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OWNER'S MANUAL

SINGLE CAT5E/6 3D EXTENDER

B-320-1CAT-HDIR-W

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.

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TABLE OF CONTENTS

1. Overview 5
2. Package Contents 5
3. Features 6
4. Connections and Controls 7
4.1. Transmitter Connections and Controls 7
4.2. Receiver Connections and Controls 8
5. Basic Connections 9
5.1. HD Link(RJ45) Connections 9
5.2. IR Control Connections 10
5.2.1. IR Receiver In (3.5mm {1/8"} Stereo) Connections 11
5.2.2. IR Control In and IR Flasher Out (3.5mm {1/8"} Mono) Connections 11
5.3. HDMI Out to Display (HDMI) 11
5.4. Optional Remote Power (2 Conductor) Connections 12
6. Installation 13
6.1. B-320-1CAT-HDIR-W Transmitter Installation 13
6.2. B-320-1CAT-HDIR-W Receiver Installation 13
6.3. EDID Configuration 14
6.3.1. EDID Mode Settings 14
6.3.2. Learning EDIDs 14
6.4. Distance Calibration 14
7. Specifications 15
8. WARRANTY 16
9. Contacting Technical Support 16

1. OVERVIEW

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

Since many installations are behind flat screen TVs, the B-320-1CAT-HDIR-W Receiver is made to mount in a single gang box and can be optionally powered from the rack to a rear power connection.

The B-320-1CAT-HDIR-W also supports the most advanced 3D video format, which is compliant with HDMI 3D specifications, and guarantees the highest 3D video compatibility on the market.

2. PACKAGE CONTENTS

(1) B-320-1CAT-HDIR-W (Transmitter)

(1) B-320-1CAT-HDIR-W (Receiver)

(4) Mounting Screws

(4) Rubber Feet

(2) 5V DC 2A Power Supply

(1) IR Adapter Cable

(1) WPS-ACC-PWR DC Power Plug (Female)

(1) Decora Wall Plate

(1) User Manual

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3. FEATURES

Form and Function

- In Wall Receiver (single gang box) Design for Easy Installation
- 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
- Rear power Connection enables remote powering

Audio

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

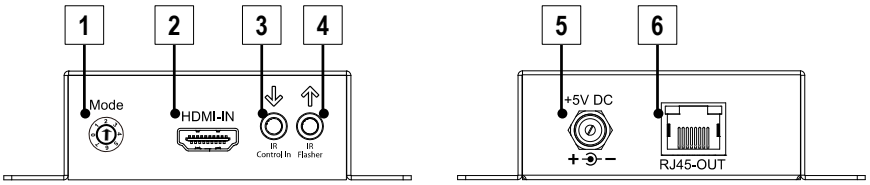
IR Functionality

- 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.

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.

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.

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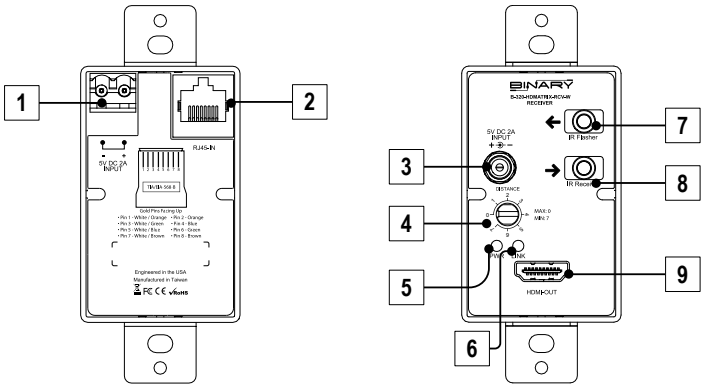
4.2. Receiver Connections and Controls



1. Optional Remote Power (2 Conductor removable)
Optional connection for power from a remote power source; this connection requires a wire run within the wall. Use only when the Latch-Locking Power Jack (3) is not being used. Do not connect both power sources.

2. HD Link (RJ45)
Connect to RJ45 output of the Transmitter; 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.

3. Latch-Locking Power Jack
Connect to the included 5V DC 2A Power Supply. Use only when the Optional Remote Power connector (1) is not being used. Do not connect both power sources.

4. 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.

5. Power LED
Indicates current state of Power, illuminates GREEN when power is applied.

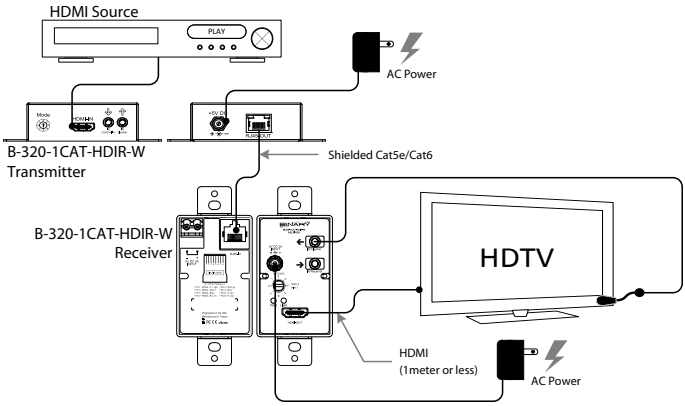
6. Signal Link LED
Indicates linking status with the Transmitter, illuminates YELLOW when active CAT5E/6 cable is attached.

7. IR Flasher Out (3.5mm {1/8"} Mono)
Connect an IR flasher to send IR control signals from Automation System connected to the Transmitter to a TV or other device.

8. IR Receiver In (3.5mm {1/8"} Stereo)
Connect an IR Receiver to send IR signals to the Transmitter from the remote location.

9. HDMI Out to Display (HDMI)
Connect an HDMI cable to the display at the remote location.

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.

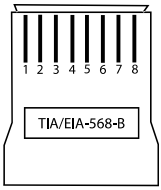
Note: *The use of keystone jack or other connections along the transmission path is not supported with this device.*

• 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



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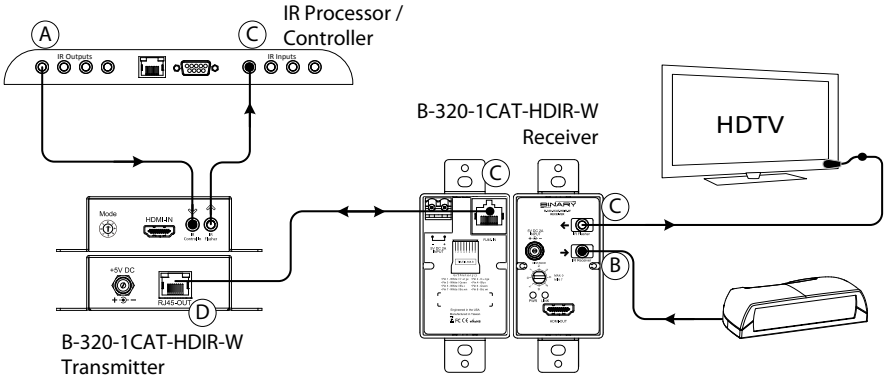
5.2. IR Control Connections

Bi-directional IR signals are transmitted between the B-320-1CAT-HDIR-W 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 (3.5mm {1/8"} Mono) – See Section 5.2.1

(B) IR Receiver In (3.5mm {1/8"} Stereo) – See Section 5.2.2

(C) IR Flasher Out (3.5mm {1/8"} Mono) – See Section 5.2.3

(D) Shielded Cat5e/Cat6 (RJ45)-See Section 5.1

Connection Precautions!

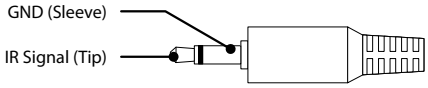
- Before connecting an IR Receiver or an IR control system, verify that the B-320-1CAT-HDIR-W is OFF to avoid damaging the unit.

- The IR Receiver In (3.5mm {1/8"} Stereo) on the B-320-1CAT-HDIR-W Receiver provides 9V to power IR receivers. This voltage can damage flashers and control 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.

- Pin out configurations for IR receivers and control systems vary. Before connecting to this input, review this section carefully in order to match the pin outs for the B-320-1CAT-HDIR-W.

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

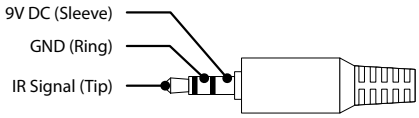


IR Signal	Tip
GND (Ground)	Ring

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 In.

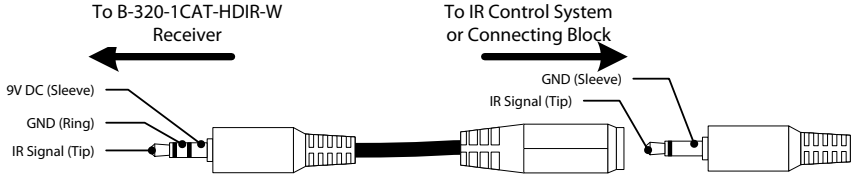
5.2.2. IR Receiver In (3.5mm {1/8"} Stereo) – Receiver Only

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.

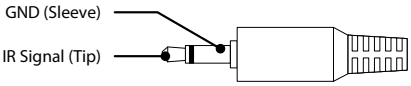


IR Signal	Tip
GND (Ground)	Ring
+9V DC	Sleeve

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 (3.5mm {1/8"} Mono) – Transmitter and Receiver



IR Signal	Tip
GND (Ground)	Ring

5.3. HDMI Out to Display (HDMI)

Recommended Cabling

- 1 meter or shorter HDMI Cable

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5.4. Optional Remote Power (2 Conductor) Connections

(B-320-1CAT-HDIR-W Receiver Only)

Power for the B-320-1CAT-HDIR-W receiver can be supplied via a remote power source when use of the Latch-Locking Power Jack is not desired. The connection is a 2 conductor removable plug located on the rear of the B-320-1CAT-HDIR-W receiver.

Recommended Cabling

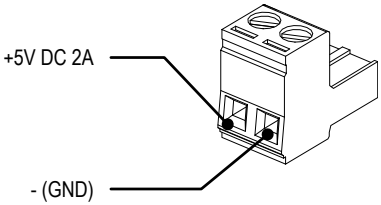
• One 18 gauge per leg or Two 22/ 24 gauge per leg

Connection Precautions!

• **Observe the connections polarity markings.** Reversing the polarity may cause damage to the product.

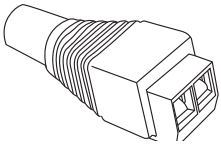
• **DO NOT** use this connection and the Latch-Locking Power Jack Connection simultaneously. Doing so may cause damage to the product.

Connection Details:



Connecting a Remote Power Supply

The included WPS-ACC-PWR DC Power Plug can be used to convert the single plug of a power supply to 2 wires. This eliminates the need to cut the wires on the end of the power supply.



6. INSTALLATION

Note: Do Not connect power to the B-320-1CAT-HDIR-W until all other connections are made and the unit is installed.

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

1. Run the cabling in the wall to the location for the B-320-1CAT-HDIR-W:
   HD Link Cable: ShieldedCat5e/Cat6
   Remote Power (Optional): (See above)
2. Mount the B-320-1CAT-HDIR-W Transmitter in the desired location.
3. Install the Remote Power supply (Optional). See 5.4 Optional Remote Power (2 Conductor).
4. Connect the HDMI out of a source component using an HDMI cable.
5. Connect the cables from the wall to the B-320-1CAT-HDIR-W transmitter.
6. Connect the 5V DC 2A Power Supply to the Latch-Locking Power Jack
7. 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.*
8. Install the B-320-1CAT-HDIR-W receiver following the steps outlined below.

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

1. Run the cabling in the wall from the head end:
   HD Link Cable: Shielded Cat5e/Cat6
   Remote Power (Optional): (See above)
2. Install the B-320-1CAT-HDIR-W transmitter following the steps outlined in section 6.1. B-320-1CAT-HDIR-W Transmitter Installation.
3. Connect the cables from the wall to the B-320-1CAT-HDIR-W receiver.
4. Install the B-320-1CAT-HDIR-W into the junction box mounted in the wall.
5. Connect an IR Flasher and/or IR receiver being used.
6. Connect an HDMI cable from the B-320-1CAT-HDIR-W to the display.
7. Connect the 5V DC 2A Power Supply to the Latch-Locking Power Jack if remote power is not being used.
8. Set the Distance Control rotary switch to 7 (Weakest).
9. Plug the local or remote power supply into an AC outlet.
10. Calibrate for distance. See 6.4 Distance Calibration for details.

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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 1080p @30Hz	24-Bit 3D	7.1 ch
4	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

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-W 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 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 audio/ video is playing normally.

7. SPECIFICATIONS

Technical	Transmitter	Receiver
HDMI Compliance	HDMI 3D	
HDCP Compliance	Yes	
Video Bandwidth	6.75Gbps	
Video Support	480i / 480p / 720p / 1080i / 1080p60	
HDMI over UTP Transmission	Resolution / Cat5e / Cat6 1080i / 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 — ±15kV (air-gap discharge) & ±8kV (contact discharge) (2) Core chipset — ±8kV	
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 Receiver (In)	---	1x 3.5mm Stereo
IR Control In	1x 3.5mmMono	---
IR Flasher (Out)	1x 3.5mmMono	1x 3.5mmMono
Power	Latch-Locking	Latch-Locking + 2 Conductor
Controls		
Rotary Control Switch	EDID Mode	Distance Signal level
Mechanical		
Housing	Metal enclosure	
Dimensions	2.9" x 3.5" x 1"	4.14"x 1.75" x 2.36"
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)	

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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

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