

► HD11CTRL

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.

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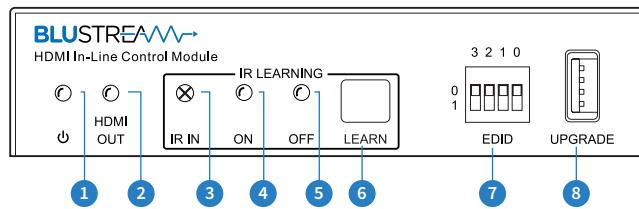
Introduction

Our HD11CTRL HDMI in-line controller is an automated room control solution including display on / off control via CEC, RS-232 and IR when a HDMI signal is sensed on the input. External relay inputs allow third party triggers for integration with devices such as sensors or switches. The HD11CTRL will also help with HDMI compatibility, HDCP 2.2, clock stretching, EDID and handshaking issues that are becoming common problems when distributing HDMI signals especially 4K. The HD11CTRL supports full HDMI 2.0 and HDCP 2.2 with video resolutions up to and including 4K @ 60Hz 4:4:4.

FEATURES:

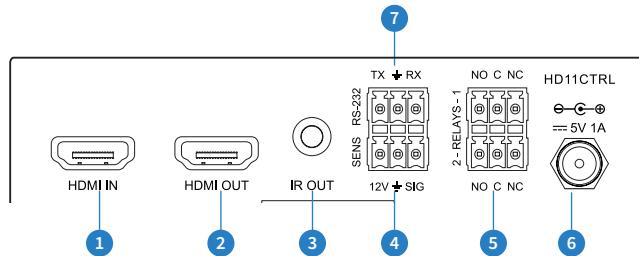
- Automated in-line HDMI control module
- Supports HDMI 2.0 18Gbps specification including HDR
- Supports resolutions up to 4K UHD 60Hz 4:4:4
- Supports bitstream passthrough of multichannel surround sound including object-based audio formats in line with HDMI specifications
- Features Smart-Scale technology to convert 4K input signal to 1080p output (**Note:** 4:2:2 colour space not supported)
- Can help to solve most HDMI EDID, HDCP, compatibility and handshaking issues
- Automatic display control via CEC, RS-232 or IR
- Relay control for interface to third party devices such as projector screens
- Signal sense input for connection from third party devices such as sensors or switches
- HDCP 2.2 compliant with advanced EDID management

Front Panel



- ① Power LED Indicator - Illuminates when detecting the device is powered
- ② HDMI Output LED Indicator - Illuminates when the device has an active connection to the display
- ③ IR Learning IR In - IR receiver used for learning IR commands to be used with auto on / off trigger
- ④ IR Learning IR On LED - Flashes blue when device is in IR learning mode - refer to the IR learning section of this guide
- ⑤ IR Learning IR Off LED - Flashes blue when device is in IR learning mode - refer to the IR learning section of this guide
- ⑥ IR Learning Learn Button - Press to enable IR learning mode - refer to the IR learning section of this guide
- ⑦ EDID DIP Switches - Adjust the EDID setting for the source input - refer to the EDID management dip switch table
- ⑧ USB Upgrade Port - USB connector used for firmware upgrades

Rear Panel



- ① HDMI Input - Connect to HDMI source device
- ② HDMI Output - Connect to HDMI display device (supports CEC)
- ③ IR Output - 3.5mm mono jack provides IR output to a device
- ④ Signal Sense Input (12V) - 3 pin Phoenix connector to connect to external sensor or switch
- ⑤ Relay 1 ~ 2 - 3-pin Phoenix connector to allow relay control of a device such as a projector screen
- ⑥ Power Port - Use included 5V/1A DC adaptor to power the device
- ⑦ RS-232 Serial Port - 3-pin Phoenix connector for control of device by third party control system

EDID Management Dip-switches

EDID (Extended Display Identification Data) is a data structure that is used between a display and a source. This data is used by the source to find out what audio and video resolutions are supported by the display then from this information the source will determine what the best resolution is to output.

While the objective of EDID is to make connecting a digital display to a source a simple plug and play procedure issues do arise when multiple displays or video matrix switching is introduced because of the increased number of variables.

To change the EDID settings move the EDID dip-switches as required on the front panel of the unit. Please see adjacent table for settings.

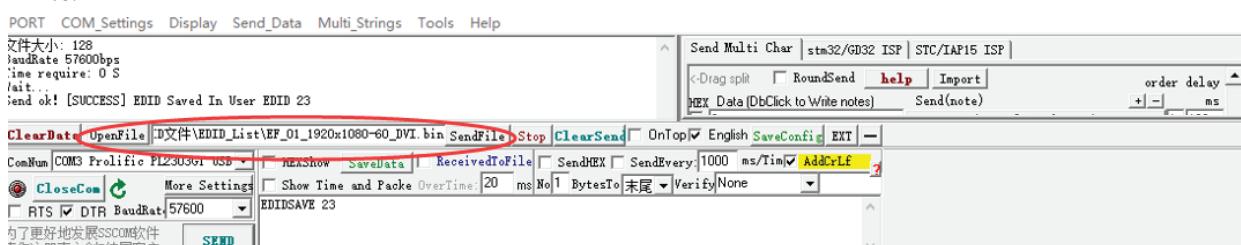
The Software EDID preset allows a custom EDID to be loaded into the HD11CTRL. This is used for sources that may output non-standard resolutions or video formats.

Combination of DIP positions				EDID Type
0	0	0	0	1080p 60Hz 2.0ch
0	0	0	1	1080p 60Hz 5.1ch
0	0	1	0	1080p 60Hz 7.1ch
0	0	1	1	1080i 60Hz 2.0ch
0	1	0	0	1080i 60Hz 5.1ch
0	1	0	1	1080i 60Hz 7.1ch
0	1	1	0	4K 60Hz 4:2:0 2.0ch
0	1	1	1	4K 60Hz 4:2:0 5.1ch
1	0	0	0	4K 60Hz 4:2:0 7.1ch
1	0	0	1	4K 60Hz 4:4:4 2.0ch
1	0	1	0	4K 60Hz 4:4:4 5.1ch
1	0	1	1	4K 60Hz 4:4:4 7.1ch
1	1	0	0	DVI 1920x1080@60Hz
1	1	0	1	DVI 1920x1200@60Hz
1	1	1	0	EDID Bypass
1	1	1	1	Software EDID

Loading a Custom EDID

A custom EDID file can be loaded into the HD11CTRL. Some custom EDID's can be found on Blustream's website, or use a 3rd party EDID tool to create a custom EDID. To load an EDID onto the device complete the following steps:

- 1) The EDID DIP switch must be set to 1111 to allow configuration via RS-232
- 2) Connect your PC to the HD11CTRL RS-232 port via a serial RS-232 cable - refer to the RS-232 Control Port section for further RS-232 information
- 3) Using Serial software that allows you to send a data file such as SSCOM, connect to the HD11CTRL and load up the EDID file:



- 4) Send the command: **EDIDSAVE zz** (where zz = 22 or 23) to save the EDID from the USB into EDID position 22 or 23
- 5) Press the "SendFile" button to send the EDID file to the HD11CTRL, you should receive a [SUCCESS] response
- 6) Send the command: **EDID 00 DF zz** to recall the EDID for all inputs where zz is the position the EDID (22 or 23)

Automatic System On / Off Control

The HD11CTRL is designed to automate basic control of AV equipment within a room without the need for a 3rd party control system. It can control devices via CEC, RS-232, IR, relay and signal sense. Its key function is to turn the system on when a HDMI signal is sensed, and turn it off when that signal is lost.

Configuration of this functionality can be completed via RS-232 - see pages 6-7 for RS-232 information.

System On:

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

- Send CEC Power On command (enabled by default), then fixed delay, then send user defined CEC input command once configured via RS-232.
- Send RS-232 On Command, then delay (between 1~180s, default 3s), then send user defined RS-232 command once configured via RS-232.
- Send IR On Command, then delay (between 1~180s, default 3s), then send user defined IR commands. IR commands must be learnt in to enable this function. Refer to IR learning on the following page.
- Toggle the state of relay 1 for a predetermined time (enabled by default, between 3~180s, default 10s).

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 CEC Power Off command (enabled by default).
- Send RS-232 Off Command, then delay (between 1~180s, default 3s), then repeat the command once configured via RS-232.
- Send IR Off Command, then delay (between 1~180s, default 3s), then repeat the command. IR commands must be learnt in to enable this function. Refer to IR learning on the following page.
- Toggle the state of relay 2 for a predetermined time (enabled by default, between 3~180s, default 10s)

CEC Control:

By default, CEC Power On and Off is enabled (subject to display device compatibility). The CEC functionality can be enabled or disabled via RS-232. It is also possible to send other CEC commands such as input selection as well as volume up or down. Please see the RS-232 command list at the end of this document for a full list of CEC commands available. Note CEC is subject to the support of the display connected to the HD11CTRL.

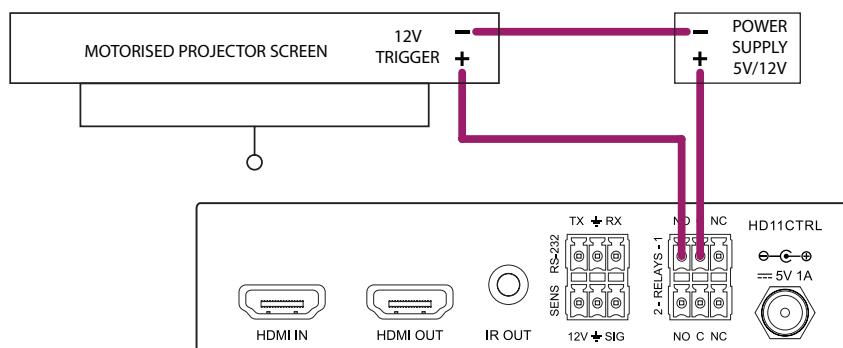
Relay Control:

The HD11CTRL features two relays. Relay 1 is triggered during System On, Relay 2 is triggered during System Off as follows:

System On: Relay 1 NO closes and NC opens. After the delay time, NO opens and NC closes.

System Off: Relay 2 NO opens and NC closes. After the delay time, NO closes and NC opens.

The time for which the relay stays open can be adjusted via RS-232. To use the relay control as a 5V/12V trigger, set the delay to time “00” which will result in ‘NO’ remaining as an open circuit whilst a video signal is present. An example wiring diagram is as follows:



IR Learning

The HD11CTRL can send out up to 5 IR commands automatically when a signal is sensed or lost. These commands are learnt into the product via the following procedure:

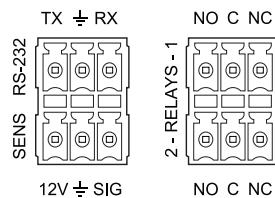
- 1) Press the “Learn” button to scroll through the 5 x IR commands in which custom IR commands can be learnt. The LED’s will indicate what position is selected as follows:

COMMAND / POSITION	LED
ON	OFF
Display On	Illuminated
Input Select	Flashing
Display Off	Off
User Command 1	Off
User Command 2	Flasing

- 2) Point the IR remote control at the IR In sensor and press the respective button on the IR remote control.
- 3) Both LEDs will remain illuminated to indicate that an IR command has been learnt.
- 4) The IR Learning mode will end after 10 seconds of inactivity and both LED’s will turn off.

Signal Sensing

The HD11CTRL also has the ability to be triggered via signal sense from a device feeding it a voltage such as a PIR sensor. The sensor port features +12V DC and ground to power a PIR sensor, as well as a signal input that triggers when the circuit is closed or grounded. Please note the max +12V DC output is 50mA.



Smart Scale

The HD11CTRL features Smart Scale technology where by a 4K signal can be down-scaled to 1080p for compatibility with 1080p displays. Downscaling is automatic based on the EDID of the display connected. This feature can be enabled (default) or disabled via RS-232. The downscaling functionality is shown below:

#	RESOLUTION	INPUT SIGNAL REFRESH	COLOUR SPACE	OUTPUT RESOLUTION
1	3840 x 2160	60Hz	4:4:4	1080p@60Hz 4:4:4
2	3840 x 2160	30Hz	4:4:4	1080p@30Hz 4:4:4
3	3840 x 2160	24Hz	4:4:4	1080p@24Hz 4:4:4
4	3840 x 2160	60Hz	4:2:0	1080p@60Hz 4:2:0
5	3840 x 2160	30Hz	4:2:0	1080p@30Hz 4:2:0
6	3840 x 2160	24Hz	4:2:0	1080p@24Hz 4:2:0
7	3840 x 2160	60Hz	4:2:2	Not supported
8	3840 x 2160	30Hz	4:2:2	Not supported
9	3840 x 2160	24Hz	4:2:2	Not supported

RS-232 Control Port

The HD11CTRL can be controlled via a 3-pin Phoenix to serial RS-232 cable (supplied). All RS-232 commands must be terminated with a carriage return <CR> or \r. The communication settings and commands are as follows:

Baud Rate: 57600 bps
Data Bit: 8-bit

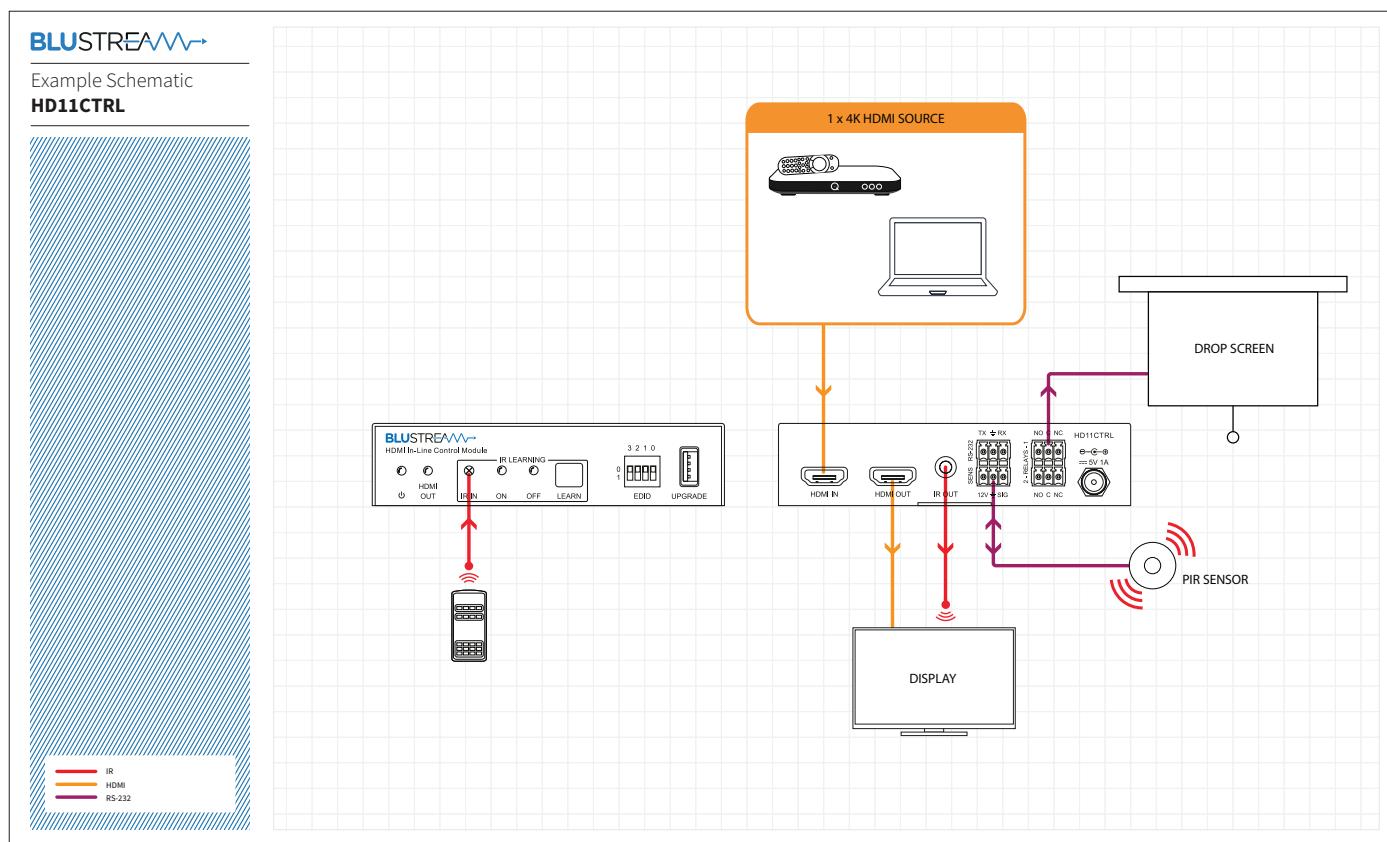
Parity: None
Stop Bit: 1-bit

Flow Control: None

RS-232 COMMAND	DESCRIPTION
?	Print Help Information
HELP	Print Help Information
STATUS	Print System Status And Port Status
INSTA	Print All Input Status
OUTSTA	Print All Output Status
CTRLSTA	Print All Control Status
KEY ON/OFF	Set System Key Control On Or Off
IR ON/OFF	Set System IR Control On Or Off
NOSIGDLY xxxx	Set No Signal Delay Timeout To xxxx Second(s)
NOSENSORDLY xxxx	Set System Off Time To xxxx Second(s) (Default 600s, Range From 0s To 10800s) When No Sensor Signal Has Been Detected, The System Will Turn Off After The Set Time
RESET	Reset System To Default Setting (Type "Yes" To Confirm, "No" To Discard)
TRGON x	Set The Trigger Method x To Perform System On x = 1 - Sensor Only x = 2 - HDMI Only (5V)(default) x = 3 - HDMI Only (TMDS) x = 4 - Sensor Or HDMI (5V) x = 5 - Sensor Or HDMI (TMDS)
TRGOFF x	Set The Trigger Method x To Perform System Off x = 1 - No Sensor Only x = 2 - No HDMI Only (5V) x = 3 - No HDMI Only (TMDS) x = 4 - No Sensor And HDMI (5V) x = 5 - No Sensor And HDMI (TMDS)
SCALER ON/OFF	Set Scaler On or Off
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: 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 4:4:4/4K@60Hz 4:2:0, Audio 2ch PCM 10: HDMI 4K@30Hz 4:4:4/4K@60Hz 4:2:0, Audio 5.1ch DTS/DOLBY 11: HDMI 4K@30Hz 4:4:4/4K@60Hz 4:2:0, Audio 7.1ch DTS/DOLBY/HD 12: HDMI 4K@60Hz 4:2:0, Audio 2ch PCM 13: HDMI 4K@60Hz 4:2:0, Audio 5.1ch DTS/DOLBY 14: HDMI 4K@60Hz 4:2:0, 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	Copy EDID From Output yy To Input xx

RS-232 COMMAND	DESCRIPTION
EDIDSAVE xx	Load the custom external EDID from USB, then save it into slot xx xx = 22: User EDID 1 xx = 23: User EDID 2
RELAY1 xxx	Set The Relay 1 Delay Time To xxx (Default 10s, Range From 3s To 180s, 00=Fixed Open)
RELAY2 xxx	Set The Relay 2 Delay Time To xxx (Default 10s, Range From 3s To 180s)
IRLEARN x	Learn IR Command Into Slot x x = 1 Learn IR Display On x = 2 Learn IR Display Input Select x = 3 Learn IR Display Off x = 4 Learn IR User Command 1 x = 5 Learn IR User Command 2
IRDEL x	Delete IR Command In Slot x x = 1 Delete IR Display On x = 2 Delete IR Display Input Select x = 3 Delete IR Display Off x = 4 Delete IR User Command 1 x = 5 Delete IR User Command 2
IRSEND x	Send IR Command In Slot x x = 1 Send IR Display On x = 2 Send IR Display Input Select x = 3 Send IR Display Off x = 4 Send IR User Command 1 x = 5 Send IR User Command 2
IRDLY xxx	Set Sending Interval Time To xxx Second(s) Between IR Commands (Default 3s, Range From 1s To 180s)
IROFFRPT 1x	Set x Number Of Times IR Off 1 Command Is Repeated (Default 1 Time, Range 1 To 2 Times)
IROFFRPT 2x	Set x Number Of Times IR Off 2 Command Is Repeated (Default 1 Time, Range 1 To 2 Times)
IROFFRPTDLY xx	Set Sending Interval Time To xx Second(s) Between IR Off Commands
AUTOONCECINPUT yy	Enable CEC input select for Auto ON Macro to input yy yy = 00: Off yy = [01-04]: Input Select
OUT CEC ENABLE	Enable CEC
OUT CEC DISABLE	Disable CEC
OUT CEC INPUT yy	Send Output CEC Input yy Command
OUT CEC PON	Send Output CEC Power On Command
OUT CEC POFF	Send Output CEC Power Off Command
OUT CEC VOLUP	Send Output CEC Vol Up Command
OUT CEC VOLDOWN	Send Output CEC Vol Down Command
OUT CEC MUTE	Send Output CEC Mute Command
RS232BAUD z	Set RS232 Baud Rate To xx. 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 - Note: will disable other RS232 feedback 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 y = a ASCII, h HEX z = 1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (Default), 7 115200 a = RS232 Command - Note: to insert a carriage return in a command use \r
RS232ON DISABLE	Disable Auto RS232 Commands When Detecting A Signal
RS232OFF y:z:a	Set RS232 Off Command a Of y Type Whose Baud Rate Is z - Note: will disable other RS232 feedback y = a ASCII, h HEX z = 1 2400, 2 4800, 3 9600, 4 19200, 5 38400, 6 57600 (Default), 7 115200 a = RS232 command - Note: to insert a carriage return in a command use \r
RS232OFF DISABLE	Disable Auto RS232 Commands When Not Detecting A Signal
RS232DLY xxx	Set Sending Interval Time In xxx Seconds Between RS232 Commands
RS232RPT x	Set x Number Of Times RS232 OFF Command Is Repeated
RS232RPTDLY xx	Set Sending Interval Time In xx Second(s) Between RS232 OFF Commands (Default 2s, Range From 1s To 10s)

Schematic



Specifications

HD11CTRL

- Video Input Connectors:** 1 x HDMI Type A, 19-pin, female
- Video Output Connectors:** 1 x HDMI Type A, 19-pin, female
- RS-232 Serial Port:** 1 x 3-pin Phoenix connector
- IR Output Port:** 1 x 3.5mm mono jack
- Relay Control:** 2 x 3-pin Phoenix connector
- Sensor Input:** 1 x 3-pin Phoenix connector
- EDID Selection:** 4-pin DIP Switch
- Product Upgrade:** 1 x USB Type A, female
- Dimensions (W x H x D):** 120mm x 28mm x 84mm
- Shipping Weight:** 0.7 Kg
- Operating Temperature:** 32°F to 104°F (0°C to 40°C)
- Storage Temperature:** -4°F to 140°F (-20°C to 60°C)
- Power Supply:** 5V/1A DC

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

Package Contents

HD11CTRL

- 1 x HD11CTRL
- 1 x 5V/1A DC Power Supply
- 1 x IR Emitter
- 1 x RS-232 Control Cable
- 1 x Mounting Kit
- 1 x User Manual

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.

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.



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