Assurance Activity Report for

Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices

Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Security Target Version 1.24, November 19, 2021

Protection Profile for Peripheral Sharing Device, Version: 4.0
PP-Module for Analog Audio Output Devices, Version 1.0
PP-Module for Keyboard/Mouse Devices, Version 1.0
PP-Module for Video/Display, Version 1.0

AAR Version 1.3, November 19, 2021

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Common Criteria Version 3.1 Revision 5

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CEM Version 3.1 Revision 5

Contents

1 TOE Overview

The Vertiv Secure Peripheral Sharing Devices (PSD) allow users to share keyboard, video, and mouse peripherals between a number of connected computers. The devices also allow for the sharing of audio and Universal Serial Bus (USB) authentication device peripherals.

The following security features are provided by the Vertiv Peripheral Sharing Devices:

- Video Security
    - Computer video input interfaces are isolated through the use of separate electronic components, power and ground domains.
    - Computer video input interfaces are isolated through the use of separate electronic components, power and ground domains. The display is isolated by dedicated, read-only, Extended Display Identification Data (EDID) emulation for each computer.
    - Access to the monitor's EDID is blocked.
    - Access to the Monitor Control Command Set (MCCS commands) is blocked.
    - DisplayPort (DP) and High-Definition Multimedia Interface (HDMI) video peripherals are supported by the SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC and SC940DPHC devices. DVID video peripheral devices are supported by the SC840DVI and SC940DVI devices.
    - Video input is accepted as DisplayPort or HDMI on the SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC and SC940DPHC devices. Additionally, the SC840DPHC and SC940DPHC accept USB Keyboard and Mouse Security Type C with DisplayPort as an alternate function. The SC840DVI and SC940DVI devices accept DVI-D video input.
    - Type C with DisplayPort as an alternate function. The SC840DVI and SC940DVI devices accept DVI-D video input.
- Keyboard and Mouse Security
    - The keyboard and mouse are isolated by dedicated, USB device emulation for each computer.
    - One-way, peripheral-to-computer data flow is enforced through unidirectional optical data diodes.
    - Communication from computer-to-keyboard/mouse is blocked.
    - Non-HID (Human Interface Device) data transactions are blocked.
- Audio Security
    - One-way computer to speaker sound flow is enforced through unidirectional optical data diodes
- Hardware Anti-Tampering
    - Any attempt to open the product enclosure will activate an antitampering system, making the product inoperable and indicating tampering via blinking Light Emitting Diodes (LEDs).
    - Special holographic tampering evident labels on the product's enclosure provide a clear visual indication if the product has been opened or compromised.

2 Assurance Activities Identification

The Assurance Activities contained within this document include all those defined within the Protection Profile for Peripheral Sharing Device, Version: 4.0 and the following PP modules:

- PP-Module for Analog Audio Output Devices, Version 1.0
- PP-Module for Keyboard/Mouse Devices, Version 1.0
- PP-Module for Video/Display Devices, Version 1.0

SRFs have been selected in accordance with PP-Configuration for Peripheral Sharing Device, Analog Audio Output Devices, Keyboard/Mouse Devices, and Video/Display Devices, 19 July 2019 and on the selections within the PP and modules.

3 Test Equivalency Justification

3.1 Architectural Description

The Vertiv Secure Keyboard, Video, Mouse (KVM) Switches allow users to share keyboard, video, and mouse peripherals between a number of connected computers. These devices also allow for the sharing of audio and Universal Serial Bus (USB) authentication device peripherals.

The Vertiv Secure Matrix Switches allow users to view and control two computers while securely sharing keyboard, video, mouse, and audio peripherals between a number of connected computers. These TOE devices also allow for the sharing of USB authentication device peripherals.

The Vertiv Secure Combiner Switches allow users to interact with multiple computers presented on the same displays at the same time using a single set of keyboard, mouse, and video peripherals. This device also allows for the sharing of audio and USB authentication device peripherals.

The models being included are listed in Section 3.3 and 3.5.

3.2 Hardware and Firmware Analysis

These devices use the same system controller board, video boards and firmware. They do not contain Central Processing Units (CPU) but instead function using 32-bit microcontrollers from STMicroelectronics. There are slight variances of microcontrollers used, but they are all 32-bit STMicroelectronics brand and as such use the same instructions.

3.3 Equivalency Analysis

The following equivalency analysis provides a per category analysis of key areas of differentiation for each hardware model to determine the minimum subset to be used in testing. The areas examined will use the areas and analysis description provided in the supporting documentation for the [PP].

The following tables provide a comparison of the model equivalency groupings. Those proposed for testing are shown in **bolded red**.

Model	System Controller PCBA	System Cont. firmware	Video Cont. firmware	Video Input	Video Output	Product Description
SC820DPH	Same	Same	Same	**DP/HDMI**	**DP/HDMI**	**CYBEX™ SC Universal DP/H Secure KVM Switch 2-Port Single Display**
SC840DPH				DP/HDMI	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Single Display
SC920DPH				DP/HDMI	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 2-Port Dual Display
SC940DPH				DP/HDMI	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Dual Display

Secure KVM models with Active Anti-tampering, Analog Audio, User Authentication and audit logging with the same Video Input/Output ports (DP/HDMI).

Model	System Controller PCBA	System Cont. firmware	Video Cont. firmware	Video Input	Video Output	Product Description
SC840DPHC	Same	Same	Same	DP/HDMI/USB C	DP/HDMI	CYBEX™ SC Universal DPH + USB-C secure KVM Switch 4-Port Single Display
SC940DPHC				DP/HDMI/USB C	DP/HDMI	CYBEX™ SC Universal DPH + USB-C secure KVM Switch 4-Port Dual Display

Secure KVM models with Active Anti-tampering, Analog Audio, User Authentication, and audit logging with the same Video Input/Output ports (DP/HDMI/USB Type C).

Model	System Controller PCBA	System Cont. firmware	Video Cont. firmware	Video Input	Video Output	Product Description
SC840DVI	Same	Same	Same	DVI	DVI	CYBEX™ SC DVI Secure KVM Switch 4-Port Single Display
SC940DVI				DVI	DVI	CYBEX™ SC DVI Secure KVM Switch 4-Port Dual Display Used for multi-display support testing only.

Secure KVM models with Active Anti-tampering, Analog Audio, User Authentication, and audit logging with the same Video Input/Output ports (DVI).

3.3.1 Base PP destructive testing

The lab has selected four units to perform all testing on (**SC820DPH, SC840DVI, SC840DPHC).** This along with the equivalency rationale provides coverage for all KVM devices identified in the Security Target. As some testing requirements in the Base PP (Base PP Module for Peripheral Sharing Devices) are destructive in nature, it was decided to use a reference unit **(SC945DPH)** to perform these tests across and claim equivalency. As discussed later here the anti-tamper evidence seal and anti-tamper switch functionality are the same across all KVM units. The SC945DPH unit was rendered disabled from destructive testing. The destructive tests are FPT_PHP.1 Test 1 and Test 2, and FPT_PHP.3 Test 1.

3.3.2 Platform/Hardware Dependencies

All of the security functionality, with the exception of video, is provided on the system controller board. The basic system controller boards vary by the number of supported ports. All of the 4-port products share the same system controller board. Likewise, all of the 8-port products use the same system controller board. System controller boards do not operate any differently and support the exact same functionality independent of the number of output ports. The system controller boards for all products use the same firmware.

All video boards share the same firmware. All video boards with the same video input and video out combinations are the same. This is how all models are grouped above.

Dual head products include two instances of the same video board stacked on top of one another in the final assembly. The instances are isolated from each other to mitigate any security impact. The lab considers the number of externally supported monitors (1 or 2) to be equivalent as there is no difference in the way the KVMs operate.

Matrix products use the same video boards and firmware as the other products with the same number of ports. The difference is that an additional video output is assembled on the boards.

3.3.3 Differences in Libraries Used to Provide TOE Functionality

Firmware is the same for all models.

3.3.4 TOE Management Interface Differences

All devices support the same management interface, called terminal mode.

3.3.5 Tamper evidence equivalency

The tamper evident seal used across all the Vertiv units is the same, so the expected evidence will not be any different.

3.3.6 TOE Functional Differences

Each hardware model within the TOE boundary provides identical SFR functionality. There is no difference in the way the user interacts with each of the devices or the services that are available to the user in for each of these devices.

Result: All platforms are functionally equivalent. The only differences to Management interfaces are the Video Input formats and this is covered by selecting a model from each group as seen below.

3.4 Recommendations/Conclusions

Based on the equivalency rationale listed above, testing will be performed on each of the BOLD selections of hardware models in the table below.

Video Input	USB/Keyboard/Mouse	Model	Video Output	Product Description
DP/HDMI	**Same**	**SC820DPH**	**DP/HDMI**	**CYBEX™ SC Universal DP/H Secure KVM Switch 2-Port Single Display**

Video Input	USB/Keyboard/Mouse	Model	Video Output	Product Description
DP/HDMI		SC840DPH	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Single Display
DP/HDMI		SC920DPH	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 2-Port Dual Display
DP/HDMI		SC940DPH	DP/HDMI	CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Dual Display
DP/HDMI/ USB C		**SC840DPHC**	**DP/HDMI**	**CYBEX™ SC Universal DPH + USB-C secure KVM Switch 4-Port Single Display**
DP/HDMI/ USB C		SC940DPHC	DP/HDMI	CYBEX™ SC Universal DPH + USB-C secure KVM Switch 4-Port Dual Display
DVI		**SC840DVI**	**DVI**	**CYBEX™ SC DVI Secure KVM Switch 4-Port Single Display**
DVI		SC940DVI	DVI	CYBEX™ SC DVI Secure KVM Switch 4-Port Dual Display
DP/HDMI		**SC945DPH[1]**	**DP/HDMI**	**CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Dual Display with CAC** **Reference model used for Base PP destructive testing only.**
DVI		**SC940DVI**	**DVI**	**CYBEX™ SC DVI Secure KVM Switch 4-Port Dual Display** **Used for multi-display testing only.**

[1] Not a TOE model, but was provided by the vendor as a spare unit for the destructive testing and has been shown to have identical tamper response and tamper evidence characteristics as each of the TOE models.

4 Test Bed Descriptions

4.1 Test Bed # 1

Below is a diagram of the components included in the test bed:

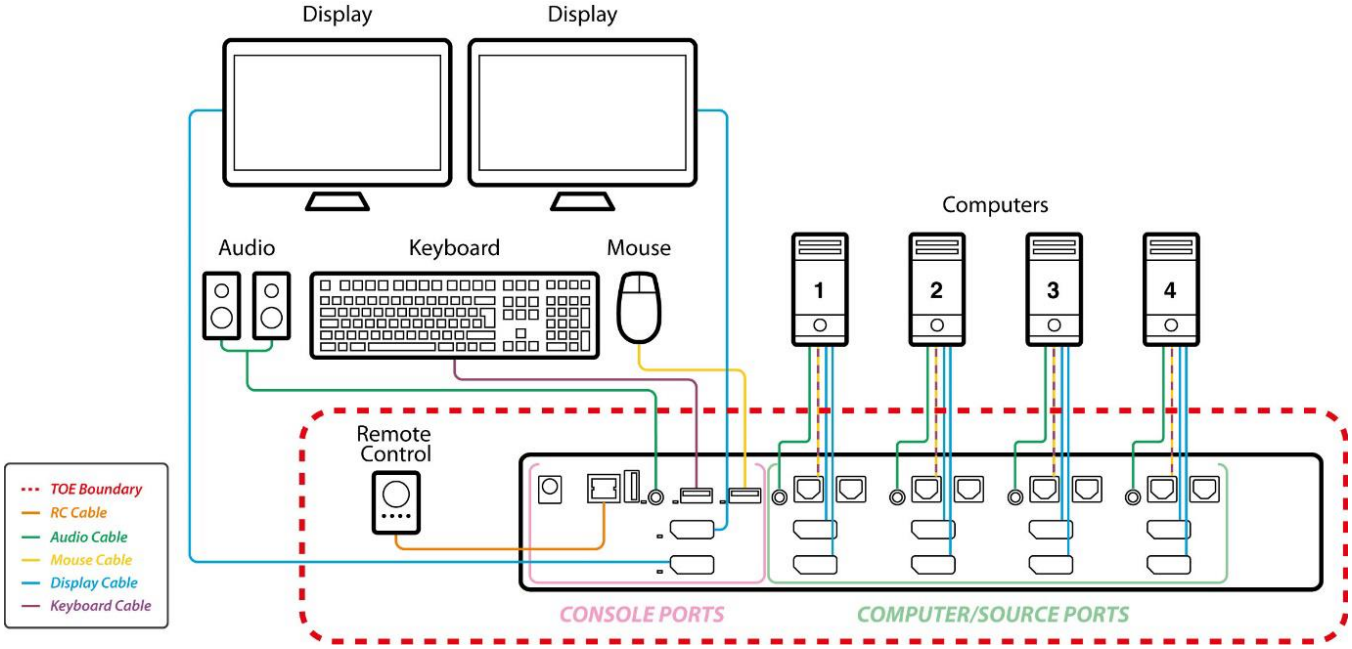


Diagram of the TOE, with how to connect cables and required equipment.
The TOE is used with a remote control.

4.1.1 Test Equipment

The following equipment was used in the testing of the TOE:

Test Equipment
Dell Keyboard with Smart Card Reader KB813T
HP Deskjet 1112 USB Printer
Dr. Meter DC Power Supply HY3005F-3
RIGOL DG1022A Waveform Audio Signal Generator
QuantumData 882E Video Test Generator (DisplayPort)
QuantumData 980 Video Test Generator (HDMI)
TELEDYNE LECROY USB-TMS2-M01-X USB Sniffer
UNIGRAF DPA-400 DisplayPort Aux Channel Monitor
Tektronix TBS1104 Oscilloscope
Fluke 117 True RMS Digital Multimeter
Custom USB Dummy Load
Edifier R980T Multimedia Speaker
PS/2 to USB Adapter
Perixx PeriMice-201 II Optical PS/2 Mouse
MPOW BH323A 3.5mm Headset with USB Connector
Identiv SCR3310 USB UA Device with Power LED
TCL 40” LED Smart TV With Audio Return Channel (ARC)
BYEASY USB 4 Port Hub

Test Equipment
Logitech V-U-0018 USB Camera
Steelseries Rival 100 USB Gaming Mouse
Custom BADUSB
Netum USB Barcode Reader
Wireless LAN Dongle
Keweisi USB Detector
3.5mm Microphone
Dell P2319H Monitor (High Resolution Monitor #1)
Asus PA238 Monitor (High Resolution Monitor #2)
Dell Wired Keyboard KB216t
UGREEN VGA to HDMI Adapter
Dell 1907FPc Monitor (Low Resolution Monitor)
Dell Wired Mouse M-UAR DEL 7
Cable Matters VGA to DisplayPort Adapter

Cables:

Cable
3.5mm Audio Splitter
Spliced HDMI Cable
Spliced 3.5mm Cable
Spliced USB Type-B Cable
Spliced DisplayPort Cable
Spliced USB Type-C Cable
Spliced USB Type-A Cable

Computers:

Name and Hardware	OS	Version	Function
Computer #1 HP ProDesk 600 G4	Windows 10	10.0.19041	Test Workstation – This computer will be connected to the KVM and provide keyboard, mouse, video, audio, and user authentication data when needed.
Computer #2 HP ProDesk 600 G4	Windows 10	10.0.19041	Test Workstation – This computer will be connected to the KVM and provide keyboard, mouse, video, audio, and user authentication data when needed.

Name and Hardware	OS	Version	Function
Lab PC Dell Vostro Desktop	Windows 10	10.0.19041	Lab Workstation – This computer will be external to the TOE and be used in measuring the KVM's data output.

Software:

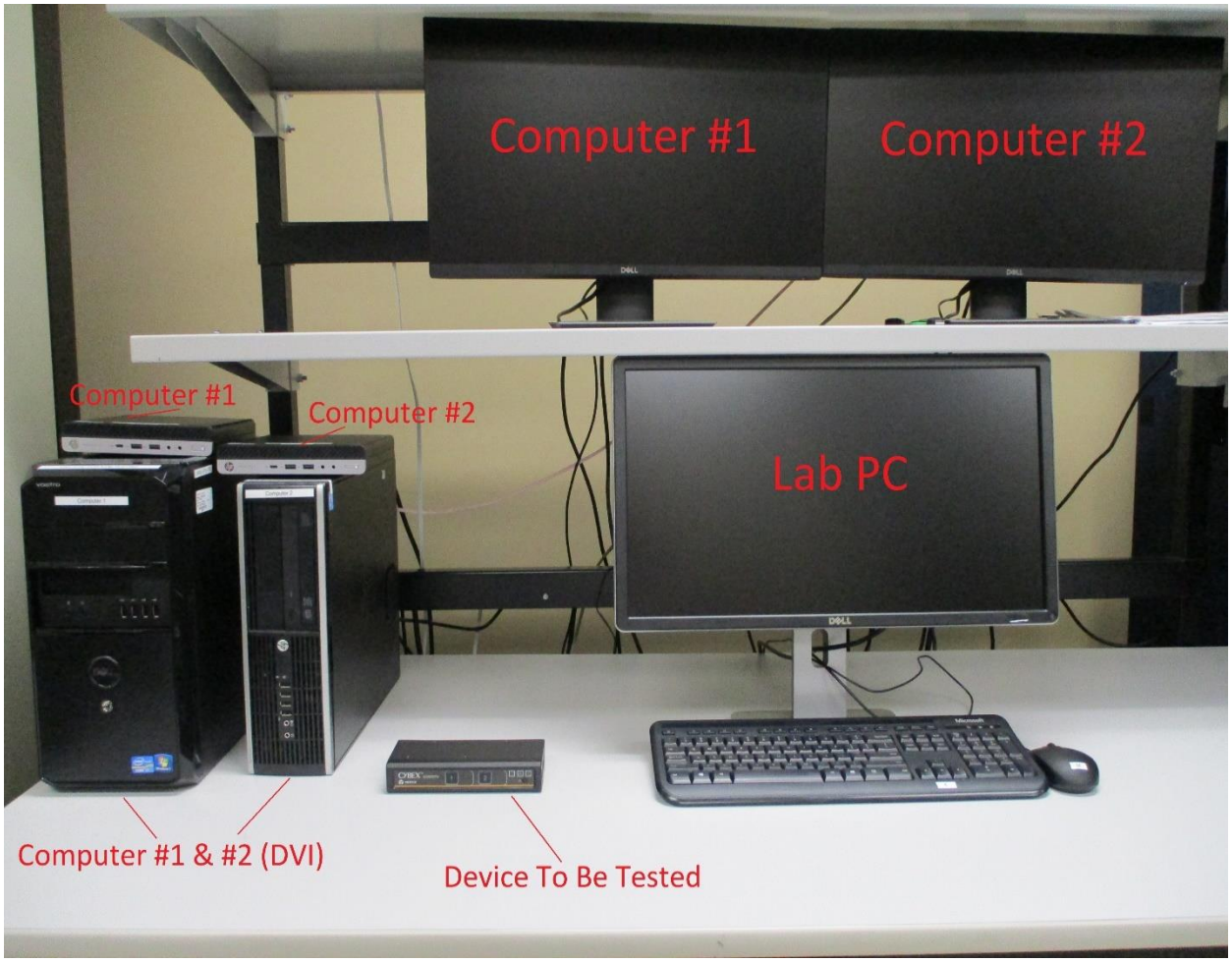
Name	Version
DisplayPort Aux Channel Monitor	2.0
Monitor Asset Manager	2.91.0.1043
SoftMCCS (Monitor Control Console Software)	2.5.0.1087
TrueRTA (Real Time Audio Spectrum Analyzer)	3.5.6
Teledyne Lecroy USB Protocol Suite™	7.60
USBlyzer (USB Analyzer Software)	2.1
Microsoft Device Manager	10.0.19041
Microsoft Notepad	10.0.19041

4.1.2 Test Time & Location

All testing was carried out on-site in Ottawa, Ontario by Acumen Security personnel. Testing occurred from January 2020 through November 2021. The TOE was in a physically protected, access controlled, designated test lab with no unattended entry/exit ways. At the start of each day, the test bed was verified to ensure that it was not compromised. All evaluation documentation was always kept with the evaluator. In addition, all the necessary precautions and safety protocols were followed.

4.1.3 Test Environment

The following test environment is in use throughout the testing process. Each device will be tested using one Lab workstation, and two test workstations. This will ensure throughout the testing process that at least two ports per TOE can be tested simultaneously. If a TOE has more than 2 ports, then the evaluator shall move the two test workstations over to the next two ports on the TOE and continue testing.


Computer #1
Computer #2
Lab PC
Computer #1
Computer #2
Computer #1 & #2 (DVI)
Device To Be Tested

The photograph above shows the environment where all the devices will be tested. The evaluator used two test computers (Computer #1 and #2) as well as a Lab PC. The device being tested was connected to one or both computers, as well as the lab PC to conduct testing.

4.1.4 Configuration Information

The following devices were tested:

4.1.5 **Product: SC840DPHC**

- Name: CYBEX™ SC Universal DPH + USB-C Secure KVM Switch 4-Port Single Display
- Number of Ports: 4 Ports
- Display Type: DisplayPort, HDMI, USB-C

4.1.6 **Product: SC820DPH**

- Name: CYBEX™ SC Universal DP/H Secure KVM Switch 2-Port Single Display
- Number of Ports: 2 Ports
- Display Type: DisplayPort, HDMI

4.1.7 **Product: SC840DVI**

- Name: CYBEX™ SC DVI Secure KVM Switch 4-Port Single Display
- Number of Ports: 4 Ports
- Display Type: DVI

4.1.8 **Product: SC945DPH (reference unit for destructive testing)**

- Name: CYBEX™ SC Universal DP/H Secure KVM Switch 4-Port Dual Display with CAC
- Number of Ports: 4 Ports
- Display Type: DisplayPort, HDMI

4.1.9 **Product: SC940DVI**

- Name: CYBEX™ SC DVI Secure KVM Switch 4-Port Dual Display
- Number of Ports: 4 Ports
- Display Type: DVI

4.1.10 **Product: SCAPF0004**

- Name: HighSecLabs™ SCAPF0004 Remote Control (CGA26687)
- Number of Buttons: 1 Button
- Computers Supported: Up to 4 computers
- Connection Type: RJ12 Cable

5 Detailed Test Cases (TSS, Isolation Document, and Guidance Activities)

The following is a list of the documents consulted:

- [ASE] Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Security Target, Version 1.24, November 19, 2021
- [Isol] Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Isolation Document, Version 1.3, October 22, 2020
- [CC_Supp] Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Common Criteria Guidance Supplement, Version 1.7, November 17, 2021
- [Tech_Bul] Vertiv CYBEX™ SC/SCM Switching System Additional Operations and Configuration Technical Bulletin, 590-1741-501B
- [2282] CYBEX™ SC SERIES SECURE SWITCHES SC800/900DPH, SC800/900DVI, and SCKM100PP4 Quick Install Guide, 590-2282-501B
- [2284] CYBEX™ SC Series Secure Switches SC800DPHC/SC900DPHC Quick Install Guide, 590-2284-501B
- [Testplan] Test Report for Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7, version 1.3, November 19, 2021

5.1 TSS, Isolation Document, and Guidance Activities (Auditing)

5.1.1 FAU_GEN.1

5.1.1.1 FAU_GEN.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.1.1.2 FAU_GEN.1 TSS 1

Objective	The evaluator shall verify that the TSS describes the audit functionality including which events are audited, what information is saved in each record type, how the records are stored, the conditions in which audit records are overwritten, and the means by which the audit records may be read. Although the TOE may provide an interface for an administrator to view the audit records, this is not a requirement.
Evaluator Findings	The evaluator examined the section titled 'Security Audit' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the 'Security Audit' section of the TSS describes in detail the audit functions, including both the critical RAM logs and the one-time programming (OTP) logs, as well as non-critical RAM logs. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.1.1.3 FAU_GEN.1 Guidance 1

Objective	The evaluator shall verify that the operational guidance provides instructions on how the audit logs can be viewed as well as any information needed to interpret the audit logs.
Evaluator Findings	The evaluator examined the Vertiv Technical Bulletin [Tech_Bul] and CC Guidance Supplement [CC_Supp] to determine the verdict of this evaluation activity. The 'Logs and Events' Section 2.2.7 of the Technical Bulletin has a description of the three types of logs [Critical RAM, Non-Critical RAM, and OTP] along with their content and how to interpret them. The 'Terminal Mode' section provides instructions on how to use the interface to access the logs. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2 TSS, Isolation Document, and Guidance Activities (User Data Protection)

5.2.1 FDP_AFL_EXT.1

5.2.1.1 FDP_AFL_EXT.1 Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.1.2 FDP_AFL.1_EXT.1 TSS 1

Objective	The evaluator shall check the TSS to verify that the TOE audio function implementation properly filters the audio passing through the TOE.
Evaluator Findings	The evaluator examined the section titled 'Audio Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section of the TSS indicates that unidirectional flow data diodes prevent audio data flow from an audio device to a selected computer. There is a separate audio interface for each computer. Each interface is electrically isolated from other interfaces, and from other TOE circuitry. These features ensure that the audio filtration specification requirements are met. This SFR includes Table 13 of [MOD_AO_V1.0]. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.1.3 FDP_AFL.1_EXT.1 Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.2 FDP_APC_EXT.1

5.2.2.1 FDP_APC_EXT.1 Isolation Document 1

Objective	The evaluator shall review the Isolation Documentation and Assessment as described in Appendix D of this PP and ensure that it adequately describes the isolation concepts and implementation in the TOE and why it can be relied upon to provide proper isolation between connected computers whether the TOE is powered on or powered off.
Evaluator Findings	The evaluator examined the Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Isolation Document. This document adequately describes the proper isolation whether the TOE is powered on or not. The 'Design Description' and 'Isolation Means Justification' sections describe how isolation is achieved. The section titled 'Main Components in the Data Path' provides additional information on how isolation is achieved when the device is powered off. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.2.2 FDP_APC_EXT.1 TSS 1

Objective	The evaluator shall verify that the TSS describes the conditions under which the TOE enters a failure state.
Evaluator Findings	The evaluator examined the section titled 'Protection of the TSF' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the TSS discusses the conditions under which the TOE enters a failure state. The device enters a failure state as a result of a self-test failure or a tampering event. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.2.3 FDP_APC_EXT.1 Guidance 1

Objective	The evaluator shall verify that the operational user guidance describes how a user knows when the TOE enters a failure state.
Evaluator Findings	The evaluator examined the CC Guidance Supplement [Supp] to determine the verdict of this evaluation activity. The CC Guidance Supplement describes the possible error states. As the product powers up, it performs a self-test procedure. Following failure of a self-test, the device will enter an error state. The error state is indicated by sequential flashing of the Light Emitting Diodes and by a clicking noise. At this point, the device will be inoperable. It will not accept input from any peripheral device or pass output to any peripheral device. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.3 FDP_APC_EXT.1/AO

5.2.3.1 FDP_APC_EXT.1/AO Isolation Document 1

Objective	The evaluator shall examine the Isolation Documentation to determine that it describes the logic under which the TSF permits audio flows from a connected computer to a connected audio output interface.
Evaluator Findings	The evaluator examined the Isolation Document to determine the verdict of this evaluation activity. The Isolation Document includes two figures, (Figure 1 and Figure2) that illustrate the possible data flows. There follows a table, Table 1 Data Flow Description, that provides an explanation of the data flows. Figures 4 ,5, 6, 7, 9 and 10, which characterize the data flows for various TOE configurations (i.e. combiner, switches, etc.), are part of the isolation justification and indicate the methods used to maintain the data separation. The 'Main Components in the Data Path' section provides an explanation of all data flow isolation. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.3.2 FDP_APC_EXT.1/AO Isolation Document 2

Objective	The evaluator shall examine the Isolation Documentation to determine that it describes how the TOE enforces audio output data flow isolation from other TOE functions, such that it is not possible for two computers connected to the TOE to use the TOE to communicate with one another. The description shall ensure the signal attenuation in the extended audio frequency range between any computer audio output interfaces is at least 45 dB measured with a 2V input pure sine wave at the extended audio frequency range, including negative swing signal.
Evaluator Findings	The evaluator examined the Isolation Document to determine the verdict of this evaluation activity. The 'Power Isolation' section discusses power isolation. The 'Isolation Means Justification' describes the isolation enforcement policy for various aspects of the TOE. Figure 6 shows the physical characteristics. The documented signal attenuation satisfies the requirements. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.3.3 FDP_APC_EXT.1/AO Isolation Document 3

Objective	The evaluator shall examine the Isolation Documentation to determine that it describes how the TOE prevents the audio output signal from traversing the TOE while the TOE is powered off.
Evaluator Findings	The evaluator examined the Isolation Document to determine the verdict of this evaluation activity. The Isolation Document includes Figure1, that illustrates the possible data flows. There follows a table, Table 1 Data Flow Description, that provides an explanation of the data flows. Figures 2, 3, 4, 5, 6 and 7, which characterize the data flows for various TOE configurations, are part of the isolation justification and indicate the methods used to maintain the data separation. The 'Main Components in the Data Path' section provides an

	explanation of all data flow isolation. The 'Unauthorized Audio to Audio Flow' section describes the design that prevents audio flow when the TOE is powered off. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.3.4 FDP_APC_EXT.1/AO TSS 1

Objective	There are no additional TSS activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.3.5 FDP_APC_EXT.1/AO Guidance 1

Objective	If the ability of the TOE to grant or deny authorization to audio communications is configurable, the evaluator shall verify that the operational guidance describes how to configure the TSF to behave in the manner specified by the SFR. This includes the possibility of both administratively configured TOE settings and any peripherals/connectors that are included with the TOE that cause data flows to behave differently if peripherals are connected through them.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The evaluator examined the product Quick Installation Guides and the CC Guidance Supplement to determine the verdict of this evaluation activity. Each guidance document provides instructions on how to install the TOE properly. The ability to grant or deny authorization to audio communications is not configurable. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.4 FDP_APC_EXT.1/KM

5.2.4.1 FDP_APC_EXT.1/KM Isolation Document 1

Objective	The evaluator shall examine the Isolation Document and verify it describes how the TOE ensures that no data or electrical signals flow between connected computers in both cases (powered on, powered off).
Evaluator Findings	The evaluator examined the Isolation Document to determine the verdict of this evaluation activity. The Isolation Document includes two figures, (Figure 1 and Figure2) that illustrate the possible data flows. There follows a table, Table 1 Data Flow Description, that provides an explanation of the data flows. Figures 2, 3, 4, 5, 6 and 7 which characterize the data flows for various TOE configurations (i.e. combiner, switches, etc.), are part of the isolation justification and indicate the methods used to maintain the data separation. The 'Main Components in the Data Path' section provides an explanation of all data flow isolation. The 'Isolation Means Justification' describes the isolation enforcement policy for various aspects of the TOE. Figure 8 shows the physical characteristics.

	Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.4.2 FDP_APC_EXT.1/KM TSS 1

Objective	There are no TSS EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.4.3 FDP_APC_EXT.1/KM Guidance 1

Objective	There are no guidance EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.5 FDP_APC_EXT.1/VI

5.2.5.1 FDP_APC_EXT.1/VI Isolation Document 1

Objective	The evaluator shall examine the Isolation Document and verify it describes how the TOE ensures that no data or electrical signals flow between connected computers in both cases (powered on, powered off).
Evaluator Findings	The evaluator examined the Isolation Document. The Isolation Document includes Figure 1 that illustrates the possible data flows. There follows a table, Table 1 Data Flow Description, that provides an explanation of the data flows. Figures 2, 3, 4, 5, 6 and 7 which characterize the data flows for various TOE configurations (i.e. combiner, switches, etc.), are part of the isolation justification and indicate the methods used to maintain the data separation. The 'Main Components in the Data Path' section provides an explanation of all data flow isolation. The 'Power Isolation' section discusses power isolation. The 'Isolation Means Justification' describes the isolation enforcement policy for various aspects of the TOE. Figure 8 shows the physical characteristics. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.5.2 FDP_APC_EXT.1/VI TSS 1

Objective	There are no EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.5.3 FDP_APC_EXT.1/VI Guidance 1

Objective	There are no guidance EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.6 FDP_CDS_EXT.1(1)

5.2.6.1 FDP_CDS_EXT.1(1) Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.6.2 FDP_CDS_EXT.1(1) TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes how many connected displays may be supported at a time.
Evaluator Findings	The evaluator examined the ST. The 'Physical Scope' section indicates the number of connected displays supported for each TOE device. Section 9.2.3.1 states" The SC820DPH, SC840DPH, SC840DPHC and SC840DVI devices support a single video display and the SC920DPH, SC940DPH, SC940DPHC and SC940DVI devices support two video displays." This information is consistent with the claims in FDP_CDS_EXT.1(1). Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.6.3 FDP_CDS_EXT.1(1) Guidance 1

Objective	The evaluator shall examine the operational user guidance and verify that it describes how many displays are supported by the TOE.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The CC Guidance Supplement section titled 'Number of Supported Displays' indicates the number of displays supported by each device. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.7 FDP_CDS_EXT.1(2)

5.2.7.1 FDP_CDS_EXT.1(2) Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.7.2 FDP_CDS_EXT.1(2) TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes how many connected displays may be supported at a time.
Evaluator Findings	The evaluator examined the ST. The 'Physical Scope' section indicates the number of connected displays supported for each TOE device. Section 9.2.3.1 states "The SC820DPH, SC840DPH, SC840DPHC and SC840DVI devices support a single video display and the SC920DPH, SC940DPH, SC940DPHC and SC940DVI devices support two video displays." This information is consistent with the claims in FDP_CDS_EXT.1(2). Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.7.3 FDP_CDS_EXT.1(2) Guidance 1

Objective	The evaluator shall examine the operational user guidance and verify that it describes how many displays are supported by the TOE.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The CC Guidance Supplement section titled 'Number of Supported Displays' indicates the number of displays supported by each device. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.8 FDP_FIL_EXT.1/KM

5.2.8.1 FDP_FIL_EXT.1/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this SFR.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.8.2 FDP_FIL_EXT.1/KM TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes whether the PSD has configurable or fixed device filtering. [Conditional - If "configurable" is selected in FDP_FIL_EXT.1.1/KM, then:] the evaluator shall examine the TSS and verify that it describes the process of configuring the TOE for whitelisting and blacklisting KM peripheral devices, including information on how this

	function is restricted to administrators. The evaluator shall verify that the TSS does not allow TOE device filtering configurations that permit unauthorized devices on KM interfaces.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Compatible Device Types' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the selection is fixed. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.8.3 FDP_FIL_EXT.1/KM Guidance 1

Objective	[Conditional - If "configurable" is selected in FDP_FIL_EXT.1.1/KM, then:] the evaluator shall examine the guidance documentation and verify that it describes the process of configuring the TOE for whitelisting and blacklisting KM peripheral devices and the administrative privileges required to do this.
Evaluator Findings	The evaluator examined the ST to determine that 'Configurable' has not been selected. Therefore, this evaluation activity is not applicable.
Verdict	Not Applicable/Pass

5.2.9 FDP_IPC_EXT.1

5.2.9.1 FDP_IPC_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable

5.2.9.2 FDP_IPC_EXT.1 TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes how data DisplayPort data is converted.
Evaluator Findings	The evaluator examined the section titled 'Video Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section describes the video switching functionality. In the discussion it states that for DisplayPort connections, the TOE video function filters the AUX channel by converting it to I2C EDID only. DisplayPort video is converted into an HDMI video stream. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.9.3 FDP_IPC_EXT.1 Guidance 1

Objective	There are no guidance EAs for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.10 FDP_PDC_EXT.1

5.2.10.1 FDP_PDC_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.10.2 FDP_PDC_EXT.1 TSS 1

Objective	The evaluator shall verify that the TSS describes the compatible devices for each peripheral port type supported by the TOE. The description must include sufficient detail to justify any PP-Modules that extend this PP and are claimed by the TOE (e.g., if the ST claims the Audio Input PP-Module, then the TSS shall reference one or more audio input devices as supported peripherals).
Evaluator Findings	The evaluator examined the section titled 'User Data Protection' in the Security Target to determine the verdict of this evaluation activity. The compatible device type for each peripheral port type is described in the sections titled 'Keyboard and Mouse Compatible Device Types', 'Video Compatible Device Types' and 'Audio Compatible Device Types'. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.3 FDP_PDC_EXT.1 TSS 2

Objective	The evaluator shall verify that the TSS describes the interfaces between the PSD and computers and the PSD and peripherals, and ensure that the TOE does not contain wireless connections for these interfaces.
Evaluator Findings	The evaluator confirmed that the ST indicates that there are no wireless peripherals allowed in this configuration. The 'Keyboard and Mouse Compatible Device Types' section indicates that the TOE does not support a wireless connection to a mouse, keyboard or USB hub. The 'Video Compatible Device Types' section indicates that the TOE does not support a wireless connection to a video display. The 'Audio Compatible Device Types' section indicates that the TOE does not support a wireless connection to an audio output device. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.4 FDP_PDC_EXT.1 TSS 3

Objective	The evaluator shall verify that the list of peripheral devices and interfaces supported by the TOE does not include any prohibited peripheral devices or interface protocols specified in Appendix E.
Evaluator Findings	The evaluator examined the section titled 'User Data Protection' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section describes the allowed peripheral devices and protocols in 'Keyboard and Mouse Compatible Device Types', 'Video Compatible Device Types' and 'Audio Compatible Device Types'. The TOE does not allow non-compliant devices. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.5 FDP_PDC_EXT.1 TSS 4

Objective	The evaluator shall verify that the TSS describes all external physical interfaces implemented by the TOE, and that there are no external interfaces that are not claimed by the TSF.
Evaluator Findings	The evaluator examined the section titled 'User Data Protection' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section describes all physical interfaces to the peripheral devices in 'Keyboard and Mouse Compatible Device Types', 'Video Compatible Device Types' and 'Audio Compatible Device Types'. The TOE is compliant to the PSD PP Appendix E and does describe any unclaimed external interfaces. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.6 FDP_PDC_EXT.1 Guidance 1

Objective	The evaluator shall verify that the operational user guidance provides clear direction for the connection of computers and peripheral devices to the TOE.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The [2284] Quick Install Guide provides clear instructions describing how to connect peripheral devices to the TOE. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.7 FDP_PDC_EXT.1 Guidance 2

Objective	The evaluator shall verify that the operational user guidance provides clear direction for the usage and connection of TOE interfaces, including general information for computer, power, and peripheral devices.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The [2284] Quick Install Guide provides clear instructions on how to connect peripheral devices, power, and computers.

	Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.8 FDP_PDC_EXT.1 Guidance 3

Objective	The evaluator shall determine if interfaces that receive or transmit data to or from the TOE present a risk that these interfaces could be misused to import or export user data.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The product guidance documents provide connectivity details. The CC Guidance Supplement provides additional instructions on usage, including environmental requirements required to alleviate the risk of data loss. This includes: 'Special analog data collection cards or peripherals such as analog to digital interface, high performance audio interface, or a component with digital signal processing or analog video capture functions may not be used with the secure peripheral sharing device.' and 'Microphones must not be plugged into the TOE audio output interfaces.' Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.9 FDP_PDC_EXT.1 Guidance 4

Objective	The evaluator shall verify that the operational user guidance describes the visual or auditory indications provided to a user when the TOE rejects the connection of a device.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The product guides discuss the acceptance/rejection of a device. When no device is detected, the LED is off. When the TOE rejects a device, an LED on the port blinks green. When the TOE accepts a device, the LED is solid green. There are no audible indications. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.10.10 FDP_PDC_EXT.1 Guidance 1-KM, VI

Objective	The evaluator shall verify that the operational user guidance describes devices authorized for use with the TOE in accordance with the authorized peripheral device connections.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The product Quick Installation Guide [2284] indicates the peripheral device type interfaces of the TOE devices. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.11 FDP_PDC_EXT.2/AO

5.2.11.1 FDP_PDC_EXT.2/AO Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.11.2 FDP_PDC_EXT.2/AO TSS 1

Objective	There are no TSS EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.11.3 FDP_PDC_EXT.2/AO Guidance 1

Objective	The evaluator shall verify that the operational guidance describes devices authorized for use with the TOE in accordance with the authorized peripheral device connections.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The evaluator examined the Quick Installation Guide [2284] which indicated the types of peripheral devices supported by the TOE. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.12 FDP_PDC_EXT.2/KM

5.2.12.1 FDP_PDC_EXT.2/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this SFR.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.12.2 FDP_PDC_EXT.2/KM TSS 1

Objective	TSS evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.12.3 FDP_PDC_EXT.2/KM Guidance 1

Objective	Guidance evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.13 FDP_PDC_EXT.2/VI

5.2.13.1 FDP_PDC_EXT.2/VI Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.13.2 FDP_PDC_EXT.2/VI TSS 1

Objective	TSS evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.13.3 FDP_PDC_EXT.2/VI Guidance 1

Objective	Guidance evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.14 FDP_PDC_EXT.3/KM

5.2.14.1 FDP_PDC_EXT.3/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this SFR.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.14.2 FDP_PDC_EXT.3/KM TSS 1

Objective	The evaluator shall examine the TSS and verify it describes which types of peripheral devices that the PSD supports.
Evaluator Findings	The evaluator examined the section titled ‘User Data Protection in the Security Target’ to determine the verdict of this evaluation activity. The evaluator confirmed that the TSS describes which peripherals are used in the ‘Keyboard and Mouse Compatible Device Types’, ‘Video Compatible Device Types’ and ‘Audio Compatible Device Types’ sections.

	Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.14.3 FDP_PDC_EXT.3/KM TSS 2

Objective	The evaluator shall examine the TSS to verify that keyboard or mouse device functions are emulated from the TOE to the connected computer.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that 'Keyboard and Mouse Switching Functionality' section indicates that the keyboard and mouse function are emulated by the TOE. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.14.4 FDP_PDC_EXT.3/KM Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.15 FDP_PDC_EXT.3/VI

5.2.15.1 FDP_PDC_EXT.3/VI Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.15.2 FDP_PDC_EXT.3/VI TSS 1

Objective	TSS evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.15.3 FDP_PDC_EXT.3/VI Guidance 1

Objective	Guidance evaluation activities for this SFR are performed under FDP_PDC_EXT.1 above.
Evaluator Findings	Not Applicable

Verdict	Not Applicable/Pass

5.2.16 FDP_PUD.EXT.1

5.2.16.1 FDP_PUD_EXT.1 Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.16.2 FDP_PUD_EXT.1 TSS 1

Objective	The evaluator shall verify the TSS states that the TOE does not supply power to an unauthorized device connected to the analog audio output interface.
Evaluator Findings	The evaluator examined the section titled 'Audio Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that the TOE does not supply power to the analog audio output interface and cannot be configured to do so. Therefore, it cannot be used to supply power to an unauthorized device on that interface. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.16.3 FDP_PUD_EXT.1 TSS 2

Objective	The evaluator shall also verify that the TOE cannot be configured to supply power to a device connected to the analog audio output interface.
Evaluator Findings	The evaluator examined the section titled 'Audio Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that the TOE does not supply power to the analog audio output interface and cannot be configured to do so. Therefore, it cannot be used to supply power to an unauthorized device on that interface. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.16.4 FDP_PUD_EXT.1 Guidance 1

Objective	The evaluator shall verify that the guidance states that a microphone should never be connected to the TOE's analog audio output interface.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The CC Guidance Supplement indicates that microphones must not be plugged into the TOE audio output interfaces in the 'Operational Environment' section. Based on these findings, this evaluation activity is considered satisfied.

Verdict	Pass

5.2.17 FDP_RDR_EXT.1

5.2.17.1 FDP_RDR_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.17.2 FDP_RDR_EXT.1 TSS 1

Objective	The evaluator shall examine the TSS to verify that it describes how the TSF identifies and rejects a device that attempts to enumerate again as a different device.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses Keyboard and Mouse Enumeration and indicates that a USB keyboard is connected to the TOE keyboard host emulator through the console keyboard port. The keyboard host emulator is a microcontroller which enumerates the connected keyboard and verifies that it is a permitted device type. This section also states that the USB mouse is connected to the TOE mouse host emulator through the USB mouse port. The mouse host emulator is a microcontroller which enumerates the connected mouse and verifies that it is a permitted device type. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.17.3 FDP_RDR_EXT.1 Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.18 FDP_RIP_EXT.1

5.2.18.1 FDP_RIP_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.18.2 FDP_RIP_EXT.1 TSS 1

Objective	The evaluator shall verify that the TSS includes a Letter of Volatility that provides the following information: • Which TOE components have non-volatile memory, the non-volatile memory technology, manufacturer/part number, and memory sizes; • Any data and data types that the TOE may store on each one of these components; • Whether or not each one of these parts is used to store user data and how this data may remain in the TOE after power down; and • Whether the specific component may be independently powered by something other than the TOE (e.g., by a connected computer). Note that user configuration and TOE settings are not considered user data for purposes of this requirement. The evaluator shall verify that the Letter of Volatility provides assurance that user data is not stored in TOE non-volatile memory or storage.
Evaluator Findings	The evaluator examined the section titled 'Letter of Volatility' in the Security Target to determine the verdict of this evaluation activity. The Letter of Volatility is provided as Annex A in the Security Target. The evaluator confirmed that this section lists each component, its function, manufacturer and part number, the type of data stored and whether the storage is volatile, or non-volatile. It also indicates the power source. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.18.3 FDP_RIP_EXT.1 TSS 2

Objective	The evaluator shall verify that the Letter of Volatility provides assurance that user data is not stored in TOE non-volatile memory or storage.
Evaluator Findings	The evaluator examined the section titled 'Letter of Volatility' in the Security Target to determine the verdict of this evaluation activity. The Letter of Volatility is provided as Annex A in the Security Target. The evaluator confirmed that this section indicates that user data is not stored in non-volatile memory or storage. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.18.4 FDP_RIP_EXT.1 Guidance 1

Objective	There are no guidance Evaluation Activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.19 FDP_RIP.1/KM

5.2.19.1 FDP_RIP.1/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.19.2 FDP_RIP.1/KM TSS 1

Objective	The evaluator shall verify that the TSS indicates whether or not the TOE has user data buffers.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that the Serial Random Access Memory (SRAM) in the host and device emulator circuitry stores USB Host stack parameters and up to the last 4 key codes. User data may be briefly retained; however, there are no data buffers. Data is erased during power off of the KVM, and when the user switches channels. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.19.3 FDP_RIP.1/KM TSS 2

Objective	The evaluator shall verify that the TSS describes how all keyboard data stored in volatile memory is deleted upon switching computers.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that data is erased during power off of the KVM, and when the user switches channels. When the TOE switches from one computer to another, the system controller ensures that the keyboard and mouse stacks are deleted, and that any data received from the keyboard in the first 100 milliseconds following switching is deleted. This is done to ensure that any data buffered in the keyboard microcontroller is not passed to the newly selected computer. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.19.4 FDP_RIP.1/KM Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.20 FDP_RIP_EXT.2

5.2.20.1 FDP_RIP_EXT.2 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.20.2 FDP_RIP_EXT.2 TSS 1

Objective	The evaluator shall verify that the TSS describes the TOE's reaction to memory purge or restore factory defaults.
Evaluator Findings	The evaluator examined the section titled 'Residual Information Protection' in the Security Target to determine the verdict of this evaluation activity. When the Reset to Factory Default command is issued, the following actions take place: • All peripheral devices are logically disconnected from the selected computer • The front panel LEDs blink together • The TOE resets, purging the appropriate data • The TOE performs a normal power up and self-test sequence When the device completes the reboot, the peripherals are connected to channel #1 and all default settings are restored. The data in the critical logs, and the primary administrator username and password data are maintained in the OTP Memory of the System Controller. All other data is purged. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.20.3 FDP_RIP_EXT.2 TSS 2

Objective	The evaluator shall verify that the Letter of Volatility included in the TSS describes the effect that the TOE Restore Factory Default function has on each component listed in the Letter of Volatility.
Evaluator Findings	The evaluator examined the section titled 'Letter of Volatility' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the 'Letter of Volatility' indicates the effect of the restore to factory default function on each component. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.20.4 FDP_RIP_EXT.2 Guidance 1

Objective	The evaluator shall check that the operational user guidance provides a method to purge TOE memory or to restore factory default settings.

Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Reset to Factory Defaults' section of the Technical Bulletin describes the factory reset function and what that entails. The 'Selected Channel at Startup' section of the CC Guidance Supplement states that Channel 1 is selected by default after a factory reset. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.21 FDP_SPR_EXT.1/DP

5.2.21.1 FDP_SPR_EXT.1/DP Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.21.2 FDP_SPR_EXT.1/DP TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes that the various sub-protocols are allowed or blocked by the TOE as described by the SFR.
Evaluator Findings	The evaluator examined the section titled 'Video Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the allowed and blocked sub-protocols supported for the DisplayPort protocol. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.21.3 FDP_SPR_EXT.1/DP Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.22 FDP_SPR_EXT.1/DVI-D

5.2.22.1 FDP_SPR_EXT.1/DVI-D Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.22.1 FDP_SPR_EXT.1/DVI-D TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes that the various sub-protocols are allowed or blocked by the TOE as described by the SFR.
Evaluator Findings	The evaluator examined the section titled 'Video Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the allowed and blocked sub-protocols supported for the DVI-D protocol. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.22.1 FDP_SPR_EXT.1/DVI-D Guidance 1

Objective	There are no guidance Evaluation Activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.23 FDP_SPR_EXT.1/HDMI

5.2.23.1 FDP_SPR_EXT.1/HDMI Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.23.2 FDP_SPR_EXT.1/HDMI TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes that the various sub-protocols are allowed or blocked by the TOE as described by the SFR.
Evaluator Findings	The evaluator examined the section titled 'Video Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the allowed and blocked sub-protocols supported for the HDMI protocol. Section 9.2.3 states "Other protocols, including Audio Return Channel (ARC), EDID from the computer to the display, MCCS, HDMI Ethernet and Audio Return Channel (HEAC), and HDMI Ethernet Channel (HEC) are blocked." Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.23.3 FDP_SPR_EXT.1/HDMI Guidance 1

Objective	There are no guidance EAs for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.24 FDP_SPR_EXT.1/USB

5.2.24.1 FDP_SPR_EXT.1/USB Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.24.2 FDP_SPR_EXT.1/USB TSS 1

Objective	The evaluator shall examine the TSS and verify that it describes that the various sub-protocols are allowed or blocked by the TOE as described by the SFR.
Evaluator Findings	The evaluator examined the section titled 'Video Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the allowed and blocked sub-protocols supported for the USB Type-C with DisplayPort as an alternate function protocol. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.24.3 FDP_SPR_EXT.1/USB Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.25 FDP_SWI_EXT.1

5.2.25.1 FDP_SWI_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.25.2 FDP_SWI_EXT.1 TSS 1

Objective	If the ST includes the selection the "TOE supports only one connected computer", the evaluator shall verify that the TSS indicates that the TOE supports only one connected computer.
Evaluator Findings	The evaluator examined FDP_SWI_EXT.1 in the 'Security Functional Requirements' section of the Security Target. The selection 'switching can be initiated only through express user action' has been made. Since 'TOE supports only one connected computer' is not selected, this evaluation activity is considered not applicable.
Verdict	Not Applicable

5.2.25.3 FDP_SWI_EXT.1 TSS 2

Objective	If the ST includes the selection "switching can be initiated only through express user action", the evaluator shall verify that the TSS describes the TOE supported switching mechanisms and that those mechanisms can be initiated only through express user action.
Evaluator Findings	The evaluator examined the section titled 'TOE Overview' and the section titled 'System Controller' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the 'TOE Overview' states that the Vertiv Secure Peripheral Sharing Devices (PSD) allow users to share keyboard, video, and mouse peripherals between a number of connected computers. The TSS has been written for multiple connected computers and explains how the user is able to conduct the switching. The System Controller section describes the switching mechanism. All devices may be switched using the front panel or remote control buttons. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.25.4 FDP_SWI_EXT.1 Guidance 1

Objective	If the ST includes the selection "switching can be initiated only through express user action", the evaluator shall verify that the operational user guidance describes the TOE supported switching mechanisms.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The switching mechanisms are described in the product Quick Installation Guides [2282] and [2284]. Each of these guides includes instructions on how the user performs switching. Section 3.2 of the [CC_Supp] describes switching for the remote. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.26 FDP_SWI_EXT.2

5.2.26.1 FDP_SWI_EXT.2 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.26.2 FDP_SWI_EXT.2 TSS 1

Objective	The evaluator shall verify that the TSS describes the TOE supported switching mechanisms. The evaluator shall verify that the TSS does not include automatic port scanning, control through a connected computer, and control through keyboard shortcuts as TOE supported switching mechanisms. The evaluator shall verify that the described switching mechanisms can be initiated only through express user action according to the selections.
Evaluator Findings	The evaluator examined the section titled 'System Controller' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that all devices may be switched using the front panel or remote control. Switching can only be initiated through express user action. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.26.3 FDP_SWI_EXT.2 Guidance 1

Objective	The evaluator shall verify that the operational user guidance describes the TOE supported switching mechanisms. The evaluator shall verify that the operational user guidance does not include automatic port scanning, control through a connected computer, and control through keyboard shortcuts as TOE supported switching mechanisms.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The switching mechanisms are described in the Quick Install Guides [2282] and [2284]. Each of these guides includes instructions on how the user performs switching. Section 3.2 of the [CC_Supp] describes switching for the remote. The evaluator also confirmed that the operational user guidance does not include automatic port scanning, control through a connected computer, and control through keyboard shortcuts as TOE supported switching mechanisms. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.27 FDP_SWI_EXT.3/KM

5.2.27.1 FDP_SWI_EXT.3/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this SFR.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.27.2 FDP_SWI_EXT.3/KM TSS 1

Objective	The evaluator shall verify that the TSS does not indicate that keyboard and mouse devices may be switched independently to different connected computers.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses keyboard and mouse switching. The 'TOE Access' section indicates that the TOE user switches between computers by pressing the corresponding front panel button on the device or remote control. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.27.3 FDP_SWI_EXT.3/KM Guidance 1

Objective	The evaluator shall verify that the guidance does not describe how to switch the keyboard and mouse devices independently to different connected computers.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'User Roles' section of the CC Guidance Supplement states that the user has access to the switching capability. All switching is performed manually. There is no way to switch the keyboard and mouse independently. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.28 FDP_UDF_EXT.1/AO

5.2.28.1 FDP_UDF_EXT.1/AO Isolation Document 1

Objective	The evaluator shall examine the Isolation Documentation to determine that it describes how the TOE enforces audio output data flow isolation from other TOE functions, such that the audio output peripheral interface is unidirectional and no data can be routed from a connected peripheral back to a connected computer. The description shall ensure the signal attenuation between any TOE audio output peripheral device interface and any other TOE computer audio output interface is at least 45 dB measured with a 2V input pure sine wave at the extended audio frequency range, including negative swing signal.
Evaluator Findings	The evaluator examined the Isolation Document section titled 'Unauthorized Audio to Audio Flow' and the section titled 'Unauthorized USB to Audio Flow' to determine the verdict of this evaluation activity. The evaluator confirmed that the 'Unauthorized Audio to Audio Flow' section indicates that isolated interfaces and components are used, as are audio data diodes. There are no shared parts. It then explains how isolation is achieved. The 'Unauthorized USB to Audio Flow' section describes how the audio output is isolated from the USB paths. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.28.2 FDP_UDF_EXT.1/AO TSS 1

Objective	There are no TSS EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.28.3 FDP_UDF_EXT.1/AO Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.29 FDP_UDF_EXT.1/KM

5.2.29.1 FDP_UDF_EXT.1/KM Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this SFR.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.29.2 FDP_UDF_EXT.1/KM TSS 1

Objective	The evaluator shall examine the TSS to verify that it describes if and how keyboard Caps Lock, Num Lock, and Scroll Lock indications are displayed by the TOE and to verify that keyboard internal LEDs are not changed by a connected computer.
Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section explains how the flows to the keyboard/mouse are unidirectional. It states that the TOE uses optical data diodes to enforce a unidirectional data flow from the user peripherals to the coupled hosts and uses isolated device emulators to prevent data leakage through the peripheral switching circuitry. It also indicates that the use of Caps lock, Num lock and Scroll lock are indicated on the TOE front panel. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.29.3 FDP_UDF_EXT.1/KM TSS 2

Objective	The evaluator shall examine the TSS to verify that keyboard and mouse functions are unidirectional from the TOE keyboard/mouse peripheral interface to the TOE keyboard/mouse computer interface.

Evaluator Findings	The evaluator examined the section titled 'Keyboard and Mouse Switching Functionality' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section explains how the flows to the keyboard/mouse are unidirectional. It states that the TOE uses optical data diodes to enforce a unidirectional data flow from the user peripherals to the coupled hosts and uses isolated device emulators to prevent data leakage through the peripheral switching circuitry. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.2.29.4 FDP_UDF_EXT.1/KM Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.30 FDP_UDF_EXT.1/VI

5.2.30.1 FDP_UDF_EXT.1/VI Isolation Document 1

Objective	There are no Isolation Document EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.30.2 FDP_UDF_EXT.1/VI TSS 1

Objective	There are no TSS EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.2.30.3 FDP_UDF_EXT.1/VI Guidance 1

Objective	There are no guidance EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.3 TSS, Isolation Document, and Guidance Activities (Identification and Authentication)

5.3.1 FIA_UAU.2

This SFR is evaluated by the Evaluation Activities in FMT_MOF.1 below.

5.3.2 FIA_UID.2

This SFR is evaluated by the Evaluation Activities in FMT_MOF.1 below.

5.4 TSS, Isolation Document, and Guidance Activities (Security Management)

5.4.1 FMT_MOF.1

5.4.1.1 FMT_MOF.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.4.1.2 FMT_MOF.1 TSS 1

Objective	The evaluator shall verify that the TSS describes the mechanism for preventing non-administrators from accessing the administrative functions stated above.
Evaluator Findings	The evaluator examined the section titled 'Identification and Authentication and Security Management' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section states that there is a single administrator role. In order to access administrative functions, the user must have an administrator username and password. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.1.3 FMT_MOF.1 TSS 2

Objective	If the TSF provides multiple administrative roles, the evaluator shall verify that the authorized behavior for each separate administrative role is described.
Evaluator Findings	The evaluator examined the section titled 'Identification and Authentication and Security Management' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section states that there is a single administrator role. An account with this role may be used to perform the following administrative tasks: • Manage administrator accounts (change password, create/delete administrator account) • Reset to factory defaults – note that this does not reset the username and password of the primary administrator, and does not reset the critical logs Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.1.4 FMT_MOF.1 TSS 3

Objective	The evaluator shall check the TSS to verify that it describes at least the following: a) Administrator name limitations and syntax requirements;

	b) Administrator password limitations and syntax requirements; c) Restoring lost name or password; d) Initial setting of administrator credentials; e) Logon success, fail limitations, and logging; and f) All functions identified in the above assignment.
Evaluator Findings	The evaluator examined the section titled 'Identification and Authentication and Security Management' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section describes the administrator account username and password limitations. For these accounts, usernames must be between 8 and 11 characters in length, and may be made up of uppercase and lowercase letters. The primary administrator has a default password which is changed on first use. This account does not revert to default but maintains the administrator's account when an RFD is performed. The administrator's password must be between 8 and 15 characters in length and may contain uppercase letters, lowercase letters, numbers or any of the following special characters: '!', '@', '#', '$', '%', '^', '&', '*', '(', ')', '-', or '_'. The password must contain at least one uppercase letter, one lowercase letter, one number and one special character. Lost passwords are irrecoverable. The user is locked out after three failed login attempts. The user may cycle the device power and try again. All password related events are logged. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.1.5 FMT_MOF.1 Guidance 1

Objective	The evaluator shall check the user and administrative guidance to verify that the administrative functions described above are only available to identified administrators. If the TSF provides multiple administrative roles, the evaluator shall verify that the authorized behavior for each separate administrative role is described.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Accessing Terminal Mode' section of the Technical Bulletin contains the information regarding passwords. This manual is intended only for use by the administrator. A user must be in possession of an administrative username and password in order to access the functionality described in this guide. Only one administrative role is supported. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.2 FMT_SMF.1

5.4.2.1 FMT_SMF.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.4.2.2 FMT_SMF.1 TSS 1

Objective	The evaluator shall check to ensure the TSS describes the management functions available to the administrators and user TOE configurations and how they are used by the TOE.
Evaluator Findings	The evaluator examined the section titled 'Identification and Authentication and Security Management' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section states that there is a single administrator role. An account with this role may be used to perform the following administrative tasks: • Manage administrator accounts (change password, create/delete administrator account) • Reset to factory defaults – note that this does not reset the username and password of the primary administrator, and does not reset the critical logs Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.2.3 FMT_SMF.1 Guidance 1

Objective	The evaluator shall check that every management function mandated in the ST for this requirement is described in the operational user guidance and that the description contains the information required to perform the management duties associated with each management function.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Terminal Mode' section of the Technical Bulletin contains instructions on how to perform administrative functions. The administrative interface is called 'Terminal Mode'. This guide provides instructions on how to perform administrative functions using Terminal Mode. This includes management of administrator accounts ('Account Management' section) and Reset to factory default ('Reset to Factory Defaults' section). Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.4.3 FMT_SMR.1

Refer to the Evaluation Activities of FMT_MOF.1.1 above.

5.5 TSS, Isolation Document, and Guidance Activities (Protection of the TSF)

5.5.1 FPT_FLS_EXT.1

Not Applicable. This SFR is evaluated in conjunction with FPT_TST.1.

5.5.2 FPT_NTA_EXT.1

5.5.2.1 FPT_NTA_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.2.2 FPT_NTA_EXT.1 TSS 1

Objective	The evaluator shall examine the TSS to ensure that the TSS documents that connected computers and peripherals do not have access to TOE software, firmware, and TOE memory, except as described above.
Evaluator Findings	The evaluator examined the section titled 'No Access to TOE' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that firmware is executed on SRAM with the appropriate protections to prevent external access and tampering of code or stacks. Firmware cannot be read or rewritten using JTAG tools. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.2.3 FPT_NTA_EXT.1 Guidance 1

Objective	The evaluator shall check the operational user guidance to ensure any configurations required to comply with this SFR are defined.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Secure Operation' section 4 of the CC Guidance Supplement provides a description of the firmware and its accessibility. No additional configuration is required to comply with this SFR. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.3 FPT_PHP.1

5.5.3.1 FPT_PHP.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.3.2 FPT_PHP.1 TSS 1

Objective	The evaluator shall verify that the TSS indicates that the TOE provides unambiguous detection of physical tampering of the TOE enclosure and TOE remote controller (if applicable). The

	evaluator shall verify that the TSS provides information that describes how the TOE indicates that it has been tampered with.
Evaluator Findings	The evaluator examined the section titled 'Passive Detection of Physical Tampering' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that the tamper evident seals are described in this section. If a seal is removed, the word VOID appears to indicate the TOE has been tampered with. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.3.3 FPT_PHP.1 Guidance 1

Objective	The evaluator shall verify that the operational user guidance describes the mechanism by which the TOE provides unambiguous detection of physical tampering and provides the user with instructions for verifying that the TOE has not been tampered with.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The Quick Install Guides [2282] and [2284] direct users to contact Technical Support if the enclosure appears to have been tampered with. It also directs users to ensure that the tamper-evident labels are intact prior to use. Additional detail is provided in [CC_Supp] Section 4.7 regarding tamper evidence for both the base unit and the remote. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.4 FPT_PHP.3

5.5.4.1 FPT_PHP.3 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.4.2 FPT_PHP.3 TSS 1

Objective	The evaluator shall verify that the TSS describes the TOE's reaction to opening the device enclosure or damaging/exhausting the anti-tampering battery associated with the enclosure.
Evaluator Findings	The evaluator examined the section 9.4.2.2 titled 'Resistance to Physical Attack' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the TOE's response to a tamper event. If the enclosure of the switch is opened, the anti-tamper circuitry causes a fuse on the system controller to melt and renders the TOE inoperable. Additionally, if the self-test detects that the battery is depleted or failing, the anti-tampering function will be triggered. In addition, the TSS states that when the anti-tampering mechanism on the remote control is triggered, the remote control device becomes permanently disabled.

	Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.4.3 FPT_PHP.3 Guidance 1

Objective	The evaluator shall examine the operational user guidance and verify that the guidance provides users with information on how to recognize a device where the anti-tampering functionality has been activated.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The Quick Install guides [2282] and [2284] contain a warning that discusses the anti-tamper circuitry. The port LEDs flash sequentially after a tamper event has occurred. Users are instructed to contact Technical Support when the tamper event occurs. Additional detail is provided in [CC_Supp] Section 4.7 regarding tamper evidence and response for both the base unit and the remote. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.4.4 FPT_PHP.3 Guidance 2

Objective	The evaluator shall verify that the operational user guidance warns the user of the actions that will cause the anti-tampering functionality to disable the device.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The Quick Install guides [2282] and [2284] contain a warning that discusses the anti-tamper circuitry. Users are instructed that if the enclosure appears to have been tampered with, or if all the port LEDs flash sequentially, they are to contact Technical Support. Additional detail is provided in [CC_Supp] Section 4.7 regarding tamper evidence and response for both the base unit and the remote. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.5 FPT_STM.1

5.5.5.1 FPT_STM.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.5.2 FPT_STM.1 TSS 1

Objective	The evaluator shall check to ensure the TSS describes how the TOE provides reliable timestamps.

Evaluator Findings	The evaluator examined the section titled 'Reliable Timestamps' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section states that the devices have a real-time clock powered by a battery and the time is set during production. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.5.3 FPT_STM.1 Guidance 1

Objective	The evaluator shall check that the operational user guidance describes how the TOE provides reliable timestamps and if there are any management functions for configuring the time.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Timestamps' section of the CC Guidance Supplement states that each device includes a real-time clock powered by a battery. The time is set during production. There are no management functions that allow configuration of time. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.6 FPT_TST.1

5.5.6.1 FPT_TST.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.6.2 FPT_TST.1 TSS 1

Objective	The evaluator shall verify that the TSS describes the self- tests that are performed on start up or on reset (if "upon reset button activation" is selected). The evaluator shall verify that the self-tests cover at least the following: a) a test of the user interface – in particular, tests of the user control mechanism (e.g., checking that the front panel push-buttons are not jammed); and b) if "active anti-tamper functionality" is selected, a test of any antitampering mechanism (e.g., checking that the backup battery is functional).
Evaluator Findings	The evaluator examined the section titled 'TSF Testing' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section discusses the self-test and what it encompasses: • Verification of the front panel push-buttons • Verification of the active anti-tampering functionality, including the continued functionality of the backup battery (where applicable)

	• Verification of the integrity of the microcontroller firmware • Verification of computer port isolation. This is tested by sending test packets to various interfaces and attempting to detect this traffic at all other interfaces Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.6.3 FPT_TST.1 TSS 2

Objective	The evaluator shall verify that the TSS describes how the TOE ensures a shutdown upon a self-test failure or a failed anti-tampering function, if present. If there are instances when a shutdown does not occur (e.g., a failure is deemed non-security relevant), those cases are identified and a rationale is provided explaining why the TOE's ability to enforce its security policies is not affected.
Evaluator Findings	The evaluator examined the section titled 'TSF Testing' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that if the self-test fails, the front panel LEDs blink and the TOE makes a clicking sound. The TOE disables the PSD switching functionality, and enters a disabled state. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.6.4 FPT_TST.1 TSS 3

Objective	The evaluator shall check the TSS to verify that it describes the TOE behavior in case of self-test failure. The evaluator shall verify that the described TOE behavior includes shutting down the PSD functionality once the failure is detected.
Evaluator Findings	The evaluator examined the section titled 'TSF Testing' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that if the self-test fails, the front panel LEDs blink and the TOE makes a clicking sound. The TOE disables the PSD switching functionality, and enters a disabled state. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.6.5 FPT_TST.1 TSS 4

Objective	The evaluator shall examine the TSS to verify that it describes how users verify the integrity of the selections in FPT_TST.1.2 and FPT_TST.1.3. This method can include restarting the TOE, a dedicated self-test, or some other method.
Evaluator Findings	The evaluator examined the section titled 'TSF Testing' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that the TOE can be rebooted to rerun the self-test to clear the error. All errors are logged. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.6.6 FPT_TST.1 Guidance 1

Objective	The evaluators shall verify that the operational user guidance describes how users verify the integrity of the selections in FPT_TST.1.2 and FPT_TST.1.3. This method can include restarting the TOE, a dedicated self-test, or some other method.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Self Tests' section of the CC Guidance Supplement provides instructions on how to initiate a self-test. In the case of a failure, users are directed to contact Vertiv Technical Support. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.7 FPT_TST_EXT.1

5.5.7.1 FPT_TST_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.5.7.2 FPT_TST_EXT.1 TSS 1

Objective	The evaluator shall check the TSS to verify that it describes the TOE behavior in case of self-test failure. The evaluator shall verify that the described TOE behavior includes shutting down the PSD functionality once the failure is detected.
Evaluator Findings	The evaluator examined the section 9.4.4 titled 'TSF Testing' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section states that the TOE front panel LEDs blink continuously and there is a clicking noise made by the TOE when a self-test fails. The TOE disables the PSD switching functionality and remains in a disabled state until the TOE is rebooted and the self-test passes. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.7.3 FPT_TST_EXT.1 Guidance 1

Objective	The evaluator shall verify that the operational user guidance: a) describes how the results of self-tests are indicated to the user; b) provides the user with a clear indication of how to recognize a failed self-test; and c) details the appropriate actions to be completed in the event of a failed self-test.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Self Tests' and 'Error State' sections of the CC Guidance Supplement describes how a successful or failed self-test is indicated, and explains what the operator has to do if there is a failure. Following a successful self-test, the device operates normally. Following failure of a

	self-test, the device will enter an error state. The error state is indicated by sequential flashing of the Light Emitting Diodes and by a clicking noise. At this point, the device will be inoperable. It will not accept input from any peripheral device or pass output to any peripheral device. In the event of a failed self-test, users are directed to contact Vertiv Technical Support. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.5.7.4 FPT_TST_EXT.1 Guidance 2

Objective	The evaluator shall verify that the operational user guidance provides adequate information on TOE self-test failures, their causes, and their indications.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The 'Self Tests' section of the CC Guidance Supplement describes a self-test failure. The document indicates that self-test failures may be caused by an unexpected input at power up, or by a failure in the device integrity. Self-test failures are indicated by blinking LEDs and a clicking noise. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.6 TSS, Isolation Document, and Guidance Activities (TOE Access)

5.6.1 FTA_CIN_EXT.1

5.6.1.1 FTA_CIN_EXT.1 Isolation Document 1

Objective	There are no Isolation Document evaluation activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

5.6.1.2 FTA_CIN_EXT.1 TSS 1

Objective	The evaluator shall verify that the TSS describes how the TOE behaves on power up and on reset, if applicable, regarding which computer interfaces are active, if any.
Evaluator Findings	The evaluator examined the section titled 'TOE Access' in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section indicates that on power up or power up following reset, all peripherals are connected to channel #1, and the corresponding push button LED will be illuminated. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.6.1.3 FTA_CIN_EXT.1 TSS 2

Objective	The evaluator shall verify that the TSS documents the behavior of all indicators when each switching mechanism is in use, and that no conflicting information is displayed by any indicators.
Evaluator Findings	The evaluator examined the section 9.2.4 in the Security Target to determine the verdict of this evaluation activity. The evaluator confirmed that this section describes the switching functionality, 'Freeze Audio' function which allows independent switching of these functions. The description and figure show how the selected channel is indicated and that no conflicting information is displayed. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.6.1.4 FTA_CIN_EXT.1 Guidance 1

Objective	The evaluator shall verify that the operational user guidance notes which computer connection is active on TOE power up or on recovery from reset, if applicable. If a reset option is available, use of this feature must be described in the operational user guidance.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The evaluator examined the CC Guidance Supplement and the Vertiv Technical Bulletin. The 'Selected Channel at Startup' section of the CC Guidance Supplement indicates that Channel 1 is selected by default when the device is started or reset. Reset is described in the Technical Bulletin. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

5.6.1.5 FTA_CIN_EXT.1 Guidance 2

Objective	The evaluator shall verify that the operational user guidance documents the behavior of all indicators when each switching mechanism is in use, and that no conflicting information is displayed by any indicators.
Evaluator Findings	The evaluator examined the guidance to determine the verdict of this evaluation activity. The evaluator examined the product Quick Installation Guides. These guides describe the behavior of the TOE indicators. These documents provide a diagram and a description of the channel indicators and a description of the indicator behavior when the switching mechanism is in use. This behavior ensures that no conflicting information is displayed by the indicators. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

6 Detailed Test Cases (Test Activities)

6.1 FAU_GEN.1 Test 1

Item	*Data/Description*		
Test ID	*FAU_GEN.1 – Test 1*		
Objective	The evaluator shall perform each of the auditable functions to succeed, and where possible, to fail. The evaluator shall use the means described in the TSS to access the audit records and verify that each of the events has been recorded, with all the of the expected information.		
Notes	• The evaluator confirms that the test execution steps were performed on all the units detailed in the units tested section. The same execution output was observed for each model tested.		
Testbed	#1		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. Set up the TOE to enable administrator access per applicable TOE administrative guidance. Verify that the TOE is in factory default format. 2. Attempt to set the initial administrator username and password. 3. Log into the TOE using administrative credentials and password. 4. Under the main operation page, select option “6” then “1” for critical one-time programming (OTP) logs. 5. Ensure tampering events logs are recorded by the TOE. 6. Ensure self-test failure logs are recorded by the TOE. 7. Ensure peripheral device rejection logs are recorded by the TOE 8. Ensure reset to factory default event logs are recorded by the TOE. 9. Ensure changes to the primary administrator password logs are recorded by the TOE. 10. Under the main operations page, select option “6” then “2” for random access memory (RAM) logs. 11. Ensure peripheral device acceptance logs are recorded by the TOE. 12. Ensure administrator login logs are recorded by the TOE. 13. Ensure administrator logout logs are recorded by the TOE. 14. Ensure creation and removal of administrator account logs are recorded by the TOE. 15. Ensure administrator password change logs are recorded by the TOE. 16. Ensure password lock event logs are recorded by the TOE.		
Pass/Fail Explanation	The evaluator confirms they accessed the audit records and verified that each of the events has been recorded, with all the of the expected information.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.2 FDP_AFL_EXT.1 Test 1

Item	*Data/Description*
Test ID	*FDP_AFL_EXT.1 – Test 1*
Objective	Step 1: Connect a computer to the TOE analog audio output peripheral interface and run audio analyzer software on it.

	Step 2: For each connected computer, ensure it is selected, use its tone generator software to generate a sine wave audio tone for each of the frequencies in the Audio Filtration Specifications table and verify in the audio analyzer software that they are attenuated by at least the amount specified in the Audio Filtration Specifications table. Step 3: Connect an oscilloscope to the TOE analog audio output peripheral interface and set it to measure the peak-to-peak voltage. Step 4: For each connected computer, perform step 5 with the signal generator set to the following settings: • Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed • Signal average to 0V (negative swing) Step 5: Set the signal generator to generate the frequencies in Audio Filtration Specifications table and verify the signal on the oscilloscope does not exceed the corresponding maximum voltage after attenuation.		
Notes	• TD0557 applied.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, Rigol Waveform Audio Signal Generator, Tektronix Oscilloscope, Spliced 3.5mm Cable, Dell P2319H Monitor.		
Test Execution Steps	1. Connect a computer to the TOE analog audio output peripheral interface and run audio analyzer software on it. 2. For each connected computer, ensure it is selected, use its tone generator software to generate a sine wave audio tone for each of the frequencies in the Audio Filtration Specifications table and verify in the audio analyzer software that they are attenuated by at least the amount specified in the Audio Filtration Specifications table. 3. Connect an oscilloscope to the TOE analog audio output peripheral interface and set it to measure the peak-to-peak voltage. 4. For each connected computer, perform step 5 with the signal generator set to the following settings: • Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed. • Signal average to 0V (negative swing). 5. Set the signal generator to generate the frequencies in Audio Filtration Specifications table and verify the signal on the oscilloscope does not exceed the corresponding maximum voltage after attenuation.		
Pass/Fail Explanation	The evaluator confirms that the TOE audio function implementation properly filters the audio passing through the TOE.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.3 FDP_APC_EXT.1 Test 1

Objective	There are no test Evaluation Activities for this component.

Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.4 FDP_APC_EXT.1/AO Test 1

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/AO – Test 1*
Objective	The evaluator shall perform the following setup steps: • Configure the TOE and the operational environment in accordance with the operational guidance. • Play a different audio file on a number of computers for each TOE computer analog audio interface. • Connect each computer to a TOE computer analog audio interface. • Turn on the TOE. Note that for a TOE that provides audio mixing function the evaluator shall maximize the volume on a specific channel where instructed in the following text to assign that specific computer. Note: Electrical signals are considered not to flow between connected computers and data is considered not to transit the TOE if no signal greater than 45 dB of attenuation at the specific audio frequency is received Test 1-AO – Analog Audio Output Data Routing Methods. This test verifies the functionality of the TOE routing methods while powered on, powered off, and in failure state. Step 1: Connect amplified speakers to the TOE audio output device interface. Set the speakers to approximately 25% volume. Step 2: [Conditional: if “switching can be initiated only through express user action” is selected in FDP_SWI_EXT.1.1 in the PSD PP, then] perform step 3 for each switching method selected in FDP_SWI_EXT.2.2 in accordance with the operational user guidance. Step 3: For each connected computer, ensure it is selected, listen to the amplified speakers, and verify that the audio is coming from the selected computer(s). Adjust the volume if necessary. Step 4: Replace the speakers with a computer connected to the TOE analog audio output device interface and run audio spectrum analyzer software on it. Run tone generator software on all connected computers. Step 5: Turn off the TOE, and for each connected computer, use the tone generator program to generate a sine wave audio tone for each of the designated frequencies and verify that no audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface. Step 6: Power on the TOE, cause the TOE to enter a failure state, and verify that the TOE provides the user with an indication of failure. For each connected computer

	use the tone generator program to generate a sine wave audio tone for each of the designated frequencies and verify that no audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Edifier Multimedia Speaker, TrueRTA, Rigol Waveform Audio Signal Generator, Dell P2319H Monitor.		
Test Execution Steps	1. Connect amplified speakers to the TOE audio output device interface. Set the speakers to approximately 25% volume. 2. *[Conditional: if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP, then]* perform step 3 for each switching method selected in FDP_SWI_EXT.2.2 in accordance with the operational user guidance. 3. For each connected computer, ensure it is selected, listen to the amplified speakers, and verify that the audio is coming from the selected computer(s). Adjust the volume if necessary. 4. Replace the speakers with a computer connected to the TOE analog audio output device interface and run audio spectrum analyzer software on it. Run tone generator software on all connected computers. 5. Turn off the TOE, and for each connected computer, use the tone generator program to generate a sine wave audio tone for each of the designated frequencies and verify that no audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface. 6. Power on the TOE, cause the TOE to enter a failure state, and verify that the TOE provides the user with an indication of failure. For each connected computer use the tone generator program to generate a sine wave audio tone for each of the designated frequencies and verify that no audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface.		
Pass/Fail Explanation	The functionality of the TOE's routing methods has been tested while powered on, powered off, and in failure state. The evaluator confirms that audio is only routed to selected authorized computers.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.5 FDP_APC_EXT.1/AO Test 2

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/AO – Test 2*
Objective	*[Conditional: perform this test if "switching through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP.]* This test verifies that no data or electrical signals flow between connected computers while the TOE is powered on or off. 1. Continue with the test setup from Test 1. 2. Connect a computer to the TOE analog audio output device interface. Run audio spectrum analyzer software on all computers. 3. Perform steps 4-13 for each TOE analog audio computer interface.

	4. Turn on the TOE and ensure the first computer is selected. 5. Use the tone generator program on the first computer to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface and is not present in the audio spectrum analyzer software on any of the non-selected computers. This step does not fail is frequencies above 20 kHz are not present in the software on the connected computer due to attenuation as per FDP_AFL_EXT.1. 6. For each other TOE analog audio computer interface, select that computer and use the tone generator program on the first computer (now no longer selected) to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is not present in the audio spectrum analyzer software on the selected computer, the other non-selected computers, or the computer connected to the TOE analog audio output device interface. 7. Power off the TOE and use the tone generator program on the first computer to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is not present in the audio spectrum analyzer software on any of the other connected computers. 8. Restart the TOE, select the first computer, and replace it with an external audio signal generator. 9. For each non-selected computer connected to the TOE analog audio output computer interface, replace it with an oscilloscope set to measure the peak-to-peak voltage and perform steps 10-14. 10. Perform steps 11-13 with the signal generator set to the following settings: Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed Signal average to 0v (negative swing). 11. Set the signal generator to generate the designated frequencies and verify the signal on the oscilloscopes is 11.2 mV or less. This level of signal ensures signal attenuation of 45 dB in the extended audio frequency range. 12. For each other TOE analog audio computer interface, select it, set the signal generator to generate the designated frequencies, and verify the signal on the oscilloscopes is 11.2 mV or less. 13. Power off the TOE and set the signal generator to generate the designated frequencies and verify the signal on the oscilloscopes is 11.2 mV or less.
Testbed	#1
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, Rigol Waveform Audio Signal Generator, Tektronix Oscilloscope, Dell P2319H Monitor, Spliced 3.5mm Cable.
Test Execution Steps	*[Conditional: perform this test if "switching through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP.]* This test verifies that no data or electrical signals flow between connected computers while the TOE is powered on or off. 1. Continue with the test setup from Test 1. 2. Connect a computer to the TOE analog audio output device interface. Run audio spectrum analyzer software on all computers. 3. Perform steps 4-13 for each TOE analog audio computer interface. 4. Turn on the TOE and ensure the first computer is selected.

	5. Use the tone generator program on the first computer to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is present in the audio spectrum analyzer software on the computer connected to the TOE analog audio output device interface and is not present in the audio spectrum analyzer software on any of the non-selected computers. This step does not fail is frequencies above 20 kHz are not present in the software on the connected computer due to attenuation as per FDP_AFL_EXT.1. 6. For each other TOE analog audio computer interface, select that computer and use the tone generator program on the first computer (now no longer selected) to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is not present in the audio spectrum analyzer software on the selected computer, the other non-selected computers, or the computer connected to the TOE analog audio output device interface. 7. Power off the TOE and use the tone generator program on the first computer to generate a sine wave audio tone for each of the designated frequencies. Verify that the audio is not present in the audio spectrum analyzer software on any of the other connected computers. 8. Restart the TOE, select the first computer, and replace it with an external audio signal generator. 9. For each non-selected computer connected to the TOE analog audio output computer interface, replace it with an oscilloscope set to measure the peak-to-peak voltage and perform steps 10-14. 10. Perform steps 11-13 with the signal generator set to the following settings: Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed Signal average to 0v (negative swing). 11. Set the signal generator to generate the designated frequencies and verify the signal on the oscilloscopes is 11.2 mV or less. This level of signal ensures signal attenuation of 45 dB in the extended audio frequency range. 12. For each other TOE analog audio computer interface, select it, set the signal generator to generate the designated frequencies, and verify the signal on the oscilloscopes is 11.2 mV or less. 26. Power off the TOE and set the signal generator to generate the designated frequencies and verify the signal on the oscilloscopes is 11.2 mV or less.		
Pass/Fail Explanation	No data or electrical signals flow between connected computers while the TOE is powered on or off. The evaluator has confirmed that audio is only present on the selected computer and does not leak to other connected computers.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.6 FDP_APC_EXT.1/AO Test 3

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/AO – Test 3*
Objective	1. Connect a computer to the TOE analog audio output peripheral interface and run audio spectrum analyzer software on it and each connected computer. 2. Perform steps 3-9 for each connected computer.

	3. Ensure the first computer is selected and perform steps 4-8 while the TOE is powered on and powered off. *[Conditional: Perform steps 4 and 5 only if the PP – Module for Video/Display Devices is part of the PP configuration being claimed.]* 4. For each other connected computer, disconnect and reconnect the video cables from the TOE computer interface several times. Verify that no sound appears on the audio analyzer software on the first computer. 5. Disconnect and reconnect the first computer's video cables from the TOE computer interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 6. *[Conditional: If the PP-Module for Keyboard/Mouse Devices or PP-Module for User Authentication Devices is part of the PP-Configuration being claimed, then:]* for each other connected computer, disconnect and reconnect the USB cable from the TOE USB computer interface several times. Verify that no sound appears on the audio analyzer software on the computer connected to the TOE analog audio output peripheral interface or any connected computers. 7. *[Conditional: If the PSD PP-Module for Keyboard/Mouse Devices is part of the PP-Configuration being claimed, then:]* disconnect and reconnect the peripheral device type(s) selected in FDP_PDC_EXT.3.1/KM from the TOE KM peripheral device interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 8. *[Conditional]: If the PP-Module for User Authentication Devices is part of the PP-Configuration being claimed and "external" is selected in FDP_PDC_EXT.4.1, then:]* disconnect and reconnect the UA peripheral device from the TOE UA peripheral device interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 9. *[Conditional: If the PP-Module for User Authentication Devices is part of the PP-Configuration being claimed, then:]* connect an authentication session to the first computer and verify that no sounds appears on the audio analyzer software on the other connected computers.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, Rigol Waveform Audio Signal Generator, Dell P2319H Monitor.
Test Execution Steps	1. Connect a computer to the TOE analog audio output peripheral interface and run audio spectrum analyzer software on it and each connected computer. 2. Perform steps 3-9 for each connected computer. 3. Ensure the first computer is selected and perform steps 4-8 while the TOE is powered on and powered off. 4. For each other connected computer, disconnect and reconnect the video cables from the TOE computer interface several times. Verify that no sound appears on the audio analyzer software on the first computer. 5. Disconnect and reconnect the first computer's video cables from the TOE computer interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 6. *[Conditional: If the PP-Module for Keyboard/Mouse Devices or PP-Module for User Authentication Devices is part of the PP-Configuration being claimed, then:]* for each other connected computer, disconnect and reconnect the USB cable from the TOE USB computer interface several times. Verify that no sound appears on the audio analyzer software on the computer connected to the TOE analog audio output peripheral interface or any connected computers.

	7. *[Conditional: If the PSD PP-Module for Keyboard/Mouse Devices is part of the PP-Configuration being claimed, then:]* disconnect and reconnect the peripheral device type(s) selected in FDP_PDC_EXT.3.1/KM from the TOE KM peripheral device interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 8. *[Conditional]: If the PP-Module for User Authentication Devices is part of the PP-Configuration being claimed and "external" is selected in FDP_PDC_EXT.4.1, then:]* disconnect and reconnect the UA peripheral device from the TOE UA peripheral device interface several times. Verify that no sound appears on the audio analyzer software on the other connected computers. 9. *[Conditional: If the PP-Module for User Authentication Devices is part of the PP-Configuration being claimed, then:]* connect an authentication session to the first computer and verify that no sounds appears on the audio analyzer software on the other connected computers.		
Pass/Fail Explanation	The evaluator has confirmed that power events at one TOE USB computer interface do not affect the analog audio output computer interface of another computer.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.7 FDP_APC_EXT.1/AO Test 4

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/AO – Test 4*
Objective	Test 4-AO – No Flow between Connected Computers over Time This test verifies that the TOE does not send data to different computers connected to the same interface at different times. Repeat this test for each TOE Analog Audio Output port. 1. Ensure only one computer is connected and it is selected. Run a tone generator program on the connected computer and the audio analyzer software on a non-connected computer. 2. Perform steps 3-11 while the TOE is powered on and powered off. 3. Perform steps 4 - 5 for each of the designated frequencies. 4. Use the tone generator program on the connected computer to generate a sine wave audio tone. 5. Disconnect the connected computer, wait two minutes, connect the other computer, and verify that the generated audio frequency is not present in the audio spectrum analyzer software. 6. Replace the connected computer with an external audio signal generator. 7. Perform steps 8-11 with the signal generator set to the following settings: 11 Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed Signal average to 0v (negative swing). 8. Perform steps 9 - 11 for each of the designated frequencies. 9. Use the signal generator to generate the signal. 10. Disconnect the signal generator, wait two minutes, and replace it with an oscilloscope set to measure the peak-to-peak voltage.

	11. Verify the signal on the oscilloscope is 11.2 mV or less at the generated frequency.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, Rigol Waveform Audio Signal Generator, Tektronix Oscilloscope, Dell P2319H Monitor, Spliced 3.5mm Cable.		
Test Execution Steps	1. Ensure only one computer is connected and it is selected. Run a tone generator program on the connected computer and the audio analyzer software on a non-connected computer. 2. Perform steps 3-11 while the TOE is powered on and powered off. 3. Perform steps 4 - 5 for each of the designated frequencies. 4. Use the tone generator program on the connected computer to generate a sine wave audio tone. 5. Disconnect the connected computer, wait two minutes, connect the other computer, and verify that the generated audio frequency is not present in the audio spectrum analyzer software. 6. Replace the connected computer with an external audio signal generator. 7. Perform steps 8-11 with the signal generator set to the following settings: 11 Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed Signal average to 0v (negative swing). 8. Perform steps 9 - 11 for each of the designated frequencies. 9. Use the signal generator to generate the signal. 10. Disconnect the signal generator, wait two minutes, and replace it with an oscilloscope set to measure the peak-to-peak voltage. 11. Verify the signal on the oscilloscope is 11.2 mV or less at the generated frequency.		
Pass/Fail Explanation	The evaluator verifies that the TOE does not send data to different computers connected to the same interface at different times.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.8 FDP_APC_EXT.1/KM Test 1

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/KM – Test 1*
Objective	For tests that use the USB sniffer or USB analyzer software, the evaluator verifies whether traffic is sent or not sent by inspection of the passing USB transactions and ensuring they do not contain USB data payloads other than any expected traffic, as well as USB NAK transactions or system messages. To avoid clutter during USB traffic capture, the evaluator may filter NAK transactions and system messages. The evaluator shall perform the following tests: Test 1-KM – KM Switching methods [Conditional: Perform this test if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP] While performing this test, ensure that switching is always initiated through express user action.

	This test verifies the functionality of the TOE's KM switching methods. Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect an authorized peripheral device for each peripheral device type selected in FDP_PDC_EXT.3.1/KM. Run an instance of a text editor on each connected computer. Step 2: Connect a display to each computer in order to see all computers at the same time, turn on the TOE, and enter text or move the cursor to verify which connected computer is selected. Step 3: For each switching method selected in FDP_SWI_EXT.2.2, switch selected computers in accordance with the operational user guidance and verify that it succeeds. Step 4: For each peripheral device type selected in FDP_PDC_EXT.3.1/KM, attempt to switch the device to more than one computer at once and verify that the TOE ignores all such commands or otherwise prevents the operation from executing. Step 5: [Conditional: If "keyboard" is selected in FDP_PDC_EXT.3.1/KM, then] attempt to control the computer selection using the following standard keyboard shortcuts, where '#' represents a computer channel number, and verify that the selected computer is not switched: • Control - Control - # - Enter • Shift - Shift - # • Num Lock - Minus - # • Scroll Lock - Scroll Lock - # • Scroll Lock - Scroll Lock - Function # • Scroll Lock - Scroll Lock - arrow (up or down) • Scroll Lock - Scroll Lock - # - enter • Control - Shift - Alt - # - Enter • Alt - Control - Shift - # Step 6: [Conditional: If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then] attempt to switch to other connected computers using the pointing device and verify that it does not succeed. Step 7: [Conditional: If "peripheral devices using a guard" is selected in FDP_SWI_EXT.2.2, then] attempt to switch to other connected computers using the peripheral device and guard by only performing some of the steps outlined in the operational user guidance, and verify that it does not succeed.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Notepad, Dell P2319H Monitor.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect an authorized peripheral device for each peripheral device type selected in FDP_PDC_EXT.3.1/KM. Run an instance of a text editor on each connected computer.

	2. Connect a display to each computer in order to see all computers at the same time, turn on the TOE, and enter text or move the cursor to verify which connected computer is selected. 3. For each switching method selected in FDP_SWI_EXT.2.2, switch selected computers in accordance with the operational user guidance, and verify that it succeeds. 4. For each peripheral device type selected in FDP_PDC_EXT.3.1/KM, attempt to switch the device to more than one computer at once and verify that the TOE ignores all such commands or otherwise prevents the operation from executing. 5. *[Conditional: If "keyboard" is selected in FDP_PDC_EXT.3.1/KM, then]* attempt to control the computer selection using the following standard keyboard shortcuts, where '#' represents a computer channel number, and verify that the selected computer is not switched: • Control - Control - # - Enter • Shift - Shift - # • Num Lock - Minus - # • Scroll Lock - Scroll Lock - # • Scroll Lock - Scroll Lock - Function # • Scroll Lock - Scroll Lock - arrow (up or down) • Scroll Lock - Scroll Lock - # - enter • Control - Shift - Alt - # - Enter • Alt - Control - Shift - # 6. *[Conditional: If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then]* attempt to switch to other connected computers using the pointing device and verify that it does not succeed. 7. *[Conditional: If "peripheral devices using a guard" is selected in FDP_SWI_EXT.2.2, then]* attempt to switch to other connected computers using the peripheral device and guard by only performing some of the steps outlined in the operational user guidance, and verify that it does not succeed.		
Pass/Fail Explanation	The functionality of the TOE's KM switching methods has been tested successfully. The evaluator has confirmed that the TOE prevents the user from switching between more than one computer at once.		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.9 FDP_APC_EXT.1/KM Test 2

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/KM – Test 2*
Objective	Test 2-KM – Positive and Negative Keyboard and Mouse Data Flow Rules Testing This test verifies the functionality for correct data flows of a mouse and keyboard during different power states of the selected computer. Step 1: Continue with the test setup from Test 1 and for each connected computer, connect a USB sniffer between it and the TOE or open the USB analyzer software. Perform steps 2-12 with each connected computer as the selected computer.

	Step 2: Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer. [Conditional: Perform steps 3-10 if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP.] Step 3: [If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then] switch the TOE to each connected computer, and use the mouse to position the mouse cursor at the center of each display. Switch the TOE back to the originally selected computer. Step 4: [If "keyboard is selected in FDP_PDC_EXT.3.1/KM, then] use the keyboard to enter text into the text editor. [If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then] use the mouse to move the cursor to the bottom right corner of the display. Step 5: Switch to each connected computer and verify that the actions taken in Step 4 did not occur on any of the non-selected computers. Step 6: Switch to the originally selected computer. Continue exercising the functions of the peripheral device(s) and examine the USB protocol analyzers on each one of the non-selected computers and verify that no traffic is sent. Step 7: Disconnect and reconnect the TOE interface cables connected to the selected computer. Examine the USB protocol analyzers on each one of the non-selected computers and verify that no traffic is sent. Step 8: Reboot the selected computer. Examine the USB protocol analyzers on each one of the nonselected computers and verify that no traffic is sent. Step 9: Enter sleep or suspend mode in the selected computer. Examine the USB protocol analyzers on each one of the non-selected computers to verify that no traffic is sent. Step 10: Exit sleep or suspend mode on the selected computer. Examine the USB protocol analyzers on each of the non-selected computers to verify that no traffic is sent. Ensure that any text in the Text Editor application is deleted. Step 11: Perform step 12 when the TOE is off and then in a failure state. Step 12: Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify t no results are observed on the selected computer and that no traffic is captured using the USB analyzer.
Test Equipment Used	Teledyne Lecroy USB sniffer, USBlyzer, Notepad, Dell Wired Keyboard, Dell Wired Mouse, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor.
Test Execution Steps	13. Continue with the test setup from Test 1 and for each connected computer, connect a USB sniffer between it and the TOE or open the USB analyzer software. Perform steps 2-12 with each connected computer as the selected computer. 14. Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer. 15. *[Conditional: Perform steps 3-10 if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP.]* [If "mouse"

	is selected in FDP_PDC_EXT.3.1/KM, then] switch the TOE to each connected computer and use the mouse to position the mouse cursor at the center of each display. Switch the TOE back to the originally selected computer. 16. [If "keyboard is selected in FDP_PDC_EXT.3.1/KM, then] use the keyboard to enter text into the text editor. [If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then] use the mouse to move the cursor to the bottom right corner of the display. 17. Switch to each connected computer and verify that the actions taken in Step 4 did not occur on any of the non-selected computers. 18. Switch to the originally selected computer. Continue exercising the functions of the peripheral device(s) and examine the USB protocol analyzers on each one of the non-selected computers and verify that no traffic is sent. 19. Disconnect and reconnect the TOE interface cables connected to the selected computer. Examine the USB protocol analyzers on each one of the non-selected computers and verify that no traffic is sent. 20. Reboot the selected computer. Examine the USB protocol analyzers on each one of the non-selected computers and verify that no traffic is sent. 21. Enter sleep or suspend mode in the selected computer. Examine the USB protocol analyzers on each one of the non-selected computers to verify that no traffic is sent. 22. Exit sleep or suspend mode on the selected computer. Examine the USB protocol analyzers on each of the non-selected computers to verify that no traffic is sent. Ensure that any text in the Text Editor application is deleted. 23. Perform step 12 when the TOE is off and then in a failure state. 24. Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that no results are observed on the selected computer and that no traffic is captured using the USB analyzer.		
Pass/Fail Explanation	Correct data flows of a mouse and keyboard during different power states of the selected computer has been tested. The evaluator has confirmed that data flow is transmitted to the correct computers at the accurate times.		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.10 FDP_APC_EXT.1/KM Test 3

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/KM – Test 3*
Objective	Test 3-KM – Flow Isolation and Unidirectional Rule This test verifies that the TOE properly enforces unidirectional flow and isolation. Step 1: Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Perform steps 2-12 with each connected computer as the selected computer. Step 2: Ensure the TOE is powered on and connect a display directly to the selected computer. Open a real-time hardware information console on the selected computer.

	[If “mouse” is selected in FDP_PDC_EXT.3.1/KM, then perform steps 3-4] Step 3: Connect a gaming mouse with programmable LEDs directly to the selected computer and attempt to configure the LEDs using the mouse application running on the selected computer. Verify that the mouse programmable LEDs change state. Step 4: Disconnect the gaming mouse from the selected computer and connect it to the TOE mouse peripheral device port through the USB sniffer. Attempt to configure the LEDs using the mouse application running on the selected computer. Verify that the mouse programmable LEDs do not change state and that no traffic is sent and captured by the USB sniffer while the evaluator is not moving the mouse. [If “keyboard” is selected in FDP_PDC_EXT.3.1/KM, then perform step 5] Step 5: Connect a keyboard to the peripheral device interface through the USB sniffer. Use a keyboard emulation software application running on the selected computer to turn the keyboard Num Lock, Caps Lock, and Scroll Lock LEDs on and off. Verify that the LEDs on the keyboard do not change state and that no traffic is sent and captured by the USB sniffer. Step 6: Power down the TOE and disconnect the peripheral interface USB cable from the TOE to the selected computer and the peripheral devices from the TOE. Step 7: Power up the TOE and ensure the selected computer has not changed (this should have no effect on the selected computer because it was disconnected in the previous step). Reconnect the peripheral devices disconnected in step 6 to the TOE. Step 8: [If “mouse” is selected in FDP_PDC_EXT.3.1/KM, then] check that immediately following the connection, the mouse LEDs are illuminated (indicating that the peripheral devices are powered on, although the selected computer is not connected). [If “keyboard” is selected in FDP_PDC_EXT.3.1/KM, then] check that immediately following the connection, the Num Lock, Caps Lock, and Scroll Lock keyboard LEDs are blinking momentarily and then stay off (indicating that the keyboard is powered on, although the selected computer is not connected). Step 9: Turn the TOE off and disconnect the peripheral devices connected in step 6. Step 10: Reconnect the first computer interface USB cable to the TOE. Step 11: Turn on the TOE and check the computer real-time hardware information console for the presence of the peripheral devices connected in step 6 and disconnected in step 9. The presence of the TOE peripheral devices in the information console when the peripheral devices are not connected to the TOE indicates that the TOE emulates the KM devices. Step 12: [Conditional] If the TOE keyboard and mouse do not appear in the listed devices, repeat the following steps for both mouse and keyboard to simulate USB traffic: • Connect a USB generator to the TOE peripheral device interface port.

	• Configure the USB generator to enumerate as a generic HID mouse/keyboard device and then to generate a random stream of mouse/keyboard report packets. • Connect a USB sniffer device between the TOE computer interface and the USB port on the first computer to capture the USB traffic between the TOE and the first computer. • Turn on the TOE and verify that no packets cross the TOE following the device enumeration.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Device Manager, Steelseries Rival 100 Gaming Mouse, Teledyne Lecroy USB Sniffer, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor.
Test Execution Steps	1. Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. *[Perform steps 2 – 12 with each connected computer as the selected computer]* 2. Ensure the TOE is powered on and connect a display directly to the selected computer. Open a real-time hardware information console on the selected computer. *[If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then perform steps 3 - 4]* 3. Connect a gaming mouse with programmable LEDs directly to the selected computer and attempt to configure the LEDs using the mouse application running on the selected computer. Verify that the mouse programmable LEDs change state. 4. Disconnect the gaming mouse from the selected computer and connect it to the TOE mouse peripheral device port through the USB sniffer. Attempt to configure the LEDs using the mouse application running on the selected computer. Verify that the mouse programmable LEDs do not change state and that no traffic is sent and captured by the USB sniffer while the evaluator is not moving the mouse. *[If "keyboard" is selected in FDP_PDC_EXT.3.1/KM, then perform step 5]* 5. Connect a keyboard to the peripheral device interface through the USB sniffer. Use a keyboard emulation software application running on the selected computer to turn the keyboard Num Lock, Caps Lock, and Scroll Lock LEDs on and off. Verify that the LEDs on the keyboard do not change state and that no traffic is sent and captured by the USB sniffer. 6. Power down the TOE and disconnect the peripheral interface USB cable from the TOE to the selected computer and the peripheral devices from the TOE. 7. Power up the TOE and ensure the selected computer has not changed (this should have no effect on the selected computer because it was disconnected in the previous step). Reconnect the peripheral devices disconnected in step 6 to the TOE. 8. [If "mouse" is selected in FDP_PDC_EXT.3.1/KM, then] check that immediately following the connection, the mouse LEDs are illuminated (indicating that the peripheral devices are powered on, although the selected computer is not connected). [If "keyboard" is selected in FDP_PDC_EXT.3.1/KM, then] check that immediately following the connection, the Num Lock, Caps Lock, and Scroll Lock keyboard LEDs are blinking momentarily and then stay off (indicating that the keyboard is powered on, although the selected computer is not connected).

	9. Turn the TOE off and disconnect the peripheral devices connected in step 6. 10. Reconnect the first computer interface USB cable to the TOE. 11. Turn on the TOE and check the computer real-time hardware information console for the presence of the peripheral devices connected in step 6 and disconnected in step 9. The presence of the TOE peripheral devices in the information console when the peripheral devices are not connected to the TOE indicates that the TOE emulates the KM devices. 12. *[Conditional]* If the TOE keyboard and mouse do not appear in the listed devices, repeat the following steps for both mouse and keyboard to simulate USB traffic: • Connect a USB generator to the TOE peripheral device interface port. • Configure the USB generator to enumerate as a generic HID mouse/keyboard device and then to generate a random stream of mouse/keyboard report packets. • Connect a USB sniffer device between the TOE computer interface and the USB port on the first computer to capture the USB traffic between the TOE and the first computer. • Turn on the TOE and verify that no packets cross the TOE following the device enumeration.		
Pass/Fail Explanation	Unidirectional flow and isolation of USB traffic has been tested. The evaluator has confirmed that USB traffic is enforced properly and in a single direction.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.11 FDP_APC_EXT.1/KM Test 4

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/KM – Test 4*
Objective	*[Conditional: Perform this test if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP]* This test verifies correct data flow while the TOE is powered on or powered off. Step 1: Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Connect a display directly to each connected computer. Perform steps 2-10 for each connected computer. Step 2: Connect a USB sniffer between a non-selected TOE KM computer interface and its computer. Run USB protocol analyzer software on all remaining computers. Step 3: Turn on the TOE and observe the TOE enumeration data flow in the protocol analyzer connected to the selected computer and is not in any other USB protocol analyzers or the USB sniffer. Step 4: Ensure the TOE is switched to the first computer. Step 5: Reboot the first computer. Verify that no USB traffic is captured on all non-selected computer USB protocol analyzers.

	Step 6: Generate intensive USB HID traffic by moving the mouse at high speed and/or holding down the keyboard space key at the same time. Verify that no new USB traffic is captured on all non-selected computer USB protocol analyzers. Step 7: Perform steps 8 and 9 for each TOE keyboard/mouse peripheral interface. Step 8: Connect a USB dummy load into the TOE KM peripheral device interface. Verify that no new USB traffic is captured on all non-selected computer USB protocol analyzers. Remove the plug after the step is completed. Step 9: Connect a switchable 5-volt power supply with any compatible USB plug into the TOE KM peripheral device interface. Modulate the 5-volt supply (i.e., cycle on and off) manually at various speeds from approximately one cycle per five seconds to one cycle per second. Verify that no new USB traffic is captured on all non-selected computer USB analyzers. Step 10: Turn off the TOE. Verify that no new traffic is captured.
Notes	• TD0507 applied.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Teledyne Lecroy USB Sniffer, USBlyzer, HSL USB Dummy Load, Dr. Meter DC Power Supply, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor, Spliced USB Type-A Cable.
Test Execution Steps	1. Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Connect a display directly to each connected computer. Perform steps 2-10 for each connected computer. 2. Connect a USB sniffer between a non-selected TOE KM computer interface and its computer. Run USB protocol analyzer software on all remaining computers. 3. Turn on the TOE and observe the TOE enumeration data flow in the protocol analyzer connected to the selected computer and is not in any other USB protocol analyzers or the USB sniffer. 4. Ensure the TOE is switched to the first computer. 5. Reboot the first computer. Verify that no USB traffic is captured on all non-selected computer USB protocol analyzers. 6. Generate intensive USB HID traffic by moving the mouse at high speed and/or holding down the keyboard space key at the same time. Verify that no new USB traffic is captured on all non-selected computer USB protocol analyzers. 7. Perform steps 8 and 9 for each TOE keyboard/mouse peripheral interface. 8. Connect a USB dummy load into the TOE KM peripheral device interface. Verify that no new USB traffic is captured on all non-selected computer USB protocol analyzers. Remove the plug after the step is completed. 9. Connect a switchable 5-volt power supply with any compatible USB plug into the TOE KM peripheral device interface. Modulate the 5-volt supply (i.e., cycle on and off) manually at various speeds from approximately one cycle per five seconds to one cycle per second. Verify that no new USB traffic is captured on all non-selected computer USB analyzers. 10. Turn off the TOE. Verify that no new traffic is captured.
Pass/Fail Explanation	Correct data flow while the TOE is powered on or powered off has been tested. The evaluator confirms that USB traffic is only captured on selected authorized computers.

Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.12 FDP_APC_EXT.1/KM Test 5

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/KM – Test 5*
Objective	Test 5-KM – No Flow between Connected Computers over Time This test verifies that the TOE does not send data to different computers connected to the same interface at different times. Repeat this test for each TOE KM computer port. Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect an authorized peripheral device for each peripheral device type selected in FDP_PDC_EXT.3.1/KM. Connect two computers to a different display and run an instance of a text editor and USB analyzer software on each computer. Step 2: Connect the first computer to the TOE and ensure it is selected and that no other computers are connected. Step 3: Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer. Step 4: Disconnect the first computer. Generate intensive USB HID traffic by moving the mouse at high speed and/or holding down the keyboard space key at the same time. Step 5: Cease generation of the USB HID traffic, connect the second computer to the same port and ensure it is selected. Step 6: Verify that no results from the previous use of the peripheral device are observed on the selected computer and that no traffic is sent and captured using the USB analyzer. Step 7: Reboot the TOE and repeat step 6. Step 8: Turn off the TOE and repeat step 6. Step 9: Restart the TOE and repeat step 6. Step 10: Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Notepad, USBlyzer, Dell P2319H Monitor.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect an authorized peripheral device for each peripheral device type selected in FDP_PDC_EXT.3.1/KM. Connect two computers to a different display and run an instance of a text editor and USB analyzer software on each computer.

	2. Connect the first computer to the TOE and ensure it is selected and that no other computers are connected. 3. Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer. 4. Disconnect the first computer. Generate intensive USB HID traffic by moving the mouse at high speed and/or holding down the keyboard space key at the same time. 5. Cease generation of the USB HID traffic, connect the second computer to the same port and ensure it is selected. 6. Verify that no results from the previous use of the peripheral device are observed on the selected computer and that no traffic is sent and captured using the USB analyzer. 7. Reboot the TOE and repeat step 6. 8. Turn off the TOE and repeat step 6. 9. Restart the TOE and repeat step 6. 10. Exercise the functions of the peripheral device type selected in FDP_PDC_EXT.3.1/KM and verify that the expected results are observed on the selected computer and that the expected traffic is sent and captured using the USB analyzer.		
Pass/Fail Explanation	Data flow through the same interface has been observed and tested. The evaluator confirms that the TOE does not send data to different computers connected to the same interface at different times.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.13 FDP_APC_EXT.1/VI Test 1

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/VI – Test 1*
Objective	Test 1-VI: Video Source Selection and Identification, TOE Off and Failure States This test verifies the TOE switching function operates properly and will stop the video output display when in an OFF or FAILURE state. Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Step 2: Play a different video with embedded audio on a number of computers for each TOE computer video interface. Step 3: Connect each computer to a TOE computer video interface. Step 4: Connect a display to each TOE display interface. Step 5: Turn on the TOE. Step 6: For each connected computer, ensure it is selected and verify that the video and its accompanying audio from the selected computer(s) are received on the proper display(s).

	Step 7: *[Conditional: If "peripheral devices using a guard" is selected in FDP_SWI_EXT.2.2, then]* attempt to switch to other connected computers using the peripheral device and guard by only performing some of the steps outlined in the operational user guidance, and verify that it does not succeed. Step 8: Turn off the TOE and verify that no video appears on any connected display. Step 9: Power on the TOE and cause the TOE to enter a failure state. Verify that the TOE provides the user with a visual indication of failure and that no usable video appears on any connected display. Step 10: Repeat steps 3 to 9 for each unique display protocol and port type supported by the TOE.			
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Edifier Multimedia Speaker, Dell P2319H Monitor.			
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. 2. Play a different video with embedded audio on a number of computers for each TOE computer video interface. 3. Connect each computer to a TOE computer video interface. 4. Connect a display to each TOE display interface. 5. Turn on the TOE. 6. For each connected computer, ensure it is selected and verify that the video and its accompanying audio from the selected computer(s) are received on the proper display(s). 7. *[Conditional: if the TOE claims the Combiner Use Case then]* verify that video generated by the TOE has clear identification marking or text to properly identify the source computer shown. 8. Turn off the TOE and verify that no video appears on any connected display. 9. Power on the TOE and cause the TOE to enter a failure state. Verify that the TOE provides the user with a visual indication of failure and that no usable video appears on any connected display. 10. Repeat steps 3 to 9 for each unique display protocol and port type supported by the TOE.			
Pass/Fail Explanation	The evaluator confirms that the TOE switching function operates properly and will stop the video output display when in an OFF or FAILURE state.			
Units Tested	SC840DPHC	SC820DPH	SC840DVI	SC940DVI
Result	PASS	PASS	PASS	PASS

6.14 FDP_APC_EXT.1/VI Test 2

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/VI – Test 2*
Objective	Test 2-VI: Computer Video Interface Isolation [Conditional: perform this test if "switching can be initiated only through express user action" is selected in FDP_SWI_EXT.1.1 in the PSD PP.] This test verifies that the TOE does not transfer data to any non-selected computer video interface.

	Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect only the first computer interface cable to one computer. Turn on the TOE. Step 2: Switch the TOE primary display to computer #1. Step 3: Observe the primary display to verify that the selected computer is the one that is shown. Step 4: Remove the non-selected computer video interface cables from the TOE and connect the oscilloscope probe to the TOE #2 computer video interface to verify that no SYNC signal is passed through the TOE. Based on the connection interface protocol, this is performed as follows: 1. Video Graphics Array (VGA) – single ended probe on pins 13 and then 14; 2. High-Definition Multimedia Interface (HDMI) – connect pin 19 to a 3.3V power supply via a 100 Ohm resistor to provide Hot Plug Detect (HPD) signal; Check for signals - differential probe between pins 10 (+) and 12 (-); 3. Digital Visual Interface (DVI)-I – connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - single ended probe on pins 8 and C4. Differential probe between pins 23 (+) and 24 (-); 4. DVI-D - connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 23 (+) and 24 (-); 5. DisplayPort - connect pin 18 to a 3.3V power supply via 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 3 (-) and 1 (+) and between 10 (-) and 12 (+); 6. USB Type-C with DisplayPort as Alternate Function – connect pin A8 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals – Differential probe between pins A2 and A3, A10 and A11; B2 and B3, and B10 and B11. Step 5: Repeat steps 3 and 4 while selecting other TOE connected computers. Verify that no SYNC signal is present. Step 6: Repeat steps 3 to 5 with the TOE unpowered. Verify that no SYNC signal is present. Step 7: With the probe connected to the TOE computer #2 video interface, disconnect / reconnect the computer #1 video cable. Power up the TOE and select computer #1. Attempt to detect the change in the oscilloscope at each one of the TOE #2 computer video interface pins. No changes shall be detected. Step 8: Repeat step 7 for each one of the other TOE computer video interfaces. Step 9: Repeat steps 7 and 8, but instead of disconnecting / reconnecting the computer, disconnect and reconnect the display. Step 10: Repeat steps 7 and 8, but instead of disconnecting / reconnecting the computer, reboot the selected computer. Step 11: Repeat steps 2 to 10 with each connected computer.

	Step 12: [Conditional: if "multiple connected displays" is selected in FDP_CDS_EXT.1.1 then] repeat steps 3 to 10 with each other display connected to the TOE. Step 13: Repeat this test for each unique display protocol and port type supported by the TOE.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Tektronix Oscilloscope, Dr. Meter DC Power Supply, Dell P2319H Monitor, Spliced HDMI Cable, Spliced DisplayPort Cable, Spliced USB Type-C Cable.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect only the first computer interface cable to one computer. Turn on the TOE. 2. Switch the TOE primary display to computer #1. 3. Observe the primary display to verify that the selected computer is the one that is shown. 4. Remove the non-selected computer video interface cables from the TOE and connect the oscilloscope probe to the TOE #2 computer video interface to verify that no SYNC signal is passed through the TOE. Based on the connection interface protocol, this is performed as follows: **a.** Video Graphics Array (VGA) – single ended probe on pins 13 and 14; b. High-Definition Multimedia Interface (HDMI) – connect pin 19 to a 3.3V power supply via a 100 Ohm resistor to provide Hot Plug Detect (HPD) signal; Check for signals - differential probe between pins 10 (+) and 12 (-); c**.** Digital Visual Interface (DVI)-I – connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - single ended probe on pins 8 and C4. Differential probe between pins 23 (+) and 24 (-); d. DVI-D - connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 23 (+) and 24 (-); e. DisplayPort - connect pin 18 to a 3.3V power supply via 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 3 (-) and 1 (+) and between 10 (-) and 12 (+); f. USB Type-C with DisplayPort as Alternate Function – connect pin A8 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals – Differential probe between pins A2 and A3, A10 and A11; B2 and B3, and B10 and B11 5. Repeat steps 3 and 4 while selecting other TOE connected computers. Verify that no SYNC signal is present. 6. Repeat steps 3 to 5 with the TOE unpowered. Verify that no SYNC signal is present. 7. With the probe connected to the TOE computer #2 video interface, disconnect / reconnect the computer #1 video cable. Power up the TOE and select computer #1. Attempt to detect the change in the oscilloscope at each one of the TOE #2 computer video interface pins. No changes shall be detected. 8. Repeat step 7 for each one of the other TOE computer video interfaces. 9. Repeat steps 7 and 8, but instead of disconnecting / reconnecting the computer, disconnect and reconnect the display. 10. Repeat steps 7 and 8, but instead of disconnecting / reconnecting the computer, reboot the selected computer. 11. Repeat steps 2 to 10 with each connected computer.

	12. [*Conditional: if "multiple connected displays" is selected in FDP_CDS_EXT.1.1 then]* repeat steps 3 to 10 with each other display connected to the TOE. 13. Repeat this test for each unique display protocol and port type supported by the TOE.			
Pass/Fail Explanation	The evaluator confirms that the TOE does not transfer data to any non-selected computer video interface.			
Units Tested	SC840DPHC	SC820DPH	SC840DVI	SC940DVI
Result	PASS	PASS	PASS	PASS

6.15 FDP_APC_EXT.1/VI Test 3

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/VI – Test 3*
Objective	3-VI - Unauthorized Sub-protocols Note that in the following steps only native video protocol cables shall be used. No conversion from other video protocols is allowed in these tests except as directed in FDP_IPC_EXT.1.1. This test verifies that unauthorized sub-protocols are blocked. Perform this test for each of the selections in FDP_PDC_EXT.3.1/VI and FDP_IPC_EXT.1.1. In the following steps the evaluator shall establish a verified test setup that passes video signals across the TOE. Step 1: Connect at least one computer with a native video protocol output to the TOE computer #1 video input interface. Step 2: Connect at least one display with native video protocol to the TOE display output. Step 3: Power up the TOE and ensure the connected computer is selected. Step 4: Verify that the video image is visible and stable on the user display. In the following steps the evaluator shall verify that the test setup properly blocks the unauthorized video sub-protocol traffic. Step 5: Open the Monitor Control Command Set (MCCS) control console program on the computer and attempt to change the display contrast and brightness. Verify that the display does not change its contrast and brightness accordingly. Step 6: Disconnect the video cable connecting the display and the TOE and connect the display directly to the computer. Verify that the video image is visible and stable on the user display. Step 7: Attempt to change the display contrast and brightness. Verify that the display does change its contrast and brightness accordingly. Step 8: Connect the following testing device based on the display video protocol being tested at the peripheral display interface: a. DisplayPort – DisplayPort AUX channel analyzer in series between the display and the TOE

	b. HDMI – HDMI sink test device c. USB Type-C with DisplayPort as Alternate Function – USB sniffer in series between the display and the TOE d. VGA – VGA sink test device e. DVI-I/DVI-D – DVI sink test device Step 9: Attempt to change the display contrast and brightness. Verify that the testing device does not capture any MCCS commands. Step 10: Replace the computer with a source generator for each selected protocol at the computer video interface. If DVI-I or DVI-D is selected, use an HDMI source generator. Step 11: Run an EDID write transaction at the generator and verify in the testing device that no EDID traffic is captured. Step 12: [Conditional, if DisplayPort, DVI-D, DVI-I, HDMI, or USB Type-C is the selected protocol being tested at the computer video interface, then] run Consumer Electronics Control (CEC) and High-bandwidth Digital Content Protection (HDCP) tests or commands at the generator and verify in the testing device that no CEC or HDCP traffic is captured. Step 13: [Conditional, if DVI-D, DVI-I, or HDMI is the selected protocol being tested at the computer video interface, then] run Audio Return Channel (ARC), HDMI Ethernet and Audio Return Channel (HEAC), and HDMI Ethernet Channel (HEC) tests or commands at the generator and verify in the testing device that no ARC, HEAC, or HEC traffic is captured. Step 14: [Conditional: If "[HDMI] protocol" is selected in FDP_IPC_EXT.1.2, then] perform steps 15 and 16 for both pin 13 (CEC) and 14 (UTILITY). Step 15: Turn off the TOE. Use a multi-meter to measure the resistance-to-ground of the pin at the TOE HDMI peripheral interface and verify it is greater than 2 Mega-ohms. Step 16: Attach a single ended oscilloscope probe between the pin and the ground, turn on the TOE, and verify that no changes between 0.0v and 0.2v and between 3.0v and 3.3v are detected. Step 17: [Conditional: if VGA is not the selected protocol being tested, then] disconnect all devices. Connect the display to a TOE computer video interface and the oscilloscope to the TOE display interface in order to verify that no HPD signal is passed by measuring a signal voltage of less than 1.0V. Based on the selected protocol being tested, this is performed as follows: a. HDMI – connect scope to pin 19 and verify no HPD signal is detected; b. DVI-D/DVI-I – connect scope to pin 16 and verify no HPD signal is detected; c. DisplayPort - connect scope to pin 18 and verify no HPD signal is detected; d. USB Type-C with DisplayPort as Alternate Function – connect scope to pin A8 and B8 and verify no HPD signal is detected.

	Step 18: Repeat this test for each of the selections in FDP_PDC_EXT.3.1/VI and FDP_IPC_EXT.1.2.
Notes	• TD0514 & TD0584 applied.
Testbed	#1
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, SoftMCCS, DisplayPort Aux Channel Monitor, Unigraf DPA-400 DisplayPort Aux Channel Monitor, QuantumData 882E Video Test Generator, Fluke True RMS Digital Multimeter, Tektronix Oscilloscope, QuantumData 980 Video Test Generator, TCL 40" Smart TV with ARC, Spliced HDMI Cable, Spliced DisplayPort Cable, Spliced USB Type-C Cable, Dell P2319H Monitor.
Test Execution Steps	1. Connect at least one computer with a native video protocol output to the TOE computer #1 video input interface. 2. Connect at least one display with native video protocol to the TOE display output. 3. Power up the TOE and ensure the connected computer is selected. 4. Power up the TOE and ensure the connected computer is selected. 5. Open the Monitor Control Command Set (MCCS) control console program on the computer and attempt to change the display contrast and brightness. Verify that the display does not change its contrast and brightness accordingly. 6. Disconnect the video cable connecting the display and the TOE and connect the display directly to the computer. Verify that the video image is visible and stable on the user display. 7. Attempt to change the display contrast and brightness. Verify that the display does change its contrast and brightness accordingly. 8. Connect the following testing device based on the display video protocol being tested at the peripheral display interface: 1. DisplayPort – DisplayPort AUX channel analyzer in series between the display and the TOE 2. HDMI – HDMI sink test device 3. USB Type-C with DisplayPort as Alternate Function – USB sniffer in series between the display and the TOE 4. VGA – VGA sink test device 5. DVI-I/DVI-D – DVI sink test device 9. Attempt to change the display contrast and brightness. Verify that the testing device does not capture any MCCS commands. 10. Replace the computer with a source generator for each selected protocol at the computer video interface. If DVI-I or DVI-D is selected, use an HDMI source generator. 11. Run an EDID write transaction at the generator and verify in the testing device that no EDID traffic is captured. 12. *[Conditional, if DisplayPort, DVI-D, DVI-I, HDMI, or USB Type-C is the selected protocol being tested at the computer video interface, then]* run Consumer Electronics Control (CEC) and High-bandwidth Digital Content Protection (HDCP) tests or commands at the generator and verify in the testing device that no CEC or HDCP traffic is captured. 13. *[Conditional, if DVI-D, DVI-I, or HDMI is the selected protocol being tested at the computer video interface, then]* run Audio Return Channel (ARC), HDMI Ethernet and Audio Return Channel (HEAC), and HDMI Ethernet Channel (HEC)

	tests or commands at the generator and verify in the testing device that no ARC, HEAC, or HEC traffic is captured. 14. *[Conditional: If "[HDMI] protocol" is selected in FDP_IPC_EXT.1.2, then]* perform steps 15 and 16 for both pin 13 (CEC) and 14 (UTILITY). 15. Turn off the TOE. Use a multi-meter to measure the resistance-to-ground of the pin at the TOE HDMI peripheral interface and verify it is greater than 2 Mega-ohms. 16. Attach a single ended oscilloscope probe between the pin and the ground, turn on the TOE, and verify that no changes between 0.0v and 0.2v and between 3.0v and 3.3v are detected. 17. *[Conditional: if VGA is not the selected protocol being tested, then]* disconnect all devices. Connect the display to a TOE computer video interface and the oscilloscope to the TOE display interface in order to verify that no HPD signal is passed by measuring a signal voltage of less than 1.0V. Based on the selected protocol being tested, this is performed as follows: 1. HDMI – connect scope to pin 19 and verify no HPD signal is detected; 2. DVI-D/DVI-I – connect scope to pin 16 and verify no HPD signal is detected; 3. DisplayPort - connect scope to pin 18 and verify no HPD signal is detected; 4. USB Type-C with DisplayPort as Alternate Function – connect scope to pin A8 and B8 and verify no HPD signal is detected. 18. Repeat this test for each of the selections in FDP_PDC_EXT.3.1/VI and FDP_IPC_EXT.1.2		
Pass/Fail Explanation	The evaluator has confirmed that the TOE successfully blocks unauthorized sub-protocols.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.16 FDP_APC_EXT.1/VI Test 4

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/VI – Test 4*
Objective	Test 4-VI - Video and EDID Channel Unidirectional Rule This test verifies that the TOE video path is unidirectional from the computer video interface to the display interface with the exception of EDID, which may be read from the display once at power up and then may be read by the connected computers. The evaluator should have at least two high-resolution displays of different models and one low-resolution display for each TOE-supported video protocol. In the following steps the evaluator should attempt to read display EDID after the TOE completed its self-test / power up. The TOE should not read the new display EDID. Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect a computer and a high-resolution display to the TOE. Step 2: Ensure the TOE is on, computer #1 is selected, and verify that the display shows video from computer #1 as expected.

	Step 3: Turn off the TOE. Disconnect the user display from the TOE. Step 4: Connect the low-resolution display to the TOE and turn on the TOE. After the video is shown on the display, turn off the TOE and disconnect the low-resolution display. Step 5: Turn on the TOE. After the TOE has completed the self-test, connect the second high-resolution display of a different model to the TOE. The TOE may fail to generate video on the user display (i.e., no EDID is read at the TOE power up). If the display is showing video, then run the EDID reading and parsing software on computer #1 and check that there is no active EDID (i.e., the computer is using a default generic display or reading older display settings from the registry). In the following steps the evaluator shall validate that the TOE video path is unidirectional from the computer video interface to the display interface. Step 6: Perform steps 7-11 for each TOE computer video interface. Step 7: Power off the TOE and disconnect the computer #1 video output and the display. Connect the display cable to the TOE computer #1 video interface. Connect the computer #1 video cable to the TOE display interface. This configuration will attempt to force video data through the TOE in the reverse direction. Step 8: Power up the TOE again. Step 9: Check that the video is not visible in the display. Step 10: Perform steps 11 while the TOE is powered on and powered off. Step 11: Remove the display cable from the TOE and connect the oscilloscope to verify that no SYNC signal is passed through the TOE. Based on the video protocols supported, this is performed as follows: 1. VGA – single ended probe on pins 13 and 14; 2. HDMI – connect pin 19 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - differential probe between pins 10 (+) and 12 (-); 3. DVI-I – connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - single ended probe on pins 8 and C4. Differential probe between pins 23 (+) and 24 (-); 4. DVI-D - connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 23 (+) and 24 (-); 5. DisplayPort - connect pin 18 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 3 (-) and 1 (+) and between 10 (-) and 12 (+); 6. USB Type-C with DisplayPort as Alternate Function – connect pin A8 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals – Differential probe between pins A2 and A3, A10 and A11; B2 and B3, and B10 and B11.
Notes	• TD0506 applied.

Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor, Asus PA238 Monitor, Dell 1907FPc Monitor, Tektronix Oscilloscope, Dr. Meter DC Power Supply, Spliced HDMI Cable, Spliced DisplayPort Cable, Spliced USB Type-C Cable.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Connect a computer and a high-resolution display to the TOE. 2. Ensure the TOE is on, computer #1 is selected, and verify that the display shows video from computer #1 as expected. 3. Turn off the TOE. Disconnect the user display from the TOE. 4. Connect the low-resolution display to the TOE and turn on the TOE. After the video is shown on the display, turn off the TOE and disconnect the low-resolution display. 5. Turn on the TOE. After the TOE has completed the self-test, connect the second high-resolution display of a different model to the TOE. The TOE may fail to generate video on the user display (i.e., no EDID is read at the TOE power up). If the display is showing video, then run the EDID reading and parsing software on computer #1 and check that there is no active EDID (i.e., the computer is using a default generic display or reading older display settings from the registry). 6. Perform steps 7-11 for each TOE computer video interface. 7. Power off the TOE and disconnect the computer #1 video output and the display. Connect the display cable to the TOE computer #1 video interface. Connect the computer #1 video cable to the TOE display interface. This configuration will attempt to force video data through the TOE in the reverse direction. 8. Power up the TOE again. 9. Check that the video is not visible in the display. 10. Perform steps 11 while the TOE is powered on and powered off. 11. Remove the display cable from the TOE and connect the oscilloscope to verify that no SYNC signal is passed through the TOE. Based on the video protocols supported, this is performed as follows: a. VGA – single ended probe on pins 13 and 14; b. HDMI – connect pin 19 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - differential probe between pins 10 (+) and 12 (-); c. DVI-I – connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - single ended probe on pins 8 and C4. Differential probe between pins 23 (+) and 24 (-); d. DVI-D - connect pin 16 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 23 (+) and 24 (-); e. DisplayPort - connect pin 18 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals - Differential probe between pins 3 (-) and 1 (+) and between 10 (-) and 12 (+); f. USB Type-C with DisplayPort as Alternate Function – connect pin A8 to a 3.3V power supply via a 100 Ohm resistor to provide HPD signal; Check for signals – Differential probe between pins A2 and A3, A10 and A11; B2 and B3, and B10 and B11.

Pass/Fail Explanation	The evaluator confirms the TOE video path is unidirectional from the computer video interface to the display interface except for EDID.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.17 FDP_APC_EXT.1/VI Test 5

Item	*Data/Description*
Test ID	*FDP_APC_EXT.1/VI – Test 5*
Objective	Test 5-VI – No Flow between Connected Computers over Time This test verifies that the TOE does not send data to different computers connected to the same TOE video interface over time. Repeat this test for each TOE Video port. Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Run EDID reading and parsing software on two computers and connect a display to the TOE. Step 2: Connect computer #1 to the TOE, ensure the TOE is on, computer #1 is selected, no other computers are connected, and verify that the display shows video from computer #1 as expected. Step 3: Capture the TOE EDID content in the software on computer #1 and save as a file with a name that indicates capture time. Step 4: Disconnect computer #1 and connect an I2C programmer to the same port. Attempt to write the characters “FFFF” over the entire EDID address range. Step 5: Disconnect the I2C programmer, reconnect computer #1 to the same port, and repeat step 3. Step 6: Reboot the TOE and repeat step 3. Step 7: Turn off the TOE and repeat step 3. Step 8. Restart the TOE and repeat step 3. Step 9: Disconnect computer #1 and repeat steps 2 to 8 with computer #2 on the same port. Step 10: Repeat steps 2 to 9 for a total of 20 EDID file captures. Step 11: Collect all 20 captured EDID files, compare them bit-by-bit, and verify that they are identical excluding null captures recorded in Step 7.
Notes	• TD0584 applied.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Monitor Asset Manager, QuantumData 980 Video Test Generator, QuantumData 882E Video Test Generator, Dell P2319H Monitor.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Run EDID reading and parsing software on two computers and connect a display to the TOE.

	2. Connect computer #1 to the TOE, ensure the TOE is on, computer #1 is selected, no other computers are connected, and verify that the display shows video from computer #1 as expected. 3. Capture the TOE EDID content in the software on computer #1 and save as a file with a name that indicates capture time. 4. Disconnect computer #1 and connect an I2C programmer to the same port. Attempt to write the characters "FFFF" over the entire EDID address range. 5. Disconnect the I2C programmer, reconnect computer #1 to the same port, and repeat step 3. 6. Reboot the TOE and repeat step 3. 7. Turn off the TOE and repeat step 3. 8. Restart the TOE and repeat step 3. 9. Disconnect computer #1 and repeat steps 2 to 8 with computer #2 on the same port. 10. Repeat steps 2 to 9 for a total of 20 EDID file captures. 11. Collect all 20 captured EDID files, compare them bit-by-bit, and verify that they are identical excluding null captures recorded in step 7.		
Pass/Fail Explanation	The evaluator confirms that that the TOE does not send data to different computers connected to the same TOE video interface over time.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.18 FDP_CDS_EXT.1(1) Test 1

Objective	There are no test EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.19 FDP_CDS_EXT.1(2) Test 1

Objective	There are no test EAs for this component beyond what the PSD PP requires.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.20 FDP_FIL_EXT.1/KM Test 1

Item	*Data/Description*
Test ID	*FDP_FIL_EXT.1/KM – Test 1*
Objective	Perform the test steps in FDP_PDC_EXT.1 with all devices on the PSD KM blacklist and verify that they are rejected as expected.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, USBlyzer, Teledyne Lecroy USB Sniffer, Device Manager, MPOW Headset with USB Connector, Logitech USB Camera, HP Deskjet USB Printer, Identiv USB UA Device, Wireless LAN Dongle, BYEASY USB Hub, Dell Keyboard with Smart Card Reader, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor.

Test Execution Steps	1. Ensure the TOE is powered off and connected to a computer. Run USB analyzer software on the connected computer and connect a USB sniffer to the TOE keyboard/mouse peripheral interface. Open the real-time hardware information console. 2. Attempt to connect the unauthorized device to the USB sniffer: • USB audio headset • USB camera • USB printer • USB user authentication device connected to a TOE keyboard/mouse peripheral interface • USB wireless LAN dongle 3. Power on the TOE. Verify the device is rejected. 4. Ensure the unauthorized device is disconnected from the USB sniffer, then attempt to connect it to the USB sniffer again. 5. Verify the device is rejected. 6. Repeat steps 1 through 5 with a USB hub connected between the USB device and USB sniffer and observe that the results are identical. 7. Repeat steps 1-6 with a composite device with non-HID device classes and verify that the non-HID functions are rejected, or the entire device is rejected.		
Pass/Fail Explanation	All devices on the PSD KM blacklist were tested and are rejected as expected. The evaluator confirms that the blacklist in place rejects all devices found in step 2.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.21 FDP_FIL_EXT.1/KM Test 2

Objective	[Conditional: Perform this only if “configurable” is selected in FDP_FIL_EXT.1.1/KM] In the following steps the evaluator shall verify that whitelisted and blacklisted devices are treated correctly. Step 1: Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Step 2: Connect to the TOE KM peripheral device interface a composite device which contains a HID class and a non-HID class. Step 3: Configure the TOE KM CDF to whitelist the composite device. Step 4: Verify that the HID-class part is accepted and that the non-HID class part is rejected through realtime device console and USB sniffer capture, or that the entire device is rejected. Step 5: Configure the TOE KM CDF to blacklist the device. Step 6: Verify that both the HID-class part and the non-HID class part is rejected through real-time device console and USB sniffer capture.
Evaluator Findings	“Configurable” has not been selected. Therefore, this evaluation activity is not applicable.
Verdict	Not Applicable/Pass

6.22 FDP_IPC_EXT.1 Test 1

Objective	Testing for this SFR is covered under FDP_APC_EXT.1 Test 3-VI.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.23 FDP_PDC_EXT.1 Test 1

Item	*Data/Description*			
Test ID	*FDP_PDC_EXT.1 – Test 1*			
Objective	The evaluator shall check the TOE and its supplied cables and accessories to ensure that there are no external wired interfaces other than the computer interfaces, peripheral device interfaces, and power interfaces.			
Test Equipment Used	N/A			
Test Execution Steps	1. Check the supplied cables and accessories to ensure there are no external wired interfaces other than the computer interfaces, peripheral device interfaces, and power interfaces.			
Pass/Fail Explanation	The evaluator confirms that all supplied cables and accessories contain no external wired interfaces. This excludes computer interfaces, peripheral device interfaces, and power interfaces.			
Units Tested	SC840DPHC	SC820DPH	SC840DVI	SCAPF0004
Result	PASS	PASS	PASS	

6.24 FDP_PDC_EXT.1 Test 2

Item	*Data/Description*			
Test ID	*FDP_PDC_EXT.1 – Test 2*			
Objective	The evaluator shall check the TOE for radio frequency certification information to ensure that the TOE does not support wireless interfaces.			
Testbed	#1			
Test Equipment Used	N/A			
Test Execution Steps	1. Check the TOE for radio frequency certification information to ensure that the TOE does not support wireless interfaces.			
Pass/Fail Explanation	The evaluator has checked the TOE for radio frequency certification information and verifies the TOE does not support wireless interfaces.			
Units Tested	SC840DPHC	SC820DPH	SC840DVI	SCAPF0004
Result	PASS	PASS	PASS	

6.25 FDP_PDC_EXT.1 Test 3

Item	*Data/Description*
Test ID	*FDP_PDC_EXT.1 – Test 3*

Objective	The evaluator shall verify that the TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the Peripheral Device Connections (Appendix E). For this test, verify device rejection through TOE user indication in accordance with the operational user guidance, an immediate cessation of traffic following device detection or enumeration, or incompatibility of the device interface with the peripheral interface, and through no such device appearing in the real-time hardware information console. Step 1: Ensure the TOE is powered off. Open a real-time hardware information console on the connected computer. Step 2: Attempt to connect a USB mass storage device to the TOE peripheral interface. Step 3: Power on the TOE. Verify the device is rejected. Step 4: Ensure the USB mass storage device is disconnected, and then attempt to connect it to the TOE peripheral interface again. Step 5: Verify the device is rejected. Step 6: Power off the TOE. Connect an unauthorized USB device to a USB hub, and attempt to connect the USB hub to the TOE peripheral interface. Step 7: Power on the TOE. Verify the device is rejected. Step 8: Ensure the USB hub is disconnected, and then attempt to connect it to the TOE peripheral interface again. Step 9: Verify the device is rejected. Step 10: Power off the TOE. Attempt to connect any Personal System/2 (PS/2) device directly to the TOE peripheral interface. Step 11: Power on the TOE. Verify the device is rejected. Step 12: Ensure the PS/2 device is disconnected, and then attempt to connect it directly to the TOE peripheral interface again. Step 13: Verify the device is rejected.
Test Equipment Used	Device Manager, BYEASY USB Hub, PS/2 to USB Adapter, Perixx PS/2 Optical Mouse, HSL BADUSB, Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.
Test Execution Steps	1. Ensure the TOE is powered off. Open a real-time hardware information console on the connected computer. 2. Attempt to connect a USB mass storage device to the TOE peripheral interface. 3. Power on the TOE. Verify the device is rejected. 4. Ensure the USB mass storage device is disconnected, and then attempt to connect it to the TOE peripheral interface again. 5. Verify the device is rejected. 6. Power off the TOE. Connect an unauthorized USB device to a USB hub, and attempt to connect the USB hub to the TOE peripheral interface. 7. Power on the TOE. Verify the device is rejected. 8. Ensure the USB hub is disconnected, and then attempt to connect it to the TOE peripheral interface again.

	9. Verify the device is rejected. 10. Power off the TOE. Attempt to connect any Personal System/2 (PS/2) device directly to the TOE peripheral interface. 11. Power on the TOE. Verify the device is rejected. 12. Ensure the PS/2 device is disconnected, and then attempt to connect it directly to the TOE peripheral interface again. 13. Verify the device is rejected.		
Pass/Fail Explanation	The evaluator confirms that the TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the Peripheral Device Connections (Appendix E)		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.26 FDP_PDC_EXT.1 Test 1-AO

Item	*Data/Description*
Test ID	*FDP_PDC_EXT.1/AO – Test 1*
Objective	The evaluator shall verify that the TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the unauthorized peripheral device connections. For this test, verify device rejection through TOE user indication in accordance with the operational user guidance or an immediate cessation of traffic following device detection or enumeration, or incompatibility of the device interface with the peripheral interface. Step 1: Ensure the TOE is powered off and audio analyzer software is running on the connected computer. Step 2: Connect an analog microphone to the TOE analog audio output peripheral interface. Step 3: Power on the TOE, speak loudly into the microphone from approximately one-inch distance, and verify no audio is present in the audio analyzer software. Step 4: Disconnect the microphone and reconnect it to the TOE peripheral interface. Step 5: Speak loudly into the microphone from approximately one-inch distance, and verify no audio is present in the audio analyzer software.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, 3.5mm Microphone, 3.5mm Audio Splitter, MPOW Headset with USB Connector.
Test Execution Steps	1. Ensure the TOE is powered off and audio analyzer software is running on the connected computer. 2. Connect an analog microphone to the TOE analog audio output peripheral interface. 3. Power on the TOE, speak loudly into the microphone from approximately one-inch distance, and verify no audio is present in the audio analyzer software. 4. Disconnect the microphone and reconnect it to the TOE peripheral interface. 5. Speak loudly into the microphone from approximately one-inch distance, and verify no audio is present in the audio analyzer software.

Pass/Fail Explanation	The evaluator confirms that the TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the unauthorized peripheral device connections.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.27 FDP_PDC_EXT.1 Test 1-KM

Item	*Data/Description*
Test ID	*FDP_PDC_EXT.1/KM – Test 1*
Objective	Test 1-KM: The evaluator shall verify that the TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the unauthorized peripheral device connections. For this test, verify device rejection through TOE user indication in accordance with the operational user guidance, an immediate cessation of traffic following device detection or enumeration, no traffic captured on the USB sniffer or analyzer software other than NAK transactions or system messages, or incompatibility of the device interface with the peripheral interface. Also verify device rejection through examination of the USB sniffer or analyzer software for no traffic captured other than NAK transactions or system messages and through examination of the real-time hardware console for no display of new USB devices (recognized or not recognized). Repeat this test for each keyboard/mouse TOE peripheral interface. Perform steps 1-6 for each of the following unauthorized devices: • USB audio headset • USB camera • USB printer • USB user authentication device connected to a TOE keyboard/mouse peripheral interface • USB wireless LAN dongle Step 1: Ensure the TOE is powered off and connected to a computer. Run USB analyzer software on the connected computer and connect a USB sniffer to the TOE keyboard/mouse peripheral interface. Open the real-time hardware information console. Step 2: Attempt to connect the unauthorized device to the USB sniffer. Step 3: Power on the TOE. Verify the device is rejected. Step 4: Ensure the unauthorized device is disconnected from the USB sniffer, then attempt to connect it to the USB sniffer again. Step 5: Verify the device is rejected. Step 6: Repeat steps 1 through 5 with a USB hub connected between the USB device and USB sniffer and observe that the results are identical.

	Step 7: Repeat steps 1-6 with a composite device with non-HID device classes and verify that the non-HID functions are rejected or the entire device is rejected.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, USBlyzer, Teledyne Lecroy USB Sniffer, MPOW Headset with USB Connector, Logitech USB Camera, HP Deskjet USB Printer, Identiv USB UA Device, Wireless LAN Dongle, BYEASY USB Hub, Dell Keyboard with Smart Card Reader, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor, Device Manager.		
Test Execution Steps	1. Ensure the TOE is powered off and connected to a computer. Run USB analyzer software on the connected computer and connect a USB sniffer to the TOE keyboard/mouse peripheral interface. Open the real-time hardware information console. 2. Attempt to connect the unauthorized device to the USB sniffer: • USB Audio headset • USB Camera • USB Printer • USB user authentication device connected to a TOE K/M peripheral interface • USB wireless LAN dongle 3. Power on the TOE. Verify the device is rejected. 4. Ensure the unauthorized device is disconnected from the USB sniffer, then attempt to connect it to the USB sniffer again. 5. Verify the device is rejected. 6. Repeat steps 1 through 5 with a USB hub connected between the USB device and USB sniffer and observe that the results are identical. 7. Repeat steps 1-6 with a composite device with non-HID device classes and verify that the non-HID functions are rejected, or the entire device is rejected.		
Pass/Fail Explanation	TOE ports properly reject unauthorized devices and devices with unauthorized protocols as per the unauthorized peripheral device connections. The Evaluator confirms that the devices listed in step 2 were all properly rejected.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.28 FDP_PDC_EXT.1 Test 2-KM

Item	*Data/Description*
Test ID	*FDP_PDC_EXT.1/KM – Test 2*

Objective	Test 2-KM: The evaluator shall verify that the TOE KM ports do not reject authorized devices and devices with authorized protocols as per the authorized peripheral device connections. Repeat this test for each of the following four device types: • Barcode reader; • Keyboard or Keypad; • Mouse, Touchscreen, Trackpad, or Trackball; and • PS/2 to USB adapter (with a connected PS/2 keyboard or mouse). Step 1: Configure the TOE and the Operational Environment in accordance with the operational guidance. Run an instance of a text editor on a connected computer. Step 2: Ensure the TOE is powered off. Step 3: Connect the authorized device to the TOE peripheral interface. Step 4: Power on the TOE. Verify the TOE user indication described in the operational user guidance is not present. Step 5: Ensure the connected computer is selected and send inputs using the authorized devices. Verify that the input is received into the text editor or on the screen of the connected computer. Step 6: Disconnect the authorized device, and then reconnect it to the TOE KM peripheral device interface. Step 7: Verify the TOE user indication described in the operational user guidance is not present. Step 8: Send inputs using the authorized devices. Verify that the input is received into the text editor or on the screen of the connected computer.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Notepad, Netum USB Barcode Reader, PS/2 to USB Adapter, Perixx Optical PS/2 Mouse, Dell P2319H Monitor.
Test Execution Steps	1. Configure the TOE and the Operational Environment in accordance with the operational guidance. Run an instance of a text editor on a connected computer. 2. Ensure the TOE is powered off. 3. Connect the authorized device to the TOE peripheral interface: • Barcode reader; • Keyboard or Keypad; • Mouse, Touchscreen, Trackpad, or Trackball; and • PS/2 to USB adapter (with a connected PS/2 keyboard or mouse). 4. Power on the TOE. Verify the TOE user indication described in the operational user guidance is not present. 5. Ensure the connected computer is selected and send inputs using the authorized devices. Verify that the input is received into the text editor or on the screen of the connected computer.

	6. Disconnect the authorized device, and then reconnect it to the TOE KM peripheral device interface. 7. Verify the TOE user indication described in the operational user guidance is not present. 8. Send inputs using the authorized devices. Verify that the input is received into the text editor or on the screen of the connected computer.		
Pass/Fail Explanation	The TOE KM ports do not reject authorized devices and devices with authorized protocols as per the authorized peripheral device connections. The evaluator has confirmed that authorized devices were accepted by the TOE.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.29 FDP_PDC_EXT.1 Test 1-VI

Item	*Data/Description*
Test ID	*FDP_PDC_EXT.1 – Test 1*
Objective	Test 1-VI: The evaluator shall verify that the TOE ports do not reject authorized devices and devices with authorized protocols as per the Peripheral Device Connections appendix in MOD_VI_V1.0. Repeat this test for each of the selected protocols in FDP_PDC_EXT.3.1/VI: Step 1: Connect the authorized device with an authorized protocol directly to a computer. Display any image on the device. Disconnect the device from the computer. Step 2: Configure the TOE and the Operational Environment in accordance with the operational guidance. Step 3: Ensure the TOE is powered off. Step 4: Connect the authorized device with an authorized protocol to the TOE peripheral interface. Step 5: Power on the TOE and verify the TOE user indication described in the operational user guidance is not present. Step 6: Ensure the connected computer is selected and verify that the device displays the same image as in step 1. Step 7: Disconnect the authorized device, then reconnect it to the TOE peripheral interface. Step 8: Verify the TOE user indication described in the operational user guidance is not present. Step 9: Verify that the device displays the same image as in step 1 and 6.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.
Test Execution Steps	1. Connect the authorized device with an authorized protocol directly to a computer. Display any image on the device. Disconnect the device from the computer. 2. Configure the TOE and the Operational Environment in accordance with the operational guidance. 3. Ensure the TOE is powered off.

	4. Connect the authorized device with an authorized protocol to the TOE peripheral interface. 5. Power on the TOE and verify user indication described in the operational user guidance is not present. 6. Ensure the connected computer is selected and verify that the device displays the same image as in step 1. 7. Disconnect the authorized device, then reconnect it to the TOE peripheral interface. 8. Verify the TOE user indication described in the operational user guidance is not present. 9. Verify that the device displays the same image as in step 1 and 6.		
Pass/Fail Explanation	The evaluator confirms that the TOE ports do not reject authorized devices and devices with authorized protocols as per the Peripheral Device Connections appendix in MOD_VI_V1.0.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.30 FDP_PDC_EXT.2/AO Test 1

Item	*Data/Description*
Test ID	*FDP_PDC_EXT – Test 2*
Objective	The evaluator shall verify that the TOE ports do not reject authorized devices and devices with authorized protocols as per the authorized peripheral device connections. Repeat this test for each of the following devices: analog headphone, and analog speakers. Step 1: Ensure the TOE is powered off. Step 2: Connect the authorized device to the TOE peripheral interface. Step 3: Power on the TOE. Verify the TOE user indication described in the operational user guidance is not present. Step 4: Play an audio file on the connected computer and verify the sound is heard through the authorized device. Step 5: Disconnect the authorized device, then reconnect it to the TOE peripheral interface. Step 6: Verify the TOE user indication described in the operational user guidance is not present. Step 7: Play an audio file on the connected computer and verify the sound is heard through the authorized device.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, MPOW 3.5mm Headset, Edifier Multimedia Speaker.

Test Execution Steps	1. Ensure the TOE is powered off. 2. Connect the authorized device to the TOE peripheral interface. 3. Power on the TOE. Verify the TOE user indication described in the operational user guidance is not present. 4. Play an audio file on the connected computer and verify the sound is heard through the authorized device. 5. Disconnect the authorized device, then reconnect it to the TOE peripheral interface. 6. Verify the TOE user indication described in the operational user guidance is not present. 7. Play an audio file on the connected computer and verify the sound is heard through the authorized device.		
Pass/Fail Explanation	The evaluator confirms that the TOE ports do not reject authorized devices and devices with authorized protocols as per the authorized peripheral device connections.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.31 FDP_PDC_EXT.2/KM Test 1

Objective	Testing of this component is performed through evaluation of FDP_PDC_EXT.1 Test 2 as specified in section 2.2.2.2 above. (See FDP_PDC_EXT.1.)
Evaluator Findings	Not Applicable. See FDP_PDC_EXT.1.
Verdict	Not Applicable/Pass

6.32 FDP_PDC_EXT.2/VI Test 1

Objective	Testing of this component is performed through evaluation of FDP_PDC_EXT.1 as specified in section 2.2.1.2 above. (See FDP_PDC_EXT.1.)
Evaluator Findings	Not Applicable. See FDP_PDC_EXT.1.
Verdict	Not Applicable/Pass

6.33 FDP_PDC_EXT.3/KM Test 1

Objective	Test activities for this SFR are covered under FDP_APC_EXT.1 tests 1-KM and 3-KM.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.34 FDP_PDC_EXT.3/VI Test 1

Objective	Testing of this component is performed through evaluation of FDP_APC_EXT.1 as specified in section 2.2.1.1 above.

Evaluator Findings	Not Applicable. See FDP_APC_EXT.1/VI/
Verdict	Not Applicable/Pass

6.35 FDP_PUD_EXT.1 Test 1

Item	*Data/Description*		
Test ID	*FDP_PUD_EXT.1 – Test 1*		
Objective	Step 1: Connect the amplified speakers directly to computer #1's analog audio output interface (typically green in color). Set the volume at the speakers to approximately 25%. Step 2: Connect the computer interface audio cable to the TOE audio output computer interface and computer #1's analog audio microphone input interface (typically pink in color) instead of the computer analog audio output interface. Step 3: Connect an open 3.5 millimeter stereo plug to the TOE analog audio peripheral interface. Step 4: Power up the TOE and ensure computer #1 is selected. Step 5: Measure the DC voltage of stereo plug from the TOE analog audio peripheral interface between the ground terminal and each one of the other two terminals (tip and ring) using a digital voltmeter. Step 6: Verify the voltage is 0.2 volts or less, ensuring there is no DC bias voltage supplied to the microphone.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Edifier Multimedia Speaker, Fluke True Digital Multimedia, Spliced 3.5mm Cable.		
Test Execution Steps	1. Connect the amplified speakers directly to computer #1's analog audio output interface (typically green in color). Set the volume at the speakers to approximately 25%. 2. Connect the computer interface audio cable to the TOE audio output computer interface and computer #1's analog audio microphone input interface (typically pink in color) instead of the computer analog audio output interface. 3. Connect an open 3.5-millimetre stereo plug to the TOE analog audio peripheral interface. 4. Power up the TOE and ensure computer #1 is selected. 5. Measure the DC voltage of stereo plug from the TOE analog audio peripheral interface between the ground terminal and each one of the other two terminals (tip and ring) using a digital voltmeter. 6. Verify the voltage is 0.2 volts or less, ensuring there is no DC bias voltage supplied to the microphone.		
Pass/Fail Explanation	The evaluator confirms that the TSS states that the TOE does not supply power to an unauthorized device connected to the analog audio output interface.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.36 FDP_RDR_EXT.1 Test 1

Item	*Data/Description*
Test ID	*FDP_RDR_EXT.1 – Test 1*
Objective	The evaluator shall use a BadUSB, programmable keyboard, and/or USB Rubber Ducky as a malicious USB device to perform the following test: Step 1: Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Ensure the TOE is powered off and connect a USB sniffer between the TOE and a computer. Open the real-time hardware information console. Step 2: Configure the malicious USB device as a HID-class device and to re-enumerate as a mass storage device. Step 3: Connect the malicious USB device to the TOE KM peripheral interface. Step 4: Power on the TOE and activate the re-enumeration after 1 minute. Step 5: Verify device rejection per TOE guidance, the cessation of traffic passed in the USB sniffer, and the absence of the device and any new devices in the information console. Step 6: Remove the malicious USB device and reconfigure as a HID-class device and to re-enumerate as a mass storage device. Step 7: Connect the malicious USB device to the TOE KM peripheral interface and activate the reenumeration after 1 minute. Step 8: Verify device rejection per TOE guidance, the cessation of traffic passed in the USB sniffer, and the absence of the device and any new devices in the information console.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Teledyne Lecroy USB Sniffer, Device Manager, HSL BADUSB, Teledyne Lecroy USB Protocol Suite, Dell P2319H Monitor.
Test Execution Steps	1. Ensure the TOE and the Operational Environment are configured in accordance with the operational guidance. Ensure the TOE is powered off and connect a USB sniffer between the TOE and a computer. Open a real-time hardware information console. 2. Configure the malicious USB device as a HID-class device and to re-enumerate as a mass storage device. 3. Connect the malicious USB device to the TOE KM peripheral interface. 4. Power on the TOE and active the re-enumeration after 1 minute. 5. Verify device rejection per TOE guidance, the cessation traffic passed in the USB sniffer, and the absence of the device and any new device in the information console. 6. Remove the malicious USB device and reconfigure as a HID-class device and to re-enumerate as a mass storage device. 7. Connect the malicious USB device to the TOE KM peripheral interface and active the re-enumeration after 1 minute. 8. Verify device rejection per TOE guidance, the cessation of traffic passed in the USB sniffer, and the absence of the device and any new devices in the information console.
Pass/Fail Explanation	The evaluator will configure the USB device accordingly to verify device rejection and ensure the TOE is properly enforcing security protocols.

Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.37 FDP_RIP_EXT.1 Test 1

Objective	There are no test Evaluation Activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.38 FDP_RIP.1/KM Test 1

Objective	There are no test EAs for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.39 FDP_RIP_EXT.2 Test 1

Item	*Data/Description*		
Test ID	*FDP_RIP_EXT.2 – Test 1*		
Objective	The evaluator shall check that the log record is not deleted if a logging function is supported by the TOE. Step 1: Perform the TOE memory purge or restore factory defaults according to the guidance and verify that the TOE enters a desirable secure state.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. Perform the TOE memory purge or restore factory defaults according to the guidance and verify that the TOE enters a desirable secure state. 2. The evaluator shall check that the log record is not deleted if a logging function is supported by the TOE		
Expected Output	1. The evaluator performs a reset to factory defaults according to guidance and verifies that the TOE enters a desirable secure state. 2. The evaluator confirms that the one-time programmable, critical, and non-critical logging functions were not deleted as a result of the memory purge.		
Execution Output	1. The evaluator performed a reset to factory defaults according to guidance and verified that the TOE entered a desirable secure state. 2. The evaluator confirmed that the one-time programmable, critical, and non-critical logging functions were not deleted as a result of the memory purge.		
Pass/Fail Explanation	The evaluator confirms that the TOE provides a restore factory default setting feature and correctly restores the state of the TOE.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.40 FDP_SPR_EXT.1/DVI-D Test 1

Objective	Testing for this SFR is covered under FDP_APC_EXT.1 Test 3-VI and Test 4-VI.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.41 FDP_SPR_EXT.1/DP Test 1

Objective	Testing for this SFR is covered under FDP_APC_EXT.1 Test 3-VI and Test 4-VI.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.42 FDP_SPR_EXT.1/HDMI Test 1

Objective	Testing for this SFR is covered under FDP_APC_EXT.1 Test 3-VI and Test 4-VI.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.43 FDP_SPR_EXT.1/USB Test 1

Objective	Testing for this SFR is covered under FDP_APC_EXT.1 Test 3-VI and Test 4-VI.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.44 FDP_SWI_EXT.1 Test 1

Objective	There are no test Evaluation Activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.45 FDP_SWI_EXT.2 Test 1

Objective	The evaluator shall ensure that switching is always initiated through express user action using the selected mechanisms throughout testing for FDP_APC_EXT.1 above. Additional tests for this SFR are performed in FDP_APC_EXT.1 test 1-KM above.
Evaluator Findings	Not Applicable

Verdict	Not Applicable/Pass

6.46 FDP_SWI_EXT.3 Test 1

Objective	The evaluator shall verify that the keyboard and mouse devices are always switched together to the same connected computer throughout testing in FDP_APC_EXT.1 in section 2.2.2.1 above. Tests for this SFR are performed in FDP_APC_EXT.1 test 1-KM in section 2.2.2.1 above.
Evaluator Findings	Not Applicable. See FDP_APC_EXT.1.
Verdict	Not Applicable/Pass

6.47 FDP_UDF_EXT.1/AO Test 1

Item	*Data/Description*
Test ID	*FDP_UDF_EXT.1/AO – Test 1*
Objective	Note: Data is considered not to transit the TOE if no signal greater than 45 dB of attenuation at the specific audio frequency is received. The evaluator shall perform the following test: Step 1: Connect a computer to the TOE analog audio output peripheral interface, run its tone generator software, and run audio analyzer software on the connected computer. Step 2: Perform steps 3-6 for each TOE analog audio output peripheral interface. Step 3: For each connected computer, ensure it is selected, use the tone generator on the computer connected to the TOE analog audio output peripheral interface to generate the designated frequencies, and verify that the audio is not present on the selected computer's audio analyzer software. Step 4: Replace the selected computer with an oscilloscope and connect an external audio signal generator to the TOE analog audio output peripheral interface. Perform step 5 with the signal generator set to the following settings: • Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed; • Signal average to 0V (negative swing) Step 5: Set the signal generator to generate the designated frequencies, and verify the signal on the oscilloscope is 11.2 mV or less.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, TrueRTA, Rigol Waveform Audio Signal Generator, Tektronix Oscilloscope, Spliced 3.5mm Cable, Dell P2319H Monitor.
Test Execution Steps	1. Connect a computer to the TOE analog audio output peripheral interface, run its tone generator software, and run audio analyzer software on the connected computer. 2. Perform steps 3-6 for each TOE analog audio output peripheral interface. 3. For each connected computer, ensure it is selected, use the tone generator on the computer connected to the TOE analog audio output peripheral interface to

	generate the designated frequencies, and verify that the audio is not present on the selected computer's audio analyzer software. 4. Replace the selected computer with an oscilloscope and connect an external audio signal generator to the TOE analog audio output peripheral interface. Perform step 5 with the signal generator set to the following settings: • Pure sine wave around the average voltage of half output (positive signal only), with the output signal set to 2.00 V peak-to-peak, calibrating the signal with the oscilloscope as needed; • Signal average to 0V (negative swing) 5. Set the signal generator to generate the designated frequencies and verify the signal on the oscilloscope is 11.2 mV or less.		
Pass/Fail Explanation	The evaluator confirms the TOE audio output peripheral interface is unidirectional and no data can be routed from a connected peripheral back to a connected computer.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.48 FDP_UDF_EXT.1/KM Test 1

Objective	Test activities for this SFR are covered under FDP_APC_EXT.1 test 3-KM.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.49 FDP_UDF_EXT.1/VI Test 1

Objective	This component is evaluated through evaluation of FDP_APC_EXT.1 as specified in section 2.2.1.1 above.
Evaluator Findings	Not Applicable. See FDP_APC_EXT.1.
Verdict	Not Applicable/Pass

6.50 FMT_MOF.1 Test 1

Item	*Data/Description*
Test ID	*FMT_MOF.1 – Test 1*
Objective	Step 1: Set up the TOE to enable administrator access per applicable TOE administrative guidance. Verify that the TOE is in factory default format. Step 2: Attempt to set the initial administrator user name and password. Step 3: Logon as a valid administrator and perform all authorized administrative functions to assure the logon was successful. Step 4: Log off from the TOE. Step 5: Attempt to logon with an incorrect administrator name. Verify that the logon is failing as expected and that administrative functions are unavailable.

	Step 6: Attempt to access administrative functions while there is no logged on administrator. Verify that all attempts fail. Step 7: If the TOE provides multiple administrative roles, repeat this test for each defined role to ensure that the authorizations for each role are consistent with what is described in the operational guidance.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. Set up the TOE to enable administrator access per applicable TOE administrative guidance. Verify that the TOE is in factory default format. 2. Attempt to set the initial administrator username and password. 3. Logon as a valid administrator and perform all authorized administrative functions to assure the logon was successful. 4. Log off from the TOE. 5. Attempt to logon with an incorrect administrative name. Verify that the logon is failing as expected and that administrative functions are unavailable. 6. Attempt to access administrative functions while there is no logged-on administrator. Verify that all attempts fail. 7. If the TOE provides multiple administrative roles, repeat this test for each define role to ensure that the authorizations for each role are consistent with what is described in the operational guidance.		
Pass/Fail Explanation	The evaluator confirms that the administrative functions described in FMT_MOF.1.1 are only available to identified administrator.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.51 FMT_SMF.1 Test 1

Item	*Data/Description*
Test ID	*FMT_SMF.1 – Test 1*
Objective	The evaluator shall test the TOE's ability to provide the management functions by configuring the TOE and testing each option assigned from above. The evaluator is expected to test these functions in all the ways in which the ST and guidance documentation state the configuration can be managed.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.
Test Execution Steps	1. Log into the TOE using administrative credentials and password. 2. Under the main operation page, select option "5" for reset to factory defaults. 3. Ensure the "reset to factory default" management function is present and tested accordingly. 4. Under the main operation page, select option "4" for account management. 5. Ensure the "create administrative account" management function is present and tested accordingly. 6. Under the main operation page, select option "4" for account management. 7. Ensure the "change password" management function is present and tested accordingly. 8. Under the main operation page, select option "4" for account management. 9. Ensure the "delete all accounts" management function is present and tested accordingly.

Pass/Fail Explanation	The evaluator confirms that the TOE provides management functions described in the ST and guidance documents and has tested each option accordingly.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.52 FPT_NTA_EXT.1 Test 1

Objective	There are no test Evaluation Activities for this component.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

6.53 FPT_PHP.1 Test 1

Item	*Data/Description*	
Test ID	*FPT_PHP.1 – Test 1*	
Objective	The evaluator shall verify, for each tamper evident seal or label affixed to the TOE enclosure and TOE remote controller (if applicable), that any attempts to open the enclosure or remove the seal results in the seal being damaged in a manner that is consistent with the operational user guidance.	
Test Equipment Used	N/A	
Test Execution Steps	1. Removed the tamper evident seals from the TOE.	
Pass/Fail Explanation	The evaluator confirms that any attempt to open the enclosure or remove the seal results in the seal being damaged in a manner that is consistent with the operational user guidance.	
Units Tested	SC945DPH	SCAPF0004
Result	PASS	

6.54 FPT_PHP.1 Test 2

Item	*Data/Description*	
Test ID	*FPT_PHP.1 – Test 2*	
Objective	The evaluator shall verify that it is not possible to administratively disable or otherwise prevent the display of any tampering indicators.	
Test Equipment Used	N/A	
Test Execution Steps	1. Attempt to remove the tamper evident seals from the TOE without damaging the tampering indicators.	
Pass/Fail Explanation	The evaluator confirms that it is not possible to administratively disable or otherwise prevent the display of any tampering indicators.	
Units Tested	SC945DPH	SCAPF0004
Result	PASS	

6.55 FPT_PHP.3 Test 1

Item	*Data/Description*
Test ID	*FPT_PHP.3 – Test 1*

Objective	In the following testing the evaluator shall attempt to gain physical access to the TOE internal circuitry (enough access to allow the insertion of tools to tamper with the internal circuitry). The TOE anti- tampering function is expected to trigger, causing an irreversible change to the TOE functionality. The evaluator then shall verify that the anti-tampering triggering provides the expected user indications and also disables the TOE. TOE disabling means that the user would not be able to use the TOE for any purpose – all peripheral devices and computers are isolated. Note that it is obvious that if the TOE was physically tampered with, then the attacker may easily circumvent the tamper indication means (for example cut the relevant TOE front panel wires). Nevertheless, the following test verifies that the user would be unable to ignore the TOE tampering indications and resume normal work. The evaluator shall perform the following steps: Step 1: [conditional: this step is applicable for TOEs having a remote controller] The evaluator shall attempt to open the PSD remote controller enclosure enough to gain access to its internal circuitry and observe that the TOE is both permanently disabled and provides the proper indication that it has been tampered with in accordance with the operational user guidance. Step 2: The evaluator shall attempt to open the PSD enclosure enough to gain access to its internal circuitry and observe that the TOE is both permanently disabled and provides the proper indication that it has been tampered with in accordance with the operational user guidance. Step 3: The evaluator shall attempt to access the TOE settings to reset the tampering state and verify that it is not possible to recover from the tampered state. Step 4: The evaluator shall acquire a copy of the TOE that has been previously tampered with. Step 5: The evaluator shall power on the TOE and verify that the tampering indicator is displayed.
Notes	• TD0583 applied.
Test Equipment Used	N/A

Test Execution Steps	1. [Conditional: this step is applicable for TOEs having a remote controller] The evaluator shall attempt to open the PSD remote controller enclosure enough to gain access to its internal circuitry and observe that the TOE is both permanently disabled and provides the proper indications that is has been tampered with in accordance with the operational user guidance. 2. The evaluator shall attempt to open the PSD enclosure enough to gain access to its internal circuitry and observe that the TOE is both permanently disabled and provides the proper indication that it has been tampered with in accordance with the operational user guidance. 3. The evaluator shall attempt to access the TOE settings to reset the tampering state and verify that it is not possible to recover from the tampered state. 4. The evaluator shall acquire a copy of the TOE that has been previously tampered with. 5. The evaluator shall power on the TOE and verify that the tampering indicator is displayed.	
Pass/Fail Explanation	The evaluator confirms that the anti-tampering triggering provides the expected user indications and disables the TOE.	
Units Tested	SC945DPH	SCAPF0004
Result	PASS	

6.56 FPT_STM.1 Test 1

Item	*Data/Description*		
Test ID	FPT_STM.1 Test 1		
Objective	The evaluator shall test the TOE's ability to provide time stamps. It is expected that this test be performed in conjunction with FAU_GEN.1. 1. Log into the TOE using administrative credentials and password. 2. Under the main operation page, select option "6" for logs and events. 3. Select either option "1","2", or "3" to bring up logs and events with accompanying time stamps.		
Test Equipment	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. Log into the TOE using administrative credentials and password. 2. Under the main operation page, select option "6" for logs and events. 3. Select either option "1","2", or "3" to bring up logs and events with accompanying time stamps.		
Pass/Fail Explanation	The evaluator determined that time stamps were provided when viewing data.		
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	Pass		

6.57 FPT_TST.1 Test 1

Item	*Data/Description*
Test ID	*FPT_TST.1 – Test 1*

Objective	The evaluator shall trigger the conditions specified in the TSS that are used to initiate TSF self-testing and verify that successful completion of the self-tests can be determined by following the corresponding steps in the operational guidance.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. The TOE must be powered off, ensure the power cable is removed from the TOE before proceeding. 2. The evaluator will connect the power cable to the TOE and observe the TOE performs a start-up self-test diagnostic for the following criteria: ○ Verification of the front panel push buttons ○ Verification of the active anti-tampering functionality ○ Verification of the integrity of the microcontroller firmware ○ Verification of computer port isolation 3. Upon completion of the self-testing diagnostic the TOE will power on into operational mode and channel 1 will be selected by default.		
Pass/Fail Explanation	The evaluator confirms that that successful completion of the self-tests can be determined by following the corresponding steps in operational guidance.		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.58 FPT_TST_EXT.1 Test 1

Item	*Data/Description*		
Test ID	*FPT_TST_EXT.1 – Test 1*		
Objective	The evaluator shall cause a TOE self-test failure and verify that the TOE responds by disabling normal functions and provides proper indications to the user.		
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.		
Test Execution Steps	1. The TOE must be powered off, ensure the power cable is removed from the TOE before proceeding. 2. Firmly press the channel 1 button on the TOE while simultaneously plugging in the power cable. This will cause the unit to enter a Self-test failure mode where the TOE will be powered on, but unusable. The front panel lights will continue to cycle between the computers connected but the TOE remains inoperable. 3. The evaluator shall ensure no video/keyboard/mouse is being output from the TOE while it is in self-test failure state.		
Pass/Fail Explanation	The evaluator confirms that the TOE does preform a self-test failure and that the TOE responds by disabling normal functions and provides proper indications to the user.		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

6.59 FTA_CIN_EXT.1 Test 1

Item	*Data/Description*
Test ID	*FTA_CIN_EXT.1 – Test 1 TD0539 has been applied.*
Objective	Step 1: The evaluator shall configure the TOE and its operational environment in accordance with the operational user guidance. Step 2: The evaluator shall select a connected computer and power down the TOE, then power up the TOE and verify that the expected selected computer is indicated in accordance with the TSS and that the connection is active. Step 3: The evaluator shall repeat this process for every possible selected TOE configuration. Step 4: [Conditional] If "upon reset button activation" is selected in FPT_TST.1.1, then the evaluator shall repeat this process for each TOE configuration using the reset function rather than power-down and powerup. Step 5: The evaluator shall verify that the TOE selected computer indications are always on (i.e., continuous) and fully visible to the TOE user. Step 6: [Conditional] If the TOE allows peripherals to have active interfaces with different computers at the same time, the evaluator shall verify that each permutation has its own selection indications. Step 7: [*Conditional: if the TOE claims the Combiner Use Case then*] verify that video generated by the TOE has clear identification marking or text to properly identify the source computer shown. Step 8: [Conditional] If "multiple indicators which never display conflicting information" is selected, the evaluator shall verify that either all indicators reflect the same status at all times, or the indicator for the most recently used switching mechanism displays the correct switching status and that all other indicators display the correct status or no status.
Notes	• TD0539 was applied.
Test Equipment Used	Dell Wired Keyboard, Dell Wired Mouse, Dell P2319H Monitor.
Test Execution Steps	1. The evaluator shall configure the TOE and its operational environment in accordance with the operational user guidance. 2. The evaluator shall select a connected computer and power down the TOE, then power up the TOE and verify that the expected selected computer is indicated in accordance with the TSS and that the connection is active. 3. The evaluator shall repeat this process for every possible selected TOE configuration. 4. [Conditional] If "*upon reset button activation*" is selected in FPT_TST.1.1, then the evaluator shall repeat this process for each TOE configuration using the reset function rather than power-down and power-up. 5. The evaluator shall verify that the TOE selected computer indications are always on (i.e., continuous) and fully visible to the TOE user. 6. [Conditional] If the TOE allows peripherals to have active interfaces with different computers at the same time, the evaluator shall verify that each permutation has its own selection indications.

	7. [Conditional] If "*a screen with dimming function*" is selected, the evaluator shall verify that indications are visible at minimum brightness settings in standard room illumination conditions. 8. [Conditional] If "*multiple indicators which never display conflicting information*" is selected, the evaluator shall verify that either all indicators reflect the same status at all times, or the indicator for the most recently used switching mechanism displays the correct switching status and that all other indicators display the correct status or no status		
Pass/Fail Explanation	The evaluator confirms the TOE properly indicates which computer connection is active on TOE power up. The evaluator also verifies the behaviour of all indicators when each switching mechanism is in use, and that no conflicting information is displayed by any indicators.		
Remote Control Used	SCAPF0004	SCAPF0004	SCAPF0004
Units Tested	SC840DPHC	SC820DPH	SC840DVI
Result	PASS	PASS	PASS

7 Security Assurance Requirements

7.1 ADV_FSP.1 Basic Functional Specification

7.1.1 ADV_FSP.1

7.1.1.1 ADV_FSP.1 Activity 1

Objective	There are no specific Evaluation Activities associated with these SARs. The Evaluation Activities listed in this PP are associated with the applicable SFRs; since these are directly associated with the SFRs, the tracing element ADV_FSP.1.2D is implicitly already done, and no additional documentation is necessary. The functional specification documentation is provided to support the evaluation activities described in Section 5.2 and other activities described for AGD and ATE SARs. The requirements on the content of the functional specification information are implicitly assessed by virtue of the other Evaluation Activities being performed. If the evaluator is unable to perform an activity because there is insufficient interface information, then an adequate functional specification has not been provided.
Evaluator Findings	Sufficient interface information was available to perform the evaluation activities. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

7.2 AGD_OPE.1 Operational User Guidance

7.2.1 AGD_OPE.1

7.2.1.1 AGD_OPE.1 Activity 1

Objective	The operational user guidance does not have to be contained in a single document. Guidance to users and Administrators can be spread among documents or web pages. The developer should review the Evaluation Activities contained in Section 5.2 of this PP to ascertain the specifics of the guidance for which the evaluator will be checking. This will provide the necessary information for the preparation of acceptable guidance.
Evaluator Findings	The evaluator examined the guidance documents to perform this evaluation. All guidance evaluation activities have been satisfied. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

7.3 AGD_PRE.1 Preparative Procedures

7.3.1 AGD_PRE.1

7.3.1.1 AGD_PRE.1 Activity 1

Objective	As with the operational user guidance, the developer should look to the Evaluation Activities contained in Section 5.2 of this PP to determine the required content with respect to preparative procedures.
Evaluator Findings	The evaluator examined the guidance documents to perform this evaluation. All guidance evaluation activities have been satisfied. Based on these findings, this evaluation activity is considered satisfied.

Verdict	Pass

7.4 ALC Assurance Activities

7.4.1 ALC_CMC.1

7.4.1.1 ALC_CMC.1 Activity 1

Objective	The "evaluation evidence required by the SARs" in this PP is limited to the information in the ST coupled with the guidance provided to administrators and users under the AGD requirements. By ensuring that the TOE is specifically identified and that this identification is consistent in the ST and in the AGD guidance, the evaluator implicitly confirms the information required by this component.
Evaluator Findings	The ST was used to determine the identification of the TOE. This was also corroborated by the identification in the TOE user guidance documents. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

7.4.2 ALC_CMS.1

7.4.2.1 ALC_CMS.1 Activity 1

Objective	Given the scope of the TOE and its associated evaluation evidence requirements, this component's Evaluation Activities are covered by the Evaluation Activities listed for ALC_CMC.1.
Evaluator Findings	Not Applicable
Verdict	Not Applicable/Pass

7.5 ATE_IND.1 Independent Testing – Conformance

7.5.1 ATE_IND.1

7.5.1.1 ATE_IND.1 Activity 1

Objective	The evaluator shall prepare a test plan and report documenting the testing aspects of the system. The test plan covers all of the testing actions contained in the CEM and the body of this PP's Evaluation Activities. While it is not necessary to have one test case per test listed in an Evaluation Activity, the evaluator must document in the test plan that each applicable testing requirement in the PP is covered. The test plan identifies the platforms to be tested, and for those platforms not included in the test plan but included in the ST, the test plan provides a justification for not testing the platforms. This justification must address the differences between the tested platforms and the untested platforms and make an argument that the differences do not affect the testing to be performed. It is not sufficient to merely assert that the differences have no affect; rationale must be provided. If all platforms claimed in the ST are tested, then no rationale is necessary. The test plan describes the composition of each platform to be tested and any setup that is necessary beyond what is contained in the AGD documentation. It should be noted that the evaluator is expected to follow the AGD documentation for installation and setup of each

	platform either as part of a test or as a standard pre-test condition. This may include special test equipment or tools. For each piece of equipment or tool, an argument (not just an assertion) should be provided that the equipment or tool will not adversely affect the performance of the functionality by the TOE and its platform. The test plan identifies high-level test objectives as well as the test procedures to be followed to achieve those objectives. These procedures include expected results. The test report (which could just be an annotated version of the test plan) details the activities that took place when the test procedures were executed, and includes the actual results of the tests. This shall be a cumulative account, so if there was a test run that resulted in a failure; a fix installed; and then a successful re-run of the test, the report would show a "fail" and "pass" result (and the supporting details), and not just the "pass" result.
Evaluator Findings	The evaluator created a test plan and executed all the tests in the test plan. The results of all the testing are included in the test plan. Based on this document, this evaluation activity is considered satisfied.
Verdict	Pass

7.6 AVA_VAN.1 Vulnerability Survey

7.6.1 AVA_VAN.1

7.6.1.1 AVA_VAN.1 Activity 1

Objective	As with ATE_IND, the evaluator shall generate a report to document their findings with respect to this requirement. This report could physically be part of the overall test report mentioned in ATE_IND, or a separate document. The evaluator performs a search of public information to determine the vulnerabilities that have been found in peripheral sharing devices and the implemented communication protocols in general, as well as those that pertain to the particular TOE. The evaluator documents the sources consulted and the vulnerabilities found in the report. For each vulnerability found, the evaluator either provides a rationale with respect to its non-applicability, or the evaluator formulates a test (using the guidelines provided in ATE_IND) to confirm the vulnerability, if suitable. Suitability is determined by assessing the attack vector needed to take advantage of the vulnerability. If exploiting the vulnerability requires expert skills and an electron microscope, for instance, then a test would not be suitable and an appropriate justification would be formulated.
Evaluator Findings	The evaluators documented their analysis and testing of potential vulnerabilities with respect to this requirement. Public searches were performed against all keywords found within the Security Target and AGD that may be applicable to specific TOE components. This included several combinations of the following words: Vertiv, Vertiv KVM, Vertiv Firmware, Firmware Version 44404-E7E7, Vertiv Peripheral Sharing Device, SC840DPHC, SC940DVI, SC820DPH, SC840DVI, SC840DPH, SC920DPH, SC940DPH, SC940DPHC, Cybex, NAK transaction, SCAPF0004, SYNC Signal, HPD signal, EDID traffic, ARC Signal, HDCP signal, USB HID traffic and STMicroelectronics 32-Bit to ensure sufficient coverage under AVA. The evaluator searched the Internet for potential vulnerabilities in the TOE using the web sites listed below. The sources of the publicly available information are provided below. • National Vulnerability Database: https://nvd.nist.gov/vuln/search • Vertiv Support: https://www.vertiv.com/en-ca/support/

	• Generic Internet Search: https://google.com The search was performed on November 9, 2021. The evaluation team found no vulnerabilities were applicable to the TOE version or hardware. Based on these findings, this evaluation activity is considered satisfied.
Verdict	Pass

8 Conclusion

The testing shows that all test cases required for conformance have passed testing.

9 Evaluation Evidence

- Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Security Target, Version 1.24, November 19, 2021
- Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Isolation Document, Version 1.3, October 22, 2020
- Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices Common Criteria Guidance Supplement, Version 1.7, November 17, 2021
- Vertiv CYBEX™ SC/SCM Switching System Additional Operations and Configuration Technical Bulletin, 590-1741-501B
- CYBEX™ SC SERIES SECURE SWITCHES SC800/900DPH, SC800/900DVI, and SCKM100PP4, 590-2282-501B
- CYBEX™ SC Series Secure Switches SC800DPHC/SC900DPHC Quick Install Guide, 590-2284-501B
- Test Report for Vertiv CYBEX™ SC820DPH, SC840DPH, SC920DPH, SC940DPH, SC840DPHC, SC940DPHC, SC840DVI, SC940DVI Firmware Version 44404-E7E7 Peripheral Sharing Devices, version 1.3, November 19, 2021

10 References

- [PP_PSD_V4.0] Protection Profile for Peripheral Sharing Device, July 19, 2019
- [MOD_AO_V1.0] PP-Module for Analog Audio Output Devices, July 19, 2019
- [MOD_KM_V1.0] PP-Module for Keyboard/Mouse Devices, July 19, 2019
- [MOD_VI_V1.0] PP-Module for Video/Display, July 19, 2019
- [CFG_PSD_AO-KM- VI_v1.0] PP-Configuration for Peripheral Sharing Device, Analog Audio Output Devices, Keyboard/Mouse Devices, and Video/Display Devices, July 19, 2021

End of Document