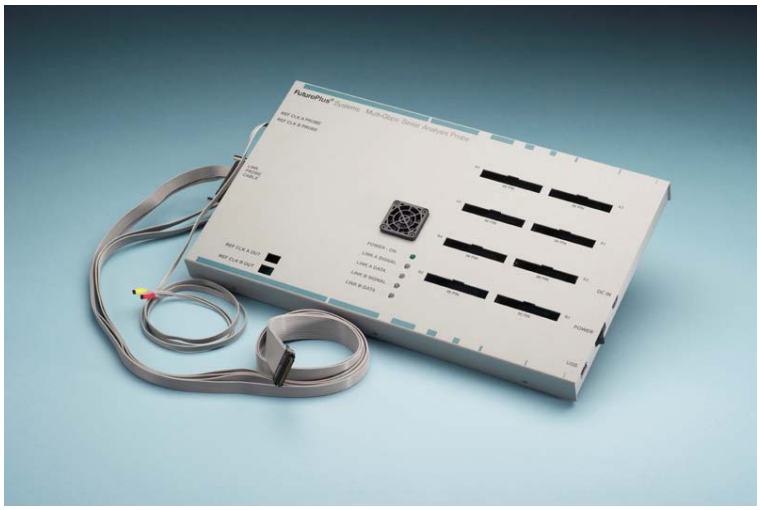
FS4415 Serial Rapid IO Protocol Preprocessor

For use with Tektronix Logic Analyzers

FuturePlus® Systems

Power Tools for Bus Analysis

- **Low cost SRIO Protocol Analysis**
- **Full size and half size connectorless midbus probing**
- **Flying lead set offers maximum probing flexibility**
- **Includes protocol decode and Transaction Viewer software**
- **Supports Tektronix Logic Analyzers**



Key Features

- 8/10b data acquisition at 3.125, 2.5 or 1.25 Gb/s
- X1, X4 and X1X4 lane modes (able to select X1 probing on lane 0 or 2
- Comprehensive error detection
- Detects packet types and check pack delimiters
- Packet-aware Data Filtering and Logic Analyzer triggering
- Support debug of physical, transport and logic layers (messaging, I.O and streaming)
- Probe Manager software funs on a PC for real time probe control
- Packet Spreading of X1 link data to four-column format
- Extendable to incorporate PCI Express analysis capability

Straightforward, Reliable SRIO Analysis

The FS4415 provides a mechanical, electrical and software interface between a SRIO bus and a Tektronix logic analyzer. The probe makes quick, reliable connections to the system under test. Internal termination networks minimize the effects of loading and reflections on the target system. Protocol-decode software decodes and displays incoming data on your logic analyzer.

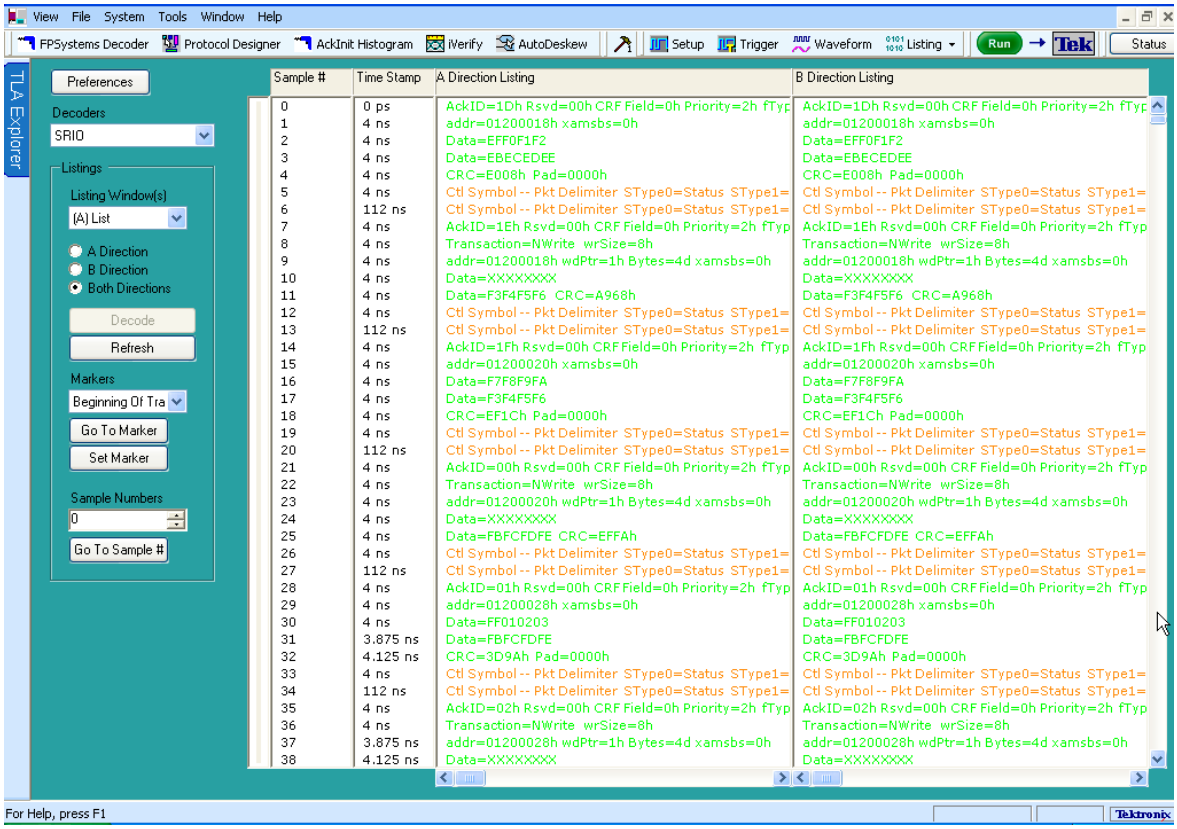
Helping you Design Tomorrow's Computers, Today

FuturePlus Systems is the technology leader in protocol analysis tools for the computer design industry. Our Interposers and software help you monitor and verify complex activities on your advanced-technology computer bus design. FuturePlus systems offerings include bus-analysis solutions for most popular computer buses. Visit www.futureplus.com for more information.

Tektronix

Embedded Systems Tools Partner

Full-featured, low-cost SRIO Protocol Analysis



The FS4415 is a low-cost SRIO protocol analysis probe, capable of non-intrusively probing a SRIO bus at a serial data rate of 1.25, 2.5 or 3.125 Gb/s. Equipped with a full-size mid-bus, half-size mid-bus, or flying-lead probe, it can intercept various combinations of X2, X4 and X1X4 lane modes.

Integral Terminations add Versatility and Save Money

FS1055 probe cables let you connect to most Tektronix logic analyzer modules. Integral termination networks minimize loading and reflections, and eliminate the need for additional termination adapters.

Choose a Connection Method to Meet Your Needs

The FS4415 accommodates a variety of low-intrusion connectivity solutions to provide maximum flexibility for a wide range of applications.

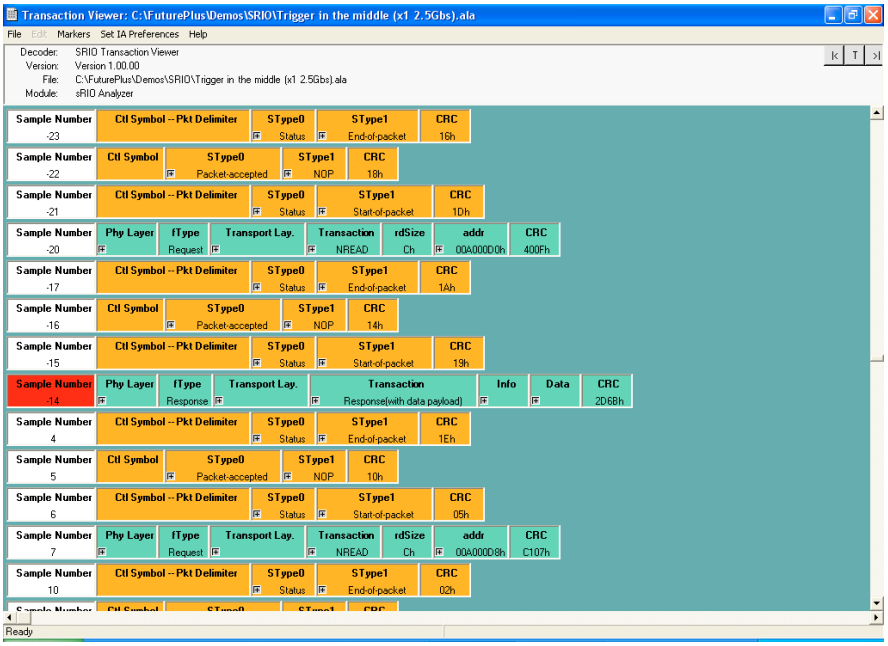
Choose from a full-size (16 channel) or half-size (8-channel) mid-bus cable that supports X1 or X4 lanes. Or choose compact, passive flying-lead probing for maximum flexibility at all support data rates.

For footprint layout information, please refer to the SRIO Design Guide, available free of charge from:

www.futureplus.com/appnote/an_srio.pdf

Transaction Viewer: A New Way to Look At Bus Transactions

The FS4415 Transaction Viewer software funs on your Tektronix logic analyzer or Windows computer to graphically display bus transactions. Start in high-level summary view to quickly scan transactions. Then use the drill-down feature to expose lower-level details of transactions of interest. Markers cross-correlate this display to the traditional logic analyzer state listing.



FS4415 Technical Details

8b/10b Data Acquisition at 1.25, 2.5 or 3.125 Gb/s

Reference clock connection provided for SRIO operation where the link transmitter frequency accuracy is outside of 100 PPM or if the link transmitter frequency is other than 1.25, 2.5 or 3.125 Gbps. This adds additional flexibility in a testing or emulation environment.

Detects, displays, filters in or out, and allows triggering on the following events:

- **Idle Sequence, Clock Compensation Sequence**
- **Control Symbols with Stype0 and Stype1**
- **Embedded Control Symbols (within packets)**
- **Packet Types:**
  - Type 0 Pkt
  - Type 2 Request Class
  - Type 5 Write Class
  - Type 6 Streaming Write
  - Type 8 Maintenance Class
  - Type 9 Data Streaming
  - Type 10 Doorbell
  - Type 11 Message
  - Type 13 Response
  - Type 15 Pkt
  - Type 1,3,4,7,12,14 Reserved
- **Packet Recognizers 1, 2, 3** (Packet Recognizer 3 for triggering only)
- **Control Symbols:**
  - Pkt Accept
  - Pkt Retry
  - Pkt Not Accepted
  - Status
  - Link Response
  - Stype 0
  - Stype 1
  - Start of Pkt
  - Stomp
  - End of Pkt
  - Restart from Retry
  - Link Request
  - Multicast
  - NOP

Packet Recognizer Functions

- Used for filtering, triggering or both
- 24 bytes pattern match and bit maskable
- 3 packet recognizers in each direction
- Simple triggering and easier inputs for building more complex triggers

Errors Detected, Displayed, and Triggered On

- Alignment error (x4 only)
- CRC errors on control
- Framing error
- Unexpected K error
- Packet Ack ID sequence
- Link down
- Electrical Idle
- LOS in any lane
- Link Alive
- Signal Detect (Beacon)
- Invalid decode or disparity
- Idle Error.

Other Features

Extendable Functionality: A factory option is available to add PCI Express analysis capability. Switching between the two is accomplished via the Probe Manager Software at power up.
Power Requirement - +5V DC (external supply included)
USB Connector: For probe control from a PC
Preserve Your Equipment Investment: The FS4415 is compatible with most Tektronix TLA7000-series logic analyzers and configurations.
Mechanical Dimensions: Width: 17 in. (43.2 cm) Depth: 10 in. (25.4 cm) Height: 1 in. (2.54 cm)

Ordering Information

FS4415 – Serial Rapid IO Preprocessor for use with Tektronix Logic Analyzers

FS4416 - Serial Rapid IO *AND* PCI Express Preprocessor for use with Tektronix Logic Analyzers

Software included with the FS4415:
FS1161 Setup files for the Tektronix logic analyzer and Protocol Decoder software, runs on the Tektronix logic analyzer (node locking not required)

Connection to your target system. Choose at least one of the following:
FS1031 Full size Midbus footprint X1, X2 or X4
FS1032 1/2 size Midbus footprint for X1, X2 or X4
FS1036 Flying Leads

Connection to the Tektronix Logic Analyzer
The following is required to connect the FS4415 to the TLA:
FS1055 – TLA7AA4/TLA7BB4 Full Channel Probe Cable – 4 ea

Logic Analyzer Requirements

System Requirements - FS4415 SRIO Protocol Preprocessor
For use with Tektronix Logic Analyzers

System Requirements by Lane Width and Bus Speed

Lane Width >	X1			X4		
Bus Speed	1.25 Gb/s	2.5 Gb/s	3.125 Gb/s	1.25 Gb/s	2.5 Gb/s	3.125 Gb/s
LA State Clock Frequency	62.5 MHz	125 MHz	156 MHz	125 MHz	250 MHz	312 MHz
TLA7AAx	2 ea TLA7AA3 or 1 ea TLA7AA4, 235 MHz			2 ea TLA7AA3 or 1 ea TLA7AA4, 450 MHz		
TLA7NAx	2 ea TLA7NA3 or 1 ea TLA7NA4, 235 MHz			2 ea TLA7NA3 or 1 ea TLA7NA4, 450 MHz		

1. We recommend you use the latest Tektronix operating software to insure you will get the best performance from FuturePlus products. To get the latest Tektronix logic analyzer software click here.

TLA7000 Series Analyzers

Module	Description	Channels Available
TLA7AA3	235 / 450 MHz State / 2 GHz Timing, 125 ps MagniVu™	102
TLA7AA4	235 / 450 MHz State / 2 GHz Timing, 125 ps MagniVu™	136
TLA7NA3	235 / 450 MHz State / 2 GHz Timing, 125 ps MagniVu™	102
TLA7NA4	235 / 450 MHz State / 2 GHz Timing, 125 ps MagniVu™	136

See http://www.futureplus.com/products/fs4415/fs4415_sysreq.shtml for detailed requirements.

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