

# BINARY

engineered by  
**Snap**  
av

## Installation Manual

HDBaseT Matrix Receiver

**B-500-RX-230-IR**



## Important Safety Instructions

**WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

1. Read and follow all instructions and warnings in this manual. Keep for future reference.
2. Do not use this apparatus near water.
3. Clean only with a dry cloth.
4. Do not block any ventilation openings. Install according to manufacturer's instructions.
5. Do not install near any heat sources such as radiators, heat registers, stoves or other apparatus (including amplifiers) that produce heat.
6. Do not override the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades - one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
7. Protect the power cord from being walked on or pinched particularly at plug, convenience receptacles, and the point where it exits from the apparatus.
8. Only use attachments/accessories specified by the manufacturer.
9. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
10. DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ARE PLACED ON THE EQUIPMENT.
11. TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.
12. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equivalent triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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## 2. Product Overview

The B-500-RX-230-IR extends HDMI over a single Cat5e/6 using HDBaseT technology allowing video and audio transmission to remote displays from any HDBaseT Transmitter including the B-500-MTRX-230 family of HDBaseT matrix switchers. The B-500-RX-230-IR supports all HDMI defined Audio and Video formats, including 3D Video and 4K, and features bi-directional IR pass-through.

### 2.1. Features

#### Form and Function

- Designed specifically for use with B-500-MTRX-230 HDBaseT matrix switchers to extend HDBaseT to displays without the need for a separate transmitter
- Wall-mountable housing design for easy installation
- Extends HDMI formats over a single cable
  - Cat5e/Cat6:** Up to 200ft (4k up to 115 ft)
  - Cat6a:** Up to 230ft (4k up to 130 ft)
- Transmits HDMI Signal via HDBaseT up to 10.2Gbps
- HDCP 1.4 Compliant
- Latch locking power supply

#### Video

- 2D Resolutions up to 1080p@60Hz – 48 Bit Deep Color
- 3D Resolutions up to 1080p@24Hz – 48 Bit Deep Color
- 4K x 2K up to 130 ft.

#### Audio

- Supports all HDMI supported audio formats, including DTS-HD Master and Dolby TrueHD

#### Bi-Directional IR Pass-Through

- Supports IR Signal up to 60 KHz
- Adaptive Circuit on IR Receiver accepts input levels from 2V DC to 12V DC.

### 2.2. Package Contents

- |                           |                          |
|---------------------------|--------------------------|
| (1) B-500-RX-230-IR       | (4) Rubber Feet          |
| (1) 5V DC 2A Power Supply | (1) Installation Manual  |
| (1) Yellow Tag Adapter    | (2) HDBaseT Cable Labels |
| (2) Mounting Screws       |                          |

## 3. Recommended For Installation

**Note:** For use in applications utilizing a B-500-MTRX-230 matrix switcher to transmit HDBaseT signal from sources. The IR pass-through feature will not work correctly with any other model or brand of equipment.

#### To Extend HDBaseT

(Section 5, Wiring Recommendations)

- Category 5e/6 Cable
- RJ45 Connectors
- (1) HDMI Cable

#### Tools

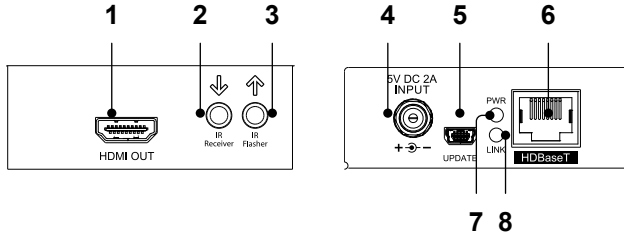
- Wire Stripper or Wire Scissors
- RJ45 Crimper
- Network Cable Analyzer or Continuity Tester

#### For IR Pass-Through

(Section 8, IR-Pass Through)

- IR Flasher/s
- Mono-mini 3.5mm cable/s

## 4. Receiver Layout



1. **HDMI Out**  
Attach HDMI cable to the display.
2. **IR Receiver**  
Connect an IR receiver to this port for capturing commands to transmit IR signal to the matrix switcher using IR pass-through. (3.5mm stereo mini)
3. **IR Flasher**  
Connect an IR flasher or control system to this port to control a display or device using IR pass-through. (3.5mm mono mini)
4. **Latch-Locking Power Jack**  
Attach the included 5V DC 2A power supply to this jack.
5. **Firmware Update Port (USB)**  
Factory use only. Requires custom non-standard USB cable.
6. **HDBaseT Link Port (RJ45)**  
Attach the HDBaseT cable from the transmitting device.
7. **Power LED**  
Illuminates solid RED when extender is powered on.
8. **Link LED**  
Illuminates solid GREEN when HDBaseT Link is active. Off indicates that HDBaseT Link is not active.

## 5. Wiring Recommendations

### 5.1. HDBaseT Link

#### Cable Type - Shielded or Unshielded Cat5e/6

- Distance Limitations

**Cat5e/ Cat6:** Up to 200ft (4K x 2K resolution is limited to 115 ft)

**Cat6a:** Up to 230ft (4K x 2K resolution is limited to 130 ft)

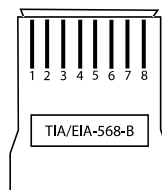
- Use at least Category 5e high quality twisted pair solid conductor cable rated to 350 Mhz bandwidth. The higher the cable standard, the better it will perform.
- For the best results install a shielded cable. This will prevent rare signal dropout and artifacts that may occur and are caused by electromagnetic and radio interference (EMI/RFI) from ceiling fans, appliances and electric motors.
- Use no more than two 5 meter or shorter, solid or stranded, 568B terminated patch cables in the run. Use shielded patch cables if the run is shielded to maintain shield continuity.
- Use no more than two keystone or couplers in the run. Use shielded keystone or couplers with shielded cable to maintain continuity.
- Cleanly terminate all cable ends and test every cable used before connecting the extender to avoid troubleshooting termination problems later.
- Mark each end of the HDBaseT cable with the included labels to avoid confusion later.

#### Cable Connector - RJ45

- Use a high quality RJ45 connector that matches or exceeds the standard of the cable in use. Shielded connectors must be used with shielded cables, and must maintain continuity of the shield to both connectors to protect from interference.
- We discourage the use of “EZ” style, open end RJ45’s with HDMI extenders.
- Always terminate RJ45 connectors in the HDBaseT signal path to the 568B termination standard as indicated by HDBaseT standards.

#### TIA/EIA Standard 568-B (Gold Pins Facing Up)

Pin 1	White/Orange	Pin 5	White/Blue
Pin 2	Orange	Pin 6	Green
Pin 3	White/Green	Pin 7	White/Brown
Pin 4	Blue	Pin 8	Brown



## 5.2. HDMI Cable

- Use Binary (or similar) 2 meter or shorter, High Speed rated HDMI cables between any device and the HDMI output port of the Receiver for the best performance.
- The Receiver should work with a longer cable, but in the case of any picture or sync issues, it should be 2 meters or less between the equipment and the Receiver to accurately troubleshoot.
- Avoid using HDMI keystones. The best practice for HDMI cables is to have one unbroken cable between the Receiver and other equipment.

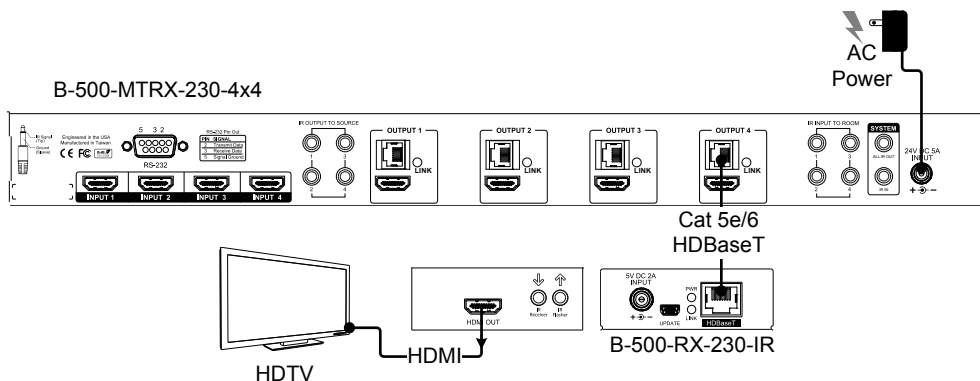
## 6. Power Supply

The B-500-RX-230-IR uses a 5V DC 2A power supply.



**Power Supply Voltage Warning!** Before applying power to the Receiver, read the label on the power supply to confirm that it is 5V DC 2A. Connecting the wrong voltage power supply may cause damage to the Receiver or the supply.

## 7. Installation Instructions



Follow these steps to install the receiver:

1. Turn off all equipment to be connected. **Do not connect power to the B-500-RX-230-IR until all other connections are made.**
2. Run the HDBaseT cable from the location of the Transmitter to the location of the Receiver and terminate the ends.
3. Test the HDBaseT cable using a continuity tester or network analyzer.
4. Connect the HDBaseT cable to the B-500-RX-230-IR Receiver and the transmitting device being used.
5. Connect an HDMI cable between the HDMI Out port of the B-500-RX-230-IR and the HDMI input of the display.
6. Screw the power connector into the latch locking jack on the Receiver, and then plug the power supply into an AC outlet. The Power LED at the Receiver should illuminate solid RED.
7. Test the system by playing media at the highest resolution that can be supported by all of the equipment.
8. After testing is complete and the unit is functional, mount the Receiver in the desired location.



**Important!** It is essential to have HDBaseT pass-through working correctly before other features are configured, so make sure this portion of the install is functional before setting up IR serial pass-through.

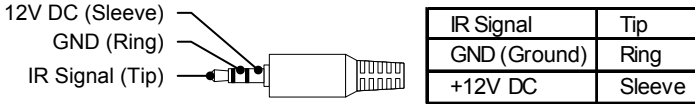


## 8. IR Pass-Through

This section outlines the connections, optional adapters, and operation of IR pass-through on the B-500-MTRX-230 HDBaseT Receiver. Integration with the B-500-MTRX-230 matrix switcher is detailed. Refer to the documentation included with any transmitter used for specific instructions to integrate IR pass-through.

### 8.1. Port Pinouts

#### 8.1.1. IR Receiver Port (3.5mm {1/8"} Stereo)

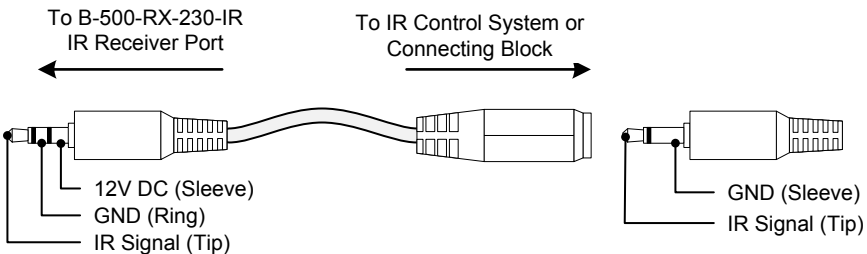


The IR Receiver port sends IR commands over the HDBaseT Link to the IR OUTPUT TO SOURCE and SYSTEM ALL IR OUT ports at the matrix switcher. Plug in a compatible IR receiver such as the Episode® EE-IR-RCVR-SURFACE to capture in-room IR commands for control of the matrix switcher and sources at the matrix switcher or Transmitter.



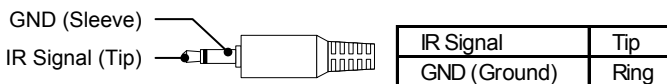
**Important!** Pinout configurations for IR receivers and control systems vary. Before connecting to the IR Receiver port, review all device pinouts carefully in order to match the configuration for the B-500-RX-230-IR.

#### 8.1.2. Yellow Tag IR Adapter



The included yellow tagged adapter (illustrated above) is used when plugging a 3.5mm mono mini cable into the IR Receiver port of the B-500-RX-230-IR. This is used to send IR commands to the matrix switcher location from other devices instead of an IR Receiver that use a 3.5mm mono mini port for output.

#### 8.1.3. IR Flasher Port



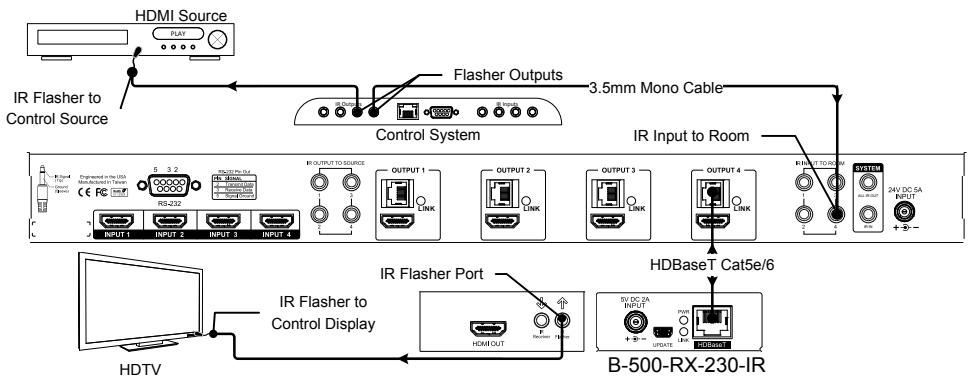
The IR flasher port outputs any signal received from the IR INPUT TO ROOM port on the matrix switcher or the IR Receiver port of a Transmitter. The port can power one single flasher, or a mono cable may be attached to the input of a powered IR distribution block to use several flashers.

## 8.2. IR Installation

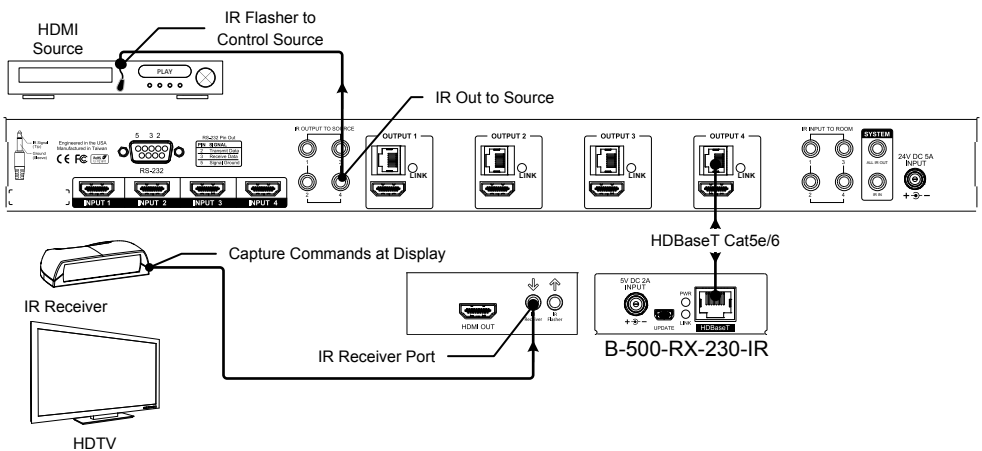
IR pass-through can be used in two ways, to control displays from the transmitting location (via commands from an automation system), or to control sources and the matrix using IR remotes in the rooms where displays are located. Commands may be passed in both directions at once if necessary. To install the IR receivers and flashers, plug the devices into the correct ports as indicated and then locate the best location for placement to either capture commands or control the device.

## 8.3. IR Pass-Through Application Diagrams

### 8.3.1. IR Control System to Control Displays



### 8.3.2. IR Receiver System to Control Sources



## 9 . Specifications

<b>TECHNICAL</b>			
HDMI Compliance	HDMI 3D		
HDCP Compliance	Yes		
Video Bandwidth	10.2 Gbps		
HDMI over UTP Transmission	Resolution	Cat5e/ Cat6	Cat6a
	1080i / 720p 24-bit color	200ft	230ft
	Full HD 1080P 24-bit color	200ft	230ft
	Full HD 1080P 36-bit deep color	200ft	230ft
Input TMDS Signal	1.2 Volts (peak-to-peak)		
Input DDC Signal	5 Volts (peak-to-peak, TTL)		
ESD Protection	(1) Human body model — ±15kV (air-gap discharge) & ±8kV (contact discharge) (2) Core chipset — ±8kV		
IR Signal (Bi-directional)	Carrier frequency: 20-60kHz		
<b>CONNECTIONS</b>			
HDBaseT Link	1x RJ45		
HDMI	1x HDMI Type A (19-pin female)		
IR Receiver	1x 3.5mm Stereo (Powered)		
IR Flasher	1x 3.5mm Mono		
Power	Latch-Locking		
USB Update Port	Mini USB - Factory Use Only		
<b>MECHANICAL</b>			
Housing	Metal enclosure		
Dimensions (Inches, W x H x D)	4.1" x 1.25" x 3.5"		
Weight	1.1 lbs.		
Power Supply	5V DC 2A		
Power Consumption	7.5w (max)		
Operation Temperature	32~104°F		
Storage Temperature	-4~140°F		
Relative Humidity	20~90% RH (no condensation)		
Certifications and Compliance	Product: CE, FCC, RoHS Power Supply: CE, FCC, RoHS, UL		

## 10. Warranty



### 2-Year Limited Warranty

This Binary™ Product has a Two-Year Limited Warranty. This warranty includes parts and labor repairs on all components found to be defective in material or workmanship under normal conditions of use. This warranty shall not apply to products which have been abused, modified or disassembled. Products to be repaired under this warranty must be returned to SnapAV or a designated service center with prior notification and an assigned return authorization number (RA).

## 11. Contacting Technical Support

Phone: (866) 838-5052

Email: [Techsupport@snapav.com](mailto:Techsupport@snapav.com)

