SAS (Serial Attached SCSI) and SATA (Serial ATA) Protocol Analyzers

**U3051C Micro**
2 port 6 Gbps SAS/SATA protocol analyzer

**U3052C and U3057C PRO**
4 port 6 Gbps SAS/SATA protocol analyzer

**U3055A and U3056A PRO II**
4 port 12 Gbps SAS/SATA protocol analyzer

**U3053C Jammer**
2 port 6 Gbps SAS/SATA error insertion (jammer) and SATA BIST generator

Data Sheet

For today’s SAS and SATA developers and integrators, getting to the root of a problem can be especially difficult when there isn’t an obvious trigger condition. Troubleshooting is further complicated by increasing storage capacities, data rates, and protocol complexity. Integrators and developers need faster and deeper analyzers to keep up. Traditionally, those needing to capture large amounts of traffic have been faced with limited trace buffers, long waits to view the data, slow searches, and slow saving. SerialTek has overcome the old limitations with the BusXpert Series of SAS/SATA Analyzers. The BusXpert uses advanced technologies such as the industry’s first PCI Express x4 uplink to the host (550 MB/s), up to 72 GB of buffer (Pro II), Hardware Accelerated Gigabit Ethernet, pre-indexed and compressed trace data, multiple analysis processors, and instant display of the captured data.

The BusXpert also features easy to use triggering, pre/post-filtering, textual search and sequence search, and many different displays of the captured traffic. It is available in a variety of configurations to fit specific needs for buffer size, port-count, protocols, and budget. The BusXpert breaks free of past analyzer limitations and lets users spend more time on development and debug efforts.
Hardware Innovations

The BusXpert also features a Native PHY, fast data Re-Lock, 2-ns timestamp resolution, Eye-opener front-end, and tunable RX/TX signaling. The Native PHY, along with SerialTek’s proprietary re-lock implementation, allows the BusXpert to achieve the industry’s fastest PLL lock-time, resulting in extremely accurate capture during speed negotiation, power management, and SSC transmissions. A 2-ns timestamp resolution allows for extra detailed timing information. This is especially useful with SAS wide links and is also helpful in determining if timing violations occurred during capture. This 2-ns timestamp resolution is three times more accurate than found in other competing solutions. The tunable RX/TX and eye-opener front-end allow the BusXpert’s signal characteristics to be adjusted on the fly.

Pre-indexing enables fast displaying of, searching for, and hiding of the captured bus activity. Trace-processing works with pre-indexing to allow for quicker display of transactions, decreasing the time needed for searching and allowing saved traces to perform just as fast as traces stored on the BusXpert. Trace formatting enables efficient use of the host system’s disk space, allowing more traces to be saved without the extra data found in other trace formats. Compression is used to cut down on the space needed for repetitive SAS and SATA link layer traffic and also to utilize the pipe connection to the host system more effectively.

BusXpert’s hardware was designed to deliver trace data at speeds of up to 550 MB/s, capturing up to 72 GB of bus activity and ensuring the data captured is represented as accurately as it appears on the bus. To take advantage of the performance offered by the hardware, BusXpert’s software was designed from the ground up to fully utilize the fast pipes and large buffers. Existing methods of dealing with the upload and display of trace data were not efficient enough and led to some key innovations found only in the BusXpert software: Pre-indexing, trace-processing, trace-formatting, and compression.

The BusXpert PRO is the only SAS analyzer and SATA analyzer to offer hardware accelerated gigabit ethernet and PCI Express x4 for the host interface. This enables fast uploads of even the largest capture files—it can be configured for up to 72 GB of data capture.
BusXpert has a new and revolutionary Java-based, portable user interface with multiple docking views and easy-to-use portable API for automation. InstaView and PreIndexing innovations allow viewing of any size trace and lets designers truly use the analyzer in under five seconds!

Outstanding features that make SAS/SATA analysis a snap include

- **Multiple capture recording:** Allows the analyzer to re-arm itself after a trigger condition has been met and start a new recording for up to 256 consecutive segments.

- **ATAPI support:** Software fully decodes ATAPI commands.

- **Live counters and monitors:** Allow the user to independently count user-specified events, such as frame errors, and take a trace simultaneously.

- **InstaSearch technology:** Uses the latest in MicroBlaze microprocessor technology to search through large trace buffers in seconds.

- **Strong compression:** Allows the user to maximize buffer space by compressing primitives even when an ALIGN or IDLE are between each occurrence.

- **Triggering improvements:** Users can now specify more than one trigger action in each “Wait for” state.

- **Additional command decoding:** Deeper decodes of popular commands such as Identify Device and Inquiry.

- **Overlapped command display:** In response to customer enhancement requests, users can now monitor the number of commands and responses while a single command is outstanding.

- **Live performance monitoring:** Measure IOPS per second, Read/Write/Total MB/s per each link for comparison.
Triggering

BusXpert’s triggering interface allows for quick definition of events with frame layouts matching the SAS2 and SATA specifications. Simple and complex triggers can be built with ease. BusXpert’s triggering includes:

- Up to 8 sequencers
- Up to 16 states per sequencer
- Up to 32 counters and timers
- Multi-level branching
- User-defined events
- External trigger in/out

Also featured is the ability to copy and paste frames and primitives from an open trace, saving additional time on defining events. Any of the events created can be saved to the User Events folder for future use.

Pre-filtering

Filtering out specific primitives, frames, data, and addresses is easy. Simply specify which patterns to filter out during a capture to maximize buffer space, resulting in more meaningful data.

Line status

The Status menu shows a visual representation of what is currently occurring on the bus and also a status of the capture.

The MUX/Spd/OOB/Link/Frame/10b Err/Cmd/ and Err Sts LEDs match the activity on the front of the BusXpert. Status lights such as Frame, Cmd, Link, and OOB are useful in determining what is happening on the bus at any given time, while the error lights, such as 10b Err and Err Sts, let the user know that signal errors and command errors are occurring.
Protocol view
Shows the precise timing relationship of each DWORD in the trace. This is useful for tracking the handshaking between products under test.

Frame details
Shows each frame in the format used by the SAS or SATA specification. This is useful for checking frame contents and correlating against expected values.

Transaction view
Shows each command in the order it was initiated. Commands may be expanded to show the frames associated with them or collapsed so that only a summary of the command is shown.

Data view
Shows the payload of a selected SAS or SATA Data Frame in several different formats.

Spreadsheet view
Provides extensive decoding of the frames, primitives, and Out-of-Band (OOB) events and sorts them to show the order in which they occurred. The displayed columns are chosen from an extensive list of fields and events.
Searching for data

Easily search for specific frames, primitives, addresses or other events with the Quick Search and Advanced Search functions. Quick Search is a text search that fills in the rest of the search term as the user starts typing. Advanced Search provides a way to search for sequences of events, either within a frame, or across multiple frames or events. It is identical to the Trigger Sequencer in appearance.

The ‘Protocol view,’ ‘Transaction View,’ and ‘Spreadsheet view’ show different levels of the same data and can be synchronized by double-clicking in any of the views. All of the views can be easily configured to display anywhere in the workspace. Hide, dock, pin, and resize to the desired configuration and the software will retain the last known settings. Each view can be exported to CSV and XML formats, and the Frame ‘Details’ view will also export to HTML.

All command decodes are XML-based and can easily be edited or created for unique or vendor-specific commands.

The intuitive interface used for Triggering is also used with the Searching and Filtering functions allow for simplicity and ease of use. Any created and saved events are available to use in each of the interfaces.

BusXpert’s software is up-to-date with the latest specifications for SAS2 and SATA Revision 3.0. It is also constantly updated with new features driven by market demands and customer requests.
Statistical Analysis: Get an Overall View of the Types of Traffic Captured

- Navigate into areas of interest
- Look for max/min performance areas

There are several reports that are generated by the statistics view and many of them can be used to find interesting areas in the trace. For example, with the graphic above, click on the 'Max Response Time' number in blue to jump to that command in the trace, and then set a bookmark to identify it for future use. Click on the arrow button next to the result for a drop-down of the 15 max/min values. Then click on the values within that drop-down to be taken to that location in the trace.

Statistics categories

<table>
<thead>
<tr>
<th>SAS/SATA</th>
<th>SATA only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Link utilization</td>
<td>Link utilization</td>
</tr>
<tr>
<td>SAS primitives</td>
<td>Sas primitives</td>
</tr>
<tr>
<td>SATA primitives</td>
<td>Primitives</td>
</tr>
<tr>
<td>SATA PM</td>
<td>PM</td>
</tr>
<tr>
<td>Connections (Type/Channel)</td>
<td>Connections (Link/Type)</td>
</tr>
<tr>
<td>SSP frames</td>
<td></td>
</tr>
<tr>
<td>STP frames</td>
<td>Frames</td>
</tr>
<tr>
<td>SMP frames</td>
<td></td>
</tr>
<tr>
<td>SCSI commands</td>
<td></td>
</tr>
<tr>
<td>SCSI IO</td>
<td></td>
</tr>
<tr>
<td>SCSI queue depth</td>
<td></td>
</tr>
<tr>
<td>SCSI tasks</td>
<td></td>
</tr>
<tr>
<td>ATA commands</td>
<td>ATA commands</td>
</tr>
<tr>
<td>ATA IO</td>
<td>ATA IO</td>
</tr>
<tr>
<td>NCQ queue depth</td>
<td>NCQ queue depth</td>
</tr>
<tr>
<td>ATAPI commands</td>
<td>ATAPI commands</td>
</tr>
<tr>
<td>ATAPI IO</td>
<td>ATAPI IO</td>
</tr>
<tr>
<td>OOB</td>
<td>OOB</td>
</tr>
<tr>
<td>Speed negotiation</td>
<td>Speed negotiation</td>
</tr>
<tr>
<td>Errors</td>
<td>Errors</td>
</tr>
</tbody>
</table>
The SerialTek BusXpert Pro II is our flagship SAS and SATA analyzer. It features the HD Mini-SAS connectors for 4-port connections, the industry’s largest buffer up to 72 GB and is small enough to easily transport around the lab or in the field. Multiple units can be cascaded together for recording multiple ports simultaneously and viewed in the same GUI.

**Key features:**
- Enhanced gigabit ethernet > 70 MB/s
- 500 picosecond timestamp resolution
- Eye-opener front end
- Tunable RX/TX signaling
- Cascadeable up to 4 BusXpert Pro platforms
- Supports 1.5/3.0/6.0/12.0 (SAS Only) Gbps
- Deep triggering and filtering
- Trace buffer up to 72 GB

**Hardware specifications:**
- Measures 10” x 14” x 3.5”
- Weighs 10 lbs
- Status LEDs per port pair for:
  - Auto speed detection
  - OOB present
  - Link up/down
  - Frames present
  - 10b error detection
  - Commands present
  - Command errors

In addition to the features above, the BusXpert Pro II also supports:
- External trigger in/out
- Manual trigger button
- (3) 7 Segment display for unit # and IP address
- 12 Gb SAS analyzer with support for 6 Gb/3 Gb SATA/STP
- Windows and Linux compatibility for both the GUI and API
The SerialTek BusXpert Pro is the workhorse for 4 port analysis of SAS and SATA. It features the optional Mini-SAS connectors for 4-port connections, the industry’s largest buffer up to 36 GB and is small enough to easily transport around the lab or in the field. Multiple units can be cascaded together for recording multiple ports simultaneously and viewed in the same GUI.

Key features:
• PCI express > 550 MB/s
• Enhanced gigabit ethernet > 70 MB/s
• Native PHY
• Fast data re-lock
• 2 ns timestamp resolution
• Eye-opener front end
• Tunable RX/TX signaling
• Cascadeable up to 4 BusXpert Pro platforms
• Available with either mini-SAS or SATA 7-pin connectors
• Supports 1.5/3.0/6.0 Gbps
• Deep trigger and filter
• Trace buffer up to 36 GB

Hardware specifications:
• Measures 8.5” x 14” x 3.5”
• Weighs 10 lbs
• Status LEDs per port pair for
  ◦ Auto-MUX detection
  ◦ Auto speed detection
  ◦ OOB present
  ◦ Link up/down
  ◦ Frames present
  ◦ 10b error detection
  ◦ Commands present
  ◦ Command errors

In addition to the features above, the BusXpert Pro also supports:
• External trigger in/out
• Manual trigger button
• SATA-only option for SATA analyzer
• SAS analyzer with support for SATA/STP
• Windows and Linux compatibility for both the GUI and API
The BusXpert Micro Series SAS and SATA analyzer has a very portable form-factor, making it a preferred choice for those developers needing a compact platform with minimal noise and size. Its small dimensions also make it easy to take along in the field and to move it from bench to bench in the lab.

The analyzer comes with several status LEDs for a quick visual reference of what is occurring on the bus. It also supports trigger in/out for those needing to trigger a scope or logic analyzer. The BusXpert Micro Series is our most capable SAS/SATA analyzer for complete SAS and SATA protocol analysis. It features the industry’s largest buffer, offering options from 2 GB up to 9 GB. It also has the industry’s most in-depth triggering, with up to three simultaneous sequencers. Each sequencer can contain up to 16 states with timers, counters, and the ability to jump anywhere within the sequence. The BusXpert GUI also makes it easier for developers to create triggers and understand what is happening on the bus, and it displays the data in a meaningful format.

**Key features:**

- PCI express > 550 MB/s
- Enhanced gigabit ethernet > 70 MB/s
- Native PHY
- Fast data re-lock
- 2 ns timestamp resolution
- Eye-opener front end
- Tunable RX/TX signaling
- Cascade-able up to 2 BusXpert Micro Systems
- SATA 7-pin connectors
- 1-port or 2-port (full duplex links)
- 5 V/12 V controllable external power connector
- License for SAS/SATA or SATA-only
- Software configurable for 3.0/6.0 Gbps
- Deep trigger and filter
- Trace buffer up to 9 GB
Hardware specifications:

- Measures 6” x 9” x 1.75”
- Weighs less than 3 lbs
- Status LEDs per port pair for
  - Auto speed detection
  - OOB present
  - Link Up/Down
  - Frames present
  - 10b error detection
  - Commands present
  - Command errors

In addition, the BusXpert Micro also supports:

- External trigger in/out
- Manual trigger button
- SATA-only option for SATA analyzer
- SAS analyzer with support for SATA/STP
- Cascade with BusXpert Micro and MicroLite USB analyzer for simultaneous record and display of SAS/SATA and USB traffic
- Windows and Linux compatibility for both the GUI and API
Validating design robustness with reliable tools

For today’s SAS and SATA developers and integrators, verifying design robustness and error recovery can be a challenging task, especially when it is difficult to duplicate test cases and customer issues. Troubleshooting is further complicated by ever-climbing storage capacities, network architectures, data rates, and protocol complexity. The BusMod Error Injector gives designers the ability to insert a variety of errors into a live data stream to test real-time error handling, system recovery, and duplication of issues seen in the field. Used in conjunction with the BusXpert SAS/SATA analyzers, users can easily verify correct and incorrect responses to issues caused by the error injector. BusMod’s error injection provides the ability to create random and defined line errors such as CRC or 8b10b encoding errors, modify or replace frames, frame data and primitives. BusMod also has the capability of generating the SATA Built-In-Self-Test (BIST) frame for testing physical compliance of both hosts and devices. Used with the Frame Error Rate Counter (FERC) capability of the BusXpert analyzers, the BusMod Micro and Pro systems become versatile SATA compliance test tools.

Creating test scripts is easy using the SerialTek GUI. The interface is very similar to the BusXpert software to maintain ease and simplicity of use. Below are some examples of the U3052C GUI and capabilities.
For SATA physical layer compliance testing, users can instead send out the BIST frame and specify the different types of BIST commands, patterns, and so on.
The diagram below shows how a combination of the right tools could be a very powerful test setup for SAS and SATA physical compliance testing:

In the diagram above, the BusGen sends a SATA BIST frame to put the device under test into a special loop-back test mode. The J-BERT is then used to send compliance patterns with varying levels of jitter. The device sends the pattern back, and the BusXpert, using its Frame Error Counter capability, counts if there are any CRC errors in the frames from the device. The scope is used to verify the eye pattern of the device under test.
System Requirements

To get the best performance out of your BusXpert Analyzer, we recommend the following systems:

**Minimum configuration:**
1.5 GHz Celeron or AMD equivalent processor, 1 GB of memory, Gigabit Ethernet and/or USB, Graphics capable of supporting 1024 x 768.

**Recommended Configuration:**
2.8 GHz or greater processor, 3 GB or greater of 1.3 GHz FSB memory, PCIe x4 or ExpressCard slot. Graphics capable of supporting 1920 x 1200 or greater BusXpert software is compatible with Windows XP and Windows Vista and Windows 7; 32 and 64-bit platforms. BusXpert requires 100 MB for installation. Additional disk space is recommended for storing traces.

The following information applies to all SAS/SATA analyzers:

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyzer control</td>
<td>Analyzer operation is controlled from PC based software operating through Ethernet connection or PCIe.</td>
</tr>
<tr>
<td>Operating system</td>
<td>Microsoft Windows 32 or 64 bit OS.</td>
</tr>
<tr>
<td>Trigger in</td>
<td>SMA connector to the FPGA sequencer logic though the buffer powered by 3.3 V with 1 K pull-down resistor.</td>
</tr>
<tr>
<td>Trigger out</td>
<td>SMA connector with LVCMOS25 driver, 6 mA drive strength, external trigger modes are: Pulse high, Pulse low, and Toggle.</td>
</tr>
<tr>
<td>Environment and safety</td>
<td>This instrument is intended for indoor use in an installation category II, pollution degree 2 environment.</td>
</tr>
<tr>
<td>Temperature</td>
<td>Operating: 20 to 30 °C</td>
</tr>
<tr>
<td></td>
<td>Non-operating: −40 to +70 °C</td>
</tr>
<tr>
<td>Humidity (non-condensing)</td>
<td>Operating: 50% to 80% at 30 °C</td>
</tr>
<tr>
<td></td>
<td>Non-operating: 90% for 12 hours at 65 °C</td>
</tr>
<tr>
<td></td>
<td>Canada: CAN/CSA C22.2. No 61010-1-04</td>
</tr>
<tr>
<td></td>
<td>USA: ANSI/UL 61010-1:2004</td>
</tr>
<tr>
<td></td>
<td>Pollution degree: 2</td>
</tr>
<tr>
<td></td>
<td>Environmental rating: Standard</td>
</tr>
</tbody>
</table>
Ordering Information

Physical specifications

<table>
<thead>
<tr>
<th>SerialTek Series</th>
<th>Model</th>
<th>Cable type</th>
<th>Port count</th>
<th>Protocol support</th>
<th>Protocol speeds</th>
<th>Buffer options</th>
<th>Trigger</th>
<th>PC control interface</th>
<th>Power</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro II</td>
<td>U3056A</td>
<td>HD MiniSAS</td>
<td>4</td>
<td>SAS/SATA</td>
<td>1.5/3/6/12 Gbps</td>
<td>72 GB</td>
<td>Y Y x4</td>
<td>200 W internal</td>
<td></td>
<td>10&quot;x14&quot;x3.5&quot;</td>
<td>12 lbs</td>
</tr>
<tr>
<td>Pro II</td>
<td>U3055A</td>
<td>HD MiniSAS</td>
<td>4</td>
<td>SAS/SATA</td>
<td>1.5/3/6/12 Gbps</td>
<td>6, 18, 36 GB</td>
<td>Y Y x4</td>
<td>200 W internal</td>
<td></td>
<td>10&quot;x14&quot;x3.5&quot;</td>
<td>12 lbs</td>
</tr>
<tr>
<td>Pro Series</td>
<td>U3057C</td>
<td>MiniSAS</td>
<td>4</td>
<td>SAS/SATA</td>
<td>1.5 /3/6 Gbps</td>
<td>36 GB</td>
<td>N Y x4</td>
<td>150 W internal</td>
<td></td>
<td>8.5&quot;x14&quot;x3.5&quot;</td>
<td>10 lbs</td>
</tr>
<tr>
<td>Pro Series</td>
<td>U3052C</td>
<td>MiniSAS</td>
<td>4</td>
<td>SAS/SATA</td>
<td>1.5 /3/6 Gbps</td>
<td>4, 9, 18 GB</td>
<td>N Y x4</td>
<td>150 W internal</td>
<td></td>
<td>8.5&quot;x14&quot;x3.5&quot;</td>
<td>10 lbs</td>
</tr>
<tr>
<td>Micro Series</td>
<td>U3051C</td>
<td>SATA (x2)</td>
<td>1, 2</td>
<td>SAS/SATA/SATA</td>
<td>1.5 /3/6 Gbps</td>
<td>2, 4, 9 GB</td>
<td>N Y x4</td>
<td>90 W external</td>
<td></td>
<td>6&quot;x9&quot;x1.75&quot;</td>
<td>3 lbs</td>
</tr>
<tr>
<td>Micro Series jammer</td>
<td>U3053C</td>
<td>SATA (x2)</td>
<td>1, 2</td>
<td>SAS/SATA/SATA</td>
<td>1.5 /3/6 Gbps</td>
<td>NA</td>
<td>N Y x4</td>
<td>90 W external</td>
<td></td>
<td>6&quot;x9&quot;x1.75&quot;</td>
<td>3 lbs</td>
</tr>
</tbody>
</table>

**U3051C Micro – 2 Port 6 Gbps SAS/SATA Protocol Analyzer**

### U3051C When ordering the U3051C, you must also order one of the available 6 configuration options.

<table>
<thead>
<tr>
<th>U3051C</th>
<th>3 G, SATA, 1 port, 2 GB memory</th>
<th>Enables SATA I and SATA II (1.5 Gbps and 3.0 Gbps) operation, enables a 2 GB capture buffer for one port only. This “Lite” configuration supports a single trigger sequence of a single state and a single buffer segment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3051C-002</td>
<td>6 G, SATA, 1 port, 2 GB memory</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 2 GB capture buffer for one port only. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3051C-003</td>
<td>6 G, SATA, 1 port, 4 GB memory</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 4 GB capture buffer for one port only. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3051C-004</td>
<td>6 G, SATA, 2 port, 4 GB memory</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 4 GB capture buffer for two ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3051C-005</td>
<td>6 G, SAS &amp; SATA, 2 port, 4 GB memory</td>
<td>Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 4 GB capture buffer for two ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3051C-006</td>
<td>6 G, SAS &amp; SATA, 2 port, 9 GB memory</td>
<td>Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 9 GB capture buffer for two ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
</tbody>
</table>
# U3052C and U3057C PRO – 4 Port 6 Gbps SAS/SATA Protocol Analyzer

<table>
<thead>
<tr>
<th>Model</th>
<th>Configuration Options</th>
<th>Description</th>
</tr>
</thead>
</table>
| **U3052C** | **When ordering the U3052C, you must also order one of the available two configuration options.** | **U3052C-001**  
Pro analyzer, 4 port, 6 Gbps link speed, SAS and SATA, 9 GB capture memory  
Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 9 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.  
**U3052C-002**  
Pro analyzer, 4 port, 6 Gbps link speed, SAS and SATA, 18 GB capture memory  
Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 18 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments. |
| **U3057C** | **When ordering the U3057C, there are no available options.**                        | **U3057C**  
Pro analyzer, 4 port, 6 Gbps link speed, SAS and SATA, 36 GB capture memory  
Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 36 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments. |
### U3055A

When ordering the U3055A, you must also order one of the available three configuration options.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3055A-001</td>
<td>Pro II analyzer, 4 port, 12 Gbps link speed, SAS, 9 GB capture memory</td>
</tr>
<tr>
<td></td>
<td>Enables SAS at 12 Gbps and SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 9 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3055A-002</td>
<td>Pro II analyzer, 4 port, 12 Gbps link speed, SAS, 18 GB capture memory</td>
</tr>
<tr>
<td></td>
<td>Enables SAS at 12 Gbps and SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 18 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3055A-003</td>
<td>Pro II analyzer, 4 port, 12 Gbps link speed, SAS, 36 GB capture memory</td>
</tr>
<tr>
<td></td>
<td>Enables SAS at 12 Gbps and SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 36 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
</tbody>
</table>

### U3056A

When ordering the U3056A, there are no available options.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3056A-001</td>
<td>Pro analyzer, 4 port, 6 Gbps link speed, SAS and SATA, 72 GB capture memory</td>
</tr>
<tr>
<td></td>
<td>Enables SAS at 12 Gbps and SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 72 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
<tr>
<td>U3056A-002</td>
<td>Pro II analyzer, 4 port, 12 Gbps link speed, SAS, 72 GB capture buffer</td>
</tr>
<tr>
<td></td>
<td>Enables SAS at 12 Gbps and SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) operation, enables a 72 GB capture buffer for four ports. Full support for multi-state triggering, with multiple sequences and buffer segments.</td>
</tr>
</tbody>
</table>
When ordering the U3053C, you must also order one of the available three configuration options.

<table>
<thead>
<tr>
<th>U3053C</th>
<th>Configuration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U3053C-001</td>
<td>BIST generator, 1 port, 6 Gbps, SATA only</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps), SATA BIST operation on one port only.</td>
</tr>
<tr>
<td>U3053C-002</td>
<td>Micro BusMod error injector, 1 port and BIST generator, 1 port, 6 Gbps link speed, SATA only</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) SATA BIST operation on one port and error injection on one port.</td>
</tr>
<tr>
<td>U3053C-003</td>
<td>Micro BusMod error injector, 2 port and BIST generator, 1 port, 6 Gbps link speed, SATA only</td>
<td>Enables SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) SATA BIST operation on one port and error injection on two ports.</td>
</tr>
<tr>
<td>U3053C-004</td>
<td>Micro BusMod error injector, 2 port and BIST generator, 1 port, 6 Gbps link speed, SAS and SATA</td>
<td>Enables SAS and SATA I, II, III (1.5 Gbps, 3.0 Gbps, and 6 Gbps) SATA BIST operation on one port and error injection on two ports.</td>
</tr>
</tbody>
</table>

Optional Accessories When Preferred Connection Is PCIe

<table>
<thead>
<tr>
<th>U3052C-OC-ACCS</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>U4601A</td>
<td>PCIe XpressCard adapter for laptop connections</td>
</tr>
<tr>
<td>U4602A</td>
<td>PCIe x4 card (slot adapter) for desktop connections</td>
</tr>
<tr>
<td>U4603A</td>
<td>PCIe x4 cable, 2 meters long</td>
</tr>
<tr>
<td>U4604A</td>
<td>PCIe x4 cable, 3 meters long</td>
</tr>
</tbody>
</table>
LAN extensions for Instruments puts the power of Ethernet and the Web inside your test systems. Agilent is a founding member of the LXI consortium.

AdvancedTCA® Extensions for Instrumentation and Test (AXIe) is an open standard that extends the AdvancedTCA for general purpose and semiconductor test. Agilent is a founding member of the AXIe consortium.

PCI extensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.

Get the best of both worlds: Agilent’s measurement expertise and product breadth, combined with channel partner convenience.

For more information on Agilent Technologies’ products, applications or services, please contact your local Agilent office. The complete list is available at: www.agilent.com/find/contactus

Americas
Canada (877) 894 4414
Brazil (11) 4197 3600
Mexico 01800 5064 800
United States (800) 829 4444

Asia Pacific
Australia 1 800 629 485
China 800 810 0189
Hong Kong 800 938 693
India 1 800 112 929
Japan 0120 (421) 345
Korea 080 769 0800
Malaysia 1 800 888 848
Singapore 1 800 375 8100
Taiwan 0800 047 866
Other AP Countries (65) 375 8100

Europe & Middle East
Belgium 32 (0) 2 404 93 40
Denmark 45 45 80 12 15
Finland 358 (0) 10 855 2100
France 0825 010 700*
*0.125 €/minute
Germany 49 (0) 7031 464 6333
Ireland 1890 924 204
Israel 972-3-9288-504/544
Italy 39 02 92 60 8484
Netherlands 31 (0) 20 547 2111
Spain 34 (91) 631 3300
Sweden 0200-88 22 55
United Kingdom 44 (0) 118 927 6201

For other unlisted countries: www.agilent.com/find/contactus

For more information on Agilent Technologies’ products, applications or services, please contact your local Agilent office. The complete list is available at: www.agilent.com/find/contactus

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2013
Published in USA, March 13, 2013
5991-1494EN