

HDBaseT EXTENDER  
B-540-EXT-230-IR

**BINARY**

## INSTALLATION MANUAL



FC CE

## IMPORTANT SAFETY INSTRUCTIONS

To reduce the risk of fire or electric shock, read and follow all instructions and warnings in this manual. Keep this manual for future reference.

1. Do not expose this apparatus to rain or moisture. 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. Do not use this apparatus near water.
2. Do not remove cover. No user serviceable parts inside.
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 plug. A polarized plug has two blades, one of which is wider than the other. A grounding plug has two matching 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 the plug end and where the power cord is attached to the apparatus.
8. Only use attachments and 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 on or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, the apparatus does not operate normally, or it has been dropped.
10. To completely disconnect this equipment from power, disconnect the power supply cord from the power outlet.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated 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 equilateral 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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## 1. PRODUCT OVERVIEW

Welcome to Binary. This product is engineered to provide years of exceptional reliability. We appreciate your business, and we stand committed to providing our customers with the highest degree of quality and service in the industry.

This device extends HDMI over a single category cable using HDBaseT technology allowing video and audio transmission to remote displays. In addition, the device is equipped with bidirectional IR over the same category cable up to 230'.

This unit supports all HDMI defined audio and video formats, including 4K2K@30 Hz, and is compatible with HDMI 2.0 and HDCP 2.2 products. The Power over Cable (PoC) feature enables the extender to be powered from either end.

## 2. FEATURES

- Extends all HDMI formats up to:

Cable Type	Cat 5e/6	Cat 6a/7
1080i/720p 24-bit color	200'	230'
Full HD 1080p 24-bit color	200'	230'
Full HD 1080p 36-bit color	200'	230'
Ultra HD 4K2K@30 Hz*	115'	130'

\*Compatible with HDMI 2.0 and HDCP 2.2

- Supports all HDMI supported audio formats, including DTS-HD Master and Dolby TrueHD
- Bidirectional IR
- PoC capable - can be powered from either the transmitter or receiver

## 3. PACKAGE CONTENTS

- 1x B-540-EXT-230-IR Transmitter
- 1x B-540-EXT-230-IR Receiver
- 1x 12V DC, 2A Power Supply
- 4x Mounting Ears
- 4x Mounting Screws
- 8x Rubber Feet
- 1x Installation Manual
- 1x Power Supply Label
- 2x HDBaseT Labels

## 4. DEVICE LAYOUT

### 4.1. B-540-EXT-230-IR Transmitter

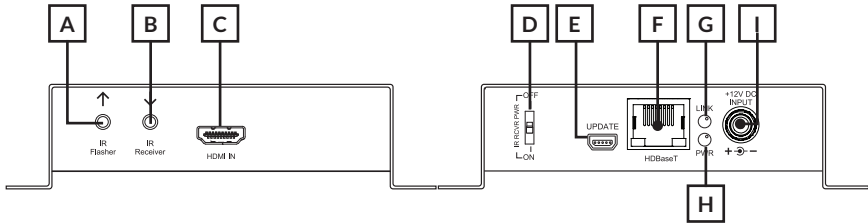


FIGURE 1: Transmitter Layout

#### A. IR Flasher Out

IR output for connection to IR Flasher

#### B. IR Receiver

Connect to the IR output of a control system or send IR signals to the remote location.

#### C. HDMI IN

HDMI Input for connection to a source HDMI output

#### D. DIP Switch

**IR RCVR PWR OFF/ON**

OFF to connect to control system | ON to connect to IR Receiver

#### E. Update (USB type Mini-B)

To connect USB cable A to Mini-B when updating firmware

#### F. HDBaseT (RJ45)

Connect to the HDBaseT RJ45 port on receiver

#### G. Power LED

Lights blue when the unit has power

#### H. Link LED

Lights green when synced with receiver

#### I. Thread-locking Power Connector

Connect to an optional 12V DC, 2A power supply (B-PS-12VDC-2A)

## 4.2. B-540-EXT-230-IR Receiver

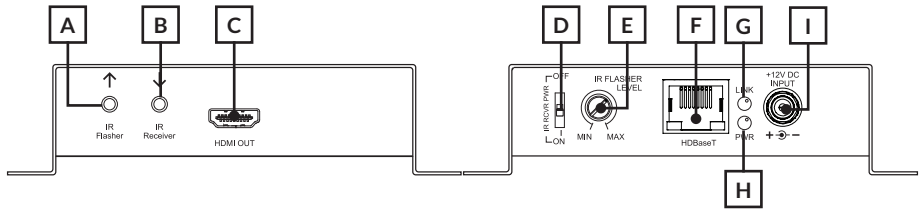


FIGURE 2: Receiver Layout

### A. IR Flasher

IR output to connect to IR Flasher

### B. IR Receiver

IR input to connect to IR Receiver or to output of a control system

### C. HDMI Out

HDMI Output to connect to the HDMI input of a sink (display)

### D. DIP Switch

IR RCVR PWR OFF/ON

OFF to connect to control system | ON to connect to IR receiver

### E. IR Flasher Level

Adjusts the intensity of the IR Flasher output

### F. HDBaseT (RJ45)

To connect to the HDBaseT RJ45 port on Matrix switcher

### G. Link LED

Lights up green when synced with a Matrix switcher or transmitter

### H. Power LED

Lights up blue when the unit has power

### I. Thread-locking Power Connector

Connect to an optional 12V DC, 2A power supply (B-PS-12VDC-2A)

## 5. INSTALLATION

**⚠CAUTION:** Do not connect power to the device until all other connections are made and the unit is installed.

### 5.1. B-540-EXT-230-IR Transmitter Installation

1. Run category cable from the location of the transmitter to the remote location of the receiver.
2. Mount the device transmitter in the desired location.
3. Connect the HDMI Out of a source component using an HDMI cable.
4. Connect an IR control system to the IR receiver and/or IR flasher if being used. Refer to Section 6.2.
5. Connect the category cable to the device transmitter.
6. Connect the 12V DC, 1A power supply to the thread-locking power connector unless PoC is being used to send power from the receiver. DO NOT plug the power supply into an AC outlet until Receiver Installation is completed.

### 5.2. B-540-EXT-230-IR Receiver Installation

1. Run category cable from the location of the transmitter to the remote location of the receiver.
2. Mount the device receiver in the desired location.
3. Connect the category cable to the device receiver.
4. Connect an IR flasher and/or IR receiver if being used. Refer to Section 6.2.
5. Connect an HDMI cable from the HDMI Out of device receiver to the display.
6. Connect the 12V DC, 2A power supply to the thread-locking power connector, unless PoC is being used to send power from the transmitter.
7. Connect the power supply to the AC outlet.

## 6. APPLICATIONS

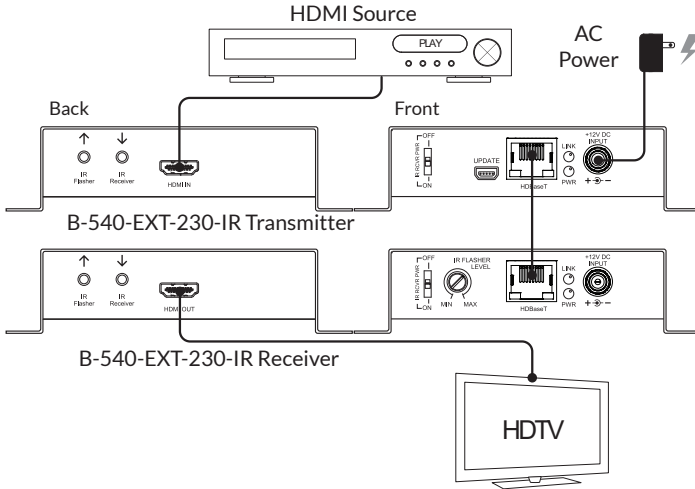


FIGURE 3: Application Diagram

**Note:** When a power supply is connected to either the transmitter or receiver, the HDBaseT link sends power to the other unit. Only one unit requires a power supply to be connected.

### 6.1. HDBaseT Link (RJ45) Connection

This device is specified to operate with category cables for communication between the transmitter and receiver. The transmission path may include a maximum of two keystones and two patch cables, as long as the total length does not exceed 200' for Cat 5e/6 and 230' for Cat 6a/7.

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



FIGURE 4: RJ45 Connections

**Note:** The HDBaseT Link RJ45 connection includes a 12V signal. Do not connect anything to this port other than an HDBaseT transmitter or receiver.



## 6.2. IR Control Connections

Bidirectional IR signals can be transmitted between transmitter and receiver through category cable. The IR signal can be generated either from a powered receiver or from a control system. The following section describes these two use cases.

**⚠CAUTION:** Pinout configurations for IR receivers and control systems vary. Before connecting to this input, review this section carefully in order to match the pinouts for the device.

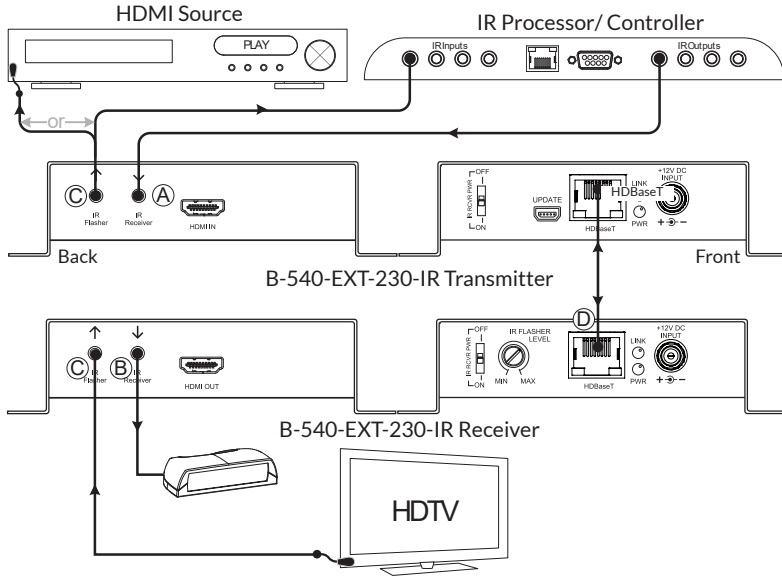


FIGURE 5: IR Connections

**Note:** Arrow direction indicates signal flow.

- Ⓐ IR Control In-3.5 mm Mono—See Section 6.2.2
- Ⓑ IR Receiver In-3.5 mm Stereo—See Section 6.2.1
- Ⓒ IR Flasher Out-3.5 mm Mono—See Section 6.2.3
- Ⓓ HDBaseT Link category cable (RJ45)—See Section 6.1

### 6.2.1. Point-to-Point IR Control – Stereo (3.5mm) IR Receiver

When using a powered IR receiver, the DIP switch for IR RCVR PWR should be set to ON. In this case a 3.5mm (1/8") stereo jack has to be used to send 9V DC power to the receiver.

**⚠CAUTION: DO NOT** connect a mono cable to this connection as damage may occur.

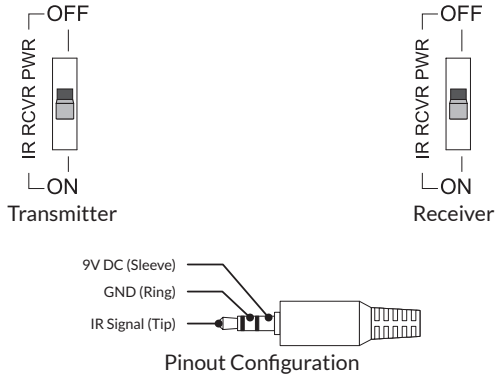


FIGURE 6: Point-to-Point IR settings

### 6.2.2. Control System – Mono (3.5mm) IR Receiver

When using a control system which generates the signal through a mono jack, the IR RCVR PWR switch should be in the OFF position.

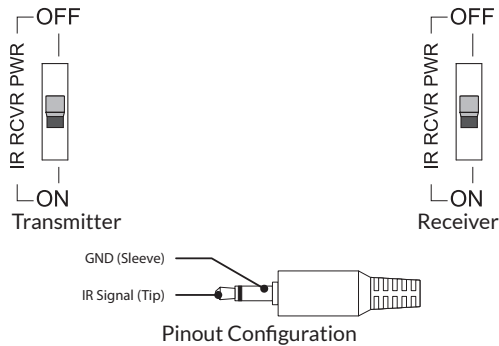


FIGURE 7 : Control System IR settings

### 6.2.3. IR Flasher Out— Mono (3.5mm)

The IR Flasher level adjusts the intensity of the IR Flasher output

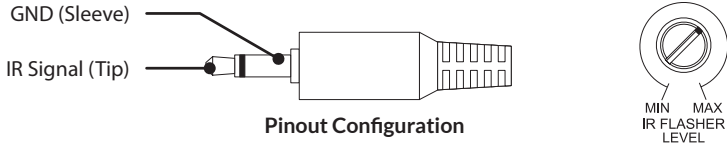


FIGURE 8: IR Flasher Out

### 6.3. Thread-Locking Power Connector

This extender pair is Power over Cable capable and therefore can be powered from either the transmitter or receiver. When a power supply is connected to either the transmitter or receiver, the HDBaseT link sends power to the other end.

**⚠CAUTION: DO NOT** connect the power supply to the device until it is completely installed and all connections have been made.

## 7. SPECIFICATIONS

Technical	Transmitter	Receiver	
HDMI Compliance	HDMI 3D		
HDCP Compliance	Yes		
Video Bandwidth	10.2 Gbps		
HDMI over UTP Transmission	Resolution	Cat 5e/6	Cat 6a/7
	1080i / 720p 24-bit color	200 ft	230 ft
	Full HD 1080P 24-bit color	200 ft	230 ft
	Full HD 1080P 36-bit deep color	200 ft	230 ft
	4K@30Hz (4:4:4)/ 4K@60Hz (4:2:0)	115 ft	130 ft
Input TMDS Signal	1.2V (peak-to-peak)		
Input DDC Signal	5V (peak-to-peak, TTL)		
ESD Protection	(1) Human body model: $\pm 5\text{kV}$ (air-gap discharge) & $\pm 8\text{kV}$ (contact discharge) (2) Core chipset – $\pm 8\text{kV}$		
IR Signal (Bidirectional)	Carrier frequency: 20–60kHz		
Connections			
HDBaseT Link	1x RJ45	1x RJ45	
HDMI	1x HDMI Type A (19-pin female)	1x HDMI Type A (19-pin female)	
IR Receiver (In)	1x 3.5mm Stereo/Mono	1x 3.5mm Stereo/Mono	
IR Flasher (Out)	1x 3.5mm Mono	1x 3.5mm Mono	
Power	Thread-Locking		
Controls			
DIP switch 1	IR RCVR PWR OFF/ON		
Mechanical			
Housing	Metal enclosure		
Dimensions	6.25"x3.1"x1.3"		
Weight	1.1 lbs.		
Power Supply	12V DC, 2A		
Power Consumption	12W (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		

## 8. CONTACTING TECH SUPPORT

Phone: 866.838.5052

For SnapAV customers, [snapav.com](http://snapav.com)

For Aisle 8 customers, [onaisle8.com](http://onaisle8.com)

## 9. WARRANTY

### 2-Year Limited Warranty

This Binary Product has a 2-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 that have been abused, modified or disassembled. Products to be repaired under this warranty must be returned to a designated service center with prior notification and an assigned return authorization number (RA).





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