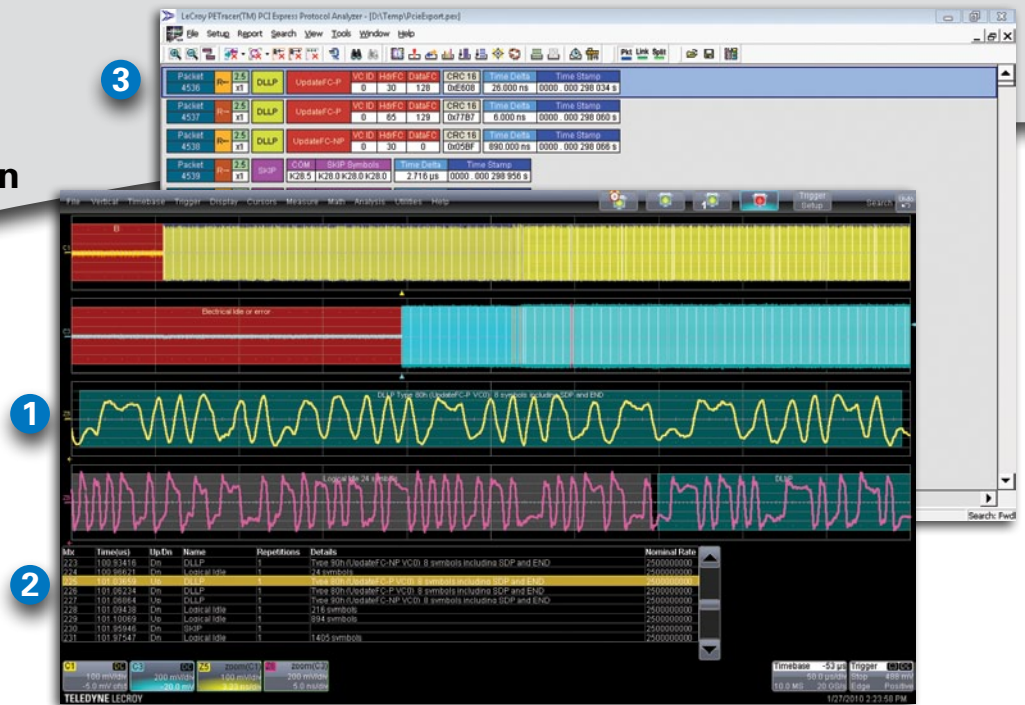


# ProtoSync™

## Decode Annotation and Protocol Analyzer Software Synchronization

### Features and Benefits

- Simultaneous physical layer signal, data link layer decode annotation, and full transaction layer protocol/BitTracer™ views
- Simultaneous “Zooms of all information”
- Compatible with:
  - PCI Express 1.0a, 1.1, 2.0 and 3.0
  - USB 1.x, 2.0, 3.0
  - USB2 HSIC
  - SATA Revision 1.0, 2.0, 3.0
  - SAS Gen1, 2, 3
  - Fibre Channel 1, 2, 4, 8GFC
- Supports 1 or 4 lanes transmit or receive, or 1 lane transmit+receive
- Ideal for understanding dynamic equalization behaviors, as in PCI Express 3.0 and SAS
- Simplifies debug coordination between physical layer and logic layer design teams
- Provides protocol analyzer view of bus traffic independent of specialized protocol analyzer hardware



ProtoSync links physical layer waveforms (1), decode annotation and table information (2), and full transaction layer protocol analysis (3). Simply touch a decode table entry in the oscilloscope or a packet in the protocol analysis software and all views are automatically synchronized and aligned. Example shown is PCI Express 3.0.

Teledyne Lecroy's ProtoSync option further leverages the supported Teledyne Lecroy decode annotation options installed on the oscilloscope by providing simultaneous views of the complete protocol stack, from physical layer to transaction layer.

### Debug Dynamic Equalization Issues

Dynamic equalization is a link initialization process where training sequences communicate transmitter and receiver parameters to establish a link, such as in PCI Express 3.0 and forthcoming versions of SAS. Debugging dynamic equalization is usually much easier if both analog waveforms and high level protocol packet data are available simultaneously.

### Ideal for Embedded Designs

More mature standards are increasingly becoming embedded in system designs. It is usually simple to connect an oscilloscope to the embedded system, and the debug and validation system engineer is quite familiar with the operation of an oscilloscope. By providing protocol analysis views using physical layer oscilloscope captures as a source, complex problems can be more easily debugged.

### Support on Multiple Oscilloscope Platforms

ProtoSync runs on WaveRunner®, WavePro®, WaveMaster®, and LabMaster® platforms, from 400 MHz to 65 GHz.

# SIMULTANEOUS VIEWS SPEED DEBUG

## Available Configurations

Teledyne LeCroy's decode annotation and ProtoSync options provide you with three ways to view the protocol traffic

- **Basic link and data layer decode annotation over the physical layer waveform (PCIExpress D, USB3bus D, USB2bus D, USB2 HSICbus D, SATAbus D, SASbus D, FCbus D options)**
- **Protocol analyzer transaction layer decode plus basic data link layer decode annotation (ProtoSync option)**
- **Protocol analyzer transaction layer, BitTracer™ logic analyzer view, plus basic data link layer decode annotation (ProtoSync-BT option, available only with PCIebus D)**

## ProtoSync™ Provides Advanced Protocol Analysis Tools Simultaneous with Physical Layer Waveform Displays

The protocol analysis software provided is a viewing, analyzing, and trace printing subset of the software provided with Teledyne LeCroy's PETracer and PETracer Summit (for PCI Express), Teledyne LeCroy's Voyager Protocol Suite (for USB 3.0, 2.0 and 1.x), Teledyne LeCroy's Sierra (for SAS, SATA, and Fibre Channel) hardware protocol analyzer product family. Therefore those already familiar with Teledyne LeCroy protocol analyzers will find it easy to operate and understand, and the synchronization of the oscilloscope and protocol analyzer tools in the oscilloscope will make it easy for hardware signal integrity, systems,

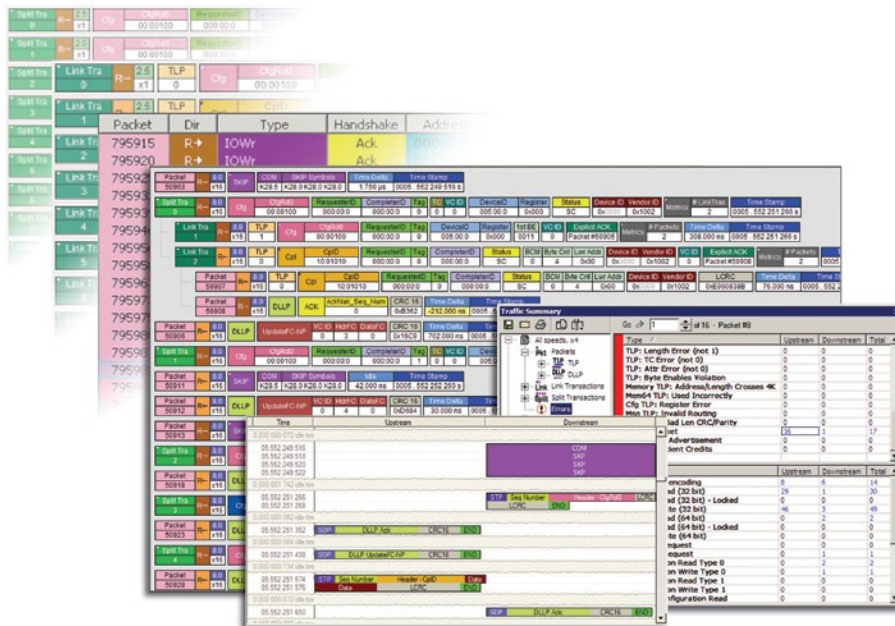
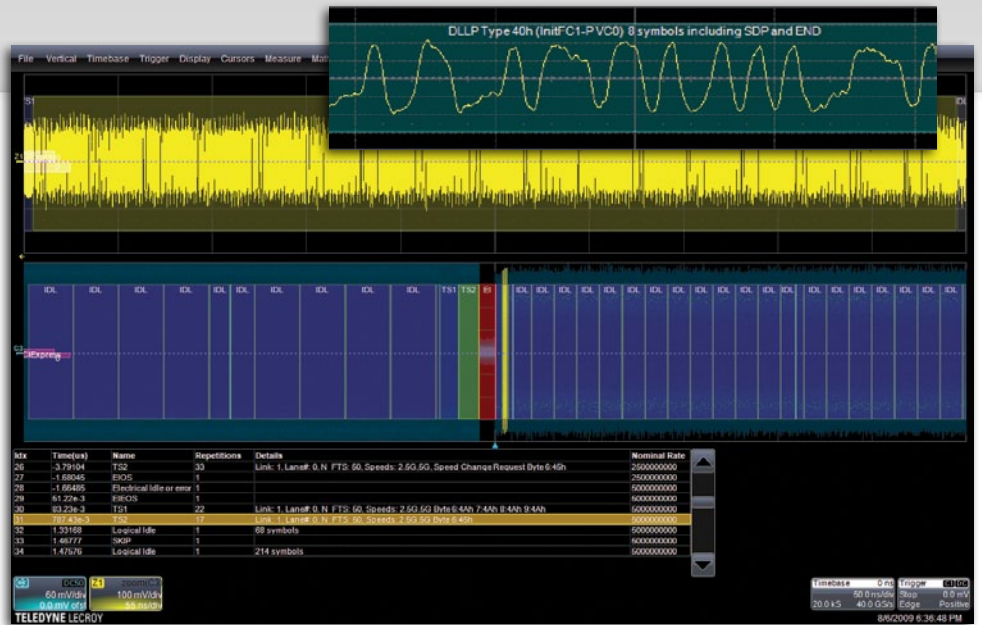
and software/FPGA engineers to work together to debug complex problems. Since the software runs directly on the oscilloscope, all physical layer and protocol views are linked directly to each other at all times—simply touch a packet or a byte in the protocol analysis software and the oscilloscope will zoom to that physical layer waveform, or vice-versa.

In all cases, decoded information is completely synchronized with the physical layer waveform—touch a table entry or packet/byte in either of the software displays, and all information is automatically zoomed and synchronized so it is easy to gather maximum insight quickly.



## Link and Data Layer Decode Annotation

The decode annotation options provide an intuitive, color-coded link and data layer decode overlaid on the waveform with a table display and a convenient “zoom to message” and search capability. Decode information expands as the timebase is adjusted or zoomed.

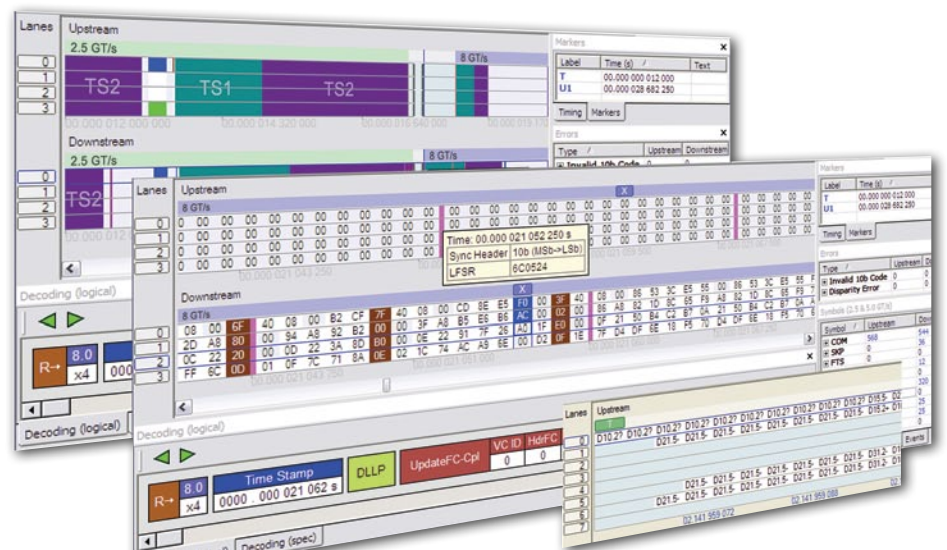


## Protocol View

The protocol view is ideal for showing traffic at the logical level, and permits drill down to the byte level to see traffic across multiple lanes on a common timescale. The software allows you to easily see the low level primitives and data structures. (Note: Decode annotation options must be purchased to enable ProtoSync protocol viewing capability.)

## BitTracer Logic Display

The PE Tracer Summit BitTracer view provides a physical layer traffic view, similar to a logic analyzer, combining the advantages of a protocol analyzer with those of a logic analyzer. Both BitTracer and standard Protocol view can be used simultaneously with the PCIe link layer decode annotation on a physical layer waveform for maximum insight. (ProtoSync-BT available with PCIebus D option only)



# ORDERING INFORMATION

## Ordering Information

Product Description	Product Code
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### ProtoSync Protocol View Options

Decode Annotation and Protocol Analyzer Synchronization Software Option (prefix part number with LM10Zi, LM9Zi, WM8Zi, WPZi, WR6Zi, or WRXi for specific oscilloscopes)	ProtoSync
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### ProtoSync Protocol and BitTracer Logic View Options

Decode Annotation and Protocol Analyzer + BitTracer Synchronization Software Option – works with PCI Express decode option only (prefix part number with LM10Zi, LM9Zi, WM8Zi, WPZi, or WR6Zi for specific oscilloscopes)	ProtoSync-BT
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### Decode Annotation Options

PCI Express Decode Annotation Option for LabMaster 10 Zi	LM10Zi-PCIEbus D
PCI Express Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-PCIEbus D
PCI Express Decode Annotation Option for WaveMaster 8 Zi/Zi-A	WM8Zi-PCIEbus D
PCI Express Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-PCIEbus D
PCI Express Trigger and Decode Annotation Option for WaveRunner 6 Zi	WR6Zi-PCIEbus TD
USB 3.0 Decode Annotation Option for LabMaster 10 Zi	LM10Zi-USB3bus D
USB 3.0 Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-USB3bus D
USB 3.0 Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-USB3bus D
USB 1.x/2.0 Trigger and Decode Annotation Option for LabMaster 10 Zi	LM10Zi-USB2bus TD
USB 1.x/2.0 Trigger and Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-USB2bus TD
USB 1.x/2.0 Decode Annotation Option for WaveMaster 8 Zi/Zi-A	WM8Zi-USB2bus D
USB 1.x/2.0 Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-USB2bus D
USB 1.x/2.0 Trigger and Decode Annotation Option for WaveRunner 6 Zi	WR6Zi-USB2bus TD
USB 1.x/2.0 Decode Annotation Option for WaveRunner Xi/Xi-A	WRXi-USB2bus D
USB2-HSIC Decode Option for LabMaster 10 Zi	LM10Zi-USB2-HSICbus D
USB2-HSIC Decode Option for LabMaster 9 Zi-A	LM9Zi-USB2-HSICbus D
USB2-HSIC Decode Option for WaveRunner 6 Zi	WR6Zi-USB2-HSICbus D
USB2-HSIC Decode Option for WaveRunner Xi/Xi-A	WRXi-USB2-HSICbus D



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Product Description	Product Code
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### Decode Annotation Options (cont'd)

USB2-HSIC Decode Option for WavePro 7 Zi/Zi-A	WPZi-USB2-HSICbus D
USB2-HSIC Decode Option for WaveMaster 8 Zi-A	WM8Zi-USB2-HSICbus D
SATA Decode Annotation Option for LabMaster 10 Zi	LM10Zi-SATABus D
SATA Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-SATABus D
SATA Decode Annotation Option for WaveMaster 8 Zi/Zi-A	WM8Zi-SATABus D
SATA Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-SATABus D
SATA Trigger and Decode Annotation Option for WaveRunner 6 Zi	WR6Zi-SATABus TD
SATA Decode Annotation Option for WaveRunner Xi/Xi-A	WRXi-SATABus D
SAS Decode Annotation Option for LabMaster 10 Zi	LM10Zi-SASbus D
SAS Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-SASbus D
SAS Decode Annotation Option for WaveMaster 8 Zi/Zi-A	WM8Zi-SASbus D
SAS Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-SASbus D
SAS Decode Annotation Option for WaveRunner 6 Zi	WR6Zi-SASbus D
SAS Decode Annotation Option for WaveRunner Xi/Xi-A	WRXi-SASbus D
Fibre Channel Decode Annotation Option for LabMaster 10 Zi	LM10Zi-FCbus D
Fibre Channel Decode Annotation Option for LabMaster 9 Zi-A	LM9Zi-FCbus D
Fibre Channel Decode Annotation Option for WaveMaster 8 Zi/Zi-A	WM8Zi-FCbus D
Fibre Channel Decode Annotation Option for WavePro 7 Zi/Zi-A	WPZi-FCbus D
Fibre Channel Decode Annotation Option for WaveRunner 6 Zi	WR6Zi-FCbus D
Fibre Channel Decode Annotation Option for WaveRunner Xi/Xi-A	WRXi-FCbus D

### Customer Service

Teledyne LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge

**Local sales offices are located throughout the world. Visit our website to find the most convenient location.**