

# ▶ HEX70HDUK-KIT

## User Manual

## Thank you for purchasing this product.

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.



### Surge Protection Device Recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lightning strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

## Contents

Introduction	03
Features	03
TX Panel Description	04
RX Panel Description	04
Mounting into the HEX70HDUK-TT	05
USB Hosts and USB-C Functionality	06
Front Panel LED's and Auto Switching	06
EDID Control	06
Automatic System On/Off Control	07
Relay Control	07
Infrared (IR) Control	08
CEC Control	08
Terminating CAT Cables for use with HDBT	09
Understanding the HDBaseT™ Status LED's	09
Schematic	10
Web GUI Control	11-20
IR Commands	21
RS-232 Config & Telnet Commands	22-25
Specifications	26
Package Contents	26
Certifications	27

# Introduction

The HEX70HDUK-KIT extender set is an industry leading HDMI2.0 4K 60Hz 4:4:4 (18Gbps) HDCP2.2 HDBaseT™ multi-format solution utilising CSC technology to deliver HDMI, USB-C and DisplayPort™ up to lengths of 40m (70m at 1080p) over a single CAT cable.

The HEX70HDUK-KIT provides enhanced features including USB 2.0 extension, local HDMI input on the HDBaseT™ Receiver for additional source input, web-GUI for control and configuration, auto display control, audio breakout and bi-directional IR pass-through.

The HEX70HDUK-KIT also features control via front panel, IR, RS-232 and TCP/IP, PoC (Power over Cable), and advanced EDID and HDCP management.

---

## FEATURES:

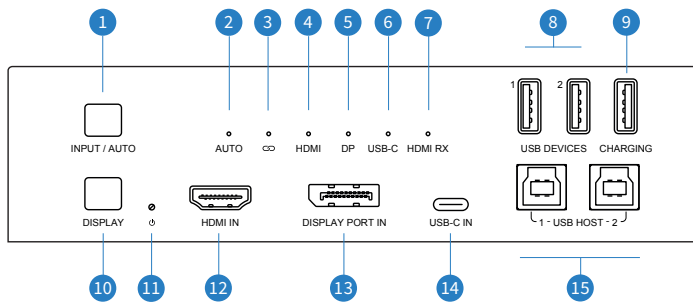
---

- Advanced HDBaseT™ technology offering distribution of video and audio over a single CAT cable
- Advanced Colour Space Conversion (CSC) supports HDMI2.0 18Gbps specification including HDR
- Features 1 x HDMI, 1 x USB-C and 1 x DisplayPort™ input on the HDBaseT™ Transmitter with manual or auto source selection
- Features 1 x local HDMI input on the HDBaseT™ Receiver for connection of a source local to the display
- Supports 4K 60Hz 4:4:4 UHD video up to 40m
- Extends HDMI 1080p up to a distance of 70m over single CAT cable
- Supports all known HDMI audio formats including Dolby Atmos, Dolby TrueHD, Dolby Digital Plus and DTS-HD Master Audio transmission
- Supports USB Type C up to 4K UHD 60Hz 4:4:4 DP1.2 with 60W charging capability\*
- Supports DisplayPort™ up to 4K UHD 60Hz 4:4:4 DP1.2
- Features 2 x USB-Type A devices (RX - peripherals), 2 x USB-Type A devices (TX - peripherals) and 2 x USB Type-B (TX - host source specific) that support a combined data transmission bandwidth of up to 250Mbps
- USB Type-A connections support charging of devices up to 500mA when there is an active connection to a Host device
- Independent USB Type-A connection to support charging only of devices up to 5V 2A
- Audio breakout to analogue L/R audio and Optical digital (S/PDIF) outputs concurrently\*\*
- Bi-directional IR pass-through
- Auto display on/off feature allowing control of display at the HDBaseT™ Receiver via CEC or RS-232
- Web interface module for control and configuration of HEX70HDUK-KIT
- Control via front panel, IR, RS-232 and TCP/IP
- Supports bi-directional PoC (Power over Cable) to power extenders from either transmitter or receiver end
- Advanced EDID and HDCP management

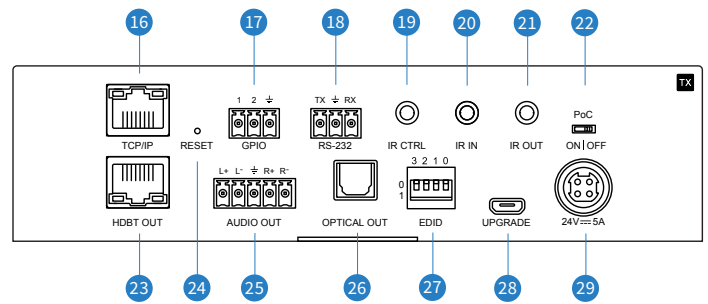
\*USB-C video support is limited to 4K 60Hz 4:2:0 when charging feature is activated by the source device, and where the TX is powered directly from the supplied PSU

\*\*Analogue audio breakout supports 2ch PCM only

# TX Panel Description

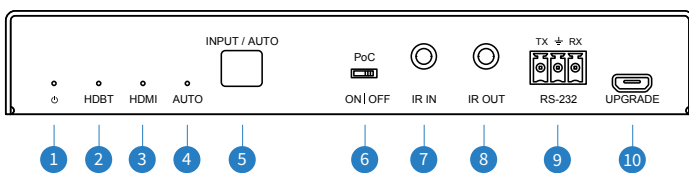


- 1 Input / Auto select button - press to change source, hold for 3 seconds to enable / disable auto signal sense switching
- 2 Auto switching input indicator
- 3 HDBaseT™ link indicator (to HEX70HDUK-RX)
- 4 Local (TX) HDMI input signal link indicator
- 5 DisplayPort™ input signal link indicator Remote (RX)
- 6 USB-C input signal link indicator
- 7 Remote (RX) HDMI input signal link indicator
- 8 USB Devices - connect to USB devices or peripherals
- 9 USB charging only - max 5V 2A charging
- 10 Display - triggers the output on / off sequence (see Display On / Off section)
- 11 Power status indicator
- 12 HDMI input - connect to source equipment
- 13 DisplayPort™ input - connect to source equipment using a cable capable of carrying video
- 14 USB-C input - connect to source / Host equipment (combined video input and USB Host)
- 15 USB Hosts - connect to USB port of Host devices (USB Host 1 linked to HDMI input, Host 2 linked to DP input)

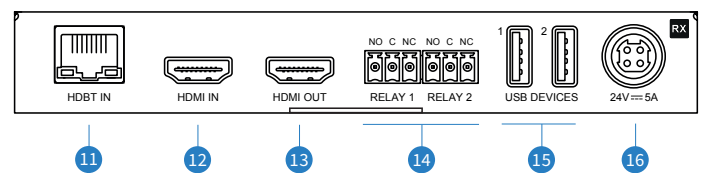


- 16 TCP/IP (RJ45) – connect to LAN for TCP/IP control. Default IP address of the HEX70HDUK-TX is: **192.168.0.200**
- 17 GPIO Port - 3-pin Phoenix connector for input sense/output relay/contact closure of 3rd party devices
- 18 RS-232 - 3-pin Phoenix connector for RS-232 pass through, or device control by RS-232 commands
- 19 IR Control Input - 3.5mm stereo connector to connect to Blustream IR receiver for IR control of the unit
- 20 IR IN (from Blustream 5V 3.5mm IR receiver)
- 21 IR OUT (to Blustream 5V 3.5mm IR emitter)
- 22 Power over Cable (PoC) switch (ON / OFF) - to enable / disable PoC being sent from the Transmitter
- 23 HDBaseT™ output - connect to HEX70HDUK-RX
- 24 Reset HEX70HDUK to default factory / IP settings
- 25 Analogue L/R Audio Output - Phoenix connector supports balanced or unbalanced variable analogue audio signals
- 26 Optical Digital Audio Output (S/PDIF)
- 27 EDID DIP switch (UP=0, DOWN=1)
- 27 USB Upgrade port
- 28 Power port – use included 24V/5A DC adaptor to power the device

# RX Panel Description



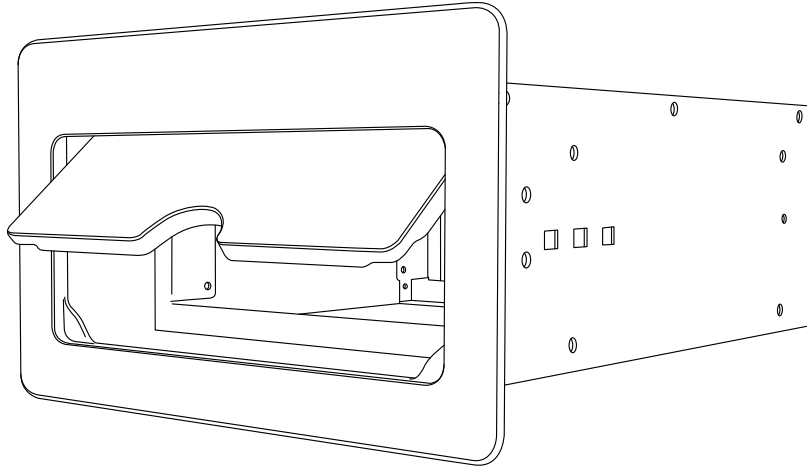
- 1 Power status indicator
- 2 HDBaseT™ link indicator (from HEX70HDUK-TX)
- 3 Local HDMI input signal link indicator
- 4 Auto input signal link indicator
- 5 Input / Auto select button - press to change source, hold for 3 seconds to enable / disable auto signal sense switching
- 6 Power over Cable (PoC) switch (ON / OFF) - to enable / disable PoC being sent from the Receiver
- 7 IR IN (from Blustream 5V 3.5mm IR receiver)
- 8 IR OUT (to Blustream 5V 3.5mm IR emitter)
- 9 RS-232 - 3-pin phoenix connector for RS-232 pass through, or device control by RS-232 commands



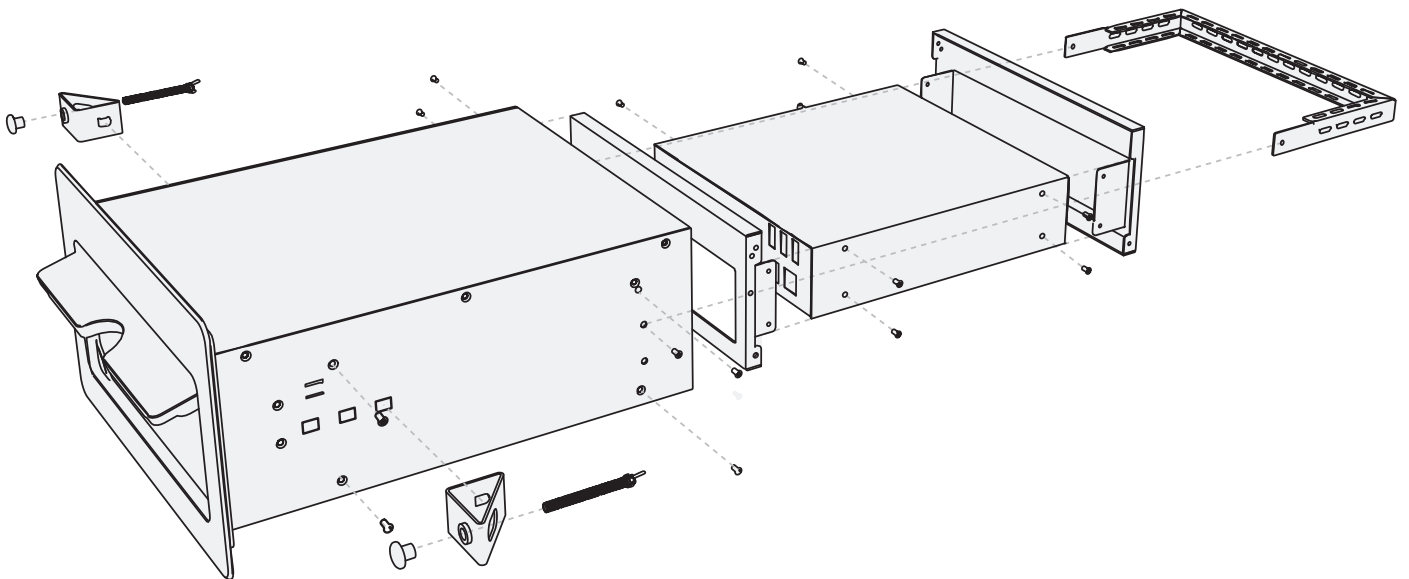
- 10 USB Upgrade port
- 11 HDBaseT™ input - connect to HEX70HDUK-TX
- 12 HDMI input - connect to local source equipment
- 13 HDMI output - connect to display equipment
- 14 Relays - 3-pin Phoenix connector to allow relay control of a device such as a projector screen
- 15 USB Devices - connect to USB devices or peripherals
- 16 Power port - use included 24V/5A DC adaptor to power the device

## Transmitter Mounting into the HEX70HDUK-TT

The HEX70HDUK transmitter can be mounted in the optional HEX70HDUK-TT table top mounting solution.



The HEX70HDUK transmitter is fixed into position with the video connectors pointing upwards (to the lid of the TT). There are two internal brackets that are attached to the Transmitter before sliding into the chassis of the TT. As per the below diagram:



## USB Hosts and USB-C Functionality

The HEX70HDUK-TX features a USB3.0 hub for pass-through and switching alongside the peripheral devices and/or video connected at the transmitter. USB Host 1 is paired to the switching of HDMI input1, USB Host 2 is paired with the DisplayPort input, whilst the USB-C connection allows for both video and data switching to be handled simultaneously. The unit also allows for USB2.0 pass-through (up to a combined maximum data rate of 250Mbps) from devices connected to the HEX70HDUK-RX over HDBaseT™.

The USB-C input supports a full 18Gbps 4K 60Hz 4:4:4 video signal. It also supports up to 60W charging, however, when charging is activated, video bandwidth is automatically limited to 10Gbps and maximum resolution up to 4K 60Hz 4:2:0 video signals. **Please note:** the TX needs to be powered directly from the PSU for USB-C charging.

## Front Panel LED's and Auto Switching

The HEX70HDUK-KIT includes LED indicator lights to identify what input is selected. On the Transmitter if an input LED is solid then it is the selected source and in manual switching mode, if it is flashing then the unit is in auto switching mode. On the Receiver, there is an input LED for showing whether remote HDBT or local HDMI source is selected, as well as a dedicated LED indicator that will be solid if auto switching mode is enabled hence the RX LED's will not flash. Auto-switching is enabled by default on both Transmitter and Receiver. When enabled, if a source is disconnected, the HEX70HDUK-KIT will go back to the previously active input, and if the previously active input isn't available it will find the next active input starting from input 1 to input 4.

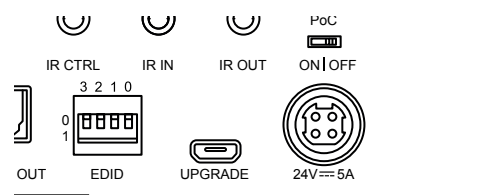
## EDID Control

EDID (Extended Display Identification Data) is a data structure that is used between a display and a source to negotiate the best audio and video resolutions that are supported in the system. A global EDID of the HEX70HDUK-KIT can be configured using a combination of DIP switch settings (see below), or using TCP/IP or RS-232 commands.

### Global EDID Settings

DIP switch position '0' = Off / Up

DIP switch position '1' = On / Down



### EDID DIP Switches

- [DIP] = 0000: HDMI 1080p @60Hz, Audio 2ch PCM (default)
- [DIP] = 0001: HDMI 1080p @60Hz, Audio 5.1ch PCM/DTS/DOLBY
- [DIP] = 0010: HDMI 1080p @60Hz, Audio 7.1ch PCM/DTS/DOLBY/HD
- [DIP] = 0011: HDMI 1080i @60Hz, Audio 2ch PCM
- [DIP] = 0100: HDMI 1080i @60Hz, Audio 5.1ch PCM/DTS/DOLBY
- [DIP] = 0101: HDMI 1080i @60Hz, Audio 7.1ch PCM/DTS/DOLBY/HD
- [DIP] = 0110: HDMI 4K @60Hz 4:2:0, Audio 2ch PCM
- [DIP] = 0111: HDMI 4K @60Hz 4:2:0, Audio 5.1ch PCM/DTS/DOLBY
- [DIP] = 1000: HDMI 4K @60Hz 4:2:0, Audio 7.1ch PCM/DTS/DOLBY/HD
- [DIP] = 1001: HDMI 4K @60Hz 4:4:4, Audio 2ch PCM
- [DIP] = 1010: HDMI 4K @60Hz 4:4:4, Audio 5.1ch PCM/DTS/DOLBY
- [DIP] = 1011: HDMI 4K @60Hz 4:4:4, Audio 7.1ch PCM/DTS/DOLBY/HD
- [DIP] = 1100: DVI 1920x1080 @60Hz, Audio None
- [DIP] = 1101: DVI 1920x1200 @60Hz, Audio None
- [DIP] = 1110: EDID Passthrough
- [DIP] = 1111: Software Controlled EDID (set EDID via TCP/IP or RS-232)

## Automatic System On/Off Control

The HEX70HDUK is designed to help automate basic control of AV equipment within a room without the need for a 3rd party control system. It can control devices via RS-232 and from the relay outputs. The key function is to turn the system on when a new video signal is sensed, and turn it off when that signal is lost.

Configuration of this functionality can be completed via RS-232. See the RS-232 Configuration and Telnet Commands section at the rear of this manual for additional information and command API.

### System On:

When the HEX70HDUK detects video signal (via TMDS or 5V), the system will start and automatically perform the following actions at the same time:

- Send RS-232 On Command, then delay (between 1~180s, default 3s), then send user defined RS-232 command once configured via RS-232
- Toggle the state of relay 1 for a predetermined time (enabled by default, between 3~180s, default 10s, 0 is always open while the unit is on)

**Please note:** when setting video signal trigger to TMDS or 5V, please ensure the System On and System Off settings match, or the feature may not operate correctly.

### System Off:

When the controller detects the video signal is lost, and does not receive a signal sense trigger within the delay time (between 5~180mins, default 10mins), the system will turn off and automatically perform the following actions:

- Send RS-232 Off Command, then delay (between 1~180s, default 3s), then repeat the command once configured via RS-232
- Toggle the state of relay 2 for a predetermined time (enabled by default, between 3~180s, default 10s, 0s will turn off when the unit turns stops sensing)

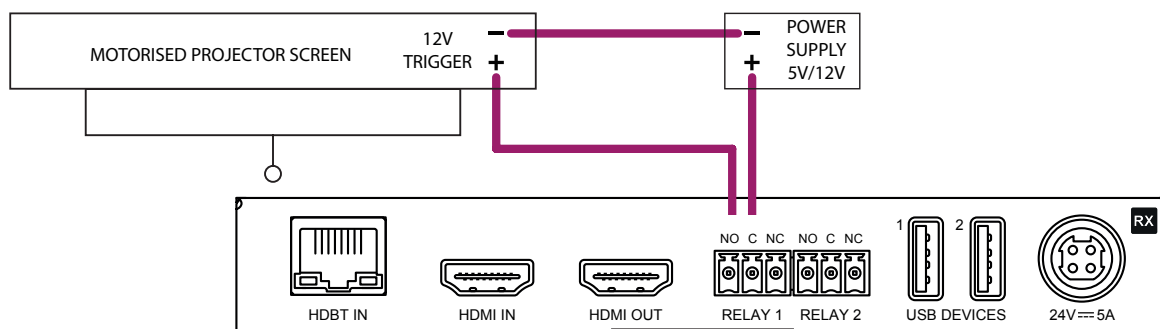
## Relay Control

The HEX70HDUK-RX features relay control to trigger external devices when a HDMI signal is sensed or lost.

By default when the unit is turned on or off, both relay 1 and 2 will open for 10 seconds and then close afterwards.

- For Relay 1, the delay time can be set to 0 seconds which will keep the relay open when the unit is turned on, and close the relay when the unit is turned off
- Relay 2 does not have this feature

For relay API commands, please see the RS-232 Configuration and Telnet Commands section at the rear of this manual.



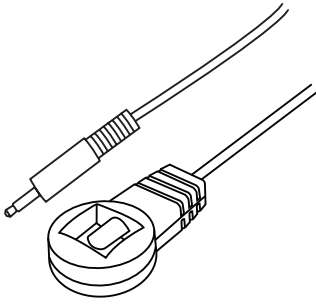
## Infrared (IR) Control

The Blustream range of extender products include source switching control via IR.

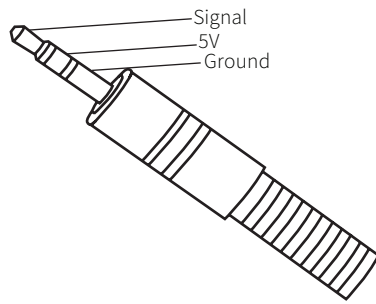
**IMPORTANT: Blustream Infrared products are all 5V and NOT compatible with alternative manufacturers Infrared solutions. When using third party 12V IR control solutions please use the Blustream IRCAB cable for IR conversion.**

### IR Receiver - IRR

Blustream 5V IR receiver to receive an IR signal for control of the extender.



### IR Receiver - Stereo 3.5mm

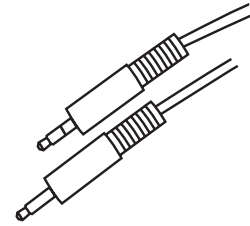


### IR Control Cable - IRCAB (not supplied)

Blustream IR Control cable 3.5mm Mono to 3.5mm Stereo for linking third party control solutions to Blustream products.

Compatible with 12V IR 3rd party products.

**Please Note:** cable is directional as indicated.



## CEC Control

The HEX70HDUK features CEC control of source devices and displays via the products web GUI, TCP/IP and RS-232. It is possible to send CEC commands such as power on / off, input selection, as well as volume up or down.

Please see the Telnet & RS-232 command list at the end of this document for a full list of CEC commands available.

**Please note:** CEC is subject to the support of standardised codes for the sources and displays connected to the extender.

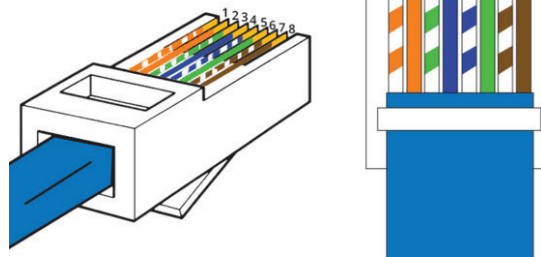


## Terminating CAT Cable for use with HDBaseT™

It is important that the interconnecting CAT cable between Blustream HDBaseT™ products is terminated using the correct RJ45 pin configuration. The link CAT cable MUST be a 'straight' (pin-to-pin) CAT cable, and it is advised that this is wired to the T568B wiring standard as this format is less prone to EMI (Electro-Magnetic Interference).

When installing CAT cables it is advised that you use the best possible CAT cable quality. HDMI distribution products will only work if used with CAT5e standard cable or above. Blustream recommends using a CAT6 cable (or better) for installations, especially when running longer distances, in areas of high EMI, or for 4K signal distribution. It is advised that using any method of patch panel, wall plate, or join within the CAT cable is avoided as these can add degradation to the signal. Blustream also recommend using RJ45 connectors that are recommended for use with the choice of CAT cable.

### RJ45 Wiring - T568B



## Understanding the HDBaseT™ Status LED's

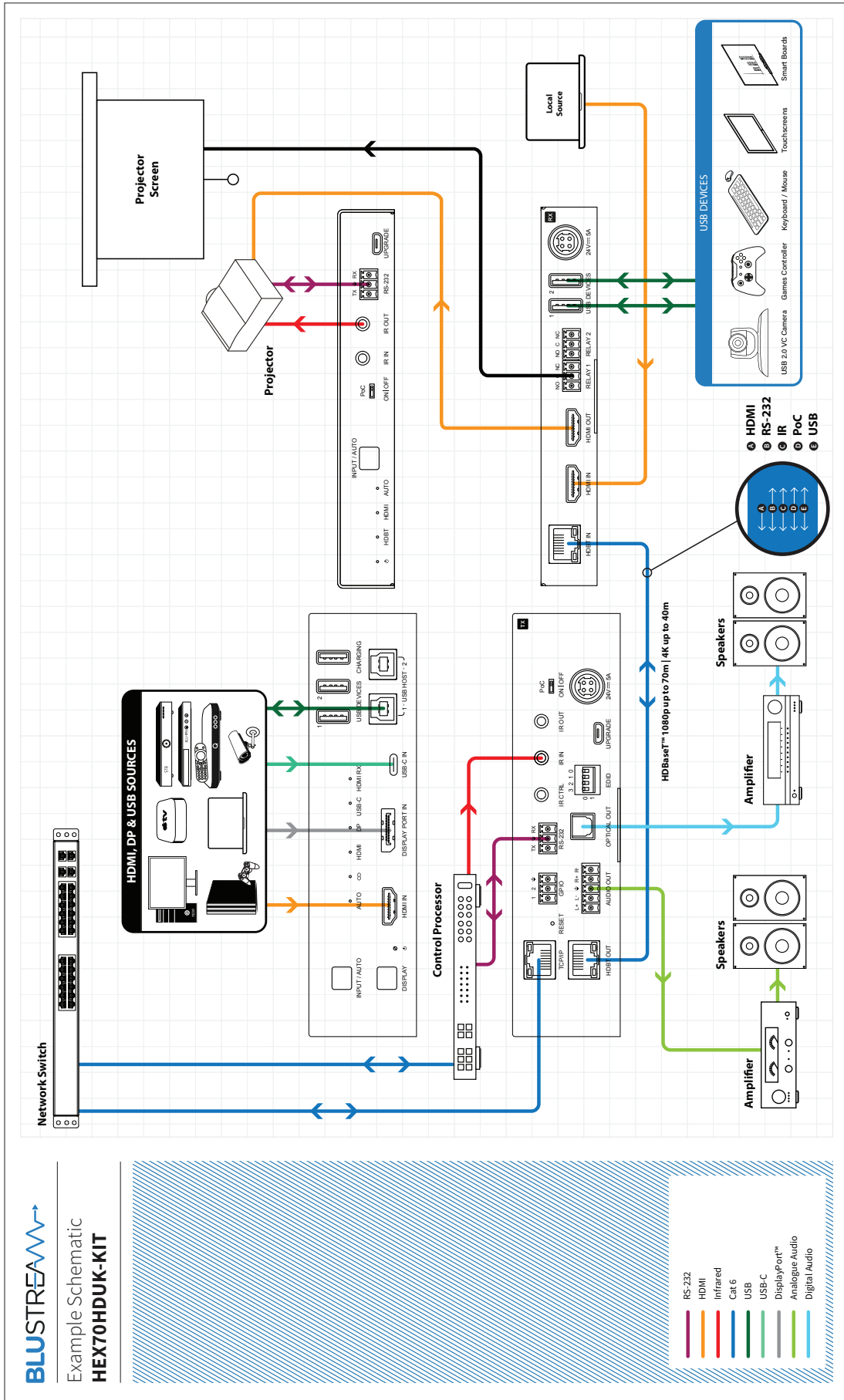
The extender includes status LED indicators on the HDBaseT™ RJ45 ports to show all connections are active, and to help diagnose potential connectivity issues.

### Understanding the Status Lights - HEX70HDU-KIT:

- The yellow HDBaseT™ status link light will be OFF when there is no HDBaseT™ link established with the Blustream HDBaseT™ receiver
- The yellow HDBaseT™ status link light will be ON when there is a HDBaseT™ link established with the Blustream HDBaseT™ receiver
- The green HDBaseT™ link light will be OFF when there is no video signal being transmitted between the HDBaseT™ Transmitter and HDBaseT™ receiver
- The green HDBaseT™ link light will be ON when there is a HDCP enabled video signal being transmitted between the HDBaseT™ Transmitter and HDBaseT™ receiver
- The green HDBaseT™ link light will BLINK when there is a video signal with no HDCP being transmitted between the HDBaseT™ Transmitter and HDBaseT™ receiver

The link lights will only serve as an indication to the connectivity between the HDBaseT™ transmitter and receiver units. The LED's will not indicate a termination, bandwidth, interference or cable length issues on a CAT cable run. Blustream always recommend qualifying / verifying / certifying a CAT cable run for suitability prior to the installation of HDBaseT™ equipment.

# Schematic



## Web-GUI Control

The following pages will break down the operation of the HEX70HDUK-KIT web-GUI. Connect the TCP/IP RJ45 socket to the local network, or directly to the unit, in order to access the products web-GUI.

By default the Transmitter is set to DHCP, however if a DHCP server (eg: network router) is not installed, the IP address will revert to the below details:

Default IP Address: [192.168.0.200](http://192.168.0.200)

Default Username: [blustream](#)

Default Password: [@BlS1234](#)

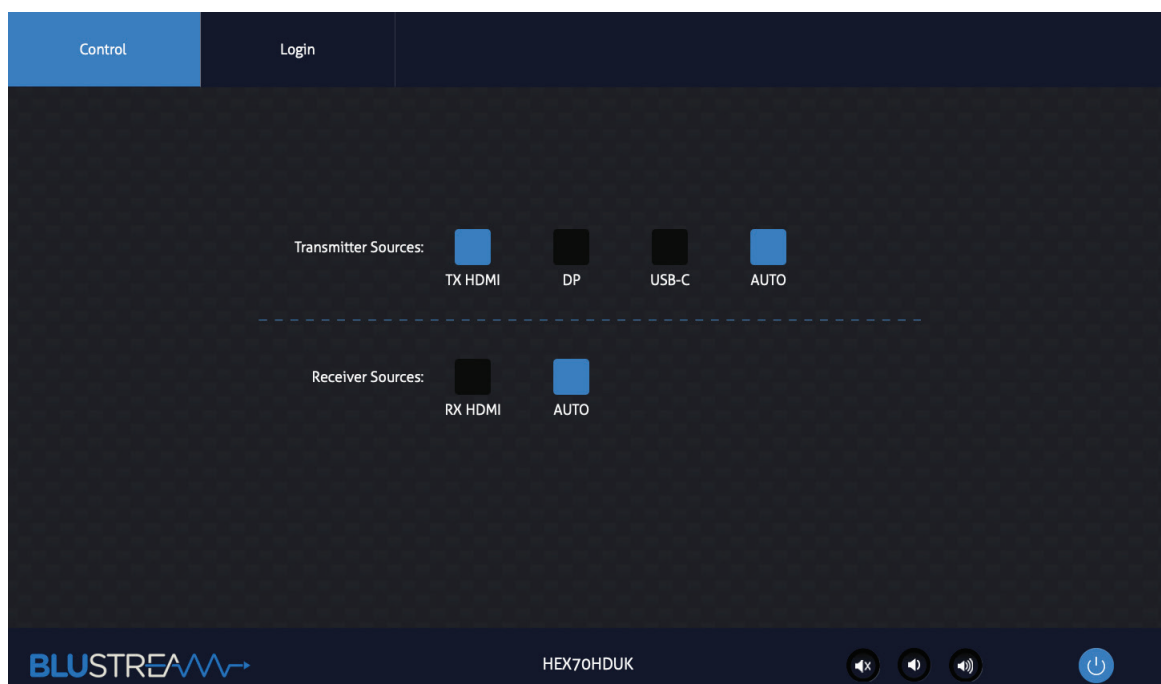
**Please note:** the unit will require a new Admin password to be set during the first log-in to the unit. Ensure that the new password is noted for future use. Forgetting the Admin password will mean that the unit will need to be reset to factory default via serial, or from the Reset button on the rear of the Transmitter to gain access. Full configuration of the system will need to be carried out again if this is done.

The web-GUI supports the ability to create multiple Users, with differing user permissions, as follows:

- **Guest Account** - This account does not require a user to login. The Guest account can only switch sources. Guest access can be altered by the Admin, limiting inputs, or deleting as necessary.
- **User Accounts** - 7x User accounts can be utilised, each with individual login details. User accounts can be assigned permissions for specific control functions. A User must log in to make use of these functions.
- **Admin Account** - This account allows full access to all functions of the kit, as well as assigning individual Users with control permissions.

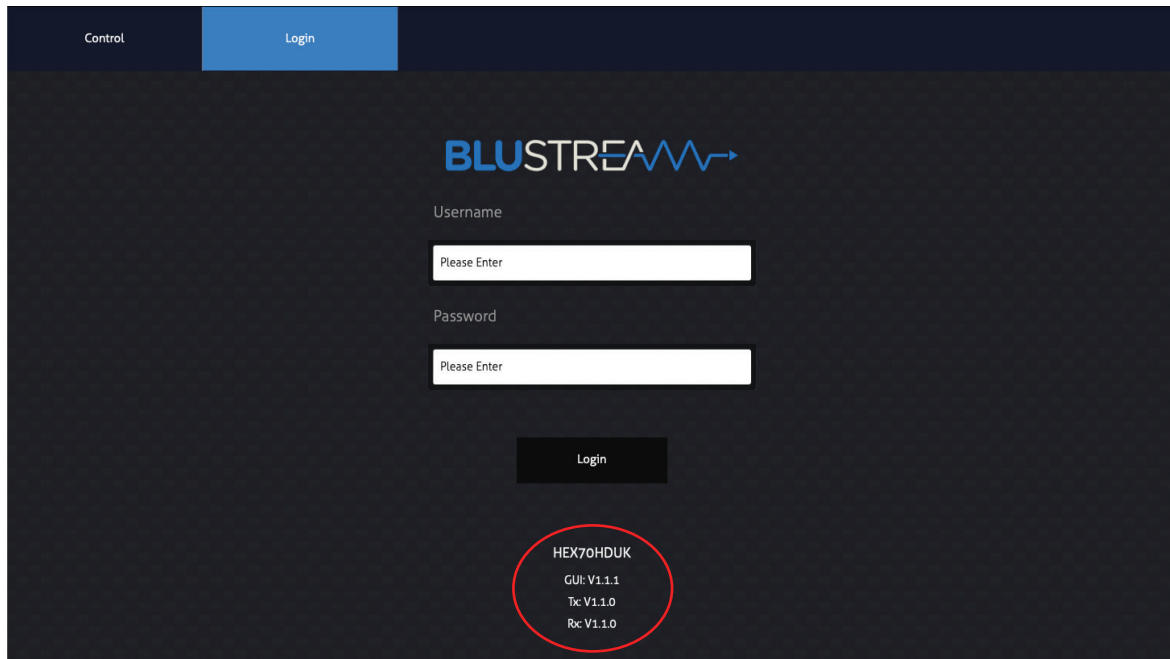
### Guest Control Page

The Guest Control page allows a Guest User to change inputs without needing to be logged into the HEX70HDUK. The Guest User can be deleted by the Admin to prevent un-authorized access to the units switching capabilities if required (see section for Admin later in this guide). Simply select the square that corresponds with the input to be selected. Volume / Mute (which can be removed from the Admin section), and the units power can be selected from the bottom menu bar of any page in the GUI:



## Login Page

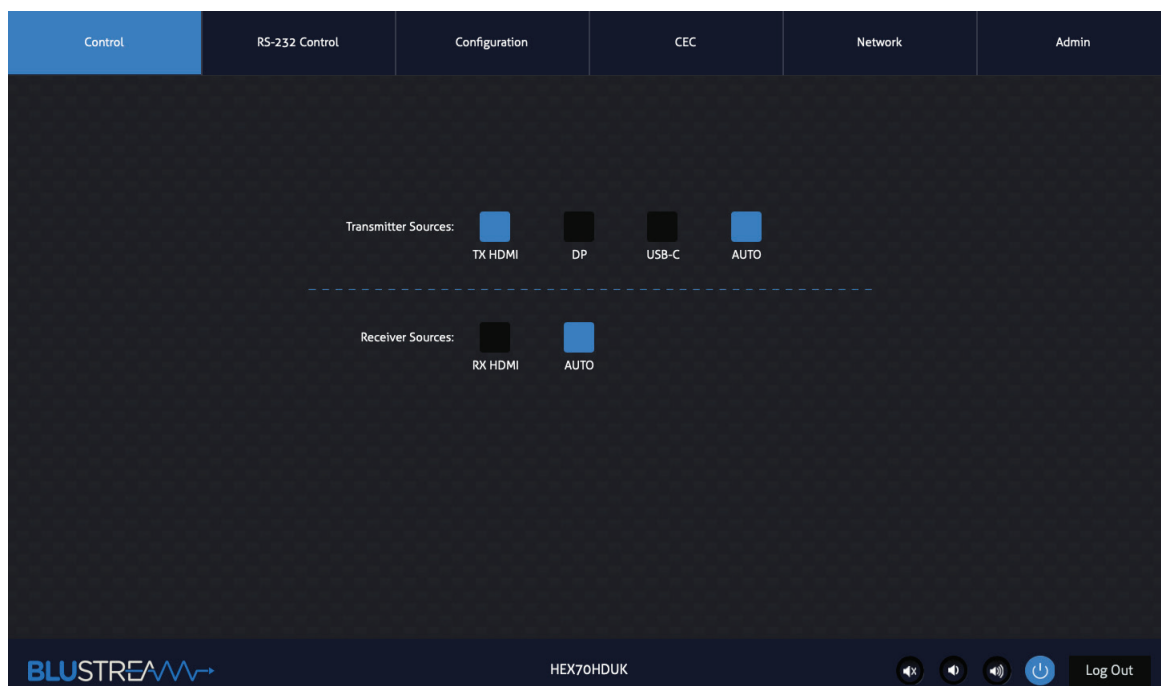
The Login page allows a User or Admin to login and access additional functionality. This page shows the current firmware versions for the web-GUI, TX and RX (circled red in the below screenshot):



**Please note:** the Admin / User will be automatically logged out after 10 minutes of inactivity. The web-GUI will revert back to the above Guest Control page, or Login screen (if the Guest User has been removed).

## Control Page

A User (or Admin) logged into the Control Page allows for the User to change inputs. Select the square that corresponds with the input to be selected. the User can Log Out by pressing the button in the bottom right hand corner of the menu bar from any page of the GUI. Auto-switching (labelled 'AUTO') mode can be enabled / disabled for both the Transmitter and/or the Receiver independently (the highlighted blue 'button' denotes which source is currently selected, or whether auto switching is enabled on both the TX or RX sides of the HDBaseT link:



## RS-232 Control Page

The RS-232 Control page allows a sink device connected to the Receiver to be controlled remotely. The display on, input select, and display off processes can be automated via RS-232.

When the 'RS-232 On' switch is enabled (switched to On), the 'Display On' and 'Display Input Select' commands (insert relevant serial command into the text field adjacent - labelled NULL) are automatically sent from the 3-pin Phoenix connector on the Receiver when the Transmitter (or HDMI input on the Receiver) senses a new video signal. The option to insert the commands as either HEX or ASCII can be used by adjusting the selection to the right of the RS-232 buttons.

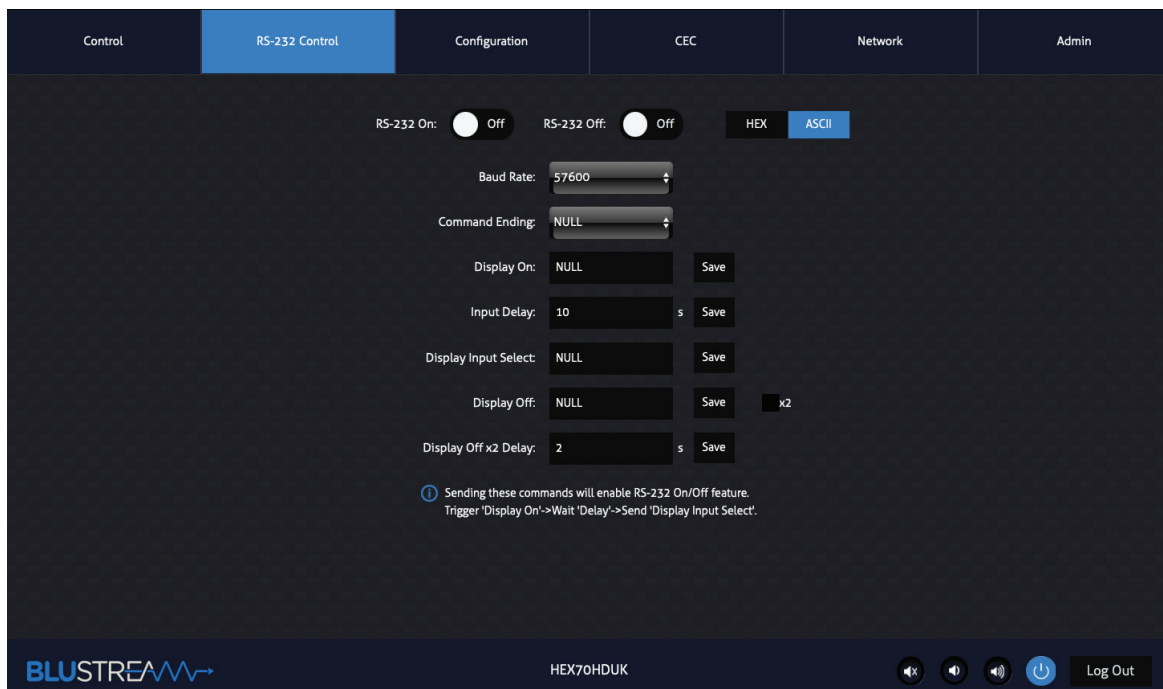
The 'Input Delay' time can be adjusted for a delay of 'x' seconds (default = 10 seconds) between the 'Display On' and 'Input Select' commands being sent.

When the 'RS-232 Off' switch is enabled (switched to On), the 'Display Off' command will be sent out of the Receiver, when the Transmitter (or HDMI input on the Receiver) stops sensing a signal. If a second 'Display Off' command is required for the sink device (i.e. a repeated command to power down a projector), click the button marked 'x2' adjacent to the 'Display Off' command field.

The 'Display Off x2 Delay' time can be adjusted for a delay of 'x' seconds (default = 2 seconds) between the first 'Display Off' command and the (same) second command being sent.

**Please note:** It is possible to just use the 'RS-232 On', or 'RS-232 Off' independently to trigger one or the other, or both functions together as required for the system in place.

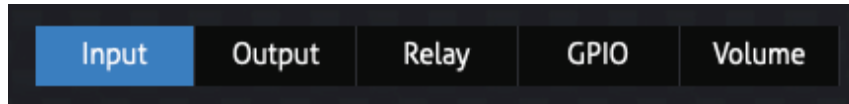
Baud Rate and Command Ending can be specified (eg: line feed - LF, carriage return - CR, or both together) to match the RS-232 device connected to the Receiver. Leaving the 'Command Ending' as NULL (default) does not insert a line feed or carriage return to the string.



## Configuration Page

The Configuration Page allows for the configuration settings for Inputs, Outputs, Relay, GPIO and Line Level Volume controls of the HEX70HDUK-KIT.

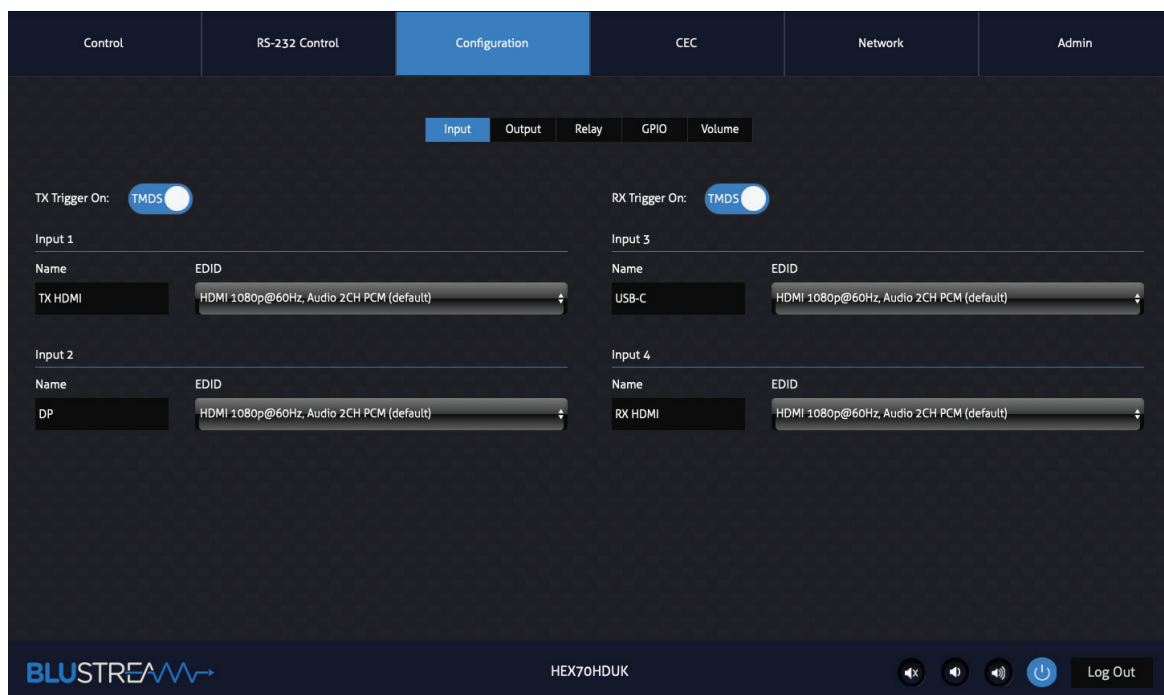
Select the configuration for the Input, Outputs, Relay, GPIO and Volume at the top of the page:



### Configuration Page - Input

The Configuration - Input page allows for the selection of how the automated RS-232 commands are triggered for the sink attached to the Receiver. Selecting TMDS (default) allows the Transmitter or Receiver to trigger the Display On and Off commands where a video signal is detected. Selecting 5V allows the Transmitter or Receiver to trigger the Display On and Off commands where a 5V hot plug is detected.

**Please note:** where static source equipment is permanently connected to either the TX or RX units, a 5V hot plug may be permanently present if the source unit is allowed to go into standby - this can stop the triggers from working effectively. In these cases, selecting TMDS would be advised.



The source names can be entered for each input where Input 1 is the HDMI input of the Transmitter, Input 2 is the DisplayPort input, Input 3 is the USB-C input, and Input 4 for the remote HDMI input located on the Receiver. Once the names of each source have been amended in the text field box, the naming convention on the Control page will be updated with the names entered here.

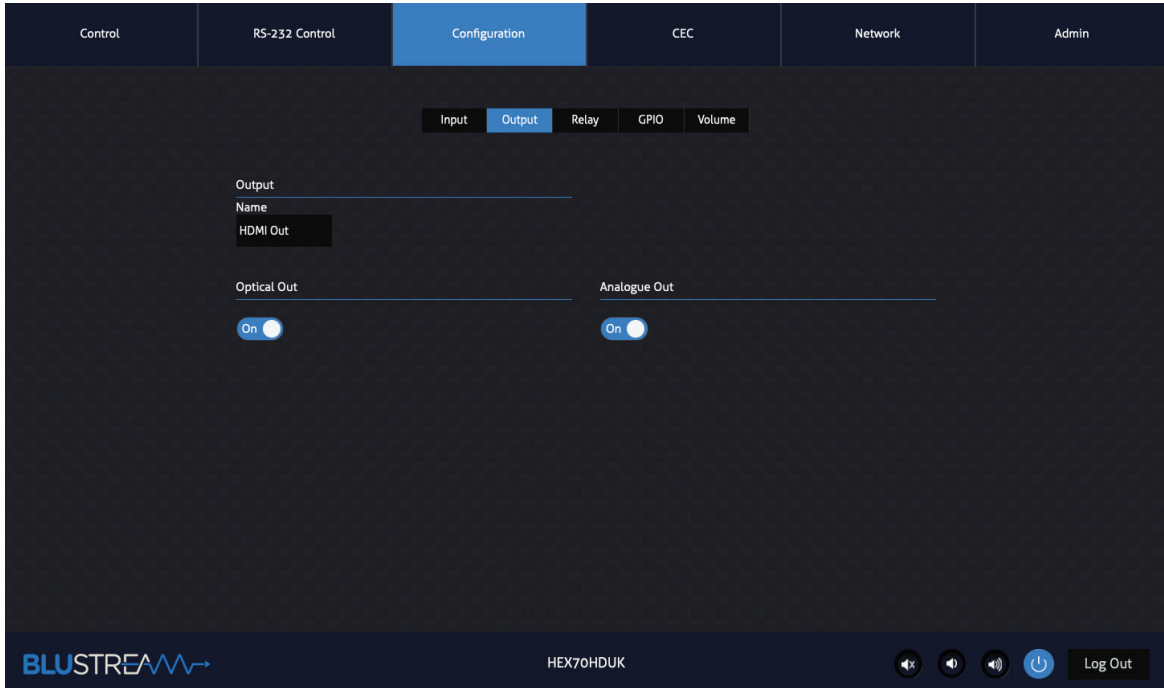
The individual EDID for the source devices can be selected from the drop down box adjacent to each naming field.

**Please note:** the EDID Dip Switches located on the HEX70HDUK Transmitter (located on the rear of the unit) must all be switched at the DOWN position (1,1,1,1) to enable Software Controlled EDID for the drop down boxes to be amended. The default EDID of all sources is set to 1080p@60Hz, Audio 2ch PCM.

### Configuration Page - Output

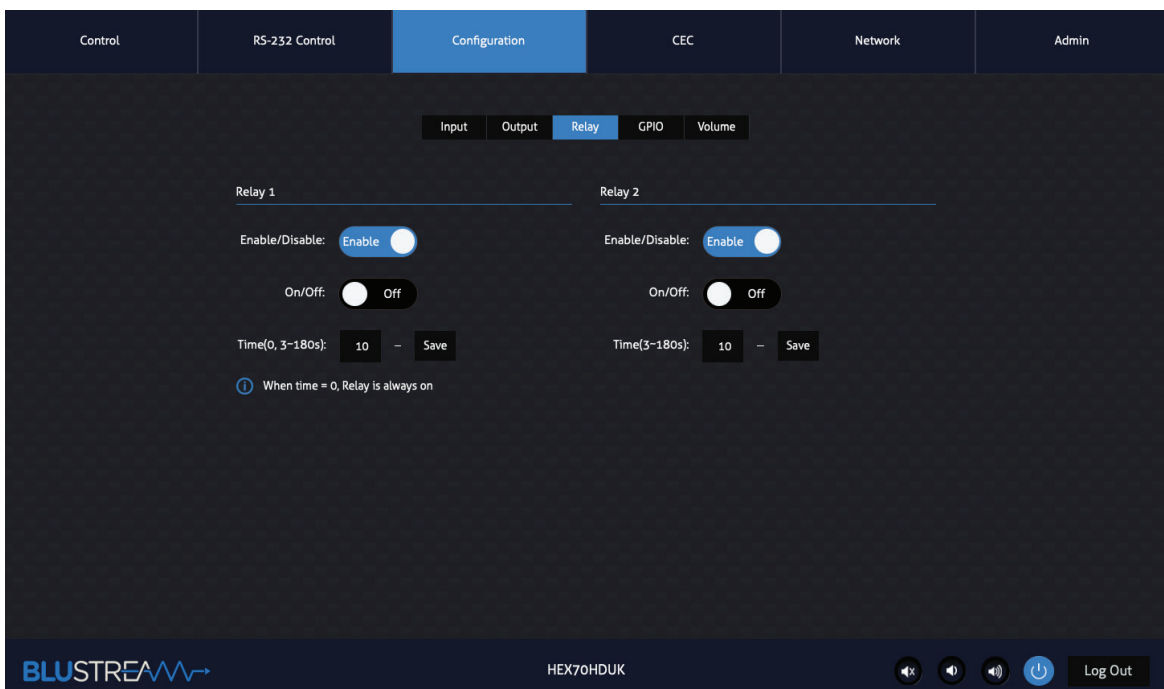
The Output Configuration Page allows for the naming of the output of the Receiver, and for the Optical (S/PDIF) or Analogue audio breakout connections to be enabled or disabled.

Enter a name for the output as required. The output name will appear on the main Control page once updated.



### Configuration Page - Relay

The HEX70HDUK Receiver features 2x relay connections for remote triggering of 3rd party products (i.e. a projection screen to be dropped / raised) as required in conjunction with the use of the HDBaseT extender.



## Configuration Page - Relay... continued

Both relays are enabled by default. To disable an individual relay, adjust the Enable/Disable switch. When disabled, it is not possible to send a TCP/IP or serial command to the Transmitter, or control from the web-GUI.

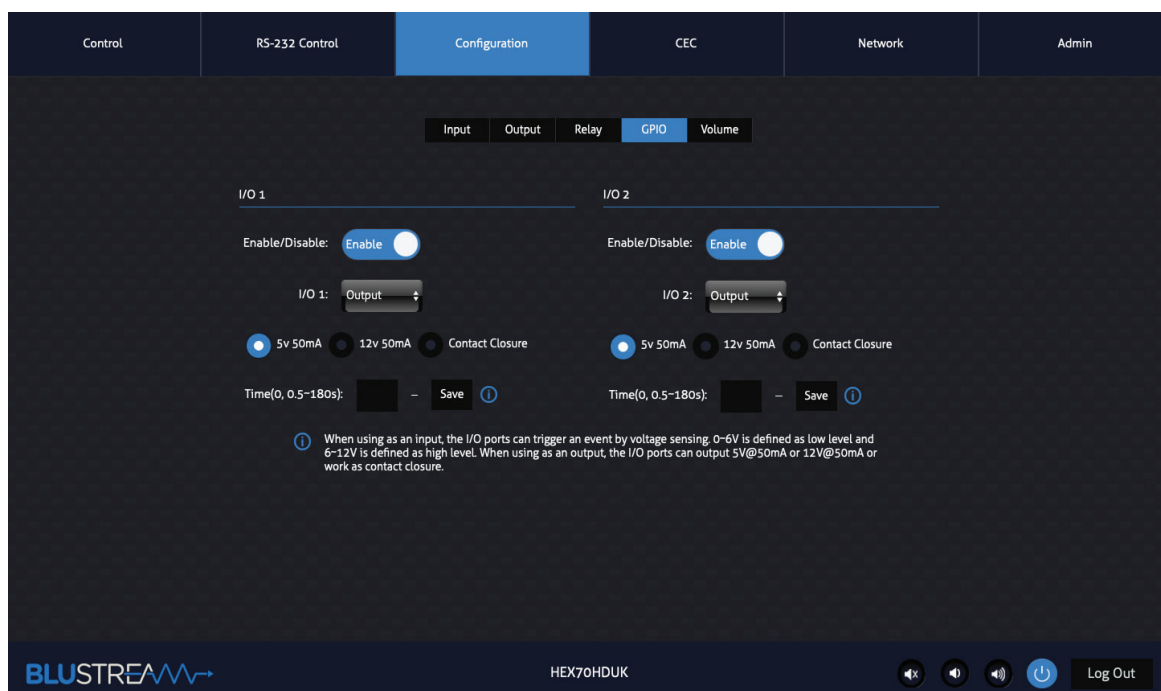
The On/Off switch will adjust the relay from NC to NO, where NC = Off, and NO = On.

The Time section allows for the time (in seconds, from 3 seconds, minimum, to 180 seconds, maximum) that the relay is opened for when turned on. Click the Save button once the correct time has been selected to save the selection and test the time set. Setting the time to 0 will keep the relay on permanently until it is turned off from the web-GUI, or via API command.

Once set, the Relays can be triggered from the API of the HEX70HDUK - see section for RS-232 Configuration & Telnet Commands towards the rear of this manual.

## Configuration Page - GPIO

The HEX70HDUK Transmitter features a GPIO (General Purpose Input / Output) connection for remote triggering of 3rd party products (i.e. voltage trigger) as required in conjunction with the use of the HDBaseT extender.



There are 2x I/O connections on the Transmitter unit that can be configured to trigger an event by voltage sensing. 0-6V is defined as low level and 6-12V is defined as high level. When using as an output, the I/O ports can output 5V@50mA, or 12V@50mA, or work as a Contact Closure as required.

The Time settings where 0 seconds is used for a permanent voltage to be output, or selected between 0.5 - 180 seconds as required.

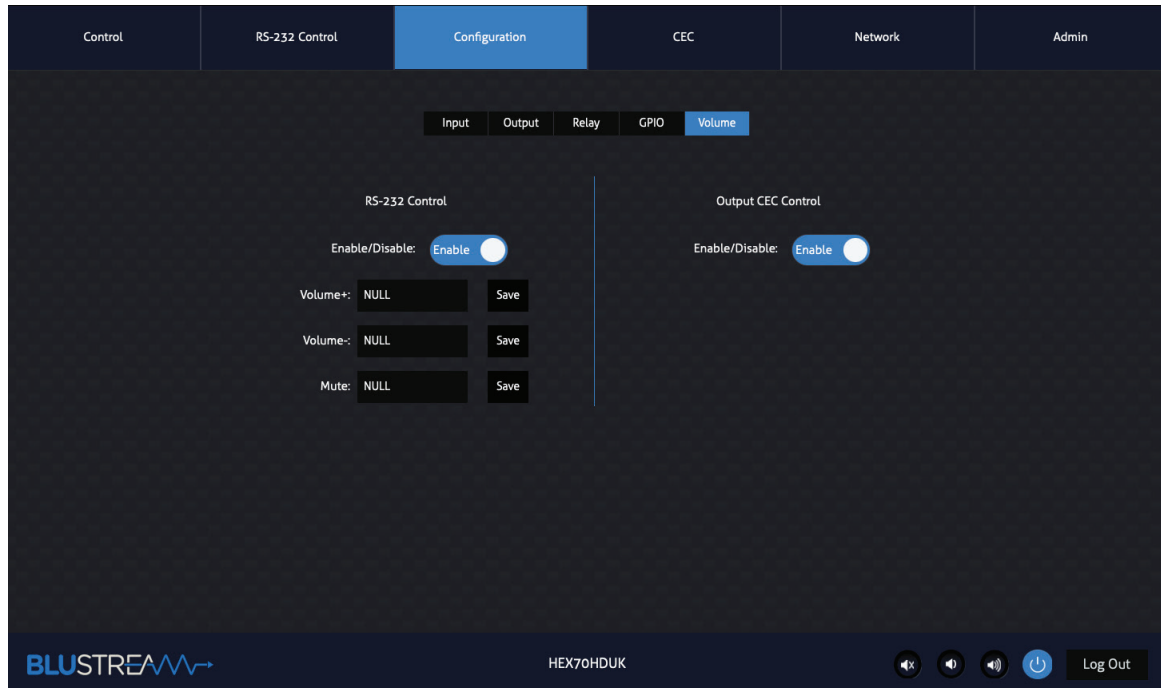
The GPIO can be controlled from the web-GUI, TCP/IP or serial API from a 3rd party control system to the HEX70HDUK - see section for RS-232 Configuration & Telnet Commands towards the rear of this manual.



## Configuration Page - Volume

The Volume control section allows a sink device connected to the Receiver to have volume and mute controlled remotely from the HEX70HDUK web-GUI or API via TCP/IP or serial. Specific RS-232 commands can be inserted to be sent from the HEX70HDUK receiver for Vol+, Vol- and Mute.

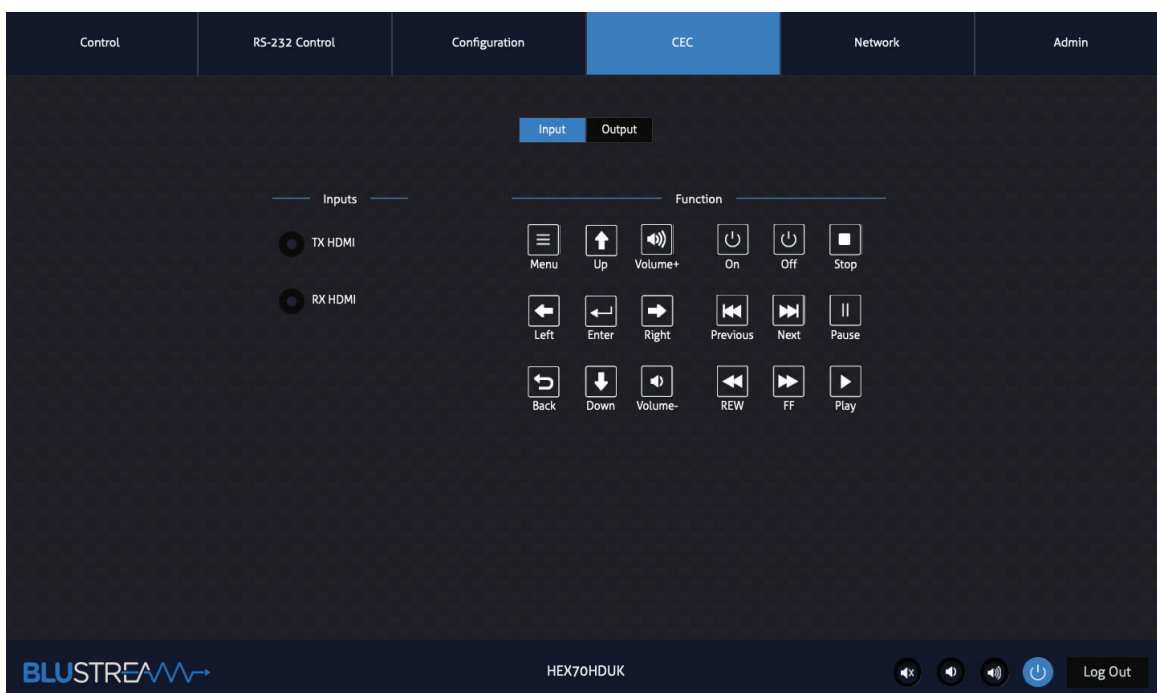
The option for CEC commands to be sent through the HDBaseT link can also be enabled or disabled from the right hand side of this screen.



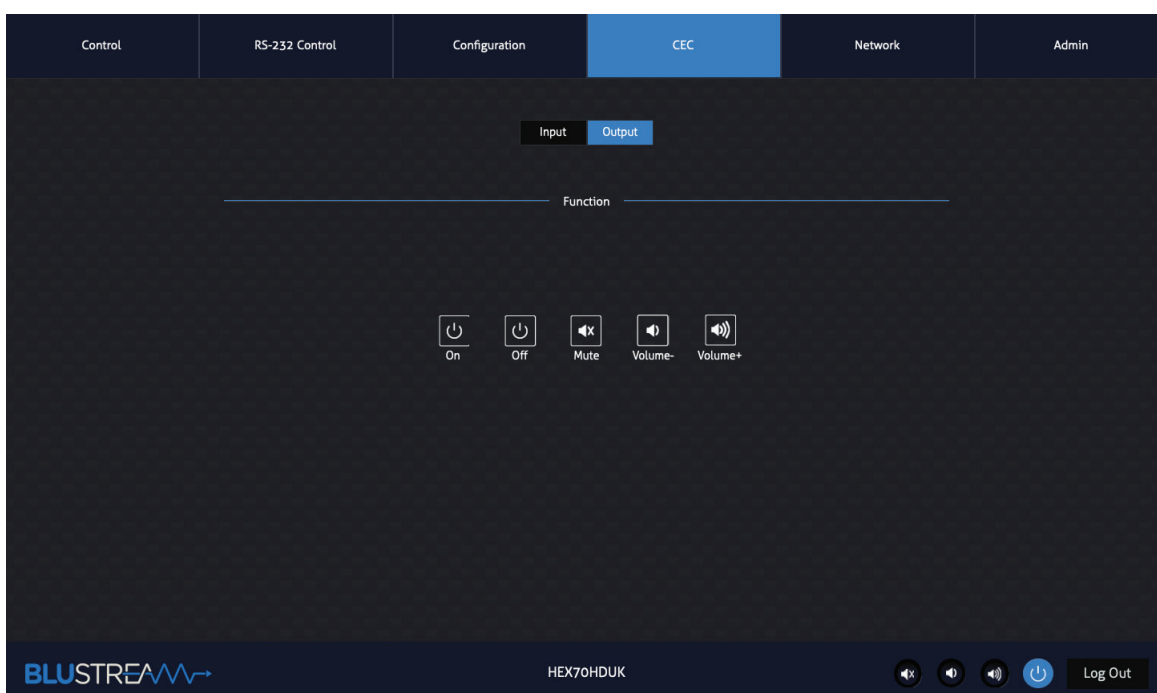
### CEC Page - Input / Output

The CEC Page allows for pre-defined CEC commands to Inputs or Outputs of the HEX70HDUK. Choose between Input or Output sections at the top of the page. On the CEC Input Page, the HDMI TX or RX input must be specified to send the CEC command to before clicking the relevant button. Click the icon of the command to be send which will be transmitted to the source device connected to the specified input via HDMI.

**Please note:** CEC is subject to the support of the source connected to the HEX70HDUK. DisplayPort and USB-C connections do not support CEC.



The output page will allow for power and volume / mute commands to be sent over HDMI to the display connected.



## Network Page

The Network page gives access to the TCP/IP network port settings of the HEX70HDUK-TX TCP/IP port.

Choose from DHCP (default) or Static IP (set to 192.168.0.200 where no DHCP router is present ), as well as specify a dedicated fixed IP Address, Subnet Mask, and Gateway.

For 3rd party control platforms, Telnet access can be enabled or disabled, the port number specified (port 23 set by default), and the ability to enable or disable port 8000:

The screenshot shows the Network configuration page for the HEX70HDUK-KIT. The page is divided into two main sections: IP configuration and Telnet settings. The top navigation bar includes tabs for Control, RS-232 Control, Configuration, CEC, Network (selected), and Admin. The MAC Address is displayed as 34:D0:88:23:08:B3. The IP configuration section has two radio buttons: DHCP (selected) and Static IP. Below these are input fields for IP Address (192.168.0.200), Subnet Mask (255.255.255.0), and Gateway. A Save button is located below the input fields. The Telnet section includes three settings: Telnet Access (On), Telnet Port (23), and Port 8000 (On). The bottom of the page features the BLUSTREAM logo, the device name HEX70HDUK, and a row of icons for volume, power, and a Log Out button.

## Admin Page

The Admin page allows the administrator to configure login credentials. The Admin login and password can be amended at the top of the page. The current password will need to be entered as well as the new password, confirmed by entering a second time to change the Admin credentials.

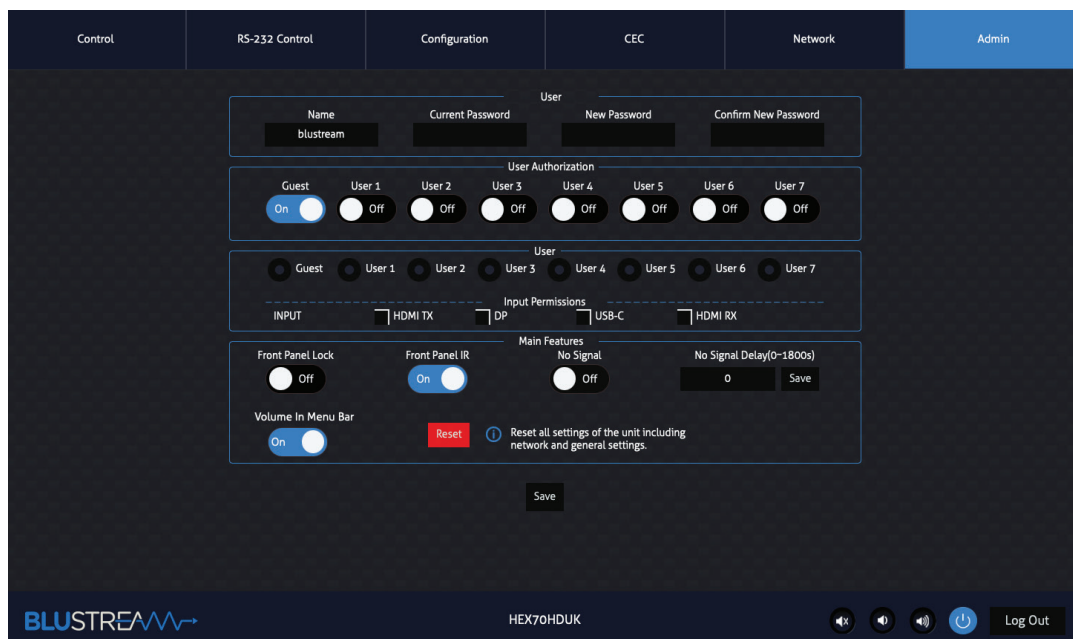
**Please note:** Ensure that the new Admin password is noted for future use. Forgetting the Admin password will mean that the unit will need to be reset to factory default via serial, or from the Reset button on the rear of the Transmitter to gain access. Full configuration of the system will need to be carried out again if this is done.

Permissions for up to 8x Users, including a Guest User (enabled by default) can also be carried on out on this page. Each User can adjust their individual password using their (limited) access to this page as required.

The Admin (and Users given Admin permissions) are able to select a personalised login name, password, and allocate permissions (including: Control with individual access to switch to each video input, Display Setting, Configuration, CEC, Network and Admin permissions) to Users.

The Admin page also allows for the Front Panel buttons of the HEX70HDUK-TX and the selection button on the RX to be enabled or disabled, IR control to be enabled / disabled at the TX or RX, No Signal and Delay functionality to be turned On or Off, Volume/Mute Control from the bottom of the menu bar to be displayed, as well as Factory Reset the unit.

The Save button at the bottom of the page must be used to apply settings adjusted on this page before they take effect.





## RS-232 Configuration and Telnet Commands

The Blustream HDBaseT™ kit can be controlled via serial and TCP/IP.

The RS-232 port is used for configuration and control of the product, as well as pass through of RS-232 commands to the Blustream HDBaseT™ receiver.

The default RS-232 communication settings are:

Baud rate:	57600
Data bit:	8
Stop bit:	1
Parity bit:	none

The following pages list all available serial commands.

### Commonly Used Serial Commands

There are several commands that are commonly used for control and testing:

<b>STATUS</b>	Status will give feedback on the kit such as input signals, type of connection etc...
<b>PON</b>	Power on
<b>POFF</b>	Power off
<b>OUTxxFRyy</b>	(xx is the zone out, yy is the input)
Example:	OUT01FR04 (This would switch output 1 to source input 4)

### Common Mistakes

- Carriage return – Some programs do not require the carriage return where as other will not work unless sent directly after the string. In the case of some Terminal software the token <CR> is used to execute a carriage return. Depending on the program you are using this token maybe different. Some other examples that other control systems deploy include \r or 0D (in hex)
- Spaces – Blustream commands do not require space between commands unless specified. There may be some programs that require spacing in order to work.
  - How the string should look is as follows OUT01ON
  - How the string may look if spaces are required: OUT{Space}01{Space}ON
- Baud rate or other serial protocol settings not correct

# RS-232 Configuration and Telnet Commands

COMMAND	ACTION
?	Print Help Information
HELP	Print Help Information
STATUS	Print System Status And Port Status
INSTA	Print All Inputs Status
OUTSTA	Print Outputs Status
CTRLSTA	Print All Controls Status
GPIOSTA	Print All GPIO Status
INSOURCESTA	Print All Input Source Set Status
PON/OFF	Set System Power On or Off
KEY ON/OFF	Set System Key Control On or Off
IR ON/OFF	Set system IR Control On or Off
KEY RS232 ENABLE/ DISBALE	Disable or Enable Send RS232 Command
KEY CEC ENABLE/ DISBALE	Disable or Enable Send Output CEC Command
NOSIGDLY xxx	Set No Signal Delay Timeout To xxx (Default 0s, Range From 0s To 1800s)
RESET	Reset System To Default Setting (Type 'Yes' To Confirm, 'No' To Discard)
OPTICAL ON/OFF	Set OPTical Audio Out On or Off

COMMAND	ACTION
ANALOGUE ON/OFF	Set Analogue Audio Out On or Off
TX SWITCH aa	Set Transmitter Switching To aa aa = AUTO: Auto Switching ON - Auto Mode aa = MAN: Auto Switching OFF - Manual Mode
RX SWITCH aa	Set Receiver Switching To aa aa = AUTO: Auto Switching ON - Auto Mode aa = MAN: Auto Switching OFF - Manual Mode
TX TRGON x	Set The Trigger Method x On Transmitter Input To Perform System On x = 1 - HDMI (5V) x = 2 - HDMI (TMDS)
RX TRGON x	Set The Trigger Method x On Receiver Input To Perform System On x = 1 - HDMI (5V) x = 2 - HDMI (TMDS)
OUT xx FR yy	Set Output From Input:yy xx = 00 : All RX Outputs xx = 01 : RX Output 1 yy = 01 : TX HDMI Input yy = 02 : TX DisplayPort Input yy = 03 : TX USB-C Input yy = 04 : RX HDMI Input
EDID xx DF zz	Set Input xx EDID To Default EDID zz (EDID Dip Switch Must Be Switched To EDID Software) xx = 00: Select All Input Port xx = [01...04]: Select One Input Port zz = 00: HDMI 1080p@60Hz, Audio 2CH PCM (default) 01: HDMI 1080p@60Hz, Audio 5.1CH DTS/DOLBY 02: HDMI 1080p@60Hz, Audio 7.1CH DTS/DOLBY/HD 03: HDMI 1080i@60Hz, Audio 2CH PCM 04: HDMI 1080i@60Hz, Audio 5.1CH DTS/DOLBY 05: HDMI 1080i@60Hz, Audio 7.1CH DTS/DOLBY/HD 06: HDMI 1080p@60Hz/3D, Audio 2CH PCM 07: HDMI 1080p@60Hz/3D, Audio 5.1CH DTS/DOLBY 08: HDMI 1080p@60Hz/3D, Audio 7.1CH DTS/DOLBY/HD 09: HDMI 4K@30Hz 4:4:4, Audio 2CH PCM 10: HDMI 4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY 11: HDMI 4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD 12: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 2CH PCM 13: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 5.1CH DTS/DOLBY 14: HDMI 4K@60Hz 4:2:0/4K@30Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD 15: HDMI 4K@60Hz 4:4:4, Audio 2CH PCM 16: HDMI 4K@60Hz 4:4:4, Audio 5.1CH DTS/DOLBY 17: HDMI 4K@60Hz 4:4:4, Audio 7.1CH DTS/DOLBY/HD 18: DVI 1280x1024@60Hz, Audio None 19: DVI 1920x1080@60Hz, Audio None 20: DVI 1920x1200@60Hz, Audio None 21: HDMI 1920x1200@60Hz, Audio 2CH PCM/6CH PCM 22: User EDID 1 23: User EDID 2 24: EDID Passthrough
EDID xx CP yy	Set Input xx EDID Copy From Output yy
EDID SAVE zz	Save EDID File From PC Into User Slot zz zz=22: User EDID 1 zz=23: User EDID 2

# RS-232 Configuration and Telnet Commands

COMMAND	ACTION	COMMAND	ACTION
RELAY xx ENABLE/ DISABLE	Set Relay xx ENABLE/DISABLE xx = 00 : All Relays xx = 01 : Relay 1 xx = 02 : Relay 2	IN xx VOLDDOWN	Send Input xx CEC And RS232 Vol Down Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
RELAY xx MODE yy	Set Relay xx to Mode yy xx = 00 : All Relays xx = 01 : Relay 1 xx = 02 : Relay 2 yy = 01 : Disable NO And Enable NC yy = 02 : Enable NO And Disable NC	IN xx STOP	Send Input xx CEC And RS232 Stop Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
RELAY1 xxx	Set The Relay Delay 1 Time To xxx.(Default 10s, Range From 3s To 180s) Triggered When System On. If xxx = 000 Relay 1 Will Remain Active Until System Off(For Fixed 5V/12V Signal Sensing).	IN xx PREVIOUS	Send Input xx CEC And RS232 Previous Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
RELAY2 xxx	Set The Relay Delay 2 Time To xxx.(Default 10s, Range From 3s To 180s) Triggered When System Off.	IN xx NEXT	Send Input xx CEC And RS232 Next Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx PON	Send Output xx CEC And RS232 Power On Command	IN xx PAUSE	Send Input xx CEC And RS232 Pause Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx POFF	Send Output xx CEC And RS232 Power Off Command	IN xx REW	Send Input xx CEC And RS232 Rew Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx VOLUP	Send Output xx CEC And RS232 Vol Up Command	IN xx FF	Send Input xx CEC And RS232 FF Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx VOLDDOWN	Send Output xx CEC And RS232 Vol Down Command	IN xx PLAY	Send Input xx CEC And RS232 Play Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx MUTE	Send Output xx CEC And RS232 Mute Toggle	IN xx DOWN	Send Input xx CEC And RS232 Down Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
OUT xx INPUT yy	Send Input xx CEC Input Channel yy xx = 01 : RX HDMI Output yy = 00 : Next HDMI Channel yy = [01...15] : HDMI Channel 01 To HDMI Channel 15	IN xx UP	Send Input xx CEC And RS232 Up Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
IN xx PON/OFF	Send Input xx CEC And RS232 Power On or Off Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input	IN xx LEFT	Send Input xx CEC And RS232 Left Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
IN xx VOLUP	Send Input xx CEC And RS232 Vol Up Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input	IN xx RIGHT	Send Input xx CEC And RS232 Right Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
		IN xx ENTER	Send Input xx CEC And RS232 Enter Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
		IN xx BACK	Send Input xx CEC And RS232 Back Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input
		IN xx MENU	Send Input xx CEC And RS232 Menu Command xx = 01 : TX HDMI Input xx = 02 : RX HDMI Input



COMMAND	ACTION
RS232BAUD z	Set RS232 Baud Rate To z z = 1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (default), 7 115200"
RS232ON x:y:z:a	Send y Type Of Command a Stored In Slot x Whose Baud Rate Is z x = 1 Send RS232 Display On x = 2 Send RS232 Display Input Select x = 3 Send RS232 User Command 1 x = 4 Send RS232 User Command 2 x = 5 Send RS232 Volume Up x = 6 Send RS232 Volume Down x = 7 Send RS232 Volume Mute y = a ASCII, h HEX z = 1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (Default), 7 115200 a = RS232 Command
RS232OFF y:z:a	Set RS232 Off Command a Of y Type Whose Baud Rate Is z y = a ASCII, h HEX z = 1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (Default), 7 115200 a = RS232 command
RS232ON DISABLE	Disable Auto RS232 Commands When Detecting A Signal
RS232OFF DISABLE	Disable Auto RS232 Commands When Not Detecting A Signal
RS232RPT x	Set x Number Of Times RS232 OFF Command Is Repeated (Default 1 Time, Range From 1 Time To 2 Times)
RS232RPTDLY xx	Set The Sending Interval Time In xx Second(s) Between RS232 OFFs (Default 2s, Range From 1s To 10s)
RS232INPUTDLY xx	Set The Sending Interval Time In xx Second(s) Between RS232 ONs (Default 10s, Range From 1s To 30s)
GPIO xx ENABLE/DISABLE	Set Relay xx ENABLE/DISABLE xx = 00 : All GPIO xx = 01 : GPIO 1 xx = 02 : GPIO 2
INPIN xx Mode yy SN zz	Set GPIO xx Input Mode yy TriggerLevel zz (when In Mode 2, SN Does Not Work) xx = 00 : All GPIO xx = 01 : GPIO 1 xx = 02 : GPIO 2 yy = 00 : Close GPIO Input yy = 01 : Standby Mode yy = 02 : Input Source Mode zz = 00 : Set Trigger Level To Low zz = 01 : Set Trigger Level To High
OUTPIN xx Mode yy TIME zzzz	Set GPIO xx Output Mode yy Time zzzz xx = 00 : All GPIO xx = 01 : GPIO 1 xx = 02 : GPIO 2 yy = 00 : Close GPIO Output yy = 01 : Output 5V50mA Mode yy = 02 : Output 12V50mA Mode zzzz = 5-1800 : Set Time 0.5s-180s

COMMAND	ACTION
GPIN xx HIGH yy LOW yy	Set The Input Source And Trigger Level Corresponding To GPIO Mode 2 xx = 01 : GPIO 1 xx = 02 : GPIO 2 yy = 01 : TX HDMI Input yy = 02 : TX DisplayPort Input yy = 03 : TX USB-C Input yy = 04 : RX HDMI Input zz = 01 : TX HDMI Input zz = 02 : TX DisplayPort Input zz = 03 : TX USB-C Input zz = 04 : RX HDMI Input
NET IP xxx.xxx.xxx.xxx	Set IP Address
NET GW xxx.xxx.xxx.xxx	Set Gateway Address
NET SM xxx.xxx.xxx.xxx	Set Subnet Mask Address
NET RB	Set Network Reboot and Apply New Config
NET TN xxxx	Set Telnet Port
NET TN ON/OFF	Set Telnet Port On or Off
NET TN8000 ON/OFF	Set Telnet Port 8000 On or Off
NET DHCP ON/OFF	Set Auto IP(DHCP) On or Off

# Specifications

## HEX70HDUK-TX Transmitter

- **Video Input Connectors:** 1 x HDMI Type A, 19-pin, female; 1 x USB Type C; 1 x DisplayPort™
- **Video Output Connectors:** 1 x HDBaseT™ RJ45 connector
- **USB Connectors:** 2 x USB3.0, female (Host), 2 x USB3.0, female (device), 1 x USB2.0, female (charging)
- **RS-232 Serial Port:** 1 x 3-pin phoenix connector
- **TCP/IP Control:** 1 x RJ45, female
- **Audio Output Connectors:** 1 x 5-pin phoenix connector (2ch balanced / unbalanced analogue audio); 1 x Optical (S/PDIF)
- **IR Input Ports:** 2 x 3.5mm stereo jack (1 x pass-through, 1 x switching control)
- **IR Output Port:** 1 x 3.5mm mono jack
- **EDID:** 4-pin DIP switch
- **PoC:** 1 x left/right switch (On / Off)
- **Product Upgrade:** 1 x Micro USB, female
- **Local Power Input:** 1 x 24V/5A 4-PIN DIN connector
- **Casing Dimensions (W x H x D):** 174mm x 45mm x 183mm

## HEX70HDUK-RX Receiver

- **Video Input Connectors:** 1 x HDMI Type A, 19-pin, female; 1 x HDBaseT™ RJ45 connector
- **Video Output Connectors:** 1 x HDMI Type A, 19-pin, female
- **USB Connectors:** 2 x USB2.0, female (Device)
- **RS-232 Serial Port:** 1 x 3-pin phoenix connector
- **Relay Control:** 2 x 3-pin phoenix connectors
- **IR Input Port:** 1 x 3.5mm stereo jack
- **IR Output Port:** 1 x 3.5mm mono jack
- **Product Upgrade:** 1 x Micro USB, female
- **Local Power Input:** 1 x 24V/5A 4-PIN DIN connector
- **Casing Dimensions (W x H x D):** 155mm x 23.5mm x 155mm
  
- **Operating Temperature:** 32°F to 104°F (-5°C to +55°C)
- **Storage Temperature:** -4°F to 140°F (-25°C to +70°C)
- **Shipping Weight:** 2.3kg
- **Power Supply:** 24V/5A DC

**NOTE:** Specifications are subject to change without notice. Weights and dimensions are approximate.

## Package Contents

- 1 x HEX70HDUK-TX
- 1 x HEX70HDUK-RX
- 1 x 24V/5A DC Power Supply
- 1 x IR Emitter
- 1 x IR Receiver
- 1 x RS-232 Control Cable
- 2 x Mounting Kits
- 1 x Quick Reference Guide

## Acknowledgements

DisplayPort™ and the DisplayPort™ logo are trademarks owned by the Video Electronics Standards Association (VESA®) in the United States and other countries.

# Certifications

## FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

**CAUTION** - changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## CANADA, INDUSTRY CANADA (IC) NOTICES

This Class B digital apparatus complies with Canadian ICES-003.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

## CANADA, AVIS D'INDUSTRY CANADA (IC)

Cet appareil numérique de classe B est conforme aux normes canadiennes ICES-003.

Son fonctionnement est soumis aux deux conditions suivantes : (1) cet appareil ne doit pas causer d'interférence et (2) cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

## CORRECT DISPOSAL OF THIS PRODUCT

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmentally safe recycling.



