TELEDYNE LECROY
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Summit T3-16
PCI Express Protocol Analyzer
Quick Start

1 Introduction

The Summit T3-16 system is a high-end and comprehensive analysis tool to display and analyze data traffic for PCI Express 3.1 bus specification. The Summit T3-16 can capture up to 16 lanes of traffic and up to 8 GB trace depth with a single unit. The Summit T3-16 can monitor, capture, decode and analyze PCIe protocol with data rates up to 8 GT/s. The portable Summit T3-16 protocol analyzer supports multiple PCIe storage protocols such as SATA Express, NVM Express and SCSI Express.

Use this document for quick installation and setup.

If you experience problems or need more information, see the *Summit T3-16 User Manual* on the Installation DVD or at the Teledyne LeCroy web site.

2 Components

The analyzer package includes the following components:

- Summit T3-16 analyzer system
- AC Power Cable
- USB and Ethernet cables
- PCIe Protocol Suite Software program DVD-ROM
- Quick Start Guide (this document)

Depending on configuration, the package may also include:

- One (for x8 recording) or two (for x16 recording) probe cables
- Slot interposer
- MidBus Probe kit

Please see the *Summit T3-16 User Manual* on the installation DVD for component specifications and further details.

Summit T3-16 Protocol Analyzer

3 Unpacking the Analyzer

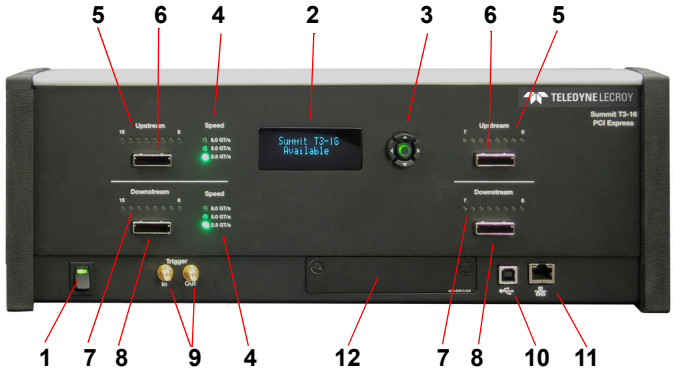
Inspect the received shipping container for any damage. Unpack the container and account for each of the system components listed on the accompanying packing list. Visually inspect each component for absence of damage.

In the event of damage, notify the shipper and Teledyne LeCroy. Retain all shipping materials for shipper's inspection.

4 Environmental Conditions

- Temperature: Operating 32° F to 122° F (0° C to 50° C)
- Temperature: Non-Operating 14° F to 176° F (-10° C to 80° C)
- Humidity: Operating 10% to 90% RH (non-condensing)

5 Front Panel Description



The Analyzer has the following features on the front:

[1] Power Switch (black): 1 = On and 0 = Off.

[2] LCD Menus: Allows you to configure Summit T3-16 and view status.

[3] Navigation Buttons: Navigate through the LCD menu.

[4] Speed LEDs: Indicate speed setting the analyzer is using for each traffic direction.

[5] Upstream [15:0] LEDs: Lane activity for upstream lanes. OFF for electrical idle, orange for activity with errors detected, green for normal operation.

[6] Upstream [15:8] and Upstream [7:0] connectors: Connection to the probe for the capture of upstream direction of the link.

[7] Downstream [15:0] LEDs: Lane activity for downstream lanes. OFF for electrical idle, orange for activity with errors detected, green for normal operation.

[8] Downstream [15:8] and Downstream [7:0] connectors: Connection to the probe for the capture of downstream direction of the link.

[9] Trigger IN and Out: Provide external trigger capabilities. You can configure Summit T3 to trigger external equipment using Trigger Out. You can use Trigger In to trigger the Analyzer from another device.

[10] USB Type B Host Machine Connector: To connect the Analyzer to the host machine using a USB connection.

[11] Ethernet Port: 1 GIGE Connectivity allows connection to the analyzer through an Ethernet network.

[12] Expansion Slot: For CATC Sync Expansion Card to allow multiple Teledyne LeCroy analyzers to send synchronization and control messages to one another.

LCD Menus

The Summit T3-16 has a front LCD panel that displays the computer name that is currently connected to the system, the unit serial number, and the current network configuration. If no computer is connected to the unit, the LCD panel displays **Available.**

The LCD panel also allows you to configure network settings for the analyzer. Use the **Up** and **Down** keypad buttons to cycle through the menu. Press the **Center** button to select.

Setup Static or Dynamic IP Mode

1. Use the **Up** and **Down** buttons to navigate to the **Set IP Configuration** menu.
2. Press the **Center** button to start the setup.
3. Use the **Up** and **Down** buttons to select **Static** or **Dynamic** IP configuration.
4. If you select the Static IP network configuration, you must specify the IP address, Subnet mask, and Gateway. Use the **Up** and **Down** buttons to navigate to the IP address, Subnet mask, or Gateway.
5. Press the **Center** button to enter edit mode.
6. In edit mode, use the **Left** and **Right** buttons to move the blinking cursor to any digit.
7. Use the **Up** and **Down** buttons to modify the digit.
8. After finishing modifications to the IP address, Subnet mask, or Gateway, press the **Center** button to return to the menu.
9. After you specify the IP address, Subnet mask, and Gateway, use the **Up** and **Down** buttons to navigate to the **Accept and Reboot** menu item. Press the **Center** button to apply the new settings and restart the analyzer.
   Note: To cancel your modifications, select the **Cancel Changes** menu item.

Warning! Do not open the enclosure. No operator serviceable parts are inside.

6 Rear Panel Description

The rear panel of the Analyzer has:

Wide-range AC Connector Module

- Power socket
- Enclosed 5.0 A 250 V fuse

Expansion Slot: Future use

Warning! For continued protection against fire, replace fuse only with the type and rating specified above.

7 Interposers and Probes

Gen3 Slot Interposer

The Gen3 Slot Interposer is designed for use with the Summit T3-16 Analyzer and supports lane widths from x1 to x16 at data rates of 2.5 GT/s (Gen1), 5.0 GT/s (Gen2), or 8.0 GT/s (Gen3). A separate interposer is used for each lane width that you would like to probe. Lane reducers should NOT be used with the Gen3 Slot Interposer. For lane widths up to x8, one Analyzer Y-cable is required. For x16 applications, two Analyzer Y-cables are required.

Warning! Interposer has static-sensitive components. Handle only at static-safe work stations.

Gen3 MidBus Probe

The Gen3 MidBus Probe is designed for use with the Summit T3-16 Analyzer and supports lane widths from x1 to x16 at data rates of 2.5 GT/s (Gen1), 5.0 GT/s (Gen2), or 8.0 GT/s (Gen3).

8 Installing the Software

The PCIe Protocol Suite software operates all of Teledyne LeCroy's PCI Express Protocol Analyzer and Exerciser products and should be installed on a Microsoft® Windows®-based host machine. You need to install the PCIe Protocol Suite software on the host machine before attaching the Analyzer to the system. The minimum requirements for the host machine are:

- Windows 8 (x86 and x64), Windows Server 2012 (x64), Windows 7 (x86 and x64), Windows Server 2008R2 (x64), Windows XP (x86).
- The latest Service Pack available for the Windows OS in use is required.
- It is recommended that you use one of the supported 64-bit Windows versions listed above as they allow using more RAM than the 32-bit ones.
- This software application may use up to 4GB of the RAM in the host machine. For improved performance of the software, it is recommended that 16GB of RAM is installed on the host machine. Memory as little as 2GB would still allow the software to function, but would limit its performance and user experience.2 GB of RAM
- Storage space of 1GB is required for installing the PCIe Protocol Suite software on the host machine.
- Additional storage space is needed for the operation of the software application and for storing recorded data in files.
- Please remember that storing large captured traces can result in multiple gigabytes of file sizes and can quickly fill your available storage space.In general, the higher the performance of the host machine, the better user experience you get.
- To take full advantage of the rich visualization and analysis of Teledyne LeCroy software it is recommended that the display is set to at least 1050 lines of vertical resolution with at least 24-bit color depth.
- The minimum requirement for the display is a resolution of 1024x768 with at least 16-bit color depth.
- It is recommended that a Gigabit (1000Mbps) Ethernet or a USB3.0 link is used for the connection with the Summit analyzers.
- At minimum the host machine should have either a 100/1000Mbps Ethernet connection to the network or a USB2.0 port.

Please refer to the **Readme** notes and *Summit T3-16 User Manual* for recommended configurations and additional information.

User manuals for your Teledyne LeCroy PCI Express products can be found in **Start > All Programs > LeCroy > PCIe Protocol Suite > PCIe Protocol Suite Documents**.

To install the software, follow the steps below:

1. Insert the DVD into the DVD-ROM drive of the host machine that will control the Analyzer. The installation window displays links to software installation, user manuals, application notes, and data sheets.
2. Select **Install PCIe Protocol Suite** and follow the on-screen instructions. The PCIe Protocol Suite software installs automatically on the host machine's hard disk. During installation, all necessary USB drivers will be installed.
3. To start the application, launch the PCIe Protocol Suite program from the Start menu: **Start > All Programs > LeCroy > PCIe Protocol Suite > PCIe Protocol Suite**

Software installation can also be downloaded from the Teledyne LeCroy website.

9 Setting Up and Connecting the Summit T3-16 Analyzer

You can connect the Analyzer to the host machine using USB or Ethernet.

Using an Ethernet Connection

To set up the Analyzer using an Ethernet connection:

1. Install PCIe Protocol Suite software on the host machine.
2. Connect the Analyzer to a 100-volt to 240-volt, 50 Hz to 60 Hz, 120 W power outlet using the provided power cord.
3. Connect the Ethernet cable between the Ethernet port on the Analyzer and a Ethernet port in the local network.
4. Turn on the power switch on the front of the analyzer.

Note 1: No driver installation is needed for Summit T3-16 to operate over a network.

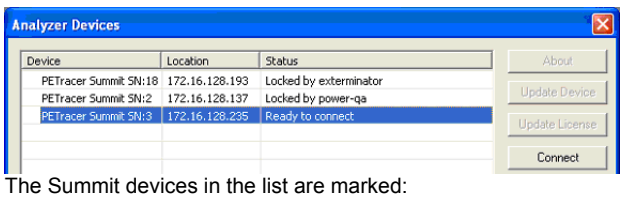
Note 2: At power-on, the Analyzer initializes and performs a self-diagnostic. The results are reflected by messages on the Summit T3-16 LCD display. If the LCD display indicates failure, call Teledyne LeCroy Customer Support for assistance.

Note 3: Summit T3 is configured at the factory to use dynamic IP setting and will get all required network parameters from the DHCP server on your network. If the DHCP server is not available, or to connect Summit T3 directly to the host machine, you can reconfigure the network settings of Summit T3 using the menus in the LCD display on the front of the analyzer (see the "LCD Menus" part of section 4 of this document).

Connecting to Summit T3-16 in the software

Start the PCIe Protocol Suite software and perform the following procedure to connect to a Summit T3-16 analyzer over the network.

1. Select the **Setup > All connected devices…** menu in the PCIe Protocol Suite application to display the Analyzer Devices dialog.



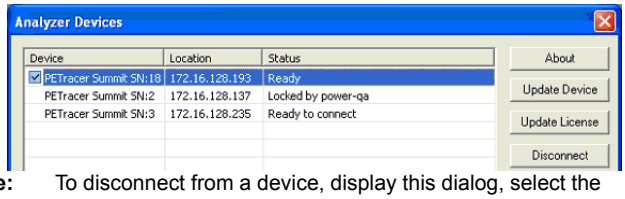
The Summit devices in the list are marked:

- **Locked**: Some other client on the network is already connected to that device
- **Ready to connect**: Available for connection

2. Select your Summit T3 device in the list and press the **Connect** button to execute the connection procedure. After the connection is established, the application displays the Connection Properties dialog.
3. Select an option:
   - **Automatically connect to the device**: When the application is started or when the named device appears on the network while the PCIe Protocol Suite application is running on this computer, the PCIe Protocol Suite application will try to connect to the named device.
   - **Ask if I want to connect to the device**: When the application is started or when the named device appears on the network while the PCIe Protocol Suite application is running on this computer, the PCIe Protocol Suite application will display a message box allowing you to connect to the named device.
   - **Take no action**: When you start the application or when the named device appears on the network while the PCIe Protocol Suite application is running on this computer, you must connect manually to use the named device.

Note: When you close the application on this computer (or you perform manual disconnect), the application disconnects from the device.

4. Press **OK** in the Connection Properties dialog. After you finish the connect procedure, the Summit T3-16 to which you have connected is marked as **Ready** and you can use it for recording.



Note: To disconnect from a device, display this dialog, select the device, and click the **Disconnect** button.

Note 2: Summit T3 will not appear in the Analyzer Device dialog if it is connected on a different Subnet on your local network. You can connect to it on the Subnet by specifying its IP address in the Add Device dialog.

Using a USB Connection

To set up the Analyzer using a USB connection:

1. Install PCIe Protocol Suite software on the host machine.
2. Connect the Analyzer to a 100-volt to 240-volt, 50 Hz to 60 Hz, 120 W power outlet using the provided power cord.
3. Connect the USB port to a USB port on the host machine using a USB cable.
4. Turn on the power switch on the front of the analyzer.

Note: At power-on, the Analyzer initializes and performs a self-diagnostic. The results are reflected by messages on the Summit T3-16 LCD display. If the LCD display indicates failure, call Teledyne LeCroy Customer Support for assistance.

5. Summit T3 will be recognized by the host machine as a USB device.

   Follow the Microsoft® Windows® on-screen Plug-and-Play instructions for the automatic installation of the Analyzer as a USB device on your analyzing host machine. (The required USB drivers are included on the Installation DVD and were installed on your system when you installed the software.) Click **Finish** when you see the message that says "Windows has finished installing the software that your new hardware requires" and the file has been installed in your host machine.

8. Start the PCIe Protocol Suite software, so you can start working with Summit T3.

10 Making Your First Recording

Connect Summit T3 to the system under test using an interposer or probe, and then configure the Recording Options. You can then test the Analyzer by creating a short snapshot recording.

Connect Summit T3 to System under Test using an Interposer or Probe

For a slot interposer, do the following:

1. Insert the slot interposer into a PCI Express slot that you want to monitor.
2. Insert the PCI Express device into the PCIe connector on top of the interposer.
3. Connect Summit T3 to the interposer with Analyzer Y cables. Connect cable Side A to the Upstream port of the Analyzer, and connect cable Side B to the Downstream port. **Note**: If you are using x16 interposer, the lower connector carries lanes 0 to 7, and the upper connector carries lanes 8 to 15.
4. Connect power to the interposer using the provided 12-V power adapter.

For Mid Bus Probe or other types of probes and interposers, please see the *Summit T3-16 User Manual*.

Configure Recording Options

1. From the **Setup** menu, select **Recording Options**.
2. Select the **General** tab and then choose **Summit T3** as the Analyzer type.
3. In the **Link** section, specify the lane width of the PCI Express link to be analyzed. The rest of the settings in this section can be left at the factory defaults for most PCI Express systems.
4. For multi-lane PCI Express links, the Analyzer needs to observe link training to record link traffic correctly.
5. Click **OK** at the bottom of the Recording Options dialog box to apply the Analyzer recording settings specified.

Start Recording

1. Start a recording session by clicking the **Record**  button in the toolbar. Recording is tracked and reported on an activity meter in the status bar.
2. After the recording buffer fills, uploading starts automatically. PCI Express traffic is saved to the hard drive as the file specified in the recording options, and this file is opened in the application for you to view the traffic.

Note: You can interrupt a session by pressing the **Stop** button. If Recording is finished and Upload has started but has not finished, a message box appears. You can:

- Continue uploading.
- Abort the upload and flush the data.
- Abort the upload and preserve all the previously saved data.

Teledyne LeCroy Customer Support

Online Download

Periodically check the Teledyne LeCroy Protocol Solutions Group web site for software updates and other support related to this product. Software updates are available to users with a current Maintenance Agreement.

Mail: 3385 Scott Blvd., Santa Clara, CA 95054-3115
Web: teledynelecroy.com/Support/SoftwareDownload/
E-mail: psgsupport@teledynelecroy.com
Tel: (800) 909-7112 (USA and Canada)
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Part Number: 923221-00 Rev B