

BINARY

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OWNER'S MANUAL

HDBaseT EXTENDER

B-500-EXT-330-RS-IP



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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1. OVERVIEW

The B-500-EXT-330-RS-IP extends HDMI over single Cat5e/6 using HDBaseT® technology, allowing video and audio transmission to remote displays. In addition, the B-500-EXT-330-RS-IP is equipped with bi-directional IR pass-through, bi-directional RS-232 pass-through, and bi-directional Ethernet, all over a single Cat5e/6 cable.

Supports all HDMI defined Audio and Video formats, including 3D Video.

The Power Over Cable feature requires only one end of the link to be powered.

2. PACKAGE CONTENTS

- (1) B-500-EXT-330-RS-IP Transmitter
- (1) B-500-EXT-330-RS-IP Receiver
- (1) 24V DC 1A Power Supply
- (4) Mounting Screws
- (8) Rubber Feet
- (1) User Manual
- (1) IR Adapter Cable

3. FEATURES

Form and Function

- Wall-Mountable Housing Design for Easy Installation
- Extends all HDMI formats up to 4Kx2K via a Single cable

Cat5e	Up to 330ft
Cat6/Cat6a	Up to 330ft

- Transmits HDMI Signal via HDBaseT up to 10.2Gbps
- HDCP 1.2 Compliant
- Power Over Cable (POC) Allows for Single Power Supply
- Latch Locking Power Supply

Video

- 2D Resolutions up to 1080p@60Hz – 48 Bit Deep Color
- 4Kx2K
- 3D Resolutions up to 1080p@24Hz – 48 Bit Deep Color
- EDIDs Read from Connected Display to Source

Audio

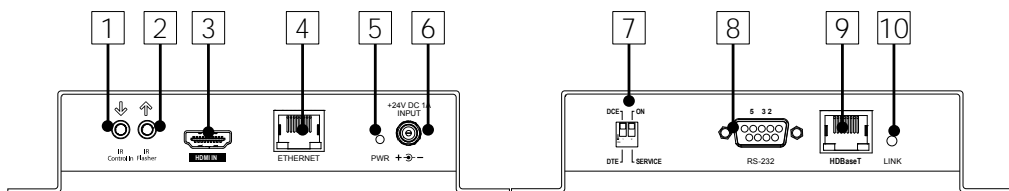
- Supports all HDMI supported Audio Formats, including DTS-HD Master and Dolby TrueHD

Control Functionality

- Bi-Directional IR Pass-Through
 - Supports IR Signal from 20kHz To 60kHz
 - Adaptive IR Input Levels (3.5V DC To 12V DC)
- Bi-Directional RS232 Up to 115.2 Kb/s
- Bi-Directional Ethernet

4. CONNECTIONS AND CONTROLS

4.1. B-500-EXT-330-RS-IP Transmitter



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

Connect the IR output of an Automation System or IR connecting block to send IR signals to the remote location. To simplify connection to most Automation Systems, this port does not supply power.

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

Connect an IR flasher to use IR signals sent from the remote location.

3. HDMI In (HDMI)

Connect an HDMI cable to the HDMI output of a source, AV Receiver, HDMI Splitter, or HDMI Switcher/Matrix.

4. Ethernet (RJ45)

Connect to an IP device to send Ethernet signals to the Receiver.

5. Power LED

Indicates current state of Power, illuminates RED when power is applied.

6. Latch-Locking Power Jack

Connect to the included 24V DC 1A Power Supply.

7. RS232 Operation Mode Dip Switches

Switch 1: Configures RS232 DB9 connection pins for DCE or DTE communication.
Switch 2: Configures RS232 DB9 connection: ON for Pass-Through (normal operation) or SERVICE for Firmware update.

See section 5.3.1.1 RS232 Operation Mode.

8. RS232 Control (DB9)

Connect to an Automation System RS232 control port to send RS232 signal to the Receiver.

See section 5.3.1 RS232 Control (DB9) Connection.

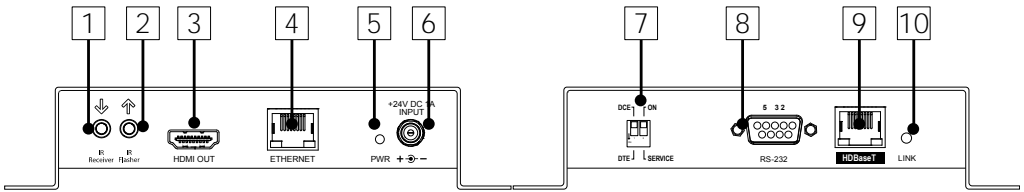
9. HDBaseT Link to Receiver (RJ45)

Connect to HDBaseT RJ45 on Receiver; this connection follows standard TIA/EIA-568B.

10. Signal Link LED

Indicates link status with Receiver; illuminates GREEN when sync is present. Blinks when in Low Power Mode.

4.2. B-500-EXT-330-RS-IP Receiver



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

Connect an IR Receiver to send IR signals to the Transmitter from the remote location. Includes +9V to power IR Receiver.

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

Connect an IR Flasher to transmit IR signals sent from the remote location.

3. HDMI Out to Display(HDMI)

Connect an HDMI cable to the HDMI In of the display or AV Receiver.

4. Ethernet (RJ45)

Connect to an IP device to receive Ethernet signals from the Transmitter.

5. Power LED

Indicates current state of Power, illuminates RED when power is applied.

6. Latch-Locking Power Jack

Connect to the included 24V DC 1A Power Supply.

7. RS232 Operation Mode Dip Switches

Switch 1: Configures RS232 DB9 connection pins for DCE or DTE communication.
Switch 2: Configures RS232 DB9 connection: ON for Pass-Through (normal operation) or SERVICE for Firmware update.

See section 5.3.1.1 RS232 Operation Mode.

8. RS232 Control (DB9)

Connect to an Automation System RS232 control port to send RS232 signal to the Receiver.

See section 5.3.1 RS232 Control (DB9) Connection.

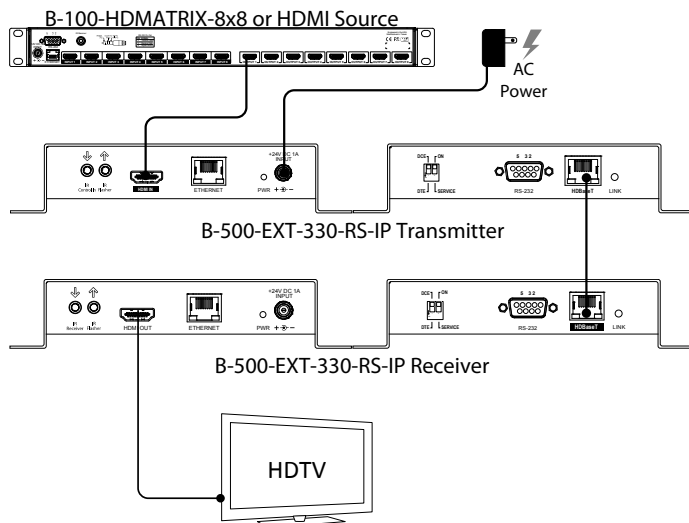
9. HDBaseT Link to Transmitter (RJ45)

Connect to HDBaseT RJ45 on Transmitter; this connection follows standard TIA/EIA-568B.

10. Signal Link LED

Indicates link status with Transmitter; illuminates GREEN when sync is present. Blinks when in Low Power Mode.

5. BASIC CONNECTIONS



Note: When a power supply is connected to either the Transmitter or Receiver, the HDBaseT link sends power to the other unit. Only 1 unit requires a power supply be connected.

5.1. HDBaseT Link (RJ45) Connection

Connection Precautions!

The B-500-EXT-330-RS-IP is specified to operate with Cat5e/Cat6/Cat6a cables for communication between the Transmitter and Receiver. The transmission path may include Keystones and Patch Cables as long as the total length does not exceed 330ft for Cat5e/Cat6/Cat6a.

Note: The HDBaseT Link RJ45 connection includes a 24V signal. DO NOT connect anything into this port other than an HDBaseT Transmitter or Receiver.

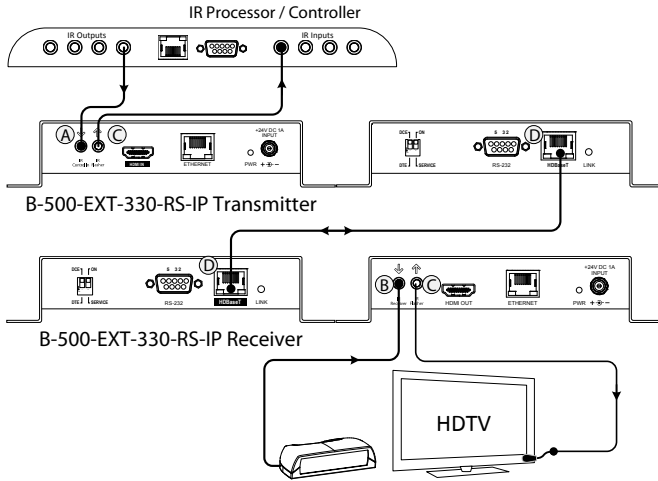
TIA/EIA Standard 568-B (Gold Pins Facing Up)

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-500-EXT-330-RS-IP 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.



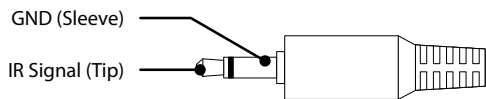
- Ⓐ IR Control In (3.5mm {1/8"} Mono) -See Section 5.2.1
- Ⓑ IR Receiver In (3.5mm {1/8"} Stereo)-See Section 5.2.2
- Ⓒ IR Flasher Out (3.5mm {1/8"} Mono)-See Section 5.2.3
- Ⓓ HDBaseT Link Cat5e/Cat6/Cat6a (RJ45)-See Section 5.1

Connection Precautions!

- Before connecting an IR Receiver or an IR Automation System, verify that the B-500-EXT-330-RS-IP 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-500-EXT-330-RS-IP.

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.

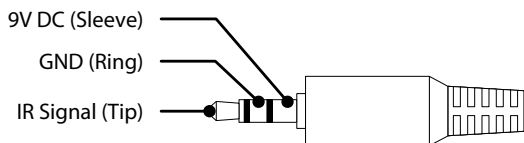


IR Signal	Tip
GND (Ground)	Ring

If the system requires a powered IR Receiver at the Transmitter, a powered IR Block will be needed between the IR Receiver and the Transmitters IR Control In.

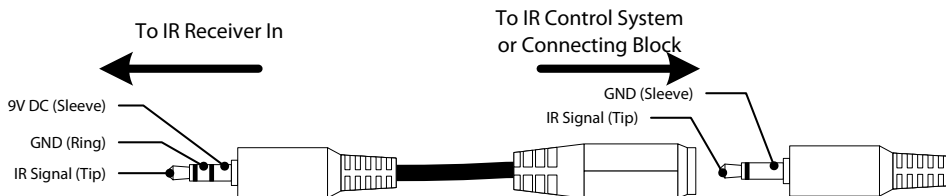
5.2.2. IR Receiver In (3.5mm {1/8"} Stereo) – Receiver Only

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.

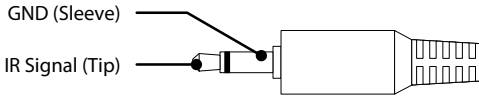


IR Signal	Tip
GND (Ground)	Ring
+9V DC	Sleeve

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.



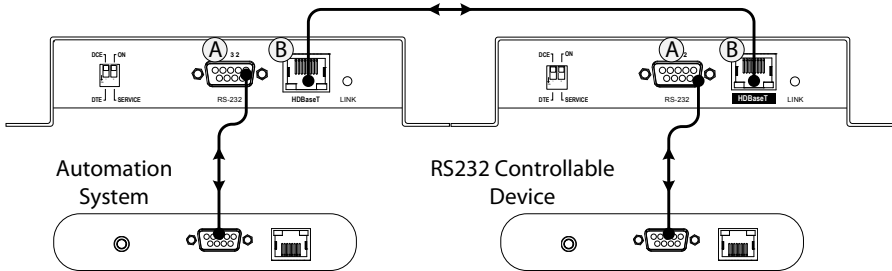
5.2.3. IR Flasher Out (3.5mm {1/8"} Mono) – Transmitter and Receiver



IR Signal	Tip
GND (Ground)	Ring

5.3. RS232 Control Connections

Bi-directional RS232 signals are transmitted between the B-500-EXT-330-RS-IP Transmitter and Receiver over the Cat5e/6 cable. The Transmitter may be connected to an Automation System controller and the Receiver connected to an RS232 controllable device.

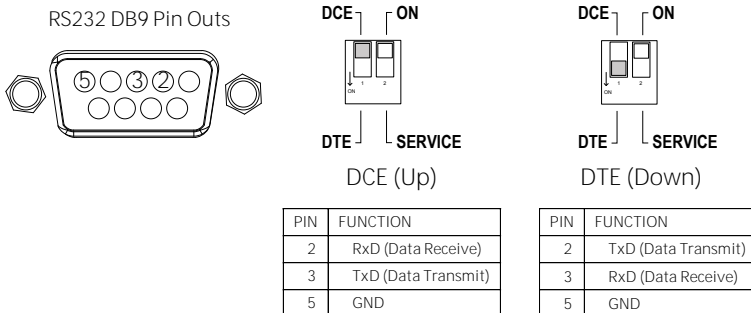


(A) RS232 Control (DB9)-See Section 5.3.1

(B) HDBaseT Link Cat5e/Cat6/Cat6a (RJ45)-See Section 5.1

5.3.1. RS232 Control (DB9) Connection

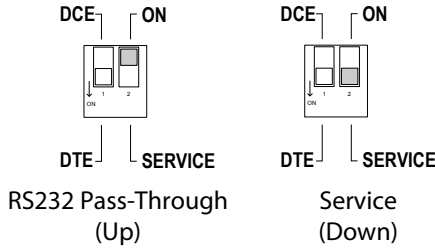
To eliminate the need to make cross over or 'null modem' cables, the RS232 pin outs can be configured for DCE or DTE. Set Switch 1 to DCE (Up) if the connected device is DCE, and to DTE (Down) if the connected device is DTE. Typically the Automation System will be DTE and the controlled device will be DCE, however, devices may vary. Refer to the manual for the connected devices for proper pin-out configuration.



5.3.1.1 RS232 Operation Mode

The RS232 connection is used for performing Firmware updates in addition to sending RS232 signals. Switch 2 is used to set the RS232 Mode.

Note: Switch 2 must be set to ON (Up) during normal RS232 Pass-Through operation.



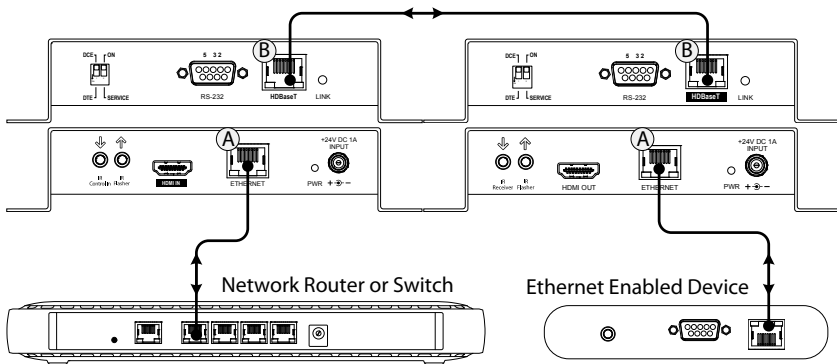
5.3.1.2. Firmware Update Operation

As new source and display devices become available, it may be necessary to modify the firmware in the B-500-EXT-330-RS-IP. To perform firmware updates, the dipswitches must be set to DTE (Down) and Service (Down). Detailed instructions and updated firmware will be posted to www.snapav.com as they are released.

5.4. Ethernet (RJ45) Connections

Bi-directional Ethernet signals are transmitted between the B-500-EXT-330-RS-IP Transmitter and Receiver over the Cat5e/6 cable. The most common use is to send Ethernet signals for Networked TVs or any device in the remote location that has an Ethernet connection. This connection is only to be used for standard Ethernet signals and cannot be used for other communication formats.

Note: This connection is for 10/100 BaseT Ethernet ONLY. DO NOT connect a cable from an HDBaseT port.



(A) Ethernet (RJ45)-See Section 5.4

(B) HDBaseT Link Cat5e/Cat6/Cat6a (RJ45)-See Section 5.1

5.5. HDMI Out to Display (HDMI)

Connection Precautions!

We recommend using a 1 meter or shorter HDMI cable to connect the B-500-EXT-330-RS-IP to the display; this will ensure the highest quality image on the display.

5.6. Latch Locking Power Supply

With Power Over Cable (POC), power is not required at both ends of the installation. When a power supply is connected to either the Transmitter or Receiver, the HDBaseT link sends power to the other unit. Only 1 unit requires a power supply be connected.

6. INSTALLATION

Note: DO NOT connect power to the B-500-EXT-330-RS-IP until all other connections are made and the unit is installed.

6.1. B-500-EXT-330-RS-IP Transmitter Installation

1. Run the Cat5e/Cat6/Cat6a cable from the location of the Transmitter to the remote location of the Receiver.
2. Mount the B-500-EXT-330-RS-IP Transmitter in the desired location.
3. Connect the HDMI Out of a source component using an HDMI cable.
4. Connect the RS232 DB9 from an Automation System if being used.
5. Connect the Ethernet RJ45 to a Router or Switch if being used.
6. Connect an IR Control System to the IR Control In and/or IR Flasher if being used.
7. Connect the Cat5e/6 cable to the B-500-EXT-330-RS-IP Transmitter.
8. Connect the 24V DC 1A Power Supply to the Latch-Locking Power Jack, unless POC is being used to send power from the Receiver. DO NOT plug the power supply into an AC outlet until Step 9 under Receiver Installation.

6.2. B-500-EXT-330-RS-IP Receiver Installation

1. Run the Cat5e/Cat6/Cat6a cable from the location of the Transmitter to the remote location of the Receiver.
2. Install the B-500-EXT-330-RS-IP Transmitter following the steps outlined in section 6.1. B-500-EXT-330-RS-IP Transmitter Installation.
3. Mount the B-500-EXT-330-RS-IP Receiver in the desired location.
4. Connect the Cat5e/6 cable to the B-500-EXT-330-RS-IP Receiver.
5. Connect an IR Flasher and/or IR Receiver if being used.
6. Connect an HDMI cable from the B-500-EXT-330-RS-IP to the display.
7. Connect the RS232 DB9 to an RS232 controllable source if being used.
8. Connect the Ethernet RJ45 to an Ethernet Enabled Device if being used.
9. Connect the 24V DC 1A Power Supply to the Latch-Locking Power Jack, unless POC is being used to send power from the Transmitter.
10. Plug the power supply for either the Transmitter or the Receiver (depending on which unit is supplying power) into an AC outlet.

7. SPECIFICATIONS

Technical	Transmitter	Receiver	
HDMI Compliance	HDMI 3D		
HDCP Compliance	Yes		
Video Bandwidth	10.2Gbps		
HDMI over UTP Transmission	Resolution	Cat5e	Cat6/Cat6a
	1080i / 720p 24-bit color	330ft	330ft
	Full HD 1080P 24-bit color	330ft	330ft
	Full HD 1080P 36-bit deep color	330ft	330ft
Input TMDS Signal	1.2 Volts (peak-to-peak)		
Input DDC Signal	5 Volts (peak-to-peak, TTL)		
ESD Protection	(1) Human body model — ± 15 kV (air-gap discharge) & ± 8 kV (contact discharge) (2) Core chipset — ± 8 kV		
IR Signal (Bi-directional)	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	
IR Control In	1x 3.5mm Mono	---	
IR Flasher (Out)	1x 3.5mm Mono	1x 3.5mm Mono	
RS232 Pass-Through	DB9	DB9	
Ethernet (10/100 BaseT)	1x RJ45	1x RJ45	
Power	Latch-Locking	Latch-Locking	
Controls			
Dipswitch 1	RS232 Pin Configuration (DCE or DTE)		
Dipswitch 2	RS232 Operation Mode (Pass-Through or Firmware Update)		
Mechanical			
Housing	Metal enclosure		
Dimensions	6.25"x3.1"x1.3"		
Weight	1.1 lbs.		
Power Supply	24V DC 1A		
Power Consumption	12 watt (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. 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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