Models:

SM20N-4 – Secure 2-Port KM Switch, NIAP PP 4.0 certified
SM40N-4 – Secure 4-port KM Switch, NIAP PP 4.0 certified
SM40NU-4 – Secure 4-Port KM Switch w/fUSB, NIAP 4.0 compliant
SM80N-4 – Secure 8-Port KM Switch, NIAP PP 4.0 certified
SM80NU-4 – Secure 8-Port KM Switch w/fUSB, NIAP 4.0 compliant
SM20N-N – Commercial 2-Port KM Switch
SM40NU-N – Commercial 4-Port KM Switch w/sUSB
SM80NU-N – Commercial 8-Port KM Switch w/sUSB
SM20N-M – Secure 2-Port KM Switch, Israeli certification
SM40N-M – Secure 4-Port KM Switch, Israeli certification
SN80N-M – Secure 8-Port KM Switch, Israeli certification

HLT31927 Rev. 2.0

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INTRODUCTION

KM Switch

The Keyboard/Mouse (KM) Switch from High Sec Labs allows interaction with multiple computers directly connected to multiple displays, using a single keyboard and mouse. By eliminating the need for purchasing and installing dedicated peripheral sets for each computer, the KM Switch frees up space and reduces clutter in the workspace.

This guide instructs how to install, configure, and operate a KM switch.

Features

- **Control multi-monitor computers:**
  Support multi-monitor computers with up to 4 displays per computer in duplicate or extended modes (Requires driver installation, currently available only for Windows).
- **Easy Switching Between Computers:**
  Switch between connected computers simply by moving the cursor from screen to screen; the keyboard and audio will automatically switch to follow the mouse.
- **Built-in Flexibility:**
  The KM Switch has multiple built-in presets to accommodate a wide range of setups, including additional displays and single- or dual-head computers.

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Features Exclusive to Secure Models

- **NIAP Common Criteria PP4.0:**
  HSL's Secure KM Switch models are compliant with the latest NIAP Common Criteria Protection Profile version 4.0 (PP4.0) certification for Peripheral Sharing Devices (PSD).

Note: The -M models are certified to Israeli standards instead of NIAP.

- **Prevent information leaks:**
  Prevent threats derived from sharing and switching of vulnerable, untrusted, or unauthorized peripheral devices. Block peripheral exploits, information leaks, signal transmissions, and computer malware. Prevent hardware and firmware tampering attacks by enforcing multi-layered security mechanisms.
- **Filter USB Peripherals:**
  Block unauthorized USB devices while allowing secure switching of smart card and biometric authentication devices between computers. Whitelist and blacklist specific USB devices based on VID/ PID characteristics.

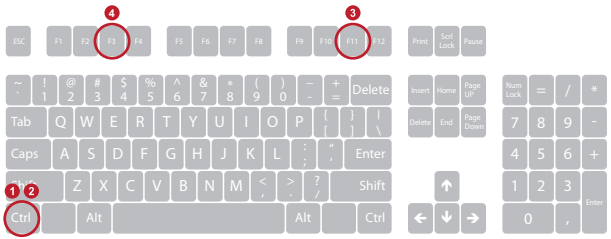
Features Exclusive to Commercial Models

- **USB 3.0 Support:**
  Transfer data and files between peripherals and computers in USB 3.0 Super Speed rates through the KM Switch's USB 3.0 ports.
- **Copy & Paste:**
  Transfer text and files between computers connected to the KM Switch, with no network connection needed between parties.
- **Express USB Charging:**
  Rapidly charge USB devices connected to the KM Switch's high-power USB port.

INTRODUCTION

Keyboard Hotkeys

The interface for operating the KM Switch utilizes keyboard hotkeys that can be entered at any time. These hotkeys are based on a QWERTY keyboard layout. For example, to enter the key combination **Ctrl | Ctrl | F11 | F3**, press the keys seen below, regardless of the keyboard layout used:



Keyboard Hotkey Terms

- **|** Separates keys pressed in sequential order. For example, to switch to Preset F3, the key combination is two presses of the **Ctrl** key, one press of the **F11** key, and one press of the **F3**, so the combination is shown as **Ctrl | Ctrl | F11 | F3**.
- **+** Press two buttons simultaneously. For example, to temporarily switch to Absolute Mouse Navigation, press and hold **LCtrl + LShift**.
- **[1...]** A range of selectable numbers. For example, to select one of the Presets on the KM Switch, enter the combination **Ctrl | Ctrl | F11| [F1...F10].**

Notes:

- Always use the left Control key (**LCtrl**) unless otherwise specified.
- Do not use the numeric pad for number keys, unless otherwise specified.
- All hotkey combinations are configured using a QWERTY keyboard. When using a non-QWERTY keyboard, use the key location corresponding to the QWERTY layout. For example, on an AZERTY keyboard where the **a** key is in the location of the **q** key on a QWERTY keyboard, the hotkey **Ctrl | Ctrl | q** would be entered as **Ctrl | Ctrl | a**.

Specifications

Part Number	SM20N-4 / SM20N-M*	SM40N-4 / SM40NU-4 / SM40N-M*	SM80N-4 / SM80NU-4 / SM80N-M*	SM20N-N	SM40NU-N	SM80NU-N
Number of Sources	2	4	8	2	4	8
Console Ports						
Mouse / Keyboard	USB Type A	USB Type A	USB Type A	USB Type A	USB Type A	USB Type A
Audio	3.5mm jack (SM20N-4: n/a)	3.5mm jack (SM40N-4: n/a)	3.5mm jack (SM80N-4: n/a)	3.5mm jack	3.5mm jack	3.5mm jack
Microphone	n/a	n/a	n/a	3.5mm jack	3.5mm jack	3.5mm jack
USB Port	n/a	USB 2.0 Type A (SM40NU-4 only)	USB 2.0 Type A (SM80NU-4 only)	n/a	4x USB 3.0 Type A	3xUSB 3.0 Type A
Computer Ports						
Mouse / Keyboard	USB Type B	USB Type B	USB Type B	USB Type B	USB Type B	USB Type B
Audio Jack	3.5mm jack (SM20N-4: n/a)	3.5mm jack (SM40N-4: n/a)	3.5mm jack (SM80N-4: n/a)	3.5mm jack	3.5mm jack	3.5mm jack
Microphone	n/a	n/a	n/a	3/5mm jack	3/5mm jack	3/5mm jack
USB Port	n/a	USB 2.0 Type B (SM40NU-4 only)	USB 2.0 Type B (SM80NU-4 only)	n/a	USB 3.0 Type B	USB 3.0 Type B
Physical						
Dimensions	177x82x35mm / 7x3.2x1.4in	342x148x42mm / 13.7x5.8x1.7in	440x192x48mm / 1 7.3x7.5x1.9in	177x82x35mm / 7x3.2x1.4in	342x148x42mm / 13.7x5.8x1.7in	440x192x48mm / 17.3x7.5x1.9in
Weight	0.52kg / 1.1lbs	1.3kg / 2.8lbs	2.4kg / 5.3lbs	0.52kg / 1.1lbs	1.3kg / 2.8lbs	2.4kg / 5.3lbs
Power						
Power Requirements	12VDC 1.5A	12VDC 1.5A	35W Max	12VDC 1.5A	12VDC 1.5A	35W Max
AC Input	100 to 240V AC	100 to 240V AC	100 to 240V AC	100 to 240V AC	100 to 240V AC	100 to 240V AC
Power Type	External	External	Internal	External	External	Internal
Environmental						
Operating Temperature	32°F to 104°F (0°C to 40°C)					
Storage Temperature	-4°F to 140°F (-20°C to 60°C)					
Humidity	0%-80% RH, non-condensing					
Software						
Supported OS	Windows, Linux, Mac					
Security Certification	Certified against NIAP Common Criteria PP4.0 PSD Protection Profile SM40NU-4 and SM80NU-4: Compliant with NIAP Common Criteria PP4.0 PSD Protection Profile			n/a	n/a	n/a

* -M models have identical architecture to -4 models but are certified to Israeli standards instead of NIAP.

INSTALLATION

Before Installation

Before opening the product's sealed packaging, inspect the seal's condition to verify that the product was not accessed or tampered with during delivery. If the packaging seal looks suspicious, contact HSL support and do not use the product.

Tamper-Evident Label

The KM Switch uses a holographic tamper-evident label to provide visual indications in case of enclosure intrusion attempts. These labels display white dots or the text "VOID" once removed. When opening the product's packaging, inspect the tamper-evident label.

Once the KM Switch is removed from its packaging materials, carefully inspect the tamper-evident label to verify that the product is properly sealed. If the label is damaged or missing, contact HSL support and do not use the product.

HSL Holographic Tamper-Evident Label

Package Contents

Once the packaging for the KM Switch is opened, inspect the contents of the package to make sure all components are included.

Model	Description	Qty
SM20-4 / SM20-M	Secure 2-Port KM Switch, PP4.0	1
	12V Power Supply	1
SM40N-4 / SM40NU-4 / SM40N-M /	Secure 4-Port KM Switch w/fUSB support (U only), PP4.0	1
	12V Power Supply	1
SM80N-4 / SM80NU-4 /	Secure 8-Port KM Switch w/fUSB support (U only), PP4.0	1
	Rack Mount Kit	1
	Adapters Kit- Plugs UK/USA/AU/EU to ERC230/C13	1
	C13 Female to C14 Male Power Cable	1
SM80N-M	Secure 8-Port KM Switch, Israeli Certification	1
	Rack Mount Kit	1
	C13 Female to Type H Male Power Cable	1
SM20N-N	Commercial 2-Port KM Switch	1
	12V Power Supply	1
SM40NU-N	Commercial 4-Port KM Switch w/SuperSpeed USB support	1
	12V Power Supply	1
SM80NU-N	Commercial 8-Port KM Switch w/SuperSpeed USB support	1
	Rack Mount Kit	1
	C13 Female to C14 Male Power Cable	1

Cable Installation

Step 1 – Connect the Console Port Peripherals

- Connect the console keyboard and mouse to the KM Switch via the console keyboard/mouse USB A ports. These are shared securely between all sources.
- Connect a remote-control device to the KM Switch via the console RJ14 port labeled "RCU" (optional).

Note: On some legacy models, this port may be labeled "RDC."

- Connect USB peripheral devices to the KM Switch via the console USB A ports (if applicable).
- Connect the audio and microphone outputs to the console 3.5mm jacks (if applicable).

Note: The Secure KM Switch mouse and keyboard USB A ports only support USB HID keyboards and mice. These ports will not support non-standard keyboards, keyboards with USB hubs or other USB-integrated devices, or other USB devices apart from keyboards and mice.

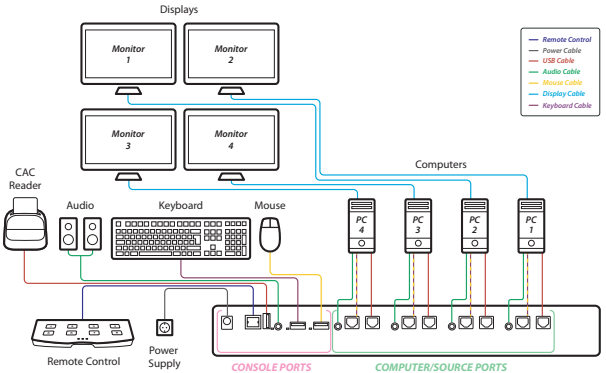
It is possible to integrate an HID device with a USB hub by connecting it to a High Sec Labs FH10NN-4 HID Filter (sold separately), which strips the USB hub traffic and allows only HID traffic to pass through. More information regarding the HID Filter can be found here:

https://highseclabs.com/product/elock-usb-lockdown/

Step 2 – Connect the Source Port Peripherals

- For each source, connect the keyboard and mouse cables to the KM Switch's corresponding source keyboard/mouse USB B ports.
- Connect USB peripheral devices to the KM Switch's corresponding source USB B ports (if applicable).
- Connect audio and microphone cables to the KM Switch's corresponding source 3.5mm jacks (if applicable).

Note: Download and install HSL's Multi-Display Driver for source computers that have multiple screens. This is currently available only for Windows PCs, and can be found here: https://highseclabs.com/dow_type/drivers-tools/



KM Network with a SM40NU-4 Secure 4-Port KM Switch with fUSB

INSTALLATION

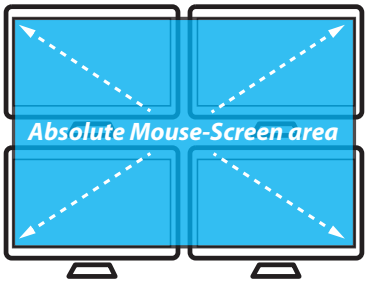
Step 3 – Power On the KM Switch

- Power ON all PCs connected to the KM Switch.
- Connect the power supply and power ON the KM Switch.

Note: Only use the power supply provided with the KM Switch. If this power supply fails, contact HSL Support to order a replacement.

Presets

The KM Switch has several preset configurations to support multiple display layouts. These presets let the KM Switch's built-in Virtual Display Technology (VDT) create an Absolute Mouse-Screen area and associate the mouse cursor with each computer based on its position in that area. This allows the cursor to move across all the displays as if they were one single screen.



To select a preset, do the following:

1. Find the preset that matches the physical alignment of the displays.
2. Enter the corresponding keyboard hotkey.
   a. The keyboard hotkey for each preset is **LCtrl | LCtrl | F11 | [m]**, where **[m]** is the key or keys corresponding to the specific preset.

Note: When a keyboard hotkey is successfully entered, the KM Switch will make a rapid clicking sound to indicate success.

3. Restart the KM Switch by disconnecting and reconnecting the power source.

Note: For this step, do not restart the KM Switch by performing a factory reset. Doing so will revert it to its default layout rather than the chosen preset.

Multi-Monitor Computers

The KM Switch can support configurations with multi-monitor Windows computers. The monitors are described in each preset as the computer's Primary and Secondary screens. For example, if Source Computer 1 has two monitors, the primary screen is described as 1P and the secondary screen as 1S.

Note: Download and install HSL's Multi-Display Driver for source computers that have multiple screens. This is currently available only for Windows PCs, and can be found here: https://highseclabs.com/dow_type/drivers-tools/

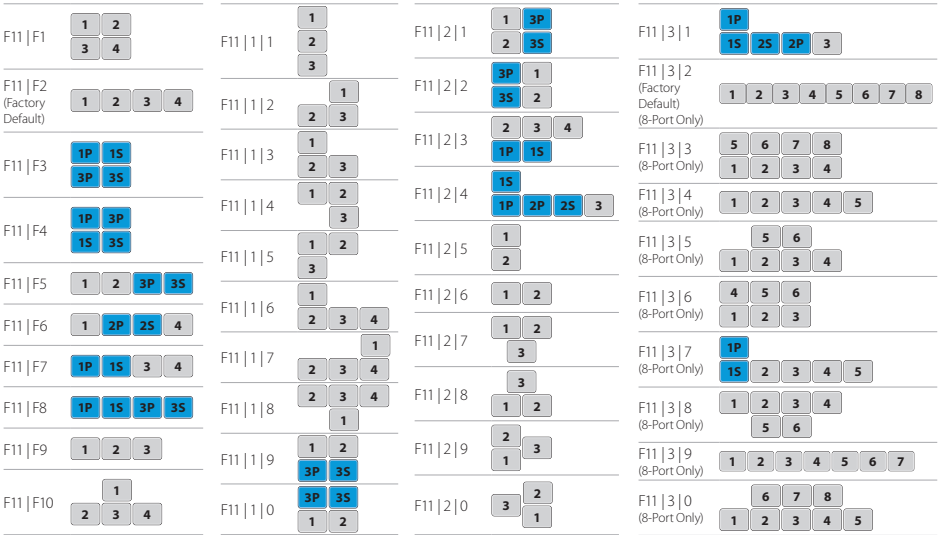
Custom Presets

The KM Switch can support a custom preset for unique layouts. Contact HSL Support to have a custom preset created.

Preset List

For each of these presets, enter **LCtrl | LCtrl**, followed by the corresponding key combination:

4/8 Port KM Presets list



Note: In the preset configurations, **Gray** indicates a single-display computer and **Blue** indicates a multi-display computer. **P** indicates primary display and **S** indicates secondary display in multi-display configurations.

Note: Download and install HSL's Multi-Display Driver for source computers that have multiple screens. This is currently available only for Windows PCs, and can be found here: https://highseclabs.com/dow_type/drivers-tools/

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2 Port KM Presets list

Note: Download and install HSL's Multi-Display Driver for source computers that have multiple screens. This is currently available only for Windows PCs, and can be found here: https://highseclabs.com/dow_type/drivers-tools/

F11 | F1 (Factory Default)	1 2
F11 | F2	1 / 2
F11 | F3	1P 1S / 2P 2S
F11 | F4	1P 2P / 1S 2S
F11 | F5	1 2P 2S
F11 | F6	1P 1S 2
F11 | F7	1P 1S 1S 2
F11 | F8	1 2P 2S 2S
F11 | F9	1P 1S 2P 2S
F11 | F10	1 / 2P 2S

F11 | 1 | 1	1P 1S / 2
F11 | 1 | 2	1 / 2P 2S
F11 | 1 | 3	1P / 1S 2
F11 | 1 | 4	2P / 1P 1S 2S
F11 | 1 | 5	1 / 2P / 2S
F11 | 1 | 6	1P / 1S / 2
F11 | 1 | 7	2P / 1 2S
F11 | 1 | 8	1 2S 2S / 2P 2S
F11 | 1 | 9	2P 2S / 1 2S 2S
F11 | 1 | 0	1P 1S / 2P 2S 2S 2S
F11 | 2 | 1	1P 1S 1S 1S / 2P 2S
F11 | 2 | 2	1P 1S / 1S 1S 2
F11 | 2 | 3	1P 1S 2 / 1S 1S
F11 | 2 | 4	1P 1S 1S / 2P 2S 1S

Operating the KM Switch

Front Panel Buttons

The KM Switch can switch channels by pressing the buttons along the front panel. Upon powering up, the KM Switch will select Channel 1 as the active channel, with the mouse cursor appearing in the center of the screen. When a button is pressed, the button's LED will stay illuminated to indicate which channel is active.

Freeze Audio (SM40NU-4, SM80NU-4, and all Commercial models)

By default, the KM Switch will play the audio of the active channel. Pressing the Audio Freeze button will keep the audio of the current source even after switching to a different channel. This allows notifications and other audio from one channel to be heard while operating on another.

Freeze USB (SM40NU-4, SM80NU-4, and all Commercial models)

By default, USB peripheral devices are only active while their corresponding source PC is active. However, pressing the USB Freeze button will keep the USB peripherals of the current source active even after switching to a different channel.

Mouse Navigation Modes

The KM Switch has two options for navigating with a mouse:

- **Relative Mouse (REL):** Relative Mouse Mode confines mouse movement to the selected source's channel. While REL Mode is active, switching between channels can be done by using the buttons on the KM Switch's front panel. REL Mode is the default mode upon booting up, and can also be enabled by entering the key combination **LCtrl | LCtrl | F11 | b**.
- **Absolute Mouse (ABS):** Absolute Mouse Mode uses Virtual Display Technology (VDT) to switch seamlessly between sources, simply by moving the cursor across the borders between channels. ABS Mode can be enabled by entering **LCtrl | LCtrl | F11 | c** or temporarily enabled from REL Mode by pressing and holding **LCtrl + LShift**.
- **Absolute Mouse Safety Trigger:** By default, hold down the **LCtrl** key to switch between channels while in ABS Mode. This prevents uncontrolled switching between source computers.

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Adjust Mouse Speed

To increase the speed of the mouse cursor, enter the combination **LCtrl | LCtrl | F11 | +**. To decrease the speed, enter **LCtrl | LCtrl | F11 | -**.

Copy and Paste (Commercial Models Only)

HSL's Commercial KM Switches can transfer text or files between connected computers by using the HSL Copy and Paste Tool. To do this, download and install the latest version of the Tool on all connected computers. The Copy and Paste Tool can be found here: https://highseclabs.com/solutions/copypaste/

To enable Copy and Paste, open Notepad on the desired source PC. Then, enter Terminal Mode on the KM Switch by entering **LCtrl | RCtrl | t**. Once Terminal Mode is opened, enter **LCtrl | LCtrl | q**.

Note: The KM Switch will not provide any indication that Copy & Paste has been enabled. To confirm it is enabled, open the Device Manager on the source PC and confirm that a new COM port has been created.

This procedure must be performed on each individual source PC on which Copy and Paste is to be enabled. These settings will remain in effect unless they are changed in Terminal Mode or the KM Switch is reset to factory defaults.

For further information regarding Terminal Mode, consult the HSL Administrator Guide, which can be found here: https://highseclabs.com/dow_type/admin-guidance/

Auto Switching via USB 3.0 Connection (SM40NU-N Only)

When a USB 3.0 cable is connected to a source computer, the SM40NU-N can automatically switch to that channel. The keyboard and mouse will switch to the new active channel. Unless the Audio Freeze has been toggled on, the audio will also switch to the new active channel.

To enable or disable auto switching, enter the combination **LCtrl | RCtrl | F12 | d**. The active channel LED will blink twice to indicate auto switching is enabled, or blink once to indicate it is disabled.

Reset

To perform a system reset while keeping behavioral characteristics like mouse settings and display presets, disconnect and reconnect the power source.

To perform a complete reset and restore the KM Switch to its factory default settings, enter the key combination **LCtrl | LCtrl | F11 | r** or enter Terminal Mode by entering **LCtrl | RCtrl | t**, then select the option "Reset to Factory Defaults."

This will clear all behavioral characteristics and settings, with the exception of the admin password.

Keyboard Hotkeys

Action	Keyboard Hotkey
Select Preset	**LCtrl	LCtrl	F11	[m]**
Enable Relative Mouse Mode	**LCtrl	LCtrl	F11	b**
Enable Absolute Mouse Mode	**LCtrl	LCtrl	F11	c**
Temporarily Enable Absolute Mouse Mode	**LCtrl + LShift** (while in Relative Mouse Mode)
Increase Mouse Cursor Speed	**LCtrl	LCtrl	F11	+**
Decrease Mouse Cursor Speed	**LCtrl	LCtrl	F11	-**
Enter Terminal Mode	**LCtrl	RCtrl	t**
Factory Reset	**LCtrl	LCtrl	F11	r**

Remote-Control Commands

The buttons on a Remote-Control Unit (RCU) can be programmed to replicate the buttons on the KM Switch's front panel. The RCU should be configured to send keepalive commands over its RS-232 interface, as described below.

Keepalive events are used by the KM Switch to periodically communicate its status to the RCU, using the RS-232 protocol. Entering an RS-232 command program updates the keepalive event. Because these events are related to the buttons on the KM Switch's front panel, they are constructed as **#AFP_ALIVE** followed by the command argument corresponding to the selected channel.

For example, to switch to Channel 2 on the KM Switch, enter the command **#AFP_ALIVE FE**.

Note: while using a Remote-Control Unit, the KM Switch's front panel buttons are deactivated. This is because the KM Switch is receiving commands from the RCU instead of the front panel buttons.

To replicate the KM Switch's front panel buttons using RS-232, enter the **#AFP_ALIVE** command with the following arguments:

Front Panel Button	Channel ID
Channel 1	FE
Channel 2	FD
Channel 3	FB
Channel 4	F7

Front Panel Button	Channel ID
Channel 5	EF
Channel 6	DF
Channel 7	BF
Channel 8	7F

Highseclabs.com

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