# 4:1 HDMI/VGA/DP Switching Extender with Scaling Receiver, Relay Triggering and HDCP 2.2

EX-SW-0401-H2-PRO
SW-510-TX | SW-515-RX

## Application Programming Interface

| | |
|---|---|
| Document Revision: | 1.2 |
| Document Date: | November 2020 |
| Supported Firmware: | 1.0.0 or higher |


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# Contents

# 1. Overview

The following document contains the Application Program Interface (API) commands to control the SW-0501-HDBT and SW-1001-HDBT presentation switchers via serial and IP commands. Read this document in its entirety before starting any communication with the product.

## 1.1 Before You Begin

Verify that the following items are on hand and that all documentation is reviewed before continuing.

EX-SW-0401-H2-PRO, SW-510-TX or SW-515-RX ☐

Control System and Control System Documentation ☐

PC or Mac for Configuring Product and Telnet Communications ☐

Visit the Product Page on WyreStorm.com to download firmware and additional product information ☐

# 2. Wiring and Communication Configuration

WyreStorm recommends that all wiring for the installation is run and terminated prior to making connections to the switcher. Read through this section in this entirety before running or terminating the wires to ensure proper operation and to avoid damaging equipment.

## 2.1 Connection Requirements

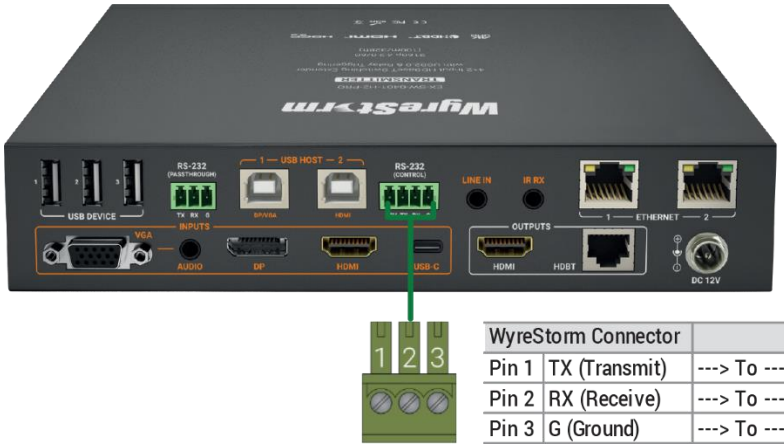
The SW-510-TX and SW-515-RX are the TX/RX from the EX-SW-0401-H2-PRO. The same API is used for both SKUs. However, there are some differences to make note of.

- The SW-510-TX does not contain a web server. Therefore, only RS-232 control of the switcher is possible.
- The SW-515-RX does contain a web server, Therefore, both LAN and RS-232 control is possible.
- If connecting the SW-510-TX and SW-515-RX together over HDBaseT then RS232 or LAN can be used to control both the TX and RX. However, in this scenario you must connect your control system to the SW-515-RX.

**Important!** If you are using the SW-510-TX or SW-515-RX as a standalone product - make note of the API requirements when specifying the output device. For example, when switching an input - you're required to include whether the switching command should be sent to the TX (510) or the RX (515).

## 2.2 RS-232 Connections

The following wiring diagrams show the pinouts for the switcher. While not shown, connect the TX (transmit) to RX (receive) pins at the control system or PC side of the cable. Most control systems and computers are configured for Digital Terminal Equipment (DTE) where pin 2 is RX and pin 3 is TX This can vary from device to device, refer to the documentation for the connected device for pin functionally to ensure that the connect connections can be made.




| WyreStorm Connector | | | 3rd Party Device |
|---|---|---|---|
| Pin 1 | TX (Transmit) | ---> To ---> | RX (Receive) |
| Pin 2 | RX (Receive) | ---> To ---> | TX (Transmit) |
| Pin 3 | G (Ground) | ---> To ---> | G (Ground) |

## 2.2 Serial and IP Settings

| | |
|---|---|
| Baud rate: | 115200 |
| Data Bits: | 8bits |
| Parity: | None |
| Stop Bits: | 1bit |
| Flow Control: | None |
| Default IP Address: | 192.168.11.43 |
| Default IP Port: | 23 |

## 2.3 Command Overview

| | |
|---|---|
| Command Type: | ASCII |
| Key Words: | Case Sensitive |
| [Prm]: | optional parameters |
| [Input]: | Video Input (HDMI/HDBaseT/DP/VGA) |
| [Output] | Output Device (TX/RX) |
| Command termination: | <CR><LF> |

# 3. Controlling the Switcher and Connected Devices

## 3.1 Switching Inputs

### Switching Input to Output

| | |
|---|---|
| Select Input and Output Mapping<br>SET SW [Input] [Output]<CR><LF><br>Response: SW [Input] all<CR><LF><br>Example: SET SW TXHDMI RX<CR><LF><br>Response: SW TXHDMI RX<CR><LF> | [Input]=VGA \| DP \| TXHDMI \| USBC \| RXHDBT \| RXHDMI1 \| RXHDMI2<br>[Output]=RX \| TX |
| Query Selected Output Mapping<br>GET MP [Output]<CR><LF><br>Response: MP GET [Input] [Output]<CR><LF><br>Example: GET MP RX<CR><LF><br>Response: MP TXHDMI RX<CR><LF> | |

### Powering On and Off Displays

**IMPORTANT! Command Requirements**

- This command only functions over RS-232 and cannot be used when controlling a display via IP
- The display section of the web UI must be configured for display baud rate and contain commands entered into **Power On Code** and **Power Off Code** listed under **Display Control Commands**.

| | |
|---|---|
| Set CEC Power On/Off<br>SET CEC_FN [Prm]<CR><LF><br>Response: CEC_FN [Prm]<CR><LF><br>Example: SET CEC_FN on<CR><LF><br>Response: CEC_FN on<CR><LF> | [Prm] = on \| off |

### Triggering Relay On and Off (Projector Screen Up/Down)

| | |
|---|---|
| SET PROSCR_LR [Prm]<CR><LF><br>Response: PROSCR_LR [Prm]<CR><LF><br>Example: SET PROSCR_LR lowering<CR><LF><br>Response: PROSCR_LR lowering <CR><LF> | [Prm] = lowering \| raising |

# 4. Configuring the Switch

## 4.1 Configuring a Static IP Address

By default, the switcher is set to a static IP of 192.168.11.043. We recommend changing this as it shared with other WyreStorm products and may cause improper communication if left unchanged. Connect to the RX via RS-232 and send the following command to set the IP address.

**Note:** The following commands can only be sent to the receivers (RX) RS-232 port.

Set Static IP Address
SET STATIC IPADDR [IP Address] [Netmask]<CR><LF>
Example: SET IPADDR STATIC 192.168.11.243 255.255.255.0 <CR><LF>
Response: IPADDR STATIC 192.168.11.243 255.255.255.0 <CR><LF>

Set DHCP IP Address
SET DHCP IPADDR<CR><LF>
Example: SET DHCP IPADDR<CR><LF>
Response: DHCP<CR><LF>

Query IP Address
GET IPADDR<CR><LF>
Response: IPADDR xx.xx.xx.xx<CR><LF>
Example: GET IPADDR<CR><LF>
Response: IPADDR 192.168.11.243<CR><LF>

## 4.2 Configuring Video

### Configuring Input EDIDs

By default, all inputs are set to an EDID of 1920x1080@60Hz 2CH. However, this can be configured to suit the installation.

Set Input EDID
SET EDID [Input] [Resolution]<CR><LF>
Example:
SET EDID TXHDMI 1920x1080@60Hz<CR><LF>
Response:
EDID TXHDMI 1920x1080@60Hz<CR><LF>

[Input]=VGA | DP | TXHDMI | USBC | RXHDMI1 | RXHDMI2
[Resolution]=

| VGA Input | HDMI \| DP \| USB-C Inputs |
|---|---|
| 1024x768@60Hz 2CH | 1024x768@60Hz 2CH |
| 1280x768@60Hz | 1280x720@60Hz |
| 1360x768@60Hz | 1360x768@60Hz |
| 1440x900@60Hz | 1440x900@60Hz |
| 1600x900@60Hz | 1600x900@60Hz |
| 1680x1050@60Hz | 1680x1050@60Hz |
| 1920x1080@60Hz | 1920x1080@60Hz |
| 1920x1200@60Hz | 3840x2160@30Hz |

Query Input EDID
GET EDID [Input]<CR><LF>
Example: GET EDID TXHDMI<CR><LF>
Response

EDID TXHDMI 1920x1080@60Hz<CR><LF>

### Enable/Disable HDCP Support

**Set HDCP Support On/Off**
SET HDCP_S [Input] [Prm]<CR><LF>
Response: HDCP_S [Input] [Prm]<CR><LF>
Example: SET HDCP_S TXHDMI on<CR><LF>
Response: HDCP_S TXHDMI on<CR><LF>

**Query HDCP Support On/Off Status**
GET HDCP_S [Input]<CR><LF>
Response: HDCP_S [Input] [Prm]<CR><LF>
Example: GET HDCP_S TXHDMI <CR><LF>
Response: HDCP_S TXHDMI on <CR><LF>

[Input]= TXHDMI | USBC | RXHDMI1 | RXHDMI2
[Prm]=on | off

## 4.3 Configuring Device Switching Modes

### Auto Switch Mode

| | |
|---|---|
| Enable/Disable Auto Switch Mode<br>SET AUTOSW_FN [Prm]<CR><LF><br>Response: AUTOSW_FN [Prm]<CR><LF><br>Example: SET AUTOSW_FN on<CR><LF><br>Response: AUTOSW_FN on<CR><LF> | [Prm] = on \| off |
| Query Auto Switch Mode Status<br>GET AUTOSW_FN<CR><LF><br>Response: AUTOSW_FN [Prm]<CR><LF><br>Example: GET AUTOSW_FN<CR><LF><br>Response: AUTOSW_FN on<CR><LF> | |

### Key Lock Function Enable/Disable

| | |
|---|---|
| Enable/Disable Key Lock<br>SET KEY_FN [Prm]<CR><LF><br>Response: KEY_FN [Prm]<CR><LF><br>Example: SET KEY_FN on <CR><LF><br>Response: KEY_FN on<CR><LF> | [Prm] = on \| off |
| Query Auto Switch Mode Status<br>GET KEY_FN<CR><LF><br>Response: KEY_FN [Prm]<CR><LF><br>Example: GET KEY_FN<CR><LF><br>Response: KEY_FN on<CR><LF> | |

## 4.4 Configuring Relays

### Relay mode

| | |
|---|---|
| Set Relay Mode<br>SET RELAY_M [Prm]<CR><LF><br>Response: RELAY_M SET [Prm]<CR><LF><br>Example: SET RELAY_M latch<CR><LF><br>Response: RELAY_M latch<CR><LF> | [Prm] = latch \| momentary |
| Query Relay Mode<br>GET RELAY_M rx<CR><LF><br>Response: RELAY_M GET [Prm]<CR><LF><br>Example: GET RELAY_M<CR><LF><br>Response: RELAY_M latch<CR><LF> | |

### Relay Timing

| | |
|---|---|
| Set Momentary Time<br>SET MOM_T [Prm]<CR><LF><br>Response: MOM_T [Prm]<CR><LF><br>Example: SET MOM_T 8<CR><LF><br>Response: MOM_T 8<CR><LF> | [Prm] = 1 ~ 10 // seconds \| default is 3s |
| Query Momentary Time<br>GET MOM_T<CR><LF><br>Response: MOM_T [Prm]<CR><LF><br>Example: GET MOM_T<CR><LF><br>Response: MOM_T 8<CR><LF> | |

## 4.5 Configuring CEC

### CEC Auto Power ON/OFF

| | |
|---|---|
| Set CEC AUTO POWER ON/OFF<br>SET DISPAUTO_FN [Prm] rx<CR><LF><br>Response: DISPAUTO_FN [Prm] rx<CR><LF><br>Example: SET DISPAUTO_FN on<CR><LF><br>Response: DISPAUTO_FN on<CR><LF> | [Prm] = on \| off |
| Query CEC AUTO POWER ON/OFF<br>GET DISPAUTO_FN<CR><LF><br>Response: DISPAUTO_FN GET [Prm]<CR><LF><br>Example: GET DISPAUTO_FN<CR><LF><br>Response: DISPAUTO_FN GET on<CR><LF> | |

### CEC Power Delay Time

| | |
|---|---|
| Set CEC POWER Delay Time<br>SET AUTOCEC_D [Prm]<CR><LF><br>Response: AUTOCEC_D [Prm]<CR><LF><br>Example: SET AUTOCEC_D 2<CR><LF><br>Response: AUTOCEC_D SET 2<CR><LF> | [Prm] = 1~30 In Minutes with a default of 2min |

## 4.6 Configuring the Serial Port and Command Structure

Note: Conditions on sending commands exist based on how the devices will be used in a system.

- When used together as a TX and RX commands can only be sent to the RX.
- When TX is used with a different HDBT receiver commands can only be sent to the TX.

### Serial Port Baudrate

| | |
|---|---|
| Set Serial Port Baudrate<br>SET UART_B [Prm]<CR><LF><br>Response: UART_B SET [Prm]<CR><LF><br>Example: SET UART_B 115200<CR><LF><br>Response: UART_B SET 115200<CR><LF> | [Prm] = 9600 \| 19200 \| 38400 \| 57600 \| 115200<br>//[PRM] is the baudrate. |
| Query Serial Port Baudrate<br>GET UART_B<CR><LF><br>Response: UART_B GET [Prm]<CR><LF><br>Example: GET UART_B<CR><LF><br>Response: UART_B 115200<CR><LF> | |

### Serial Port Data Type

| | |
|---|---|
| Set Serial Data Type<br>SET UART_T [Prm]<CR><LF><br>Response: SET UART_T [Prm]<CR><LF><br>Example: SET UART_T string<CR><LF><br>Response: UART_T string<CR><LF> | [Prm] = string \| hex<br>//str in [Prm] = ASCII string |
| Query Serial Data Type<br>GET UART_T<CR><LF><br>Response: UART_T GET [Prm]<CR><LF><br>Example: GET UART_T<CR><LF><br>Response: UART_T string<CR><LF> | |

### Serial Command End Character

| | |
|---|---|
| Set Serial Command End Character<br>SET UART_E [Prm]<CR><LF><br>Response: UART_E [Prm]<CR><LF><br>Example: SET UART_E crlf<CR><LF><br>Response: UART_E crlf<CR><LF> | [Prm] = null \| cr \| lf \| crlf<br>cr: carriage Response, ascii code is 0x0D.<br>lf: line feed, ascii code is 0x0A. |
| Query Serial Command End Character<br>GET UART_E<CR><LF><br>Response: UART_E [Prm]<CR><LF><br>Example: GET UART_E<CR><LF><br>Response: UART_E crlf<CR><LF> | |

### Edit Serial Command in ASCII String

| | |
|---|---|
| Set Serial Command ASCII String<br>SET UART_STR [Prm1] [Prm2]<CR><LF><br>Response: UART_STR [Prm1] [Prm2]<CR><LF><br>Example: SET UART_STR on xxxx<CR><LF><br>Response: UART_STR on xxxx<CR><LF> | [Prm1] = poweron \| poweroff<br>[Prm2] = xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx<br>//PRM2 is the original command according to device guidelines |

### Edit Serial Command in HEX String

| | |
|---|---|
| Set Serial Command HEX String<br>SET UART_HEX [Prm] [Hex String]<CR><LF><br>Response: UART_HEX SET [Prm] [Hex String] <CR><LF><br>Example: SET UART_HEX poweron 31 32 33 34 35 36<CR><LF><br>Response: UART_HEX SET poweron 31 32 33 34 35 36<CR><LF> | [Prm] = poweron \| poweroff<br>[Hex String] = Hex string up to 64bytes<br>// [Hex1] \| [Hex2] ~ is ascii string in hex value.<br>For example, string "123", convert to correct format string is"31 32 33". |

# 5. Troubleshooting

## Query Input Signal Status

| | |
|---|---|
| GET SIG_S<CR><LF><br>Response: [Input] [Prm]<CR><LF>]<br>Example: GET SIG_S RXHDBT<CR><LF><br>Response: SIG_S RXHDBT Have Signal<CR><LF> | [Input]=VGA \| DP \| TXHDMI \| USBC \| RXHDBT \| RXHDMI1 \| RXHDMI2<br>[Output]=RX \| TX [Prm] = NO Signal \| Have Signal |

## Query Unit Firmware Version

| | |
|---|---|
| GET VER<CR><LF><br>Response: [Prm]<CR><LF>]<br>Example: GET VER<CR><LF><br>Response:<br>VER MCU 1.2 tx<CR><LF><br>VER ARM 1.4 tx<CR><LF> | [Prm] =x.x// according to actual firmware version |

## Reboot Device

| |
|---|
| APP<CR><LF><br>Response: APP<CR><LF><br>Example: APP<CR><LF><br>Response: APP<CR><LF> |

## Restore Factory Defaults

| |
|---|
| SYSR<CR><LF><br>Response: SYSR<CR><LF><br>Example: SYSR<CR><LF><br>Response: SYSR<CR><LF> |

## Query Command List (Help)

| | |
|---|---|
| HELP<CR><LF><br>Response: HELP<CR><LF><br>[Command List]<br>Example: HELP<CR><LF><br>Response: HELP<CR><LF><br>[Command List] | [Command List]=<br>[00]SET AUTOSW_FN prm <CR> <LF>( To set the auto switch on/off )<br>[01] GET AUTOSW_FN <CR> <LF>( To verify the auto switch status )<br>[02] SET KEY_FN prm <CR> <LF>( To set key lock on/off )<br>[03] GET KEY_FN <CR> <LF>( To verify the key lock status )<br>[04] SET SW in out<CR> <LF>( To execute a switch )<br>[05] SET SW in all<CR> <LF>( To execute a switch )<br>[06] GET MP out<CR> <LF>( To verify switch status )<br>[07] GET SIG_S in<CR> <LF>( To verify input signal status )<br>[08] SET CEC_FN prm<CR> <LF>( To execute a display control on/off )<br>[09] SET DISPAUTO_FN prm <CR> <LF>( To define the display control automatically )<br>[10] GET DISPAUTO_FN <CR> <LF>( To verify the display control Status )<br>[11] SET AUTOCEC_D prm<CR> <LF>( To define a delay time to control the display off when no signal )<br>[12]GET VER ALL <CR> <LF>( Get all firmware version )<br>[13] SET UART_B prm<CR> <LF>( To set UART baud rate )<br>[14] GET UART_B<CR> <LF>( To get UART baud rate )<br>[15] SET UART_E prm<CR> <LF>( To set UART end character ) |

# 6. Contacting Technical Support

Should further clarification of the content in this document or assistance on troubleshooting be required, please contact WyreStorm technical support.

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# 7. Document Revision History

| | |
|---|---|
| **v1.2 – November 2020** | |
| All Sections | Updated to include SW-510-TX and SW-515-RX |
| **v1.1 – February 2019** | |
| Various | General formatting and content cleanup |
| Controlling the Switcher and Connected Devices | • Moved to before configuration and renamed<br>• Moved Powering On and Off displays from Configuring CEC Section and renamed<br>• Added important note about using display power commands<br>• Moved Triggering Relay On and Off from Relay section and renamed<br>• Corrected typo for Triggering Relay command SET PROSCR_LR |
| **v1.0 – October 2018** | |
| All Sections | Initial Release of Document |

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