FuturePlus Systems is expanding. To better fulfill the needs of you, our customers, we have added two new employees.

David Grabove recently joined the staff at the FuturePlus Colorado Springs office. He is our new Marketing Communications Manager with over 20 years of experience in the Test and Measurement industry. He has worked with Hewlett-Packard in marketing communications and as a consultant to Agilent Technologies in web site design and management. His responsibilities include sales order management, product publicity, press relations, advertising management, and web site design and management.

Paul Sirois has joined our New Hampshire design center. Paul is a Maine native who has worked at BAE, Cabletron, 3Com, and Cisco. He has developed embedded applications for a variety of Data and TDM switches and has experience with telephony gateways. Paul is responsible for developing the protocol and transaction software in the newest FuturePlus products.

Please join us in welcoming Paul and David to the FuturePlus team. We look forward to the experience they bring, as we continue to find better ways to serve you.

Forthcoming Events

The 2001 conference season is well underway. Upcoming events on the FuturePlus calendar include the Platform Conference and the Intel Developers’ Forum. Drop by our booth and ask about our interesting new products and developments! The Platform Conference takes place in San Jose, July 24 - 25. The Intel Developers’ Forum is in San Jose, August 27-30.

Introducing the FS4120 USB 2.0 Analysis Probe

If you’re involved with debugging, testing, verification, and compliance testing of USB 2.0 peripherals and USB-based systems, the FS4120 Universal Serial Bus (USB) analysis probe can make your task a great deal easier. The new probe is designed for use with Agilent Technologies logic analyzers.

New FuturePlus Web Site

We are pleased to announce that the new FuturePlus web site is now online. We’ve redesigned the web site to better utilize your feedback. The new site navigation makes it easier than ever before to find the information you’re looking for, including product data sheets, user manuals, and other documentation. Download software updates, seminar presentations and app notes. You can also request quotes and register your warranties online.

Please visit the new site soon at www.futureplus.com.

FuturePlus is a member of these organizations:

- The PCI Special Interest Group
- The USB Implementers Forum
- The AGP Implementers Forum
- Agilent Premier Channel Partners
- IEEE-1394 Trade Association

The FS4120 USB analysis probe offers complete USB 2.0 serial-to-parallel decode, providing a protocol-level view of bus traffic.

Brave New World: New Measurement Challenges for USB 2.0 Designers

The USB 1.1 specification has a maximum operating speed of 12 Mb/s. While these speeds are adequate for human interface devices such as mice or keyboards they are very limiting for devices such as high-resolution printers, video-conferencing cameras, and high-density storage devices such as R/W DVD.

**New Software Tool Helps Ensure Compliance with PCI Specification**

The FS1105 PCI Bus Compliance Verification Consultant is a software tool that runs on an Agilent logic analyzer. The FS1105 takes the input labels from the passive PCI configuration file FORMAT menu and generates columns in the listing screen on the logic analyzer. These columns decode the PCI bus traffic in an easy-to-read format and provide additional compliance verification information on 26 common rules of the PCI Compliance Verification Test Specification. Making sure you adhere to these rules will insure that your product complies with the PCI specification.

Whether you have a standard PCI Local Bus or an embedded PCI bus with a non-standard connection, the FS1105 is like adding a full time PCI consultant to your staff or design team! The FS1105 product is licensed to a single Agilent 1670x frame.

The FS1105 includes several sample configuration files that match the passive PCI analysis probe products from FuturePlus Systems. Customers with custom physical connections can use any of these files and modify them for their own custom configuration. The configuration software sets up the format specification menu of the logic analyzer for compatibility with the specified FuturePlus PCI probe. Once installed, the FS1105 PCI transactor/compliance software appears as an icon in the CUSTOM area of the logic analyzer workspace. In addition to custom probing solutions, the FS1105 post-processes data from the FS2000, FS2001, FS2004, FS2005, FS2006, FS3010, FS3020, and FS3030 FuturePlus PCI Analysis Probes.

**Supported Logic Analyzers**

The FS1105 is supported on the 16700A/B or 16702A/B logic analysis systems with one or more of the following cards installed:

You can download a demo version of the FS1105 from the FuturePlus website and evaluate it for 10 days. After that period, please contact FuturePlus Systems on the web at sales@futureplus.com or phone us at (719) 278-3540 to purchase a copy.

The FS1105 has a U.S. List price of $1995 and is now shipping. §

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**Agilent Introduces New Logic Analyzers**

Agilent Technologies recently introduced a new line of benchtop logic analyzers using a Windows 2000 PC-based operating system. There are eight new models; four of the 1680-series incorporate an embedded PC and four of the 1690-series require the user to supply an external PC. The channel counts available are 34, 68, 102 and 136. State analysis speed is listed as 200 MHz, and timing analysis is 400 MHz full channel, 800 MHz half channel. Setup and hold time is a 2.5ns window adjustable from 4.5/-2 ns to -2.0/4.5 ns in 100ps increments per channel with a single clock and a single edge. The window increases to 3 ns with multiple clocks and multiple edges. Data acquisition memory is 256 KB with an optional 1 MB available. The Agilent 1680-series will include a color display with a 15 GB hard disk, a 24X CD ROM drive, and a 1.44 MB floppy disk drive.

Full details about the new logic analyzers are available at the Agilent web site at: [www.agilent.com/find/logicanalyzers](http://www.agilent.com/find/logicanalyzers)

FuturePlus is pleased to be the first to announce bus support for the new Agilent 1680 and 1690 logic analyzers with the FS4120 USB 2.0 analysis probe. Because the Agilent 1680 and 1690 logic analyzers are a completely new, PC-based design, existing configuration files and inverse assemblers from the Agilent 1660 and 1670 series logic analyzers are not compatible. FuturePlus and Agilent are working to convert to the new architecture. To help us prioritize which products need to be converted we are asking for your suggestions. Please email us at sales@futureplus.com, or call us at (719) 278-3540 Ext. 11 with your ideas on which bus analysis tools should be converted first. §
New HyperTransport Analysis Probe
FuturePlus Systems is leveraging our experience in high speed bus analysis to develop a new debug solution for HyperTransport bus designers. The HyperTransport Bus, formerly known as the LDT or Lightning Data Transport, is being used in designs incorporating the AMD K8 processor in workstation and server applications. In addition, companies such as Broadcom and PMC Sierra are embedding Hyper-Transport within network processors. The FS2240 analysis probe monitors activity on the HyperTransport bus at full speed using a special connector that the user installs on the bus. The Agilent 16700A/B or 16702A/B logic analysis system and associated logic analyzer cards will be required.

Strict electrical design requirements are implemented to guarantee the highest level of signal integrity and to minimize the intrusiveness of the probing system. Software that ships with the product runs on the logic analyzer and decodes all of the HyperTransport transactions at full speed. The FS2240 supports 8-bit buses; two FS2240’s support 16-bit buses. Deliveries are targeted for Oct. 1, 2001. §

Fixture Coordinates
Scope, Logic Analyzer Measurements

With the new Agilent E5850A time-correlation fixture, you can easily cross-trigger and time-correlate measurements between an Agilent 16700-series logic analysis system and an Agilent Infiniium 54800-series oscilloscope. The fixture automatically de-skews the waveforms in time and lets you view both the logic analyzer’s timing waveforms and the oscilloscope’s analog waveforms together on the 16700’s display. The analysis system’s global markers will time-correlate all measurements. This new product will be especially useful when using FuturePlus products that include an oscilloscope connection to the bus. §

New USB Analysis Probe
(Continued from page 1)

Key FS4120 Features
♦ complete USB serial-to-parallel decode providing a protocol-level view of bus traffic; dual-channel operation with time-correlated displays for analysis;
♦ support for current measurements, including inrush current;
♦ support for both USB 1.1 and 2.0;
♦ external power supply connection for USB devices;
♦ detects errors, including bad or invalid PID, bit stuffed, CRC, Start of Frame, USB reset and others;
♦ operates at all USB speeds, 480 MB/s, 12 MB/s or 1.5 MB/s;
♦ supports all types of data transfers, including isochronous transfers;
♦ LEDs for quick visual identification of bus status and activity; SMA connections for easy access for high-speed oscilloscope measurements; and
♦ External scope trigger has eight user-selectable trigger conditions that provide bit-level waveform capture.

Dual-port Operation Allows Simultaneous Measurements of Two Devices
The FS4120 has two separate measurement ports. This allows you to independently measure a high-speed device and a full-speed device at the same time, while having to purchase only one analysis probe. FuturePlus Systems knows of no other product that incorporates this capability.

All USB cycles and transaction identifiers are decoded by protocol-sensitive clocking logic and presented to the logic analyzer as separate data bits. These packet identifiers enable users to store all USB traffic, to store only certain packet types, or to store only packets to and from a user-specified function. The FuturePlus transaction inverse assembler simplifies accurate analysis of the captured USB traffic.

Comprehensive USB performance Monitoring
The FS4120, combined with Agilent performance-analysis software, enhanced triggering and cross-domain analysis gives users complete system and USB performance monitoring. Triggering can occur on any address, address and end point, data pattern, CRC error or USB error. Store qualifiers allow the storage of any combination of those criteria.

Price and Availability
The FS4120 analysis probe has a U.S. list price of $7995. It is available from FuturePlus Systems Corporation or Agilent Technologies.

About this Newsletter
The Bus Analyzer is provided free by FuturePlus Systems Corporation to our customers and developers in the computer design industry. FuturePlus Systems Corporation is a Value-Added Business Partner of Agilent Technologies and provides easy-to-use state of the art test equipment to engineers and computer scientists around the globe. We can be reached at:

New Address and Phone Number!
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New Measurement Challenges
Continued from page 1

As a result USB 2.0 was developed to increase data throughput to 480 Mb/s (“high speed”) this is 40 times faster than full speed USB 1.1. A key value of USB 2.0 is the backward-compatible extension of USB 1.1. It uses the same cables, connectors, and software interfaces.

Different data rates, newer devices demand flawless signal integrity

One of the greatest challenges of USB 2.0 is that the hub must process different signaling rates on its ports; any downstream port of a USB 2.0 hub must support any speed USB device. It must match all other devices data rates; low speed, full speed, high-speed, isochronous, and bulk data transfers. All hubs must be able to communicate with seven peripherals, the host controller, and up to five other hubs.

When implementing USB 2.0, the designer must meet stringent signal integrity, current, and data interoperability requirements. The FuturePlus Systems FS4120 USB analysis probe simplifies this process by providing a variety of connectors for easy measurement access. Two separate measurement ports provide dual bus analysis capability.

Logic analyzer, analysis probe combine to trap elusive problems quickly.

Because a USB system is a form of network with a wide variety of interdependencies and speeds, determining the cause of a protocol error or a performance problem can be very difficult.

Combining a logic analyzer and USB bus analysis probe helps the designer solve these problems by providing a protocol-level view of the bus traffic. Powerful protocol triggers, for events like enumeration failure or corrupted data packets, make it the ideal tool for detecting and debugging high-level problems. Deep acquisition memory and powerful real-time triggering provide a quick, reliable method of capturing elusive problems.

Because of the logic analyzer’s deep acquisition memory, the designer can see the events that lead up to a failure (pre-trigger events) and how the device responded to this error condition (post-trigger events).

The FS4120 can uniquely turn off input and/or output NAKs providing more efficient memory use of memory and saving the user from having to wade through information that may not be useful. Many other data storage qualification tools are also available.

Being able to measure time relationships between events, like a request and acknowledge, is an important tool for debugging a wide variety of problems. This measurement methodology is commonly referred to as event timing. Logic analyzers can provide high-resolution event timing with accuracy of 4 ns.

If accuracy greater than 4 ns is needed, or if true asynchronous timing is required, the FS4120 offers flexible oscilloscope triggering on the D+ and D- lines. These connections are provided on the FS4120.

Get the whole picture with cross-bus analysis

Another key test-and-debug technique is cross-bus analysis.

To determine the root cause of a problem it is often necessary to simultaneously and separately measure the input and output of a hub or hubs, or to observe the interaction between the USB bus, PCI bus, and PC memory system. Logic analyzers provide the capability to trigger on one bus and view the activity of a variety of other bus, with all of the data time-correlated and presented on a single display.

Use a logic analyzer for faster, more efficient acquisition of massive data.

Logic analyzers substantially reduce debug time due to their efficiency in displaying data. Capturing and displaying 32 MB on a PC takes a tremendous amount of time. Processing and displaying all of the data takes even longer. This problem is compounded when multiple buses are analyzed because the data being analyzed now could be 64MB or even 128MB. Unlike a PC, logic analyzers are designed specifically to deal efficiently with huge amounts of data and use techniques such as “demand driven data analysis” providing the user with a fast presentation of the information required.

USB 2.0 is a fast, reliable bus architecture that improves the usefulness and capabilities of the PC world. However, it is not a slow, simple digital bus: It is complex and sophisticated, and it requires designers to exercise their skill and talent. By following the guidelines and advice set forth by the USB-IF, and by using tools designed for the high-speed analog/digital world, you can develop reliable USB 2.0 products and quickly bring them to the marketplace. §