DS-MT 1

HDMI 2.0 over IP
Multicast Transceiver System

User Manual │ English

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INTRODUCTION

The DS-MT1 HDMI 2.0 over IP Multicast Transceiver System with Bi-directional IR, RS-232, Audio Extender/Extractor, USB & Video Wall Support boosts up your video/audio transmission distance up to 100m(330ft)**[over copper] or 300m (990ft) (OM3) / 400m (1320ft) (OM4)[over fiber] in Ultra-HD 4K2K@60(4:4:4) format. Users can readily extend Ultra-HD sources from Blu-ray Disc player, PS4, PC, and any other HDMI sources to distant display / monitor, including HDMI or DVI enabled TV sets or LCD PC monitors. Besides DS-MT1 is HDCP compliant.

With broadcasting management software and 10 Gigabit Ethernet network switch (supported IGMP Snooping), DS-MT1 is a complete Ultra-HD 4K2K@60(4:4:4) video broadcasting solution for many 4K requirement applications, such as medical care, digital signage etc. It can transmit Ultra-HD 4K2K@60(4:4:4) HDMI video broadcasting over IP network. The broadcasting format can be Point to Point, Point to Many, and Multi-Casting. Multi-casting is based on Managed 10 Gigabit Switch with 802.1Q VLAN function which provides control remotely with multi device.

> * Up to 4K@60 4:4:4 (4K@60 4:4:4 needs light compression)
> ** Cat-6A cable or better is recommended for better performance

FEATURES

- Supports HDR and up to 4K@60 4:4:4
- HDCP & CEC Bypass
- Supports EDID management
- Can be configured as a full duplex transmitter and receiver when 4K@60 4:4:4
- Slide switch to select transmission over 10G copper RJ45 or SFP
- Auto equalization
- Pure unaltered uncompressed 7.1ch digital HDMI over cat.6A/fiber transmission
- DTS-HD Master Audio and Dolby TrueHD high bit rate audio support
- Supports bi-directional full frequency IR signal from 20KHz to 60KHz
- Bi-directional Analog audio path-through
- Full duplex RS-232 control up to 115,200 bps
- Cat.6A/fiber extension and connection to a 10GbE Ethernet Switch which support IGMP version 2.
- Supports software to configure & upgrade device and to control the switching operation of the various signal types
- Supports seamless switching
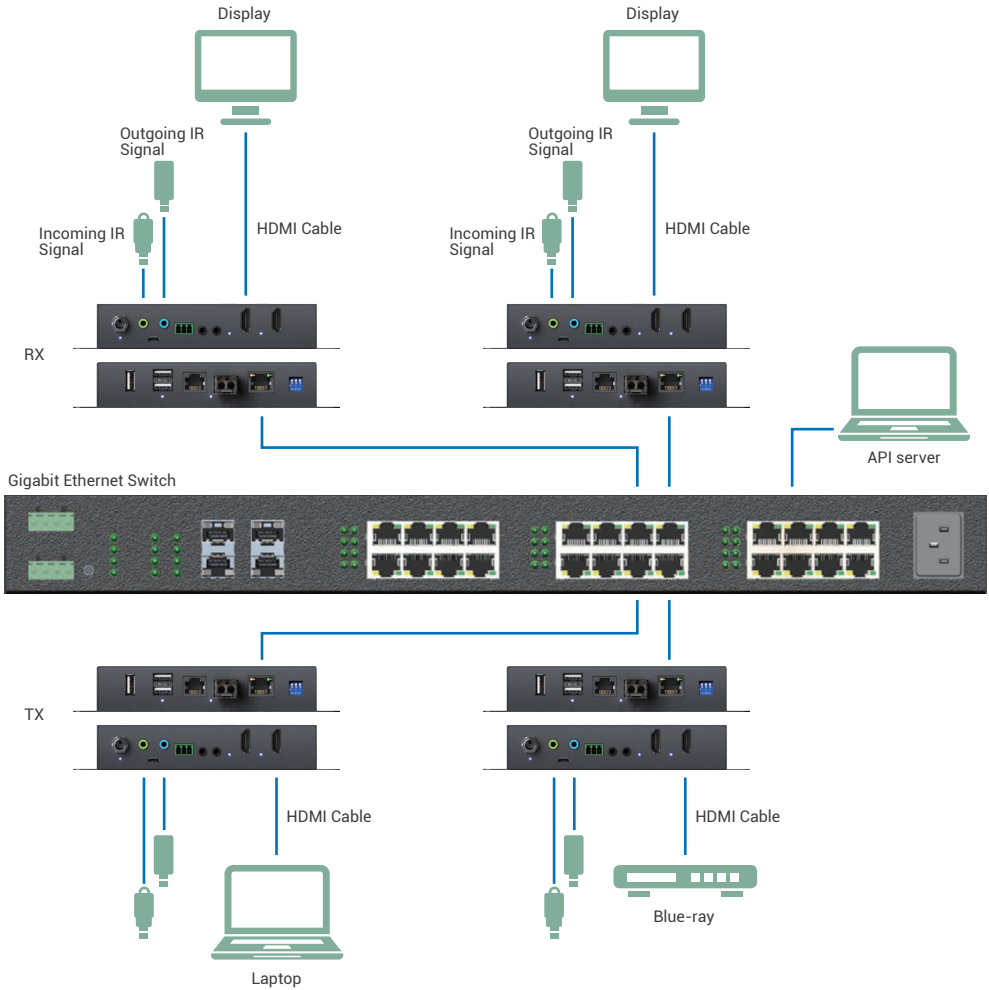- Supports Video Wall* & Multi-view function
- Supports custom scaling to display

> * Supports the compensation of frame-tearing
> ** Cat-6A cable or better is recommended for better performance

PACKAGE CONTENTS

- 1x DS-MT1
- 1x IR blaster
- 1x IR receiver
- 1x DC 12V
- 1x User Manual

CONNECTION DIAGRAM

SDVoE network switch capability requirements
· 10 gigabit connectivity (one port per endpoint)
· IGMP version 2 support
SDVoE network switch configuration requirements
· IGMPv2 Snooping: Enabled
· IGMP Fast Leave: Enabled
· Unregistered Multicast Flooding: Disabled

SPECIFICATIONS

Technical	
Role of usage	Transceiver
HDMI compliance	HDMI 2.0a
HDCP compliance	HDCP 2.2 & 1.4
Video bandwidth	Single-link 594MHz [18Gbps]
Video support	480i / 480p / 720p / 1080i / 1080p60 / 4K2K@30 / 4K2K@60 4:4:4
HDMI over UTP	4K2K@60 4:4:4 100m (330ft) [CAT.6A]
HDMI over fiber	4K2K@60 4:4:4 up to 300m (990ft) (OM3) / 400m (1320ft) (OM4)
Audio support	[multi-mode optic cable]
Equalization	Surround sound [up to 7.1ch] or stereo digital audio
Input TMDS signal	Auto
Input DDC signal	1.2 Volts [peak-to-peak]
ESD protection	5 Volts [peak-to-peak, TTL]
PCB stack-up	Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge]
IR pass-thru	6-layer board [impedance control — differential 100Ω; single 50Ω]
RS-232 support	Bi-directional
I/O connector	Yes
HDMI source control	2x HDMI + 4x 3.5mm + 3x USB + 2x RJ45 + 1x fiber + 1x RS-232
HDMI connector	Controllable via IR pass-through from RX to TX or TX to RX with IR extenders
RJ-45 connector	Type A [19-pin female]
USB connector	WE/SS 8P8C
3.5mm connector	Type A
Mechanical	
Housing	Metal enclosure
Dimensions [L x W x H]	Model : 172 x 162 x 30mm [6.7" x6.3" x1.2"] Package : 325 x 196 x 92mm [12.7" x 7.7" x 3.6"] Carton : 490 x 426 x 352mm [1'6" x 1'4" x 1'2"]
Weight	Model : 685g[1.5 lbs] / Package : 400g [3 lbs]
Fixedness	Wall-mounting case with screws
Power supply	12V DC
Power consumption	18 Watt [max]
Operation temperature	0~40°C [32~104°F]
Storage temperature	-20~60°C [-4~140°F]
Relative humidity	20~90% RH [no condensation]

PANEL DESCRIPTIONS
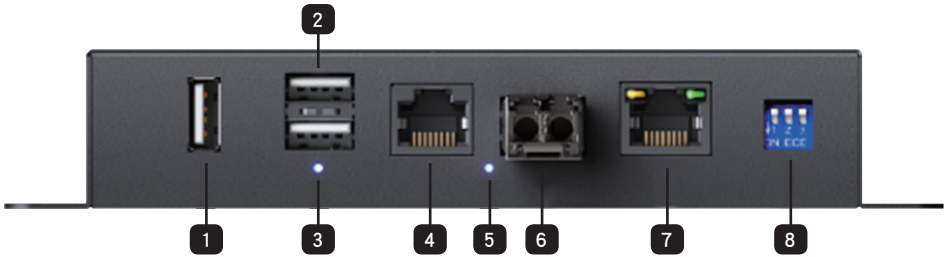
1. **USB-HID** : Connect to keyboard or mouse

2. **USB-HID** :

   [Top USB] Connect to keyboard or mouse [Bottom USB]

   (1) Connector to keyboard or mouse when the USB routing on the software is set as "remote"

   (2) Connect to computer when the USB routing on the software is set as "local"

3. **Indicator LED** : USB-HID LED

4. **10G Copper IN/OUT** : Plug in RJ-45 cable that needs to be linked to the other unit

5. **Indicator LED** : Link LED

6. **10G SFP IN/OUT∗** :

   Plug in single/multi-mode fiber optic cables cable that needs to be linked to the other unit

   (∗ Fiber module is NOT included in the product)

7. **Ethernet Port** : Ethernet control port

8. **Dip Switch** :

DIP Switch Position			Description
PIN#1	PIN#2	ON [↓] OFF [↑]	FW update 1
		ON [↓] ON [↓]	Reserved
		OFF [↑] ON [↓]	FW update 2
		OFF [↑] OFF [↑]	Normal mode
PIN#3		ON [↓]	Select transmission over SFP
		OFF [↑]	Select transmission over copper
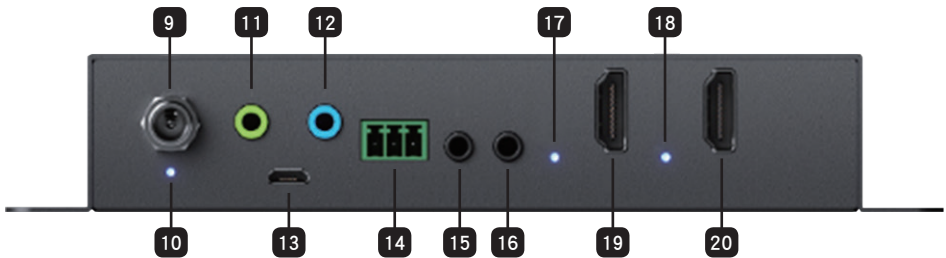
9. **+12V DC :** Connect to a 12V power supply unit

10. **Indicator LED :** Power LED

11. **IR Receiver :** Infrared 3.5mm socket for plugging in the extension cable of IR receiver

12. **IR Blaster :** Infrared 3.5mm socket for plugging in the extension cable of IR blaster

13. **Micro-USB :** for F/W update

14. **RS-232(terminal block format) :**

 The order of RS-232 pin are TX, RX, GND (from the left side to the right)

15. **Stereo OUT :** Connect to analog stereo audio speaker

16. **Stereo IN :** Connect to analog stereo audio source

17. **Indicator LED :** HDMI out signal LED

18. **Indicator LED :** HDMI in signal LED

19. **HDMI OUT :** Connect to a HDMI display with a HDMI male-male cable

20. **HDMI IN :** Connect to a HDMI source with a HDMI male-male cable

IR PASS-THROUGH

[IR Extenders]

Users can create video streams on the streaming service platform. The below steps show how to complete the video streaming settings from Twitch and YouTube.

[IR Sockets]

IR BLASTER : plug in the IR blaster to emit all IR command signals received from the IR receiver from the other end to control the devices corresponding to the IR signals.

IR RECEIVER : plug in the IR receiver to receive all IR command signals from the IR remote controls of the corresponding devices.

> Incorrect placement of IR Blaster and Receiver may result in the failure of the IR extenders. Please check carefully before plugging in the IR extender to the respective IR sockets. Warranty will not cover the damage.

[Definition of IR Earphone Jack]

IR Blaster

IR Receiver

1. IR Signal
2. Grounding

1. IR Signal [30-56 kHz]
2. Grounding
3. Power

1 2

1 2 3

> You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the extender if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

HDMI PIN DEFINITION
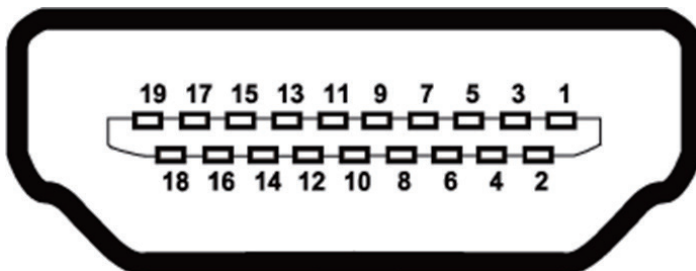
Type A (Receptacle) HDMI

Pin 1	TMDS Data2+
Pin 2	TMDS Data2 Shield
Pin 3	TMDS Data2−
Pin 4	TMDS Data1+
Pin 5	TMDS Data1 Shield
Pin 6	TMDS Data1−
Pin 7	TMDS Data0+
Pin 8	TMDS Data0 Shield
Pin 9	TMDS Data0−
Pin 10	TMDS Clock+
Pin 11	TMDS Clock Shield
Pin 12	TMDS Clock−
Pin 13	CEC
Pin 14	Reserved (N.C. on device)
Pin 15	SCL
Pin 16	SDA
Pin 17	DDC/CEC Ground
Pin 18	+5V Power
Pin 19	Hot Plug Detect

OPERATION APPROACH

Software Control through Ethernet port

1. System Requirement

    (1) OS information: Microsoft Windows 7/10/11

    (2) Software size: 35MB

    (3) Minimum RAM requirement: 256MB

2. Start the software control program

    (1) Extract the SDVoE Controller vX.X.rar file.

        SDVoE Controller v1.0.rar

    (2) Run SDVoE Controller.exe file from the folder.

        SDVoE Controller.exe

    (3) The application will automatically deploy the necessary files at the first start.

        log
        controlserver.conf
        controlserver.exe
        controlserver.log
        SDVoE Controller.exe
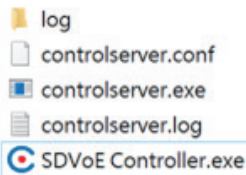
    (4) It's ready to be used once the controlserver.exe and the SDVoE Controller.exe are both running.

        * The control server listens at port 22280 by default. Please make sure that this port is not occupied or change the client port.
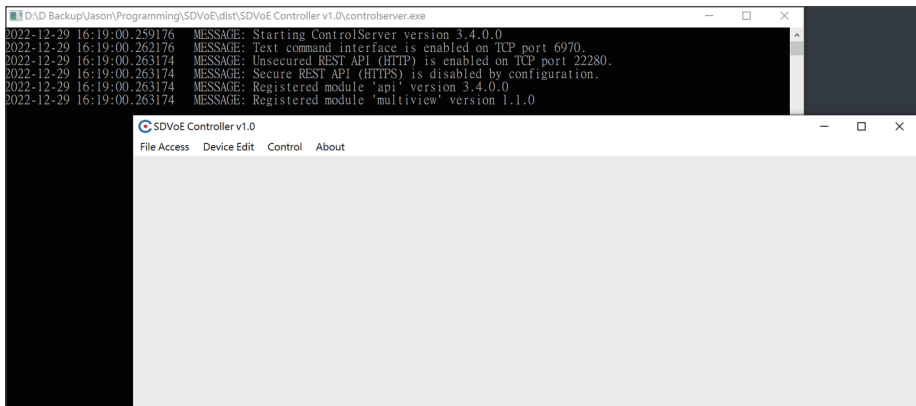
3. Control Interface

(1) Device Manager
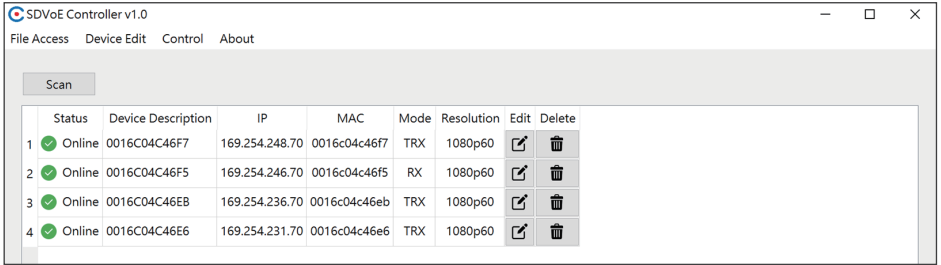
Go to **Device Edit → Device Manager**, and click **Scan** to find all the SDVoE devices within the same local network as the PC that runs this application.
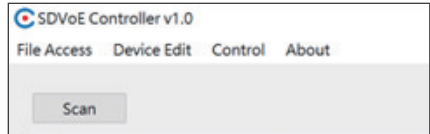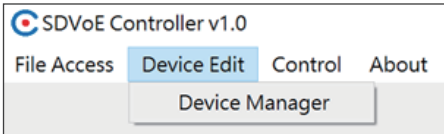

Device information

▪ **Status** : The online/offline status of each device. Click **Scan** to update the status.
  * The status of the devices would not automatically update unless scanned.


▪ **Device Description** : A custom string to identify a device. It can be edited by clicking **Edit** button.
▪ **IP :** The IP address of each device.
▪ **MAC:** The MAC address of each device.
▪ **Mode :** The mode of each device. It can be TX (Transmitter) / RX (Receiver) / TRX (Transceiver).
▪ **Resolution :** The output resolution of a device (TRX, RX only).
▪ **Edit :** It calls the device properties window. Users can configure device description, mode, and resolution here.
▪ **Delete :** It deletes the device from the list.

(2) Device Control Panel
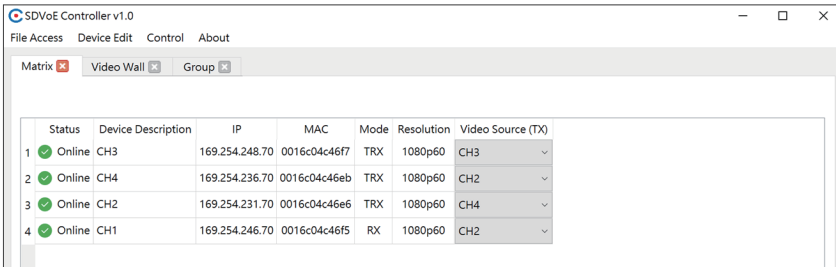
Click **Control → TX/RX Mapping** to switch to device control panel.
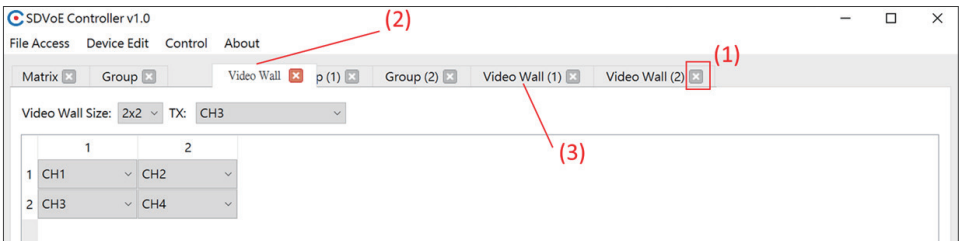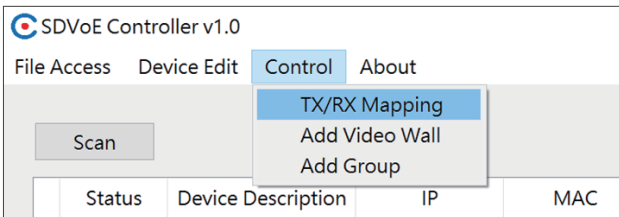
(1) Close a control panel
Click the ![x] button to close a control panel.
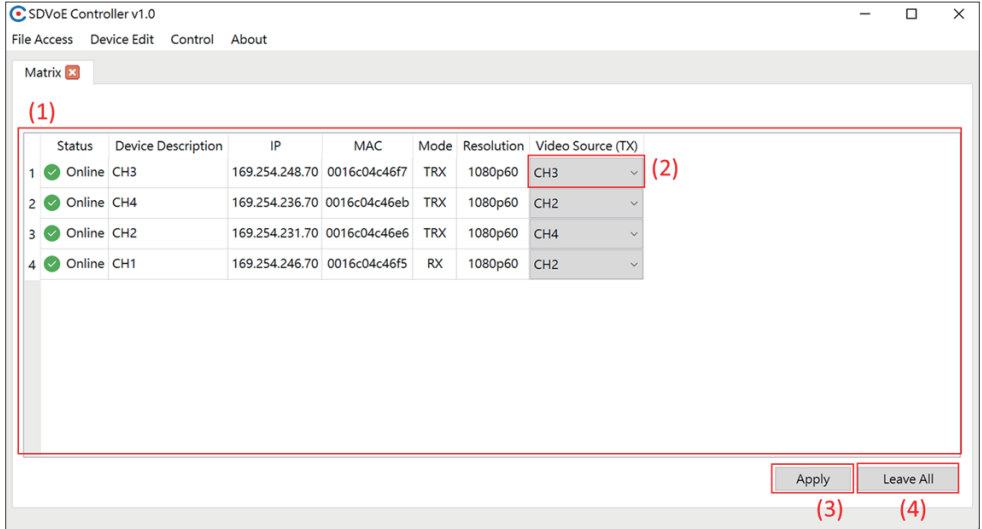
(2) Change the control panels' order
Drag and drop a control panel's tab horizontally to change the order of the control panels.

(3) Change the name of a control panel
Users can self-define a control panel's name by double-clicking its tab.

Matrix

Matrix control panel can be used to connect RX devices with any source in the TX group.

In the matrix panel, users can see a table of all devices in the RX group. They can connect a source from the TX group by selecting the source device on the dropdown list in the last column of the table.

(1) **List of RX device group** : All RX/TRX devices will be listed here.
(2) **Dropdown list of TX device group** : All TX/TRX devices would be included. Once a source device is selected, the corresponding RX device will display the source image. Selecting the blank item can disconnect the RX device from any source.
(3) **Apply button** : It applies all the RX and TX device pairs set on the table.
   * If an RX device is not assigned with any TX source(dropdown list set to blank), it would not be affected by this button.
(4) **Leave All** : It resets all the RX and TX device pairs on the table and disconnects the sources of all devices in the RX group.

Video Wall

A video wall control panel can be used to set up a video wall matrix with multiple RX devices and connect a TX source to it.
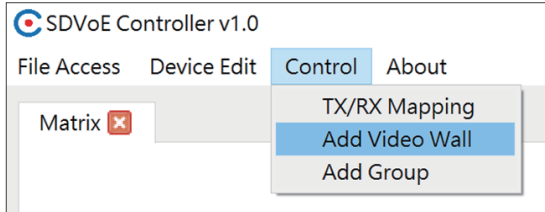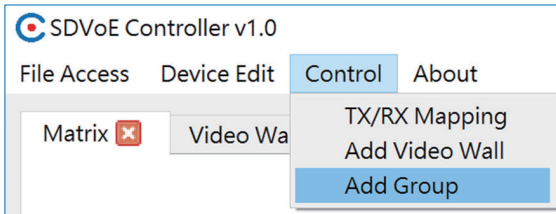

Go to Control, and click Add Video Wall to add a video wall control panel.
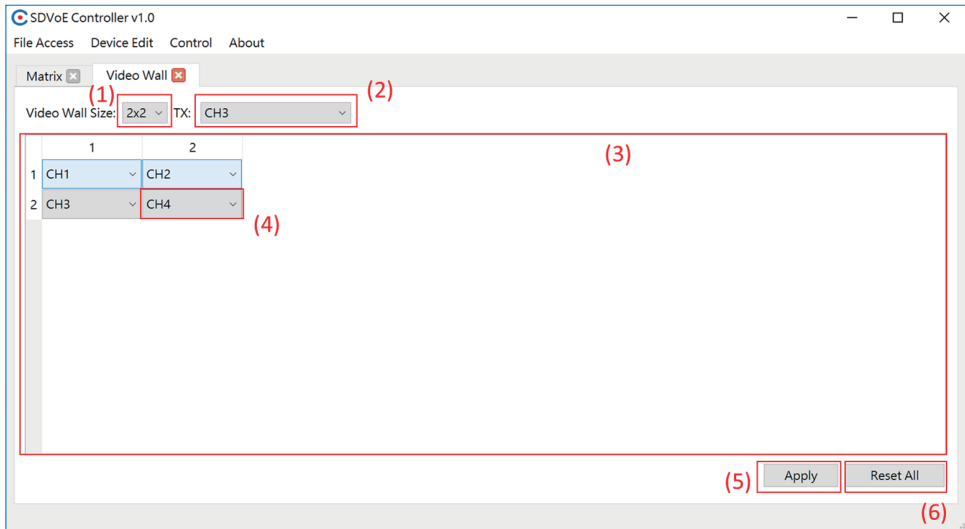
(1) **Video Wall Size** : Select the video wall size. It can be a 2x2, 3x3, …, and up to 9x9.
(2) **TX** : Select the source that will be displayed on the video wall.
(3) **Video wall panel frame** : The table listed all video wall panels with the absolute position on the video wall.
(4) **RX devices connected to each video wall panel** : Select the RX device on the dropdown list to define which RX device is connected to the video panel at the relative position.
(5) **Appy button** : It applies the video wall settings on the table.
(6) **Reset All** : It only resets all the RX and TX device selections on the table but does not disconnect the sources of RX devices in this video wall group.

Group

A group control panel is used to assign multiple RX devices with the same TX source at once.

Go to Control, and click Add Group to add a video wall control panel.
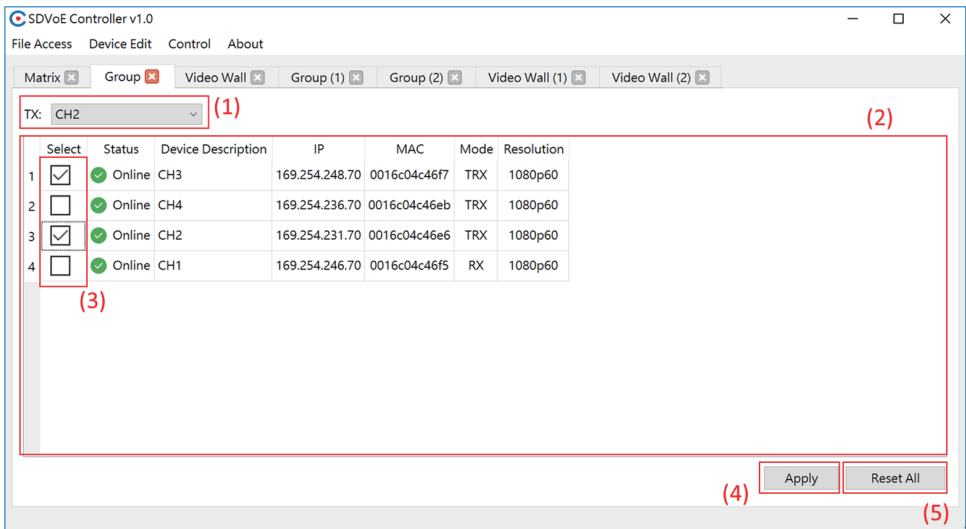
(1) **TX** : Select the video source that will be displayed on selected RX devices.
(2) **List of RX device group** : All RX/TRX devices will be listed here.
(3) **Checkbox of RX devices** : Select the RX devices that will be applied with the selected TX source.
(4) **Appy button** : It applies the group control settings to the selected devices.
(5) **Reset All** : It only resets all the RX and TX device selections on the table but does not disconnect the sources of RX devices in this group control panel.

4. SDVoE Project

Once users finish setting the SDVoE devices, all the configurations in the control panels can be saved as an SDVoE project. And the application will deploy the configurations within an SDVoE project after it is opened.
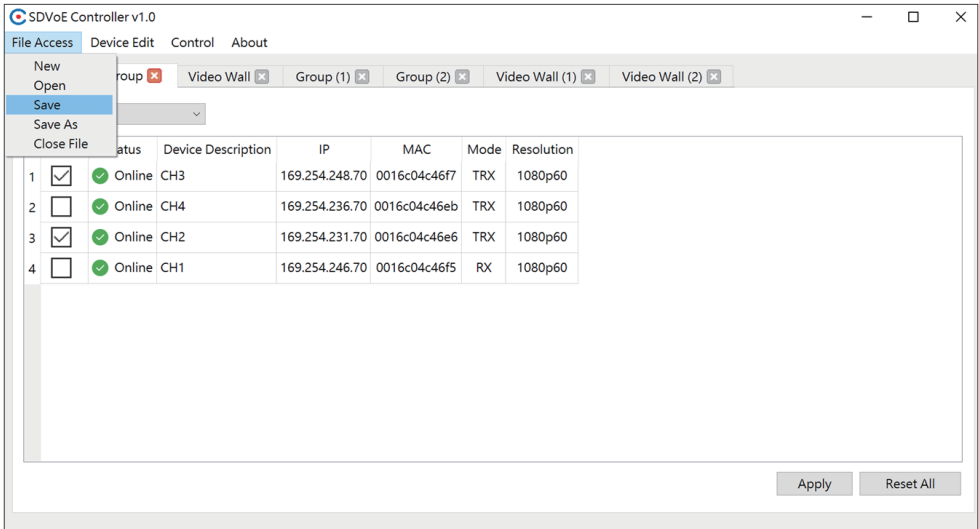
(1) **New** : Close the current project and create a new one.
(2) **Open** : Open an existing project and deploy all the settings to the devices.
  * **Note** : When an RX device is assigned in multiple control panels, its configuration will be overridden to the last setting applied. The application will deploy with the latest settings as well.
(3) **Save** : Save the current project.
(4) **Save As** : Save the current project to a new location.
(5) **Close File** : Close the current project.

WARRANTY

AREC Inc. warrants the **DS-MT1 HDMI 2.0 over IP Multicast Transceiver System with Bi- directional IR, RS-232, Audio Extender/Extractor, USB & Video Wall Support** free from defects in the material and workmanship for 1 year from the date of purchase from AREC Inc. or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, AREC Inc., at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surge. This warranty is offered by AREC Inc. for its BUYER with direct transaction only. This warranty is void if the warranty seal on the metal housing is broken.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from AREC Inc. Cables and power adapters are limited to a 30 day warranty and must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, AREC Inc. assumes no responsibility for any inaccuracies that may be contained in this manual. AREC Inc. will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. **Also, the technical information contained herein regarding the DS-MT1 features and specifications is subject to change without further notice.**

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