

UNCLASSIFIED

KVM Combiners

The KVM Combiner is a multi-viewer, a scaler, and a KVM switch, all combined into a single product.

HDC14294 Rev. F



THE SOLUTION

What is a KVM Combiner?

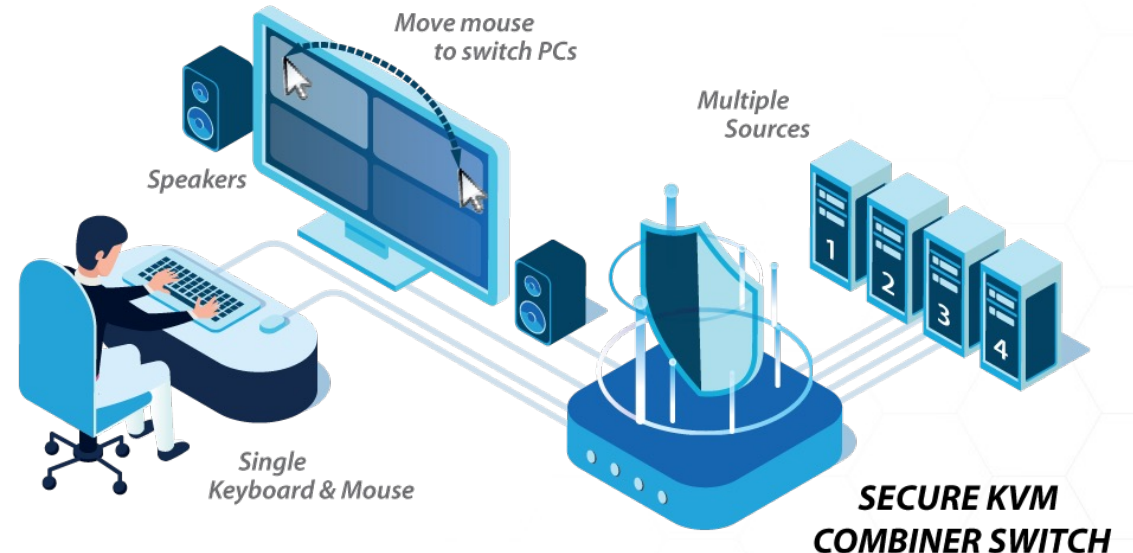
A KVM Combiner is a multi-viewing KVM switch that allows users share a single keyboard-and-mouse set, to control:

- **All** connected computers
- On **one** display (or two, in extended-view mode)

HSL's KVM combiner is a multi-viewer, a scaler, and a KVM switch all combined into a single product.

Channel switching is done simply by dragging the mouse from window to window, with no need for push buttons or any other user interaction.




HSL has both secure, NIAP certified products (in rugged and civilian versions), and commercial products.



SECURE KVM COMBINER PRODUCT LIST






All Products are Certified to NIAP PP4.0 for PSD, TAA and BAA Compliant

| Model | | # of sources (inputs) | # of projected displays (outputs) | KB ports | Video | Max Resolution |
|-----------|---|-----------------------|-----------------------------------|----------|---------|---|
| SC42PHU-4 |  | 4 | 2 | USB | DP/HDMI | Supporting UHD 4K resolutions up to 3840x2160 @30Hz |
| SC82PH-4 |  | 8 | 2 | USB | DP/HDMI | Supporting UHD 4K resolutions up to 3840x2160 @30Hz |
| SC162PH-4 |  | 16 | 2 | USB | DP/HDMI | Supporting UHD 4K resolutions up to 3840x2160 @30Hz |

COMMERCIAL KVM COMBINER PRODUCT LIST



All Products are TAA and BAA Compliant

| Model | # of sources (inputs) | # of projected displays (outputs) | KB/M ports | Other Ports | Max Resolution |
|---|-----------------------|-----------------------------------|---------------------------|--|---|
| SC42PHU-N  | 4 (DP/HDMI) | 2 (HDMI) | USB A/B (Console /Source) | Microphone Audio USB 3.0 (1xType B per source; 4xType A Console) | Up to UHD 4K resolutions 3840x2160 @30Hz |
| SC82PHU-N  | 8 (DP/HDMI) | 2 (DP/HDMI) | USB A/B (Console /Source) | Audio USB 2.0 (1xType B per source; 4xType A Console) | Up to UHD 4K resolutions 3840x2160 @30Hz |
| SC44PHU60-N  | 4 (DP/HDMI) | 4 (DP/HDMI) | USB A/B (Console /Source) | Audio, USB 3.2 (1xType B per source; 4 x Type A Console) | Up to UHD 4K resolutions 3840X2160 @60Hz |

COMBINER

Key Features

MULTIVIEW – VIEW MULTIPLE COMPUTERS ON A SINGLE DISPLAY

The KVM Combiner functions as a multi-viewer.

View multiple computers (up to 16) on just one or two displays.

For example, using an 8-port KVM Combiner, in a basic layout, all eight computers can be viewed at the same time:

The same goes for a 16-port KVM Combiner:

8P Combiner
Extended Display



8P Combiner
Single Display



16P Combiner
Extended Display

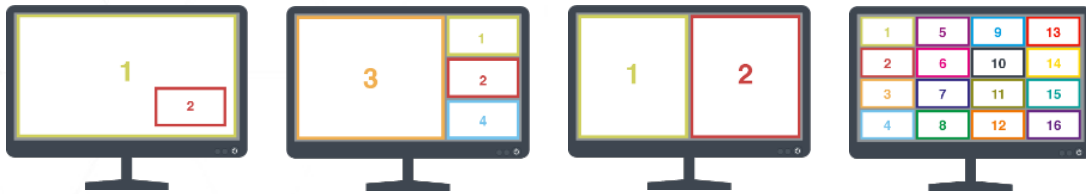


16P Combiner
Single Display



MULTIVIEW – CUSTOMIZED LAYOUTS

Create multiple pre-set layouts to meet the user's exact needs:



Easily switch between the different layouts.
Channel switching is done by dragging the mouse from window to window.
Any layout is possible; the user has complete flexibility to create their own view and save it as a preset.

[Link to Video](#)



Resize and change views while maintaining the aspect ratio on a 4P KVM Combiner.

QUAD-SCREEN MULTIVIEWER (4X4 COMBINER)

Interact with up to 4 Display Screens

- Advanced combiner with leading specifications:
 - UHD @ 60Hz resolutions
 - USB 3.0 SuperSpeed, including Type A ports on Console with fast-charging power supply
- Supports, 1, 2, 3 or 4 console display screens and 4 input sources
- Supports side-by-side, vertical, triangle and video wall layouts.



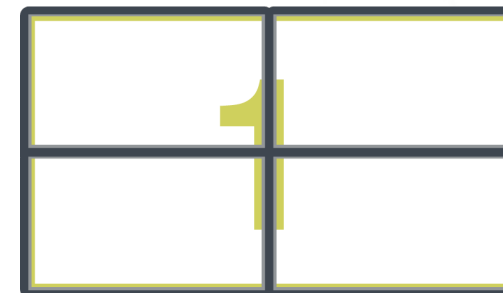
**One
Screen**



**Two
Screens**



**Three
Screens**



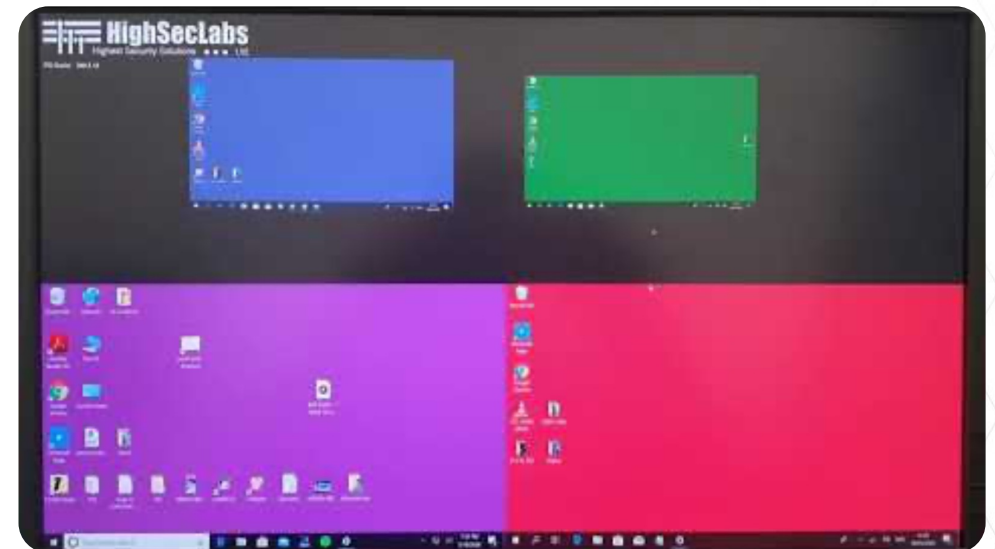
**Four Screen
Video Wall**

SMOOTHLY SWITCH BETWEEN COMPUTERS (VIRTUAL DISPLAY TECHNOLOGY)

Intuitively Switch Between Displays

- Seamlessly switch control from one computer to another by sliding the mouse cursor into a new display window.
- No need to press the front-panel buttons.
- The other shared peripherals (keyboard, audio, USB) switch to the new source, once the mouse cursor passes its display border.
- For security, guard mode is added obligating users to press and hold the control key to exit the active window's border.

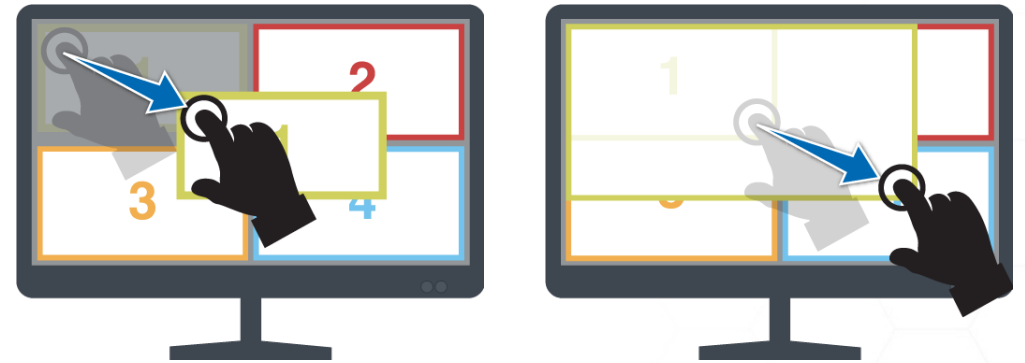
Drag mouse between screen borders



[Link to Video](#)

NATIVE TOUCH SCREEN SUPPORT

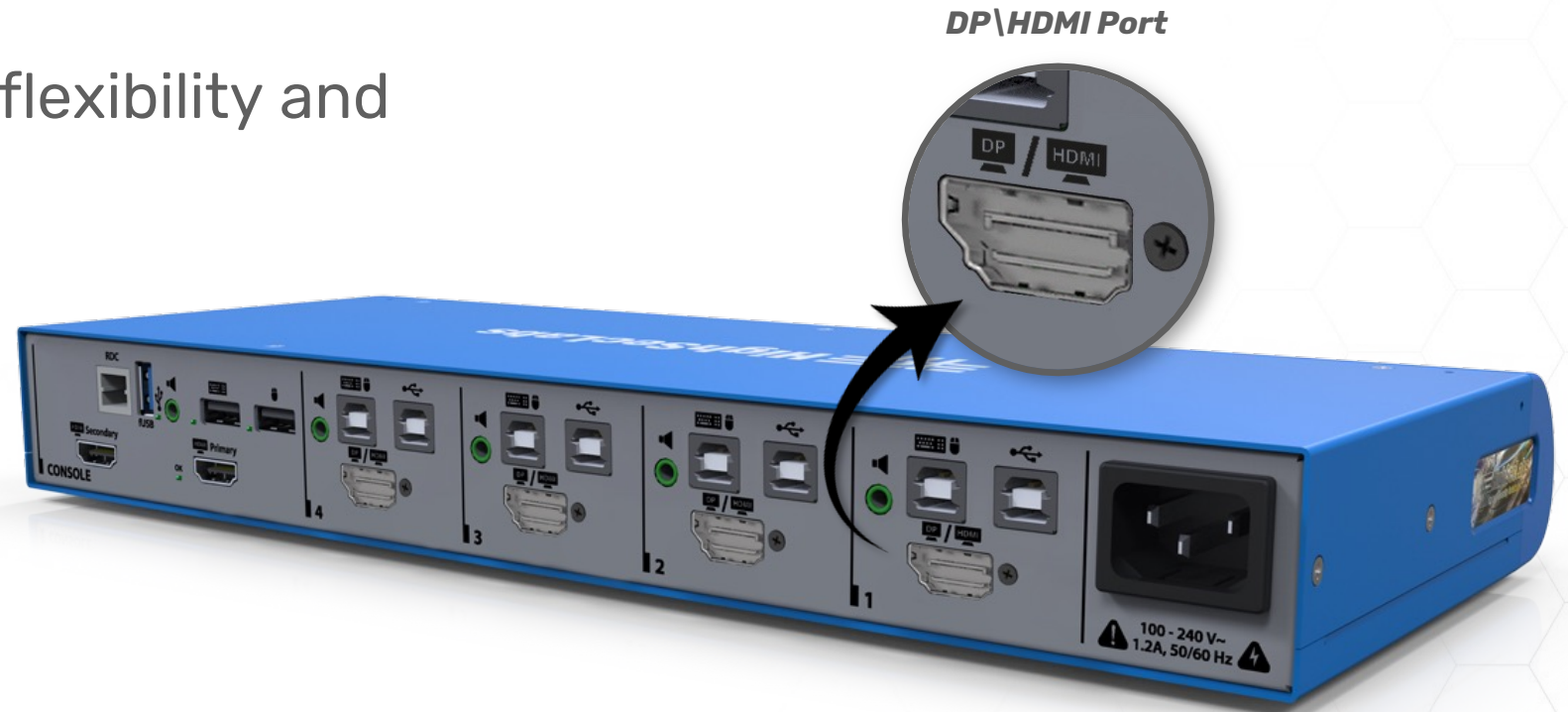
- No need to install a driver or software
- Use touch gestures instead of a mouse
- All mouse commands can be implemented using touch gestures, such as:
 - ✓ Switching control to another source by touching its window
 - ✓ Resizing a window using standard finger movements
 - ✓ Moving a window to a new location
 - ✓ Selecting an option by tapping



Use touch gestures to select, move and resize source windows

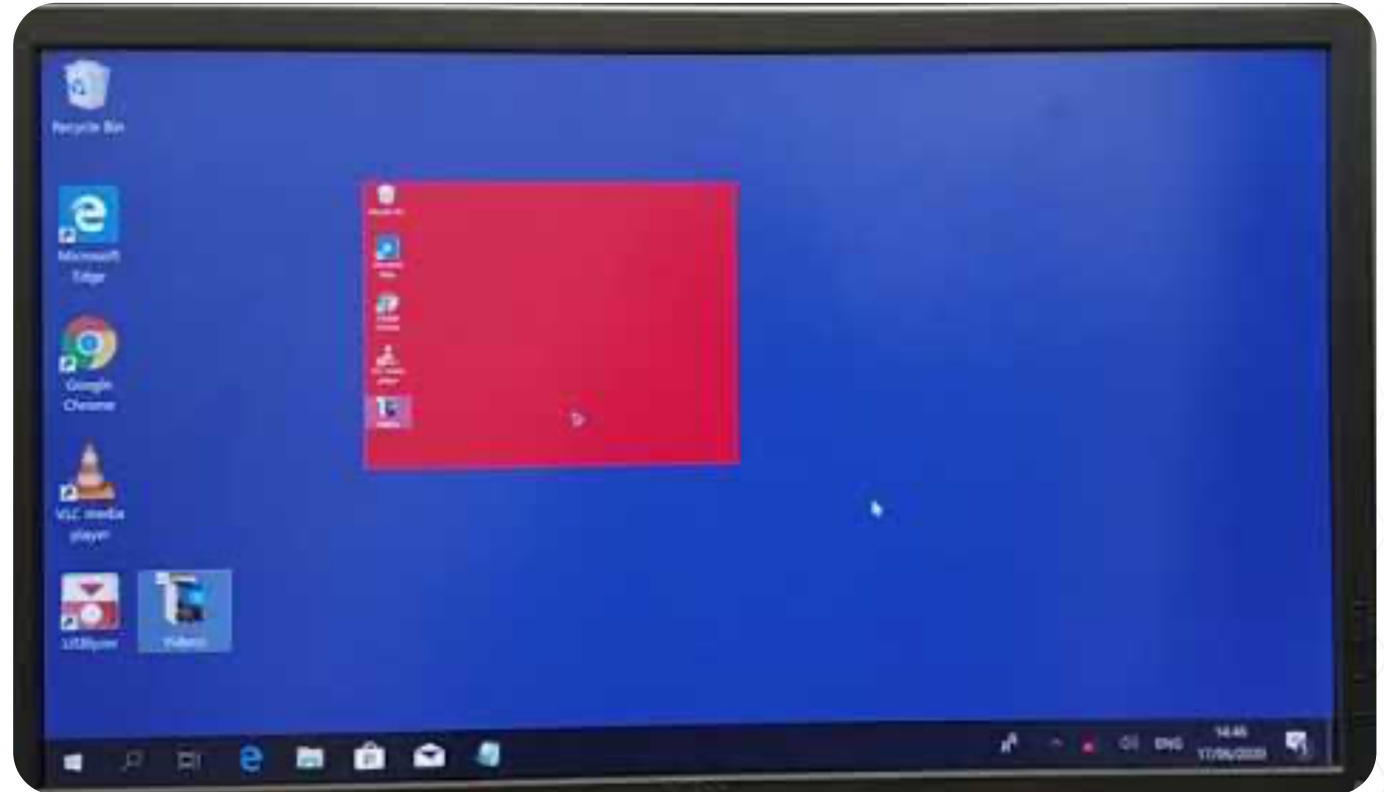
INTEROPERABILITY – DP\HDMI COMBO PORT

- HSL Combiners use a DP / HDMI combo port
- Either a DisplayPort or HDMI connector can be used on each port
- Enhances installation flexibility and interoperability



USER DEFINED PRESETS – CUSTOM DISPLAY VIEWS

- “Presets” define how the Combiner’s sources are displayed on the console display screen(s).
- This includes all aspects of presenting the information, such as:
 - Size of each source window
 - Location of each window
 - What sources are presented on each of the console displays
- The Combiner allows for 8 user-defined presets.
- Invoke a preset is by using its keystroke.
- Switching between presets is quick and easy.



[Link to Video](#)

FREEZE CHANNEL LAYER

- Continue using the resource of one source channel, while switching control to another. E.g.:
 - Select a window to always be on top. Other windows dragged across the frozen layer go to the background.
 - Freeze Audio to listen to one source's audio channel, while the KBD and Mouse are interacting with another source.
 - Freeze USB (commercial only) so that the contents of a USB stick can be used by different source computers.



Freeze layer
to be always on top

[Link to Video](#)

ON-SCREEN DISPLAY (OSD)

- Easily configure and operate the Combiner using the OSD
- Intuitive menus are used instead of remembering keystroke patterns
- All Combiner features and capabilities can be accessed via the OSD.



SECURE RUGGED COMBINERS



- Designed for field deployment:
 - 4/8/16 host, up to 2 display screens
- Option: H.264 encoded & encrypted video stream
- Video supported up to 4K@30Hz or 3440x1440@60Hz
 - Both DisplayPort and HDMI supported
- Fully rugged design compliant to:
 - MIL-HDBK-216, MIL-STD-810, MIL-STD-1275, MIL-STD-461
- 65,000 hours MTBF
- Compliant with NIAP PP4.0 & TEMPEST Level A
- IP67 compliant illuminated buttons.
NVG option available



SECURE PERIPHERAL SHARING – SECURE and RUGGED COMBINERS ONLY

Securely Share Peripherals Between Computers of Different Classification Levels

Peripheral vulnerabilities cannot be exploited to exchange data between different networks being accessed through an HSL Combiner, because of the Combiner's security certifications:

- **NIAP/Common Criteria PP4.0 Certification**
HSL's secure KVMs are certified against the latest NIAP Common Criteria Protection Profile version 4.0 (PP4.0) for Peripheral Sharing Device (PSD) devices.
- **Securely share peripherals across different security domains**
Securely share peripherals between computers that belong to different security classifications levels, while maintaining the highest possible data separation security.
- **Prevent information leaks**
Block threats derived from sharing and switching of vulnerable, untrusted or unauthorized peripheral devices. Prevent peripheral exploits, information leaks, eavesdropping, signal transmission, computer malware, hardware, and firmware tampering by enforcing multilayered security mechanisms.



SECURITY FEATURES

HSL's Secure Combiners Implement Unmatched Protection

- **Ensuring unidirectional data flow (Video, HID)**
 - Achieved by implementing device and host emulations.
 - No data flow from console display screens back to the source computers
 - No data flow from the source computers to the keyboard/mouse.
- **Blocking extraneous communications, such as:**
 - Display MCCS commands
 - Non-HID data across the HID USB interface
- **Audio Security**
 - Enforcing unidirectional flow, prevents repurposing speakers as microphones
- **Anti-tampering**
 - Any attempt to open the device renders it inoperational, with an alarm implemented by flashing led-lights.
 - Holographic tamper-evident labels protect the product's casing
 - Firmware is protected by unidirectional data access and resides in One Time Programmable memory. Firmware integrity is checked during self-tests.



COMMERCIAL ONLY FEATURES

There are several features in HSL's commercial Combiners that are not permitted in a secure NIAP certified product.

These features include:

- Copy/Paste between sources, including with USB stick support
- USB 3.0 support, with high-power charging
- Channel switching using keyboard shortcuts
- Microphone support
- Freeze USB



Commercial Combiner

COPY & PASTE – COMMERCIAL COMBINERS ONLY

Copy & Paste

- Transfer text and files between the computers connected to the Combiner, using the Combiner as the intermediary (no network connection is needed between parties).
- Use standard copy-and-paste keyboard key combinations (**Ctrl+c**/**Ctrl+v**) or mouse-context menu commands.



Thank You

For more info:



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