



**ReThink**

There's a better way.

**RAV-SW-C2x1HU**

**User Manual**

# **RAV-SW-C2x1HU**

## **2x1 HDMI and USB-C Auto Switcher**

### **Kratos family of switchers**



## Thank you for purchasing this product

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

## Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended to protect and extend the life of your equipment.

## Introduction

**RAV-SW-C2x1HU** is a 2x1 HDMI and USB-C auto switcher with hotkey switching. It supports resolutions up to 4K@60Hz 4:4:4 8bit and can also transmit USB 3.0 signals up to 5Gbps.

Input consists of 1x HDMI port, and 1x USB-C port with a separate USB-C charging port which can supply power to the USB-C device.

The switcher features virtual interaction function, so that it can automatically wake up the connected PC that is in standby mode, which can reduce the switching time. It also supports direct switching through buttons on the front panel, IR remote, and hotkey through keyboard/mouse connected to the special USB port. It provides a wide compatibility choice for different operating systems, such as Windows, Mac OS and Linux, no driver required and simple plug and play.

## Key Features

- HDCP 2.3 and DP 1.4 compliant.
- Input supports 1x HDMI port and 1x USB-C port. 1x HDMI output.
- Ultra-wide Screen, resolution to 4K@60Hz, 2K@60Hz/144Hz as specified in HDMI 2.0.
- HDR, HDR10, HDR10+, Dolby Vision, HLG pass-through.
- Use of one keyboard, mouse & monitor to control 2 computers.
- Support video fast switching, and keyboard/mouse seamless switching
- Supports auto switching
- Each input port has an EDID emulator to provide the correct information or the PC.
- Support for hot plug detect. Disconnect or connect devices at any time.
- Switching via front panel, hotkeys, IR remote control, and RS-232 commands.
- USB-C charging port, supporting PD 3.0 charging 100W.
- Advanced hardware/software design and production ensure zero latency.
- The integrated USB 3.0 ports allow you to share USB peripherals such as printer, scanner, cameras between computers with data transfer rate up to 5Gbp/s.

## Package Contents

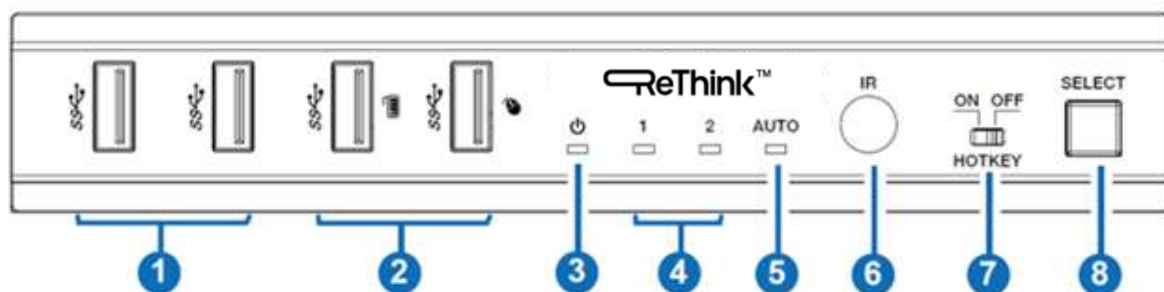
- 1 x 2x1 HDMI/USB-C auto switcher.
- 1 x IR Remote.
- 1 x 3pin-3.81mm Phoenix Connector (male).
- 1 x Fixed Frequency 38KHz IR Receiver Cable (1.5 metres).
- 1 x USB Cable (USB 3.0, AM to BM, 1.8 metres).
- 1 x USB Type-C Cable (USB 3.2 GEN2, male to male, 1 metres).
- 1 x HDMI Cable (male to male, 1.5 metres).
- 2 x Mounting brackets and screws.
- 1 x 12V/1A Multinational Locking Power Supply.
- 1 x User Manual.

## Specifications

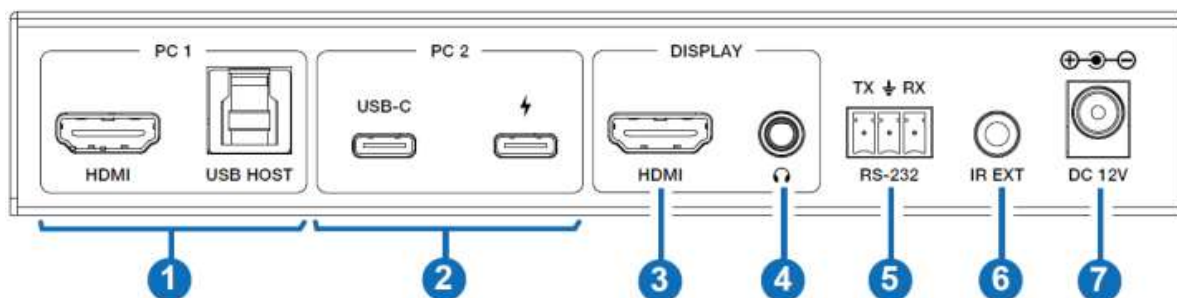
| Technical        |                                                                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HDMI Compliance  | HDMI 2.0                                                                                                                                                                      |
| HDCP Compliance  | HDCP 2.3                                                                                                                                                                      |
| DP Compliance    | DP 1.4                                                                                                                                                                        |
| Video Bandwidth  | 18Gbps                                                                                                                                                                        |
| Audio Latency    | No Latency                                                                                                                                                                    |
| Video Latency    | No Latency                                                                                                                                                                    |
| Video Resolution | Up to 4K@60Hz, 2K@60Hz/144Hz                                                                                                                                                  |
| IR Level         | 5Vp-p                                                                                                                                                                         |
| IR Frequency     | Fixed frequency 38KHz                                                                                                                                                         |
| Colour Space     | RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0                                                                                                                              |
| Colour Depth     | 8/10/12bit                                                                                                                                                                    |
| HDR              | HDR, HDR10, HDR10+, Dolby Vision, HLG                                                                                                                                         |
| CEC              | Support                                                                                                                                                                       |
| Audio Formats    | <b>HDMI IN/OUT:</b> LPCM, Dolby Digital/Plus/EX, Dolby True HD, Dolby Atmos,DTS, DTS-EX, DTS-96/24, DTS High Res, DTS-HD MasterAudio, DTS:X, DSD<br><b>L/R OUT:</b> PCM 2.0CH |
| ESD Protection   | IEC 61000-4-2: ±8kV (Air-gap discharge), ±4kV (Contact discharge)                                                                                                             |
| Connections      |                                                                                                                                                                               |
| Input ports      | 1x HDMI [Type A, 19-pin female]<br>1x USB-C [AV signal input]<br>1x USB-C [Power input]                                                                                       |
| Output Ports     | 1x HDMI [Type A, 19-pin female]<br>1x L/R audio output [3.5mm Stereo]                                                                                                         |
| Control Ports    | 1x RS-232 [3pin-3.81mm phoenix connector]<br>1x IR EXT [3.5mm Stereo]<br>1x USB HOST [USB 3.0 Type B,11-pin female]<br>4x USB DEVICES [USB 3.0 Type A,13-pin female]          |

| Mechanical            |                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------|
| Housing               | Metal Enclosure                                                                         |
| Colour                | Black                                                                                   |
| Dimensions            | 175mm [W] x 100mm [D] x 30mm [H]                                                        |
| Weight                | 505g                                                                                    |
| Power Supply          | Input: AC 100 - 240V 50/60Hz<br>Output: DC 12V/1A (US/EU standard, CE/FCC/UL certified) |
| Power Consumption     | Typical value: 7.8W / Standby mode 0.6W                                                 |
| Operating Temperature | 32 - 104°F / 0 - 40°C                                                                   |
| Storage Temperature   | -4 - 140°F / -20 - 60°C                                                                 |
| Relative Humidity     | 20 - 90% RH (no-condensing)                                                             |

## Operation Controls and Functions



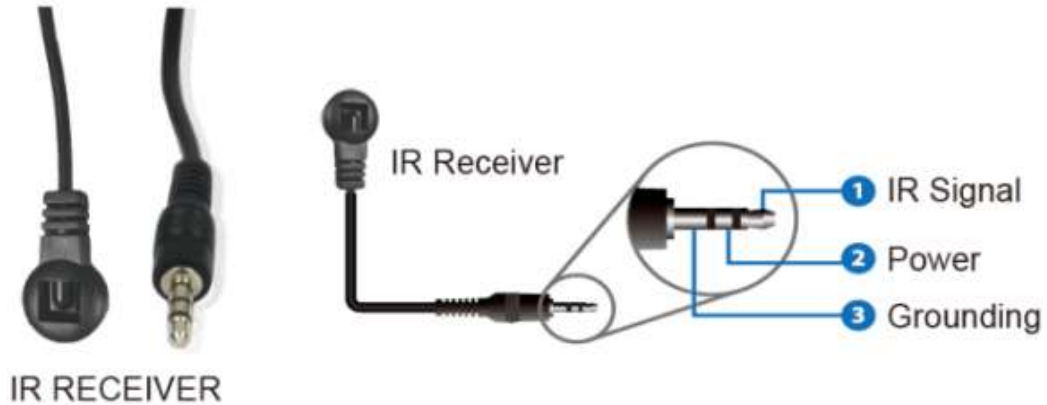
| No. | Name                                | Function Description                                                                                                                                                                                                                     |
|-----|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | USB 3.0 ports                       | USB 3.2 Gen 1 device ports.                                                                                                                                                                                                              |
| 2   | USB 3.0 ports<br>(with hotkey mode) | a) When Hotkey switch is OFF, these two ports support USB 3.2 Gen1.<br>b) When Hotkey switch is ON, these two ports support USB 1.1 keyboard & mouse.                                                                                    |
| 3   | Power LED                           | The Power LED will light in green when the product is working, and red when the product is on standby.                                                                                                                                   |
| 4   | Input channel LED 1/2               | When the HDMI input port 1/2 is selected as the signal input channel, the corresponding LED 1/2 will light in green.                                                                                                                     |
| 5   | AUTO LED                            | When the auto switching function is enabled, the AUTO LED will light in green, otherwise it will light off.                                                                                                                              |
| 6   | IR Window                           | IR signal receiving window.                                                                                                                                                                                                              |
| 7   | Hotkey switch                       | Use the switch to enable/disable the hotkey switching mode.<br>Switch to "ON": The connected keyboard and mouse support hotkey switching mode.<br>Switch to "OFF": The connected keyboard and mouse don't support hotkey switching mode. |
| 8   | SELECT button                       | Press the button to switch the input channel.                                                                                                                                                                                            |



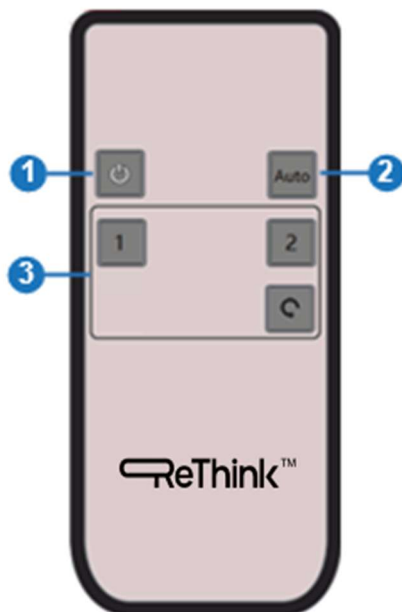
| No. | Name              | Function Description                                                                                                                                                                                                                                                                            |
|-----|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | PC 1 ports        | <b>HDMI:</b> HDMI signal input port, connected to HDMI sourcedevice such as PC with HDMI cable.<br><b>USB HOST:</b> USB Host port, connected to PC 1. It can be used for firmware upgrade.                                                                                                      |
| 2   | PC 2 ports        | <b>USB-C:</b> USB-C signal input port, connected to USB-C sourcedevice such as PC with USB cable.<br><b>USB charging:</b> USB-C power input port (supporting PD 3.0 protocol). You can connect the charging port with a power adapter to power PC 2 which is connected to the USB-C port.       |
| 3   | DISPLAY HDMI Port | HDMI signal output port. Connected to HDMI display device with HDMI cable.                                                                                                                                                                                                                      |
| 4   | L/R audio port    | 3.5mm analogue audio PCM2.0 output port.                                                                                                                                                                                                                                                        |
| 5   | RS-232 port       | 3-pin phoenix connector, connected to a PC or control system for serial port upgrade.                                                                                                                                                                                                           |
| 6   | IR EXT port       | IR signal receiving port, connected with 38KHz IR Receiver cable. If the IR signal receiving window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the "IR EXT" port to receive the IR remote signal. |
| 7   | DC 12V            | DC 12V/1A power input port.                                                                                                                                                                                                                                                                     |



## IR Pin Definition



## IR Remote



### (1) Power on or Standby:

Press this button to power on the switcher or set it to standby mode.

### (2) Auto:

Press this button to enable/disable the auto switching function.

### (3) 1/2:

Press 1/2 button to select the HDMI input port 1/2 as the input channel, and the corresponding channel LED on the front panel will light in green.



Press this button to cyclically switch the input channel.

## Hotkey Switch Function

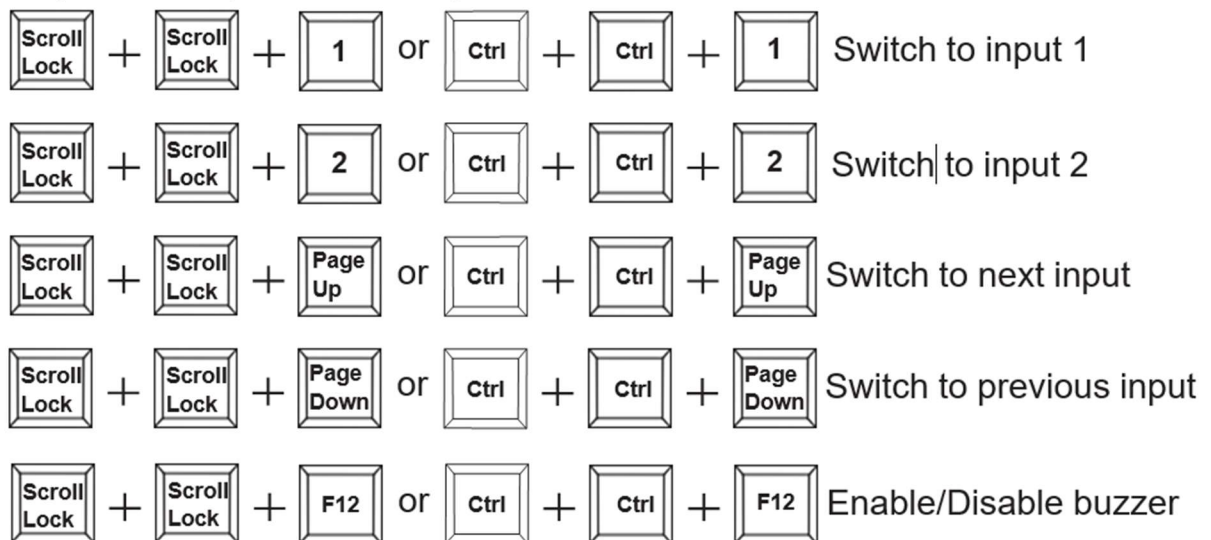
The Hotkey switch on the front panel allows you to enable/disable the hotkey switch function.

- (1) When Hotkey switch to OFF mode, the hotkey switch function is disabled, and two USB 3.0 ports (with hotkey mode) support USB 3.2 Gen 1 device.
- (2) When Hotkey switch to ON mode, the hotkey switch function is enabled, and two USB 3.0 ports (with hotkey mode) only support USB 1.1 mouse and keyboard, which can be used for hotkey switching

## Keyboard & Mouse Hotkey Function

When the hotkey mode is enabled, you can use keyboard and mouse hotkeys to operate and control the product.

- (1) Keyboard hotkeys are as following:



- (2) Mouse hotkeys are as following:

Double-Click Middle-Right (Double-click the mouse scroll wheel, and then click the right button): Switch to next input

Double-Click Middle-Left (Double-click the mouse scroll wheel, and then click the left button): Switch to previous input

## API Command Set

RAV-SW-C2x1HU also supports ASCII commands control. Connect the RS-232 port of the product to a PC with a 3-pin phoenix connector cable and an RS-232 to USB cable. The connection method is as follows.

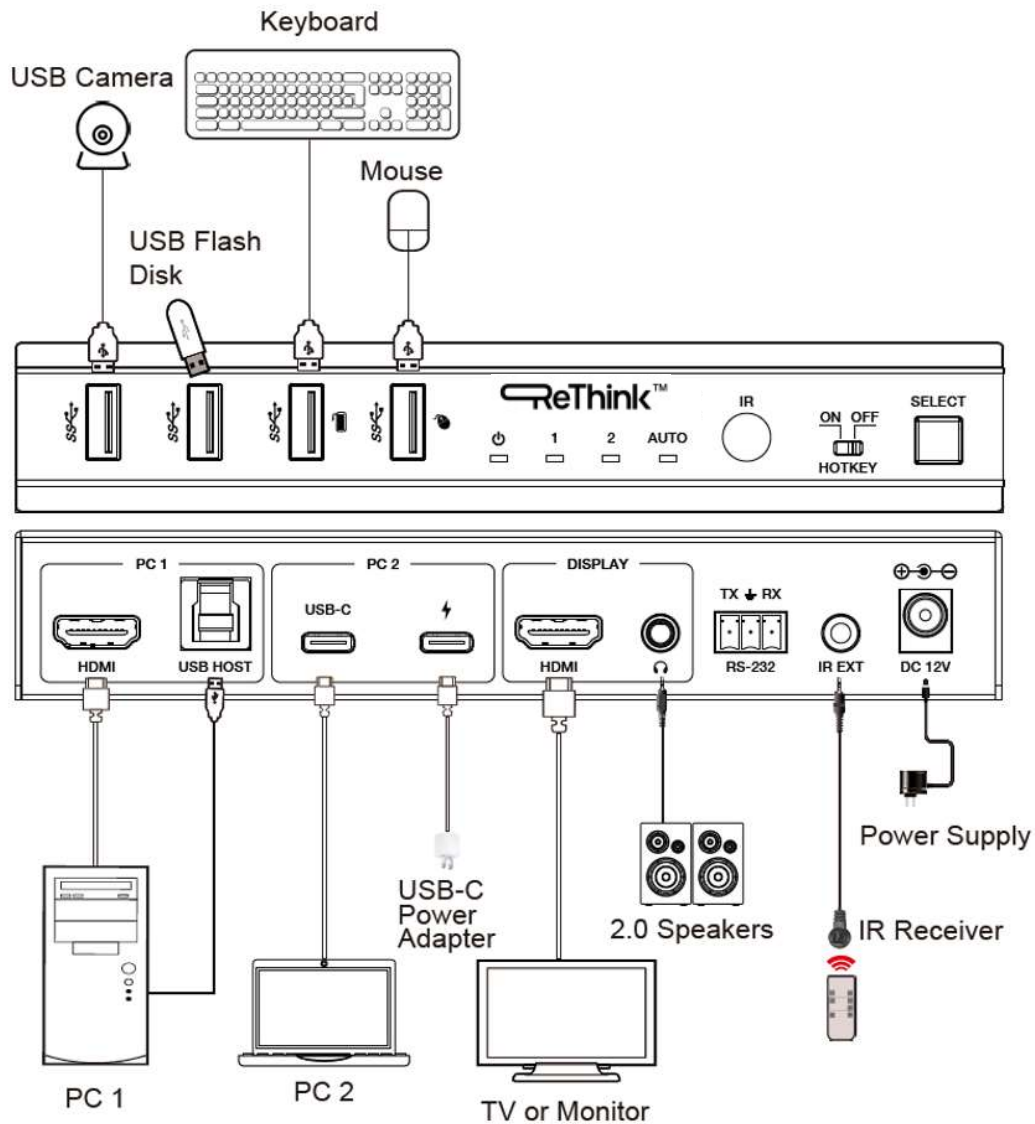


Open a Serial Command tool on PC to send ASCII commands to control the product.

| ASCII Commands                                                                                                                                       |                                                                |               |                                                                                                                            |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------|---------|
| Serial port protocol.<br>Baud rate: 115200 (default), Data bits: 8, Stop bits:1, Check bit: 0<br>x – Parameter 1<br>Z – Parameter 2<br>! - Delimiter |                                                                |               |                                                                                                                            |         |
| Command                                                                                                                                              | Function                                                       | Example       | Feedback                                                                                                                   | Default |
| help!                                                                                                                                                | List all commands                                              | help!         |                                                                                                                            |         |
| status!                                                                                                                                              | Get device status                                              | status!       |                                                                                                                            |         |
| r type!                                                                                                                                              | Get device model                                               | r type!       |                                                                                                                            |         |
| r fw version!                                                                                                                                        | Get firmware version                                           | r fw version! | mcu fw version:<br>vx.xx.xx<br>sub fw version:<br>vx.xx.xx<br>sub boot version:<br>vx.xx.xx<br>kvm fw version:<br>vx.xx.xx |         |
| power z!                                                                                                                                             | Power on/off the device (z=0~1)<br>0. power off<br>1. power on | power 1!      | power on                                                                                                                   |         |
| r power!                                                                                                                                             | Get current power state                                        | r power!      | power on                                                                                                                   |         |
| reboot!                                                                                                                                              | Reboot the device                                              | reboot!       | reboot...                                                                                                                  |         |
| reset!                                                                                                                                               | Reset to factory defaults                                      | reset!        | reset to factory defaults                                                                                                  |         |

|                         |                                                                                               |                         |                         |                         |
|-------------------------|-----------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|
| s output 1 stream x!    | Set output 1 stream enable/disable (x=0~1)<br>0. disable out stream<br>1. enable out stream   | s output 1 stream 1!    | output 1 stream: enable | output 1 stream: enable |
| r output 1 stream!      | Get output 1 stream status                                                                    | r output 1 stream!      | output 1 stream: enable |                         |
| s auto switch x!        | Enable/disable auto switch feature (x=0~1)<br>0. disable auto switch<br>1. enable auto switch | s auto switch 1!        | auto switch: enable     | Auto switch: enable     |
| r auto switch!          | Get auto switch feature                                                                       | r auto switch!          | auto switch: enable     |                         |
| s output 1 in source x! | Route input x source to output 1 (x=1~2)<br>1. input1<br>2. input2                            | s output 1 in source 1! | output1->input1         |                         |
| r output 1 in source!   | Get output 1 selected input source                                                            | r output 1 in source!   | output1->input1         |                         |
| s beep z!               | Enable/disable buzzer function (z=0~1)<br>0. beep off<br>1. beep on                           | s beep 1!               | beep on                 | beep on                 |
| r beep!                 | Get buzzer state                                                                              | r beep!                 | beep on                 |                         |

## Application Diagram



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