



Programmers Guide

SP-SW5200-VUHBT

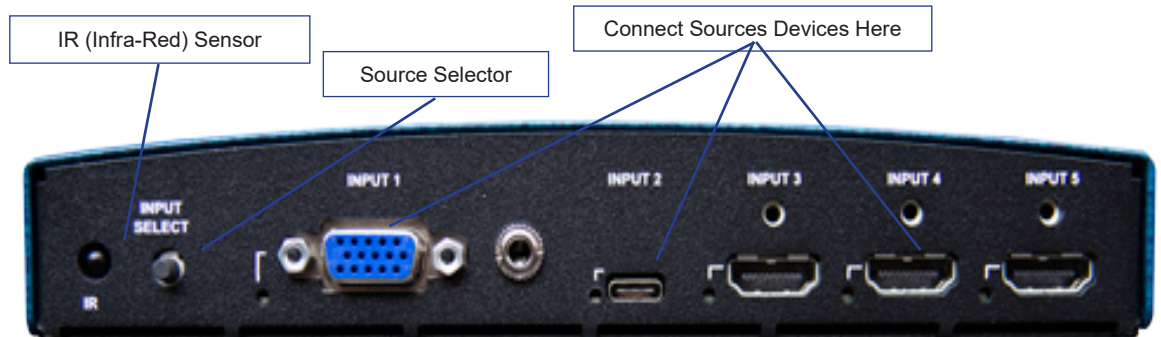
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Introduction

Getting to Know the SP-SW5200-VUHBT (SW-5200)

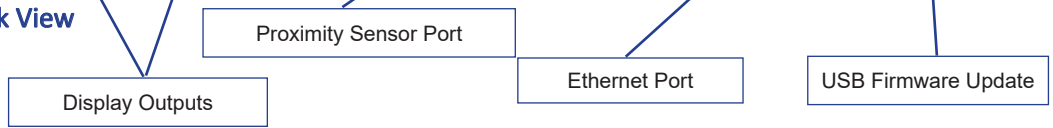
The graphic below points out key elements of the **SW5200**



Front View



Back View



Auto-Sense, Auto-Switching

Auto-sense, automatic switching (ASW) is a very powerful feature of the SW5200 and will be explained further to best understand how it can be utilized. ASW is enabled by default and can be disabled using the Windows “Switcher Settings” application (described in the Users Manual) or RS-232 interface (described further in this Programming Manual).

The SW5200 is very sensitive. When a user connects a device to one of the 5 (VGA, USB-C, or HDMI) input ports, the SW5200 responds immediately by routing the video from the

newly connected device to both display ports. If the color space is different than the display, color is automatically converted internally to ensure the highest quality image is displayed at the highest resolution practicable.

If another person connects a computer or mobile device to an available input port, that device will immediately appear on the display ports. The rule is: The last to connect will always appear on the displays.

Should an actively displayed device be disconnected, the SW5200 will search from input 1 through input 5 for the first active signal. Once found, the image from that device will appear on the displays. From a design standpoint, consider having the home room computer on input 1 and any ancillary or guest connections on inputs 2 through 5.

Automatic Display On/Off

Automatic display on/off (CEC) is another powerful feature of the SW5200. CEC is enabled by default but can be disabled using the Switcher Settings application or RS-232 interface.

CEC must be enabled on the display itself for this feature to work with the SW5200.



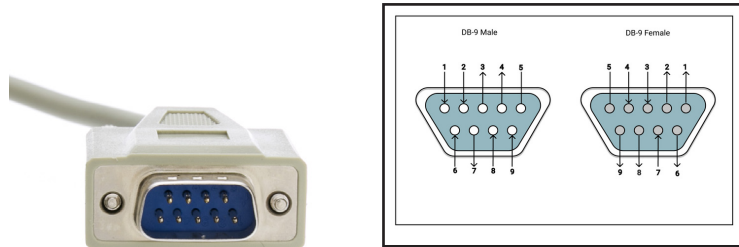
Trade names for CEC are Anynet+ (Samsung), Aquos Link (Sharp), BRAVIA Link and BRAVIA Sync (Sony), HDMI-CEC (Hitachi), E-link (AOC), Kuro Link (Pioneer), INlink (Insignia), CE-Link and Regza Link (Toshiba), RIHD (Remote Interactive over HDMI) (Onkyo), RuncoLink (Runco International), SimpLink (LG), T-Link (ITT), HDAVI Control, EZ-Sync, VIERA Link (Panasonic), EasyLink (Philips), and NetCommand for HDMI (Mitsubishi).

If a user connects to the SW5200, the SW5200 will automatically turn the displays on. When the last person disconnects, the SW5200 will wait 15 (adjustable) seconds of inactivity then turn off the display. In many cases, this feature eliminates the need for television remotes, extends display life, saves power, and simplifies classrooms, conference rooms, and huddle spaces, making them more user friendly.

RS-232 Connection

Communications Interface

The SW5200 uses a serial interface (RS-232) to change attributes and behavior of the SW5200.



Parameters are as follows: 115200 baud, 8 bit, no parity, and 1 stop bit. The baud rate is adjustable. Pins 2 (Rx), 3 (Tx), and 5 (GND) are used.

Attribute	Value
Type (on SW5200)	DB-9, Female
Baud Rate	115,200 (adjustable)
Data Size	8 bit
Parity	None
Stop Bits	1

RS-232 Control Codes

Help / Available Commands

Type "HELP" to list all available commands for this version of SW5200.

Command Format	
HELP	
Examples in ASCII	Response
HELP	Complete list of available commands. See Command Line Example below.
Examples in HEX	Response
48 45 4C 50 0D	Complete list of available commands. See Command Line Example below.
Command Line Example	
<pre> Firmware Revision 1.0 \$ HELP M A I N M E N U COMMAND FORMAT DESCRIPTION ----- - * * Displays system information - - Volume Down + + Volume Up SW SW [xx] + - Selects Input to be Displayed VOL VOL [x] Set Volume (0-100) MUTE MUTE [x] Set Mute 1=nute, 0=unmute ASW ASW [x] Auto-Switch Enable [0=Off, 1=On] CEC CEC [x] CEC Display Control [0=Off, 1=On] TV TV [x] Displays Power [0=Off, 1=On] RES RES [x] Sets EDID Resolution (see manual) PROX PROX [x] Proximity Sensor On/Off [0=Off, 1=On] DOUT DOUT [x] Shutdown Display Non-Activity [0=Off, x=Mins] LAN LAN Displays All Ethernet Settings DHCP DHCP [x] IP Address from DHCP Svr [0=Off, 1=Enabled] IP IP x Set IP Address [xxx.xxx.xxx.xxx] SUBN SUBN x Set Subnet Addr [xxx.xxx.xxx.xxx] GWAY GWAY x Set Gateway Addr [xxx.xxx.xxx.xxx] DNS DNX x Set DNS Svr Addr [xxx.xxx.xxx.xxx] DEBUG DEBUG [x] Debug Messages [0=Off, 1=On] FACDEF FACDEF Set System to Factory Defaults and Reset ID ID Show Product Model VER VER Show Firmware Revision for this Device RESET RESET Restart System HELP HELP Display this Menu QUIT QUIT Leave Command Mode (When USB is needed) </pre>	

Select Input / Source

This command selects a source or input device to display.

Command Format	
SW #	Replace # with the input to display (1-5). End command with carriage return.
Examples in ASCII	Response
SW 2	None.
Examples in HEX	Response
53 57 20 32 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ SW 2 SW 2</pre>	

Get Current Input / Source

This command displays the currently selected input being routed to the output device.

Command Format	
SW	Type return (carriage return) after typing SW.
Examples in ASCII	Response
SW	Current Input Selected: 2
Examples in HEX	Response
53 57 0D	43 75 72 72 65 6E 74 20 49 6E 70 75 74 20 53 65 6C 65 63 74 65 64 3A 20 32 0D
Command Line Example	
<pre>Firmware Revision 1.0 \$ SW Current Input Selected: 2</pre>	

Set Master Volume Level

This command sets the current master volume level of the SW5200.

Command Format	
VOL #	Replace # with the volume level (1-100). End command with carriage return.
Examples in ASCII	Response
VOL 85	None.
Examples in HEX	Response
56 4F 4C 20 38 35 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ VOL 85 \$</pre>	

Get Master Volume Level

This command obtains the current master volume level of the SW5200.

Command Format	
VOL	Type return (carriage return) after typing VOL.
Examples in ASCII	Response
VOL	VOL is at level 85
Examples in HEX	Response
56 4F 4C 0D	56 4F 4C 20 69 73 20 61 74 20 6C 65 76 65 6C 20 38 35
Command Line Example	
<pre>Firmware Revision 1.0 \$ VOL VOL is at level 85</pre>	

Increase Volume

The “+” command increases the volume by 1 step (1-100).

Command Format	
+	Type plus '+'. No carriage return is required.
Examples in ASCII	Response
+	None
Examples in HEX	Response
2B	None
Command Line Example	
<pre>Firmware Revision 1.0 \$ +</pre>	

Decrease Volume

The minus or dash “-” command decreases the volume by 1 step (1-100).

Command Format	
-	Type minus or dash '-'. No carriage return is required.
Examples in ASCII	Response
-	None.
Examples in HEX	Response
2D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ -</pre>	

Mute, Stereo Output

This command will turn off the audio to the stereo output port. This command does not interfere with the HDMI audio output.

Command Format	
MUTE #	Replace '#' with 0 to unmute or 1 to mute audio. End command by typing a carriage return.
Examples in ASCII	Response
MUTE 0	None.
Examples in HEX	Response
4D 55 54 45 20 30 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ MUTE 0 \$</pre>	

Mute Status, Stereo Output

This command returns the current state of the MUTE feature.

Command Format	
MUTE	Typing MUTE without a following 0 or 1 will provide you a status of the MUTE feature.
Examples in ASCII	Response
MUTE	Out is unmuted
Examples in HEX	Response
4D 55 54 45 0D	4F 75 74 20 69 73 20 75 6E 6D 75 74 65 64
Command Line Example	
<pre>Firmware Revision 1.0 \$ MUTE Out is unmuted</pre>	

Set Resolution

This command sets the current resolution level of the SW5200.

Command Format	
RES #	Replace # with the resolution (0-12). End command with carriage return. Resolutions: 0=Pass thru (uses native resolution of the connected display) 1=2160@30Hz 2=1080p@60Hz 3=720p@60Hz 4=576p@60Hz 5=480p@60Hz 6=1920x1200@60Hz 7=1600x1200@60Hz 8=1400x1050@60Hz 9=1280x1024@60Hz 10=1280x768@60Hz 11=1024x768@60Hz 12=800x600@60Hz Reset is required to enable this setting.
Examples in ASCII	Response
RES 1	None.
Examples in HEX	Response
52 45 53 20 31 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ RES 1 RES 1</pre>	

Get Current Resolution Setting

This command returns the current EDID setting of the SW5200.

Command Format	
RES	Type return (carriage return) after typing RES.
Examples in ASCII	Response
RES	Resolution Being Set To: 0 - Uses Displays EDID
Examples in HEX	Response
52 45 53 0D	52 65 73 6F 6C 75 74 69 6F 6E 20 42 65 69 6E 67 20 53 65 74 20 54 6F 3A 20 30 20 2D 20 55 73 65 20 44 69 73 70 6C 61 79 73 20 45 44 49 44
Command Line Example	
<pre>Firmware Revision 1.0 \$ RES Resolution Being Set To: 0 - Use Displays EDID</pre>	

Auto-Switch On/Off

This command controls the status of the auto-sensing auto-switch capability of the SW5200. When turning this feature off, switching can only occur using the RS232 serial interface or the front panel Source Selector.

Command Format	
ASW #	Replace # with either 0 or 1. 0 = Disable, 1 = Auto-Switch enabled. End command with carriage return.
Examples in ASCII	Response
ASW 0	None.
Examples in HEX	Response
41 53 57 20 30 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ ASW 0 ASW 0</pre>	

Get Auto-Switch Feature Status

This command returns the status of the Auto-Switching feature of the SW5200.

Command Format	
ASW	Type ASW without a 0 or 1.
Examples in ASCII	Response
ASW	Enabled - Type ASW 0 to disable.
Examples in HEX	Response
41 53 57 0D	45 6E 61 62 6C 65 64 20 2D 20 54 79 70 65 20 41 53 57 20 30 20 74 6F 20 64 69 73 61 62 6C 65 2E
Command Line Example	
<pre>Firmware Revision 1.0 \$ ASW Enabled - Type ASW 0 to disable.</pre>	

Turn Automatic Display Control (CEC) On/Off

This function turns the automated Display Control feature on and off.

Command Format	
CEC #	Replace the “#” with a 0 - disable display power control or 1 - enable the display power on/off control feature.
Examples in ASCII	Response
CEC 0	None.
Examples in HEX	Response
43 45 43 20 30 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ CEC 1 \$</pre>	

Get Display Control Feature Status

This function returns the status of the display control (CEC) feature.

Command Format	
CEC	Type CEC without a 0 or 1 to get the status of this feature.
Examples in ASCII	Response
CEC	None.
Examples in HEX	Response
43 45 43 20 30 0D	45 6E 61 62 6C 65 64 20 2D 20 54 79 70 65 20 43 45 43 20 30 20 74 6F 20 64 69 73 61 62 6C 65 2E
Command Line Example	
<pre>Firmware Revision 1.0 \$ CEC Enabled - Type CEC 0 to disable.</pre>	

Turn Display On/Off

This function turns the Display's Power on and off.

Command Format	
TV #	Replace the "*" with a 0 - turn off display or 1 to turn on the display.
Examples in ASCII	Response
TV 0	None.
Examples in HEX	Response
54 56 20 30 0D	None.
Command Line Example	
<pre>Firmware Revision 1.0 \$ TV 0 \$</pre>	

Get Display Power Status

This function gets the current power status as determined by the CEC commands.

Command Format	
TV	Type TV and carriage return.
Examples in ASCII	Response
TV	Display Power Status: ON
Examples in HEX	Response
54 56 20 30 0D	44 69 73 70 6C 61 79 20 50 6F 77 65 72 20 53 74 61 74 75 73 3A 20 20 4F 4E
Command Line Example	
<pre>Firmware Revision 1.0 \$ TV Display Power Status: ON</pre>	

Get Firmware Revision

Use this routine to get the firmware revision of this device. In this case, the model number should always read SW5200. This routine is often used to see if the switcher is connected and listening.

Command Format	
VER	Type ID then a carriage return.
Examples in ASCII	Response
VER	1.0
Examples in HEX	Response
56 45 52 0D	31 2E 30
Command Line Example	
<pre> Firmware Revision 1.0 \$ VER 1.0 </pre>	

Proximity Shutdown Feature On/Off

This function turns the proximity sensor feature on and off. When enabled, the sensor uses infra-red heat to determine if someone is in the room. If nobody is in the room, the system will shutdown the display (assuming Display Control CEC is enabled).

Command Format	
PROX #	Replace the # with a 0 - disable display power control or 1 - enable the display power on/off control feature.
Examples in ASCII	Response
PROX 0	None
Examples in HEX	Response
43 45 43 20 30 0D	None
Command Line Example	
<pre> \$ Firmware Revision 1.0 \$ PROX 0 \$ </pre>	

Get Proximity Shutdown Feature Status

This command returns the status of the Proximity Shutdown feature: either enabled or disabled.

Command Format	
PROX	Type PROX and carriage return.
Examples in ASCII	Response
PROX	None
Examples in HEX	Response
43 45 43 20 30 0D	45 6E 61 62 6C 65 64 20 2D 20 54 79 70 65 20 50 52 4F 58 20 30 20 74 6F 20 64 69 73 61 62 6C 65 2E
Command Line Example	
<pre>Firmware Revision 1.0 \$ PROX Enabled - Type PROX 0 to disable.</pre>	

HDBaseT RS232 Port Configuration

One of the display outputs of the SW5200 is HDBaseT. Within the SW5200, the HDBaseT connection provides an RS232 port to the connected device. This H232X routine configures the RS232 for proper communications with the connected device.

Command Format	
H232X BAUD DATA PARITY STOPBITS TOUT ASC	Port settings for RS232 port attached to HDBaseT receiver. Baud = Baudrate (1200-115200) Data = Data bits (7-8) Parity = Parity (Y/N) Stopbits = Stopbits (0/1) Tout = Timeout before sending read packet back to SW5200. Measured in 1/BAUD. Asc = Packet structure being sent back to SW5200. A = ASCII or H = Hexidecimal Text
Examples in ASCII	Response
H232X 9600 8 N 1 100 A	The response will display the current settings after this command executed.
Examples in HEX	Response
Command Line Example	
<pre>Firmware Revision 1.0 \$ H232X 9600 8 N 1 100 A Baud is 9600 8 data bit No Parity One Stop bit 100 milliseconds delay Ascii</pre>	

HDBaseT Send Data via RS232

This feature allows an external controller connected to the SW5200 to send data to the RS232 port within the HDBaseT to an external device (connected display or HDBaseT receiver).

Command Format	
H232S DATA	DATA can be two types. If port has been configured as an ASC = 'A' or text format, DATA will be the text that will be sent via RS232. If ASC = 'H' then DATA represents the hexadecimal value of the Ascii characters to be sent. In the example below, the same command is being sent in both Ascii text and hexadecimal value of the ASCII character.
Examples in ASCII	Response
H232S (PWR1)	The response will display the current settings after this command executed.
Examples in HEX	Response
H232S 28 50 57 52 31 29	See below.
Command Line Example	
<pre> Firmware Revision 1.0 \$ H232S 28 50 57 52 31 29 Message sent 6 characters. </pre>	

HDBaseT Read Data from RS232

These data packets appear on the SW5200's comm ports when an RS232 message is received from the HDBaseT's RS232 serial port.

Command Format	
H232R DATA	DATA can be two types. If port has been configured as an ASC = 'A' or text format, DATA will be the text that will be sent via RS232. If ASC = 'H' then DATA represents the hexadecimal value of the Ascii characters to be sent. In the example below, the same command is being sent in both Ascii text and hexadecimal value of the ASCII character.
Examples Received in ASCII	Response
H232R Hello World!	N/A
Examples in HEX	Response
H232R 48 65 6C 6C 6F 20 57 6F 6C 64 21	Same as above

IR Control Codes

Introduction

The SW5200 uses the standard NEC IR transmission protocol. It's carrier frequency is 38kHz and has a pulse length of 562.5µs. The SW5200 does not support pulse codes at this time.

For our purposes here, we are only interested in the LSB (least significant byte) in the transmission. All other data in the IR command structure are ignored.

Note: 0x24 = Hexidecimal value 24.

Commands

Command Format	Hexidecimal Code (LSB)
Power On/Off	0x27 or 0x9D
Select Next Input (Input + 1)	0x7F or 0x85
Select Previous Input (Input - 1)	0xEF or 0xCF
Volume Up	0x5F or 0x67
Volume Down	0xFF or 0xC7

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