jump anywhere within the sequence.



U4612A Jammer GUI control for injecting U4612A Jammer GUI control for injecting USB 3.0 errors

System Requirements

In order to take full advantage of the U4612A working in conjunction with the U4611A/B protocol analyzer with its high speed trace processing technology, the host computer must have the ability to receive the deep trace record with minimum delay. Therefore a high speed interface to the instrument is required.

Recommended configuration	
Operating system	Windows XP, Windows Vista, Server 2003/2008, Win7 32 bit and Win7 64 bit platforms Linux versions: Fedora 12, and RedHat/CentOS 5.4 or later, Ubuntu 9.10, and SUSE
Processor	2.8 GHz or greater dual-core
Memory	3 GB or greater of 1.3 GHz FSB memory
Graphics	Capable of supporting 1920x1200 or greater
Interface	PCIe™ x4 (550 MB/s) recommended or Express Card Slot (70 MB/s)
Free disk space for installation	100 MB

Specifications	
Protocol(s) supported	USB 1.0, 2.0, and 3.0 *Note:* USB 1.0 and 2.0 support supplied as standard with the product. Optional software license required for 3.0 operation
Power	19 Vdc 90 watts maximum
Keysight U4611A-1PS power supply	Input: 50/60 Hz, 100 to 240 Vac ±10% Output: 19 Vdc at 4.47 A
Triggering	
Trigger input	Input impedance: ~1 k ohm Trigger level: Rising or falling edge ~1.5 v Maximum input: 5.5 V
Trigger output	Source impedance: 50 ohms Modes: pulse high, pulse low, and toggle
Environmental and safety	
This instrument is intended for indoor use in an installation category II, pollution degree 2 environment.	
Temperature	Operating: 20 to 30 °C Non-operating: –40 to –70 °C
Humidity (non-condensing)	Operating: 50% to 80% at 30 °C Non-operating: 90% for 12 hours at 65 °C
Altitude	2000 m (6500 feet)
Electromagnetic compatibility	IEC 61326-1:2005/EN 61326-1:2006 CISPR 11/EN 55011 — Group 1 Class A IEC 61000-4-2/EN 61000-4-2 — 4 kV CD, 8 kV AD IEC 61000-4-3/EN 61000-4-3 — 3 V/m, 80-1000 MHz & 1.4-2 GHz, 1 V/m 2-2.7 GHz IEC 61000-4-4/EN 61000-4-4 — 0.5 kV signal lines, 1 kV power lines IEC 61000-4-5/EN 61000-4-5 — 0.5 kV line-line, 1 kV line-ground IEC 61000-4-6/EN 61000-4-6 — 3 V, 0.15-80 MHz IEC 61000-4-11/EN 61000-4-11 — 0% for 1/0.5 (0°,180°) cycle 0% for 250/300 cycle 70% for 25/30 cycles Canada: ICES-001:2004 Australia/New Zealand: AS/NZS CISPR 11:2004
Safety	Canada: CAN/CSA-C22.2 No. 61010-1-04 IEC 61010-1:2001/EN 61010-1:2001 USA: ANSI/UL 61010-1: 2004
Instrument	
Dimensions	Width: 15.24 cm (6.0 inches) Height: 4.45 cm (1.75 inches) Depth: 22.9 cm (9.0 inches)
Weight	Instrument only: 1.36 Kg (3.0 Lb) Shipping: 2.95 Kg (6.5 Lb)

Ordering Information

Instrument hardware	Description
U4612A USB 3.0 Jammer	Jammer for USB 3.0

USB analyzer	Description
U4611A	USB 3.0 Analyzer; see data sheet for configuration options
U4611B	USB 3.0 Analyzer with 18 GB trace memory

Host connection accessories*	Description
U4601A PCIe XpressCard for laptops*	XpressCard for laptop based systems
U4602A PCIe XpressCard for desktops*	PCIe XpressCard for desktop based systems
U4603A PCIe X4 cable, 2 m long	
U4604A PCIe X4 cable, 3 m long	

* Choose one for either desktop or laptop based systems

Related Keysight Literature

Publication title	Pub number
USB Design and Test – A Better Way, Brochure	5990-4640EN
U7243A USB 3.0 Software for the Infiniium Series Oscilloscopes Data Sheet	5990-4115EN
U4611A/B USB 2.0/3.0 Analyzer Data Sheet	5990-9001EN

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