

Streamline Series VNA & PC setup procedure and its Troubleshooting tips

Keysight Technologies
30-Mar-2026

Streamline Series VNA A model:

P5000A,P5001A,P5002A,P5003A,P5004A,P5005A,P5006A,P5007A,P5008A
P5020A,P5021A,P5022A,P5023A,P5024A,P5025A,P5026A,P5027A,P5028A
P9370A,P9371A,P9372A,P9373A,P9374A,P9375A

Streamline Series VNA B model:

P5000B,P5001B,P5002B,P5003B,P5004B,P5005B,P5006B,P5007B,P5008B
P5020B,P5021B,P5022B,P5023B,P5024B,P5025B,P5026B,P5027B,P5028B
P9370B,P9371B,P9372B,P9373B,P9374B,P9375B,P9377B,P9382B,P9384B
P5027M, P5028M

Streamline Series VNA and PC setup overview



01

Select Streamline Series VNA compatible PC



02

Update PC configurations



03

Connect Streamline Series VNA with PC



04

Troubleshooting tips

1. Select PC

When using a PC that was used for another purpose, we recommend to perform system recovery before setting up PC configurations for Streamline Series VNA. System Recovery prevents conflicts between the registries/drivers which were previously configured and the ones that will be configured for the Streamline Series VNA.




1. Select PC

PC Requirements for Streamline Series VNA control

Go to Table 49 of [Streamline series VNA A model Data Sheet](#) or Table 53 of [Streamline series VNA B model Data Sheet](#) or Table 26 of Streamline series VNA B P5027M/P5028M^(*1) Data Sheet ^(*2) for External PC System Requirements.

Notes of PC specifications for Streamline Series VNA B model:

1. Connections via USB2.0 cable or USB3.x cable are not supported. Connection via USB-to-Thunderbolt adapter is not supported.
2. Desktop PCs usually don't have adequate Thunderbolt 3+ support by default. When configuring a Desktop PC on the manufacturer's website, you must select an option to include a PCIe Thunderbolt 3+ card installed in the PC. It is best to use one which comes from the original manufacturer of the whole PC, since a third-party Thunderbolt 3+ PCIe card might not work. Contact PC maker about valid Thunderbolt 3+ PCIe card, if needed. See [Thunderbolt PC and Streamline Series VNA B model compatibility list](#) in Appendix.
3. If Thunderbolt 3+ PC cannot work with Streamline Series VNA B model, contact Keysight. For more details, see [Contact Keysight - issue sharing](#) in Appendix.

 KEYSIGHT ^(*1) External PC requirements are identical to VNA B. P502xM leverages VNA B platform.
^(*2) Contact Keysight for data sheet.

2. Update current PC configurations

It is important to use the latest version of OS, BIOS, software and drivers that your Software vendor or PC maker provides.

Most PC makers provide a support assistant tool. We recommend using that tool to install the latest version of the application software and drivers.

2-1 Windows Update

2-2 BIOS

2-3 [Thunderbolt™ control center app and Thunderbolt™ drivers](#)
[for Streamline Series VNA B model only]

2-4 Keysight IO Libraries Suite

2-5 Keysight VNA firmware

2-6 Keysight License Manager 5

2-7 [Windows Registry](#) [for Streamline Series VNA B model only]

2-8 Tips on software installation/ uninstallation sequence.

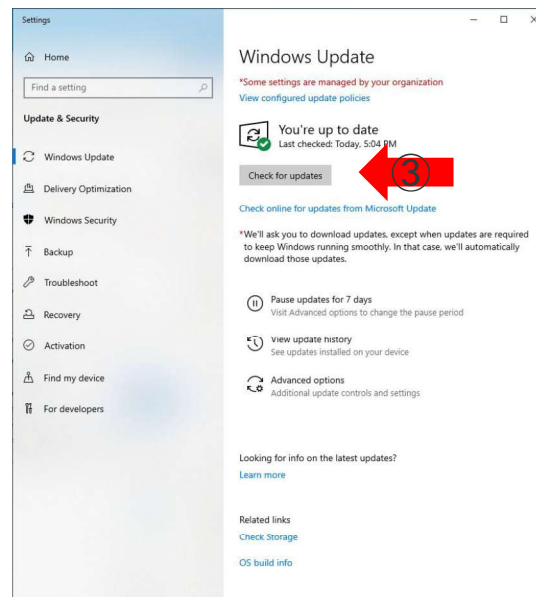
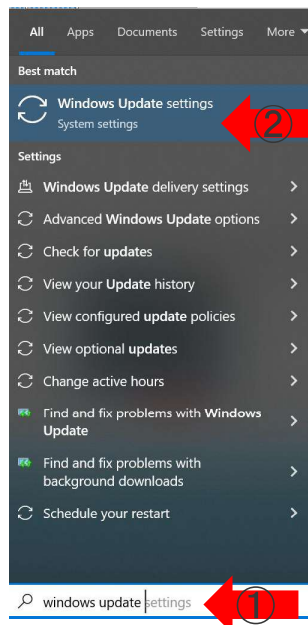


2. Update current PC configurations

2-1. Windows Update

Launch Windows Update and check for updates

- ① Enter Windows Update at Windows Search
- ② Select Windows Update settings
- ③ Select Check for updates
then download and install the updates



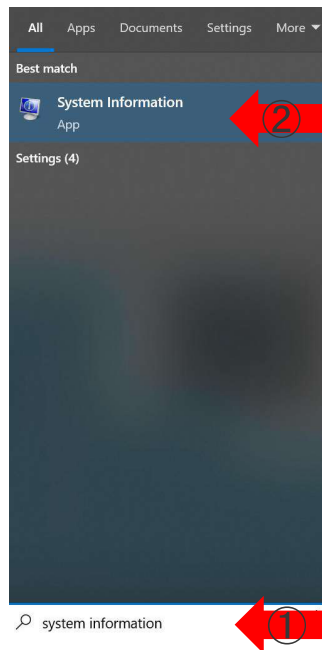
2. Update current PC configurations

2-2. BIOS

Step-1: Launch System Information

- ① Enter System Information at Windows Search
- ② Select System Information

[result] the current BIOS version/Date is shown in System Information.



A screenshot of the 'System Information' application window. The window title is 'System Information' and it has a menu bar with 'File', 'Edit', 'View', and 'Help'. The left sidebar shows a tree view with 'System Summary' expanded, containing 'Hardware Resources', 'Components', and 'Software Environment'. The main pane displays a table of system information. The 'BIOS Version/Date' row is highlighted in blue.

| Item | Value |
|-----------------------|---|
| OS Name | Microsoft Windows 10 Enterprise |
| Version | 10.0.19044 Build 19044 |
| Other OS Description | Not Available |
| OS Manufacturer | Microsoft Corporation |
| System Name | XXXXXXXXXX |
| System Manufacturer | HP |
| System Model | HP ZBook Power 15.6 inch G9 Mobile Workstation PC |
| System Type | x64-based PC |
| System SKU | 6W9L7UC#ABJ |
| Processor | 12th Gen Intel(R) Core(TM) i7-12800H, 2400 Mhz, 14 Core(s), 20 Logical Processor(s) |
| BIOS Version/Date | HP U97 Ver. 01.01.11, 5/24/2022 |
| SMBIOS Version | 3.4 |
| Embedded Controll... | 17.53 |
| BIOS Mode | UEFI |
| BaseBoard Manufact... | HP |
| BaseBoard Product | 89C0 |

2. Update current PC configurations

2-2. BIOS

Step-2: Visit your PC maker's Support page (See [PC makers' driver download page](#) in appendix) and check if installed PC BIOS (UEFI) is latest.

Step-3: If not, download and install the latest version.

2. Update current PC configurations

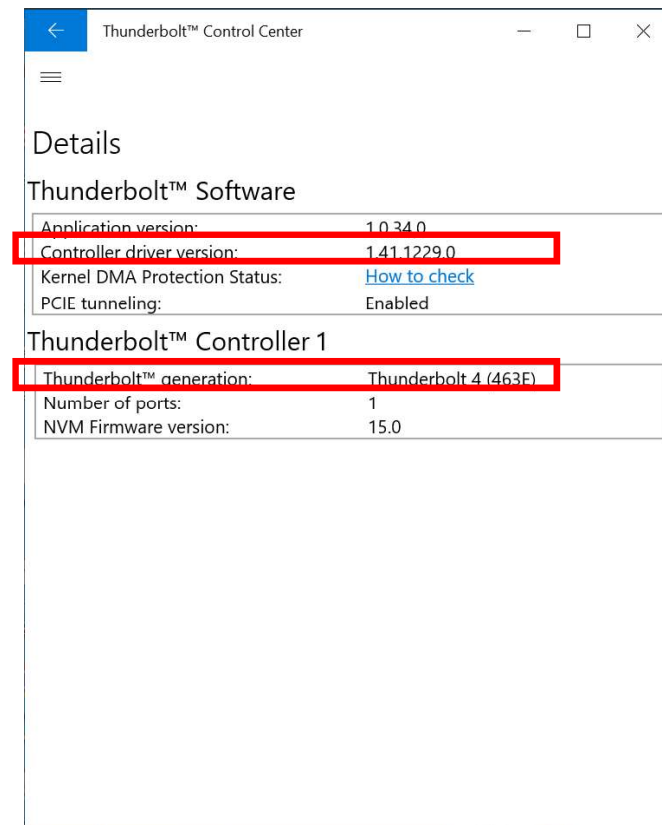
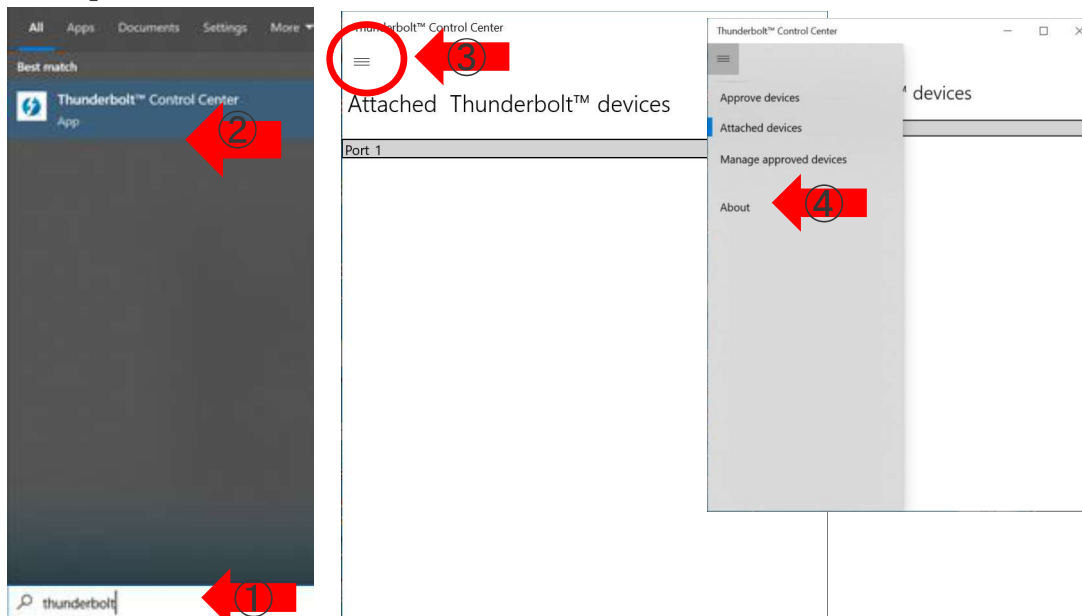
2-3. Thunderbolt generation and driver version [for Streamline Series VNA B model only]

Step-1: Launch Thunderbolt Control Center and check Thunderbolt generation and driver version



- ① Enter Thunderbolt at Windows Search
- ② Select Thunderbolt Control Center
- ③ Select hamburger menu
- ④ Select About

[result] Thunderbolt Generation and driver version are shown.



2. Update current PC configurations

2-3. Thunderbolt Software and Thunderbolt drivers [for Streamline Series VNA B model only]



Step-2: Visit your PC maker's Support page (See [PC makers' driver download page](#) in appendix) and check if current Thunderbolt Software and Thunderbolt drivers are up to date.

Step-3: If not, download and install the latest version.

If Thunderbolt Software is not installed, go to [Troubleshooting tips 2-3-1](#).

Step-4: If PCIe tunneling is Disabled in Detail screen, go to [Troubleshooting tips 2-3-2](#).

2. Update current PC configurations

2-4. Keysight IO Libraries Suite



Step-1: Launch 'Programs and Features' and check IO Library Suites version

- ① Enter Control Panel at Windows Search
- ② Select Control Panel
- ③ Select Programs
- ④ Select Programs and Features

The image shows a sequence of four screenshots illustrating the steps to reach 'Programs and Features' in Windows. 1. Windows Search results for 'control panel' with 'Control Panel' selected. 2. The Control Panel window showing various system settings categories, with 'Programs' selected. 3. The 'Programs' window showing 'Programs and Features' selected. 4. The 'Programs and Features' window showing the 'Uninstall a program' tab. Red arrows and circled numbers 1-4 indicate the navigation path. The Keysight logo is in the bottom left corner.

control panel

Control Panel

Best match

Control Panel

App

Apps

NVIDIA Control Panel

Settings

System

Taskbar notification area

See if you have a 32-bit or 64-bit version of Windows

Adjust your computer's settings

System and Security

Network and Internet

Hardware and Sound

Programs

User Accounts

Appearance and Personalization

Clock and Region

Ease of Access

Programs

Control Panel Home

System and Security

Network and Internet

Hardware and Sound

Programs

User Accounts

Appearance and Personalization

Clock and Region

Ease of Access

Programs and Features

Uninstall a program

Default Programs

2. Update current PC configurations

2-4. Keysight IO Libraries Suite



[result] the versions of the programs are shown in Programs and Features

Control Panel Home

Uninstall or change a program

To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.

View installed updates

Turn Windows features on or off

Install a program from the network

| Name | Publisher | Installed On | Size | Version |
|--|-----------------------------|--------------|---------|-----------------|
| HP Notifications | HP | 7/6/2022 | 18.7 MB | 1.1.28.1 |
| ICS | HP Inc. | 6/11/2022 | 182 MB | 3.0.16.0 |
| IVI Shared Components 3.0.0 | IVI Foundation | 8/16/2022 | 42.7 MB | 3.0.2828.0 |
| IVI.NET Shared Components 1.4.1 for .NET 2.0 | IVI Foundation | 8/16/2022 | 5.22 MB | 1.41.49153 |
| Jabra XPRESS | GN Netcom A/S | 7/21/2022 | 81.2 MB | 100.0.5208 |
| Keysight BenchVue Troubleshooting Wizard | Keysight Technologies | 8/10/2022 | 3.02 MB | 2020 |
| Keysight CA Certificates | Agilent | 7/20/2022 | 69.0 KB | 3.0 |
| Keysight CalPod API | Keysight Technologies, Inc. | 8/9/2022 | 37.1 MB | 03.01.006.0004 |
| Keysight Communications Fabric 2.2 | Keysight Technologies | 7/22/2022 | 281 KB | 2.2.22112.11724 |
| Keysight Device Measurement eXpert Lite | Keysight Technologies, Inc | 7/23/2022 | 32.8 MB | 01.03.003.0003 |
| Keysight Exchange CA Certificates | Agilent | 7/21/2022 | 69.0 KB | 1.0 |
| Keysight Exchange CA Certificates | Agilent | 7/20/2022 | 73.0 KB | 2.0 |
| Keysight Host Processor Platform | Keysight Technologies | 8/9/2022 | 34.3 MB | 5.4.28008.10818 |
| Keysight Ingot OF Utilities | Keysight Technologies, Inc. | 7/28/2022 | 66.2 MB | 01.02.002.0034 |
| Keysight IO Libraries Suite 2022 Update 2 | Keysight Technologies | 8/16/2022 | 203 MB | 18.2.28229.2 |
| Keysight License Manager | Keysight Technologies | 7/22/2022 | 35.2 MB | 3.4.1.1309 |
| Keysight License Manager 6 | Keysight Technologies | 7/22/2022 | 53.3 MB | 6.0.3 |
| Keysight License Service | Keysight Technologies | 7/23/2022 | 19.8 MB | 5.3.2.19 |
| Keysight Secure Instrument Communication Expert 2022 | Keysight Technologies | 8/10/2022 | 520 MB | 1.1.19 |
| Keysight VNA Series Network Analyzer | Keysight Technologies, Inc. | 8/17/2022 | 911 MB | 15.75.19.58.0 |
| Keysight VNA Uncertainty (X64) | Keysight Technologies, Inc. | 7/24/2022 | 16.7 MB | 05.00.018.0000 |
| KtPusbChassis IVI.NET Driver 1.1.9 | Keysight Technologies | 8/17/2022 | 11.6 MB | 1.1.9.0 |
| KtPusbChassis IVI-C Driver 1.1.9 | Keysight Technologies | 8/17/2022 | 103 MB | 1.1.9.0 |

2. Update current PC configurations

2-4. Keysight IO Libraries Suite



Step-2: Visit www.keysight.com/find/iosuite and check if the current version is latest or not.

Step-3: If not, uninstall IOLS and perform deep clean.

For more details, go to [Keysight Uninstall IOLS and Deep Clean](#)

Step-4: Download and install the latest version.

Do not use Keysight IO Libraries version: 2024 Update1, Build 21.0.47, release date: 2024-09-03.

- ① Select the download button
- ② Run the downloaded installer with administrator privilege
- ③ After the installation is completed successfully, re-boot the PC
- ④ If the installation is not completed successfully, go to [Troubleshooting tips 2-4](#).

Notes on .NET Framework 3.5/2.0 and known issues:

Keysight IO Libraries Suite 2021 or later does not install .NET Framework.

If .NET Framework is needed, go to [Troubleshooting tips 2-4-4](#).

Notes on Windows 11 PC:

Install IO Libraries Suite 2023 (18.3.29324.3) or newer.

Earlier revisions will **not** be compatible with P50xxB/P93xxB/P502xM firmware on Windows 11.

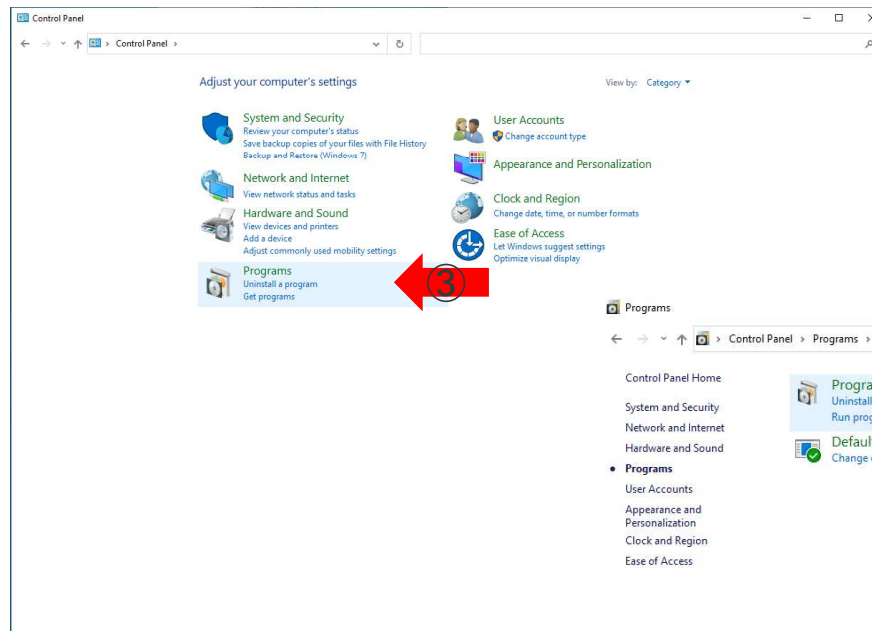
2. Update current PC configurations

2-5. Keysight VNA firmware



Step-1: Launch 'Programs and Features' and check VNA firmware version

- ① Enter Control Panel at Windows Search
- ② Select Control Panel
- ③ Select Programs
- ④ Select Programs and Features



2. Update current PC configurations

2-5. Keysight VNA firmware



[result] the versions of the programs are shown in Programs and Features

Control Panel Home

Uninstall or change a program

To uninstall a program, select it from the list and then click Uninstall, Change, or Repair.

View installed updates

Turn Windows features on or off

Install a program from the network

| Name | Publisher | Installed On | Size | Version |
|--|-----------------------------|--------------|---------|-----------------|
| HP Notifications | HP | 7/6/2022 | 18.7 MB | 1.1.28.1 |
| ICS | HP Inc. | 6/11/2022 | 182 MB | 3.0.16.0 |
| IVI Shared Components 3.0.0 | IVI Foundation | 8/16/2022 | 42.7 MB | 3.0.2828.0 |
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| Keysight BenchVue Troubleshooting Wizard | Keysight Technologies | 8/10/2022 | 3.02 MB | 2020 |
| Keysight CA Certificates | Agilent | 7/20/2022 | 69.0 KB | 3.0 |
| Keysight CalPod API | Keysight Technologies, Inc. | 8/9/2022 | 37.1 MB | 03.01.006.0004 |
| Keysight Communications Fabric 2.2 | Keysight Technologies | 7/22/2022 | 281 KB | 2.2.22112.11724 |
| Keysight Device Measurement eXpert Lite | Keysight Technologies, Inc | 7/23/2022 | 32.8 MB | 01.03.003.0003 |
| Keysight Exchange CA Certificates | Agilent | 7/21/2022 | 69.0 KB | 1.0 |
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| Keysight Ingot OF Utilities | Keysight Technologies, Inc. | 7/28/2022 | 66.2 MB | 01.02.002.0034 |
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| Keysight Secure Instrument Communication Expert 2022 | Keysight Technologies | 8/10/2022 | 520 MB | 1.1.19 |
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| KtPusbChassis IVI-C Driver 1.1.9 | Keysight Technologies | 8/17/2022 | 103 MB | 1.1.9.0 |

2. Update current PC configurations

2-5. Keysight VNA firmware



Step-2: Visit <https://www.Keysight.com/find/pxiusbvna-firmware> and check if the installed version is **A.19.30.21** or later.

Step-3: If not, download and install **A.19.30.21** or later.

For Windows 11 host PC, download and install **A.17.60.13** or later.

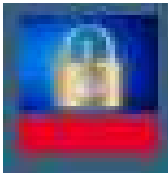
For P5027M & P5028M, download and install **A.19.30.08** or later.

Recommended FW: **A.19.30.21** or later.

- ① Select the download button
- ② Run the downloaded installer with administrator privilege
- ③ After the installation is completed successfully, re-boot the PC
- ④ If the installation did not complete successfully, go to [Troubleshooting tips 2-5](#).

2. Update current PC configurations

2-6. Keysight License Manager



If Keysight License Manager is not installed on your PC, go to [Keysight License Manager 5 Download | Keysight](#) and

- ① Select the download button
- ② Run the downloaded installer with administrator privilege
- ③ After the installation is completed successfully, re-boot the PC
- ④ If the installation does not complete successfully, go to [Troubleshooting tips 2-6](#)

Note: For floating licenses on a local server, [KLM6](#) or [PLM7](#) is required to install.
For every other type of license, KLM5 is used.

KLM/ PLM is included in VNA firmware installer.

PLM 7 is included in VNA FW A.19.00.09 and newer revisions, superseding KLM 6.

2-7. Shutdown your PC once the installations are all done

2. Update current PC configurations

2-7. Windows Registry [for Streamline Series VNA B model only]

When your Streamline Series VNA B model is 2 modules model, some PCs which shows Code12 error in Device Manager do not recognize one of two VNA modules. If Code12 error is shown, editing Windows Registry is required. For more details, go to [Troubleshooting Tips #3-6-1](#).

VNA B model may show Code31 error in Device Manager. The device is not working properly because Windows cannot load the drivers required for this device. For more details, go to [Troubleshooting Tips #3-6-8](#).

2-8. Shutdown your PC once the installations are all done

2. Update current PC configurations

2-8. Tips on software installation/ uninstallation sequence

If issue persists,

① Remove all programs listed below (except the Thunderbolt software).

In case IOLS libraries fail to be uninstalled, to perform clean uninstallation of IO Libraries, refer to [Troubleshooting Tips #2-4](#).

② Install Keysight IO Libraries Suite first.

③ Reboot the PC.

④ Install VNA firmware.

⑤ Reboot the PC.

Proven latest versions of Key program (as of 30-Mar-2026)

| Publisher | Program | Version |
|-----------------------|--|-----------------|
| Keysight Technologies | Communication Fabric 2.2 | 2.2.22112.11724 |
| Keysight Technologies | Host Processor Platform | 5.5.2.30000 |
| Keysight Technologies | IO Libraries Suite 2025 | 21.1.174 |
| Keysight Technologies | KtPUsbChassis IVI.NET Driver 1.1.11 | 1.1.11.0 |
| Keysight Technologies | KtPUsbChassis IVI-C Driver 1.1.11 | 1.1.11.0 |
| Keysight Technologies | License Manager (Keysight License Manager 5) | 5.7.0.732 |
| Keysight Technologies | License Manager (PathWave License Manager) | 7.4.1 |
| Keysight Technologies | License Service | 5.7.0.732 |
| Keysight Technologies | VNA Series Network Analyzer firmware | 19.30.21.153.0 |
| Intel® Corporation | Thunderbolt™ Software | 1.0.37.0 |
| IVI Foundation | IVI Shared Components 3.0.0 | 3.0.2828.0 |
| IVI Foundation | IVI.NET Shared Components 2.0.0 for .NET 2.0 | 2.0.2928.0 |
| IVI Foundation | VISA Shared Components 7.2.0 (64-Bit) | 7.2 |
| IVI Foundation | VISA.NET Shared Components 7.2.0 (64-Bit) | 7.2.0205 |

3. Connect Streamline Series VNA with PC

- 3-1. Connect the cable between Streamline Series VNA and PC
- 3-2. Plug in the appropriate AC adapter to Streamline Series VNA
- 3-3. Power on Streamline Series VNA, then confirm if the Power LED is green
- 3-4. Power on your PC
- 3-5. Confirm that Device License Changed dialog is shown in the right bottom of PC screen
- 3-6. Confirm that Device manager recognizes Streamline Series VNA
- 3-7. [Confirm that Thunderbolt Control Center recognizes Thunderbolt device \[for Streamline Series VNA B model only\]](#)
- 3-8. Confirm that Keysight connection Expert recognizes Streamline Series VNA
- 3-9. Confirm that Keysight License Manager recognizes all the required licenses
- 3-10. Launch Network Analyzer
- 3-11. Communicate remotely using LAN(TCPIP)



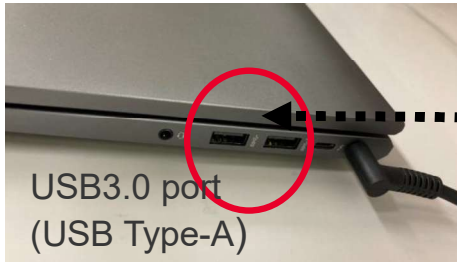
3. Connect Streamline Series VNA with PC

3-1. Connect the cable between Streamline Series VNA and PC

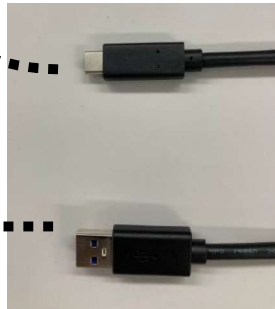
P50xxA/P93xxA rear panel



USB3.0 port x1
(USB Type-C)



USB3.0 port
(USB Type-A)

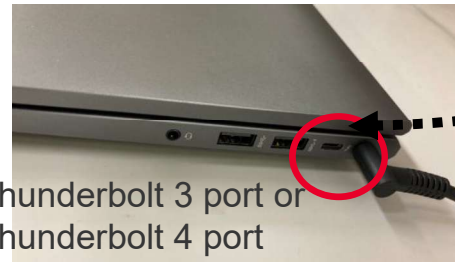


USB3.0 cable ¹

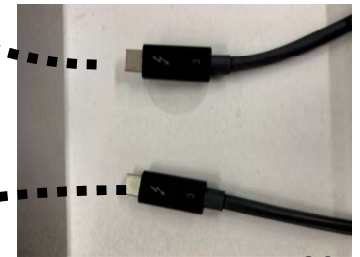
P50xxB/P93xxB rear panel



Thunderbolt 3 port x2
(USB Type-C)



Thunderbolt 3 port or
Thunderbolt 4 port
(USB Type-C)



Thunderbolt 3 cable ^{2,3}

Note:

1. Make sure to connect the USB3.0 cable included in the Streamline Series VNA (KPN: P9375-60010)
2. Make sure to connect the Thunderbolt 3 cable included in the Streamline Series VNA (KPN: P5000-60010).
3. The Thunderbolt 3 cable included in the Streamline Series VNA can be used for connection with a Thunderbolt 4 PC

3. Connect Streamline Series VNA with PC

3-2. Plug in the appropriate AC adapter to Streamline Series VNA



Streamline Series VNA (2-port model)² rear panel



Streamline Series VNA (4- or 6-port model) rear panel



Note:

1. Make sure to connect the AC adapter included in the Streamline Series VNA.
2. 2-port model requires minimum 90W adapter (KPN: 0950-6128). 150W adapter (KPN: 0950-6166) can work, too.

3. Connect Streamline Series VNA with PC

3-3. Power on Streamline Series VNA, then confirm if the Power LED is green

If Power LED is not green, go to [Troubleshooting tips 3-3](#)



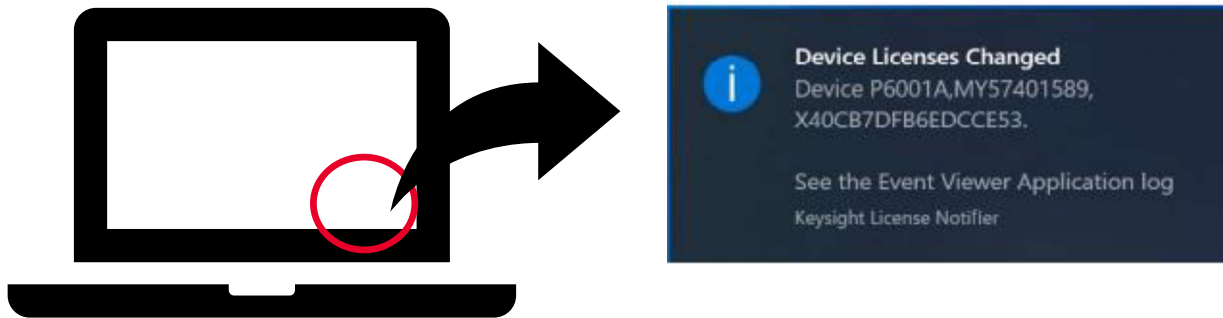
3. Connect Streamline Series VNA with PC

3-4. Power on your PC

Make sure to supply power from AC/DC adapter for the PC.

3-5. Confirm that Device License Changed dialog is shown in the right bottom of PC screen

If Device License Changed dialog is not shown, go to [Troubleshooting tips 3-5](#)



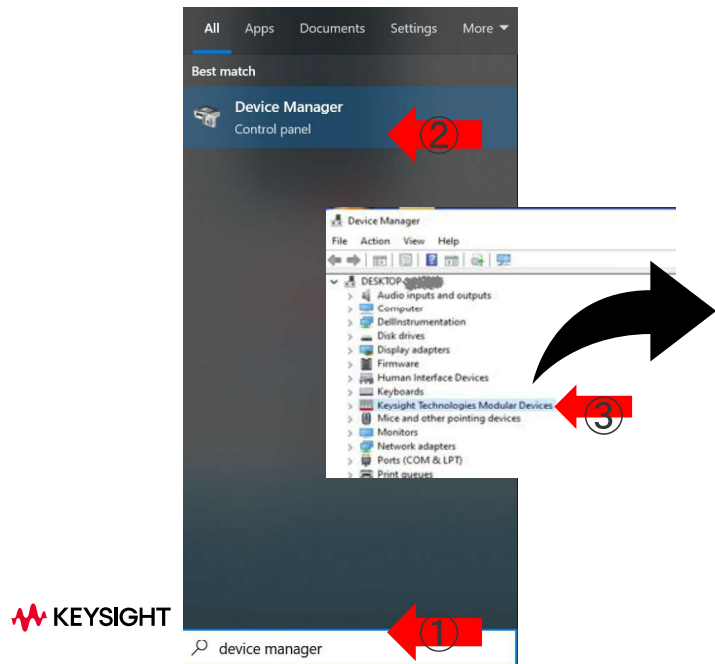
3. Connect Streamline Series VNA with PC

3-6. Confirm that Device manager recognizes Streamline Series VNA

- ① Enter Device Manager at Windows Search
- ② Select Device Manager
- ③ Select Keysight Technologies Modular Devices

[result] one P600X Chassis device and one or two VNA device(s) are shown.

If P600X Chassis or VNA device(s) are not shown correctly, go to [Troubleshooting tips 3-6](#).



| | 1 module model (See 3-8-A) | 2 modules model (See 3-8-B) |
|---------|---|--|
| A model | <ul style="list-style-type: none"> Keysight Technologies Modular Devices <ul style="list-style-type: none"> P600X Chassis P93XX | <ul style="list-style-type: none"> Keysight Technologies Modular Devices <ul style="list-style-type: none"> P50xx USB VNA P50xx USB VNA P600X Chassis |
| B model | <ul style="list-style-type: none"> Keysight Technologies Modular Devices <ul style="list-style-type: none"> P50xxB/P93xxB P600X Chassis | <ul style="list-style-type: none"> Keysight Technologies Modular Devices <ul style="list-style-type: none"> P50xxB/P93xxB P50xxB/P93xxB P600X Chassis |

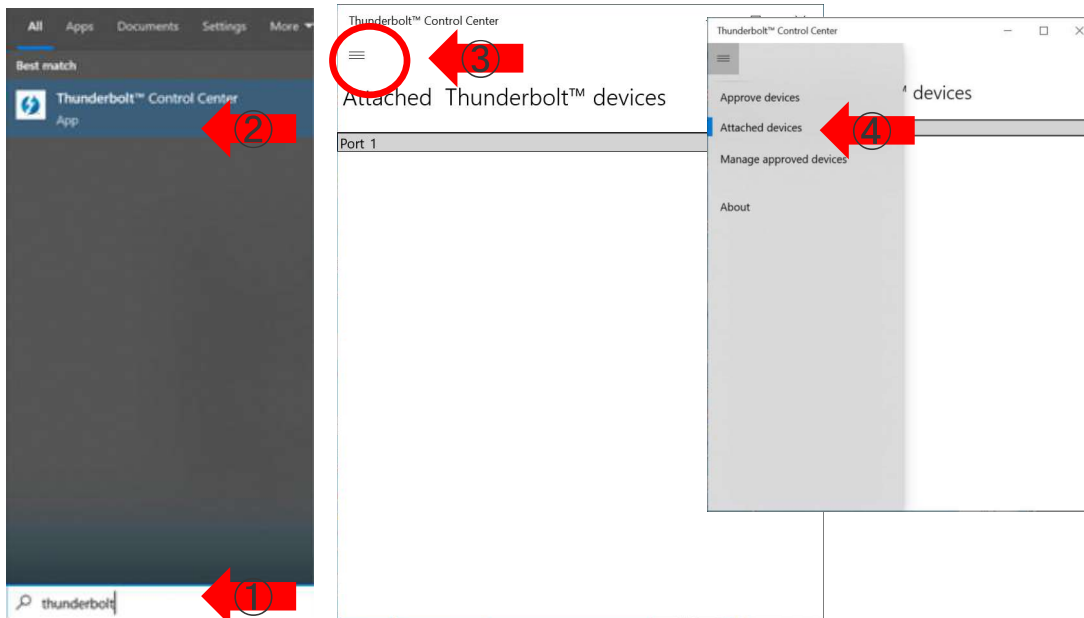
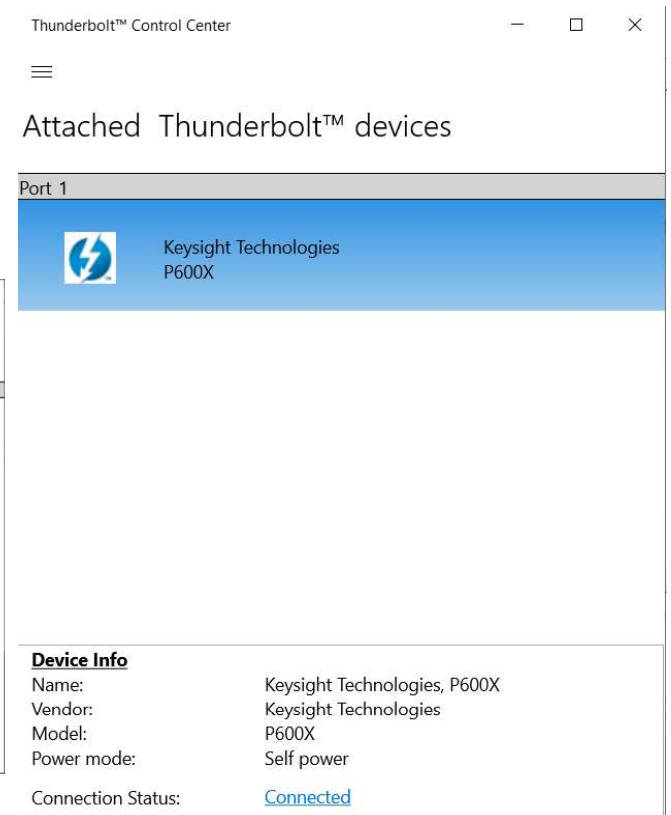
3. Connect Streamline Series VNA with PC

3-7. Confirm that Thunderbolt Control Center recognizes Thunderbolt device [for Streamline Series VNA model only]

- ① Enter Thunderbolt Control Center at Windows Search
- ② Select Thunderbolt Control Center
- ③ Select hamburger menu
- ④ Select Attached devices

[result] P600X is connected in Attached Thunderbolt devices.



If P600X is not connected, go to [Troubleshooting tips 3-7](#).

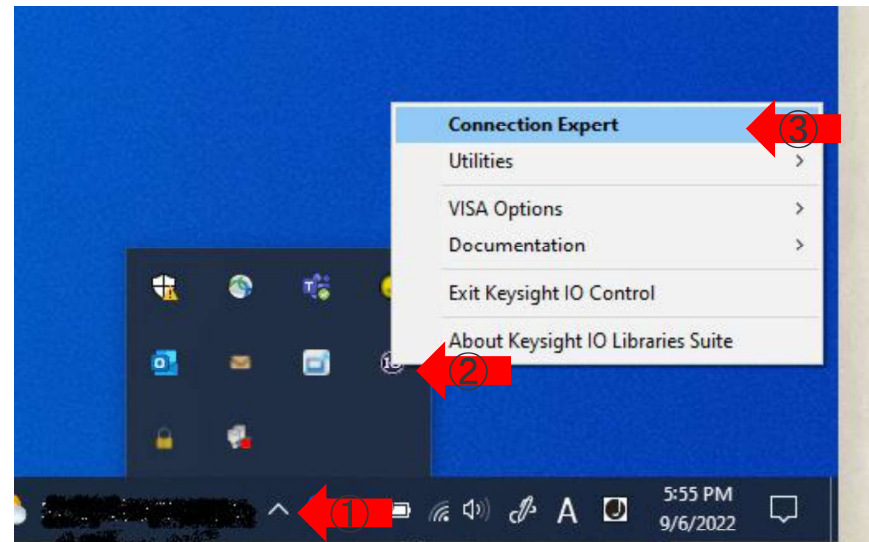
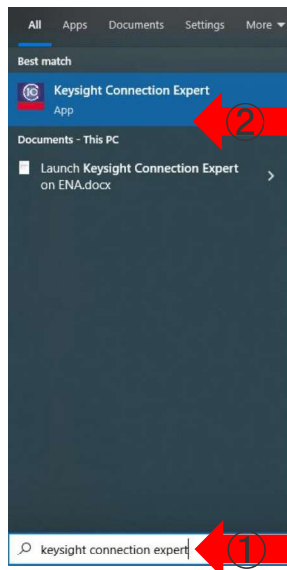


3. Connect Streamline Series VNA with PC

3-8. Confirm that Keysight connection Expert recognizes Streamline Series VNA

- ① Enter Keysight Connection Expert at Windows Search
 - ② Select Keysight Connection Expert
- or

- ① Select  Show hidden icons
- ② Select  Keysight IO Libraries Suite
- ③ Select Connection Expert

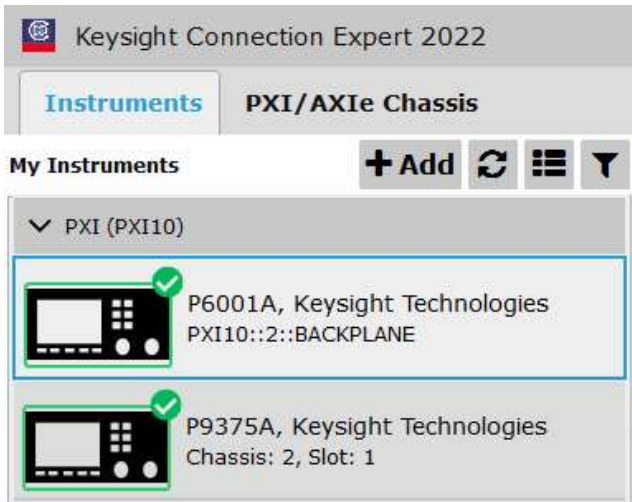


3. Connect Streamline Series VNA with PC

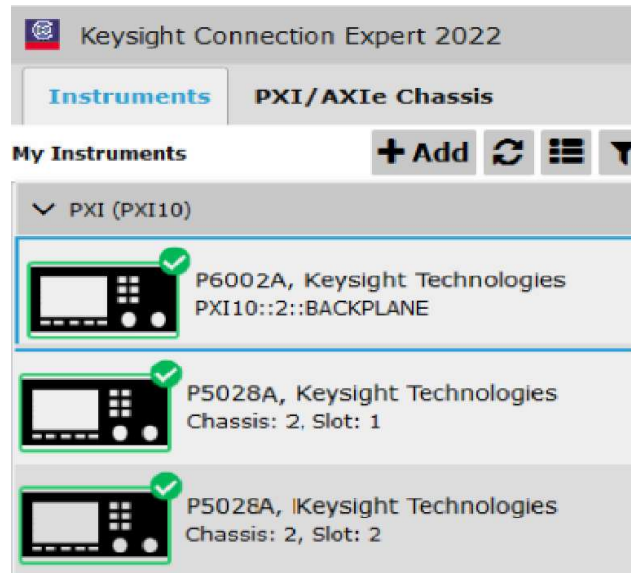
3-8-A. Confirm that Keysight Connection Expert recognizes Streamline Series VNA A-model

[result] one P6001A/P6002A and one or two VNA device(s) are shown under **PXI (PXI10)**
If they are not shown correctly, go to [Troubleshooting tips 3-8](#).

A model with 1 module



A model with 2 modules



A model with 1 module:

P937xA,
P500xA-200,
P5020A-400/600,
P5021A-400/600,
P5022A-400/600,
P5023A-400/600,
P5024A-400/600

A model with 2 modules:

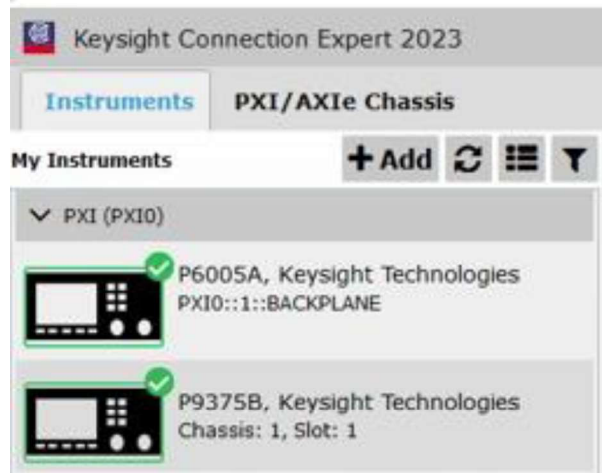
P5020A-402,
P5021A-402,
P5022A-402,
P5023A-402,
P5024A-402,
P5025A-400/402,
P5026A-400/402,
P5027A-400/402,
P5028A-400/402

3. Connect Streamline Series VNA with PC

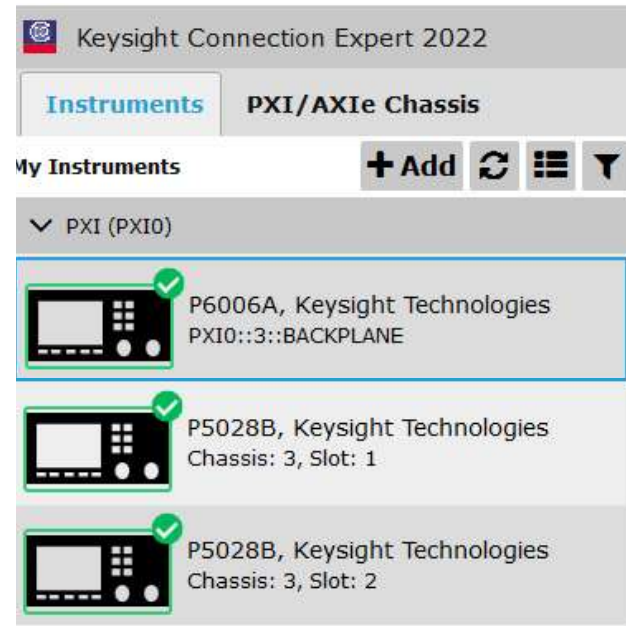
3-8-B. Confirm that Keysight Connection Expert recognizes Streamline Series VNA B model

[result] one P6005A/P6006A and one or two VNA device(s) are shown under **PXI (PXI0)**.
If they are not shown correctly, go to [Troubleshooting tips 3-8](#).

B model with 1 module



B model with 2 modules



B model with 1 module:

P937xB-200,
P938xB-400,
P500xB-200,
P5020B-400/600,
P5021B-400/600,
P5022B-400/600,
P5023B-400/600,
P5024B-400/600

B model with 2 modules:

P5020B-402,
P5021B-402,
P5022B-402,
P5023B-402,
P5024B-402,
P5025B-400/402,
P5026B-400/402,
P5027B-400/402,
P5028B-400/402
P5027M-400
P5028M-400

3. Connect Streamline Series VNA with PC

3-9. Confirm that Keysight License Manager recognizes all the required licenses

Step-1: Launch Keysight Software Manager and check your purchased licenses

- ① Go to <http://www.keysight.com/find/softwaremanager>
 - ② Enter Order Number and Certificate Number of your Streamline Series VNA
 - ③ Select Find Certificate
- [result] all the purchased licenses are shown in Keysight Software Manager(KSM)



[Return to Main Menu](#)

Welcome, **J. Smith**

Keysight Software Manager

Add New Certificate

Please Add a Certificate to Associate Your License Entitlements to Your Account.

Order Number *

Certificate Number *

Find Certificate



Order Number *

Certificate Number *

Find Certificate

Order Details

| Product | Description | Term | Start Date | End Date | Qty Purchased | Qty Remaining |
|---------------------|---|--------------|---------------|--------------|---------------|---------------|
| P5024B | Vector network analyzer, 9 kHz to 20 GHz, Thunderbolt 3 Interfaces | PERPETUAL | | | 1 | 0 |
| P5024B-402 | 4 port, 9 kHz to 20 GHz with second source | PERPETUAL | | | 1 | 0 |
| S97214B | High Performance Enabler Software for P5024B | | | | 1 | 0 |
| S97214B-1FP | R-ASK-001-A High Performance Enabler Software for P5024B, node-locked perpetual license | PERPETUAL | | | 1 | 0 |
| S97214B+R-A6C-001-L | R-A6C-001-L High Performance Enabler Software for P5024B, KeysightCare software support subscription, node-locked 12 months | SUBSCRIPTION | April 7, 2022 | May 26, 2023 | 1 | |
| S97234B | Vector network analyzer activation software for P5024B | | | | 1 | 0 |
| S97234B-1FP | R-ASK-001-A Vector network analyzer activation software for P5024B, node-locked perpetual license | PERPETUAL | | | 1 | 0 |
| S97234B+R-A6C-001-L | R-A6C-001-L Vector network analyzer activation software for P5024B, KeysightCare software support subscription, node-locked - 12 months | SUBSCRIPTION | April 7, 2022 | May 26, 2023 | 1 | |

Cancel Changes

Add Certificate



3. Connect Streamline Series VNA with PC

3-9. Confirm that Keysight License Manager recognizes all the required licenses

Step-2: Launch Keysight License Manager and check loaded licenses for Streamline Series VNA

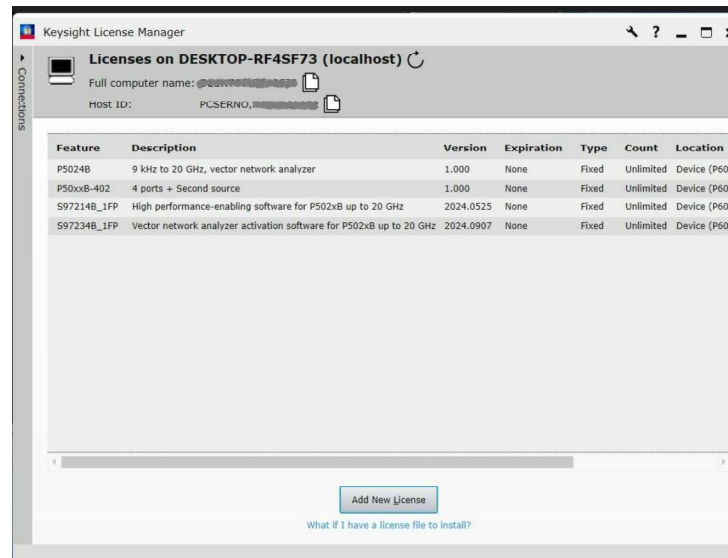
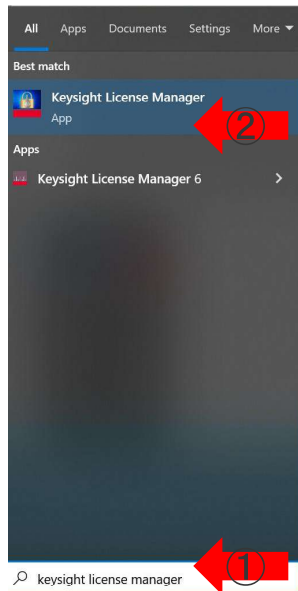
① Enter Keysight License Manager at Windows Search

② Select Keysight License Manager

[result] all the loaded licenses to Streamline Series VNA are shown in Keysight License Manager (KLM)

Step-3: Compare purchased licenses in KSM with loaded licenses for Streamline Series VNA in KLM

Step-4: If required licenses are not shown, go to [Troubleshooting tips 3-9](#).



3. Connect Streamline Series VNA with PC

3-10. Launch Network Analyzer

- ① Click the Network Analyzer icon on the PC desktop to execute the VNA application
- ② Select Streamline Series VNA model(s)
If VNA model(s) not shown, go to [Troubleshooting tips 3-6-1](#) and [Troubleshooting tips 3-3-1-3](#)
- ③ Select Run and then confirm if the Instrument Status LED is green
If not, go to [Troubleshooting tips 3-3-2](#)

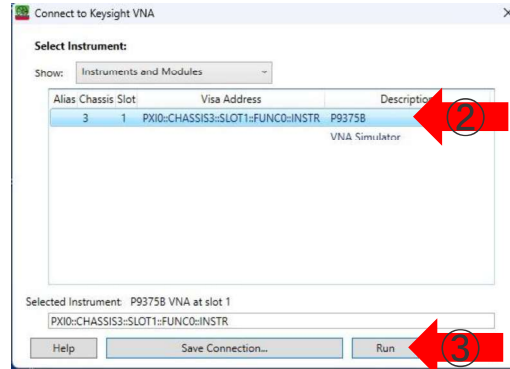
Note:

If FPGA image in FW is different from FPGA image in VNA, the FW will require updating the VNA's FPGA. It takes some time to complete the FPGA update. Until the completion, do not turn off the PC or VNA and do not pull off the cable between PC and VNA.

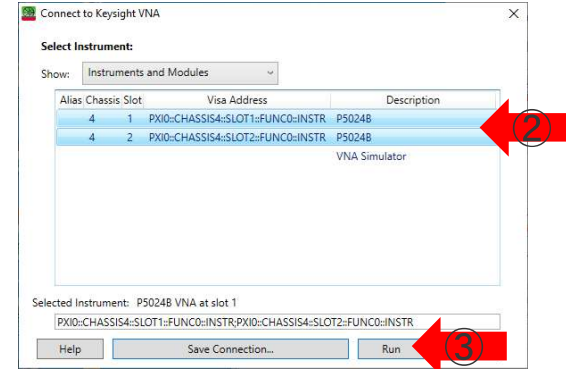


KEYSIGHT

1 module model



2 modules model

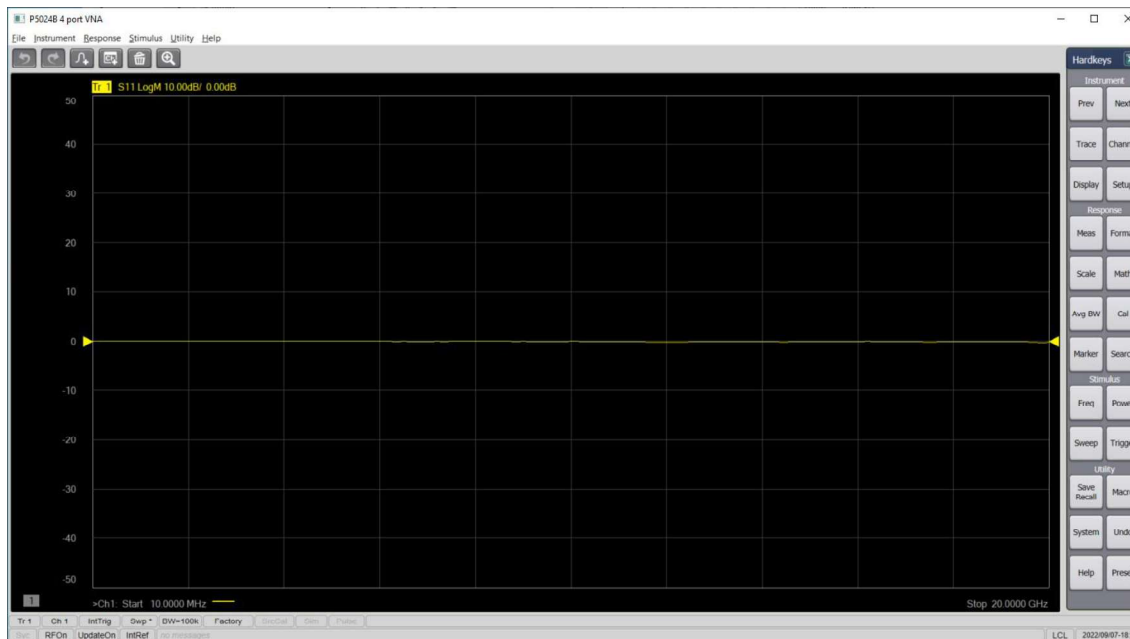


3. Connect Streamline Series VNA with PC

3-10. Launch Network Analyzer

[result] measurement screen is shown.

If VNA firmware halts or shows error message before showing the measurement screen, go to [Troubleshooting tips 3-10](#).



3. Connect Streamline Series VNA with PC

3-11. Communicate remotely using LAN (TCPIP)

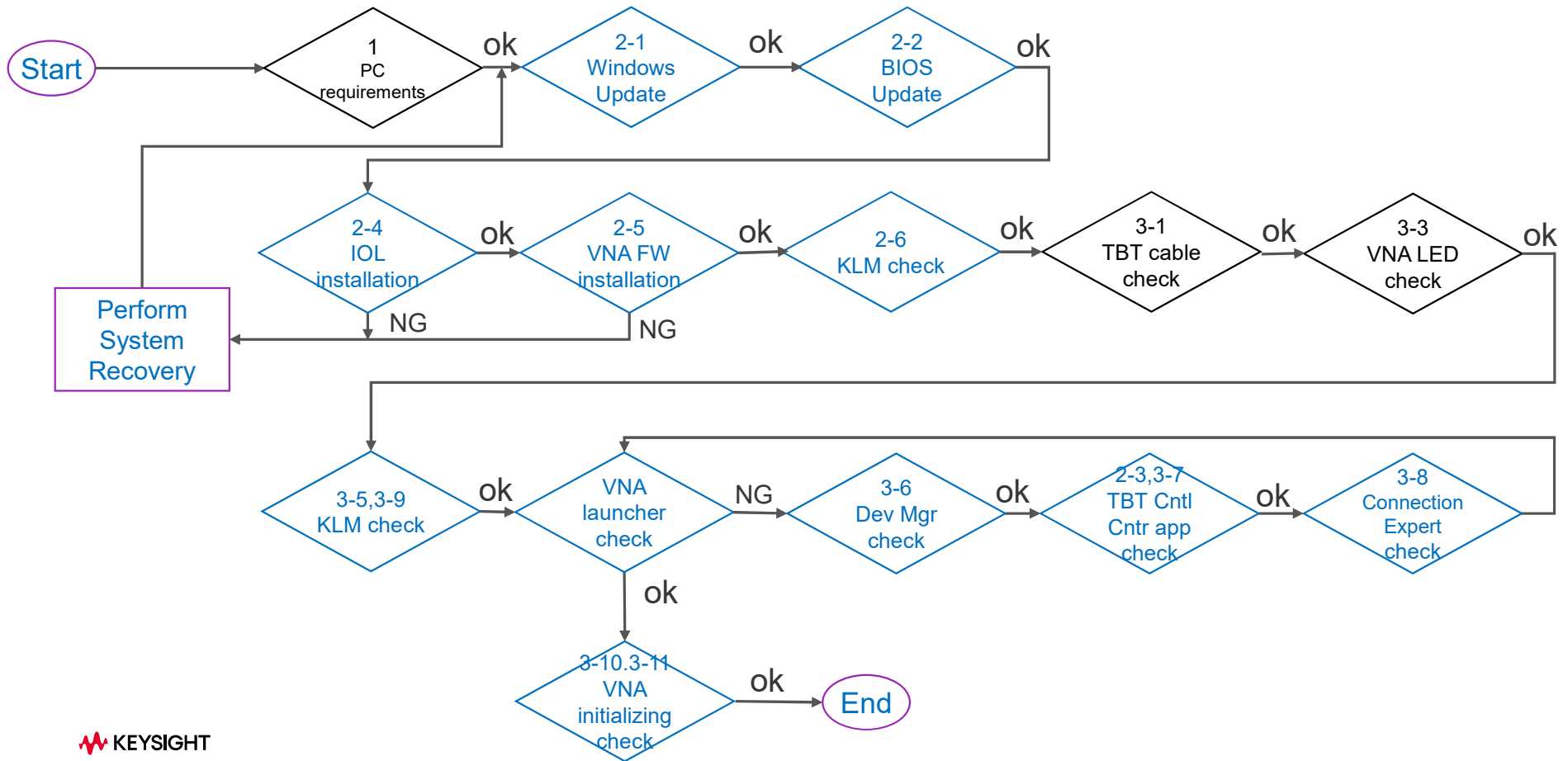
Refer to [Keysight Streamline Series VNA – LAN \(TCPIP\) communication setup](#)
If remote communication does not work well, go to [Troubleshooting tips 3-11](#).

4. Troubleshooting tips



4. Troubleshooting tips

Troubleshooting Flow



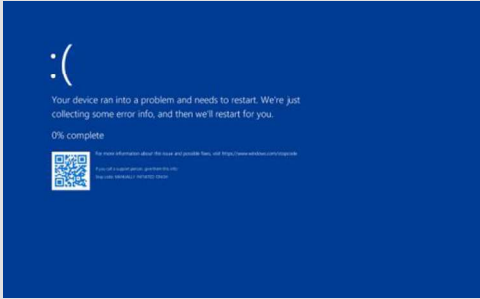
4. Troubleshooting tips 1

1. PC requirements

| Symptom | Possible root cause | Solution |
|--|---|---|
| #1-1 PCIe Thunderbolt card does not communicate with VNA properly on Desktop PC | Poor signal quality of PCIe Thunderbolt card or Thunderbolt cable | Go to Troubleshooting tips #3-10-4 . |
| #1-2 Cannot install Keysight IO Libraries Suite and/or VNA firmware. | There are conflicts between the registries/drivers which were previously configured and the ones that will be configured for the Streamline Series VNA. | <p>Step-1:</p> <ol style="list-style-type: none"> ① Download IO Libraries Suite direct download again ② Open the exe file with Administrator mode ③ Select Repair > Next > Finish <p>If the symptom still occurs,</p> <p>Step-2:</p> <ol style="list-style-type: none"> ① Download Command Expert direct download ② Open the exe file with Administrator mode ③ Select Next > Repair > Next > Install > Finish <p>If the symptom still occurs,</p> <p>Step-3:</p> <ol style="list-style-type: none"> ① Download BenchVue Platform direct download ② Open the exe file with Administrator mode ③ Select Install > Repair > Install > Install > Next > Finish <p>If the symptom still occurs,</p> <p>Step-4:</p> <p>Perform system recovery of your PC before setting up PC configurations for Streamline Series VNA.</p> |

4. Troubleshooting tips 1

1. PC requirements

| Symptom | Possible root cause | Solution |
|--|---------------------|--|
| <p>#1-3 BSOD (Blue Screen Of Death) is shown</p>  | | <p>Go to Windows 11 BSODs Automatic Repair and advanced troubleshooting options - Microsoft Community</p> <p>Refer to Bug Check Code Reference - Windows drivers Microsoft Learn for more details.</p> |

4. Troubleshooting tips 2-1, 2-2

2-1. Windows Update

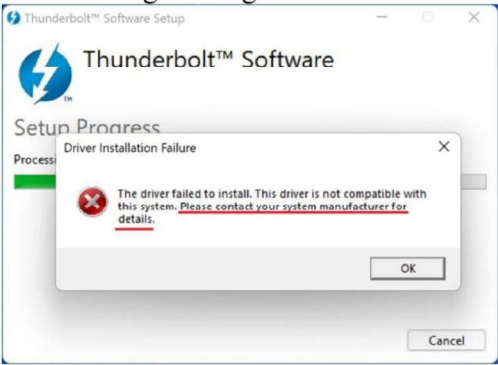
Install the latest Windows update settings, then you can reduce the possibility that the behavior is caused by a bug in Windows OS.

2-2. BIOS Update

Install the latest BIOS drivers, then you can reduce the possibility that the behavior is caused by a bug in the BIOS.

4. Troubleshooting tips 2-3

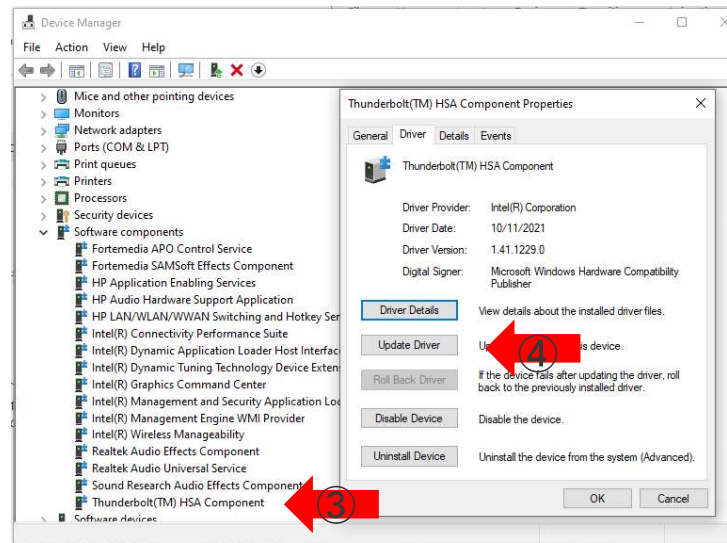
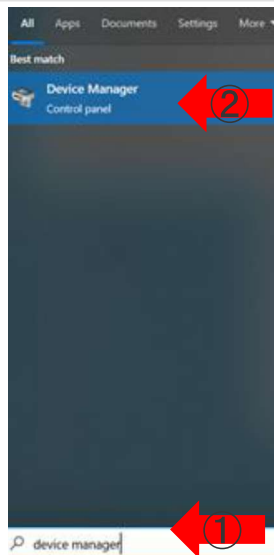
2-3. Thunderbolt Control Center related issues

| Symptom | Possible root cause | Solution |
|--|--|---|
| <p>#2-3-1 Driver Installation Failure is shown on Intel Gen12 CPU with Windows 11</p>  | <p>For Intel Gen12 CPU, Windows 11 OS already contains the necessary driver for Thunderbolt device to work properly.</p> | <p>No action is needed. Refer to Troubleshooting Tips #3-7-3.</p> |

4. Troubleshooting tips 2-3


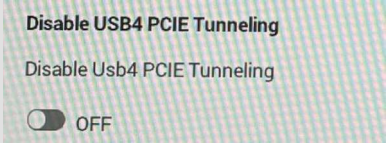
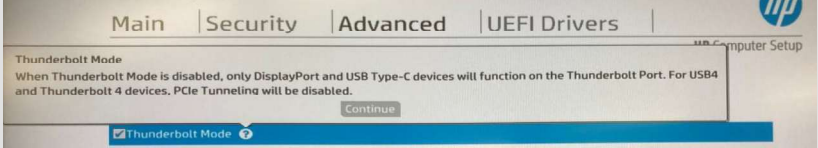
2-3. Thunderbolt Control Center related issues

| Symptom | Possible root cause | Solution |
|---|--|--|
| <p>#2-3-1 (for CPU Gen11 or below with Win11 OS & any CPU Gen with Win10 OS) Thunderbolt Control Center is not shown from the Windows Start menu.</p> | <p>Cannot download Thunderbolt Software (Thunderbolt Control Center app) via Microsoft Store</p> | <p>Step-1: Update Thunderbolt driver</p> <ol style="list-style-type: none"> Enter Device Manager at Windows Search Select Device Manager Navigate to Software Components > Thunderbolt™ HSA Component In the Driver tab, choose Update Driver If Thunderbolt Control Center app still cannot be installed, ask Intel to support <p>Step-2: If the symptom still occurs, go to Error 0x803FB005 While Installing Thunderbolt Control Center App</p> |



4. Troubleshooting tips 2-3

2-3. Thunderbolt Control Center related issues

| Symptom | Possible root cause | Solution | | | | | | | | | | | | |
|--|----------------------|----------|----------------------------|-------------|-----------------|----------|--------------------------|----------------------|------------------|---|-----------------------|------|---|--|
| <p>#2-3-2 PCIe tunneling is Disabled</p>  <p>Thunderbolt™ Control Center</p> <p>Details</p> <p>Thunderbolt™ Software</p> <table border="1"><tr><td>Application version:</td><td>1.0.36.0</td></tr><tr><td>Controller driver version:</td><td>1.41.1325.0</td></tr><tr><td>PCIe tunneling:</td><td>Disabled</td></tr></table> <p>Thunderbolt™ Controller 3</p> <table border="1"><tr><td>Thunderbolt™ generation:</td><td>Thunderbolt 4 (1137)</td></tr><tr><td>Number of ports:</td><td>2</td></tr><tr><td>NVM Firmware version:</td><td>27.0</td></tr></table> <p>When PCIe tunneling is disabled, some Thunderbolt™ devices, including external GPUs and storage drives, may not work properly. PCIe tunneling settings may be changed in BIOS.</p> | Application version: | 1.0.36.0 | Controller driver version: | 1.41.1325.0 | PCIe tunneling: | Disabled | Thunderbolt™ generation: | Thunderbolt 4 (1137) | Number of ports: | 2 | NVM Firmware version: | 27.0 | <p>PCIe tunneling setting in BIOS might be incorrect.</p> | <p>Step-1: If you are setting up with desktop-PC, confirm the PCIe Thunderbolt card is installed to the appropriate slot which supports PCIe tunneling.</p> <p>Step-2: If the symptom still occurs, go to PC BIOS setting menu and enable PCIe tunneling. [samples of BIOS setting] <u>Dell Desktop PC BIOS (UEFI)</u> BIOS Setup > Integrated devices > Disable USB4 PCIe Tunneling > Off</p>  <p><u>HP Laptop PC BIOS (UEFI)</u> HP Computer Setup > Advanced > Thunderbolt Options > Enable Thunderbolt Mode</p>  |
| Application version: | 1.0.36.0 | | | | | | | | | | | | | |
| Controller driver version: | 1.41.1325.0 | | | | | | | | | | | | | |
| PCIe tunneling: | Disabled | | | | | | | | | | | | | |
| Thunderbolt™ generation: | Thunderbolt 4 (1137) | | | | | | | | | | | | | |
| Number of ports: | 2 | | | | | | | | | | | | | |
| NVM Firmware version: | 27.0 | | | | | | | | | | | | | |

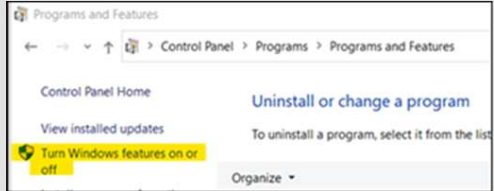
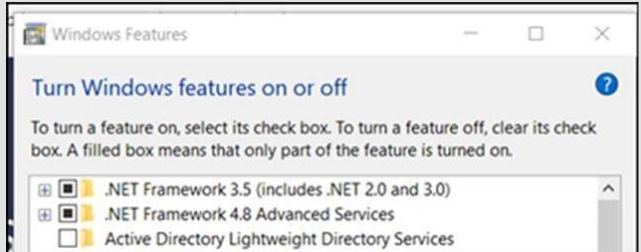
4. Troubleshooting tips 2-4

2-4. Keysight IO Libraries Suite installation is not completed successfully

| Symptom | Possible root cause | Solution |
|---|-------------------------------------|---|
| #2-4-1 IVI drivers and/or VISA drivers are not installed (See Proven latest versions in Appendix) | Old drivers are left on the system. | <ol style="list-style-type: none">① Go to Shared Components (ivifoundation.org)② Download IVI Shared Components Cleanup Utility③ Download VISA and VISA.NET Shared Components VISA Cleanup Utility④ Execute Cleanup Utility and VISA Cleanup Utility with administrator privilege⑤ Re-boot the PC⑥ Install the latest Keysight IO Libraries Suite with administrator privilege⑦ If the symptom still occurs, go to Troubleshooting tips #1-2. |

4. Troubleshooting tips 2-4

2-4. Keysight IO Libraries Suite installation is not completed successfully

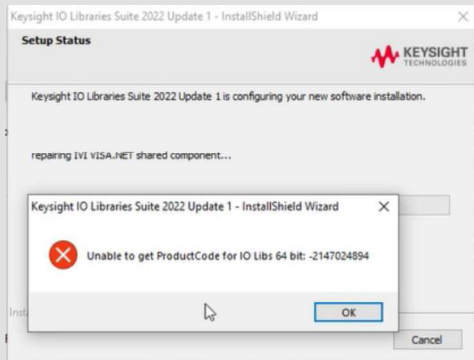
| Symptom | Possible root cause | Solution |
|---|---------------------|---|
| #2-4-2 .NET Framework 3.5 is not enabled | | <ol style="list-style-type: none">① Enter Control Panel at Windows Search② Navigate to Programs > Programs and Features > Turn Windows Features on or off③ Enable the .NET Framework 3.5④ Re-boot the PC <p>For more details, go to https://docs.microsoft.com/en-us/dotnet/framework/install/dotnet-35-windows</p>   |

4. Troubleshooting tips 2-4

2-4. Keysight IO Libraries Suite installation is not completed successfully

Symptom

#2-4-3
Unable to get ProductCode for IO
Libs 64 bit error is shown



Possible root cause

Some files or registries were not removed
correctly.

Solution

Uninstall IOLS and perform deep clean.

For more details, go to [Keysight Uninstall IOLS and Deep Clean](#)

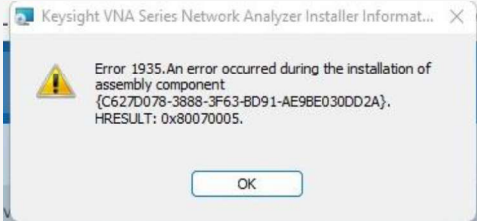
4. Troubleshooting tips 2-4

2-4. Keysight IO Libraries Suite installation is not completed successfully

| Symptom | Possible root cause | Solution |
|--|---|---|
| <p>#2-4-4 .NET Framework 3.5 is not installed.</p> <ul style="list-style-type: none">• Ivi.Visa.Interop.dll is missing in the 32-bit VISA COM applications | <p>Keysight IO Libraries Suite 2021 or later does not install .NET Framework.</p> <p>If users want to use VISA.NET drivers which are provided by the IVI Organization rather than Keysight Technologies, Inc., then they must install .NET Framework 3.5/2.0.</p> | <p>The workarounds to resolve the issue is as follows:</p> <ul style="list-style-type: none">• Install .NET Framework 3.5• You can install .NET Framework 3.5 using the IO Libraries Suite installer with the net35 directive. For example: <i>IOLibSuite_version.exe /s /z"typical;net35"</i>• Uninstall VISA shared component• Repair IO Library Suite to install VISA shared component <p>Another way to fix the issue is as follows:</p> <ul style="list-style-type: none">• Open Visual Studio developer command window with elevated privilege• Change to C:\Program Files (x86)\IVI Foundation\VISA\VisaCom\Primary Interop Assemblies• Run "IviPiaRegistration.bat" |

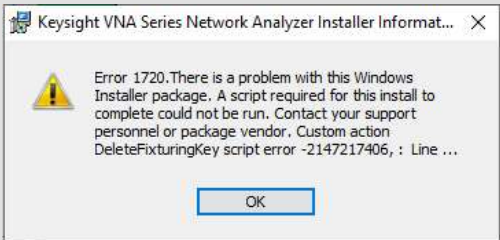
4. Troubleshooting tips 2-5

2-5. Keysight VNA firmware installation is not completed successfully

| Symptom | Possible root cause | Solution |
|--|---|--|
| #2-5-1 KtPUsbChassis IVI drivers are not installed | Known issue on VNA firmware A.15.75.19 when no previous VNA firmware was installed. | Install A.15.75.22 or newer |
| #2-5-2 Error 1935 is shown while installing VNA firmware.  | During the VNA firmware installation, required permissions are missing, or .Net Framework setting is not correct. | <ol style="list-style-type: none">① Re-boot the PC and install the latest VNA firmware again. Make sure the VNA firmware is installed with “Run as administrator” capability.② If the symptom still occurs, disable any anti-virus, anti-spyware or firewalls while installing VNA firmware.③ If the symptom still occurs, go to Troubleshooting tips #2-4-2. <p>For more details, go to Download Microsoft .NET Framework Repair Tool from Official Microsoft Download Center</p> <ol style="list-style-type: none">④ If the symptom still occurs, go to Troubleshooting tips #1-2. |

4. Troubleshooting tips 2-5

2-5. Keysight VNA firmware installation is not completed successfully

| Symptom | Possible root cause | Solution |
|---|---|---|
| <p>#2-5-3 Error 1720 is shown while installing VNA firmware</p>  | <p>There is a problem with Windows Installer Package.</p> | <p>Go to Error 1720: There is a problem with this Windows Installer package. A - Microsoft Community</p> <p>If the symptom still occurs, go to Troubleshooting tips #1-2.</p> |

4. Troubleshooting tips 2-6

2-6. Keysight License Manager installation is not completed successfully

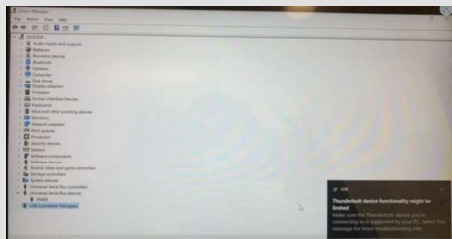
| Symptom | Possible root cause | Solution |
|---|--|---|
| #2-6-1 Keysight License Service is installed but not running on the host PC | Agilent License Service/ Keysight License Service Stopped. | Change Agilent License Service/ Keysight License Service status from Stop to Running For more details, go to FAQ in Keysight.com . |
| #2-6-2 License Service not installed | Old VNA firmware installer didn't handle Keysight License service well | The 89600 VSA firmware installer enables user to manually install the required Keysight Licensing Service. For more details, go to FAQ in Keysight.com . |
| #2-6-3 VNA firmware shows "Error Initializing licensing provider. File Keysight.Ccl.Licensing.App.dll does not appear to be signed with a valid digital signature" | Missing "DigiCert Assured ID Root CA" | <ol style="list-style-type: none">① Download "DigiCert Assured ID Root CA Serial Number: 0CE7E0E517D846FE8FE560FC1BF03039" from DigiCert Root Certificates - Download & Test DigiCert.com② Enter Manage User Certificates at Windows Search③ Select Manage User Certificates④ Install the certificate under Certificates – Current User\Trusted Root Certification Authorities\Certificates\ |

4. Troubleshooting tips 3-1

3-1. USB-C cable is connected wrongly

Symptom

#3-1
Thunderbolt device functionality might be limited is shown in Device Manager



Thunderbolt device functionality might be limited
Make sure the Thunderbolt device you're connecting to is supported by your PC. Select this message for more troubleshooting info.

Possible root cause

USB-C cable is connected between Streamline B model and PC

Solution

Replace USB-C cable with the Thunderbolt 3 cable included in the Streamline Series VNA

4. Troubleshooting tips 3-3

3-3-1. Power LED does not turn green



| Symptom | Possible root cause | Solution |
|--|---|---|
| #3-3-1-1 Not glowing amber when power adapter is connected to VNA | Power adapter or power line in the VNA is broken. | Return it to Keysight for repair |
| #3-3-1-2 Blinking red | Power adapter does not supply enough power | <ol style="list-style-type: none"> ① Check if proper power adapter is used (See 3-2). If KPN 0950-6128 is used to Streamline Series VNA 4-/6- port model, replace it with KPN 0950-6166. ② Retry powering on the VNA. If the symptom still occurs, return it to Keysight for repair. |
| #3-3-1-3 Glowing red | PC does not recognize the VNA | <ol style="list-style-type: none"> ① Check the power on sequence. <ol style="list-style-type: none"> 1. Connect the cable between PC and the VNA (See 3-1) 2. Power on the VNA (See 3-2, 3-3) 3. Power on the PC (3-4) ② If the symptom still occurs, return it to Keysight for repair. |

4. Troubleshooting tips 3-3

3-3-1. Power LED does not turn green

Power LED



| Symptom | Possible root cause | Solution |
|--|--|--|
| #3-3-1-4 Once glowing green for a few seconds, then shutdown automatically Impacted model: 2-port VNA only | VNA firmware version A.15.60.05 or newer has a function to shutdown automatically when in-rush voltage drop event is detected. [This is intended behavior] | <ol style="list-style-type: none"> Check if VNA firmware version A.15.55.14 or newer. If VNA firmware version is A.15.60.05 or newer, the firmware has a function to shutdown automatically when in-rush voltage drop event is detected. Retry powering on the VNA. If the symptom still occurs, return it to Keysight for repair. |
| #3-3-1-5 Glowing blue | Chassis FPGA update failed. | Return it to Keysight for repair |

[Power LED status]

Refer to https://helpfiles.keysight.com/csg/pxivna/Front_Panel/P937xA_Front_Panel.htm

4. Troubleshooting tips 3-3

3-3-1. Power LED does not turn green

Power LED



Symptom

#3-3-1-6
VNA chassis power button LED turned from Green to Red when USB/Thunderbolt cable is connected.

Possible root cause

VNA firmware is equipped with current surge detection function to shutdown automatically when surge is detected. [This is intended behavior].
Abrupt surge (transient) during power on stage lead to the false alarm and the chassis is automatically switched off.

Solution

- ① Update VNA firmware to version A.16.70.00 or newer. VNA chassis IVI-C and IVI.NET driver version 1.1.10 and above resolve the false alarm.
- ② Retry powering on the VNA.
If the symptom still occurs, return it to Keysight for repair.

[Power LED status]

Refer to https://helpfiles.keysight.com/csg/pxivna/Front_Panel/P937xA_Front_Panel.htm

4. Troubleshooting tips 3-3

3-3-2. Instrument Status LED does not turn Green

Instrument Status LED



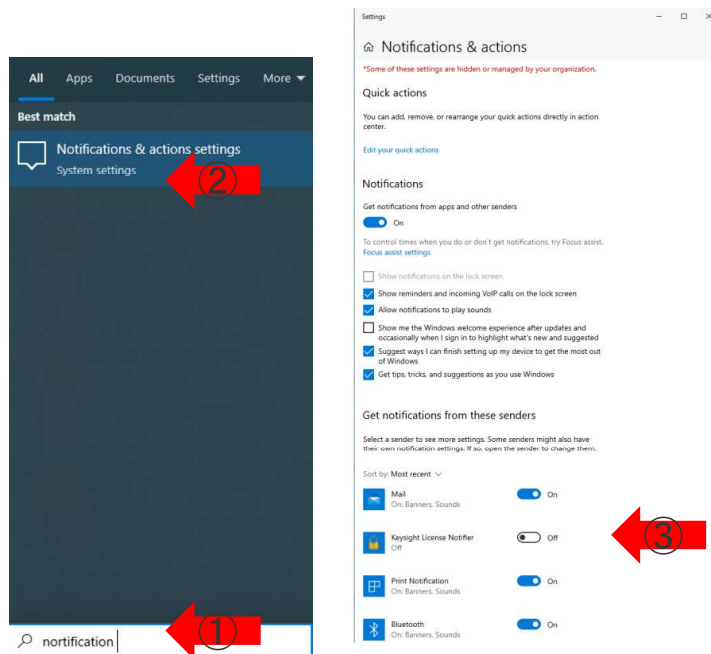
| Symptom | Possible root cause | Solution |
|---------------------------|---|---|
| #3-3-2-1 Glowing amber | Power is ON, but firmware is not running. | <ol style="list-style-type: none"> ① Check if VNA firmware is working correctly. ② If not, go to Troubleshooting tips2-5 ③ Check if the cable between Streamline Series VNA and PC is connected correctly ④ If not, replace the cable ⑤ If the symptom still occurs, return it to Keysight for repair. |
| #3-3-2-2 Glowing red | PC battery is not maintained in a fully charged condition. Or A hardware error has occurred, or the VNA firmware is not installed or corrupted in the PC. | <ol style="list-style-type: none"> ① Make sure AC/DC adapter for the PC is connected. ② Check if VNA firmware is installed correctly. ③ If not, go to Troubleshooting tips 2-5 ④ If the symptom still occurs, check if Keysight IO Libraries Suites is installed correctly. ⑤ If not, go to Troubleshooting tips 2-4 ⑥ If the symptom still occurs, return it to Keysight for repair. |

[Instrument Status LED status]
Refer to https://helpfiles.keysight.com/csg/pxivna/Front_Panel/P937xA_Front_Panel.htm

4. Troubleshooting tips 3-5

3-5. Device Licenses Changed dialog is not shown

| Symptom | Possible root cause | Solution |
|---|--|--|
| #3-5-1 Device Licenses Changed dialog is not shown | #1 Notifications for Keysight License Notifier turns off | ① Enter Notification at Windows Search ② Select Notifications & actions settings ③ Turn on Keysight License Notifier |



4. Troubleshooting tips 3-5

3-5. Device Licenses Changed dialog is not shown

| Symptom | Possible root cause | Solution |
|---|--|--|
| #3-5-1 Device Licenses Changed dialog is not shown | #2. Agilent License Service/ Keysight License Service is not running | <ol style="list-style-type: none">Enter Services at Windows SearchSelect ServicesIf Status of Agilent License Service/ Keysight License Service is blank, open Agilent License Service/ Keysight License Service PropertiesSelect StartSelect OK |

The image shows a sequence of steps to troubleshoot the missing 'Device Licenses Changed' dialog. It includes a Windows Start menu search for 'services', the Windows Services console listing various services with 'Keysight License Service' selected, and the 'Keysight License Service Properties' dialog box. Red arrows and numbers 1-5 indicate the following steps:

- Search for 'services' in the Windows Start menu.
- Select 'Services' from the search results.
- Select 'Keysight License Service' in the Services console.
- Click the 'Start' button in the 'Keysight License Service Properties' dialog box.
- Click the 'OK' button in the 'Keysight License Service Properties' dialog box.

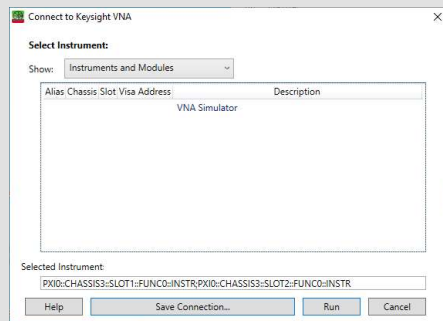
KEYSIGHT

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Symptom

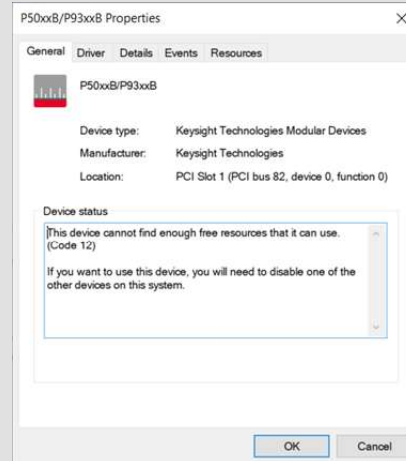
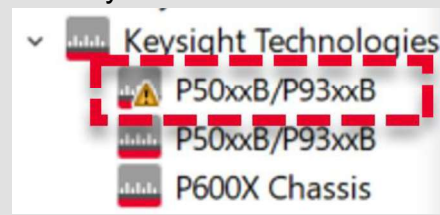
#3-6-1



For B model with 2 modules, one of two VNA modules is not correctly recognized in some PCs as shown with Code 12 error in Device Manager.

Possible root cause

PC cannot allocate enough free Kernel memory resource for PCIe



Solution

To solve this issue, registry edit is required with TH_PCIE.zip



Note:

1. The following steps are to be performed at end user's own risk.
2. This solution of Code12 error is for Streamline B model with 2 modules only. This solution cannot be applied to Code 12 error of A model and of B model with 1 module.

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

#3-6-1

Step-1: Backup the current registry and check the current registry values

Launch Registry Editor:

- ① Enter registry editor at Windows Search
- ② Select Registry Editor
- ③ Navigate to File> Export
- ④ Select All for Export Range
- ⑤ Enter file name (example original_reg_ddmmyyyy.reg)
- ⑥ Select Save
- ⑦ Check the current value before registry patch at \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\PnP\Pci

The image shows a sequence of four screenshots illustrating the steps to backup the registry and check the current value. Red arrows and numbers 1-7 point to specific actions:

- ①: Windows search bar with 'registry editor' entered.
- ②: Registry Editor application icon selected in search results.
- ③: 'Export...' option selected in the Registry Editor 'File' menu.
- ④: 'All' selected under 'Export range' in the 'Export Registry File' dialog.
- ⑤: File name 'original_reg_15092022' entered in the 'File name' field.
- ⑥: 'Save' button clicked in the 'Export Registry File' dialog.
- ⑦: 'DisableExternalDMAUnderLock' registry value highlighted in the registry tree.

| Name | Type | Data |
|-----------------------------|-----------|-----------------|
| (Default) | REG_SZ | (value not set) |
| DisableExternalDMAUnderLock | REG_DWORD | 0x00000000 (0) |

Step-2: Download and unzip the TH_PCIE.reg registry patch to the PC the VNA is connected to.

TH_PCIE.zip

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

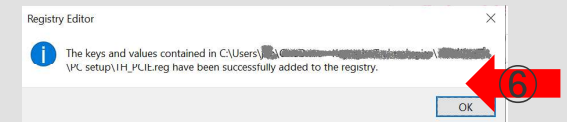
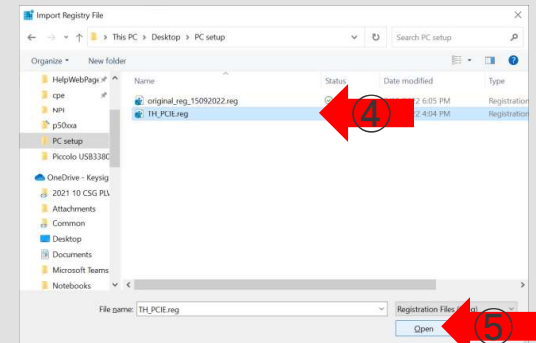
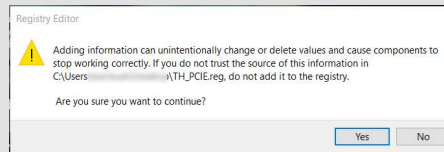
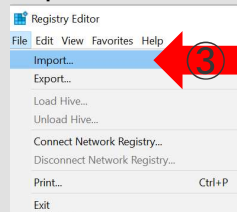
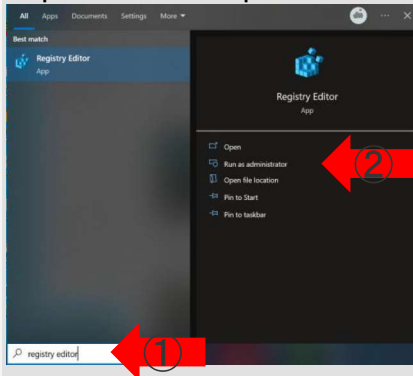
#3-6-1

Step-3: Edit registry

Launch Registry Editor with administrator privilege:

- ① Enter registry editor at Windows Search
- ② Execute Registry Editor with administrator privilege
- ③ Navigate to File> Import
- ④ Select TH_PCIE.reg
- ⑤ Select Open
- ⑥ Select OK

Tips: Alternative procedure for step ① to ⑥, double click on the registry patch to add.



4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

#3-6-1

Step-4: Ensure the HackFlags value is successfully edited to \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\PnP\Pci

The image displays two screenshots of the Windows Registry Editor, illustrating the state of the HackFlags registry value before and after a patch.

Before registry patch: The Registry Editor window shows the path Computer\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\PnP\Pci. The right pane displays a table of registry values:

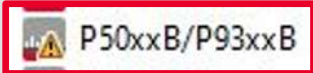

| Name | Type | Data |
|-----------------------------|-----------|-----------------|
| (Default) | REG_SZ | (value not set) |
| DisableExternalDMAUnderLock | REG_DWORD | 0x00000000 (0) |

After registry patch: The Registry Editor window shows the same path. The right pane displays a table of registry values, with the HackFlags value highlighted by a red dashed box:

| Name | Type | Data |
|-----------------------------|-----------|----------------------|
| (Default) | REG_SZ | (value not set) |
| DisableExternalDMAUnderLock | REG_DWORD | 0x00000000 (0) |
| HackFlags | REG_DWORD | 0x00100000 (1048576) |

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

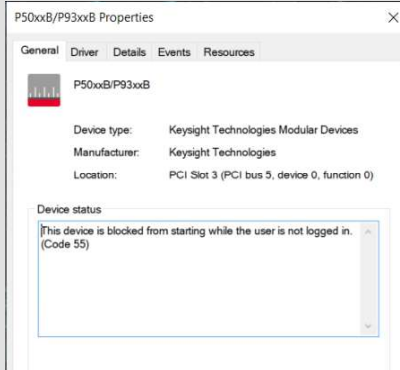
| Symptom | Possible root cause | Solution |
|---|---|--|
| <p>#3-6-2 For A model with 1 module and B model with 1 module, Code 12 error is shown in Device Manager</p>  | <p>PC cannot allocate enough free Kernel memory resource for PCIe</p> | <p>Use another PC in Thunderbolt PC and Streamline Series VNA B model compatibility list</p> |
| <p>#3-6-3 For 2 VNA operation with star topology or with daisy topology, Code 12 error is shown in Device Manager</p>  | <p>PC cannot allocate enough free Kernel memory resource for PCIe</p> | <p>Go to Troubleshooting Tips #3-6-1</p> |

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Symptom

#3-6-4
For B model, Code 55 error is shown in Device Manager



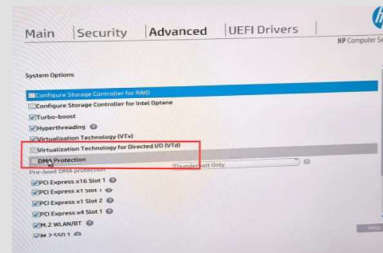
Possible root cause

B model is blocked from enumeration, due to a Group policy / MDM policy to protect from DMA attack.

Solution

- ① This issue can be resolved with Microsoft service pack update [KB5014699](#) for Windows 10 versions 20H2 and newer. Install Windows 10 versions 20H2 or newer.
- ② If you need to stay on older versions of Windows 10 prior to 20H2, the workaround is to disable the Kernel DMA Protection in the BIOS setting. To disable Bitlocker and Windows Kernel DMA Protection, it depends on different manufacturer BIOS. You may also set Intel Virtualization Technology for I/O (VT-d) to Disabled in the BIOS, if Kernel DMA Protection cannot be disabled.

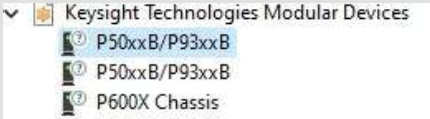
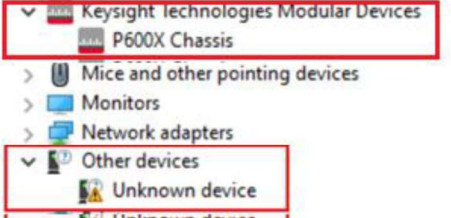
Below is a sample of HP PC BIOS setting.



- ③ If the symptom still occurs, contact end user's IT department to change the Group Policy / MDM policy to protect from DMA attack.

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

| Symptom | Possible root cause | Solution |
|---|--|---|
| <p>#3-6-5 Keysight VNA icon is not shown</p>  | | This is not an issue. No action is required. |
| <p>#3-6-6 No VNA device(s) is/are shown under Keysight Technologies Modular Devices, but VNA device(s) is/are shown under Other devices</p>  | <p>Windows does not recognize VNA device(s) correctly, since P50xx drivers are not installed correctly.</p> <p>[Known Issue on A15.75.19 for Streamline Series VNA (P50xxA/B, P93xxA/B)]: The unit will not be detected if you install the firmware from scratch. The driver for Chassis is not installed at this version.</p> | Go to Troubleshooting Tips #2-5-1 |

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Symptom

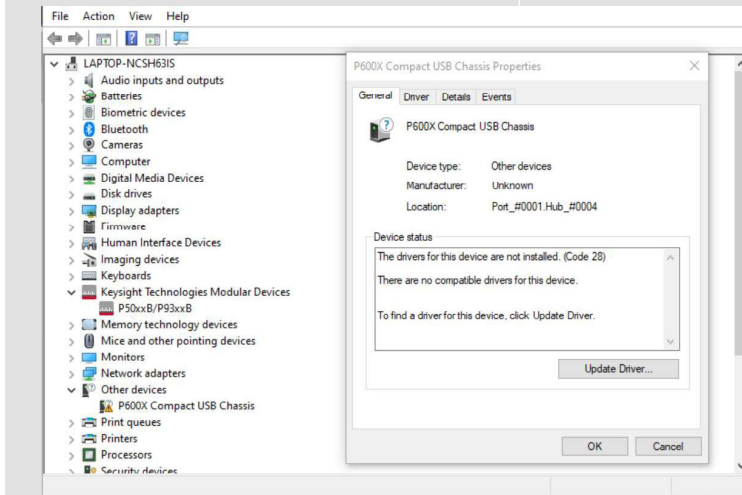
#3-6-7
P600X Chassis is not shown under Keysight Technologies Modular Devices, but P600X Chassis is shown under Other devices. Code 28 error is shown in Device Manger.

Possible root cause

#1. Chassis drivers are missing or broken
#2. Thunderbolt Control Center does not recognize P600X Chassis

Solution

#1. Go to [Troubleshooting tips 2-5](#)
#2. Go to [Troubleshooting tips 3-7](#)

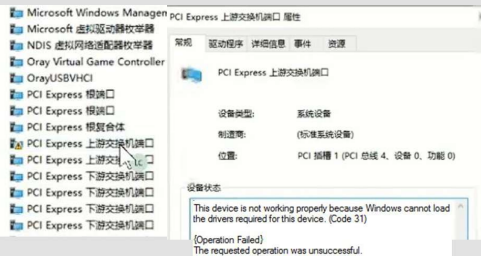


4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Symptom

#3-6-8



For B models, Thunderbolt control center detects and recognizes the instrument correctly.

In Device Manager, the B model is not correctly recognized. Under “System Devices” > PCI Express Upstream/ Downstream Port shows Code31 error.

Possible root cause

Operating System runs out of PCI bus numbers. Typically, the computer BIOS configures a limited bus-number range for PCI Express bridge device. When an expansion chassis that contains a PCI Express complex switch together with a deep device hierarchy is added to the computer, the OS runs out of available bus numbers. Therefore, the system cannot start devices in the expansion chassis.

[Fail to attach PCI Express expansion chassis - Windows Client | Microsoft Learn](#)

Solution

To solve this issue, perform the following:

This requires two-stage solutions:

First, remove Code31 error.

Secondly, remove Code12 error. (Code12 may appear after Code31 is resolved)

Note:

1. The listed steps are to be performed at end user’s own risk.

4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

#3-6-8

Step-1: Backup the current registry and check the current registry values

Launch Registry Editor:

- ① Enter registry editor at Windows Search
- ② Select Registry Editor
- ③ Navigate to File> Export
- ④ Select All for Export Range
- ⑤ Enter file name (example original_reg_ddmmyyyy.reg)
- ⑥ Select Save
- ⑦ Check the current value before registry patch at \HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\PnP\Pci

The screenshot shows the Windows Registry Editor and the Export Registry File dialog. Red arrows and numbers 1-7 indicate the steps described in the text. Step 1 points to the search bar in Windows Search. Step 2 points to the Registry Editor app icon. Step 3 points to the 'Export...' option in the File menu. Step 4 points to the 'All' radio button in the Export range section. Step 5 points to the 'File name' field containing 'original_reg_15092022'. Step 6 points to the 'Save' button. Step 7 points to the 'DisableExternalDMAUnderLock' registry value in the registry tree.

| Name | Type | Data |
|-----------------------------|-----------|-----------------|
| (Default) | REG_SZ | (value not set) |
| DisableExternalDMAUnderLock | REG_DWORD | 0x00000000 (0) |

4. Troubleshooting tips 3-6

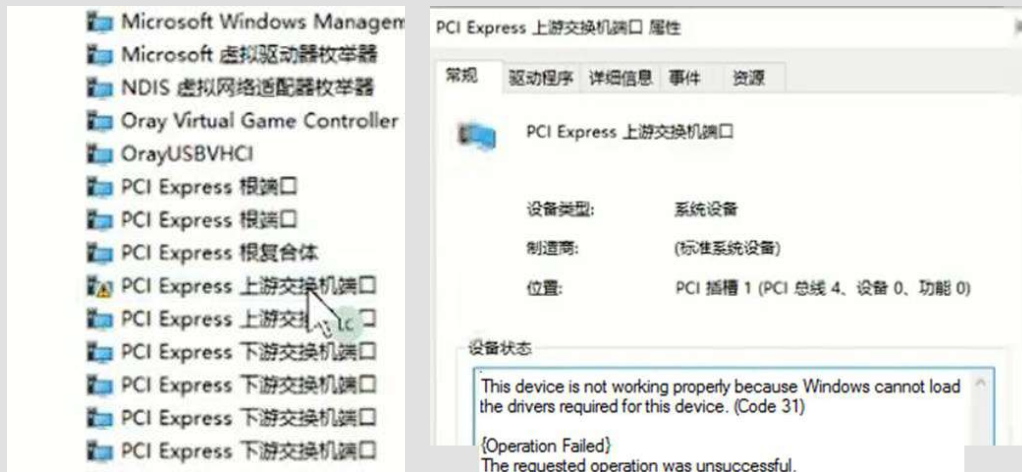
3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

#3-6-8

Group1: Intel PCI Express Root Port. (Description starts with Intel)
Group2: PCI Express Downstream/ Upstream Switch Port.

Step-2: In Device Manager, under “System Devices”, identify the PCI Express item (Group2) with Code31 ! warning status. Disable it.



4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

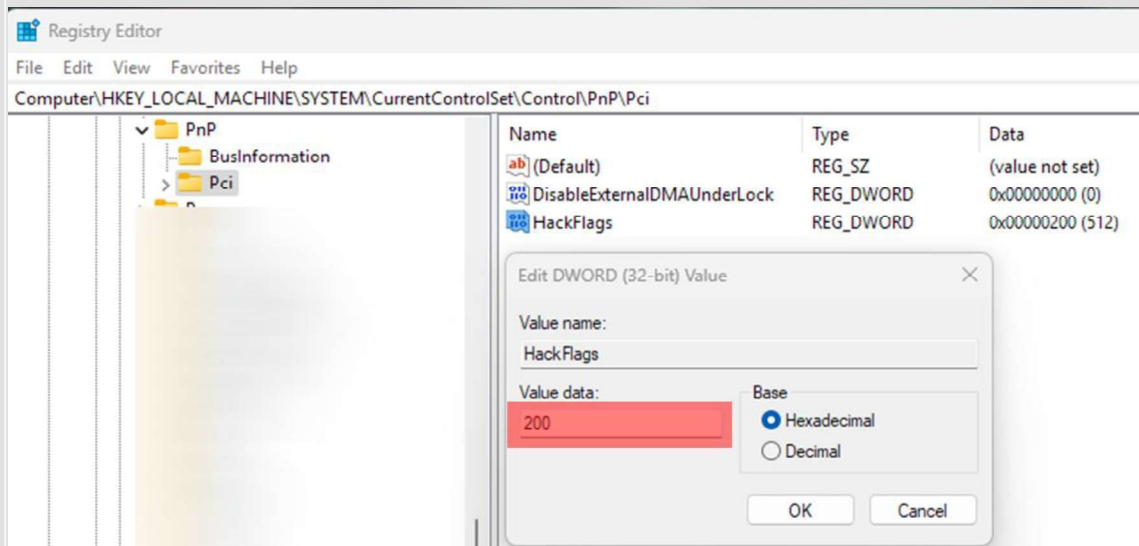
Solution (cont.)

#3-6-8

Group1: Intel PCI Express Root Port. (Description starts with Intel)
Group2: PCI Express Downstream/ Upstream Switch Port.

Step-3: Apply registry hack flags of 200 (Hex). Restart PC.

[Fail to attach PCI Express expansion chassis - Windows Client | Microsoft Learn](#)



4. Troubleshooting tips 3-6

3-6. one P600X Chassis device and one or two VNA device(s) are not shown correctly

Solution (cont.)

#3-6-8

Group1: Intel PCI Express Root Port. (Description starts with Intel)
Group2: PCI Express Downstream/ Upstream Switch Port.

Step-4: Disable some of the Intel® PCI Express Root Port (Group1).

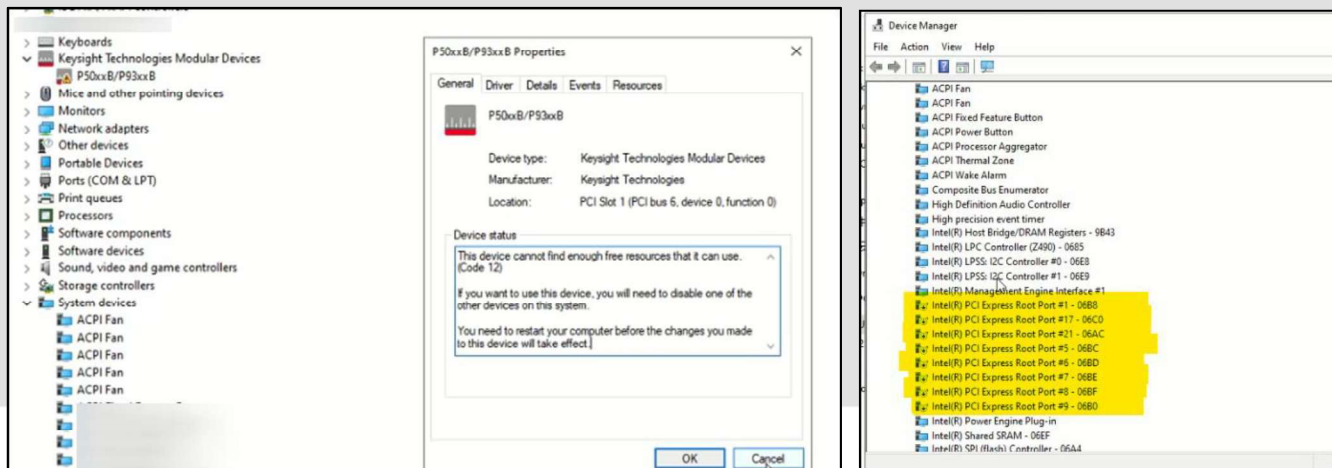
Step-5: Re-enable the PCI Express Upstream Switch Port (Group2) until P50xxB appears in Device Manager.

Note: At this stage, if B model remains undetected, repeat step-4 for every single Intel PCI Express Root Port (Group1) followed with step-5.

If the B model appears in Keysight Technologies Modular Devices group with Code 12 error, proceed with Step-6. Otherwise, proceed with step-7.

Step-6: Disable even more Intel PCI Express Root Port (Group1) until the B model appears correctly without Code 12.

Step-7: Once it is correctly recognised, re-enable the devices previously disabled in Device Manager (Group1 & Group2)



4. Troubleshooting tips 3-7

3-7. one P600X is not connected in Attached Thunderbolt™ device [for Streamline Series VNA B model only]

| Symptom | Possible root cause | Solution |
|--|---|---|
| #3-7-1 P600X is not shown | Chassis drivers are missing or broken | Go to Troubleshooting tips 2-5 |
| #3-7-2 P600X is shown, but is not connected | Old version of Thunderbolt Control Center app requests user to approve to connect P600X as Thunderbolt device | <ol style="list-style-type: none"> ① Enter Thunderbolt at Windows Search ② Select Thunderbolt Control Center ③ Select hamburger menu ④ Select Approve devices ⑤ Select Keysight Technologies, P600X ⑥ Select Always connect |

The screenshots show the following steps:

- Windows search for "thunderbolt" (Step 1).
- Selecting "Thunderbolt™ Control Center App" (Step 2).
- Selecting the hamburger menu icon (Step 3).
- Selecting "Approve devices" (Step 4).
- Selecting "Keysight Technologies, P600X" (Step 5).
- Selecting "Always connect" (Step 6).

4. Troubleshooting tips 3-7

3-7. one P600X is not connected in Attached Thunderbolt™ device [for Streamline Series VNA B model only]

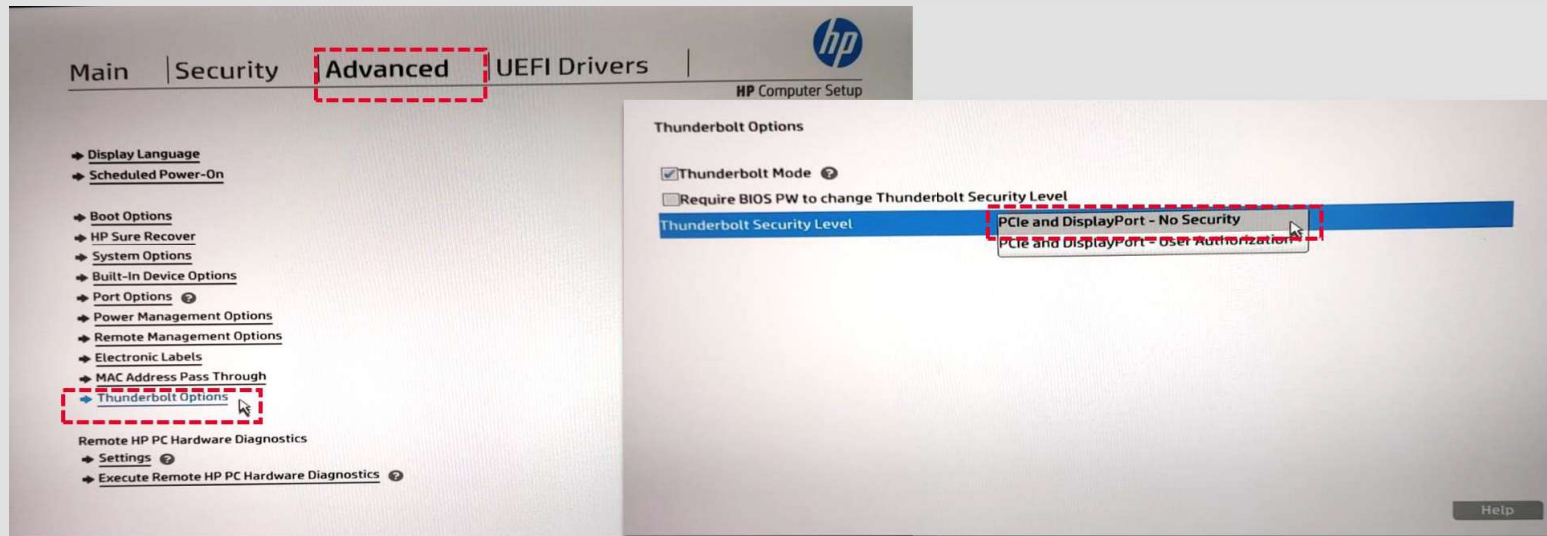
Solution (Cont.)

#3-7-2

To pre-approve Thunderbolt device connection for every device

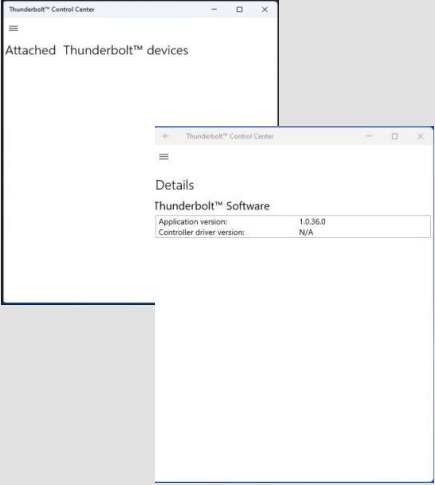
- ① Re-boot into BIOS (UEFI) settings
- ② Select “PCIe and Display Port – No Security” in Thunderbolt Options
- ③ Save changes and restart the PC

Below are the HP BIOS settings samples.



4. Troubleshooting tips 3-7

3-7. one P600X is not connected in Attached Thunderbolt™ device [for Streamline Series VNA B model only]

| Symptom | Possible root cause | Solution |
|--|---|--|
| <p>#3-7-3 P600X is not shown in Thunderbolt Control Center application on PC of Windows 11 OS .</p>  <p>The screenshot shows two windows of the Thunderbolt Control Center application. The top window is titled 'Thunderbolt™ Control Center' and has a header 'Attached Thunderbolt™ devices'. The bottom window is also titled 'Thunderbolt™ Control Center' and has a header 'Details'. Under 'Details', it says 'Thunderbolt™ Software' and lists 'Application version: 1.0.36.0' and 'Controller driver version: N/A'.</p> | <p>P50xxB/P93xxB is connected to PC of Gen12 or later CPU with Windows 11 OS through USB4 connection manager.</p> | <p>This is not an issue on PC of Gen12 or later CPU with Windows 11 OS, when Keysight Connection Expert shows the required devices. No action is required.</p> <p>Introduction to the USB4 connection manager in Windows Microsoft Learn</p> |

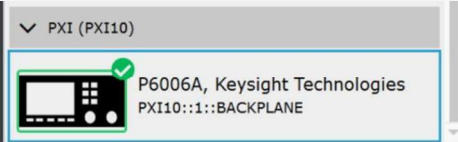
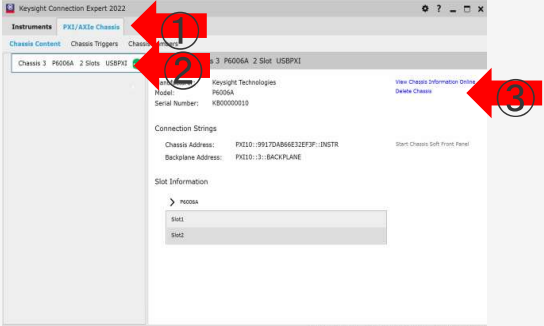
4. Troubleshooting tips 3-8

3-8. One chassis and one or two VNA device(s) are not shown in Keysight Connection Expert

| Symptom | Possible root cause | Solution |
|--|--|---|
| #3-8-1 P6001A,P6002A,P6005A or P6006A is not shown | Chassis drivers are missing or broken | Go to Troubleshooting tips 2-5 |
| #3-8-2 P50xxA, P93xxA, P50xxB, P93xxB is not shown | #1. Instrument drivers are missing or broken. #2. IVI drivers are missing or broken or #3. PC cannot allocate enough free Kernel memory resource for PCIe | #1. Go to Troubleshooting tips 2-5 #2. Go to Troubleshooting tips 2-4 #3. Go to Troubleshooting tips #3-6-1 for Streamline Series VNA B model with 2 modules |

4. Troubleshooting tips 3-8

3-8. One chassis and one or two VNA device(s) are not shown in Keysight Connection Expert

| Symptom | Possible root cause | Solution |
|--|--|---|
| <p>#3-8-3 P6001A or P6002A is shown under PXI (PXI0)</p> | | <p>Launch Keysight Connection Expert</p> <ol style="list-style-type: none">① Click PXI/AXIe Chassis② Select P6001A or P6002A③ Click Delete Chassis④ Close Keysight Connection Expert and re-boot the PC |
| <p>#3-8-4 P6005A or P6006A is shown under PXI (PXI10)</p>  | <p>Device Manager cannot recognize PXI Chassis</p> | <p>Launch Keysight Connection Expert</p> <ol style="list-style-type: none">① Click PXI/AXIe Chassis② Select P6005A or P6006A③ Click Delete Chassis  <ol style="list-style-type: none">④ Close Keysight Connection Expert and re-boot the PC |

4. Troubleshooting tips 3-8

3-8. One chassis and one or two VNA device(s) are not shown in Keysight Connection Expert

| Symptom | Possible root cause | Solution |
|--|---------------------|----------|
| #3-8-5 P50xxA, P93xxA is shown under PXI (PXI0) | | |
| #3-8-6 P50xxB, P93xxB is shown under PXI (PXI10) | | |

4. Troubleshooting tips 3-9

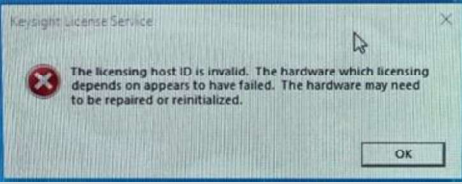
3-9. required license is not shown in Keysight License Manager

| Symptom | Possible root cause | Solution |
|---|---|---|
| #3-9-1 No license is shown | Agilent License Service/ Keysight License Service stopped | Go to Troubleshooting tips #3-5 |
| #3-9-2 A certain license is missing | | <ol style="list-style-type: none">① Go to http://www.keysight.com/find/softwaremanager② Enter Order Number and Certificate Number of your Streamline Series VNA③ Select Find Certificate④ Get the license⑤ Install the license |
| #3-9-3 “The Agilent License Service was unable to start. The licensing host ID is invalid” error message is shown | | Go to Troubleshooting tips #1-2 Step-3 |



4. Troubleshooting tips 3-9

3-9. required license is not shown in Keysight License Manager

| Symptom | Possible root cause | Solution |
|---|---------------------|--|
| <p>#3-9-4 The licensing host ID is invalid.</p>  | | Go to Troubleshooting tips #1-2 Step-3 |
| | | |

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-1
Fail to read FPGA of Pxxxxx
(chassis x, slot x) is shown while
Initializing hardware.



Possible root cause

VNA firmware was not able to read FPGA
on Analog Module

Solution

Go to [Troubleshooting Tips #3-10-4](#)

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

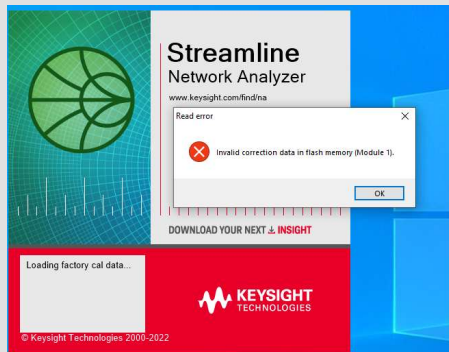
Possible root cause

Solution

#3-10-2
Invalid correction data in Flash memory (Module1) is shown while loading factory cal data.

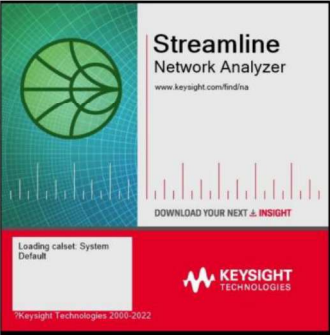
Factory calibration data is corrupted.

Return it to Keysight for calibration



4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

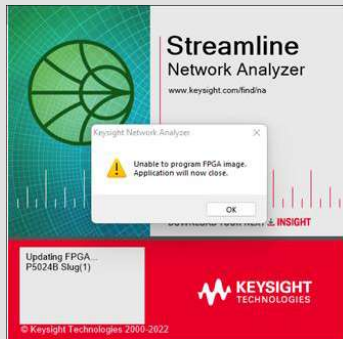
| Symptom | Possible root cause | Solution |
|--|--|---|
| <p>#3-10-3 VNA firmware halts at “Loading Calset”</p>  <p>The screenshot shows the Streamline Network Analyzer software interface. At the top, it says 'Streamline Network Analyzer' with the website 'www.keysight.com/find/na'. Below that is a red banner with the text 'DOWNLOAD YOUR NEXT INSIGHT'. The main area displays a graph with a red line. At the bottom, a red box contains the text 'Loading calset: System Default' and the Keysight Technologies logo. The footer reads '© Keysight Technologies 2000-2022'.</p> | <p>Combination issue between VNA firmware and HPP5.3</p> | <p>Install VNA firmware A.15.75.22 or newer</p> |

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-4
“Unable to program FPGA image.
Application will now close”
message is shown, while updating
VNA FPGA.



Possible root cause

When FPGA image in VNA is different from the one in VNA firmware, VNA firmware attempts to load the FPGA image to VNA chassis. During this process, a time out error may occur.

The root cause of this issue is due to declined Thunderbolt signal quality on PCIe Thunderbolt card for Desktop PC or Thunderbolt cable.

Solution

Step-1:

- ① Install VNA firmware A.19.30.21 or newer
- ② Launch Network Analyzer (See [3-10](#))

4. Troubleshooting tips 3-10

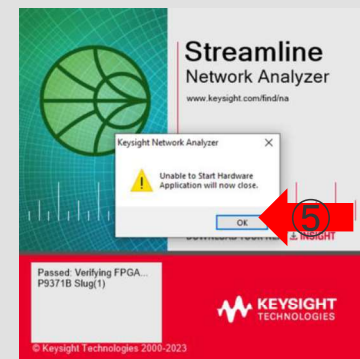
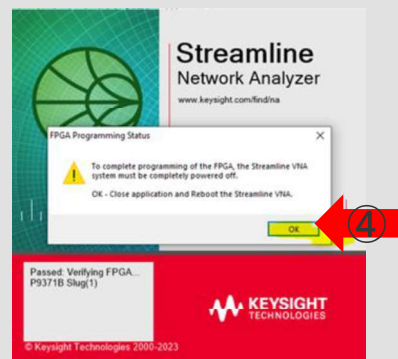
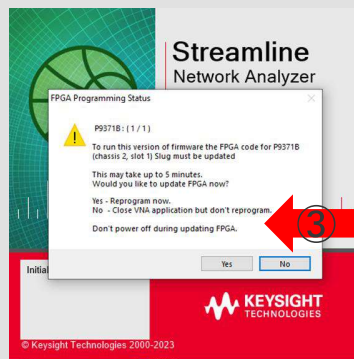
3-10. VNA firmware halts or shows error message

Solution (Cont.)

#3-10-4

Step-1:

- ③ FPGA Programming Status pops up, then click Yes
- ④ FPGA Programming Status pops up and click OK, then launch Network Analyzer (See [3-10](#)).
- ⑤ The following message pops up, then click OK



- ⑥ Launch Network Analyzer (See [3-10](#)), again

4. Troubleshooting tips 3-10

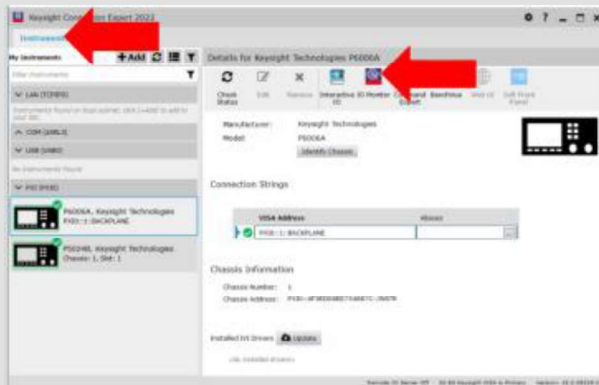
3-10. VNA firmware halts or shows error message

Solution (Cont.)

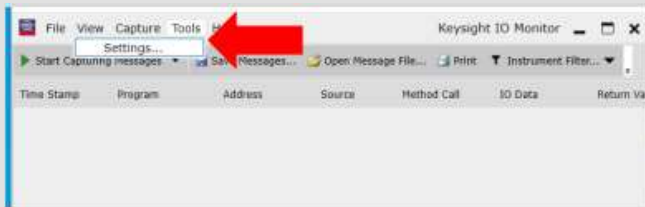
#3-10-4

Step-2: If the symptom still occurs, follow the steps from ① to ⑩ as IO monitor workaround

- ① Open Keysight Connection Expert as administrator
- ② Click Instrument and click IO Monitor



- ③ Select Tools and Settings...



4. Troubleshooting tips 3-10

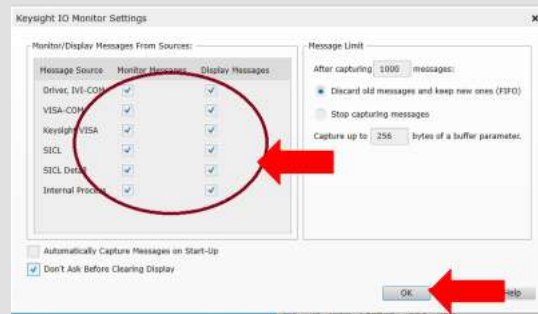
3-10. VNA firmware halts or shows error message

Solution (Cont.)

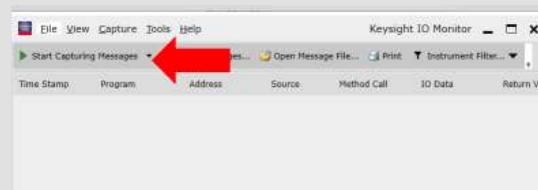
#3-10-4

Step-2:

- ④ Check every single IO log capture source and click OK



- ⑤ Click Start Capturing Message in IO Monitor



- ⑥ Launch Network Analyzer (See [3-10](#))
Note that the message are captured in Keysight IO Monitor

4. Troubleshooting tips 3-10

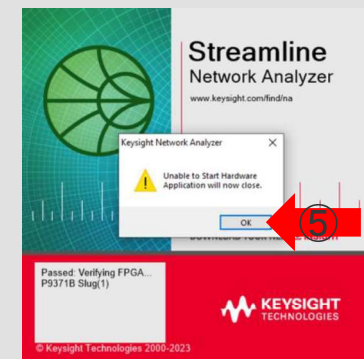
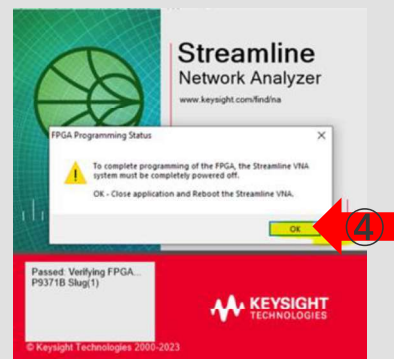
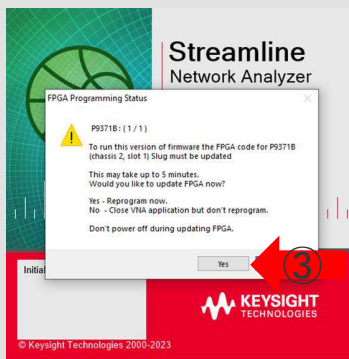
3-10. VNA firmware halts or shows error message

Solution (Cont.)

#3-10-4

Step-2:

- ⑦ FPGA Programming Status pops up, then click Yes
- ⑧ FPGA Programming Status pops up and click OK, then launch Network Analyzer (See [3-10](#)).
- ⑨ The following message pops up, then click OK



- ⑩ Launch Network Analyzer (See [3-10](#)), again

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Solution (Cont.)

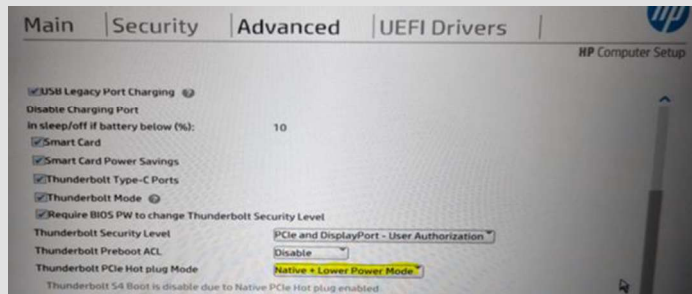
#3-10-4

Step-3: If the symptom still occurs, go to [Troubleshooting tips #3-3-2](#) to check status LED

Step-4: If the symptom still occurs, check if the Thunderbolt PCIe Hot plug Mode in BIOS (UEFI) setting is Legacy Mode.

- ① Re-boot into BIOS (UEFI) settings.
- ② If Thunderbolt PCIe Hot plug mode is “Legacy Mode”, change it to “Native + Low Power Mode”.

Below is the HP BIOS settings sample.



Step-5: If the above BIOS setting does not exit and the symptom still occurs, try the followings.

- Use [known-good cable](#)
- Use another known-good laptop PC
- Use PCIe Thunderbolt card for desktop PC which the desktop PC maker recommends

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-5
“Self test failure: Sweep timeout”
error message is shown



Possible root cause

Interconnect cables for LO or control cable is not connected properly or broken.

Solution

- ① Check if the control cable (Black) is connected properly. If the connection is missing or loosened, connect it and tighten it with the nuts as shown in the image below.
- ② If the symptom still occurs, replace the control cable.



1 VNA operation
of [Streamline Series VNA A model with 2 modules](#) or
of [Streamline Series VNA B model with 2 modules](#)

control cable

2 VNA operation



nuts



[2 VNA multipoint connection]

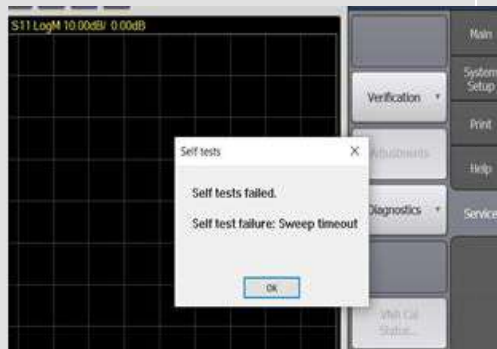
Refer to https://helpfiles.keysight.com/csg/pxivna/S0_Start/Multipoint_and_Multisite_Configuration.htm#P937xA_Multipoint_VNA

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-5
“Self test failure: Sweep timeout”
error message is shown



Possible root cause

Incorrectly configured chassis number for primary and secondary chassis in Connection Expert/ IOLS.

Solution

① Check if the control cable is connected in the correct direction. To configure a unit into a primary chassis, it needs to be assigned with a lower chassis# in IOLS than secondary chassis.

Primary chassis will always output Ctrl-M and LO-out signal into secondary chassis Ctrl-S and LO-in.

[2 VNA multipoint connection]

Refer to

https://helpfiles.keysight.com/csg/pxivna/S0_Start/Multipoint_and_Multisite_Configuration.htm#P937xA_Multipoint_VNA

Note: In the multipoint configuration using 2 modules, it is critical that the correct chassis number be assigned to the “primary” chassis. The primary chassis must have the lowest chassis number.

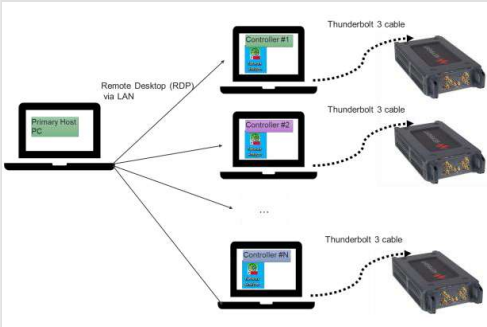
4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

| Symptom | Possible root cause | Solution |
|--|---|---|
| <p>#3-10-6 [Streamline Series VNA B model only] Hot plug-in/out¹ of VNA is not working correctly on non-English (Traditional Chinese and Simplified Chinese) OS. PC re-boot is required to recognize the VNA after hot plug-in.</p> <p>Note: 1. Hot plug-in/out is a function that PC can recognize Thunderbolt device while connecting or disconnecting Thunderbolt cable without re-booting the PC.</p> | <p>KtPUsbChassis IVI.NET driver 1.1.8 and KtPUsbChassis IVI-C driver 1.1.8 cannot handle non-English code properly.</p> | <p>Install VNA firmware A.15.75.22 or newer</p> |

4. Troubleshooting tips 3-10

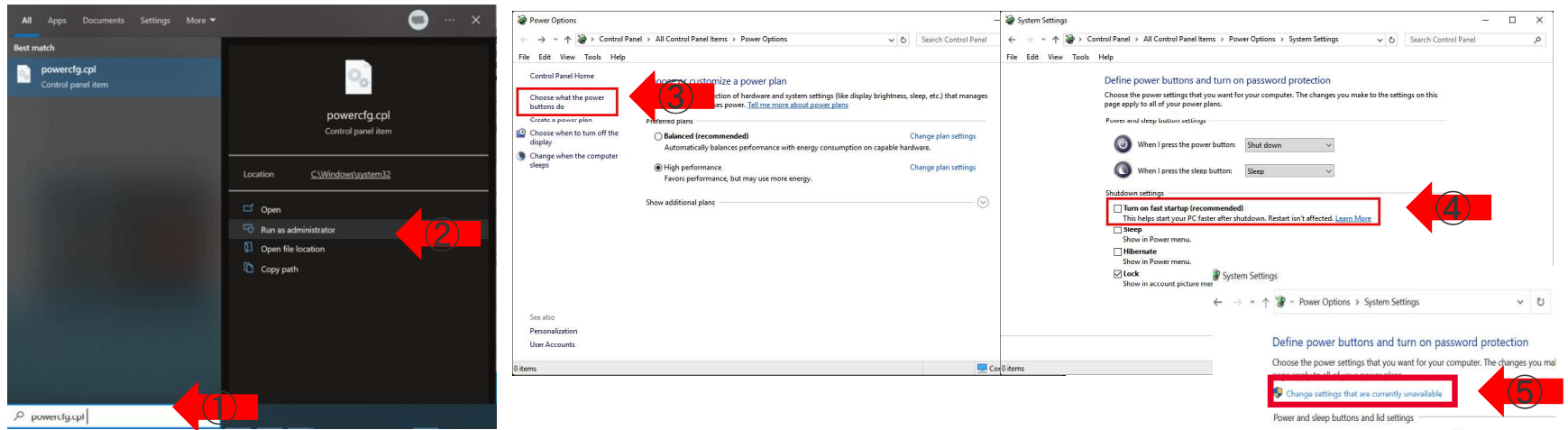
3-10. VNA firmware halts or shows error message

| Symptom | Possible root cause | Solution |
|--|---|---|
| <p>#3-10-7 [Streamline Series VNA B model only] When user tries to access Streamline B model remotely via Remote Desktop (remote logon after controller PC reboot), Streamline B model cannot be recognized until user manually logon the controller PC with physical keyboard.</p>  | <p>Windows Kernel DMA Protection blocks an external access to Thunderbolt device.</p> <p><i>When Kernel DMA Protection is enabled: Peripherals with DMA Remapping-compatible device drivers are automatically enumerated and started Peripherals with DMA Remapping-incompatible drivers are blocked from starting if the peripheral was plugged in before an authorized user logs in, or while the screen is locked. Once the system is unlocked, the peripheral driver is started by the OS, and the peripheral continues to function normally until the system is rebooted, or the peripheral is unplugged. The peripheral will continue to function normally if the user locks the screen or signs out of the system. Kernel DMA Protection Microsoft Learn</i></p> | <p>Solution 1: Disable Kernel DMA Protection. For more information on how this works and how to prevent it, refer to the following document from Microsoft and configure it appropriately https://docs.microsoft.com/en-us/windows/security/information-protection/kernel-dma-protection-for-thunderbolt</p> <p>Solution 2: Enable auto-logon to Windows. If user intends to enable the Kernel DMA Protection function, configure the controller PC to enable auto-logon upon reboot. For more information on how this works, refer to the following document from Microsoft and configure it appropriately. https://learn.microsoft.com/en-us/sysinternals/downloads/autologon</p> |

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

| Symptom | Possible root cause | Solution |
|---|--|---|
| #3-10-8 [Streamline Series VNA B model only] When PC is resumed, Streamline B model cannot be recognized. | Fast Startup disconnects Thunderbolt device. | Disable Fast Startup. ① Enter powercfg.cpl at Windows Search ② Execute powercfg.cpl with administrator privilege ③ Select “Choose what the power buttons do” from the menu on left. ④ Uncheck the box of “Turn on fast startup”. ⑤ If these options are greyed out, then select “Change settings that are currently unavailable” and go to ④ again |



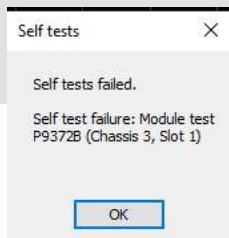
4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-9

VNA shuts down intermittently, after running for an extended period of time. Sometimes error like “Self test failure: Module test Pxxxx (Chassis x, Slot x) is shown



Possible root cause

One of possible cause is overheating.

[Streamline Series VNA A model only]

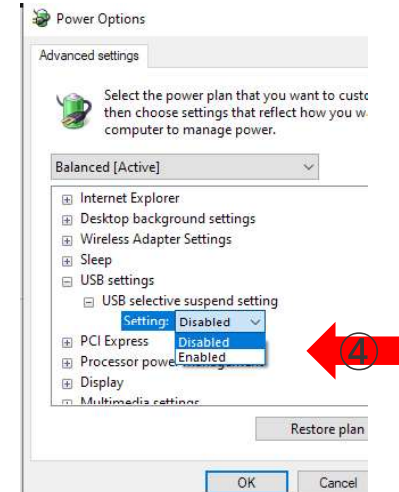
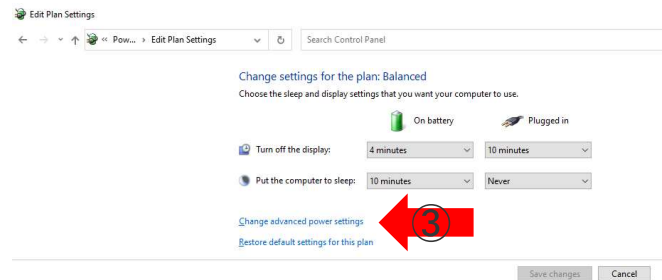
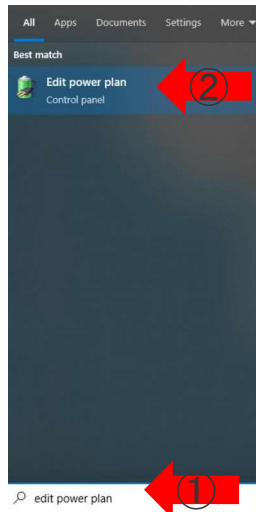
Another possible cause is Windows power settings interfering with VNA operation

Solution

Remove dust and air blockage from around the VNA, increase airflow however possible

Disable automatic USB shutoff in Windows

- ① Enter Edit power plan at Windows Search
- ② Select Edit power plan
- ③ Select Change advanced power settings
- ④ Navigate to USB settings > USB selective suspend setting and turn this Disabled:



4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Solution (cont.)

#3-10-9

Disable automatic USB shutoff in Windows.

- ① Enter Computer Management at Windows Search
- ② Execute Computer Management with administrator privilege
- ③ Navigate to Device Manager > View > Devices by connection
- ④ Navigate to ACPI x64-based PC > Microsoft ACPI-Compliant System > PCI Express Root Complex > Intel® USB 3.10 eXtensible Host Controller – 1.20 (Microsoft) > the Keysight devices labelled "P50xx USB VNA" and "P600X Chassis"
- ⑤ Select the USB Root hub one level above these items and open Properties
- ⑥ Uncheck "Allow the computer to turn off this device to save power" in the Power Management tab

The screenshot illustrates the steps to disable automatic USB shutoff in Windows. It shows the Windows Search interface with 'Computer Management' entered. The 'Computer Management' window is open, showing the 'Device Manager' tab. The 'View' menu is open, and 'Devices by connection' is selected. The 'Device Manager' window shows the hierarchy: 'ACPI x64-based PC' > 'Microsoft ACPI-Compliant System' > 'PCI Express Root Complex' > 'Intel® USB 3.10 eXtensible Host Controller – 1.20 (Microsoft)'. The 'USB Root Hub (USB 3.0)' is selected, and its context menu is open, showing 'Properties'. The 'USB Root Hub (USB 3.0) Properties' dialog box is open, showing the 'Power Management' tab. The checkbox 'Allow the computer to turn off this device to save power' is unchecked.

① computer management

② Run as administrator

③ Devices by connection

④ ACPI x64-based PC

⑤ Properties

⑥ Allow the computer to turn off this device to save power

KEYSIGHT

4. Troubleshooting tips 3-10


3-10. VNA firmware halts or shows error message

Solution (cont.)

| | |
|---------|--|
| #3-10-9 | If the symptom still occurs, return it to Keysight for repair. |
|---------|--|

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

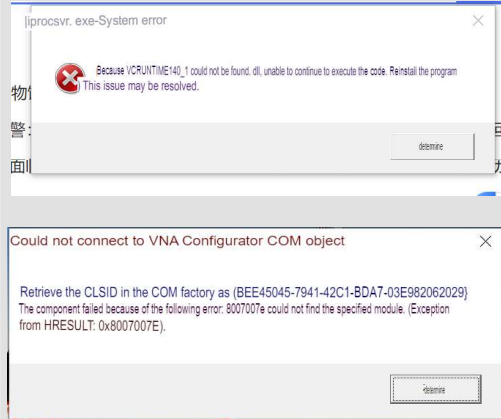
| Symptom | Possible root cause | Solution |
|--|---|---|
| <p>#3-10-10 DSP Execution Error is shown</p>  | <p>When DSP cannot receive the whole measurement data within the specified time, this error message is shown.</p> <p>There are some root causes found.</p> <p>#1. Command list size is bigger than FPGA processing capability</p> <p>#2. Contact failure due to</p> <ul style="list-style-type: none">• PCIe connector lubricant• control cable connector contamination• control cable physical stress.• solder residual on backplane board• flux residual on backplane board | <p>Step1: Check if control cable is connected properly. Go to Troubleshooting tips #3-10-5.</p> <p>Step2: If the symptom still occurs, try Workaround for #1. Workaround for #1 If user measures multiple sweeps per channel, VNA firmware sends one command list per channel. Keysight workaround proposal is to send one command per sweep. Ask Keysight for more details.</p> <p>Step3: If the symptom occurs continuously, return it to Keysight for repair.</p> |

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-11
DLL & COM error is shown.



Possible root cause

Microsoft Visual C++ 2015-2019 versions are missing or corrupted.

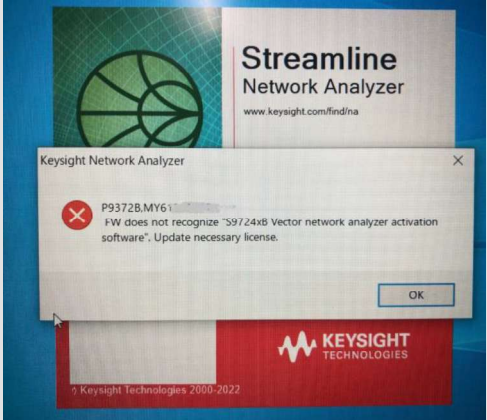
Solution

Download and install [x64 for Visual C++ 2015/2017/2019](#) from [Latest supported Visual C++ Redistributable downloads | Microsoft Learn](#)

Refer to [VCRUNTIME140_1.dll Missing: where to get? - Microsoft Community](#)

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

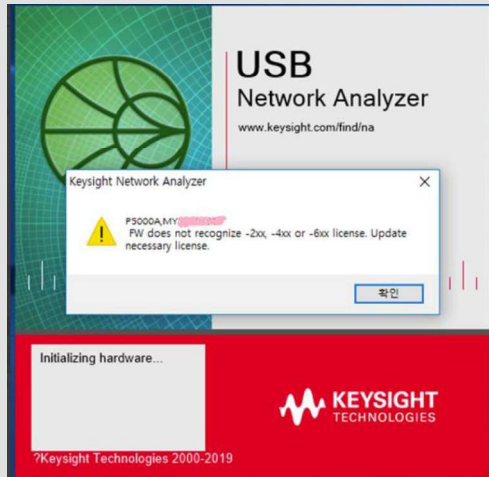
| Symptom | Possible root cause | Solution |
|---|---|---|
| <p>#3-10-12 FW does not recognize "S97824xB Vector network analyzer activation software" Update necessary license pop-up is shown.</p>  | <p>FW bug to check the required license</p> | <p>Install VNA firmware A.15.60.05 or newer</p> |

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-13
FW does not recognize -2xx,-4xx
or -6xx license. Update necessary
license pop-up is shown.



Possible root cause

KLM license is expired

Solution

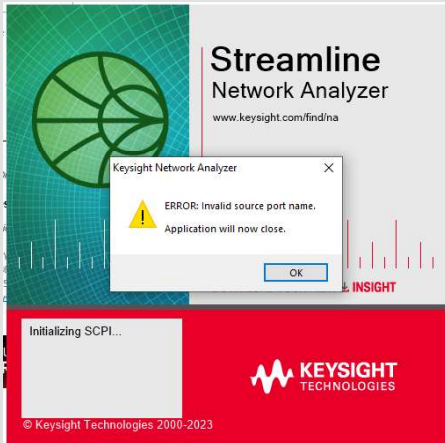
Check the license in Keysight License Manager
Update necessary license, if the license is expired.

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-14
Invalid source port name error is shown.



Possible root cause

VNA firmware detects a different number of physical source ports than the installed option

Solution

- ① Uninstall VNA firmware and delete the below folders.
C:\ProgramData\Keysight\Network Analyzer
C:\Program Files\Keysight\Network Analyzer
C:\Users\Public\Public Documents\Network Analyzer
- ② Install the latest VNA firmware again

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-15
The trigger operation failed.
Application will now close error is shown.

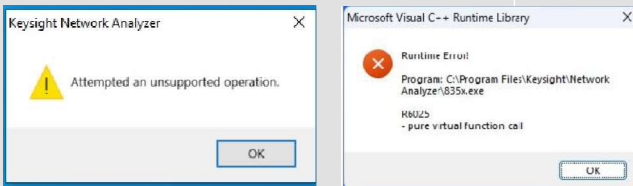


Possible root cause

Interconnect cables for LO or control cable is not connected properly or broken.

Solution

Go to [Troubleshooting tips #3-10-5](#)

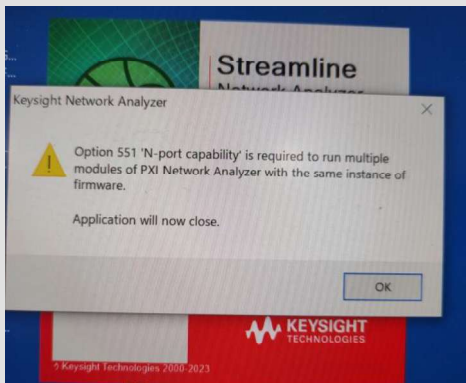


4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-16
Option 551 'N-port capability' is required error is shown.



Possible root cause

S97551B-1FP license is not loaded to Keysight License Manager.

Solution

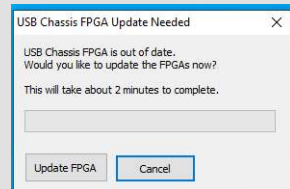
Go to [Troubleshooting tips #3-9-2](#)

4. Troubleshooting tips 3-10

3-10. VNA firmware halts or shows error message

Symptom

#3-10-17
During USB Chassis FPGA Update, “Failed to retrieve model number from VNAParser.exe, application will exit.” error and “VNA Parser has encountered a problem” error are shown.

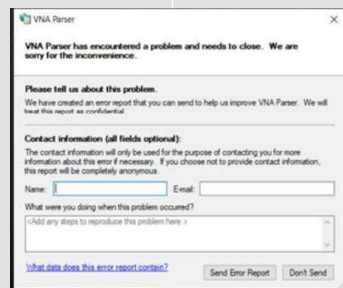


Possible root cause

SCPII parser is crashed during VNA FW installation.

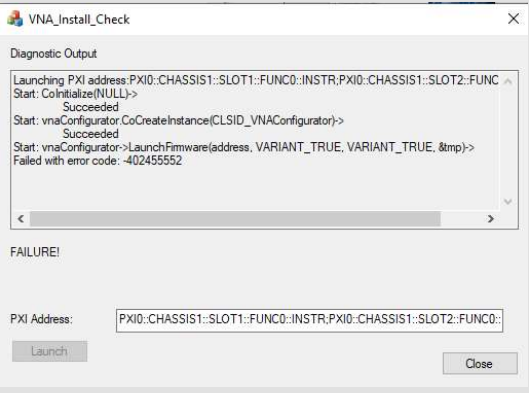
Solution

Go to [Troubleshooting Tips#3-10-4](#) Step-2.



4. Troubleshooting tips 3-10

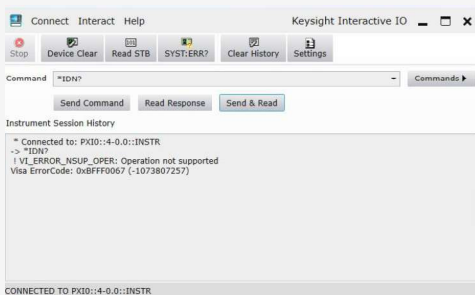
3-10. VNA firmware halts or shows error message

| Symptom | Possible root cause | Solution |
|---|---------------------|--|
| #3-10-18 Other VNA firmware installation issue | | <p>Further investigation is required to solve the VNA firmware installation issue.</p> <ol style="list-style-type: none">① Download the diagnostic tool (VNA_Install_Check.exe) from https://files.keysight.com/dl/ljMqqBP1rm② Launch the diagnostic tool③ If you see Failure!, copy the Diagnostic Output and send it to Keysight.  <p>The screenshot shows a window titled 'VNA_Install_Check' with a 'Diagnostic Output' section. The output text is as follows:</p> <pre>Launching PXI address:PXI0:CHASSIS1::SLOT1::FUNC0::INSTR;PXI0:CHASSIS1::SLOT2::FUNC0: Start: CoInitialize(NULL)-> Succeeded Start: vnaConfigurator.CoCreateInstance(CLSID_VNAConfigurator)-> Succeeded Start: vnaConfigurator->LaunchFirmware(address, VARIANT_TRUE, VARIANT_TRUE, &tmp)-> Failed with error code: -40245552</pre> <p>Below the output, the word 'FAILURE!' is displayed. At the bottom, there is a 'PXI Address:' label with a text box containing 'PXI0:CHASSIS1::SLOT1::FUNC0::INSTR;PXI0:CHASSIS1::SLOT2::FUNC0:'. There are 'Launch' and 'Close' buttons at the bottom of the window.</p> |

4. Troubleshooting tips 3-11

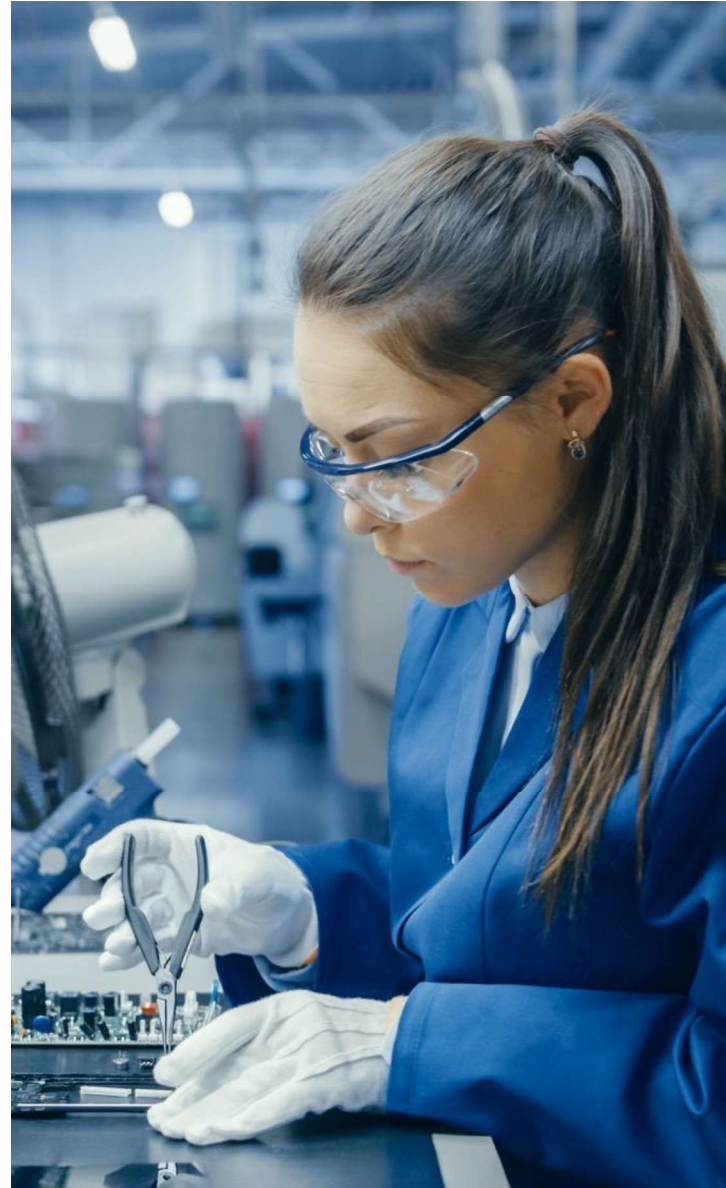
3-11. Remote communication does not work well

| Symptom | Possible root cause | Solution |
|--|--|--|
| #3-11-1 Device Licenses Changed dialog is not shown. | Agilent License Service is not working | Go to Troubleshooting tips #3-5-1 |
| #3-11-2 *IDN? shows ! VI_ERROR_NSUP_OPER: Operation not supported Visa ErrorCode: 0xBFFF0067 (-1073807257) | Remote Interface is not set up correctly | Go to 3-11. Communicate remotely using LAN (TCPIP) |



Appendix

- [Thunderbolt PC and Streamline Series VNA B model compatibility list](#)
- [PC makers' driver download page](#)
- [Proven latest versions](#)
- [VNA firmware revision history](#)
- [Contact Keysight – Issue sharing](#)



Thunderbolt 3 PC and Streamline Series VNA B model compatibility list

PCs with Thunderbolt 3 interface in the list are verified to work with P50xxB/P93xxB VNAs

| PC Maker | PC model name | CPU Gen - Code name | CPU | OS | Microsoft Windows | BIOS | Thunderbolt Controller (chipset) Gen | # of Thunderbolt3 connectors | Single VNA operation (1module model) ¹ | Single VNA operation (2modules model) ² | Two VNA operation (star topology) ³ | Two VNA operation (daisy topology) ⁴ | Verified by |
|---------------------------|--------------------------|------------------------------------|----------------------|-------------------------------|-------------------|------------------------------|--------------------------------------|------------------------------|---|--|--|---|-------------|
| Laptop/Mobile workstation | | | | | | | | | | | | | |
| Dell | Latitude 7410 | 10 th Gen - Comet Lake | Intel Core i7-10810U | Windows 10 Business (x64) | | 1.19.0, 11/7/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | end user |
| Dell | Precision 5530 | 8 th Gen - Coffee Lake | Intel Core i7-8850H | Windows 11 Professional (x64) | | 1.31.0, 3/13/2023 | 15D9 | 1 | Pass | Pass | N/A | Pass | Keysight |
| Dell | Precision 5540 | 9 th Gen - Coffee Lake | Intel Xeon E-2276M | Windows 10 Professional (x64) | | 1.23.0, 7/18/2023 | unknown | 1 | Pass | Pass | N/A | Pass | end user |
| Dell | Precision 5550 | 10 th Gen - Comet Lake | Intel Core i7-10750H | Windows 10 Professional (x64) | | 1.6.1, 1/14/2021 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 7550 | 10 th Gen - Comet Lake | Intel Core i7-10850H | Windows 10 Professional (x64) | | 1.22.0, 3/21/2023 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | XPS 15 9560 | 7 th Gen - Kaby Lake | Intel Core i7-7700HQ | Windows 10 Professional (x64) | | 1.22.1, 3/24/2021 | unknown | 1 | Pass | not tested | N/A | not tested | end user |
| HP | EliteBook 830 G6 | 8 th Gen - Whiskey Lake | Intel Core i5-8365U | Windows 10 Professional (x64) | | R70 Ver 01.12.20 | 15EB | 1 | Pass | not tested | N/A | not tested | end user |
| HP | EliteBook 830 G7 | 10 th Gen - Comet Lake | Intel Core i5-10210U | Windows 10 Professional (x64) | | unknown | 15EB | 2 | Fail | not tested | not tested | not tested | end user |
| HP | EliteBook 840 G5 | 8 th Gen - Coffee Lake | Intel Core i5-8350U | Windows 10 Enterprise (x64) | | unknown | 15E8 | 1 | Pass | not tested | not tested | not tested | end user |
| HP | EliteBook 840 G6 | 8 th Gen - Whiskey Lake | Intel Core i5-8365U | Windows 10 Professional (x64) | | R70 Ver.01.20.00, 5/10/2022 | 15E8 | 1 | Pass | Pass | N/A | Fail | end user |
| HP | EliteBook 840 G7 | 10 th Gen - Comet Lake | Intel Core i5-10310U | Windows 10 Professional (x64) | | S70 Ver.01.09.00, 5/10/2022 | 15EB | 1 | Pass | Pass ⁵ | N/A | Pass | Keysight |
| HP | ZBook 15 G4 | 7 th Gen - Kaby Lake | Intel Core i7-7028HQ | Windows 10 Professional (x64) | | P70 Ver.01.41, 4/29/2022 | 15EB ⁶ | 2 | Pass | not tested | not tested | not tested | end user |
| HP | ZBook 15 G5 | 8 th Gen - Coffee Lake | Intel Core i7-8850H | Windows 10 Professional (x64) | | Q70 Ver 01.19.00, 1/27/2022 | 15EB | 2 | Pass | Pass | Pass | not tested | end user |
| HP | ZBook 15 G6 | 9 th Gen - Coffee Lake | Intel Core i9-9880H | Windows 10 Professional (x64) | | R92 Ver 01.23.00, 11/29/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | Zbook Power G7 | 10 th Gen - Comet Lake | Intel Core i7-10850H | Windows 10 Enterprise (x64) | | T75 Ver 01.12.00, 3/1/2023 | 15EB | 1 | Pass | Pass | N/A | Pass | Keysight |
| HP | ZBook Studio G7 | 10 th Gen - Comet Lake | Intel Core i7-10750H | Windows 10 Professional (x64) | | S91 Ver.01.90.00, 5/10/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | ZBook Firefly 14 G7 | 10 th Gen - Comet Lake | Intel Core i7-10810U | Windows 10 Professional (x64) | | S70 Ver.01.03.02, 4/11/2020 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | ZBook Firefly 14 G7 | 10 th Gen - Comet Lake | Intel Core i7-10810U | Windows 10 Professional (x64) | | S70 Ver.01.12.00, 4/1/2023 | 15EB | 2 | Fail | not tested | not tested | not tested | Keysight |
| Lenovo | ThinkPad P1 Gen2 | 9 th Gen - Coffee Lake | Intel Core i7-9850H | Windows 10 Professional (x64) | | unknown | 15EB | 2 | Pass | not tested | not tested | not tested | end user |
| Lenovo | ThinkPad P52 | 8 th Gen - Coffee Lake | Intel Core i7-8750H | Windows 10 Professional (x64) | | N2CET67W (1.50), 12/15/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| Lenovo | ThinkPad P53 | 9 th Gen - Coffee Lake | Intel Core i7-9850H | Windows 10 Professional (x64) | | N2NUJ21W (1.36), 3/30/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| Lenovo | ThinkPad X1 Carbon Gen 8 | 10 th Gen - Comet Lake | Intel Core i7-10510U | Windows 10 Home (x64) | | N2WUJ22W (1.26), 4/27/2022 | 15D2 | 2 | Pass | not tested | not tested | not tested | end user |
| LG | gram 14Z90N-VR51J | 10 th Gen - Ice Lake | Intel Core i5-1035G7 | Windows 10 Home (x64) | | C2ZE0210 X64, 02/02/2022 | 8A17 | 1 | Pass | Pass ⁵ | N/A | not tested | end user |
| LG | gram 15ZB95N | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Enterprise (x64) | | unknown | 15EB | 1 | Pass | Pass ⁵ | N/A | not tested | end user |
| Panasonic | CF-LV8RD7VS | 8 th Gen - Whiskey Lake | Intel Core i5-8365U | Windows 10 Professional (x64) | | unknown | 15D9 | 1 | Pass | not tested | N/A | not tested | end user |
| Panasonic | CF-SV9 | 10 th Gen - Ice Lake | Intel Core i5-10210U | Windows 10 Professional (x64) | | 005142, 11/20/2023 | unknown | 1 | Pass | not tested | N/A | not tested | end user |
| Toshiba | Dynabook UZ63/L | 8 th Gen - Whiskey Lake | Intel Core i7-8565U | Windows 10 Home (x64) | | v4.10, 12/16/2021 | unknown | 2 | Pass | Pass | not tested | not tested | end user |

Note:

- 1 module model: P93xxB, P50xxB, P5020B-400/600, P5021B-400/600, P5022B-400/600, P5023B-400/600, P5024B-400/600
- 2 modules model: P5020B-402, P5021B-402, P5022B-402, P5023B-402, P5024B-402, P5025B, P5026B, P5027B, P5028B
- Two VNA operation with star topology requires two Thunderbolt ports on a single PC. This topology is not available with a PC with a single Thunderbolt port.
- Two VNA operation with daisy topology requires only one Thunderbolt port on a single PC. This topology is available with a PC with a single Thunderbolt port.
- If PC cannot detect 2 modules model with Code12 error in Device Manager, a registry change is required.
- Thunderbolt Controller chipset driver was copied from Zbook 15 G5.



Thunderbolt 3 PC and Streamline Series VNA B model compatibility list

PCs with Thunderbolt 3 interface in the list are verified to work with P50xxB/P93xxB VNAs

| PC Maker | PC model name | CPU Gen - Code name | CPU | OS | Microsoft Windows | BIOS | Thunderbolt Controller (chipset) Gen | # of Thunderbolt3 connectors | Single VNA operation (1module model) ¹ | Single VNA operation (2modules model) ² | Two VNA operation (star topology) ³ | Two VNA operation (daisy topology) ⁴ | Verified by |
|-----------------------------|--|-----------------------------------|------------------------|--|-------------------|--------------------------|--------------------------------------|------------------------------|---|--|--|---|-------------|
| Desktop | When configuring the PC on the manufacturer's website, you must select an option to include a PCIe Thunderbolt 3 card installed in the PC. | | | | | | | | | | | | |
| Dell | Optiplex 7070 Tower | 9 th Gen - Coffee Lake | Intel Core i7-9700 | Windows 10 Professional (x64) | | 1.0.3, 5/30/2019 | 15D2 | 2 | Pass | Pass | Fail | Fail | Keysight |
| Dell | Optiplex 7090 Tower | 10 th Gen - Comet Lake | Intel Core i9-10900K | Windows 11 Professional (x64) | | 1.15.0, 12/6/2021 | 15D2 ^{7.#} | 1 | Pass | Pass | N/A | Pass | Keysight |
| Dell | Precision 3660 Tower | 12 th Gen - Alder Lake | Intel Core i7-12700 | Windows 11 Professional (x64) for Workstations | | 2.2.0, 2/14/2023 | 15D2 ^{7.#} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 5820 Tower | 6 th Gen - Skylake | Intel Xeon W-2135 | Windows 10 Professional (x64) for Workstations | | 2.0.2, 2/27/2020 | 15D2 ^{9.#} | 2 | Pass | Pass | Fail | Fail | Keysight |
| HP | Z4 G4 | 6 th Gen - Skylake | Intel Xeon W-2123 | Windows 10 Enterprise (x64) | | P61 Ver.02.91, 3/22/2023 | 15D2 ⁹ | 2 | Pass ¹⁰ | Pass ^{5,10} | Pass ¹⁰ | Pass ^{5,10} | Keysight |
| HP | Z6 G4 | 6 th Gen - Skylake | Intel Xeon Silver 4114 | Windows 10 Professional (x64) for Workstations | | P60 Ver.02.91, 3/22/2023 | 15D2 ⁹ | 2 | Pass ¹⁰ | Pass ^{5,10} | Pass ¹⁰ | Pass ^{5,10} | Keysight |
| Mini-PC | | | | | | | | | | | | | |
| Asus | PN62 | 10 th Gen - Comet Lake | Intel Core i7-10710U | Windows 11 Professional (x64) | | 1006, 9/15/2022 | 15BF | 1 | Pass | Pass ⁵ | N/A | Pass ⁵ | Keysight |
| PXle embedded PC controller | | | | | | | | | | | | | |
| Keysight | M9038A | 9 th Gen - Coffee Lake | Intel Core i7-9850HE | Windows 10 Enterprise (x64) | | KS08.0, 7/25/2022 | 15EB | 2 | Pass | Pass | Pass | Pass | Keysight |
| Mother Board | | | | | | | | | | | | | |
| Asus | Prime H670-Plus D4 | 12 th Gen - Alder Lake | Intel H670 | unknown | | 2212, 1/12/2023 | 15EB ¹³ | 2 | Pass | not tested | not tested | not tested | end user |

| | | | | | | | | | | | | | |
|-------|---|--|--|--|--|--|--|--|--|--|--|--|--|
| Note: | | | | | | | | | | | | | |
| 1. | 1 module model: P93xxB, P500xB, P5020B-400/600, P5021B-400/600, P5022B-400/600, P5023B-400/600, P5024B-400/600 | | | | | | | | | | | | |
| 2. | 2 modules model: P5020B-402, P5021B-402, P5022B-402, P5023B-402, P5024B-402, P5025B, P5026B, P5027B, P5028B | | | | | | | | | | | | |
| 3. | Two VNA operation with star topology requires two Thunderbolt ports on a single PC. This topology is not available with a PC with a single Thunderbolt port. | | | | | | | | | | | | |
| 4. | Two VNA operation with daisy topology requires only one Thunderbolt port on a single PC. This topology is available with a PC with a single Thunderbolt port. | | | | | | | | | | | | |
| 5. | If PC cannot detect 2 modules model with Code12 error in Device Manager, a registry change is required. | | | | | | | | | | | | |
| 7. | tested with Thunderbolt 3 extended PCIe card, FH5T4 | | | | | | | | | | | | |
| 8. | tested with Thunderbolt 3 extended PCIe card, R9MN8 | | | | | | | | | | | | |
| 9. | tested with Thunderbolt 3 extended PCIe card, 3UU05AA | | | | | | | | | | | | |
| 10. | 3UU05AA is unstable to communicate with P50xxB/P93xxB. | | | | | | | | | | | | |
| | Known issues: (1) Only Port-A of Controller PC can communicate with P50xxB/P93xxB, due to PCIe resource limitations. | | | | | | | | | | | | |
| | (2) 2m/40Gbps Thunderbolt 3 active cable cannot communicate with P50xxB/P93xxB both on Port-A and on Port-B. | | | | | | | | | | | | |
| 13. | tested with Thunderbolt 3 extended PCIe card, ThunderboltEX 3-TR (ASUS) | | | | | | | | | | | | |
| * | FPGA update pass with IO monitor workaround (#3-10-4 Step-2) | | | | | | | | | | | | |
| #. | BSOD occurs when launching VNA firmware | | | | | | | | | | | | |

Thunderbolt 4 PC and Streamline Series VNA B model compatibility list

PCs with Thunderbolt 4 interface in the list are verified to work with P50xxB/P93xxB VNAs

| PC Maker | PC model name | CPU Gen - Code name | CPU | OS Windows | Microsoft BIOS | Thunderbolt Controller (chipset) Gen | # of Thunderbolt4 connectors | Single VNA operation (1module model) ¹ | Single VNA operation (2modules model) ² | Two VNA operation (star topology) ³ | Two VNA operation (daisy topology) ⁴ | Verified by |
|---------------------------|-----------------------|-------------------------------------|-------------------------|-------------------------------|-------------------------|--------------------------------------|------------------------------|---|--|--|---|-------------|
| Laptop/Mobile workstation | | | | | | | | | | | | |
| Acer | Swift SF314-511 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Home (x64) | v1.06, 7/19/2021 | 9A1B | 1 | Pass | not tested | N/A | not tested | end user |
| Asus | TUF Gaming F15 | 12 th Gen - Alder Lake-P | Intel Core i7-12700H | Windows 11 Home (x64) | Version 311, 8/30/2022 | N/A (USB4) | 1 | Pass | Pass ⁵ | not tested | not tested | end user |
| Asus | Zenbook UX425EA | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Home (x64) | Version 309, 12/25/2021 | 9A1B/9A1D | 2 | Pass | not tested | not tested | not tested | end user |
| Dell | Inspiron 16 Plus 7620 | 12 th Gen - Alder Lake-P | Intel Core i7-12700H | Windows 11 Professional (x64) | 1.4.0, 7/14/2022 | N/A (USB4) | 1 | Pass | not tested | not tested | not tested | end user |
| Dell | Latitude 5320 | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 11 Professional (x64) | 1.26.2, 3/2/2023 | 9A1B | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 5440 | 13 th Gen - Raptor Lake | Intel Core i7-1370P | Windows 11 Professional (x64) | 1.10.0, 8/11/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 5520 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 10 Professional (x64) | 1.18.1, 5/9/2022 | 9A1B | 2 | Pass | Pass | not tested | not tested | end user |
| Dell | Latitude 5530 | 12 th Gen - Alder Lake-P | Intel Core i7-1265U | Windows 10 Professional (x64) | 1.12.0, 3/17/2023 | 463E | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 5531 | 12 th Gen - Alder Lake-P | Intel Core i7-12800H | Windows 10 Professional (x64) | 1.13.0, 10/3/2023 | 463E | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 5531 | 12 th Gen - Alder Lake-P | Intel Core i7-12800H | Windows 11 Professional (x64) | 1.13.0, 10/3/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 5550 | Series 1 - Meteor Lake | Intel Core Ultra 7 165U | Windows 11 Professional (x64) | 1.8.0, 10/9/2024 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Latitude 7420 | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 10 Business (x64) | 1.20.0, 10/17/2022 | 9A1B | 2 | Pass | Pass | Pass | Pass | end user |
| Dell | Latitude 7520 | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 11 Professional (x64) | 1.4.4, 3/9/2021 | 9A1B | 2 | Pass | not tested | not tested | not tested | end user |
| Dell | Latitude 7530 | 12 th Gen - Alder Lake-P | Intel Core i7-1265U | Windows 10 Professional (x64) | 1.13.0, 3/13/2023 | 463E | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 3560 | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 10 Professional (x64) | 1.11.1, 8/13/2021 | 9A1B | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 3560 | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 10 Professional (x64) | 1.27.0, 3/17/2023 | 9A1B | 2 | Fail | not tested | not tested | not tested | Keysight |
| Dell | Precision 3561 | 11 th Gen - Tiger Lake | Intel Core i7-11850H | Windows 10 Enterprise (x64) | 1.11.1, 4/14/2022 | 9A1F | 2 | Pass | Pass | not tested | not tested | end user |
| Dell | Precision 3571 | 12 th Gen - Alder Lake-P | Intel Core i7-12700H | Windows 11 Professional (x64) | 1.17.1, 9/18/2023 | N/A (USB4) | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | end user |
| Dell | Precision 3581 | 13 th Gen - Raptor Lake | Intel Core i9-13900 | Windows 11 Professional (x64) | 1.4.1, 5/31/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 3591 | Series 1 - Meteor Lake | Intel Core Ultra 7 165H | Windows 11 Enterprise (x64) | 1.14.1, 4/10/2025 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 5560 | 11 th Gen - Tiger Lake | Intel Core i7-11850H | Windows 10 Enterprise (x64) | 1.12.0, 7/14/2022 | 9A21 | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| Dell | Precision 5570 | 12 th Gen - Alder Lake-P | Intel Core i9-12900 | Windows 10 Professional (x64) | 1.12.0, 3/15/2023 | 463E | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 7670 | 12 th Gen - Alder Lake-P | Intel Core i7-12850HX | Windows 10 Professional (x64) | 1.3.1, 7/14/2022 | 1137* | 2 | Pass | Pass | Pass | Pass | end user |
| Dell | Precision 7670 | 12 th Gen - Alder Lake-P | Intel Core i9-12950HX | Windows 10 Professional (x64) | 1.8.0, 11/17/2022 | 1137* | 2 | Pass | not tested | not tested | not tested | end user |
| Dell | XPS 15 9530 | 13 th Gen - Raptor Lake | Intel Core i7-13700H | Windows 11 Professional (x64) | 1.13.0, 4/11/2024 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | XPS 16 9640 | Series 1 - Meteor Lake | Intel Core Ultra 9 185H | Windows 11 Professional (x64) | 1.10.0, 11/11/2024 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | XPS 17 9720 | 13 th Gen - Raptor Lake | Intel Core i7-13700H | Windows 11 Professional (x64) | 1.20.0, 11/10/2023 | N/A (USB4) | 4 | Pass | not tested | not tested | not tested | end user |
| Dell | Vostro 7620 | 12 th Gen - Alder Lake-P | Intel Core i7-12700H | Windows 11 Professional (x64) | 1.4.0, 7/14/2022 | N/A (USB4) | 1 | Pass | not tested | not tested | not tested | end user |

Note:

- 1 module model: P93xxB, P500xB, P5020B-400/600, P5021B-400/600, P5022B-400/600, P5023B-400/600, P5024B-400/600
 - 2 modules model: P5020B-402, P5021B-402, P5022B-402, P5023B-402, P5024B-402, P5025B, P5026B, P5027B, P5028B
 - Two VNA operation with star topology requires two Thunderbolt ports on a single PC. This topology is not available with a PC with a single Thunderbolt port.
 - Two VNA operation with daisy topology requires only one Thunderbolt port on a single PC. This topology is available with a PC with a single Thunderbolt port.
 - If PC cannot detect 2 modules model with Code12 error in Device Manager, a registry change is required.
- *. FPGA update pass with VNA FW A.17.05.10



Thunderbolt 4 PC and Streamline Series VNA B model compatibility list

PCs with Thunderbolt 4 interface in the list are verified to work with P50xxB/P93xxB VNAs

| PC Maker | PC model name | CPU Gen - Code name | CPU | OS Windows | Microsoft BIOS | Thunderbolt Controller (chipset) Gen | # of Thunderbolt4 connectors | Single VNA operation (1module model) ¹ | Single VNA operation (2modules model) ² | Two VNA operation (star topology) ³ | Two VNA operation (daisy topology) ⁴ | Verified by |
|---------------------------|--------------------------------|-------------------------------------|-------------------------|-------------------------------|------------------------------|--------------------------------------|------------------------------|---|--|--|---|-------------|
| Laptop/Mobile workstation | | | | | | | | | | | | |
| HP | Elite x2 G2 Tablet | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 11 Professional (x64) | T91 Ver.01.04.00, 5/18/2021 | 9A1B | 2 | Pass | Pass ⁵ | not tested | not tested | end user |
| HP | EliteBook 830 G8 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Enterprise (x64) | T76 Ver.01.04.02, 6/25/2021 | 9A1B | 2 | Pass | not tested | not tested | not tested | end user |
| HP | EliteBook 840 Aero G8 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 10 Professional (x64) | T76 Ver.01.09.01, 5/24/2022 | 9A1B | 2 | Pass | not tested | not tested | not tested | end user |
| HP | EliteBook 840 G8 | 11 th Gen - Tiger Lake | Intel Core i5-1145G7 | Windows 10 Enterprise (x64) | T76 Ver. 01.06.02, 8/12/2021 | 9A1B | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| HP | EliteBook 840 14" G9 | 12 th Gen - Alder Lake-P | Intel Core i5-1245U | Windows 10 Enterprise (x64) | U70 Ver.01.05.00, 12/30/2022 | 463E/466D | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| HP | EliteBook 840 G10 | 13 th Gen - Raptor Lake | Intel Core i7-1365U | Windows 11 Professional (x64) | V70 Ver.01.01.08, 5/30/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | EliteBook 850 G8 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 10 Professional (x64) | T76 Ver.01.12.10, 2/15/2023 | 9A1B | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| HP | OMEN 17-ck0906ng | 11 th Gen - Tiger Lake | Intel Core i7-11800H | Windows 11 Home (x64) | unknown | unknown | 1 | Pass | not tested | N/A | not tested | end user |
| HP | ProBook 650 G8 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Professional (x64) | T72 Ver.01.09.01, 5/13/2022 | 9A1B | 1 | Pass | not tested | N/A | not tested | end user |
| HP | Spectre x360 Convertible 15-eb | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 11 Professional (x64) | AMI F08, 7/26/2021 | 9A1B | 2 | Pass | Pass ⁵ | not tested | not tested | end user |
| HP | ZBook Firefly 14 G9 | 12 th Gen - Alder Lake-P | Intel Core i7-1260P | Windows 10 Professional (x64) | U71 Ver.01.05.00, 4/1/2023 | 463E/466D | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | ZBook Firefly 14 G9 | 12 th Gen - Alder Lake-P | Intel Core i7-1260P | Windows 11 Professional (x64) | U71 Ver.01.05.00, 4/1/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | ZBook Power 15.6 G8 | 11 th Gen - Tiger Lake | Intel Core i7-11850H | Windows 10 Professional (x64) | T81 Ver.01.12.00, 4/1/2023 | 9A1F | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| HP | ZBook Power 15.6 G9 | 12 th Gen - Alder Lake-P | Intel Core i7-12800H | Windows 10 Enterprise (x64) | U97 Ver.01.01.11, 5/24/2022 | 463E | 1 | Pass | Pass ⁵ | N/A | Pass ⁵ | Keysight |
| HP | Zbook Power 16 G11 | Series 1 - Meteor Lake | Intel Core Ultra 7 165H | Windows 11 Enterprise (x64) | W97 Ver.01.07.00, 8/22/2025 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Lenovo | ThinkBook 14 Gen2 ITL | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Home (x64) | F8CN47WWW (V2.10), 4/8/2022 | 9A1B | 1 | Pass | Pass ⁵ | N/A | not tested | end user |
| Lenovo | ThinkBook 14s Yoga ITL | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 11 Professional (x64) | F8CN38WWW, 4/25/2022 | 9A1B | 1 | Pass | not tested | N/A | not tested | end user |
| Lenovo | ThinkBook 15 Gen2 ITL | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 11 Professional (x64) | F8CN47WWW (V2.10), 4/8/2022 | 9A1B | 1 | Pass | Pass ⁵ | N/A | not tested | end user |
| Lenovo | ThinkBook 16 G7 | AMD Zen 3+ Rembrant Refre: | AMD Ryzen 7 7735HS | Windows 11 Enterprise (x64) | P6CN24WWW, 1/4/2025 | N/A (USB4) | 1 | Pass | Pass | N/A | Pass | Keysight |
| Lenovo | ThinkPad L15 Gen2 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Enterprise (x64) | R1JET55W (V1.55), 2/28/2022 | 9A1B | 1 | Pass | Pass ⁵ | N/A | not tested | end user |
| Lenovo | ThinkPad P15s Gen2 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 10 Professional (x64) | N34ET55W(1.55), 2/14/2023 | 9A1B/9A1D | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| Microsoft | Surface Pro 9 | 12 th Gen - Alder Lake-P | Intel Core i7-1265U | Windows 11 Professional (x64) | Nov 2023 Update, 7/17/2023 | N/A (USB4) | 2 | Pass | not tested | not tested | not tested | end user |
| MSI | Prestige 15 A11SB-469CA | 11 th Gen - Tiger Lake | Intel Core i7-1185G7 | Windows 10 Home (x64) | AMI E16S6IMS.119, 7/1/2022 | 9A1B | 2 | Pass | not tested | not tested | not tested | end user |

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|--|
| Note: |
| 1. 1 module model: P93xxB, P500xB, P5020B-400/600, P5021B-400/600, P5022B-400/600, P5023B-400/600, P5024B-400/600 |
| 2. 2 modules model: P5020B-402, P5021B-402, P5022B-402, P5023B-402, P5024B-402, P5025B, P5026B, P5027B, P5028B |
| 3. Two VNA operation with star topology requires two Thunderbolt ports on a single PC. This topology is not available with a PC with a single Thunderbolt port. |
| 4. Two VNA operation with daisy topology requires only one Thunderbolt port on a single PC. This topology is available with a PC with a single Thunderbolt port. |
| 5. If PC cannot detect 2 modules model with Code12 error in Device Manager, a registry change is required. |

Thunderbolt 4 PC and Streamline Series VNA B model compatibility list

PCs with Thunderbolt 4 interface in the list are verified to work with P50xxB/P93xxB VNAs

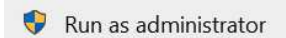
| PC Maker | PC model name | CPU Gen - Code name | CPU | OS Windows | Microsoft BIOS | Thunderbolt Controller (chipset) Gen | # of Thunderbolt4 connectors | Single VNA operation (1module model) ¹ | Single VNA operation (2modules model) ² | Two VNA operation (star topology) ³ | Two VNA operation (daisy topology) ⁴ | Verified by |
|--|-------------------------|--|-------------------------|--------------------------------------|--|---|------------------------------------|--|---|---|--|-------------|
| Desktop | | | | | | | | | | | | |
| When configuring the PC on the manufacturer's website, you must select an option to include a PCIe Thunderbolt 4 card installed in the PC. | | | | | | | | | | | | |
| Corsair | ONE i300 | 10 th Gen - Ice Lake | Intel Core i9-10900K | Windows 11 Professional (x64) | 7D29v12, 2/22/2022 | 1137* | 2 | Pass | not tested | not tested | not tested | end user |
| Dell | Optiplex 7000 Tower | 12 th Gen - Alder Lake-S | Intel Core i7-12700 | Windows 11 Professional (x64) | 1.9.0, 1/10/2023 | N/A (USB4) | 2 | Pass | not tested | not tested | not tested | end user |
| Dell | Optiplex 7020 Tower | 14 th Gen - Raptor Lake Refresh | Intel Core i7-14700 | Windows 11 Professional (x64) | 1.11.1, 8/11/2024 | 1137 ^{15, ^} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Optiplex 7090 Tower | 10 th Gen - Ice Lake | Intel Core i9-10900K | Windows 11 Professional (x64) | 1.19.0, 7/3/2023 | 1137 ^{15, *} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Poweredge R7610 | Ivy Bridge EP | Intel Xeon E5-2697 v2 | Windows 10 Professional (x64) | A07, 8/20/2014 | 1137 ^{15, *} | 2 | Pass | Pass | Pass | Pass | end user |
| Dell | Precision 3650 Tower | 11 th Gen - Rocket Lake | Intel Core i7-11700 | Windows 11 Professional (x64) | 1.24.0, 7/12/2023 | 1137 ^{15, *} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 3660 Tower | 12 th Gen - Alder Lake-S | Intel Core i7-12700 | Windows 11 Professional (x64) for WS | 2.2.0, 2/14/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Precision 3680 Tower | 14 th Gen - Raptor Lake Refresh | Intel Core i9-14900 | Windows 11 Professional (x64) | 1.9.0, 9/20/2024 | 1137 ^{15, ^} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Pro Max Tower T2 | Series 2 - Arrow Lake | Intel Core Ultra 9 285K | Windows 11 Enterprise (x64) | 1.6.1, 6/23/2025 | N/A (USB4) | 1 | Pass | Pass | N/A | Pass | Keysight |
| HP | Envy TE02 | 12 th Gen - Alder Lake-S | Intel Core i9-12900K | Windows 11 Home (x64) | F.16 Rev.A, 9/14/2023 | N/A (USB4) | 1 | Pass | Pass | N/A | not tested | end user |
| HP | Z1 G8 Tower | 11 th Gen - Rocket Lake | Intel Core i9-11900 | Windows 11 Professional (x64) | T01 Ver. 02.11.00, 12/21/2022 | 1134 ^{11, *} | 1 | Pass | Pass | N/A | Pass | Keysight |
| HP | Z2 G8 SFF | 11 th Gen - Rocket Lake | Intel Core i5-11500 | Windows 11 Professional (x64) | T50 Ver. 01.06.01, 2/10/2023 | 1134 ^{12, *} | 1 | Pass | Pass | N/A | Pass | Keysight |
| HP | Z2 G8 Tower | 11 th Gen - Rocket Lake | Intel Xeon W-1370 | Windows 11 Professional (x64) for WS | T50 Ver. 01.06.00, 2/10/2023 | 1134 ^{11, *} | 1 | Pass | Pass | N/A | Pass | Keysight |
| HP | Z4 G5 Tower | Sapphire Rapids | Intel Xeon W3-2423 | Windows 10 Enterprise (x64) | HP U61 Ver. 01.02.17, 1/10/2025 | 1137 ^{16, ^} | 2 | Pass | Pass | Pass | Pass | Keysight |
| HP | Z8 G5 Fury Tower | Sapphire Rapids | Intel Xeon W5-3423 | Windows 11 Professional (x64) for WS | HP U61 Ver. 01.02.17, 1/10/2025 | 1137 ^{16, ^} | 2 | Pass | Pass | Pass | Pass | Keysight |
| Mini-PC | | | | | | | | | | | | |
| Asus | NUC 14 Pro AI | Series 2 - Lunar Lake | Intel Core Ultra 9 288V | Windows 11 Enterprise (x64) | 0006.2024.1210.1520, 10/12/2024 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Asus | NUC 15 Pro | Series 2 - Arrow Lake | Intel Core Ultra 5 225H | Windows 11 Enterprise (x64) | CRARL579.0028.2025.1029.1430, 11/10/2024 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Dell | Optiplex 7090 Ultra UFF | 11 th Gen - Tiger Lake | Intel Core i5-1145G7 | Windows 10 Professional (x64) | 1.4.1, 7/19/2021 | 9A1D | 1 | Pass | Pass | N/A | Pass | Keysight |
| GIGABYTE | GB-BSi7-1165G7 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 10 Professional (x64) | F9, 2/14/2022 | 9A1B | 1 | Pass | Pass | N/A | Pass | end user |
| Intel | NUC11TNHi5 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 11 Enterprise (x64) | 0064, 2/17/2022 | 9A1B/9A1D | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| Intel | NUC11TNKi5 | 11 th Gen - Tiger Lake | Intel Core i5-1135G7 | Windows 10 Professional (x64) | 0057, 7/7/2021 | 9A1B/9A1D | 2 | Pass | not tested | Pass | not tested | end user |
| Intel | NUC11PAHi7 | 11 th Gen - Tiger Lake | Intel Core i7-1165G7 | Windows 11 Professional (x64) | 0050, 12/28/2022 | 9A1B/9A1D | 2 | Pass | Pass ⁵ | Pass | Pass ⁵ | Keysight |
| Intel | NUC 13 Pro | 13 th Gen - Raptor Lake | Intel Core i7-1360P | Windows 11 Professional (x64) | ANRPL357.0027.2023.0607.1754, 7/10/2023 | N/A (USB4) | 2 | Pass | Pass | Pass | Pass | Keysight |
| Minisforum | UM760 Slim | AMD Zen 4 Phoenix | AMD Ryzen 5 -7640HS | Windows 11 Professional (x64) | AMI, LLC. 1.08, 11/5/2024 | N/A (USB4) | 1 | Pass | Pass | N/A | Pass | Keysight |
| Note: | | | | | | | | | | | | |
| 1. 1 module model: P93xxB, P500xB, P5020B-400/600, P5021B-400/600, P5022B-400/600, P5023B-400/600, P5024B-400/600 | | | | | | | | | | | | |
| 2. 2 modules model: P5020B-402, P5021B-402, P5022B-402, P5023B-402, P5024B-402, P5025B, P5026B, P5027B, P5028B | | | | | | | | | | | | |
| 3. Two VNA operation with star topology requires two Thunderbolt ports on a single PC. This topology is not available with a PC with a single Thunderbolt port. | | | | | | | | | | | | |
| 4. Two VNA operation with daisy topology requires only one Thunderbolt port on a single PC. This topology is available with a PC with a single Thunderbolt port. | | | | | | | | | | | | |
| 5. If PC cannot detect 2 modules model with Code12 error in Device Manager, a registry change is required. | | | | | | | | | | | | |
| 11. tested with Thunderbolt 4 extended PCIe card, 2A0B0AV | | | | | | | | | | | | |
| 12. tested with Thunderbolt 4 extended PCIe card, 3E4N1AV | | | | | | | | | | | | |
| 14. tested with Thunderbolt 4 extended PCIe card, ThunderboltEX 4 (ASUS) | | | | | | | | | | | | |
| 15. tested with Dell Thunderbolt 4 extended PCIe card, 7R4VG | | | | | | | | | | | | |
| 16. tested with HP Thunderbolt 4 extended PCIe card, 340L1AA | | | | | | | | | | | | |
| *. FPGA update pass with VNA FW A.17.05.10 | | | | | | | | | | | | |
| ^ . FPGA update pass with VNA FW A.19.30.21 | | | | | | | | | | | | |

PC makers' driver download page

| PC Maker | Driver Update page | Assistant tool |
|----------|--|--|
| HP | Official HP® Drivers and Software Download HP® Customer Support | HP Support Assistant |
| Dell | Drivers & Downloads Dell US | SupportAssist |
| Intel | Intel® Driver & Support Assistant | Intel DSA |
| Lenovo | Official Lenovo Laptop, Accessories & PC Support - Lenovo Support US | Lenovo Vantage Lenovo US |
| Asus | Download Center Official Support ASUS USA | MyAsus Application |
| Acer | Download Acer Support Drivers and Manuals | |
| | | |

Note:

1. Administrator privileges are required to install the application software and drivers
2. The above links are subject to change.



Proven latest versions of Key program (as of 30-Mar-2026)

| Publisher | Program | Version |
|-----------------------|--|-----------------|
| Keysight Technologies | Communication Fabric 2.2 | 2.2.22112.11724 |
| Keysight Technologies | Host Processor Platform | 5.5.2.30000 |
| Keysight Technologies | IO Libraries Suite 2025 | 21.1.174 |
| Keysight Technologies | KtPUsbChassis IVI.NET Driver 1.1.11 | 1.1.11.0 |
| Keysight Technologies | KtPUsbChassis IVI-C Driver 1.1.11 | 1.1.11.0 |
| Keysight Technologies | License Manager (Keysight License Manager 5) | 5.7.0.732 |
| Keysight Technologies | License Manager (PathWave License Manager) | 7.4.1 |
| Keysight Technologies | License Service | 5.7.0.732 |
| Keysight Technologies | VNA Series Network Analyzer firmware | 19.30.21.153.0 |
| Intel® Corporation | Thunderbolt™ Software | 1.0.37.0 |
| IVI Foundation | IVI Shared Components 3.0.0 | 3.0.2828.0 |
| IVI Foundation | IVI.NET Shared Components 2.0.0 for .NET 2.0 | 2.0.2928.0 |
| IVI Foundation | VISA Shared Components 7.2.0 (64-Bit) | 7.2 |
| IVI Foundation | VISA.NET Shared Components 7.2.0 (64-Bit) | 7.2.0205 |

VNA firmware revision history

| Release date | FW revision | FPGA1 | FPGA2 | Comment |
|--|-------------|--------------------------|--------------------------|--|
| 12/9/2021 | A.15.40.13 | 00.16 datecode: 2111155d | 00.14 datecode: 2111155d | Support P50xxB/P93xxB |
| 1/7/2022 | A.15.55.08 | 00.16 datecode: 2111155d | 00.14 datecode: 2111155d | |
| 2/3/2022 | A.15.55.14 | 00.16 datecode: 2111155d | 00.14 datecode: 2111155d | |
| 2/17/2022 | A.15.60.05 | 00.16 datecode: 2111155d | 00.14 datecode: 2111155d | Feature added: Auto shutdown when in-rush voltage drop event is detected (#3-3-1-4) Resolved: activation lic check issue (#3-10-12) |
| 3/11/2022 | A.15.60.08 | 00.16 datecode: 2111155d | 00.14 datecode: 2111155d | |
| 4/26/2022 | A.15.65.19 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | |
| 7/27/2022 | A.15.75.19 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | |
| 9/6/2023 | A.15.75.22 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | Resolved: missing chassis driver (#2-5-1), halt at Loading Calset (#3-10-3), hot plug-in/out issue (#3-10-6) |
| 10/5/2022 | A.15.75.26 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | |
| 11/22/2022 | A.16.20.02 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | |
| 2/3/2023 | A.16.20.04 | 00.16 datecode: 2111155d | 00.14 datecode:22041387 | |
| 2/17/2023 | A.16.70.00 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 4/5/2023 | A.16.70.01 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 5/25/2023 | A.16.70.06 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 6/7/2023 | A.16.70.08 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 6/21/2023 | A.17.05.10 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | Resolved: Unable to program FPGA image (#3-10-4) |
| 8/9/2023 | A.17.20.08 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 8/17/2023 | A.17.20.09 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 9/3/2023 | A.17.25.03 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 9/15/2023 | A.17.25.05 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | Support Windows 11 OS (#3-7-3) |
| 11/6/2023 | A.17.35.05 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| 12/4/2023 | A.17.35.10 | 00.16 datecode: 2111155d | 00.14 datecode:22081948 | |
| This VNA firmware version is not available to download in Keysight.com | | | | |

For more details, go to [PXIe/USB VNA Firmware Revision History | Keysight](#)

Contact Keysight – Issue sharing

This document provides lots of troubleshooting tips and will continue to improve based on your feedback.

Since Windows security is getting stricter, newer OS/BIOS might block Streamline Series VNA. In the case that a customer's PC cannot use Streamline Series VNA B model, or the troubleshooting document does not cover the symptoms of the issue, please contact Keysight.

Please include this information in the case:

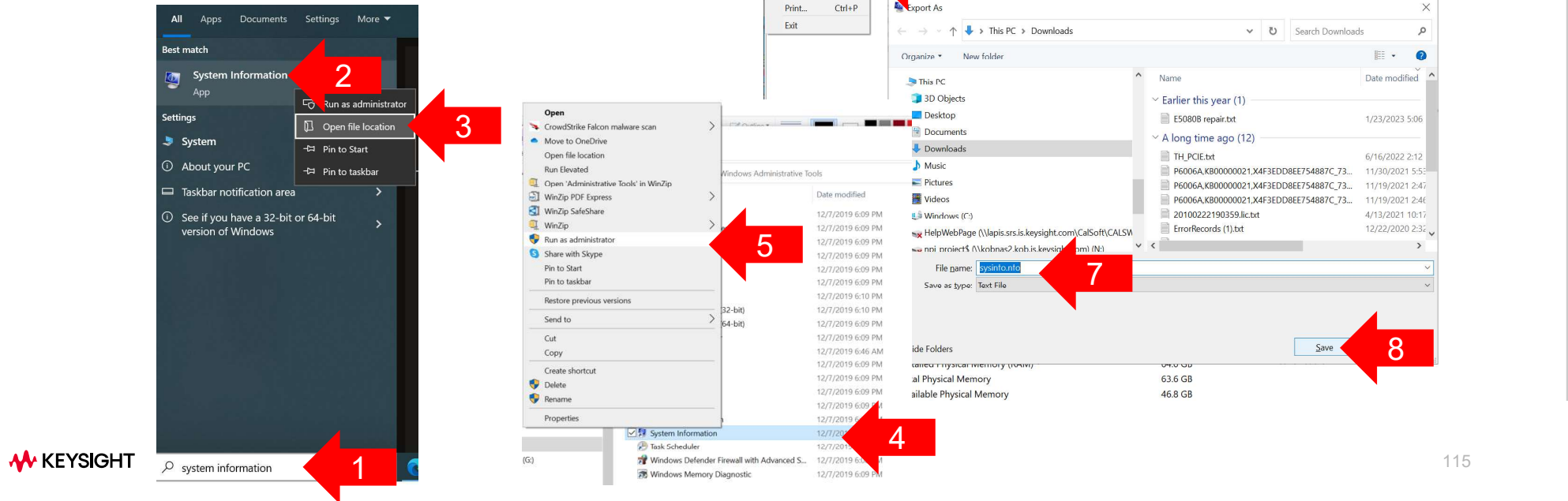
- Photo/video of the symptom
- System Information w/ administrative mode
- Device Manager information
- Thunderbolt Control Center information
- Connection Expert information
- Programs and Features information (software version information)

Contact Keysight - Issue sharing

System Information /w administrative mode

1. Enter System Information at Windows Search
2. Right click System Information
3. Click Open file location
4. Right click System Information
5. Click Run as administrator or
Click Run Elevated (for Keysight internal user)

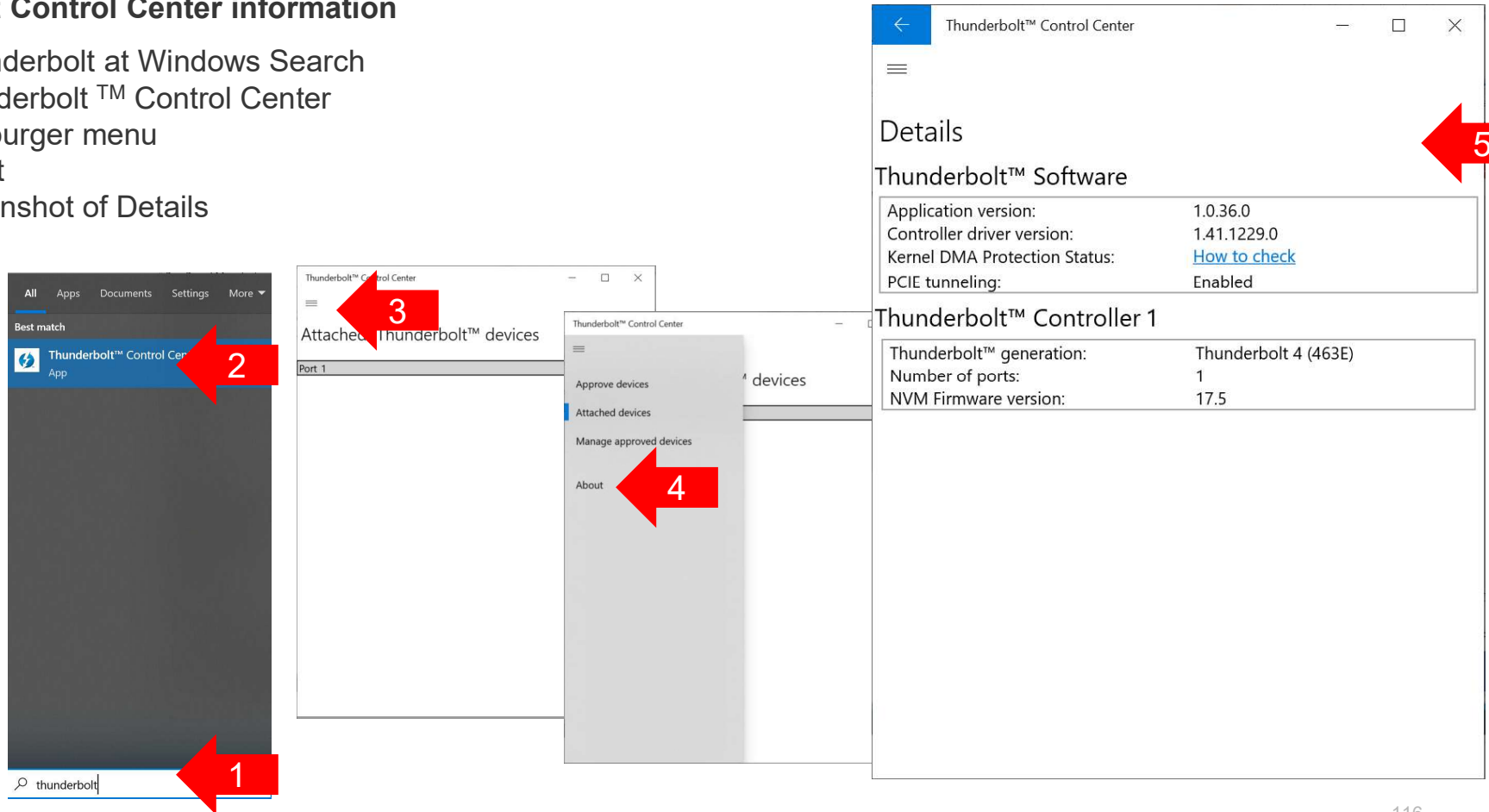
6. Click File > Export
7. Enter sysinfo.txt at File name
8. Click Save



Contact Keysight – Issue sharing

Thunderbolt Control Center information

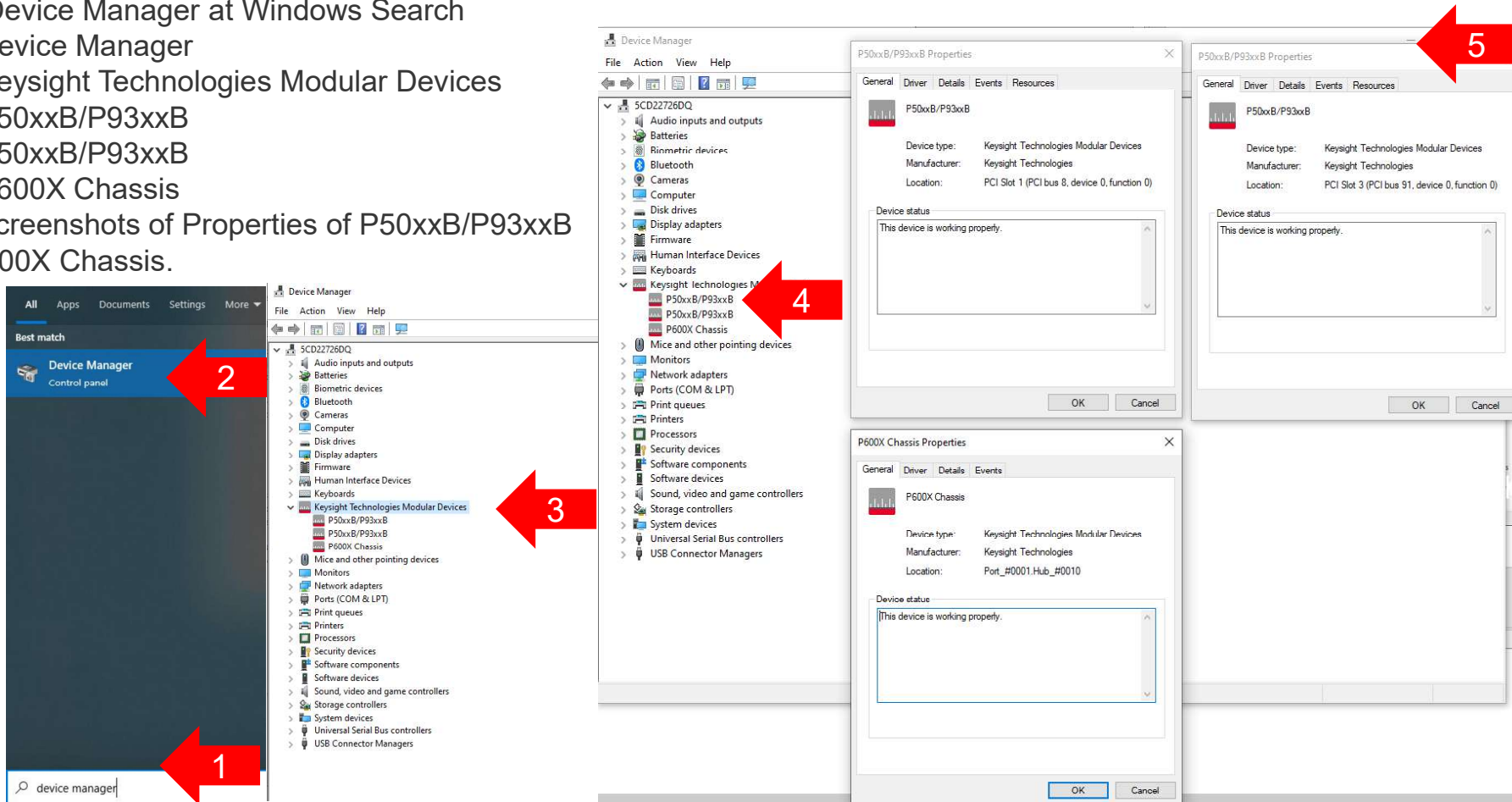
1. Enter Thunderbolt at Windows Search
2. Click Thunderbolt™ Control Center
3. Click hamburger menu
4. Click About
5. Take screenshot of Details



Contact Keysight – Issue sharing

Device Manager information

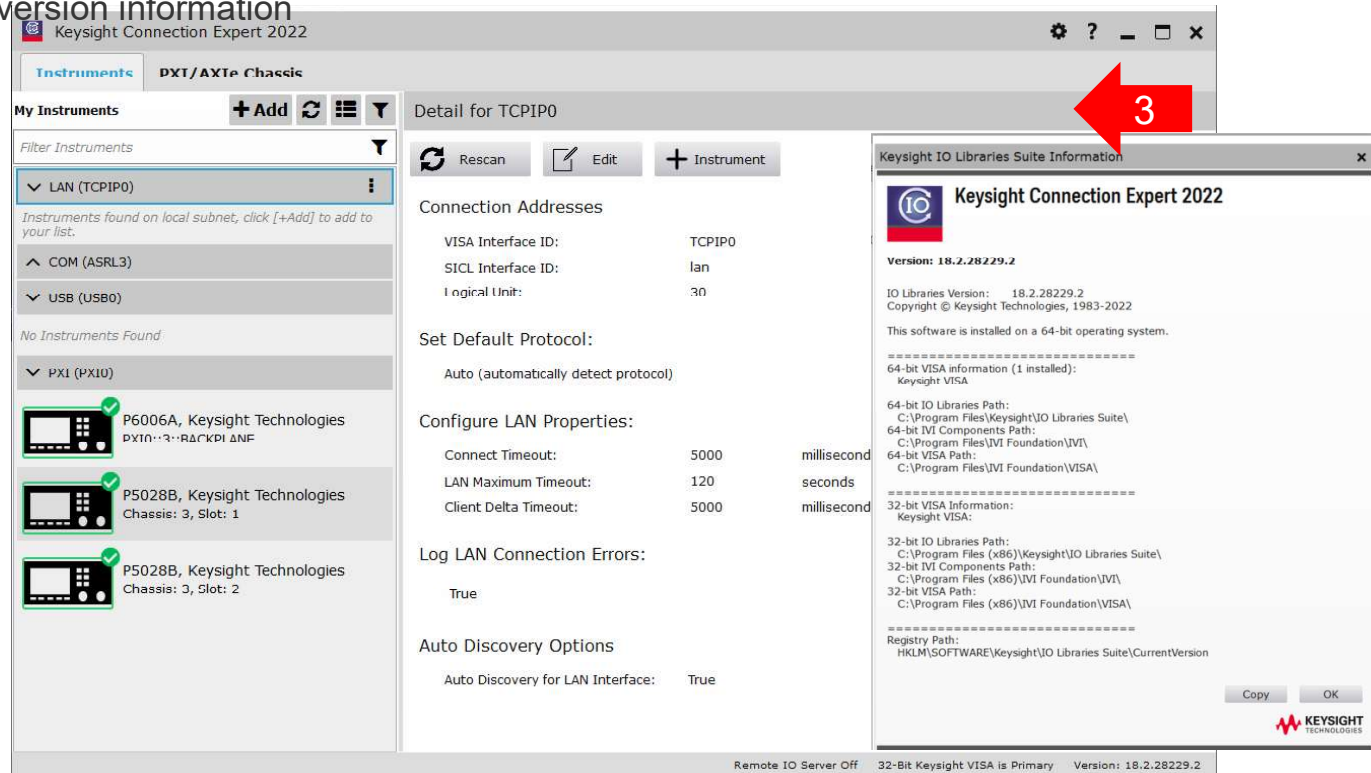
1. Enter Device Manager at Windows Search
2. Click Device Manager
3. Click Keysight Technologies Modular Devices
4. Click P50xxB/P93xxB
Click P50xxB/P93xxB
Click P600X Chassis
5. Take Screenshots of Properties of P50xxB/P93xxB and P600X Chassis.



Contact Keysight – Issue sharing

Connection Expert information

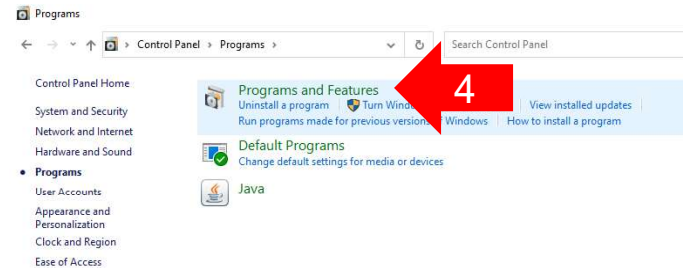
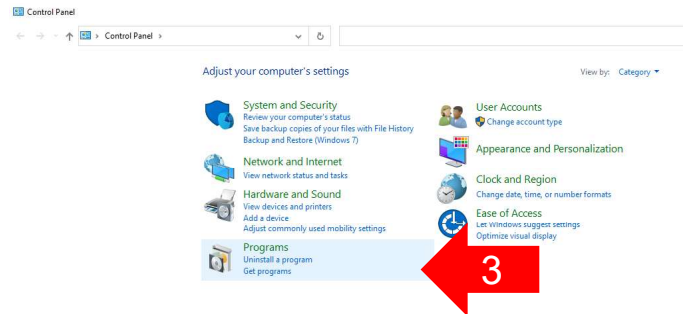
1. Enter Keysight Connection Expert at Windows Search
2. Click Keysight Connection Expert
3. Take screenshot of Instruments and version information



Contact Keysight – Issue sharing

Program and Features information

1. Enter Control Panel at Windows Search
2. Click Control Panel
3. Click Programs
4. Click Programs and Features
5. Take screenshot of programs and its version



A screenshot of the Windows 'Programs and Features' window showing a list of installed programs. A red arrow with the number '5' points to the top right corner of the window. The table below lists the installed programs with their names, publishers, installation dates, sizes, and versions.

| Name | Publisher | Installed On | Size | Version |
|--|-----------------------------|--------------|---------------|--------------------|
| AgNA IVI Driver 2.4.0 | Agilent Technologies | 9/27/2022 | 23.0 MB | 3.4.0.0 |
| Dell Peripheral Manager | Dell Inc. | 3/2/2023 | 197 MB | 1.6.4 |
| Intel® Driver & Support Assistant | Intel | 3/2/2023 | 58.6 MB | 23.1.9.7 |
| Intel® Serial IO | Intel Corporation | 3/24/2022 | 30,100,2129.8 | |
| Intel(R) Computing Improvement Program | Intel Corporation | 1/10/2023 | 65.8 MB | 2.4.09007 |
| Thunderbolt™ Software | Intel(R) Corporation | 3/24/2022 | 65.6 MB | 1.47.0.0 |
| IVI Shared Components 2.6.1 | IVI Foundation | 8/24/2022 | 2,61,491.52 | |
| IVI Shared Components 5.11.0 (64-bit) | IVI Foundation | 8/24/2022 | 5,11,030.1 | |
| IVI Shared Components 7.1.1 (64-bit) | IVI Foundation | 8/24/2022 | 7.1.1 | |
| IVI Shared Components 1.4.1 for .NET 2.0 | IVI Foundation | 8/24/2022 | 5,22 MB | 1.41,491.53 |
| Keysight IO Libraries Suite 2022 Update 2 | Keysight Technologies | 3/16/2022 | 53.3 MB | 6.0.3 |
| Keysight License Manager | Keysight Technologies | 9/27/2022 | 203 MB | 18.2,282.29.2 |
| KPIUsbChassis IVI.NET Driver 1.1.9 | Keysight Technologies | 9/20/2022 | 11.6 MB | 1.1.9.0 |
| Keysight License Manager | Keysight Technologies | 4/28/2022 | 33.2 MB | 5.4.1,159.9 |
| KPIUsbChassis IVI-C Driver 1.1.10 | Keysight Technologies | 3/3/2023 | 23.9 MB | 1.1.10.0 |
| Keysight License Service | Keysight Technologies | 3/15/2022 | 19.8 MB | 5.3.2.19 |
| KPIUsbChassis IVI.NET Driver 1.1.10 | Keysight Technologies | 3/3/2023 | 11.6 MB | 1.1.10.0 |
| Keysight Host Processor Platform | Keysight Technologies | 11/28/2022 | 34.4 MB | 5.4,283.28,108.54 |
| Keysight Device Measurement xPert Lite | Keysight Technologies, Inc. | 8/24/2022 | 32.8 MB | 01.03.003.0003 |
| Keysight VNAUncertainty (x64) | Keysight Technologies, Inc. | 11/28/2022 | 18.2 MB | 05.00.020.0000 |
| Keysight VNA Series Network Analyzer | Keysight Technologies, Inc. | 3/9/2023 | 905 MB | 16.70.003.0 |
| Keysight Ingot OF Utilities | Keysight Technologies, Inc. | 4/28/2022 | 66.2 MB | 01.02.002.0034 |
| Keysight VNAUncertainty (x64) | Keysight Technologies, Inc. | 8/24/2022 | 18.1 MB | 05.00.018.0000 |
| Keysight CalPod API | Keysight Technologies, Inc. | 8/24/2022 | 37.1 MB | 03.01.006.0004 |
| Keysight Communications Fabric 2.2 | Keysight Technologies | 8/24/2022 | 281 KB | 2.2,221.12,117.24 |
| Microsoft OneDrive | Microsoft Corporation | 3/20/2023 | 270 MB | 23,043,026,26,0001 |
| Microsoft Edge | Microsoft Corporation | 3/20/2023 | 111.0,1661.44 | |
| Microsoft Edge WebView2 Runtime | Microsoft Corporation | 3/20/2023 | 111.0,1661.44 | |
| Microsoft .NET Core Runtime - 3.1.28 (x64) | Microsoft Corporation | 8/17/2022 | 91.8 MB | 3.1,28,3151.3 |
| Microsoft Visual C++ 2012 Redistributable (x86) - 11.0.61030 | Microsoft Corporation | 2/12/2022 | 17.3 MB | 11.0,61030.0 |
| Microsoft Visual C++ 2015-2022 Redistributable (x64) - 14.32.31332 | Microsoft Corporation | 8/10/2022 | 20.1 MB | 14,32,31332.0 |
| Microsoft Visual C++ 2015-2022 Redistributable (x86) - 14.32.31332 | Microsoft Corporation | 8/10/2022 | 17.6 MB | 14,32,31332.0 |
| Microsoft Visual C++ 2012 Redistributable (x64) - 11.0.61030 | Microsoft Corporation | 2/12/2022 | 20.5 MB | 11.0,61030.0 |
| Microsoft Visual C++ 2010 x64 Redistributable - 10.0.40219 | Microsoft Corporation | 2/11/2022 | 13.8 MB | 10.0,40219 |
| Microsoft Visual C++ 2008 Redistributable - x86 9.0.30729.4148 | Microsoft Corporation | 2/11/2022 | 10.1 MB | 9.0,30729,4148 |
| Microsoft Visual C++ 2008 Redistributable - x64 9.0.30729.4148 | Microsoft Corporation | 2/11/2022 | 13.1 MB | 9.0,30729,4148 |
| Microsoft Visual C++ 2005 Redistributable (x64) | Microsoft Corporation | 3/15/2022 | 6.88 MB | 8.0,59192 |
| Microsoft Update Health Tools | Microsoft Corporation | 1/26/2023 | 1.00 MB | 4.71.0.0 |
| MSM (MATLAB) Compiler Host Controller (R x64-x) | Microsoft Corporation | 6/29/2023 | 779 KB | 0.1 |
| Microsoft Visual C++ 2010 x86 Redistributable - 10.0.40219 | Microsoft Corporation | 2/11/2022 | 11.1 MB | 10.0,40219 |
| MATLAB(R) Compiler Runtime 7.14 | The MathWorks | 3/15/2022 | 508 MB | 7.14 |

