



MED-AS60

Multi-Input Switcher with Multi-Window Display



Operation Manual

HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI licensing Administrator, Inc.

DISCLAIMERS

The information in this manual has been carefully checked and is believed to be accurate. Cypress Technology assumes no responsibility for any infringements of patents or other rights of third parties which may result from its use.

Cypress Technology assumes no responsibility for any inaccuracies that may be contained in this document. Cypress also makes no commitment to update or to keep current the information contained in this document.

Cypress Technology reserves the right to make improvements to this document and/or product at any time and without notice.

COPYRIGHT NOTICE

No part of this document may be reproduced, transmitted, transcribed, stored in a retrieval system, or any of its part translated into any language or computer file, in any form or by any means—electronic, mechanical, magnetic, optical, chemical, manual, or otherwise—without express written permission and consent from Cypress Technology.

© Copyright 2018 by Cypress Technology.

All Rights Reserved.

TRADEMARK ACKNOWLEDGMENTS

All products or service names mentioned in this document are trademarks of the companies with which they are associated.



SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REV.	DATE	SUMMARY OF CHANGE
RDV1	2020/10/23	Preliminary release



CONTENTS

1. Introduction	1
2. Applications	1
3. Package Contents	1
4. System Requirements	2
5. Features	2
6. Operation Controls and Functions	3
6.1 Front Panel.....	3
6.2 Rear Panel.....	4
6.3 RS-232 Pinout and Defaults	5
6.4 Software Control.....	6
6.4.1 Software Installation	6
6.4.2 Device Connection	7
6.4.3 Settings Tab.....	8
6.4.4 System Tab.....	10
6.5 Serial Commands.....	11
7. Connection Diagram	20
8. Specifications	21
8.1 Technical Specifications	21
8.2 Video Specifications	22
8.3 Audio Specifications	23
8.3.1 Digital Audio	23
8.4 Cable Specifications	24
9. Acronyms	25



1. INTRODUCTION

This Multi-Input Switcher with Multi-Window Display unit supports all of the most common professional video formats used by medical devices at resolutions up to 1080p@60Hz (4:4:4, 12-bit). Available inputs include: 4 HDMI, 2 SDI, 2 RGBHV (VGA), and 2 composite video. After connecting multiple medical device signal sources, this unit converts all of the signals to HDMI to allow the information to be integrated together within a variety of convenient multi-window (up to 4 simultaneous windows) preset arrangements for output and easy monitoring. With two independently configured video output channels it's possible to arrange the information to match two different viewing scenarios simultaneously while a third, independently switchable, output can select which multi-window channel to monitor.

This multiviewer is optionally expandable with the addition of external video management units to enable recording and/or streaming the content of any of the video outputs for archival or educational purposes if required. Control is provided via front panel buttons, easy to use PC software, or RS-232 commands.

2. APPLICATIONS

- Medical Equipment Multiviewer and Monitoring
- Lecture Room Presentations
- Showrooms & Demo Rooms

3. PACKAGE CONTENTS

- 1× Multi-Input Switcher with Multi-Window Display
- 1× 24V/2.7A DC Power Adapter
- 1× 3-pin Terminal Block
- 1× Shockproof Feet (Set of 4)
- 1× Operation Manual

4. SYSTEM REQUIREMENTS

- HDMI, VGA, SDI, and composite video source equipment such as video cameras, medical equipment, or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.
- Windows 10 or later PC for configuration and control.
- External network streaming/recording unit. (Optional)

5. FEATURES

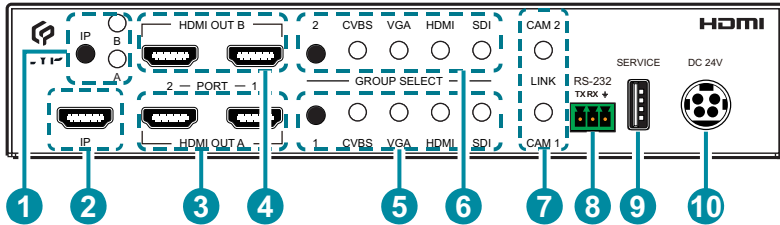
- HDMI 1.4 and DVI 1.0 compliant (with the use of an HDMI-DVI adapter)
- HDCP 1.x compliant
- 4 HDMI, 2 SDI, 2 RGBHV (VGA), and 2 composite video inputs
- 5 HDMI outputs (2 unique output channels, other ports are mirrored)
- HDMI inputs/outputs support up to 1080p/WUXGA (6.75Gbps, 1080p@50/60Hz 4:4:4, 12-bit) video input and output
- HDMI inputs/outputs support 2 channel LPCM audio
- SDI inputs support the following video standards: SMPTE 259M-C, SMPTE 292M, and SMPTE 424M/425M-A

Note: SDI audio is not supported.

- Composite video inputs support both NTSC and PAL
- Supports conversion of multiple video formats to HDMI output
- Supports dual independent output paths with selectable full screen or multi-window configurations. Multi-window configurations include PiP, Equal Quad-view, Large-Left Quad-view, and Large-Top Quad-view with definable primary window source.
- Independent audio source selection via RS-232
- Intuitive and easy adjustment of multiviewer window configurations and routing using the Windows PC software
- Control is provided via front panel buttons, easy to use PC software, or RS-232 commands

6. OPERATION CONTROLS AND FUNCTIONS

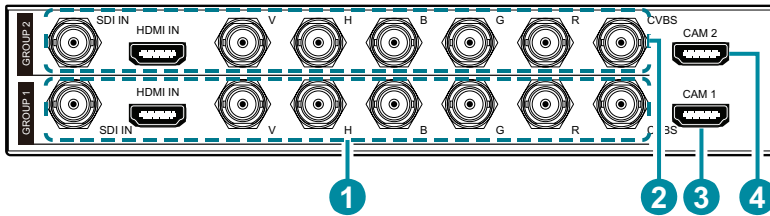
6.1 Front Panel



- 1 IP A/B Button & LEDs:** Press this button to toggle between monitoring HDMI output A or B on the IP output. The LED will illuminate to indicate which output is currently being monitored by the IP output.
- 2 IP HDMI Output Port:** Connect to an HDMI TV, monitor, amplifier or other HDMI receiving device for digital video and audio output.

Note: This output port is primarily intended for monitoring and will typically be connected to a IP streaming or recording device.
- 3 HDMI OUT A Ports 1 & 2:** Connect to HDMI TVs, monitors, or amplifiers for digital video and audio output.
- 4 HDMI OUT B Ports 1 & 2:** Connect to HDMI TVs, monitors, or amplifiers for digital video and audio output.
- 5 GROUP SELECT 1 Button and LEDs:** Press this button to sequentially switch through the available sources to display in the “Group 1” window. The LED will illuminate to indicate which source is currently selected.
- 6 GROUP SELECT 2 Button and LEDs:** Press this button to sequentially switch through the available sources to display in the “Group 2” window. The LED will illuminate to indicate which source is currently selected.
- 7 CAM 1 & 2 Link LEDs:** These LEDs will illuminate to indicate that a live source has been detected on the associated input port. When no source is detected the LED will remain off.
- 8 RS-232 3-pin Terminal Block:** Connect directly to a PC, laptop, or other serial control device with a 3-pin adapter cable to send RS-232 commands to control the unit.
- 9 SERVICE USB 2.0 Port:** This port is reserved for firmware update use only.
- 10 DC 24V Port:** Plug the 24V DC power adapter into this port and connect it to an AC wall outlet for power.

6.2 Rear Panel



1 GROUP 1:

SDI IN Port: Connect to SDI source equipment such as a video camera, medical equipment, or set-top box.

Note: SDI audio is not supported.

HDMI IN Port: Connect to HDMI source equipment such as a video camera, medical equipment, or set-top box.

RGBHV 5-BNC Port: Connect to VGA source equipment such as a PC, medical equipment, or set-top box. The use of a 15-pin to 5-BNC adapter may be required.

Note: YUV, RGBS and RGsB sources are not supported.

CVBS Port: Connect to composite video source equipment such as a video camera or medical equipment.

2 GROUP 2:

SDI IN Port: Connect to SDI source equipment such as a video camera, medical equipment, or set-top box.

Note: SDI audio is not supported.

HDMI IN Port: Connect to HDMI source equipment such as a video camera, medical equipment, or set-top box.

RGBHV 5-BNC Port: Connect to VGA source equipment such as a PC, medical equipment, or set-top box. The use of a 15-pin to 5-BNC adapter may be required.

Note: YUV, RGBS and RGsB sources are not supported.

CVBS Port: Connect to composite video source equipment such as a video camera or medical equipment.

3 CAM 1 Port:

Connect to HDMI source equipment such as a media player, game console, or set-top box.

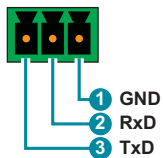
4 CAM 2 Port:

Connect to HDMI source equipment such as a media player, game console, or set-top box.

6.3 RS-232 Pinout and Defaults

Serial Port Default Settings	
Baud Rate	19200
Data Bits	8
Parity Bits	None
Stop Bits	1
Flow Control	None

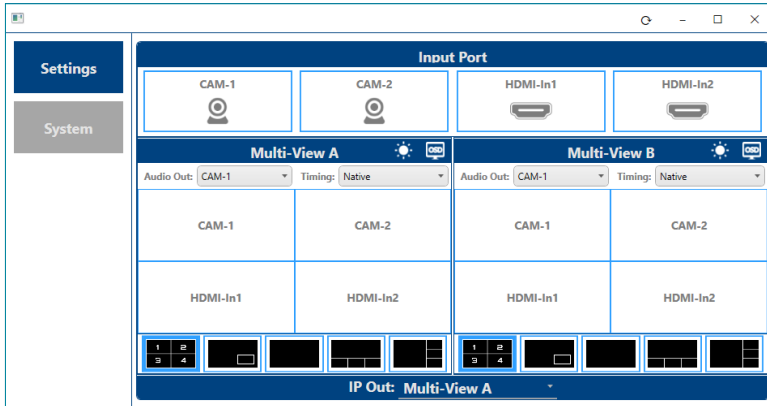
3-pin Terminal Block



6.4 Software Control

This unit's dedicated control software provides complete control over the unit via the RS-232 terminal block connection. This software provides control over source switching, multiview layout selection, IP output monitoring selection, output resolutions, primary input type selection, audio source selection, and per-window proc-amp settings.

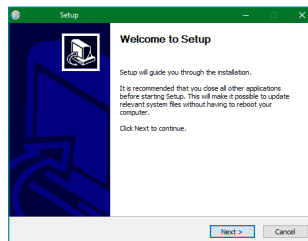
Note: This software is only compatible with PCs running Windows 10 or later Windows operating systems.



6.4.1 Software Installation

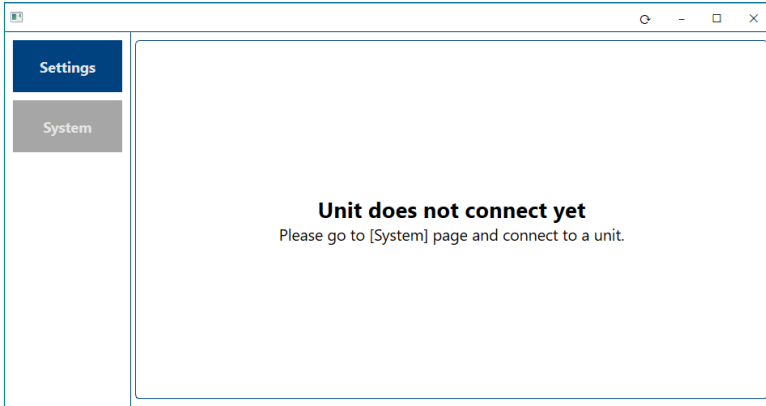
Before beginning the installation of the software, it is recommended to uninstall any previously installed versions of the software, to avoid potential conflicts, by using the Windows "Add or Remove Programs" function.

Please obtain the control software's installer from your authorized dealer and save it in a directory where you can easily find it. Extract all files from the *.zip file, find the Install.exe file, and execute it to launch the Installation Wizard. Follow the installation prompts and select your preferred installation location to complete the installation. After the installation is complete, a shortcut will be placed on the Windows desktop. Double click on the shortcut to start the control software.



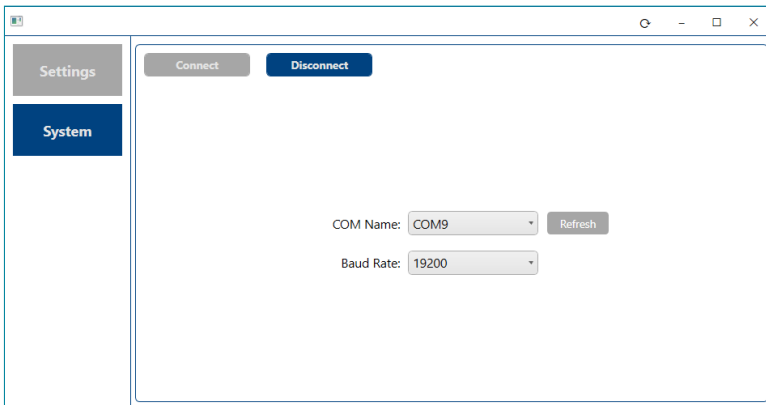
6.4.2 Device Connection

By default, when the software starts, it will not be connected to a unit, and a blank starter screen will be displayed.



To connect to a unit, switch to the System Tab and use the dropdowns to select the correct COM port and baud rate for connecting to the preferred unit.

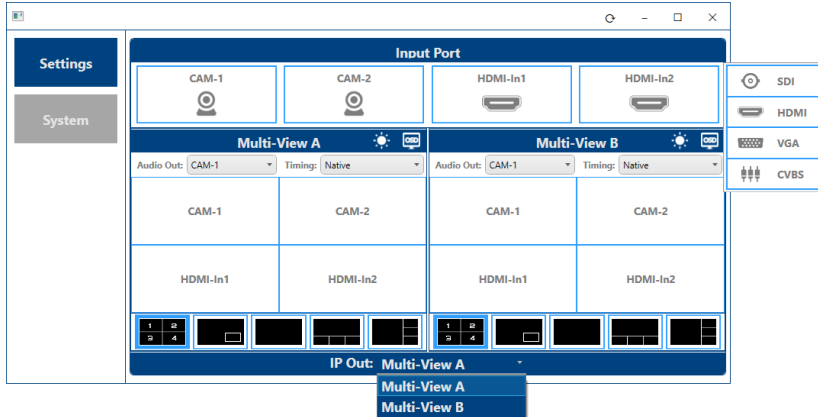
Note: If a USB dongle was added to the PC to provide RS-232 functionality, the COM port might not appear initially. In this case, click the “Refresh” button to update the list of available COM ports in the dropdown.



Once the COM port and baud rate has been selected, click on the “Connect” button and the software will connect to the unit and download it’s current configuration and settings. After this is completed, you may switch to the Settings Tab to begin controlling the unit directly.

6.4.3 Settings Tab

This tab provides convenient access to control over all input, output, and display configuration functions of the unit. At the top of the page is a Sync icon (⌂) that can be clicked on to force the software to resynchronize with the unit, if necessary.

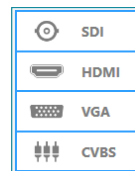


1) **Input Port Section:** This section contains controls for renaming inputs and selecting the input source type used by input groups 1 and 2. If a source is not currently detected as active, the port icon will be replaced with a No Sync icon (⊘).

- **Rename Inputs:** To rename any input, double click on the input's name, above the icon. This will open the "Rename" dialog window. Type in the preferred new name, up to 32 characters long, and then click "OK".

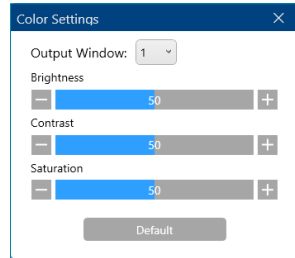
Note: Group 1 and 2 input names can only be changed when they are active as the current source for that group.

- **Input Group 1/2 Source:** To change the currently active source for Group 1 or 2, right click on the associated section to open up the source selection window then select a new source from the 4 available options.



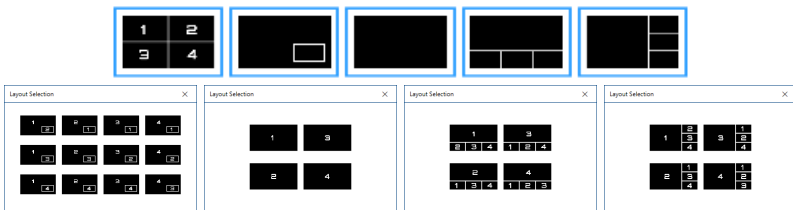
2) **Multiview Output A/B Sections:** This section provides control over the multiview layouts for HDMI outputs A and B as well as output resolutions, audio source selection, and proc-amp settings for each individual multiview window.

- Rename Output:** To rename either output, double click on the output's name to open the "Rename" dialog window. Type in the preferred new name, up to 32 characters long, and then click "OK".
- Multiview Window Color Settings:** To adjust the brightness, contrast, or saturation of a multiview window, click on the Color Settings icon (☼) and a window will pop up. This allows you to select the multiview window to modify, and set your preferred values. To return the window to its default values, click on the "Default" button.



Note: Changes made to these settings will occur immediately.

- Output OSD:** Click on the OSD icon (Ⓜ) to enable or disable the display of the information OSD on the associated HDMI output.
- Audio Out:** Use the dropdown to select the audio source to use for the associated HDMI output.
- Timing:** Use the dropdown to select the output resolution for the associated HDMI output.
- Multiview Layout:** To change an HDMI output's multiview layout, click on the preferred new layout from the 5 provided premade layouts that are associated with the HDMI output. If the selected layout has multiple variations, a "Layout Selection" window will pop up to allow you to select the preferred window/input assignments.



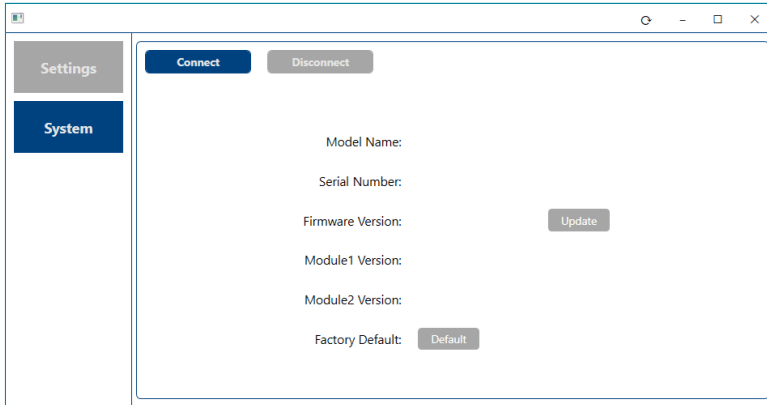
Note: The quad-view layout only has one window arrangement.

- IP Out Section:** Use the dropdown to select which primary HDMI output set (A or B) to mirror over the unit's IP HDMI output.

Note: Changing the IP Out mirror source may cause the selected mirror source to briefly blink out and back on during the switch.

6.4.4 System Tab

Once connected to a unit, this tab provides access to basic unit details such as model name, serial number, and firmware versions, as well as a way to reset the unit to its factory defaults, update the primary MCU's firmware, and disconnect from the unit. At the top of the page is a Sync icon (⌂) that can be clicked on to force the software to resynchronize with the unit, if necessary.



- 1) **Connect:** Press this button, when not already connected to a unit, to connect to a unit after selecting an appropriate COM port and baud rate.
Note: Please refer to section 6.4.2 for more details.
- 2) **Disconnect:** Press this button to disconnect the software from a unit.
- 3) **Model Name/Serial Number:** Displays the unit's model name and serial number.
- 4) **Firmware Versions:** Displays the current firmware version of the primary MCU, hardware module 1, and hardware module 2.
- 5) **Firmware Update:** Provides a way to update the primary MCU's firmware. To update the firmware, click the "Update" button and the follow the prompts. When prompted, insert a USB thumb drive, with a valid firmware file (*.bin format) in the root directory, into the unit's USB service port and the update process will begin. After the update is complete the unit will automatically reboot.
Note: Only the primary MCU's firmware is updated when using the software's firmware update function. In the unlikely event that the firmware for module 1 and 2 need to be updated, please contact your authorized dealer for detailed instructions.
- 6) **Factory Default:** Selecting this will reset the unit's settings back to their factory defaults.

6.5 Serial Commands

COMMAND
Description and Parameters
<p>help↵</p> <p>Show the full command list.</p>
<p>help N1↵</p> <p>Show details about the specified command.</p> <p>N1 = {Command}</p>
<p>?↵</p> <p>Show the full command list.</p>
<p>? N1↵</p> <p>Show details about the specified command.</p> <p>N1 = {Command}</p>
<p>get fw ver↵</p> <p>Show the unit's current firmware version.</p>
<p>get command ver↵</p> <p>Show the unit's current command version.</p>
<p>get model name↵</p> <p>Show the unit's model name.</p>
<p>set factory default↵</p> <p>Reset the unit to the factory defaults.</p>
<p>get update filename↵</p> <p>Show the unit's update firmware filename.</p>
<p>set out N1 name N2↵</p> <p>Set the name of the specified output.</p> <p>Available values for N1:</p> <p>A [HDMI output A] B [HDMI output B]</p> <p>N2 = {ASCII Name} [Output name, 32 characters max]</p>

COMMAND

Description and Parameters

get out N1 name↵

Show the name of the specified output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

get out name list↵

List the names of all outputs on the unit.

set out N1 timing N2↵

Set the output resolution to use for the specified output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

Available values for **N2**:

0	[720×480p@60Hz]
1	[720×576p@50Hz]
2	[1280×720p@50Hz]
3	[1280×720p@60Hz]
4	[1920×1080p@24Hz]
5	[1920×1080p@25Hz]
6	[1920×1080p@30Hz]
7	[1920×1080p@50Hz]
8	[1920×1080p@60Hz]
9	[1024×768@60Hz]
10	[1280×800@60Hz]
11	[1280×1024@60Hz]
12	[1366×768@60Hz]
13	[1440×900@60Hz]
14	[1600×900@60Hz RB]
15	[1600×1200@60Hz]
16	[1680×1050@60Hz]
17	[1920×1200@60Hz]
18	[Native]

COMMAND

Description and Parameters

get out N1 timing↵

Show the current resolution used by the specified output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

set audio out N1 route N2↵

Route the specified audio input to the specified audio output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

Available values for **N2**:

1	[Cam 1 audio]
2	[Cam 2 audio]
3	[Group 1 HDMI audio]
4	[Group 2 HDMI audio]

get audio out N1 route↵

Show the current audio input routed to the specified audio output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

set out N1 window N2 contrast N3↵

Set the contrast level for the specified window on the specified output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

N2 = 1~4 [Window number]

N3 = 0~100 [Contrast level]

COMMAND	
Description and Parameters	
get out N1 window N2 contrast↵	<p>Show the current contrast level for the specified window on the specified output.</p> <p>Available values for N1:</p> <p>A [HDMI output A] B [HDMI output B]</p> <p>N2 = 1~4 [Window number]</p>
set out N1 window N2 brightness N3↵	<p>Set the brightness level for the specified window on the specified output.</p> <p>Available values for N1:</p> <p>A [HDMI output A] B [HDMI output B]</p> <p>N2 = 1~4 [Window number] N3 = 0~100 [Brightness level]</p>
get out N1 window N2 brightness↵	<p>Show the current brightness level for the specified window on the specified output.</p> <p>Available values for N1:</p> <p>A [HDMI output A] B [HDMI output B]</p> <p>N2 = 1~4 [Window number]</p>
set out N1 window N2 saturation N3↵	<p>Set the saturation level for the specified window on the specified output.</p> <p>Available values for N1:</p> <p>A [HDMI output A] B [HDMI output B]</p> <p>N2 = 1~4 [Window number] N3 = 0~100 [Saturation level]</p>

COMMAND

Description and Parameters

get out N1 window N2 saturation↵

Show the current saturation level for the specified window on the specified output.

Available values for **N1**:

A [HDMI output A]

B [HDMI output B]

N2 = 1~4 [Window number]

set out N1 osd info display N2↵

Enable or disable the info OSD for the specified output.

Available values for **N1**:

A [HDMI output A]

B [HDMI output B]

Available values for **N2**:

ON [Info OSD enabled]

OFF [Info OSD disabled]

get out N1 osd info display↵

Show the current info OSD state for the specified output.

Available values for **N1**:

A [HDMI output A]

B [HDMI output B]

set group N1 in N2 name N3↵

Set the name of the specified input within the specified group.

Available values for **N1**:

1 [Group 1]

2 [Group 2]

Available values for **N2**:

1 [SDI input]

2 [HDMI input]

3 [VGA input]

4 [CVBS input]

N3 = {ASCII Name} [Input name, 32 characters max]

COMMAND

Description and Parameters

get group N1 in N2 name↵

Show the current name of the specified input within the specified group.

Available values for **N1**:

- 1 [Group 1]
- 2 [Group 2]

Available values for **N2**:

- 1 [SDI input]
- 2 [HDMI input]
- 3 [VGA input]
- 4 [CVBS input]

set in N1 name N2↵

Set the name of the specified camera input.

Available values for **N1**:

- 1 [Cam 1 input]
- 2 [Cam 2 input]

N2 = {ASCII Name} [Input name, 32 characters max]

get in N1 name↵

Show the current name of the specified input.

Available values for **N1**:

- 1 [Cam 1 input]
- 2 [Cam 2 input]

set group N1 route N2↵

Set the active input within the specified group.

Available values for **N1**:

- 1 [Group 1]
- 2 [Group 2]

Available values for **N2**:

- 1 [SDI input]
- 2 [HDMI input]
- 3 [VGA input]
- 4 [CVBS input]

COMMAND									
Description and Parameters									
get group N1 route ↵	<p>Show which input is currently active within the specified group.</p> <p>Available values for N1:</p> <table> <tr> <td>1</td> <td>[Group 1]</td> </tr> <tr> <td>2</td> <td>[Group 2]</td> </tr> </table>	1	[Group 1]	2	[Group 2]				
1	[Group 1]								
2	[Group 2]								
set all group route N1 ↵	<p>Set the specified input type as active within both groups.</p> <p>Available values for N1:</p> <table> <tr> <td>1</td> <td>[SDI input]</td> </tr> <tr> <td>2</td> <td>[HDMI input]</td> </tr> <tr> <td>3</td> <td>[VGA input]</td> </tr> <tr> <td>4</td> <td>[CVBS input]</td> </tr> </table>	1	[SDI input]	2	[HDMI input]	3	[VGA input]	4	[CVBS input]
1	[SDI input]								
2	[HDMI input]								
3	[VGA input]								
4	[CVBS input]								
get all group route ↵	<p>Show which input type is currently active within the both groups.</p>								
get group N1 port number ↵	<p>Show the total number of inputs within the specified group.</p> <p>Available values for N1:</p> <table> <tr> <td>1</td> <td>[Group 1]</td> </tr> <tr> <td>2</td> <td>[Group 2]</td> </tr> </table>	1	[Group 1]	2	[Group 2]				
1	[Group 1]								
2	[Group 2]								
get group N1 type list ↵	<p>List the port type for all inputs within the specified group.</p> <p>Available values for N1:</p> <table> <tr> <td>1</td> <td>[Group 1]</td> </tr> <tr> <td>2</td> <td>[Group 2]</td> </tr> </table>	1	[Group 1]	2	[Group 2]				
1	[Group 1]								
2	[Group 2]								
get group N1 in name list ↵	<p>List the names of all inputs within the specified group.</p> <p>Available values for N1:</p> <table> <tr> <td>1</td> <td>[Group 1]</td> </tr> <tr> <td>2</td> <td>[Group 2]</td> </tr> </table>	1	[Group 1]	2	[Group 2]				
1	[Group 1]								
2	[Group 2]								
get in name list ↵	<p>List the names of all camera inputs on the unit.</p>								

COMMAND

Description and Parameters

set out N1 window layout mode N2↵

Set the unit's window layout mode for the specified output.

Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

Available values for **N2**:

1	[Quad split, equal division]
2	[PiP, Cam 1 primary, Cam 2 secondary]
3	[PiP, Cam 1 primary, Group 1 secondary]
4	[PiP, Cam 1 primary, Group 2 secondary]
5	[PiP, Cam 2 primary, Cam 1 secondary]
6	[PiP, Cam 2 primary, Group 1 secondary]
7	[PiP, Cam 2 primary, Group 2 secondary]
8	[PiP, Group 1 primary, Cam 1 secondary]
9	[PiP, Group 1 primary, Cam 2 secondary]
10	[PiP, Group 1 primary, Group 2 secondary]
11	[PiP, Group 2 primary, Cam 1 secondary]
12	[PiP, Group 2 primary, Cam 2 secondary]
13	[PiP, Group 2 primary, Group 1 secondary]
14	[Full screen, Cam 1]
15	[Full screen, Cam 2]
16	[Full screen, Group 1]
17	[Full screen, Group 2]
18	[Quad, Cam 1 upper primary]
19	[Quad, Cam 2 upper primary]
20	[Quad, Group 1 upper primary]
21	[Quad, Group 2 upper primary]
22	[Quad, Cam 1 left primary]
23	[Quad, Cam 2 left primary]
24	[Quad, Group 1 left primary]
25	[Quad, Group 2 left primary]

get out N1 window layout mode↵

Show the current window layout mode on the specified output.

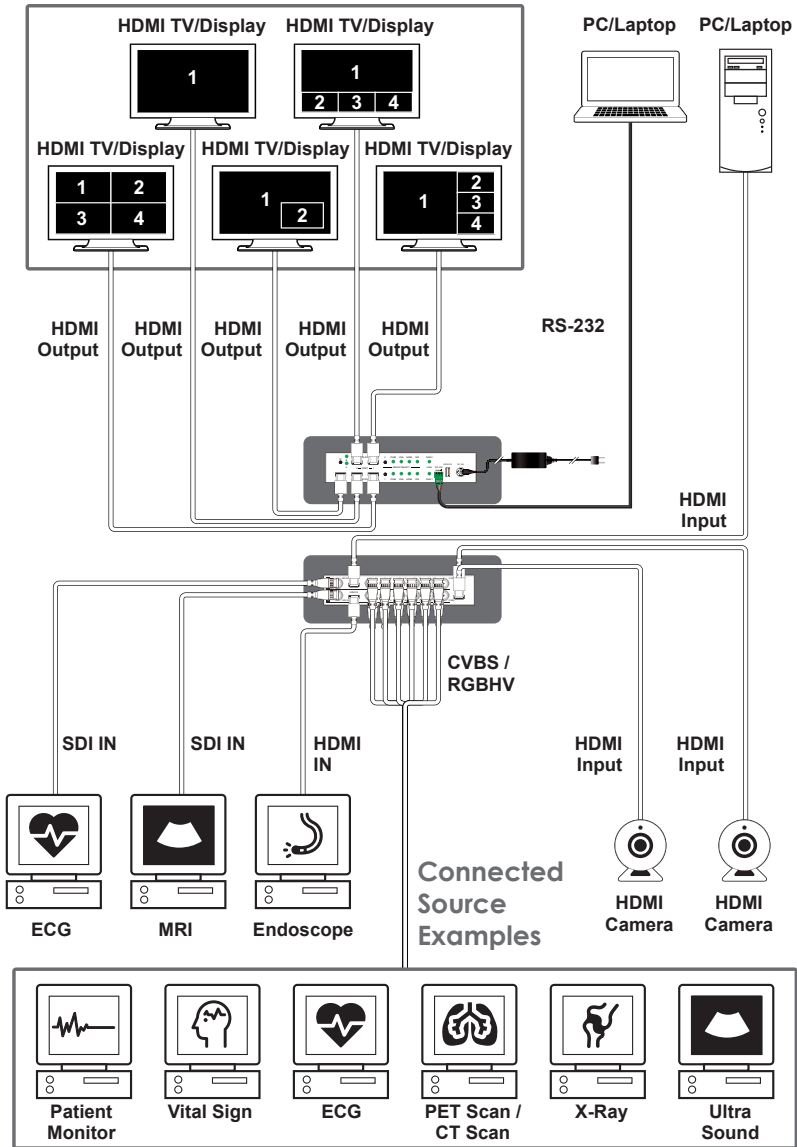
Available values for **N1**:

A	[HDMI output A]
B	[HDMI output B]

COMMAND	
Description and Parameters	
set ToIP route N1 ↵	
	Set which output's content to also route to the "IP" HDMI output.
	Available values for N1 :
A	[HDMI output A]
B	[HDMI output B]
get ToIP route ↵	
	Show the HDMI output that is currently monitored by the "IP" HDMI output.

Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	6.75Gbps
VGA Bandwidth	165MHz
SDI Bandwidth	2.970Gbps
Input Ports	4×HDMI (Type-A) 2×3G-SDI (BNC) 2×VGA (5-BNC) 2×CVBS (BNC)
Output Ports	5×HDMI (Type-A)
Control Port	1×RS-232 (3-pin Terminal Block)
Service Port	1×USB 2.0 (Type-A)
Baud Rate	19200
Power Supply	24V/2.7A DC (US/EU standards, CE/FCC/UL certified)
ESD Protection (HBM)	±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions (W×H×D)	220mm×43mm×293mm [Case Only] 220mm×43mm×310mm [All Inclusive]
Weight	2150g
Chassis Material	Metal (Steel)
Chassis Color	White
Operating Temperature	0°C – 40°C/32°F – 104°F
Storage Temperature	-20°C – 60°C/-4°F – 140°F
Relative Humidity	20 – 90% RH (Non-condensing)
Power Consumption	49.5W

8.2 Video Specifications

Supported Resolutions (Hz)	Input				Output
	HDMI	SDI	VGA	CVBS	HDMI
720×400p@70/85	✓	×	✓	×	×
640×480p@60/72/75/85	✓	×	✓	×	×
720×480i@60	×	✓	×	✓	×
720×480p@60	✓	✓	✓	×	✓
720×576i@50	×	✓	×	✓	×
720×576p@50	✓	✓	✓	×	✓
800×600p@56/60/72/75/85	✓	×	✓	×	×
848×480p@60	✓	×	✓	×	×
1024×768p@60/70/75/85	✓	×	✓	×	60
1152×864p@75	✓	×	✓	×	×
1280×720p@50/60	✓	✓	✓	×	✓
1280×768p@60/75/85	✓	×	✓	×	×
1280×800p@60/75/85	✓	×	✓	×	60
1280×960p@60/85	✓	×	✓	×	×
1280×1024p@60/75/85	✓	×	✓	×	60
1360×768p@60	×	×	×	×	×
1366×768p@60	×	×	×	×	✓
1400×1050p@60	×	×	×	×	×
1440×900p@60/75	×	×	×	×	60
1600×900p@60RB	✓	×	✓	×	✓
1600×1200p@60	✓	×	✓	×	✓
1680×1050p@60	✓	×	✓	×	✓
1920×1080i@50/60	✓	✓	✓	×	×
1920×1080p@24/25/30	✓	✓	✓	×	✓
1920×1080p@50/60	✓	✓	✓	×	✓
1920×1200p@60RB	✓	×	✓	×	✓

Supported Resolutions (Hz)	Input				Output
	HDMI	SDI	VGA	CVBS	HDMI
2560×1440p@60RB	x	x	x	x	x
2560×1600p@60RB	x	x	x	x	x
2048×1080p@24/25/30	x	x	x	x	x
2048×1080p@50/60	x	x	x	x	x
3840×2160p@24/25/30	x	x	x	x	x
3840×2160p@50/60 (4:2:0)	x	x	x	x	x
3840×2160p@24, HDR10	x	x	x	x	x
3840×2160p@50/60 (4:2:0), HDR10	x	x	x	x	x
3840×2160p@50/60	x	x	x	x	x
4096×2160p@24/25/30	x	x	x	x	x
4096×2160p@50/60 (4:2:0)	x	x	x	x	x
4096×2160p@24, HDR10	x	x	x	x	x
4096×2160p@50/60 (4:2:0), HDR10	x	x	x	x	x
4096×2160p@50/60	x	x	x	x	x

8.3 Audio Specifications

8.3.1 Digital Audio

HDMI Input / Output	
LPCM	
Max Channels	2 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	None

8.4 Cable Specifications

Cable Length	480i/p	1080p	4K30	4K60
	8-bit	8-bit	(4:4:4) 8-bit	(4:4:4) 8-bit
High Speed HDMI Cable				
HDMI Input	20m	10m	x	
HDMI Output	20m	10m	x	
Coaxial Cable (75Ω)				
SDI Input	400m	65m	x	
CVBS Input	25m	x		
VGA Cable (5-BNC)				
VGA Input	2m		x	

Bandwidth Category Examples:

- **1080p (FHD Video)**
 - Up to 1080p@60Hz, 12-bit color
 - Data rates lower than 5.3Gbps or below 225MHz TMDS clock
- **4K30 (4K UHD Video)**
 - 4K@24/25/30Hz & 4K@50/60Hz (4:2:0), 8-bit color
 - Data rates higher than 5.3Gbps or above 225MHz TMDS clock but below 10.2Gbps
- **4K60 (4K UHD⁺ Video)**
 - 4K@50/60Hz (4:4:4, 8-bit)
 - 4K@50/60Hz (4:2:0, 10-bit HDR)
 - Data rates higher than 10.2Gbps

Note: SDI cable length assumes cable with performance equal to, or better than, Belden 1695A has been used.

9. ACRONYMS

ACRONYM	COMPLETE TERM
3G-SDI	3 Gigabit Serial Digital Interface
ASCII	American Standard Code for Information Interchange
AVR	Audio/Video Receiver or Recorder
CLI	Command-Line Interface
COAX	Coaxial
COM	Communication
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
Gbps	Gigabits per second
GUI	Graphical User Interface
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HD-SDI	High-Definition Serial Digital Interface
HDTV	High-Definition Television
kHz	Kilohertz
LED	Light-Emitting Diode
LPCM	Linear Pulse-Code Modulation
MHz	Megahertz
NTSC	National Television System Committee
OSD	On-Screen Display
PAL	Phase Alternating Line
PiP	Picture in Picture
PoP	Picture outside of Picture
SDI	Serial Digital Interface
SDTV	Standard-Definition Television
TMDS	Transition-Minimized Differential Signaling
4K UHD	4K Ultra-High-Definition (10.2Gbps max)

ACRONYM	COMPLETE TERM
4K UHD*	4K Ultra-High-Definition (18Gbps max)
UHDTV	Ultra-High-Definition Television
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
XGA	Extended Graphics Array
Ω	Ohm



CYPRESS TECHNOLOGY CO., LTD.
www.cypress.com.tw
