

ZIGEN

COMPLETE HD/IP
CONNECTIVITY SOLUTIONS

Zigen SW-42Plus 4 x 2 HDMI Switch



4K 60 Hz 4:4:4
HDCP 2.2 & Auto Switching
ZigNet, Full Web Interface and System Diagnostics

SW-42PLUS USER MANUAL

REVISION C.2018.5.21

Important Safety Instructions

1. Do not use this product near water.
2. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
3. Do not install or place this product near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
4. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
5. Only use attachments/accessories specified by the manufacturer.
6. To reduce the risk of electric shock and/or damage to this product, never handle or touch this unit or power cord if your hands are wet or damp. Do not expose this product to rain or moisture.
7. Unplug this apparatus during lightning storms or when unused for long periods of time.
8. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
9. Batteries that may be included with this product and/or accessories should never be exposed to open flame or excessive heat. Always dispose of used batteries according to the instructions.

Warranty Information

Powered Product Warranty

Zigen, Inc. warrants its powered products against any defects in materials and workmanship for a period of three years from the date of invoice. Touchscreen displays carry a one year parts and labor warranty. If a malfunction occurs during the warranty period, Zigen, Inc. will repair or replace a product to its original operating condition. A return authorization number must be obtained from Zigen, Inc. before products are returned for service.

Non-Powered and Cable Products - Lifetime Limited Performance Warranty

Zigen, Inc. warrants that its non-powered products and cable products will be free from defects in material and workmanship for as long as you or your customer owns the product. All Zigen non-powered products and cables are designed and engineered to meet and exceed performance specifications. If, at anytime, the product fails due to manufacturer defect, Zigen will repair or replace the product to ensure that it meets original performance specifications. Reduced performance due to normal wear and tear, or damages caused by misuse or negligence will not be covered. Zigen will test and evaluate all non-powered and cable products claimed defective. Products must be shipped to Zigen, prepaid along with proof of purchase only after obtaining a Return Merchandise Authorization (RMA) number from the Zigen. This statement of policy is in lieu of any other policy expressed or implied and no representative or person is authorized to assume any other liability or adopt any other policy for Zigen without our written consent.

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Licensing

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Features

- 4x2 HDMI Switch
- HDMI 2.0a (18 GBPS UHD) on all ports
- Full color depth support including 10,12,16 bit
- Supports digital video formats up to 4K UHD including:
2160p60 @ 4:4:4, 2160p60 @ 4:2:2, 2160p60 @ 4:2:0
- HDCP 2.2, 1.4 and Auto Switching
- Independent Up and Down Scaling
- EDID Management
- Video Diagnostics
- Humidity & Temperature Monitoring
- Hot Plug
- ZigNet Full Web Interface and System Diagnostics
- Advanced EDID management
- Supports uncompressed PCM 2-Ch., 5.1, 7.1, Dolby Digital, DTS, Dolby TrueHD, DTS HD-Master Audio and more.
- Built in IR sensor plus 3.5mm jack and remote control
- Bi-directional RS-232 Control or integrate 3rd party control

Packing List

The SW-42Plus, packaged with the following items:

- 1x 18 GBPS Ultra HD 4x2 Switch for HDMI with HDR
- 1x Universal 110/240-V 12V/2.5Amp Power Pack with 125V AC Power Cord
- 1x Hand-held IR Remote Control
- 1x CR2025 Lithium Cell 3V Battery
- 1x Quick Start Guide

If any of these products are not present upon first opening of the package, please contact Zigen or your dealer.

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This product uses UL-Listed power supplies



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1 IR

This IR sensor receives signals from the included IR remote control unit.

2 HDMI Input Indicators 1-4

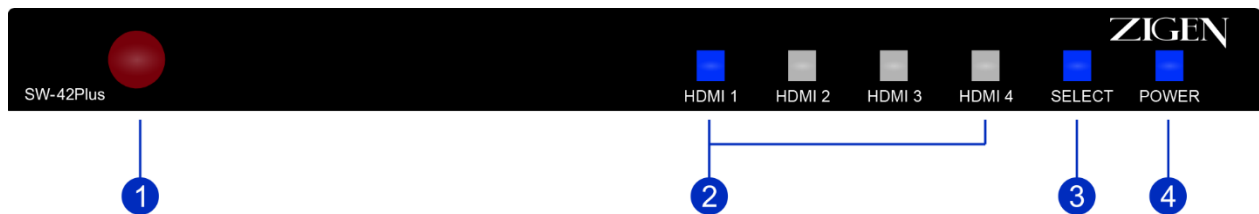
Each of these push button selectors represent an input on the rear panel of the switcher. When an input is selected it will change the input for the selected output. These buttons will light up bright blue or red based on the selected output. Flashing behaviors may occur for alert and diagnostic purposes.

3 Select

The Select button along with the HDMI Indicators display the input that is routed to the selected output.

4 Power

This push button will glow bright blue when the included 12V DC power supply is connected to the SW-42Plus from an available electrical outlet. The function of the push button is to place the SW-42Plus in stand-by mode which will glow bright red, or full functioning mode which will glow bright blue.



Back Panel

1 HDMI IN 1-4

Connect an HDMI cable from an HDMI source to each of the Input connectors.
The Zigen locking HDMI cable is recommended.

2 HDMI OUT 1-2

Connect an HDMI cable from this output port to your display.
The SW-42Plus supports 1080p, 4K, and Ultra 4K resolutions.
The Zigen locking HDMI cable is recommended.

3 SETUP

DIP switches provide overrides for defaults or prior system settings.
See page 7 for details.

4 IR IN

Connect an IR extender or electrical IR cable from an automation system to this port.

5 RS-232

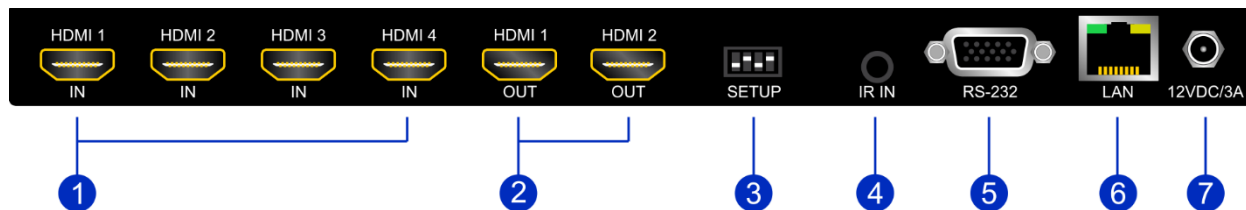
Connect an RS-232 cable from this port to an RS-232 device.

6 LAN

Connect an Ethernet cable between this jack and a LAN to use IP control.

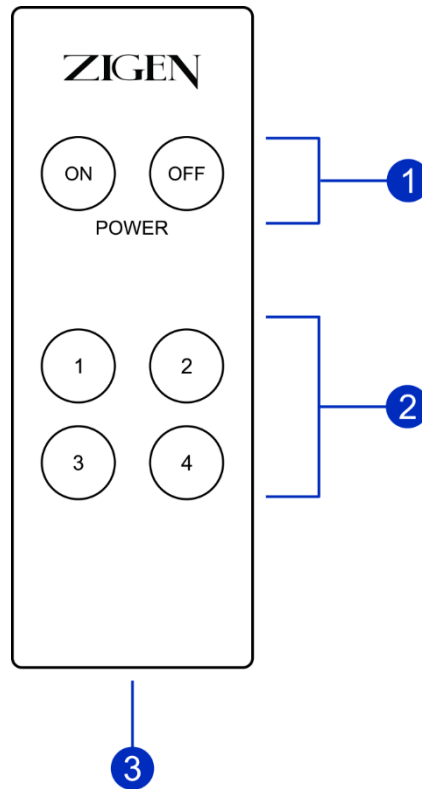
7 12V DC

Connect the included locking 12V DC power supply to this power receptacle.



IR Remote Control

The SW-42Plus IR remote control can be used for switching between inputs and powering the unit up or down.



1 ON/OFF Button

Press these buttons to toggle between the operating modes.

2 Input Buttons 1-4

Press these buttons to select the desired input for the selected output. Each button corresponds to an accompanying HDMI port (1-4) on the back panel of the switch.

3 Battery Compartment

Accepts one CR2025 Lithium Cell 3V Battery (included).

Video

1. Use an HDMI cable to connect up to four UltraHD sources to inputs (1-4) on the back panel of the unit. The Zigen locking HDMI cable is recommended for a sturdy connection.
2. Connect an HDMI cable to the Output 1 port on the back panel of the unit. The Zigen locking HDMI cable is recommended for a sturdy connection.

The HDMI cable can then be connected in any of the following ways:

- Connect the HDMI cable to an Ultra HD display.
- Connect the HDMI cable to another Zigen switch or splitter, for cascading purposes.

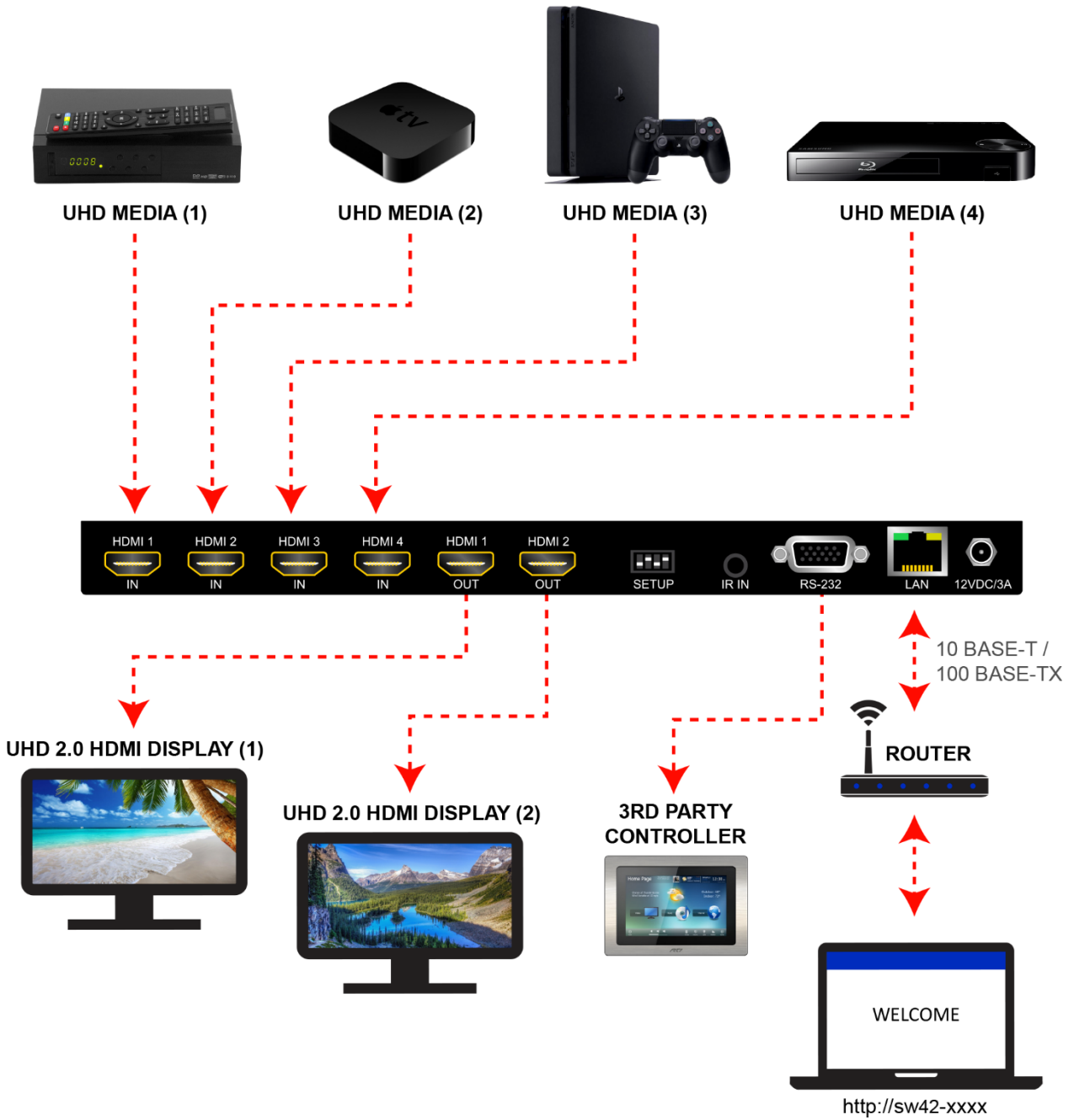
Power

3. Connect the included 12V DC locking power supply to the 12V DC power receptacle on the rear panel of the switch.
4. Connect the power supply to an electrical outlet.



Important: Cable quality is critical when handling 18 GBPS HDMI signals. Zigen HDMI cables are designed and tested to work at 18 GBPS and reliably transport the full 18 GBPS throughput of HDMI 2.0.

Application Diagram (sample)



Using the Front Panel

The front panel of the SW-42Plus has a set of four LED push button selectors which are associated with each HDMI input connectors on the rear of the switch. Press the Input button to select the desired input.

HDMI IN 1-4

When the SW-42Plus is powered-on for the first time, Input 1 will automatically be selected. Under normal conditions, the four input selector buttons will illuminate when the corresponding input is selected. Input will illuminate blue if Output 1 is selected and red if Output 2 is selected. However, all input selectors will flash simultaneously if a fault condition is detected.

IR Sensor

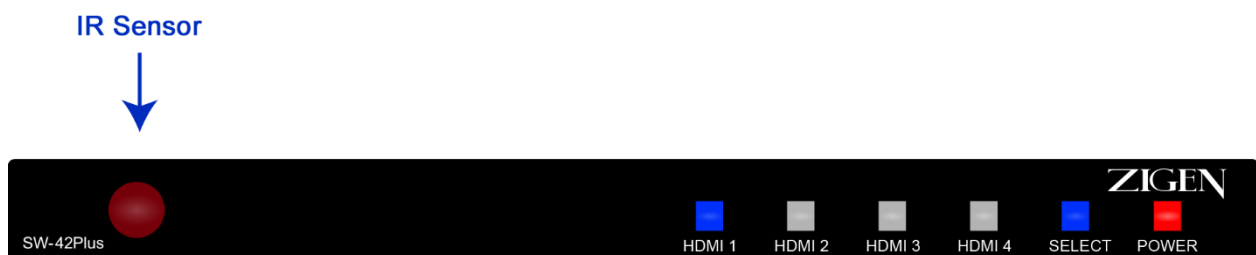
The IR sensor shown on the Front Panel accepts infrared commands from the included remote control device.

Select

The Select button along with the HDMI Indicators display the input that is routed to the selected output. Pressing the Select button will toggle the selection of the outputs. A bright blue color button will indicate Output 1 is selected. A bright red color button will indicate Output 2 is selected.

Power

This push button will glow bright blue when the included 12V DC power supply is connected to the SW-42Plus from an available electrical outlet. The function of the push button is to place the SW-42Plus in stand-by mode which will glow bright red, or full functioning mode which will glow bright blue.



Using the Back Panel

The back panel of the SW-42Plus has a set of four DIP switches.

DIP switch explanations from left to right

1. DIP 1 is force Hot Plug Detect (HPD) enable. To enable set switch to down position.
2. DIP 2 is inactive.
3. DIP 3 is downstream EDID control. To disable set switch to down position.
4. DIP 4 is Null Modem control. Toggle switch to reverse polarity.



DIP Switches

Using the IR Remote Control

The included IR remote control is used to switch between HDMI inputs. The front panel of the SW-42Plus has a set of four LED indicators which are associated with each input on the switch.

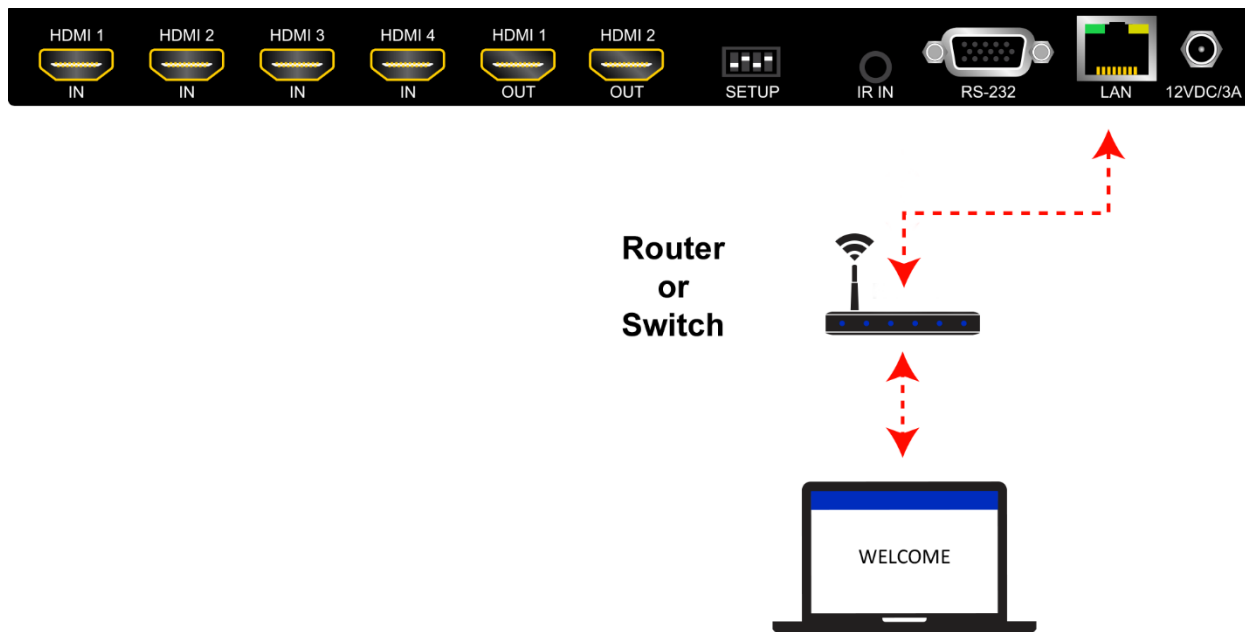
1. Point the IR remote control unit at the IR sensor on the front panel.
If an IR extender is being used, then both IR sensors will be used to receive IR signals.
2. Each numbered button on the IR remote control unit represents an input.
Press the desired source button on the IR remote control to switch to that input.
3. Press ON/OFF buttons to toggle between the operating modes. OFF will set the unit in Stand-By mode. ON has two functions. If the unit is off (Stand-By mode) it will turn on the unit. If the unit is turned on it will act as a Select button and toggle the selection of the Outputs.



Connecting to ZigNet

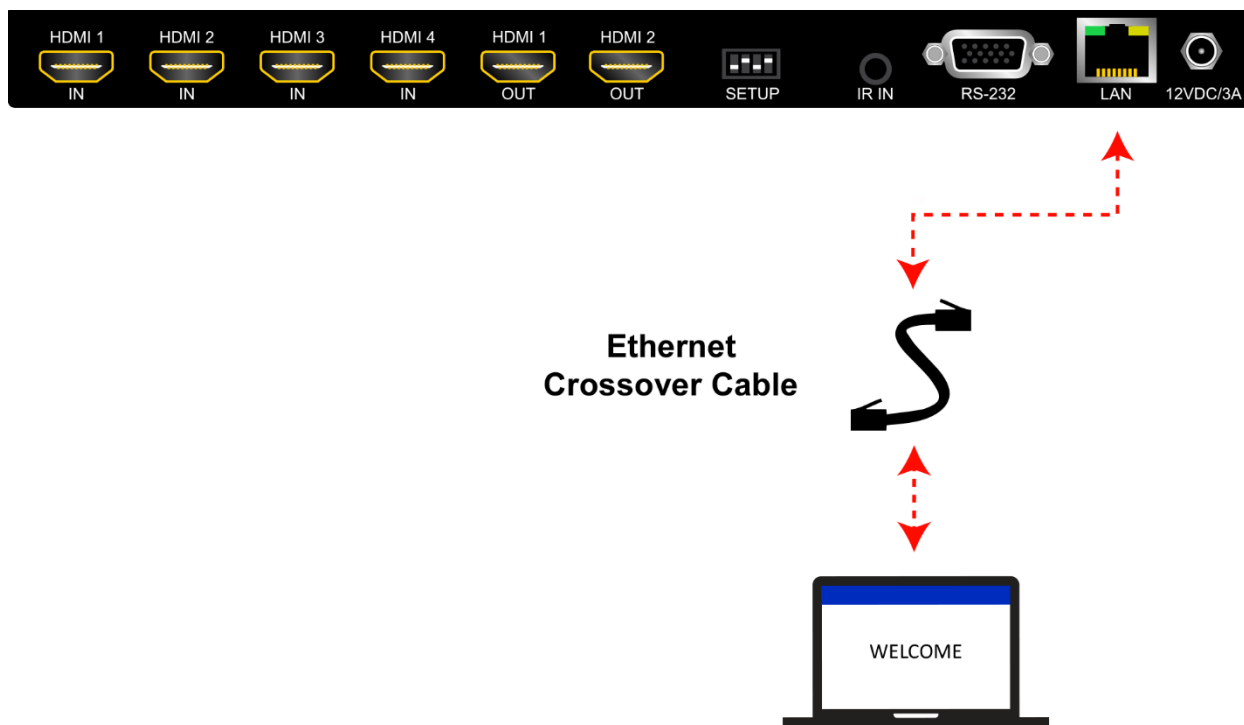
Network Setup Option 1:

Connect the unit and a computer into a router or switch.



Network Setup Option 2:

Connect a computer directly into the unit by using an Ethernet crossover cable



IP Address Retrieval

1. Open an RS-232 connection and power on the unit.
2. Upon power-up of the unit the IP address will be displayed on the RS-232 interface.
3. Open a web browser of your choice and insert the given IP address in the address bar.

Optional for Windows users: Skip steps 1-3 and type in the host name which is displayed on the bottom of the unit.

Requirements:

In order to retrieve the IP address of the Web Interface a valid RS-232 connection is required. For details on how to setup an RS-232 connection, see next page.

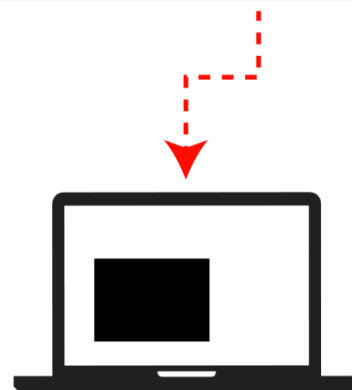
RS-232 Configuration

Configuring an RS-232 Connection

1. Connect the RS-232 port on the back of the SW-42Plus to a computer using an RS-232 cable.
2. Open a hyperterminal app of your choice (Putty recommended) on a computer.
3. Enter default settings shown below:

Baud Rate: 115200
Data Bits: 8
Stop Bits: 1
Parity: None
Flow Control: None

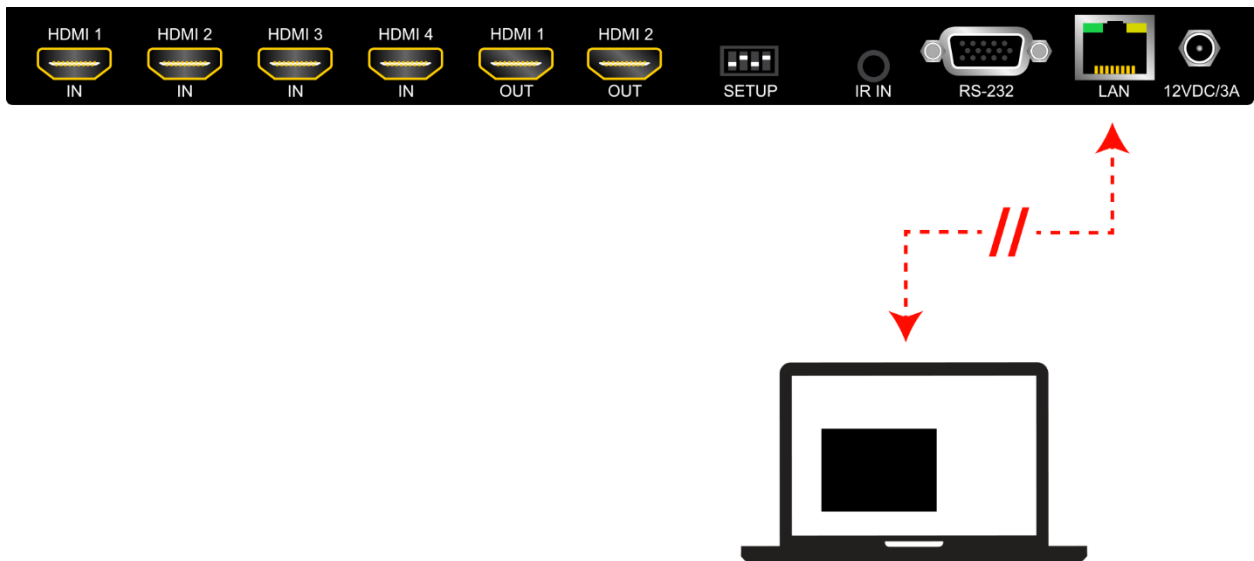
4. Your unit should now be connected.



Telnet IP Configuration

Configuring a Telnet IP Connection

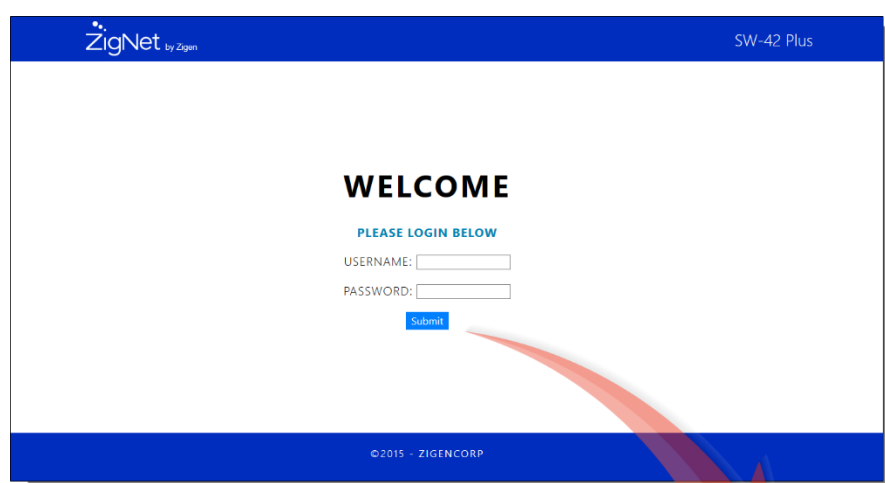
1. Connect the SW-42Plus to the network or with a crossover cable.
See page 9 for more information.
2. Open a Telnet client application of your choice (Putty recommended) on a computer.
3. Enter the IP address or host name of your SW-42Plus.
See page 10 for more information.
4. Once connected you will receive a welcome message.



The web interface provides easy management of all features used by the SW-42Plus.

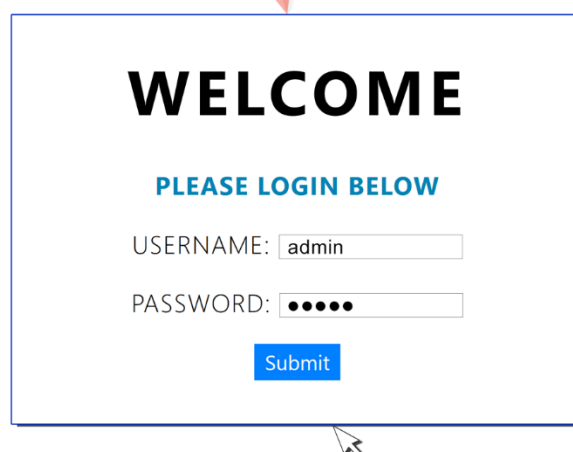
The SW-42Plus features a highly functional web server that is accessible either remotely across the Internet or directly with a connection between a personal computer on a local area network, or a connection directly to the Ethernet connector on the back panel of the unit.

The following is the Welcome page requesting login information.



Logging In

1. Launch web browser.
2. Type the IP address of the unit in the address bar.
3. The login page will be displayed.
4. Enter Username and Password.
Default Username: admin
Default Password: Zigen
5. Press Submit.



Navigation Bar

From the navigation bar, select the appropriate link to get to the corresponding page. The blue bar below the link indicates that the page is selected.



Control Page

Allows the user to switch the inputs for the outputs, change EDID settings and adjust audio settings.

Diagnostics Page

Allows the user to monitor video signals and system vitals.

Email Alert Page

Allows the user to receive system notifications via email.

Admin Page

Allows the user to change administration settings and save installation notes.

Using ZigNet

Control Page

Switch

Click the desired input (source). The active Input is indicated by a blue bar.



EDID Management

Active EDID

Displays the current EDID sent to the source.

Sink EDID

Displays the EDID available at the sink.

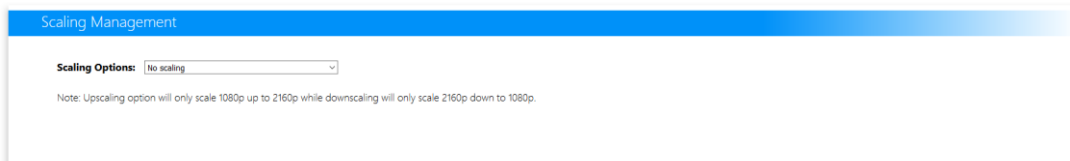
New EDID

Use the three drop down menus to select a new EDID configuration and press Set EDID.

Custom EDID

Press Browse to upload a custom EDID configuration.

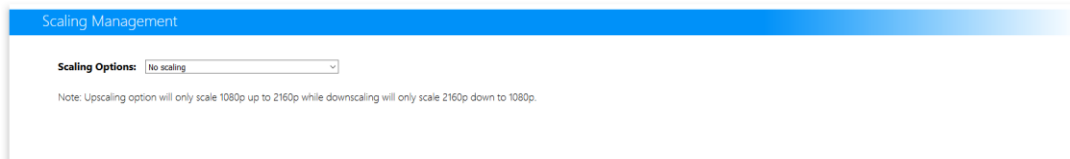
Select your custom EDID file and press Upload.



Scaling Management

Scaling Options

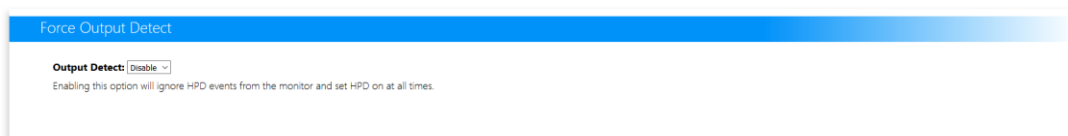
Use the dropdown menu to select the desired scaling option.



Force Output Detect

Output Detect

Use the dropdown menu to set the HPD on at all times, ignoring HPD events from the monitor.



Diagnostics Page

Diagnostics displays the status and parameters of the HDMI Input, Outputs and the disposition of the system.

HDMI Inputs					
HDMI 1		HDMI 2		HDMI 3	
Source:	Connected	Source:	Connected	Source:	Connected
Video Link:	Active	Video Link:	Active	Video Link:	Active
Source Type:	HDMI	Source Type:	HDMI	Source Type:	HDMI
18G Signal:	No	18G Signal:	Yes	18G Signal:	Yes
HDCP Status:	Authenticated	HDCP Status:	Authenticated	HDCP Status:	Authenticated
HDCP version:	1.4	HDCP version:	2.2	HDCP version:	2.2
HDCP attempts:	1	HDCP attempts:	1	HDCP attempts:	1
HDMI 4					
Source:	Connected				
Video Link:	Active				
Source Type:	DVI				
18G Signal:	Yes				
HDCP Status:	No HDCP				
HDCP version:	No HDCP				
HDCP attempts:	0				

HDMI Outputs			
HDMI 1		HDMI 2	
Input Resolution:	1920x1080p	Input Resolution:	3840x2160p
Output Resolution:	1920x1080p	Output Resolution:	3840x2160p
Pixel Clock:	297 MHz	Pixel Clock:	297 MHz
Colorspace:	YUV:444	Colorspace:	YUV:420
Bit Width:	8	Bit Width:	12
3D Video Format:	Frame	3D Video Format:	None
Audio Frequency:	32KHz	Audio Frequency:	32KHz
Audio Word Length:	24	Audio Word Length:	24
Audio Format:	I2S	Audio Format:	I2S
Audio Channels:	2 channels	Audio Channels:	8 channels
Scan Type:	Progressive	Scan Type:	Progressive
Sink:	Connected	Sink:	Connected
Video Link:	Active	Video Link:	Active

System Monitoring	
5V Meter:	5.047 V
3.3V Meter:	3.293 V
1.1V Meter:	1.107 V
Runtime:	00:59:59
Temperature:	82 F
Humidity:	31%

See appendix for Diagnostics Specifications (pg.31) for detailed explanations.

Email Alert Page

The Email Alert page allows full customization of system notifications.

Toggle between specific alerts and choose the frequency of notifications.

Email Alert Settings

Email:

Frequency of report:

Temperature - notifies if the temperature rises above:	110	☒ Enable
Humidity - notifies if the humidity rises above:	60	☒ Enable
12 Volt Meter - notifies if the voltage deviates too much from 12 V.		☐ Enable
3.3 Volt Meter - notifies if the voltage deviates too much from 3.3 V.		☐ Enable
1.1 Volt Meter - notifies if the voltage deviates too much from 1.1 V.		☐ Enable
Input 1 - notifies if the input is unplugged or shut off.		☐ Enable
Input 2 - notifies if the input is unplugged or shut off.		☐ Enable
Input 3 - notifies if the input is unplugged or shut off.		☐ Enable
Input 4 - notifies if the input is unplugged or shut off.		☐ Enable
Input 1 HDCP - notifies if HDCP authentication fails for this input.		☐ Enable
Input 2 HDCP - notifies if HDCP authentication fails for this input.		☐ Enable
Input 3 HDCP - notifies if HDCP authentication fails for this input.		☐ Enable
Input 4 HDCP - notifies if HDCP authentication fails for this input.		☐ Enable
Output 1 - notifies if this output is unplugged or shut off.		☐ Enable
Output 2 - notifies if this output is unplugged or shut off.		☐ Enable
Output 1 Link - notifies if this output is currently outputting video/audio.		☐ Enable
Output 2 Link - notifies if this output is currently outputting video/audio.		☐ Enable

Admin Page

User Notes

Allows the user to write and save notes for system configuration.

A screenshot of the 'User Notes' web interface. It features a blue header bar with the text 'User Notes'. Below the header is a large, empty white text area for writing notes. At the bottom left of the text area is a blue button labeled 'Save Notes'. At the bottom right is a small text indicator '0/1000'.

Device Settings and Information

Hostname: type desired host name and press Change Name.

Manual IP Address: Use these fields to change the IP address used in static IP mode and the IP address used in DHCP mode when no IP address can be obtained. Settings will take place after reset.

IP Mode: The IP mode allows selecting between DHCP and Static IP mode.

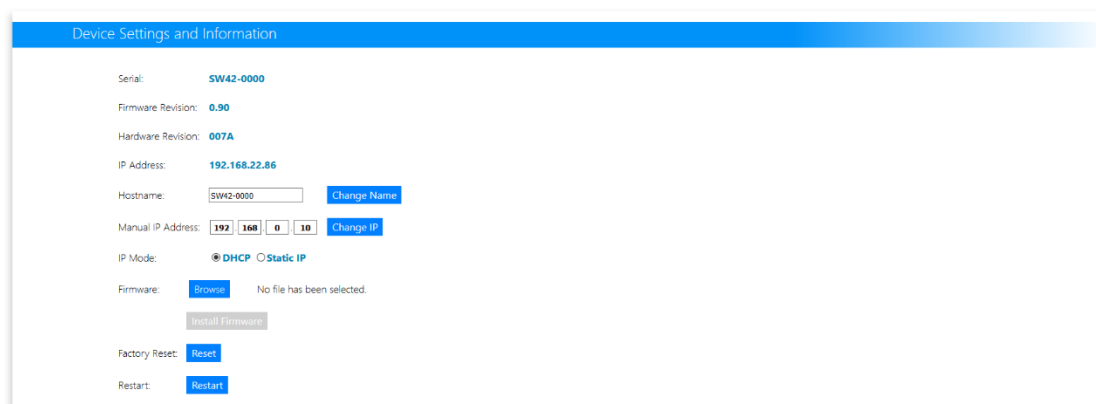
Firmware: Select browse to upload firmware updates.

Select the firmware update file and press Install Firmware. File type: *.bin

A progress bar will show upload transfer process. Once the transfer is complete the unit will reset itself and commence the update.

Factory Reset: Allows the unit to restore all settings back to factory defaults.

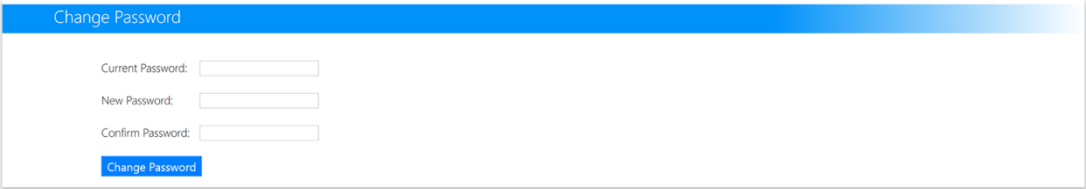
Restart: This feature restarts the unit.

A screenshot of the 'Device Settings and Information' web interface. It has a blue header bar with the text 'Device Settings and Information'. The interface displays various system information and settings: 'Serial: SW42-0000', 'Firmware Revision: 0.90', 'Hardware Revision: 007A', 'IP Address: 192.168.22.86', 'Hostname: SW42-0000' with a 'Change Name' button, 'Manual IP Address: 192.168.0.10' with a 'Change IP' button, 'IP Mode: DHCP (selected) Static IP', 'Firmware: Browse' button with the text 'No file has been selected.' and an 'Install Firmware' button, 'Factory Reset: Reset' button, and 'Restart: Restart' button.

Admin Page

Change Passeord

To change the password, type the current password, the desired new password and confirm the new password.



A screenshot of a web form titled "Change Password". The form has a blue header bar with the title. Below the header, there are three input fields: "Current Password:", "New Password:", and "Confirm Password:". Each field is followed by a small rectangular input box. At the bottom of the form, there is a blue button labeled "Change Password".

Command	Syntax	Description
Help	@SW42-xxxx help	Shows a list of available commands.
Uptime	@SW42-xxxx uptime	Shows elapsed time.
Version	@SW42-xxxx version	Shows product name, firmware release, version, build date and serial number.
Device Status	@SW42-xxxx st	Shows connected monitors and sources.
Output Select	@SW42-xxxx outsel <1/2>	Lets you select desired output.
Input Select	@SW42-xxxx insel <1/2/3/4>	Lets you select desired input.
Null Modem	@SW42-xxxx null <on/off>	Lets you enable RS-232 null modem.
Power	@SW42-xxxx pwr <on/off>	Powers the device on or off.
Scaling	@SW42-xxxx scale <up/down/both>	Activate upscaling, downscaling or both.

To address a single unit, replace “xxxx” with the serial number located on the bottom of your unit.

To address a cluster of SW-42Plus units use only “xxxx” without serial numbers.

Note:

These commands can be combined like so: “@SW42-xxxx st uptime version”

Powering Device Command Example:

- To power ON the SW-42Plus use command: @SW42-xxxx pwr on \n
- To power OFF the SW-42Plus use command: @SW42-xxxx pwr off \n

Telnet IP Commands

Command	Syntax	Description
Help	SW42-xxxx help	Shows a list of available commands.
Uptime	SW42-xxxx uptime	Shows elapsed time.
Version	SW42-xxxx version	Shows product name, firmware release, version, build date and serial number.
Device Status	SW42-xxxx st	Shows connected monitors and sources.
Output Select	SW42-xxxx outsel <1/2>	Lets you select desired output.
Input Select	SW42-xxxx insel <1/2/3/4>	Lets you select desired input.
Null Modem	SW42-xxxx null <on/off>	Lets you enable RS-232 null modem.
Power	SW42-xxxx pwr <on/off>	Powers the device on or off.

To address a single unit, replace “xxxx” with the serial number located on the bottom of your unit.

To address a cluster of SW-41Plus units use only “xxxx” without serial numbers.

Note:

These commands can be combined like so: “SW42-xxxx st uptime version”

Powering Device Command Example:

- To power ON the SW-42Plus use command: SW-42-xxxx pwr on \n
- To power OFF the SW-42Plus use command: SW-42-xxxx pwr off \n

Connections

4 x HDMI type A HDMI Input
2 x HDMI type A HDMI Output
1 x RJ45 LAN Port for TCP/IP Control
1 x 9-pin RS-232 port
1 x 3.5mm IR In Port
1 x IR Sensor (In)
1 x 12 VDC Locking Connector

Temperature

Operating 32-122 F (0-50 C)
Humidity: 20-90% non condensing

Dimensions

0.86 x 3.70 x 10.76 inches
21.844 x 93.98 x 273.0754 millimeters

Weight

1.4 pounds
635.03 grams

Certifications/Compliance

FCC, CE, RoHS, HDCP, HDMI

Specifications

Video Bandwidth

18 GBPS

Video Resolutions

All SMPTE & VESA in HDMI 2.0 Specification

Max SMPTE UHD - 4096 x 2160P60/ RGB / 4:4:4

Color Space

RGB, YUV

Color Bit Depth

8-bit, 10-bit, 12-bit & 16-bit per pixel

Note: Resolution and video bandwidth limitations: ex. 2160p60 RGB or 4:4:4 8-bit would use almost the entire 18 Gb/s of bandwidth.

Chroma Subsampling

4:4:4, 4:2:2, 4:2:0

See note above – chroma subsampling or color compression is related to bit depth and video resolution settings with regard to total bandwidth requirements.

A 4K/60 signal at 4:4:4 chroma subsampling can have a maximum bit depth of 8 bits according to the HDMI 2.0a specification.

Audio

HDMI In & Out – Up to Dolby TrueHD and DTS-HD Master

SPDIF – Up to Dolby Digital & DTS 5.1

Line Level RCS Stereo Outputs

Distance

HDMI – Up to 5M @ 4K

HDCP

2.2, 1.4 or None

CEC

Pass through

Diagnostics Specifications

Source: Indicates if a source is connected to the unit.

Video Link: Indicates if video is being passed from the source.

Source Type: Indicates if the source is connected through an HDMI or DVI interface.

18G Signal: Indicates if the HDMI signal being transmitted is greater than 3.4 GBPS.

HDCP Status: Indicates the HDCP authentication status.

HDCP version: Shows the HDCP version (2.2 / 1.4).

HDCP attempts: Show the number of times HDCP authentication has been attempted.

Input Resolutions: Displays the incoming resolution.

Output Resolutions: Displays the outgoing resolution.

Pixel Clock: Displays the Pixel Clock frequency.

Colorspace: Displays HDMI signal colorspace (RGB, YUV, etc).

Bit Width: Displays the bit width of the video (8, 10, 12 or 16 bit).

3D Video Format: Displays the 3D video format packing.

Audio Frequency: Displays the audio frequency (32, 44.1, 48, etc)

Audio Word Length: Display the length of the audio sample (16, 20, or 24 bits).

Audio Format: Displays audio format (PCM, S/PDIF, etc).

Audio Channels: Displays the number of channels in the audio.

Scan Type: Indicates whether the video is interlaced or progressive.

Sink: Indicates if a sink (monitor/TV) is connected.

Video Link: Indicates whether video is being sent to the sink or not.

12V Meter: Displays the voltage level from the power supply captured in real-time.

3.3V Meter: Displays the regulated 3.3 voltage in real-time.

1.1V Meter: Displays the regulated 1.1 voltage in real-time.

Runtime: Displays how long the unit has been running.

Temperature: Displays the temperature inside the box captured in real-time.

Humidity: Displays the humidity inside the box captured in real-time.

[This section details the parameters on the Diagnostics Page \(pg.24\).](#)

4:4:4 – Type of chroma subsampling. 4:4:4 defines 12 unique values of color per 4 pixels.

4:2:2 – Type of chroma subsampling. 4:2:2 defines 8 unique values of color per 4 pixels.

4:2:0 – Type of chroma subsampling. 4:2:0 defines 6 unique values of color per 4 pixels.

4K60 – defines a video format of 3840 x 2160 pixels at 60 Hz.

CEC – Consumer electronics control. A channel in the HDMI connection that allows consumer electronics to control other media.

S/PDIF – Digital audio interconnect delivering digital audio over a coaxial cable with RCA connectors.

DHCP – Dynamic Host Configuration Protocol is a standardized network protocol used to designate IP addresses to media.

DIP Switch – dual in-line package switch is a manual electric switch that is packaged with others in a group.

Dolby TruHD – High performance audio codec from Dolby.

DTS-HD Master – High performance audio codec from DTS.

EDID – Extended Display Information Data is used to relay specifications and capabilities of a sink device to a source device.

HDCP – High-bandwidth Digital Content Protection is a form of digital copy protection to prevent copying of digital audio and video content across connections.

HDMI – High Definition Multimedia Interface is a proprietary audio/video interface for transmitting video data and audio data.

HDR – High Dynamic Range refers to a technique in imaging to reproduce a greater range of luminosity.

HPD – Hot plug detect is a signal in the HDMI interface that allows a sink device to notify a source that a connection is valid.

IR – Infrared

LAN – Local Area Network.

Null Modem – Null modem is referred to as a device or implementation that allows the receiver and transmitter lines of the RS232 protocol to be swapped.

RCA – also called a phono connector is an electrical connector used to carry audio and video signals.

RGB – A color format in which color data is represented as a combination of Red, Green, and Blue.

RS-232 – RS-232 is a standard for serial communication transmission of data. It is commonly used with a DB-9 connector.

SMPTE – SMPTE is a foundation that has set standards for television and digital cinema formats. In this manual it is used to refer to cinema formats such as 4096 x 2160.

Static IP – In contrast to DHCP, static IP refers to a unit or device that has a set IP address and configured to attempt connect with the predefined IP address.

UHD – Ultra High Definition. This is commonly referred to the video format 3840 x 2160.

VESA – Video Electronics Standards Association is a technical standards organization for computer display formats.

ZigNet – Proprietary web control developed by Zigen, Inc.

HDMI 2.0 4K Specifications

The table below specifies the only combinations of resolution, frame rate, color space and depth.

	8 bit	10 bit	12 bit	16 bit
4K@24	RGB 4:4:4	RGB 4:4:4	RGB 4:4:4 4:2:2	RGB 4:4:4
4K@25				
4K@30				
4k@50	RGB 4:4:4 4:2:0	4:2:0	4:2:2 4:2:0	4:2:0
4K@60				

Infrared (IR) Protocol

The SW-42 Plus IR protocol uses the NEC standard over 38kHz. An example IR message that uses the protocol with address 0x00 and command 0xAD is shown below this section.

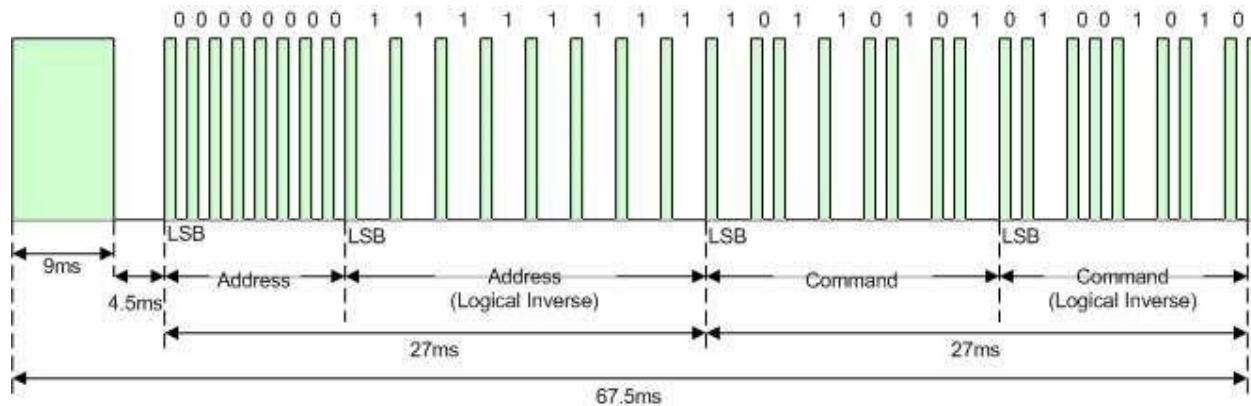


Illustration 1: NEC Protol

IR Commands

Below are pronto hex codes for IR commands for the SW-42 Plus. All IR commands use address 0x0A.

Set Output 1 to Input 1

Description: Set HDMI Output 1 to Input 1. Command:

0x20 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f
0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 003f 0015 003f 0015 003f 0015 003f 0015 003f 0015 0015
003f 0015 1d0b
```

Description: Set HDMI Output 1 to Input 2. Command:

0x21 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f
003f 0015 003f 0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 0015 0015 003f 0015 003f 0015 003f 0015 003f 0015 0015
003f 0015 1d0b
```

Infrared (IR) Protocol

Set Output 1 to Input 3

Description: Set HDMI Output 1 to Input 3. Command:

0x22 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 0015 0015 003f 0015 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Set Output 1 to Input 4

Description: Set HDMI Output 1 to Input 4. Command:

0x23 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 003f 0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 0015 0015 0015 003f 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Set Output 2 to Input 1

Description: Set HDMI Output 2 to Input 1. Command:

0x24 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 0015 0015 0015 003f 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Infrared (IR) Protocol

Set Output 2 to Input 2

Description: Set HDMI Output 2 to Input 2. Command:

0x25 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 003f 0015 003f 0015 0015 0015 003f 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Set Output 2 to Input 3

Description: Set HDMI Output 2 to Input 3. Command:

0x26 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 003f 0015 0015 0015 003f 0015 003f 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 003f 0015 0015 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Set Output 2 to Input 4

Description: Set HDMI Output 2 to Input 4. Command:

0x27 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 003f 0015 003f 0015 003f 0015 0015 0015 0015 0015 003f
0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f
0015 003f 0015 1d0b
```

Infrared (IR) Protocol

Toggle Null Modem

Description: Reverses the TX and RX lines of the RS-232 DB9 Connector.

Command: 0x30 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 0015 0015 003f 0015 003f
0015 0015 0015 0015 0015 003f 0015 003f 0015 003f 0015 003f 0015 0015 0015 0015
003f 0015 003f 0015 1d0b
```

Scale Up

Description: Activate up-scaling Command:

0x40 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015
0015 003f 0015 0015 0015 003f 0015 003f 0015 003f 0015 003f 0015 003f 0015 0015 0015
003f 0015 1d0b
```

Scale Down

Description: Activate down-scaling Command:

0x41 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 003f 0015 003f 0015 0015 0015 0015 0015 0015 0015 0015 0015 0015
0015 003f 0015 0015 0015 0015 0015 003f 0015 003f 0015 003f 0015 003f 0015 003f 0015
0015 0015 003f 0015 1d0b
```

Infrared (IR) Protocol

Power Off

Description: Sets the unit in standby mode. Command:

0x19 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 003f 0015 0015 0015 0015 003f 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 003f 0015 0015 0015 0015 0015 003f 0015
003f 0015 003f 0015 1d0b
```

Power On

Description: Sets the unit in normal mode. Command:

0x12 Pronto Hex:

```
0000 006C 0000 0022 0156 00ab 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 0015 0015 003f 0015
003f 0015 003f 0015 003f 0015 0015 0015 003f 0015 0015 0015 0015 003f 0015 0015
0015 0015 0015 0015 0015 003f 0015 0015 0015 003f 0015 003f 0015 0015 0015 003f 0015 003f
0015 003f 0015 1d0b
```

Revision History

Revision.B.2017.8.25

1. HDMI 2.0 4k Specifications Chart
2. ZigNet Email Alert Notifications
3. RS-232 / Telnet command additions

Revision.B.2018.5.21

4. Infrared (IR) Protocol