MilDef KSW5101 Firmware Version 4444-M1D1 Peripheral Sharing Device

Security Target

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MilDef Group AB
Muskötgatan 6,
254 66 Helsingborg, Sweden

Prepared by:
EWA-Canada, An Intertek Company
1223 Michael Street North, Suite 200
Ottawa, Ontario, Canada
K1J 7T2

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1 SECURITY TARGET INTRODUCTION

This Security Target (ST) defines the scope of the evaluation in terms of the assumptions made, the intended environment for the Target of Evaluation (TOE), the Information Technology (IT) security functional and assurance requirements to be met, and the level of confidence (evaluation assurance level) to which it is asserted that the TOE satisfies its IT security requirements. This document forms the baseline for the Common Criteria (CC) evaluation.

1.1 DOCUMENT ORGANIZATION

Section 1, ST Introduction, provides the Security Target reference, the Target of Evaluation reference, the TOE overview and the TOE description.

Section 2, Conformance Claims, describes how the ST conforms to the Common Criteria, Protection Profile (PP) and PP Modules.

Section 3, Security Problem Definition, describes the expected environment in which the TOE is to be used. This section defines the set of threats that are relevant to the secure operation of the TOE, organizational security policies with which the TOE must comply, and secure usage assumptions applicable to this analysis.

Section 4, Security Objectives, defines the set of security objectives to be satisfied by the TOE and by the TOE operating environment in response to the problem defined by the security problem definition.

Section 5, Extended Components Definition, defines the extended components which are then detailed in Section 6.

Section 6, Security Functional Requirements, specifies the security functional requirements that must be satisfied by the TOE and the IT environment.

Section 7, Security Assurance Requirements, specifies the security assurance requirements that must be satisfied by the TOE and the IT environment.

Section 8, Security Requirements Rationale, provides a rationale for the selection of functional and assurance requirements.

Section 9, TOE Summary Specification, describes the security functions that are included in the TOE to enable it to meet the IT security functional requirements.

Section 10, Terminology and Acronyms, defines the acronyms and terminology used in this ST.

Section 11, References, provides a list of documents referenced in this ST.

1.2 SECURITY TARGET REFERENCE

ST Title:	MilDef KSW5101 Firmware Version 4444-M1D1 Peripheral Sharing Device Security Target
ST Version:	1.5
ST Date:	18 December 2025

1.3 TOE REFERENCE

TOE Identification:	MilDef KSW5101 Firmware Version 4444-M1D1 Peripheral Sharing Device
TOE Developer:	MilDef Group AB
TOE Type:	Peripheral Sharing Device (Other Devices and Systems)

1.4 TOE OVERVIEW

The MilDef ruggedized secure KVM switch allows users to securely share keyboard, video, mouse peripherals, and Universal Serial Bus (USB) authentication device peripherals between up to 4 connected computers. Security features ensure isolation between computers and peripherals to prevent data leakage between connected systems.

The following security features are provided by the MilDef Peripheral Sharing Device:

- Video Security
    - 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
    - EDID file is transferred to connected hosts via a secure mechanism to assure uni-directional information flow.
    - Access to the Monitor Control Command Set (MCCS commands) is blocked
    - Only HDMI Interfaces are supported
    - Bi-directional interfaces of HDMI, for example, HEC, ARC, CEC and more are not connected.
- Keyboard and Mouse Security
    - 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
- Authentication Device
    - Unauthorized USB devices are blocked
    - USB authentication devices are authorized by default; all other devices are blocked
- Anti-Tampering
    - The TOE provides passive detection of physical attack. Tamper evident labels on the product's enclosure provide a clear visual indication if the product has been opened or compromised.
- TOE Access
    - The TOE provides continuous indication of which computer is currently selected.

The secure peripheral sharing devices use multiple isolated microcontrollers (one microcontroller per connected computer) to emulate connected peripherals in order to prevent an unauthorized data flow through bit-by-bit signaling.

The TOE is a combined software and hardware TOE.

1.4.1 TOE Environment

The following components are required for operation of the TOE in the evaluated configuration.

Component	Description
Connected Computers	1-4 General purpose computers
Keyboard	General purpose USB keyboard
Mouse	General purpose USB mouse
User authentication device	Standard USB smartcard reader/authentication device
User display	Standard computer display (HDMI 2.0)

Component	Description
KVM Cables	Ruggedized 37 pin console cable. The console cable has a round 37 pin connector on the KVM side. On the peripheral side, there is an HDMI video connector, three USB 2.0 connectors for the keyboard, mouse and CAC reader and a port for connecting the KSW4202 remote control. Ruggedized 26 pin PC cables. The PC cables have a single round 26 pin connector on the KVM side. On the PC side, there is an HDMI video connector and two USB 2.0 connectors for the keyboard and mouse and a second cable for CAC.
Power Supply	28 Volt Direct Current (VDC) Power Supply.

Table 1 – Non-TOE Hardware and Software

1.5 TOE DESCRIPTION

1.5.1 Evaluated Configurations

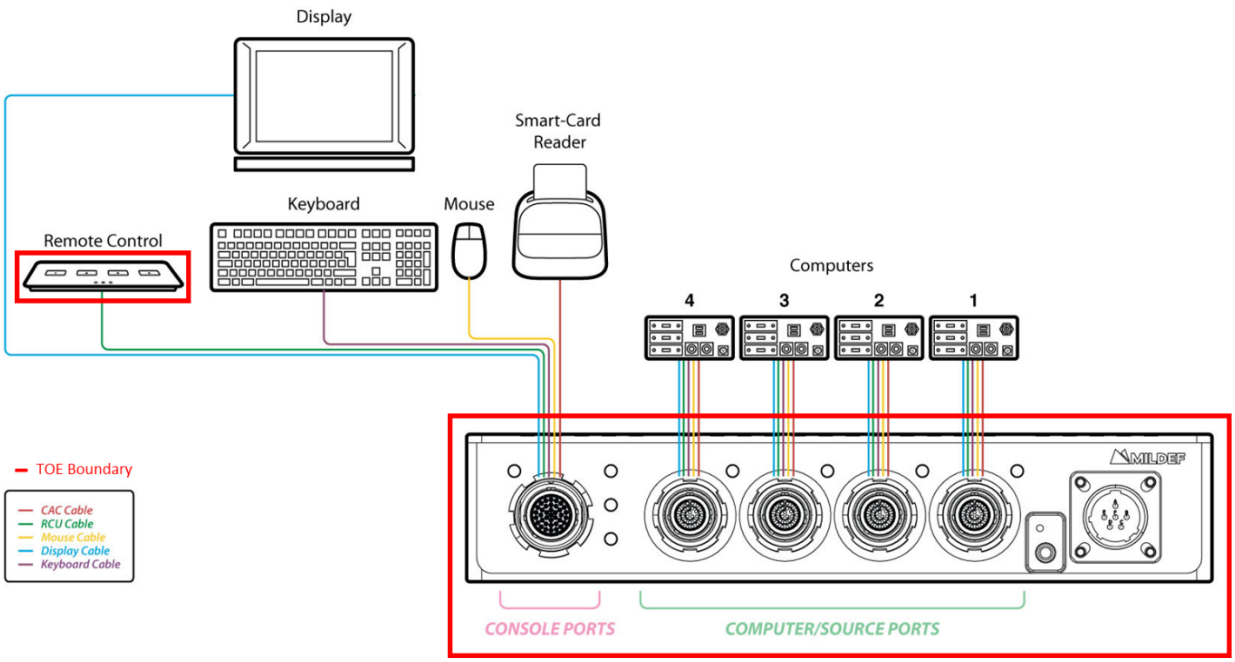

Figure 1 –Evaluated Configuration

Figure 1 shows a basic evaluated configuration. In the evaluated configuration, the TOE is connected to a keyboard, a mouse, and up to four computers. The video input is HDMI and a single display is connected. The TOE uses all metallic, ruggedized pin connectors (MIL-SDT-38999) that support both HDMI and USB 2.0 protocols. The KVM is used with a wired remote control.

1.5.2 Physical Scope

The TOE consists of the devices shown in Table 2 and the MilDef Firmware Version 4444-M1D1.

Family Description	Part Number	Model
Ruggedized Secure KVM Switch	211-4403	KSW5101
Remote Control	CGA32549	KSW4202

Table 2 – TOE Devices

1.5.2.1 TOE Delivery

The TOE, together with its corresponding cables are delivered to the customer via trusted carrier, such as Fed-Ex, that provide a tracking service for all shipments.

1.5.2.2 TOE Guidance

The TOE includes the following guidance documentation:

- MilDef Quick Installation Guide KSW5101 4 Ports Secure Ruggedized HDMI KVM Switch, HLT32537 Rev 1.3, 2024-08-29

Guidance may be downloaded from the MilDef website (https://download.mildef.com/se) in .pdf format.

The following guidance is available upon request by emailing service@mildef.com:

- MilDef KSW5101 Firmware Version 4444-M1D1 Peripheral Sharing Device Common Criteria Guidance Supplement, Version 1.2

1.5.3 Logical Scope

The logical boundary of the TOE includes all interfaces and functions within the physical boundary. The TOE does not provide a management function to configure aspects of the TSF. The logical boundary of the TOE may be broken down by the security function classes described in Section 6. Table 3 summarizes the logical scope of the TOE.

Functional Classes	Description
User Data Protection	The TOE provides secure switching and unidirectional data flow capabilities for keyboard, video, and mouse. The TOE ensures that only authorized peripheral devices may be used. The TOE does not support a factory reset capability.
Protection of the TSF[1]	The TOE ensures a secure state in the case of failure, provides only restricted access, and performs self-testing. The TOE provides passive detection of physical attack.
TOE Access	The TOE provides a continuous indication of which computer is currently selected.

Table 3 – Logical Scope of the TOE

[1] TOE Security Functionality

2 CONFORMANCE CLAIMS

2.1 COMMON CRITERIA CONFORMANCE CLAIM

This Security Target claims to be conformant to Version 3.1 of Common Criteria for Information Technology Security Evaluation according to:

- Common Criteria for Information Technology Security Evaluation, Part 1: Introduction and General Model; CCMB-2017-04-001, Version 3.1, Revision 5, April 2017
- Common Criteria for Information Technology Security Evaluation, Part 2: Security Functional Components; CCMB-2017-04-002, Version 3.1, Revision 5, April 2017
- Common Criteria for Information Technology Security Evaluation, Part 3: Security Assurance Components CCMB-2017-04-003, Version 3.1, Revision 5, April 2017

As follows:

- CC Part 2 extended
- CC Part 3 conformant

The Common Methodology for Information Technology Security Evaluation, Version 3.1, Revision 5, April 2017 has been taken into account.

2.2 PP-CONFIGURATION CONFORMANCE CLAIM

This ST claims exact conformance with the National Information Assurance Partnership (NIAP) PP-Configuration for Peripheral Sharing Device, Keyboard/Mouse Devices, User Authentication Devices, and Video/Display Devices, 2019-07-19 [CFG_PSD-KM-UA-VI_V1.0].

This PP-Configuration includes the following components:

- Base-PP: Protection Profile for Peripheral Sharing Device, Version 4.0 [PP_PSD_V4.0]
- PP-Module: PP-Module for Keyboard/Mouse Devices, Version 1.0 [MOD_KM_V1.0]
- PP-Module: PP-Module for Video/Display Devices, Version 1.0 [MOD_VI_V1.0]
- PP-Module: PP-Module for User Authentication Devices, Version 1.0 [MOD_UA_V1.0]

2.3 TECHNICAL DECISIONS

The Technical Decisions in Table 4 apply to the PP and the modules and have been accounted for in the ST and in the evaluation.

TD	Name	PP affected	Relevant Y/N
TD0506	Missing Steps to disconnect and reconnect display	[MOD_VI_V1.0]	Y
TD0507	Clarification on USB plug type	[MOD_KM_V1.0]	Y
TD0514	Correction to MOD VI FDP_APC_EXT.1 Test 3 Step 6	[MOD_VI_V1.0]	Y
TD0518	Typographical errors in dependency Table	[PP_PSD_V4.0]	N FPT_STM.1 is not claimed in the ST
TD0539	Incorrect selection trigger in FTA_CIN_EXT.1 in MOD_VI_V1.0	[MOD_VI_V1.0]	Y
TD0583	FPT_PHP.3 modified for remote controllers	[PP_PSD_V4.0]	N FPT_PHP.3 is not claimed in the ST
TD0584	Update to FDP_APC_EXT.1 Video Tests	[MOD_VI_V.10]	Y
TD0593	Equivalency Arguments for PSD	[MOD_KM_V1.0], [MOD_UA_V1.0], [MOD_VI_V1.0]	Y
TD0619	Test EAs for internal UA devices	[MOD_UA_V1.0]	Y
TD0620	EDID Read Requirements	[MOD_VI_V1.0]	Y
TD0681	PSD purging of EDID data upon disconnect	[MOD_VI_V1.0]	Y
TD0686	DisplayPort CEC Testing	[MOD_VI_V1.0]	N The TOE does not include a DisplayPort
TD0804	Clarification regarding Extenders in PSD Evaluations	[PP_PSD_V4.0]	Y
TD0842	Alternate Conversion Option for FDP_IPC_EXT.1	[MOD_VI_V1.0]	N FDP_IPC_EXT.1 is not claimed in the ST

TD	Name	PP affected	Relevant Y/N
TD0844	Addition of Assurance Package for Flaw Remediation V1.0 Conformance Claim	[PP_PSD_V4.0]	N No ALC_FLR SARs are claimed in this ST.

Table 4 – Applicable Technical Decisions

2.4 PACKAGE CLAIM

This Security Target does not claim conformance with any package.

2.5 CONFORMANCE RATIONALE

The TOE is inherently consistent with the Compliant Targets of Evaluation described in the [PP_PSD_V4.0] and in the PP modules listed in Section 2.2, and with the PP-Configuration for Peripheral Sharing Device, Keyboard/Mouse Devices, User Authentication Devices, and Video/Display Devices [CFG_PSD-KM-UA-VI_V1.0].

The security problem definition, statement of security objectives and statement of security requirements in this ST conform exactly to the security problem definition, statement of security objectives and statement of security requirements contained in [PP_PSD_V4.0] and the modules listed in Section 2.2.

3 SECURITY PROBLEM DEFINITION

3.1 THREATS

Table 5 lists the threats described in Section 3.1 of the [PP_PSD_V4.0]. Mitigation to the threats is through the objectives identified in Section 4.1, Security Objectives for the TOE.

Threat	Description
T.DATA_LEAK	A connection via the PSD[2] between one or more computers may allow unauthorized data flow through the PSD or its connected peripherals.
T.SIGNAL_LEAK	A connection via the PSD between one or more computers may allow unauthorized data flow through bit-by-bit signaling.
T.RESIDUAL_LEAK	A PSD may leak (partial, residual, or echo) user data between the intended connected computer and another unintended connected computer.
T.UNINTENDED_USE	A PSD may connect the user to a computer other than the one to which the user intended to connect.
T.UNAUTHORIZED_DEVICES	The use of an unauthorized peripheral device with a specific PSD peripheral port may allow unauthorized data flows between connected devices or enable an attack on the PSD or its connected computers.
T.LOGICAL_TAMPER	An attached device (computer or peripheral) with malware, or otherwise under the control of a malicious user, could modify or overwrite code or data stored in the PSD's volatile or non-volatile memory to allow unauthorized information flows.
T.PHYSICAL_TAMPER	A malicious user or human agent could physically modify the PSD to allow unauthorized information flows.
T.REPLACEMENT	A malicious human agent could replace the PSD during shipping, storage, or use with an alternate device that does not enforce the PSD security policies.

[2] Peripheral Sharing Device

Threat	Description
T.FAILED	Detectable failure of a PSD may cause an unauthorized information flow or weakening of PSD security functions.

Table 5 – Threats

3.2 ORGANIZATIONAL SECURITY POLICIES

There are no Organizational Security Policies applicable to this TOE.

3.3 ASSUMPTIONS

The assumptions required to ensure the security of the TOE are listed in Table 6.

Assumptions	Description
A.NO_TEMPEST	Computers and peripheral devices connected to the PSD are not TEMPEST approved. The TSF may or may not isolate the ground of the keyboard and mouse computer interfaces (the USB ground). The Operational Environment is assumed not to support TEMPEST red-black ground isolation.
A.PHYSICAL	The environment provides physical security commensurate with the value of the TOE and the data it processes and contains.
A.NO_WIRELESS_DEVICES	The environment includes no wireless peripheral devices.
A.TRUSTED_ADMIN	PSD Administrators[3] and users are trusted to follow and apply all guidance in a trusted manner.
A.TRUSTED_CONFIG	Personnel configuring the PSD and its operational environment follow the applicable security configuration guidance.
A.USER_ALLOWED_ACCESS	All PSD users are allowed to interact with all connected computers. It is not the role of the PSD to prevent or otherwise control user access to connected computers. Computers or their connected network shall have the required means to authenticate the user and to control access to their various resources.

[3] There are no administrative functions in the TOE. Therefore, there is no administrator so this assumption only refers to users.

Assumptions	Description
A.NO_SPECIAL_ANALOG_CAPABILITIES	The computers connected to the TOE are not equipped with special analog data collection cards or peripherals such as analog to digital interface, high performance audio interface, digital signal processing function, or analog video capture function.

Table 6 – Assumptions

4 SECURITY OBJECTIVES

The purpose of the security objectives is to address the security concerns and to show which security concerns are addressed by the TOE, and which are addressed by the environment. Threats may be addressed by the TOE or the security environment or both. Therefore, the CC identifies two categories of security objectives:

- Security objectives for the TOE
- Security objectives for the environment

4.1 SECURITY OBJECTIVES FOR THE TOE

This section identifies and describes the security objectives that are to be addressed by the TOE, and traces each Security Functional Requirement (SFR) back to a security objective of the TOE.

<table>
<tr><th>TOE Security Objective</th><th>Description</th></tr>
<tr><td>O.COMPUTER_INTERFACE_ISOLATION</td><td>The PSD shall prevent unauthorized data flow to ensure that the PSD and its connected peripheral devices cannot be exploited in an attempt to leak data. The TOE-Computer interface shall be isolated from all other PSD-Computer interfaces while TOE is powered.
Addressed by:
<table><tr><td>MOD_VI</td><td>FDP_APC_EXT.1/VI, FDP_PDC_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
</table>

<table>
<tr><th>TOE Security Objective</th><th>Description</th></tr>
<tr><td>O.COMPUTER
_INTERFACE
_ISOLATION
_TOE_UNPOWERED</td><td>The PSD shall not allow data to transit a PSD-Computer interface while the PSD is unpowered.
Addressed by:<table><tr><td>MOD_VI</td><td>FDP_APC_EXT.1/VI, FDP_PDC_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
<tr><td>O.USER_DATA
_ISOLATION</td><td>The PSD shall route user data, such as keyboard entries, only to the computer selected by the user. The PSD shall provide isolation between the data flowing from the peripheral device to the selected computer and any non-selected computer.
Addressed by:<table><tr><td>MOD_VI</td><td>FDP_APC_EXT.1/VI, FDP_PDC_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
<tr><td>O.NO_USER
_DATA_RETENTION</td><td>The PSD shall not retain user data in non-volatile memory after power up or, if supported, factory reset.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_RIP_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_RIP.1/KM</td></tr></table></td></tr>
<tr><td>O.NO_OTHER
_EXTERNAL
_INTERFACES</td><td>The PSD shall not have any external interfaces other than those implemented by the TSF.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_PDC_EXT.1</td></tr></table></td></tr>
</table>

<table>
<tr><th>TOE Security Objective</th><th>Description</th></tr>
<tr><td>O.LEAK
_PREVENTION
_SWITCHING</td><td>The PSD shall ensure that there are no switching mechanisms that allow signal data leakage between connected computers.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_SWI_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
<tr><td>O.AUTHORIZED
_USAGE</td><td>The TOE shall explicitly prohibit or ignore unauthorized switching mechanisms, either because it supports only one connected computer or because it allows only authorized mechanisms to switch between connected computers. Authorized switching mechanisms shall require express user action restricted to console buttons, console switches, console touch screen, wired remote control, and peripheral devices using a guard. Unauthorized switching mechanisms include keyboard shortcuts, also known as “hotkeys,” automatic port scanning, control through a connected computer, and control through keyboard shortcuts. Where applicable, the results of the switching activity shall be indicated by the TSF so that it is clear to the user that the switching mechanism was engaged as intended.
A conformant TOE may also provide a management function to configure some aspects of the TSF. If the TOE provides this functionality, it shall ensure that whatever management functions it provides can only be performed by authorized administrators and that an audit trail of management activities is generated.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_SWI_EXT.1, FDP_SWI_EXT.2, FTA_CIN_EXT.1</td></tr><tr><td>MOD_VI</td><td>FDP_CDS_EXT.1, FTA_CIN_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_FIL_EXT.1/KM</td></tr><tr><td>MOD_UA</td><td>FDP_FIL_EXT.1/UA</td></tr></table></td></tr>
</table>

<table>
<tr><th>TOE Security Objective</th><th>Description</th></tr>
<tr><td>O.PERIPHERAL
_PORTS_ISOLATION</td><td>The PSD shall ensure that data does not flow between peripheral devices connected to different PSD interfaces.
Addressed by:<table><tr><td>MOD_VI</td><td>FDP_APC_EXT.1/VI, FDP_PDC_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
<tr><td>O.REJECT
_UNAUTHORIZED
_ENDPOINTS</td><td>The PSD shall reject unauthorized peripheral devices connected via a Universal Serial Bus (USB) hub.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_PDC_EXT.1</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
</table>

<table>
<tr><th>TOE Security Objective</th><th>Description</th></tr>
<tr><td>O.REJECT
_UNAUTHORIZED
_PERIPHERAL</td><td>The PSD shall reject unauthorized peripheral device types and protocols.
Addressed by:<table><tr><td>PP_PSD</td><td>FDP_PDC_EXT.1</td></tr><tr><td>MOD_VI</td><td>FDP_PDC_EXT.2/VI, FDP_PDC_EXT.3/VI, FDP_SPR_EXT.1/HDMI</td></tr><tr><td>MOD_KM</td><td>FDP_APC_EXT.1/KM, FDP_FIL_EXT.1/KM, FDP_PDC_EXT.1, FDP_RDR_EXT.1, FDP_SWI_EXT.3, FDP_PDC_EXT.2/KM, FDP_PDC_EXT.3/KM</td></tr><tr><td>MOD_UA</td><td>FDP_APC_EXT.1/UA, FDP_FIL_EXT.1/UA, FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4, FDP_PWR_EXT.1, FDP_SWI_EXT.2</td></tr></table></td></tr>
<tr><td>O.NO_TOE_ACCESS</td><td>The PSD firmware, software, and memory shall not be accessible via its external ports.
Addressed by:<table><tr><td>PP_PSD</td><td>FPT_NTA_EXT.1</td></tr></table></td></tr>
<tr><td>O.TAMPER
_EVIDENT
_LABEL</td><td>The PSD shall be identifiable as authentic by the user and the user must be made aware of any procedures or other such information to accomplish authentication. This feature must be available upon receipt of the PSD and continue to be available during the PSD deployment. The PSD shall be labeled with at least one visible unique identifying tamper-evident marking that can be used to authenticate the device. The PSD manufacturer must maintain a complete list of manufactured PSD articles and their respective identification markings’ unique identifiers.
Addressed by:<table><tr><td>PP_PSD</td><td>FPT_PHP.1</td></tr></table></td></tr>
</table>

TOE Security Objective	Description
O.ANTI_TAMPERING	The PSD shall be physically enclosed so that any attempts to open or otherwise access the internals or modify the connections of the PSD would be evident, and optionally thwarted through disablement of the TOE. Note: This applies to a wired remote control as well as the main chassis of the PSD. Addressed by: PP_PSD: FPT_PHP.1
O.SELF_TEST	The PSD shall perform self-tests following power up or powered reset. Addressed by: PP_PSD: FPT_TST.1
O.SELF_TEST _FAIL_TOE _DISABLE	The PSD shall enter a secure state upon detection of a critical failure. Addressed by: PP_PSD: FPT_FLS_EXT.1, FPT_TST_EXT.1
O.SELF_TEST _FAIL_INDICATION	The PSD shall provide clear and visible user indications in the case of a self-test failure. Addressed by: PP_PSD: FPT_TST_EXT.1
O.EMULATED_INPUT	The TOE shall emulate the keyboard and/or mouse functions from the TOE to the connected computer. Addressed by: MOD_KM: FDP_PDC_EXT.2/KM, FDP_PDC_EXT.3/KM
O.UNIDIRECTIONAL _INPUT	The TOE shall enforce unidirectional keyboard and/or mouse device’s data flow from the peripheral device to only the selected computer. Addressed by: MOD_KM: FDP_UDF_EXT.1/KM

TOE Security Objective	Description
O.USER_AUTHENTICATION_ISOLATION	The TOE shall isolate the user authentication function from all other TOE functions. Addressed by: MOD_UA: FDP_UAI_EXT.1
O.SESSION_TERMINATION	The TOE shall immediately terminate an open session with the selected computer upon disconnection of the authentication element. Addressed by: MOD_UA: FDP_TER_EXT.1, FDP_TER_EXT.2, FDP_TER_EXT.3
O.PROTECTED_EDID	The TOE shall read the connected display Extended Display Identification Data (EDID) once during the TOE power up or reboot sequence and prevent any EDID channel write transactions that connected computers initiate. Addressed by: MOD_VI: FDP_PDC_EXT.2/VI, FDP_SPR_EXT.1/HDMI
O.UNIDIRECTIONAL_VIDEO	The TOE shall enforce unidirectional video data flow from the connected computer video interface to the display interface only. Addressed by: MOD_VI: FDP_UDF_EXT.1/VI

Table 7 – Security Objectives for the TOE

4.2 SECURITY OBJECTIVES FOR THE OPERATIONAL ENVIRONMENT

This section identifies and describes the security objectives that are to be addressed by the IT environment or by non-technical or procedural means.

OE Security Objective	Description
OE.NO_TEMPEST	The operational environment will not use TEMPEST approved equipment.
OE.PHYSICAL	The operational environment will provide physical security, commensurate with the value of the PSD and the data that transits it.

OE Security Objective	Description
OE.NO_WIRELESS_DEVICES	The operational environment will not include wireless keyboards, mice, audio, user authentication, or video devices.
OE.TRUSTED_ADMIN	The operational environment will ensure that trusted PSD Administrators and users are appropriately trained.
OE.TRUSTED_CONFIG	The operational environment will ensure that administrators configuring the PSD and its operational environment follow the applicable security configuration guidance.
OE.NO_SPECIAL_ANALOG _CAPABILITIES	The operational environment will not have 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.

Table 8 – Security Objectives for the Operational Environment

4.3 SECURITY OBJECTIVES RATIONALE

The security objectives rationale describes how the assumptions and threats map to the security objectives.

Threat or Assumption	Security Objective(s)	Rationale
T.DATA_LEAK	O.COMPUTER _INTERFACE _ISOLATION	Isolation of computer interfaces prevents data from leaking between them without authorization.
	O.COMPUTER _INTERFACE _ISOLATION _TOE_UNPOWERED	Maintaining interface isolation while the TOE is in an unpowered state ensures that data cannot leak between computer interfaces.
	O.USER_DATA _ISOLATION	The TOE’s routing of data only to the selected computer ensures that it will not leak to any others.
	O.NO_OTHER _EXTERNAL _INTERFACES	The absence of additional external interfaces ensures that there is no unexpected method by which data can be leaked.
	O.PERIPHERAL_PORTS _ISOLATION	Isolation of peripheral ports prevents data from leaking between them without authorization.

Threat or Assumption	Security Objective(s)	Rationale
	O.UNIDIRECTIONAL_INPUT	The TOE's enforcement of unidirectional input for keyboard/mouse data prevents leakage of computer data through a connected peripheral interface.
	O.USER_AUTHENTICATION_ISOLATION	The TOE's user authentication function mitigates this threat by ensuring that the bidirectional channel between the device and the connected computer through the user authentication function is isolated from all other TOE functions.
	O.SESSION_TERMINATION	The TOE mitigates the threat by ensuring that open sessions are terminated and no traffic flows upon disconnection of the authentication element.
	O.PROTECTED_EDID	The TOE's protection of the EDID interface prevents its use as a vector for unauthorized data leakage via this channel.
	O.UNIDIRECTIONAL_VIDEO	The TOE's enforcement of unidirectional output for video data protects against data leakage via connected computers by ensuring that no video data can be input to a connected computer through this interface.
T.SIGNAL_LEAK	O.COMPUTER_INTERFACE_ISOLATION	Isolation of computer interfaces prevents data leakage through bit-wise signaling because there is no mechanism by which the signal data can be communicated.
	O.NO_OTHER_EXTERNAL_INTERFACES	The absence of additional external interfaces ensures that there is no unexpected method by which data can be leaked through bitwise signaling.
	O.LEAK_PREVENTION_SWITCHING	The TOE's use of switching methods that are not susceptible to signal leakage helps mitigate the signal leak threat.

Threat or Assumption	Security Objective(s)	Rationale
	O.UNIDIRECTIONAL_INPUT	The TOE's enforcement of unidirectional input for keyboard/mouse data prevents leakage of computer data through bit-by-bit signaling to a connected peripheral interface.
	O.PROTECTED_EDID	The TOE's protection of the EDID interface prevents its use as a vector for bit-by-bit signal leakage via this channel.
	O.UNIDIRECTIONAL_VIDEO	The TOE's enforcement of unidirectional output for video data protects against signaling leakage via connected computers by ensuring that no video data can be input to a connected computer through this interface.
	O.USER_AUTHENTICATION_ISOLATION	The TOE's user authentication function mitigates this threat by ensuring that the bidirectional channel between the device and the connected computer through the user authentication function is isolated from all other TOE functions.
	O.SESSION_TERMINATION	The TOE mitigates the threat by ensuring that open sessions are terminated and no traffic flows upon disconnection of the authentication element.
T.RESIDUAL_LEAK	O.NO_USER_DATA_RETENTION	The TOE's lack of data retention ensures that a residual data leak is not possible.
	O.PROTECTED_EDID	The TOE's protection of the EDID interface prevents the leakage of residual data by ensuring that no such data can be written to EDID memory.

Threat or Assumption	Security Objective(s)	Rationale
	O.USER_AUTHENTICATION_ISOLATION	The TOE's user authentication function mitigates this threat by ensuring that the bidirectional channel between the device and the connected computer through the user authentication function is isolated from all other TOE functions.
	O.SESSION_TERMINATION	The TOE mitigates the threat by ensuring that open sessions are terminated and no traffic flows upon disconnection of the authentication element.
T.UNINTENDED_USE	O.AUTHORIZED_USAGE	The TOE's support for only switching mechanisms that require explicit user action to engage ensures that a user has sufficient information to avoid interacting with an unintended computer.
T.UNAUTHORIZED_DEVICES	O.REJECT_UNAUTHORIZED_ENDPOINTS	The TOE's ability to reject unauthorized endpoints mitigates the threat of unauthorized devices being used to communicate with connected computers.
	O.REJECT_UNAUTHORIZED_PERIPHERAL	The TOE's ability to reject unauthorized peripherals mitigates the threat of unauthorized devices being used to communicate with connected computers.
	O.EMULATED_INPUT	The TOE's emulation of keyboard/mouse data input ensures that a connected computer will only receive this specific type of data through a connected peripheral.
	O.UNIDIRECTIONAL_VIDEO	The TOE's limitation of supported video protocol interfaces prevents the connection of unauthorized devices.
	O.SESSION_TERMINATION	The TOE mitigates the threat by ensuring that open sessions are terminated and no traffic flows upon disconnection of the authentication element.

Threat or Assumption	Security Objective(s)	Rationale
T.LOGICAL _TAMPER	O.NO_TOE_ACCESS	The TOE's prevention of logical access to its firmware, software, and memory mitigates the threat of logical tampering.
	O.EMULATED_INPUT	The TOE's emulation of keyboard/mouse data input prevents logical tampering of the TSF ensuring that only known inputs to it are supported.
T.PHYSICAL _TAMPER	O.ANTI_TAMPERING	The TOE mitigates the threat of physical tampering through use of an enclosure that provides tamper detection functionality.
	O.TAMPER_EVIDENT _LABEL	The TOE mitigates the threat of physical tampering through use of tamper evident labels that reveal physical tampering attempts.
T.REPLACEMENT	O.TAMPER_EVIDENT _LABEL	The TOE's use of a tamper evident label that provides authenticity of the device mitigates the threat that it is substituted for a replacement device during the acquisition process.
T.FAILED	O.SELF_TEST	The TOE mitigates the threat of failures leading to compromise of security functions through self-tests of its own functionality.
	O.SELF_TEST_FAIL _TOE_DISABLE	The TOE mitigates the threat of failures leading to compromise of security functions by disabling all data flows in the event a failure is detected.
	O.SELF_TEST_FAIL _INDICATION	The TOE mitigates the threat of failures leading to compromise of security functions by providing users with a clear indication when it is in a failure state and should not be trusted.
A.NO_TEMPEST	OE.NO_TEMPEST	If the TOE's operational environment does not include TEMPEST approved equipment, then the assumption is satisfied.

Threat or Assumption	Security Objective(s)	Rationale
A.NO_PHYSICAL[4]	OE.PHYSICAL	If the TOE's operational environment provides physical security, then the assumption is satisfied.
A.NO_WIRELESS _DEVICES	OE.NO_WIRELESS _DEVICES	If the TOE's operational environment does not include wireless peripherals, then the assumption is satisfied.
A.TRUSTED_ADMIN	OE.TRUSTED _ADMIN	If the TOE's operational environment ensures that only trusted administrators will manage the TSF, then the assumption is satisfied.
A.TRUSTED _CONFIG	OE.TRUSTED _CONFIG	If TOE administrators follow the provided security configuration guidance, then the assumption is satisfied.
A.USER_ALLOWED _ACCESS	OE.PHYSICAL	If the TOE's operational environment provides physical access to connected computers, then the assumption is satisfied.
A.NO_SPECIAL _ANALOG _CAPABILITIES	OE.NO_SPECIAL _ANALOG _CAPABILITIES	If administrators in the TOE's operational environment take care to ensure that computers with special analog data collection interfaces are not connected to the TOE, then the assumption that such components are not present is satisfied.

Table 9 – Security Objectives Rationale

[4] Note: A.NO_PHYSICAL in this table is referring A.PHYSICAL in Section 3.3.

5 EXTENDED COMPONENTS DEFINITION

The extended components definition is presented in Appendix C of the Protection Profile for Peripheral Sharing Device [PP_PSD_V4.0] and in the modules for keyboard/mouse devices [MOD_KM_V1.0], user authentication devices [MOD_UA_V1.0], and display devices [MOD_VI_1.0].

The families to which these components belong are identified in the following table:

Functional Class	Functional Families	Protection Profile Modules
User Data Protection (FDP)	FDP_APC_EXT Active PSD Connections	[PP_PSD_V4.0] [MOD_KM_V1.0] [MOD_VI_V1.0] [MOD_UA_V1.0]
	FDP_CDS_EXT Connected Displays Supported	[MOD_VI_V1.0]
	FDP_FIL_EXT Device Filtering	[MOD_KM_V1.0] [MOD_UA_V1.0]
	FDP_PDC_EXT Peripheral Device Connection	[PP_PSD_V4.0] [MOD_VI_V1.0] [MOD_KM_V1.0] [MOD_UA_V1.0]
	FDP_PWR_EXT Powered By Computer	[MOD_UA_V1.0]
	FDP_RDR_EXT Re-Enumeration Device Rejection	[MOD_KM_V1.0]
	FDP_RIP_EXT Residual Information Protection	[PP_PSD_V4.0]
	FDP_SPR_EXT Sub-Protocol Rules	[MOD_VI_V1.0]
	FDP_SWI_EXT PSD Switching	[PP_PSD_V4.0] [MOD_KM_V1.0] [MOD_UA_V1.0]
	FDP_TER_EXT Session Termination	[MOD_UA_V1.0]
	FDP_UAI_EXT User Authentication Isolation	[MOD_UA_V1.0]
	FDP_UDF_EXT Unidirectional Data Flow	[MOD_VI_V1.0] [MOD_KM_V1.0]

Functional Class	Functional Families	Protection Profile Modules
Protection of the TSF (FPT)	FPT_FLS_EXT Failure with Preservation of Secure State	[PP_PSD_V4.0]
	FPT_NTA_EXT No Access to TOE	[PP_PSD_V4.0]
	FPT_TST_EXT TSF Testing	[PP_PSD_V4.0]
TOE Access (FTA)	FTA_CIN_EXT Continuous Indications	[PP_PSD_V4.0] [MOD_VI_V1.0]

Table 10 **– Functional Families of Extended Components**

6 SECURITY FUNCTIONAL REQUIREMENTS

Section 6 provides security functional and assurance requirements that must be satisfied by a compliant TOE.

6.1 CONVENTIONS

The CC permits four types of operations to be performed on functional requirements: selection, assignment, refinement, and iteration. These operations are denoted as follows:

- Assignment: Indicated by bold text, e.g., **assigned item**.
- Selection: Indicated by text in italics, e.g., *selected item*.
- Refinement: Refined components are identified by using underlined text for additional information, or ~~strikeout~~ for deleted text.
- Iteration: Iteration operations for iterations within the Protection Profile and associated modules are identified with a slash ('/') and an identifier (e.g. "/KM"). Where multiple iterations of the SFR are required within the ST, a number is appended to the SFR identifier (e.g. "FDP_CDS_EXT.1(1)").

Extended SFRs are identified by the inclusion of "_EXT" in the SFR name.

The CC operations already performed in the PP and PP modules are reproduced in plain text and not denoted in this ST. The requirements have been copied from the PP and PP modules and any remaining operations have been completed herein. Refer to the PP and PP modules to identify those operations.

6.2 SECURITY FUNCTIONAL REQUIREMENTS

Section 6.2 details the security functional requirements.

Class	Identifier	Name	Source
User Data Protection (FDP)	FDP_APC_EXT.1/KM	Active PSD Connections	[MOD_KM_V1.0]
	FDP_APC_EXT.1/UA	Active PSD Connections	[MOD_UA_V1.0]
	FDP_APC_EXT.1/VI	Active PSD Connections	[MOD_VI_V1.0]
	FDP_CDS_EXT.1	Connected Displays Supported	[MOD_VI_V1.0]
	FDP_FIL_EXT.1/KM	Device Filtering (Keyboard/Mouse)	[MOD_KM_V1.0]

Class	Identifier	Name	Source
	FDP_FIL_EXT.1/UA	Device Filtering (User Authentication Devices)	[MOD_UA_V1.0]
	FDP_PDC_EXT.1	Peripheral Device Connection	[PP_PSD_V4.0] [MOD_VI_V1.0][5] [MOD_KM_V1.0][6] [MOD_UA_V1.0][7]
	FDP_PDC_EXT.2/KM	Authorized Devices (Keyboard/Mouse)	[MOD_KM_V1.0]
	FDP_PDC_EXT.2/UA	Authorized Devices (User Authentication Devices)	[MOD_UA_V1.0]
	FDP_PDC_EXT.2/VI	Authorized Devices (Video Output)	[MOD_VI_V1.0]
	FDP_PDC_EXT.3/KM	Authorized Connection Protocols (Keyboard/Mouse)	[MOD_KM_V1.0]
	FDP_PDC_EXT.3/VI	Authorized Connection Protocols (Video Output)	[MOD_VI_V1.0]
	FDP_PDC_EXT.4	Supported Authentication Device	[MOD_UA_V1.0]
	FDP_PWR_EXT.1	Powered By Computer	[MOD_UA_V1.0]
	FDP_RDR_EXT.1	Re-Enumeration Device Rejection	[MOD_KM_V1.0]

[5] There is no modification to this SFR in the [MOD_VI_V1.0]. However, there are additions to the Peripheral Device Connections Policy associated with this SFR, and additional evaluation activities.

[6] There is no modification to this SFR in the [MOD_KM_V1.0]. However, there are additions to the Peripheral Device Connections associated with this SFR, modifications of the application note, and additional evaluation activities.

[7] There is no modification to this SFR in the [MOD_UA_V1.0]. However, because of additions to the Peripheral Device Connections Policy, there is an additional application note and additional evaluation activities for this SFR.

Class	Identifier	Name	Source
	FDP_RIP.1/KM	Residual Information Protection (Keyboard Data)	[MOD_KM_V1.0]
	FDP_RIP_EXT.1	Residual Information Protection	[PP_PSD_V4.0]
	FDP_SPR_EXT.1/HDMI	Sub-Protocol Rules (HDMI Protocol)	[MOD_VI_V1.0]
	FDP_SWI_EXT.1	PSD Switching	[PP_PSD_V4.0]
	FDP_SWI_EXT.2	PSD Switching Methods	[PP_PSD_V4.0] [MOD_KM_V1.0]
	FDP_SWI_EXT.3	Tied Switching	[MOD_KM_V1.0]
	FDP_TER_EXT.1	Session Termination	[MOD_UA_V1.0]
	FDP_TER_EXT.2	Session Termination of Removed Devices	[MOD_UA_V1.0]
	FDP_TER_EXT.3	Session Termination upon Switching	[MOD_UA_V1.0]
	FDP_UAI_EXT.1	User Authentication Isolation	[MOD_UA_V1.0]
	FDP_UDF_EXT.1/KM	Unidirectional Data Flow (Keyboard/Mouse)	[MOD_KM_V1.0]
	FDP_UDF_EXT.1/VI	Unidirectional Data Flow (Video Output)	[MOD_VI_V1.0]
Protection of the TSF (FPT)	FPT_FLS_EXT.1	Failure with Preservation of Secure State	[PP_PSD_V4.0]
	FPT_NTA_EXT.1	No Access to TOE	[PP_PSD_V4.0]
	FPT_PHP.1	Passive Detection of Physical Attack	[PP_PSD_V4.0]
	FPT_TST.1	TSF testing	[PP_PSD_V4.0]
	FPT_TST_EXT.1	TSF Testing	[PP_PSD_V4.0]

Class	Identifier	Name	Source
TOE Access (FTA)	FTA_CIN_EXT.1	Continuous Indications	[PP_PSD_V4.0] [MOD_VI_V1.0]

Table 11 – Summary of Security Functional Requirements

6.2.1 User Data Protection (FDP)

6.2.1.1 FDP_APC_EXT.1/KM Active PSD Connections

FDP_APC_EXT.1.1/KM The TSF shall route user data only to the interfaces selected by the user.

FDP_APC_EXT.1.2/KM The TSF shall ensure that no data or electrical signals flow between connected computers whether the TOE is powered on or powered off.

FDP_APC_EXT.1.3/KM The TSF shall ensure that no data transits the TOE when the TOE is powered off.

FDP_APC_EXT.1.4/KM The TSF shall ensure that no data transits the TOE when the TOE is in a failure state.

6.2.1.2 FDP_APC_EXT.1/UA Active PSD Connections

FDP_APC_EXT.1.1/UA The TSF shall route user data only to or from the interfaces selected by the user.

FDP_APC_EXT.1.2/UA The TSF shall ensure that no data or electrical signals flow between connected computers whether the TOE is powered on or powered off.

FDP_APC_EXT.1.3/UA The TSF shall ensure that no data transits the TOE when the TOE is powered off.

FDP_APC_EXT.1.4/UA The TSF shall ensure that no data transits the TOE when the TOE is in a failure state.

6.2.1.3 FDP_APC_EXT.1/VI Active PSD Connections

FDP_APC_EXT.1.1/VI The TSF shall route user data only from the interfaces selected by the user.

FDP_APC_EXT.1.2/VI The TSF shall ensure that no data or electrical signals flow between connected computers whether the TOE is powered on or powered off.

FDP_APC_EXT.1.3/VI The TSF shall ensure that no data transits the TOE when the TOE is powered off.

FDP_APC_EXT.1.4/VI The TSF shall ensure that no data transits the TOE when the TOE is in a failure state.

6.2.1.4 FDP_CDS_EXT.1 Connected Displays Supported

FDP_CDS_EXT.1.1 The TSF shall support *one connected display* at a time.

6.2.1.5 FDP_FIL_EXT.1/KM Device Filtering (Keyboard/Mouse)

FDP_FIL_EXT.1.1/KM The TSF shall have *fixed* device filtering for *keyboard, mouse* interfaces.

FDP_FIL_EXT.1.2/KM The TSF shall consider all PSD KM blacklisted devices as unauthorized devices for *keyboard, mouse* interfaces in peripheral device connections.

FDP_FIL_EXT.1.3/KM The TSF shall consider all PSD KM whitelisted devices as authorized devices for *keyboard, mouse* interfaces in peripheral device connections only if they are not on the PSD KM blacklist or otherwise unauthorized.

6.2.1.6 FDP_FIL_EXT.1/UA Device Filtering (User Authentication Devices)

FDP_FIL_EXT.1.1/UA The TSF shall have *fixed* device filtering for user authentication device interfaces.

FDP_FIL_EXT.1.2/UA The TSF shall consider all PSD UA blacklisted devices as unauthorized devices for user authentication device interfaces in peripheral device connections.

FDP_FIL_EXT.1.3/UA The TSF shall consider all PSD UA whitelisted devices as authorized devices for user authentication device interfaces in peripheral device connections only if they are not on the PSD UA blacklist or otherwise unauthorized.

6.2.1.7 FDP_PDC_EXT.1 Peripheral Device Connection

FDP_PDC_EXT.1.1 The TSF shall reject connections with unauthorized devices upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

FDP_PDC_EXT.1.2 The TSF shall reject connections with devices presenting unauthorized interface protocols upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

FDP_PDC_EXT.1.3 The TOE shall have no external interfaces other than those claimed by the TSF.

FDP_PDC_EXT.1.4 The TOE shall not have wireless interfaces.

FDP_PDC_EXT.1.5 The TOE shall provide a visual or auditory indication to the User when a peripheral is rejected.

6.2.1.8 FDP_PDC_EXT.2/KM Authorized Devices (Keyboard/Mouse)

FDP_PDC_EXT.2.1/KM The TSF shall allow connections with authorized devices and functions as defined in Appendix E of [MOD_KM_V1.0] and

- *authorized devices and functions as defined in the PP-Module for User Authentication Devices,*
- *authorized devices as defined in the PP-Module for Video/Display Devices*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

FDP_PDC_EXT.2.2/KM The TSF shall allow connections with authorized devices presenting authorized interface protocols as defined in Appendix E of [MOD_KM_V1.0] and

- *authorized devices and functions as defined in the PP-Module for User Authentication Devices,*
- *authorized devices presenting authorized interface protocols as defined in the PP-Module for Video/Display Devices*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

6.2.1.9 FDP_PDC_EXT.2/UA Authorized Devices (User Authentication Devices)

FDP_PDC_EXT.2.1/UA The TSF shall allow connections with authorized devices as defined in Appendix E of [MOD_UA_V1.0] and

- *authorized devices and functions as defined in the PP-Module for Keyboard/Mouse Devices,*
- *authorized devices as defined in the PP-Module for Video/Display Devices*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

FDP_PDC_EXT.2.2/UA The TSF shall allow connections with authorized devices presenting authorized interface protocols as defined in Appendix E of [MOD_UA_V1.0] and

- *authorized devices presenting authorized interface protocols as defined in the PP-Module for Keyboard/Mouse Devices,*
- *authorized devices presenting authorized interface protocols as defined in the PP-Module for Video/Display Devices*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

6.2.1.10 FDP_PDC_EXT.2/VI Peripheral Device Connection (Video Output)

FDP_PDC_EXT.2.1/VI The TSF shall allow connections with authorized devices as defined in Appendix E of [MOD_VI_V1.0] and

- *authorized devices and functions as defined in the PP-Module for Keyboard/Mouse Devices,*
- *authorized devices as defined in the PP-Module for User Authentication Devices,*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

FDP_PDC_EXT.2.2/VI The TSF shall allow connections with authorized devices presenting authorized interface protocols as defined in Appendix E of [MOD_VI_V1.0] and

- *authorized devices presenting authorized interface protocols as defined in the PP-Module for Keyboard/Mouse Devices,*
- *authorized devices presenting authorized interface protocols as defined in the PP-Module for User Authentication Devices*

upon TOE power up and upon connection of a peripheral device to a powered-on TOE.

6.2.1.11 FDP_PDC_EXT.3/KM Authorized Connection Protocols (Keyboard/Mouse)

FDP_PDC_EXT.3.1/KM The TSF shall have interfaces for the *USB (keyboard), USB (mouse)* protocols.

FDP_PDC_EXT.3.2/KM The TSF shall apply the following rules to the supported protocols: the TSF shall emulate any keyboard or mouse device functions from the TOE to the connected computer.

6.2.1.12 FDP_PDC_EXT.3/VI Authorized Connection Protocols (Video Output)

FDP_PDC_EXT.3.1/VI The TSF shall have interfaces for the *HDMI* protocols.

FDP_PDC_EXT.3.2/VI The TSF shall apply the following rules to the supported protocols: the TSF shall read the connected display EDID information once during power-on or reboot *automatically*.

Application Note: TD0620 applies to this SFR definition.

6.2.1.13 FDP_PDC_EXT.4 Supported Authentication Devices

FDP_PDC_EXT.4.1 The TSF shall have an *external* user authentication device.

6.2.1.14 FDP_PWR_EXT.1 Powered by Computer

FDP_PWR_EXT.1.1 The TSF shall not be powered by a connected computer.

6.2.1.15 FDP_RDR_EXT.1 Re-Enumeration Device Rejection

FDP_RDR_EXT.1.1 The TSF shall reject any device that attempts to enumerate again as a different unauthorized device.

6.2.1.16 FDP_RIP.1/KM Residual Information Protection (Keyboard Data)

FDP_RIP.1.1/KM The TSF shall ensure that any keyboard data in volatile memory is purged upon switching computers.

6.2.1.17 FDP_RIP_EXT.1 Residual Information Protection

FDP_RIP_EXT.1.1 The TSF shall ensure that no user data is written to TOE non-volatile memory or storage.

6.2.1.18 FDP_SPR_EXT.1/HDMI Sub-Protocol Rules (HDMI Protocol)

FDP_SPR_EXT.1.1/HDMI The TSF shall apply the following rules for the HDMI protocol:

- block the following video/display sub-protocols:
  - ARC
  - CEC,
  - EDID from computer to display,
  - HDCP,
  - HEAC,
  - HEC,
  - MCCS
- allow the following video/display sub-protocols:
  - EDID from display to computer,
  - HPD from display to computer.

6.2.1.19 FDP_SWI_EXT.1 PSD Switching

FDP_SWI_EXT.1.1 The TSF shall ensure that *switching can be initiated only through express user action*.

6.2.1.20 FDP_SWI_EXT.2 PSD Switching Methods

FDP_SWI_EXT.2.1 The TSF shall ensure that no switching can be initiated through automatic port scanning, control through a connected computer, or control through keyboard shortcuts.

FDP_SWI_EXT.2.2 The TSF shall ensure that switching can be initiated only through express user action using *console buttons, wired remote control*.

6.2.1.21 FDP_SWI_EXT.3 Tied Switching

FDP_SWI_EXT.3.1 The TSF shall ensure that connected keyboard and mouse peripheral devices are always switched together to the same connected computer.

6.2.1.22 FDP_TER_EXT.1 Session Termination

FDP_TER_EXT.1.1 The TSF shall terminate an open session upon removal of the authentication element.

6.2.1.23 FDP_TER_EXT.2 Session Termination of Removed Devices

FDP_TER_EXT.2.1 The TSF shall terminate an open session upon removal of the user authentication device.

6.2.1.24 FDP_TER_EXT.3 Session Termination upon Switching

FDP_TER_EXT.3.1 The TSF shall terminate an open session upon switching to a different computer.

FDP_TER_EXT.3.2 The TSF shall reset the power to the user authentication device for at least one second upon switching to a different computer.

6.2.1.25 FDP_UAI_EXT.1 User Authentication Isolation

FDP_UAI_EXT.1.1 The TSF shall isolate the user authentication function from all other TOE USB functions.

6.2.1.26 FDP_UDF_EXT.1/KM Unidirectional Data Flow (Keyboard/Mouse)

FDP_UDF_EXT.1.1/KM The TSF shall ensure *keyboard, mouse* data transits the TOE unidirectionally from the *TOE keyboard, mouse* peripheral interface(s) to the *TOE keyboard, mouse* interface.

6.2.1.27 FDP_UDF_EXT.1/VI Unidirectional Data Flow (Video Output)

FDP_UDF_EXT.1.1/VI The TSF shall ensure video data transits the TOE unidirectionally from the TOE computer video interface to the TOE peripheral device display interface.

6.2.2 Protection of the TSF (FPT)

6.2.2.1 FPT_FLS_EXT.1 Failure with Preservation of Secure State

FPT_FLS_EXT.1.1 The TSF shall preserve a secure state when the following types of failures occur: failure of the power-on self-test and *no other failures*.

6.2.2.2 FPT_NTA_EXT.1 No Access to TOE

FPT_NTA_EXT.1.1 TOE firmware, software, and memory shall not be accessible via the TOE's external ports, with the following exceptions: *the Extended Display Identification Data (EDID) memory of Video TOEs may be accessible from connected computers*.

6.2.2.3 FPT_PHP.1 Passive Detection of Physical Attack

FPT_PHP.1.1 The TSF shall provide unambiguous detection of physical tampering that might compromise the TSF.

FPT_PHP.1.2 The TSF shall provide the capability to determine whether physical tampering with the TSF's devices or TSF's elements has occurred.

6.2.2.4 FPT_TST.1 TSF Testing

FPT_TST.1.1 The TSF shall run a suite of self-tests during initial start-up and at the conditions *no other conditions* to demonstrate the correct operation of user control functions and *no other functions*.

FPT_TST.1.2 The TSF shall provide authorized users with the capability to verify the integrity of *TSF data*.

FPT_TST.1.3 The TSF shall provide authorized users with the capability to verify the integrity of *TSF*.

6.2.2.5 FPT_TST_EXT.1 TSF Testing

FPT_TST_EXT.1.1 The TSF shall respond to a self-test failure by providing users with a *visual, auditory* indication of failure and by shutdown of normal TSF functions.

6.2.3 TOE Access (FTA)

6.2.3.1 FTA_CIN_EXT.1 Continuous Indications

FTA_CIN_EXT.1.1 The TSF shall display a visible indication of the selected computers at all times when the TOE is powered.

FTA_CIN_EXT.1.2 The TSF shall implement the visible indication using the following mechanism: easily visible graphical and/or textual markings of each source video on the display, ***illuminated buttons***.

FTA_CIN_EXT.1.3 The TSF shall ensure that while the TOE is powered the current switching status is reflected by *multiple indicators which never display conflicting information*.

7 SECURITY ASSURANCE REQUIREMENTS

The assurance requirements are summarized in Table 12.

Assurance Class	Assurance Components	
	Identifier	**Name**
Development (ADV)	ADV_FSP.1	Basic Functional Specification
Guidance Documents (AGD)	AGD_OPE.1	Operational user guidance
	AGD_PRE.1	Preparative procedures
Life-Cycle Support (ALC)	ALC_CMC.1	Labeling of the TOE
	ALC_CMS.1	TOE CM Coverage
Security Target Evaluation (ASE)	ASE_CCL.1	Conformance claims
	ASE_ECD.1	Extended Components Definition
	ASE_INT.1	ST Introduction
	ASE_OBJ.2	Security Objectives
	ASE_REQ.2	Derived Security Requirements
	ASE_SPD.1	Security Problem Definition
	ASE_TSS.1	TOE Summary Specification
Tests (ATE)	ATE_IND.1	Independent Testing - Conformance
Vulnerability Assessment (AVA)	AVA_VAN.1	Vulnerability Survey

Table 12 – Security Assurance Requirements

8 SECURITY REQUIREMENTS RATIONALE

8.1 SECURITY FUNCTIONAL REQUIREMENTS RATIONALE

Table 7 provides a mapping between the SFRs and Security Objectives.

8.2 DEPENDENCY RATIONALE

Table 13 identifies the Security Functional Requirements and their associated dependencies. It also indicates whether the ST explicitly addresses each dependency.

SFR	Dependencies	Rationale Statement
FDP_APC_EXT.1/KM	None	N/A
FDP_APC_EXT.1/UA	None	N/A
FDP_APC_EXT.1/VI	None	N/A
FDP_CDS_EXT.1	None	N/A
FDP_FIL_EXT.1/KM	FDP_PDC_EXT.1	Included
FDP_FIL_EXT.1/UA	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.1	None	N/A
FDP_PDC_EXT.2/KM	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.2/UA	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.2/VI	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.3/KM	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.3/VI	FDP_PDC_EXT.1	Included
FDP_PDC_EXT.4	FDP_PDC_EXT.1 FDP_PDC_EXT.2	Included Included
FDP_PWR_EXT.1	None	N/A
FDP_RDR_EXT.1	FDP_PDC_EXT.1	Included
FDP_RIP.1/KM	None	N/A
FDP_RIP_EXT.1	None	N/A
FDP_SPR_EXT.1/HDMI	FDP_PDC_EXT.3	Included
FDP_SWI_EXT.1	None	N/A

SFR	Dependencies	Rationale Statement
FDP_SWI_EXT.2	FDP_SWI_EXT.1	Included
FDP_SWI_EXT.3	FDP_SWI_EXT.1	Included
FDP_TER_EXT.1	None	N/A
FDP_TER_EXT.2	FDP_PDC_EXT.2	Included
FDP_TER_EXT.3	FDP_SWI_EXT.1	Included
FDP_UAI_EXT.1	None	Included
FDP_UDF_EXT.1/KM	FDP_APC_EXT.1	Included
FDP_UDF_EXT.1/VI	FDP_APC_EXT.1	Included
FPT_FLS_EXT.1	FPT_TST.1 FPT_PHP.3	Included Included only if anti-tamper is selected in FPT_FLS_EXT.1.1
FPT_NTA_EXT.1	None	N/A
FPT_PHP.1	None	N/A
FPT_TST.1	None	N/A
FPT_TST_EXT.1	FPT_TST.1	Included
FTA_CIN_EXT.1	FDP_APC_EXT.1	Included

Table 13 – Functional Requirement Dependencies

8.3 SECURITY ASSURANCE REQUIREMENTS RATIONALE

The TOE assurance requirements for this ST consist of the requirements indicated in the [PP_PSD_V4.0] and in the PP modules listed in Section 2.2.

9 TOE SUMMARY SPECIFICATION

This section provides a description of the following TOE security functions that meet the TOE security requirements claimed in Section 6:

- User Data Protection
- Protection of the TSF
- TOE Access

Note: The TOE does not provide a management function to configure aspects of the TSF.

9.1 USER DATA PROTECTION

9.1.1 System Controller

Each device includes a System Controller which is responsible for device management, user interaction, system control security functions, and device monitoring. It receives user input from the switches on the front panel or remote control, and drives the TOE channel select lines that control switching circuits within the TOE.

The System Controller includes a microcontroller with internal non-volatile, Read Only Memory (ROM). The controller function manages the TOE functionality through a pre-programmed state machine loaded on the ROM as read-only firmware during product manufacturing.

Following boot up of the TOE, the channel select lines are set to Channel 1 by default. The channel select lines are also used to link the System Controller channel select commands to the Field Programmable Gate Array (FPGA) that supports video processing.

The user determines the host computer to be connected to the peripherals by pressing a button on the TOE front panel or on the wired remote control device. The front panel button of the selected computer is illuminated. Switching can only be initiated through express user action and not through automated port scanning, connected computer control, or keyboard shortcuts.

TOE Security Functional Requirements addressed: FDP_SWI_EXT.1, FDP_SWI_EXT.2.

9.1.1.1 Active PSD Connections

The TOE ensures that data flows only between the peripherals and the connected computer selected by the user. The TOE ensures that no electrical signal flows between the connected computers selected by the user. No data or electrical signal transits the TOE when the TOE is powered off, or when the TOE is in a failure state. A failure state occurs when the TOE fails a self-test when powering on.

TOE Security Functional Requirements addressed: FDP_APC_EXT.1/KM, FDP_APC_EXT.1/UA, FDP_APC_EXT.1/VI.

9.1.1.2 Connected Computer Interfaces

The connected computers are attached to the TOE as follows:

- The TOE connects to the computer keyboard and mouse port using a ruggedized 26 pin cable that supports USB A
- The TOE is connected to the computer video port using a ruggedized 26 pin cable that supports HDMI video
- The TOE connects to the computer USB peripheral port (CAC) using a ruggedized 26 pin cable that supports USB A

There are no wireless interfaces or additional external interfaces.

TOE Security Functional Requirements addressed: FDP_PDC_EXT.1.

9.1.1.3 Residual Information Protection

The TOE does not support a factory reset capability. The Letter of Volatility is included as Annex A.

TOE Security Functional Requirements addressed: FDP_RIP_EXT.1.

9.1.2 Keyboard and Mouse Functionality

9.1.2.1 Keyboard and Mouse Enumeration

The TOE determines whether or not a peripheral device that has been plugged into the keyboard and mouse peripheral ports is allowed to operate with the TOE. 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.

The Static 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 peripheral sharing device, 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.

The TOE supports USB Type A HIDs on keyboard and mouse ports. The USB bidirectional communication protocol is converted into a unidirectional proprietary protocol, and is then converted back into the USB bidirectional protocol to communicate with the coupled computer host(s).

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. Once the keyboard has been verified, the USB keyboard sends scan codes, which are generated when the user types. These scan codes are converted by the keyboard host emulator into a proprietary protocol data stream that is combined with the data stream from the mouse host emulator.

Similarly, 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. Once the mouse device has been verified, it sends serial data generated by mouse movement and button use. The mouse serial data is converted by the mouse host emulator into a proprietary protocol data stream that is combined with the data stream from the keyboard host emulator.

TOE Security Functional Requirements addressed: FDP_PDC_EXT.3/KM, FDP_UDF_EXT.1/KM, FDP_RIP.1/KM.

9.1.2.2 Keyboard and Mouse Switching Functionality

Figure 2 is a simplified block diagram showing the TOE keyboard and mouse data path for two ports. A Host Emulator (HE) communicates with the user keyboard via the USB protocol. The Host Emulator converts user key strokes into unidirectional serial data.

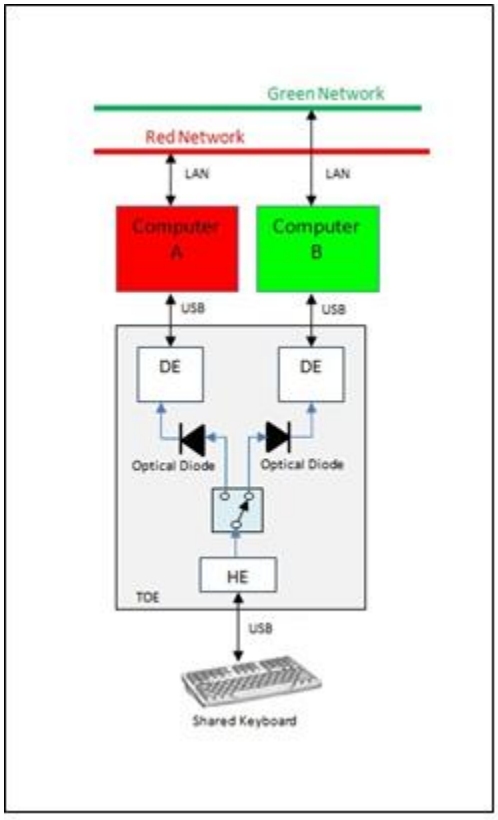

Figure 2 – Simplified Switching Diagram

The combined data stream is passed through the channel select lines to the selected host channel. The channel select lines are driven by the System Controller Module, and the selection is based on user input through use of the mouse or keyboard. Once a channel is selected, the combined mouse and

keyboard data stream is passed through an optical data diode and routed to the specific host channel device emulator. The optical data diode is an opto-coupler designed to physically prevent reverse data flow. The keyboard and mouse can only be switched together.

Device emulators are USB enabled microcontrollers that are programmed to emulate a standard USB keyboard and mouse composite device. The combined data stream is converted back to bidirectional data before reaching the selected host computer.

Since the keyboard and mouse function are emulated by the TOE, the connected computer is not able to send data to the keyboard that would allow it to indicate that Caps Lock, Num Lock or Scroll Lock are set.

TOE Security Functional Requirements addressed: FDP_APC_EXT.1/KM, FDP_UDF_EXT.1/KM, FDP_SWI_EXT.3.

9.1.2.3 Keyboard and Mouse Compatible Device Types

The TOE employs fixed device filtering and accepts only USB HID devices at the keyboard and mouse peripheral ports. Only USB connections over custom 37 pin ruggedized cables are permitted. The TOE does not support a wireless connection to a mouse, keyboard or USB hub and there are no additional external interfaces.

TOE Security Functional Requirements addressed: FDP_PDC_EXT.1, FDP_PDC_EXT.2/KM, FDP_FIL_EXT.1/KM.

9.1.2.4 Re-Enumeration Device Rejection

If a connected device attempts to re-enumerate as a different USB device type, it will be rejected by the TOE. The TOE will reject devices which are not allowed at any time during operation and start-up. This is indicated by an LED on the TOE next to the Keyboard and mouse ports. This LED shows a solid green light for an accepted device, flickering green light during enumeration, and no light for a rejected device.

TOE Security Functional Requirements addressed: FDP_RDR_EXT.1.

9.1.3 Video Switching Functionality

Video data flow is comprised of unidirectional Extended Display Identification Data (EDID) and video data flow paths. Figure 3 shows a data flow during the display EDID read function.

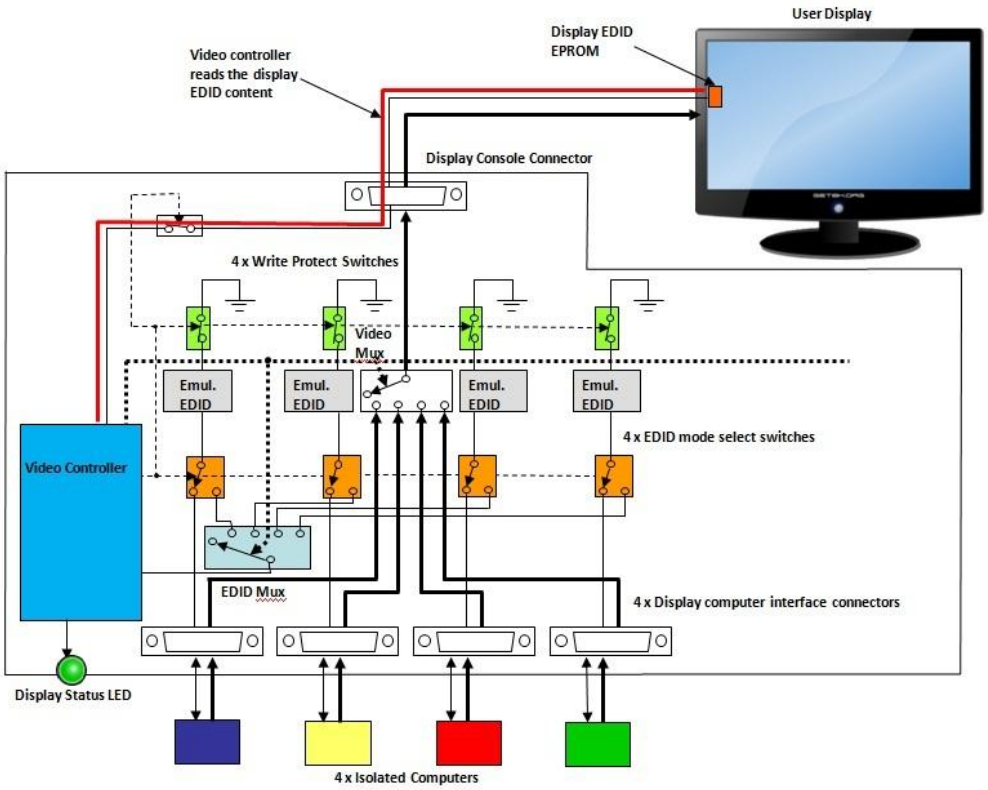

Figure 3 – Display EDID Read Function

An EDID read event only occurs as the TOE is being powered up. The video controller reads the EDID content from the display device to verify that it is valid and usable. If data is not valid, TOE operation will cease and wait for the display peripheral to be changed.

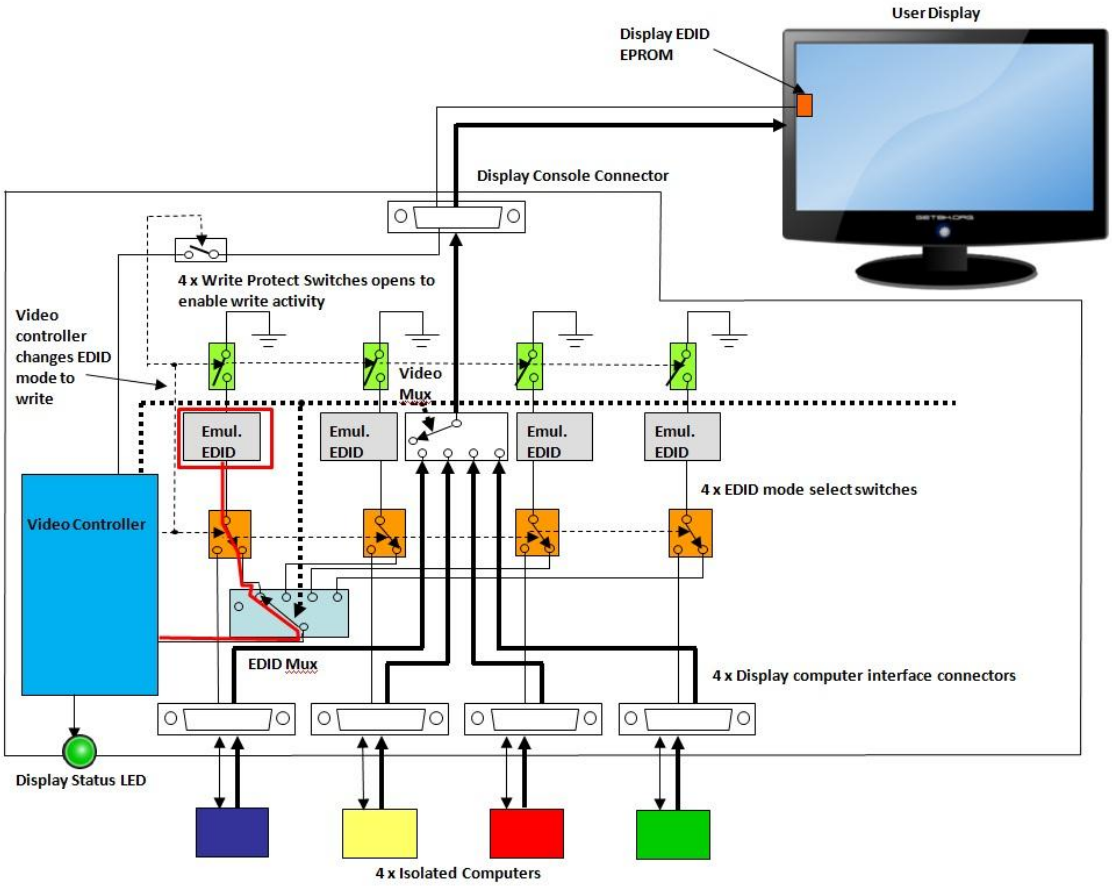

Figure 4 – Display EDID Write Function

Figure 4 illustrates the video controller (shown in blue) as it writes the EDID content into the first channel emulated EDID Electrically Erasable Programmable Read-Only Memory (EEPROM) chip (shown in gray). The thick lines in this figure indicate native video lines, and the thin lines indicate Inter-Integrated Circuit (I2C) lines. The EDID multiplexer couples the I2C lines to the first EDID mode switch (shown in orange). The first EDID mode switch switches the video controller I2C lines to the first emulated EDID EEPROM chip (shown in gray). The chip write protect switch opens to enable writing. The video controller uses the I2C lines to write to the first emulated EDID EEPROM chip. Once the write operation is complete and verified, the video controller switches the EDID multiplexer to the next channel and the operation repeats until all chips are programmed. Once the write operation is complete, the video controller switches to normal operating mode, as shown in Figure 5 below.

In EDID write mode, the Emulated EDID EEPROM chips are switched to their respective computers to enable reading of the EDID information. The write protect switches are switched back to protected mode to prevent any attempt to write to the EEPROM or to transmit MCCS commands.

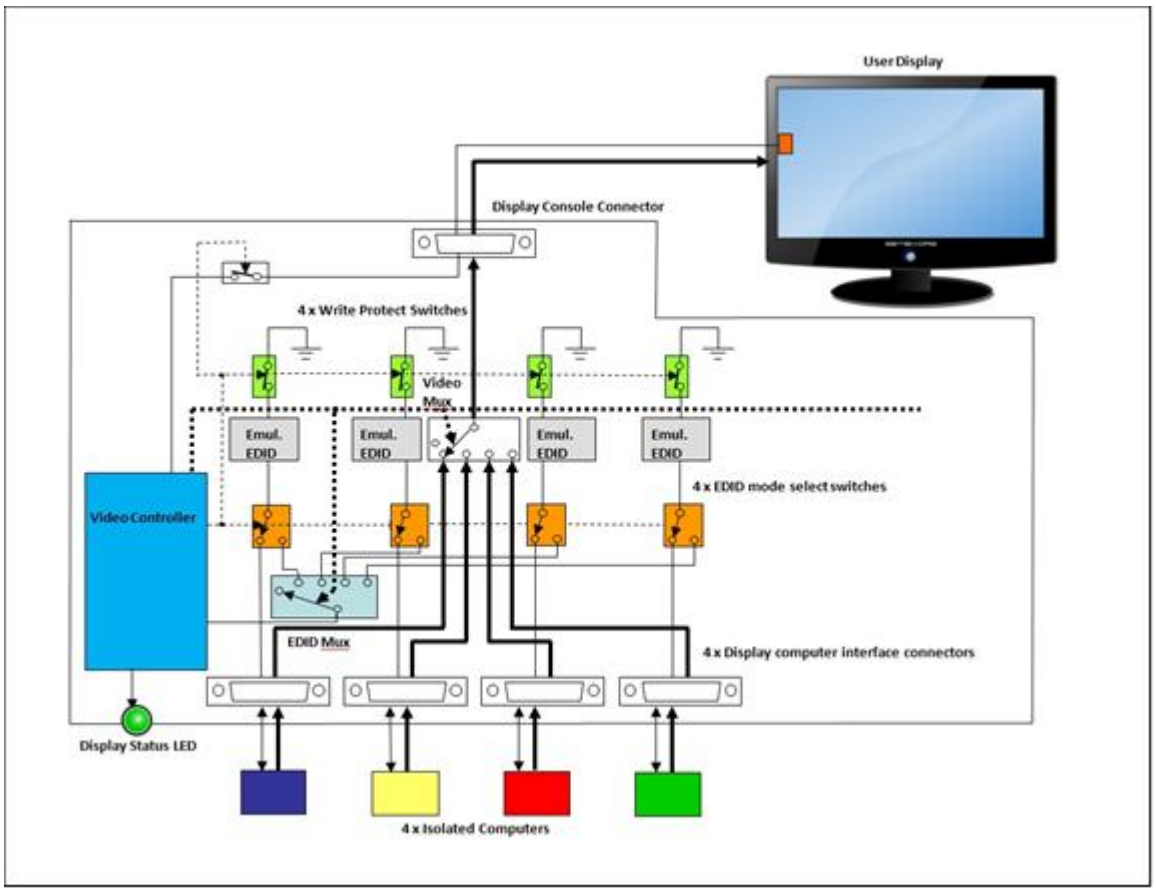

Figure 5 – Display Normal Mode

In normal mode, each computer interface operates independently. The power to each emulated EDID EEPROM is received from its respective computer through the video cable. The main video multiplexer is switched to the user selected computer to enable the proper video display.

During TOE normal operation (Figure 5), any attempt by a connected computer to affect the EDID channel is blocked by the architecture. Each computer is only able to affect its own emulated EDID EEPROM.

Video input interfaces are isolated from one another. Isolation is achieved through the use of separate power and ground planes, separate electronic components and a separate emulated EDID chip for each channel.

The EDID function is emulated by an independent emulation EEPROM chip for each computer channel. These chips read content from the connected display once during TOE power up. Any subsequent change to the display peripheral will be ignored.

The TOE will reject any display device that does not present valid EDID content. An LED on the rear panel of the TOE will indicate a rejected display device.

The TOE supports HDMI 2.0 (video input/output):

- For HDMI connections, EDID information is allowed to pass from the display to the computer, as described above. HPD information is also

allowed to pass. Other protocols, including Audio Return Channel (ARC), EDID from the computer to the display, HDMI Ethernet and Audio Return Channel (HEAC), and HDMI Ethernet Channel (HEC) are blocked. HDCP and Consumer Electronics Control (CEC) functions are not connected.

The TOE video function blocks MCCS write transactions through the emulated EDID EEPROMs. The emulated EEPROMs support only EDID read transactions, and are isolated by the write protect switch.

Following a failed self-test, or when the TOE is powered off, all video input signals are isolated from other video inputs and from the video output interfaces by the active video re-drivers. Emulated EDID EEPROMs may still operate since they are powered by their respective computers; however, the video function remains isolated.

TOE Security Functional Requirements addressed: FDP_SPR_EXT.1/HDMI, FDP_UDF_EXT.1/VI.

9.1.4 Video Compatible Device Types

The TOE accepts any HDMI display device at the video peripheral ports. The TOE does not support a wireless connection to a video display.

A single video display is supported.

TOE Security Functional Requirements addressed: FDP_PDC_EXT.1, FDP_PDC_EXT.2/VI, FDP_PDC_EXT.3/VI, FDP_CDS_EXT.1.

9.1.5 User Authentication Device Switching Functionality

The TOE supports the use of an external user authentication device with a feature called Freeze USB (fUSB). The TOE does not support internal user authentication devices.

By default, only standard USB smart-card readers or biometric authentication devices with USB smart-card class interfaces that comply with the USB Organization standard Chip Card Interface Device (CCID) Revision 1.1 or CCID Revision 1.0 will be accepted by the TOE on the fUSB port. This function is separate and physically isolated from the USB connections for keyboard and mouse. The user authentication device must be able to receive power from the TOE. An external power source, such as power from the connected computer, is prohibited for this interface. The TOE does not receive power from the computer user authentication device interface. This restriction is indicated in the applicable user guidance.

Computer interfaces are isolated. Each fUSB computer interface uses independent circuitry and power planes. There is no shared circuitry, and no shared logical functions.

The System Controller drives the mode select switch that initially routes the device USB to the microcontroller. The qualification microcontroller uses the

predefined USB qualification parameters and compares them with the discovered USB device parameters. If the parameters match, the device is accepted. The System Controller then switches the mode switch to the USB multiplexer. The USB multiplexer receives channel selected commands from the system controller function to allow the connection to the computer selected by the user. The data path used by the user authentication device is fully isolated from all other user data paths and functions.

When a user switches from one connected computer to another, the TOE resets the user authentication device through power supply switching, i.e. a temporary power dip. This is performed by High-side Power switches on the System Controller board that switch 5V power to the fUSB device jack. A load field-effect transistor (FET) shorts the supply voltage to the ground to quickly discharge any capacitance in the TOE or in the connected device to a level below 0.5V.

The TOE does not emulate or process user authentication device data. Therefore, no data retention is possible.

Following a failed self-test, or when the TOE is powered off, all user authentication device data paths are isolated through the peripheral multiplexer. These events effectively disconnect any open authentication session. Removal of the authentication device will also close the authentication session.

TOE Security Functional Requirements addressed: FDP_FIL_EXT.1/UA, FDP_PWR_EXT.1, FDP_TER_EXT.1, FDP_TER_EXT.2, FDP_TER_EXT.3, FDP_UAI_EXT.1.

9.1.5.1 User Authentication Compatible Device Types

The TOE does not include an authentication device, but accepts any USB Smart Card device at the fUSB peripheral port. Only USB Type A connections are permitted. The TOE does not support a wireless connection to an authentication device.

TOE Security Functional Requirements addressed: FDP_PDC_EXT.1, FDP_PDC_EXT.2/UA, FDP_PDC_EXT.4.

9.2 PROTECTION OF THE TSF

9.2.1 No Access to TOE

Connected computers do not have access to TOE firmware or memory, with the following exceptions:

- EDID data is accessible to connected computers from the TOE

All the TOE microcontrollers run from internal protected flash memory. Firmware cannot be updated from an external source. Firmware cannot be read or rewritten through the use of Joint Test Action Group (JTAG) tools. Firmware is executed on Static Random Access Memory (SRAM) with the appropriate protections to prevent external access and tampering of code or stacks.

TOE Security Functional Requirements addressed: FPT_NTA_EXT.1.

9.2.2 Anti-tampering Functionality

The TOE provides passive anti-tampering functionality. The TOE enclosure was designed specifically to prevent physical tampering. It features a stainless-steel welded chassis and panels that prevent external access through bending or brute force.

Additionally, the KVM switch fitted with Tampering Evident Labels placed at critical locations on the TOE enclosure. The remote control also has a Tampering Evident Label placed at a critical location. Any attempt to open the enclosure or remove a Tampering Evident Label results in the label being damaged so that the user can detect that the attempt to physically tamper with it occurred.

TOE Security Functional Requirements addressed: FPT_PHP.1.

9.2.3 TSF Testing

The TOE performs a self-test at initial start-up. The self-test runs independently at each microcontroller and performs the following checks:

- Verification of the front panel push-buttons
- 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

If the self-test fails, the LEDs on the front panel blink and the device makes a clicking sound to indicate the failure. The TOE disables the PSD switching functionality, and remains in a disabled state until the self-test is rerun and passes.

TOE Security Functional Requirements addressed: FPT_FLS_EXT.1, FPT_TST.1, FPT_TST_EXT.1.

9.3 TOE ACCESS

The TOE user switches between computers by pressing the corresponding front panel button on the device, or on the remote control. The front panel button of the KVM or the remote control button corresponding to the selected computer will illuminate. When the button to switch computers is pressed, a signal is sent and the TOE peripheral sharing device switches to the indicated channel.

On power up or power up following reset, all peripherals are connected to channel #1, and the corresponding push button LED will be illuminated.

TOE Security Functional Requirements addressed: FTA_CIN_EXT.1.

10TERMINOLOGY AND ACRONYMS

10.1 TERMINOLOGY

The following terminology is used in this ST:

Term	Description
Guard	'Guard' refers to a peripheral sharing device function that requires multiple express user actions in order to switch between connected computers using connected peripherals.
KM	KM refers to the requirements for Keyboard/Mouse Devices.
UA	UA refers to the requirements for User Authentication Devices
VI	VI refers to the requirements for Video Display Devices.

Table 14 – Terminology

10.2 ACRONYMS

The following acronyms are used in this ST:

Acronym	Definition
ARC	Audio Return Channel
CC	Common Criteria
CEC	Consumer Electronics Control
EDID	Extended Display Identification Data
EEPROM	Electrically Erasable Programmable Read-Only Memory
FPGA	Field Programmable Gate Array
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HE	Host Emulator
HEAC	HDMI Ethernet and Audio Return Channel
HEC	HDMI Ethernet Channel
HID	Human Interface Device
HPD	Hot-Plug Detection

Acronym	Definition
I2C	Inter-Integrated Circuit
IT	Information Technology
JTAG	Joint Test Action Group
KVM	Keyboard, Video, Mouse
LED	Light Emitting Diode
MCCS	Monitor Control Command Set
NIAP	National Information Assurance Partnership
OTP	One Time Programming
PP	Protection Profile
PSD	Peripheral Sharing Device
ROM	Read Only Memory
SFR	Security Functional Requirement
SRAM	Static Random Access Memory
ST	Security Target
TOE	Target of Evaluation
TSF	TOE Security Functionality
USB	Universal Serial Bus

Table 15 – Acronyms

11 REFERENCES

Identifier	Title
[CC]	Common Criteria for Information Technology Security Evaluation – • Part 1: Introduction and General Model, CCMB-2017-04-001, Version 3.1 Revision 5, April 2017 • Part 2: Security Functional Components, CCMB-2017-04-002, Version 3.1 Revision 5, April 2017 • Part 3: Security Assurance Components, CCMB-2017-04-003, Version 3.1 Revision 5, April 2017
[CEM]	Common Methodology for Information Technology Security Evaluation, Evaluation Methodology, CCMB-2017-04-004, Version 3.1 Revision 5, April 2017
[PP_PSD_V4.0]	Protection Profile for Peripheral Sharing Device, Version: 4.0, 2019-07-19
[MOD_KM_V1.0]	PP-Module for Keyboard/Mouse Devices, Version 1.0, 2019-07-19
[MOD_UA_V1.0]	PP-Module for User Authentication Devices, Version 1.0, 2019-07-19
[MOD_VI_V1.0]	PP-Module for Video/Display Devices, Version 1.0, 2019-07-19
[CFG_PSD-KM-UA-VI_V1.0]	PP-Configuration for Peripheral Sharing Device, Keyboard/Mouse Devices, User Authentication Devices, and Video/Display Devices, 19 July 2019

Table 16 – References

ANNEX A – LETTER OF VOLATILITY

The table below provides volatility information and memory types for the MilDef KSW5101 device. User data is not retained in any TOE device when the power is turned off.

Product Model	No. in each product	Function, Manufacturer and Part Number	Storage Type	Size	Power Source (if not the TOE)	Volatility	Contains User Data
KSW5101	1	System Controller, Host emulators: ST Microelectronics STM32F446ZCT	Embedded SRAM[1]	128KB		Volatile	May contain user data
			Embedded Flash[2]	256KB		Non-Volatile	No user data
			Embedded EEPROM	4KB		Non-Volatile	No user data
			OTP Memory	512bytes		Non-Volatile	No user data
	1	Video Controller: ST Microelectronics STM32F070RBT6	Embedded SRAM[1]	16KB		Volatile	No user data
			Embedded Flash[2]	128KB		Non-Volatile	No user data
	4	Video Channel Controller: STM32LF070CBT6	Embedded SRAM[1]	16KB		Volatile	No user data
			Embedded Flash[2]	128KB		Non-Volatile	No user data
	4	Device emulators: ST Microelectronics STM32F070C6T6	Embedded SRAM[1]	6KB	Connected computer	Volatile	May contain user data
			Embedded Flash[2]	32KB		Non-Volatile	No user data
	1	USB Controller: NXP MIMXRT1052CVJ5B MIMXRT1052DVJ6B	Embedded SRAM[1]	512KB		Volatile	No user data
	1	Boot flash for USB Controller	External Flash	2MB		Non-Volatile	No user data
	1	HID Filter DE:	Embedded SRAM[1]	6KB		Volatile	No user data

Product Model	No. in each product	Function, Manufacturer and Part Number	Storage Type	Size	Power Source (if not the TOE)	Volatility	Contains User Data
		ST Microelectronics STM32F070C6T6	Embedded Flash[2]	32KB		Non-Volatile	No user data

Notes:

[1] SRAM stores USB Host stack parameters and up to the last 4 key-codes. Data is erased during power off of the KVM, and when the user switches channels. Device emulators receive power from the individual connected computers and therefore devices are powered on as long as the associated computer is powered on and connected.

[2] Flash storage is used to store firmware code. It contains no user data. Flash storage is permanently locked by fuses after initial programming to prevent rewriting. It is an integral part of the ST Microcontroller together with SRAM and EEPROM.

[3] EEPROM is used to store operational parameters, such as display Plug & Play. They contain no user data. These devices receive power from the individual computers connected to the TOE, and therefore are powered on as long as the associated computer is powered on and connected.

[4] EEPROM is used to store operational parameters, such as display Plug & Play, and contains no user data.