

BINARY

OWNER'S MANUAL

SINGLE CAT5E/6 3D EXTENDER

B-320-1CAT-HDIR



IMPORTANT SAFETY INSTRUCTIONS

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

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.

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



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 equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

TABLE OF CONTENTS

1. Overview	4
2. Package Contents	4
3. Features	5
4. Connections and Controls.....	6
4.1. Transmitter Connections and Controls.....	6
4.2. Receiver Connections and Controls	7
5. Basic Connections.....	8
5.1. HD Link (RJ45) Connections	8
5.2. IR Control Connections	9
5.2.1. IR Control In - Transmitter Only	10
5.2.2. IR Receiver In - Receiver Only.....	11
5.2.3. IR Flasher Out - Transmitter and Receiver.....	11
5.3. HDMI Out to Display (HDMI)	11
6. Installation	12
6.1. B-320-1CAT-HDIR Transmitter Installation.....	12
6.2. B-320-1CAT-HDIR Receiver Installation	12
6.3. EDID Configuration.....	13
6.3.1. EDID Mode Settings	13
6.3.2. Learning EDIDs.....	13
6.4. Distance Calibration	14
7. Specifications	15
8. Warranty.....	16
9. Contacting Technical Support	16

1. OVERVIEW

The B-320-1CAT-HDIR extends HDMI over single Cat5e/6 providing video and audio transmission to remote displays. In addition, the B-320-1CAT-HDIR is equipped with bi-directional IR pass-through allowing users to have bi-directional IR control with no additional wires.

2. PACKAGE CONTENTS

- (1) B-320-1CAT-HDIR (Transmitter)
- (1) B-320-1CAT-HDIR (Receiver)
- (4) Mounting Screws
- (8) Rubber Feet
- (2) 5V DC 2A Power Supply
- (1) IR Adapter Cable
- (1) User Manual

3. FEATURES

Form and Function

- Extends HDMI Signals via a Single Cat5e/Cat6

Resolution	Cat5e	Cat6e
1080i / 720p 24-bit color	200ft	200ft
Full HD 1080P 24-bit color	130ft	165ft
Full HD 1080P 36-bit deep color	65ft	65ft

- Support for HDMI 3D
- HDCP 2.0 Compliant
- Adjustable 8-Level Distance Equalization Control

Audio

- All HDMI Supported Formats including DTS-HD Master and Dolby TrueHD

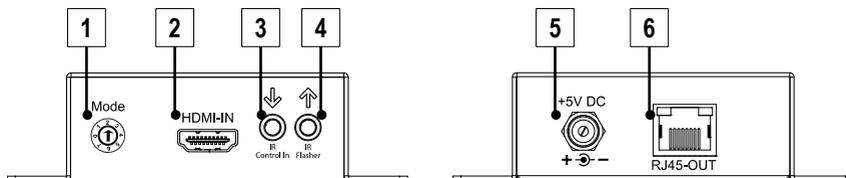
IR Functionality

- Supports IR Signal from 20khz To 60khz
- Bi-Directional IR Pass-Through
- Adaptive IR Input supports IR signals from 3.5V To 12V

***Note:** *The transmission distance is subject to the quality of installed cable(s), source device, and display. Only point to point cable connections are supported. Keystone or other connecting devices should not be used. To minimize the chance of EMI interference, STP (Shielded Twisted Pair) cable is recommended.*

4. CONNECTIONS AND CONTROLS

4.1. Transmitter Connections and Controls



1. EDID Mode Setting

7 position rotary switch that provides selection of 6 pre-configured EDIDs and learning. See section: 6.3 EDID Configuration.

2. HDMI In from Source (HDMI)

Connect an HDMI cable to the HDMI output of the source component.

3. IR Control In (3.5mm {1/8"} Mono)

Connect an IR Control System to send IR signals to the Receiver in the remote location. See Section 5.2.1 for details.

4. IR Flasher Out (3.5mm {1/8"} Mono)

Connect an IR flasher to send IR control signals from the Receiver to an Automation System or Source Component. See Section 5.2.3 for details.

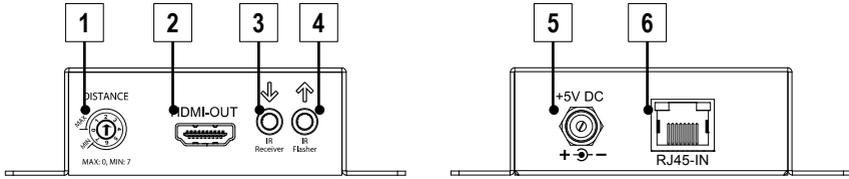
5. Latch-Locking Power Jack

Connect to the included 5V DC 2A Power Supply.

6. HD Link (RJ45)

Connect to RJ45 1cat input of the Receiver; this connection follows standard TIA/EIA-568B. While 568A can be used, its use will degrade performance due to the nature of the signals being transmitted.

4.2. Receiver Connections and Controls



1. Distance Control

8 position rotary switch that provides equalization control to prevent over or under loading the HD signal. See Distance Calibration for more details.

2. HDMI Out to Display (HDMI)

Connect an HDMI cable to the HDMI output of the source component.

3. IR Receiver (3.5mm {1/8"} Stereo)

Connect an IR Control System to send IR signals to the Receiver in the remote location. See Section 5.2.1 for details.

4. IR Flasher Out (3.5mm {1/8"} Mono)

Connect an IR flasher to send IR control signals from the Receiver to an Automation System or Source Component. See Section 5.2.3 for details.

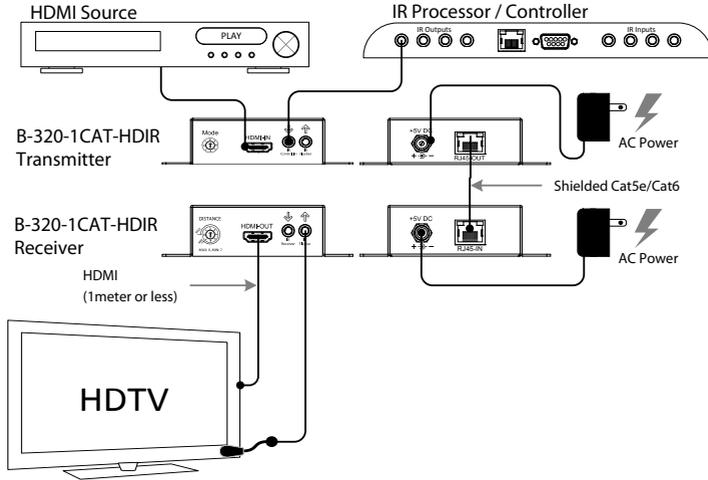
5. Latch-Locking Power Jack

Connect to the included 5V DC 2A Power Supply.

6. HD Link (RJ45)

Connect to RJ45 1cat input of the Receiver; this connection follows standard TIA/EIA-568B. While 568A can be used, its use will degrade performance due to the nature of the signals being transmitted.

5. BASIC CONNECTIONS



5.1. HD Link (RJ45) Connections

Recommended Cabling

- Shielded Cat5e/Cat6

Connection Precautions!

- The transmission distance is subject to the quality of installed cables, source device, and display.

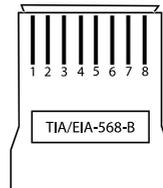
Note: The use of keystone jack or other connections along the transmission path is not supported with this device.

- To reduce video dropouts from ceiling fans and other EMI issues, it is strongly recommended that shielded CAT5e/CAT6 and shielded RJ45 connectors are used; "EZ-ends" should not be used.

Connection Details:

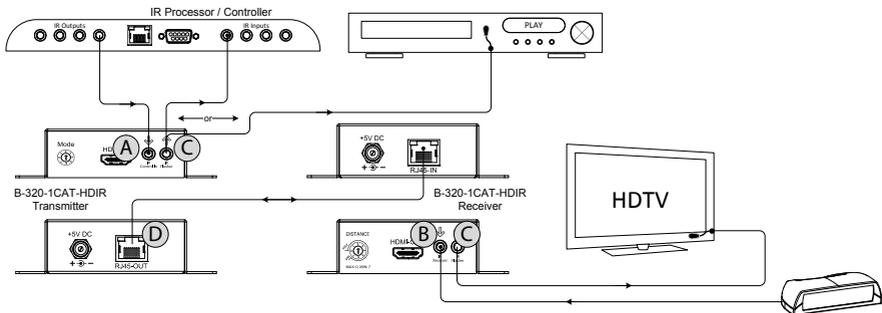
TIA/EIA Standard 568-B (Gold Pins Facing Up)

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. IR Control Connections

Bi-directional IR signals are transmitted between the B-320-1CAT-HDIR Transmitter and Receiver over the Cat5e/6 cable. How the IR connections function varies on the Transmitter and Receiver based on the common use cases for sending and receiving IR. This section outlines the operation of IR on the Transmitter and Receiver.



- (A) IR Control In Transmitter-See Section 5.2.1
- (B) IR Receiver In Receiver-See Section 5.2.2
- (C) IR Flasher Out -See Section 5.2.3
- (D) HD Link (RJ45)-See Section 5.1

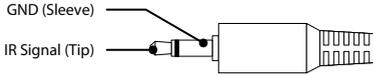
Connection Precautions!

- Before connecting an IR Receiver or an IR Automation System, verify that the B-320-1CAT-HDIR is OFF to avoid damaging the unit.
- The IR Receiver In (3.5mm {1/8"} Stereo) on the Receiver provides 9V power to power IR Receivers. This voltage can damage flashers and Automation Systems. Take caution before plugging an IR Flasher or IR Receiver into the respective IR sockets. The Manufacturer's Warranty will not cover any damage that may occur. See IR Control Connections section for proper cabling.
- Pin out configurations for IR Receivers and Automation Systems vary. Before connecting to this input, review this section carefully in order to match the pin outs for the B-320-1CAT-HDIR.

5.2.1 IR Control In- Transmitter Only

The most common use of the IR Control In port is to send a wired IR signal from an Automation System to an IR Flasher connected to the Receiver. This connection does not include power for an IR Receiver. A 3.5mm {1/8"} Mono Cable is used to connect directly to the Automation System IR output or Connecting Block.

Connection Type: 3.5mm {1/8"} Mono



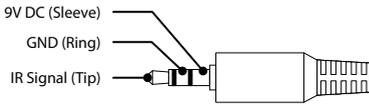
IR Signal	Tip
GND (Ground)	Ring

If the system requires a powered IR Receiver at the Transmitter, a powered IR Block (ex: SnapAV KIT-IR-RPTR-1X4) will be needed between the IR Receiver and the Transmitters IR Control

5.2.2 IR Receiver In - Receiver Only

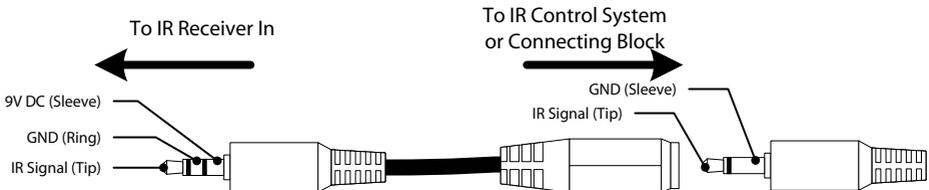
The most common use of the IR Receiver port is to send an IR signal from a powered IR Receiver to an IR Flasher connected to the Transmitter. This connection includes +9V DC power for an IR Receiver. A 3.5mm {1/8"} Stereo Cable is used to connect directly to an IR Receiver, DO NOT connect a mono cable to this connection as damage may occur.

Connection Type: 3.5mm {1/8"} Stereo



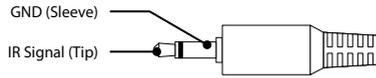
IR Signal	Tip
GND (Ground)	Ring
+9V DC	Sleeve

If the system requires connection to an Automation System or Connecting Block to send IR to the Transmitter, the included IR Adapter Cable between the Automation System or Connecting Block output and the IR Receiver input must be used.



5.2.3 IR Flasher Out - Transmitter and Receiver

Connection Type: 3.5mm {1/8"} Mono



IR Signal	Tip
GND (Ground)	Ring

5.3 HDMI Out to Display (HDMI)

Recommended Cabling

- 1 meter or shorter HDMI Cable

6. INSTALLATION

Note: *DO NOT connect power to the B-320-1CAT-HDIR until all other connections are made and the unit is installed.*

6.1. B-320-1CAT-HDIR Transmitter Installation

Note: If EDID learning is required, the EDID from the display MUST be learned prior to installing the Transmitter. See section 6.3.2. Learning EDIDs

1. Run the cabling in the wall to the location for the B-320-1CAT-HDIR:
HD Link Cable: Shielded Cat5e/Cat6
2. Mount the B-320-1CAT-HDIR Transmitter in the desired location.
3. Connect the HDMI out of a source component using an HDMI cable.
4. Connect the cables from the wall to the B-320-1CAT-HDIR transmitter.
5. Connect the 5V DC 2A Power Supply to the Latch-Locking Power Jack
6. Select the desired EDID setting using the EDID Mode Selector dial. See 6.3 EDID Configuration.

Note: *If an EDID was learned into the transmitter, DO NOT move the dial away from 7 as the EDID will be lost.*

7. Install the B-320-1CAT-HDIR receiver following the steps outlined below.

6.2. B-320-1CAT-HDIR Receiver Installation

1. Run the cabling in the wall from the head end:
HD Link Cable: Shielded Cat5e/Cat6
2. Install the B-320-1CAT-HDIR transmitter following the steps outlined in section 6.1. B-320-1CAT-HDIR Transmitter Installation.
3. Mount the B-320-1CAT-HDIR Receiver in the desired location.
4. Connect the CAT5 cable from the wall to the B-320-1CAT-HDIR receiver.
5. Connect an IR Flasher and/or IR receiver being used.
6. Connect an HDMI cable from the B-320-1CAT-HDIR to the display.
7. Connect the 5V DC 2A Power Supply to the Latch-Locking Power connection.
8. Set the Distance Control rotary switch to 7 (Weakest).
9. Plug the power supplies into the AC outlets.
10. Calibrate for distance. See 6.4 Distance Calibration for details.

6.3. EDID Configuration

6.3.1. EDID Mode Settings

EDID Setting	Supported Resolutions	Color Depth	Audio Channels
0	1080p @60Hz	24-Bit	7.1 ch
1	1080p @60Hz	24-Bit	2 ch
2	1080p @60Hz	36-Bit	7.1 ch
3	1080p @60Hz	24-Bit 3D	7.1 ch
4	1080p @30Hz 1080i @60Hz, 720p @60Hz	24-Bit	7.1 ch
5	1080p @30Hz 1080i @60Hz 720p @60Hz	24-Bit	2 ch
6	1080p @60Hz	24-Bit 3D	2 ch
7	Learning Mode	—	—

6.3.2. Learning EDIDs

In most cases, EDIDs will not require learning from the display. Only perform learning if none of the EDIDS available using the Mode Dial does not provide the desired outcome.

1. Set the EDID Mode dial to "7".
2. Connect the HDMI display to "HDMI IN" on the Transmitter with a HDMI cable.
3. Set "MODE" on the transmitting unit to "7".
4. Power on the Transmitter by connecting the 5V Power Supply.
5. The LED on the RJ45 of the transmitter will flash On and Off once to learn the EDID. Keep the mode dial on "7" at all times to use the learned EDID.
6. Unplug the HDMI cable from the display and follow the installation instructions in section 6.1 B-320-1CAT-HDIR Transmitter Installation.

6.4. Distance Calibration



CAUTION: Inappropriate signal level setting may cause an overpowering issue that may shorten the product life. Follow the steps below to adjust the distance setting in order to avoid overdriving.

1. Set the distance control to 7 (Weakest).
2. Select a source that is outputting the highest-quality video that will be transmitted to the receiver.
 - A. If you see a flickering or blinking images on the display:
 - A-1. Adjust the signal level from 7 to 0 one step at a time, and stop turning the rotary switch when the audion/video is playing normally.

7. SPECIFICATIONS

Technical

	Transmitter	Receiver	
HDMI Compliance	HDMI 3D		
HDCP Compliance	Yes		
Video Bandwidth	6.75 Gbps		
Video Support	480i / 480p / 720p / 1080i / 1080p60		
HDMI over UTP Transmission	Resolution	Cat5e	Cat6
	180i / 720p 24-bit color	200ft	200ft
	Full HD 1080P 24-bit color	130ft	165ft
	Full HD 1080P 36-bit deep color	65ft	65ft
Signal Equalization	8-level digital control at RX		
Input TMDS Signal	1.2 Volts (peak-to-peak)		
Input DDC Signal	5 Volts (peak-to-peak, TTL)		
ESD Protection	(1) Human body model — $\pm 15\text{kV}$ (air-gap discharge) & $\pm 8\text{kV}$ (contact discharge) (2) Core chipset — $\pm 8\text{kV}$		
IR Signal (Bi-directional)	Carrier frequency: 20-60kHz		

Connections

HD Link	1x RJ45	1x RJ45
HDMI	1x HDMI Type A (19-pin female)	1x HDMI Type A (19-pin female)
IR Control In	1x 3.5mm Mono	—————
IR Receiver (In)	—————	1x 3.5mm Stereo
IR Flasher (Out)	1x 3.5mm Mono	1x 3.5mm Mono
Power	Latch-Locking	Latch-Locking

Controls

Rotary Control Switch	EDID Mode	Distance Signal Level
-----------------------	-----------	-----------------------

Mechanical

Housing	Metal enclosure
Dimensions	2.9" x 3.5" x 1"
Weight	1.1 lbs
Power Supply	5V DC 2A
Power Consumption	3 Watt (max)
Operation Temperature	32~104°F
Storage Temperature	4~140°F
Relative Humidity	20~90% RH (no condensation)

8. 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).

9. CONTACTING TECHNICAL SUPPORT

Phone: (866) 838-5052

Email: Techsupport@snapav.com

