

4K HDR HDBaseT Extender with IR & RS-232  
**B-660-EXT-444-40**

**BINARY**

## INSTALLATION MANUAL



## 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.

**CAUTION**

CAUTION: TO REDUCE THE RISK OF ELECTRICAL SHOCK.

DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE.

REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

## FCC WARNINGS

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## TRADEMARKS

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## CONTENTS

1. Product Overview .....	5
2. Features.....	5
3. Package Content.....	5
4. Device Layout.....	6
4.1. B-660-EXT-444-40 Transmitter.....	6
4.2. B-660-EXT-444-40 Transmitter.....	7
4.3. B-660-EXT-444-40 Receiver .....	7
4.4. B-660-EXT-444-40 Receiver .....	8
5. Installation & Wiring .....	9
5.1. Installation .....	9
5.2. Wiring .....	9
6. EDID Management .....	10
7. Function Setting.....	11
8. Connections.....	12
8.1. HDBaseT Link (RJ45) Connection.....	12
8.2. RS-232 Control Connections .....	12
8.2.1. RS-232 Control (DB-9) Connection .....	13
9. Specifications .....	14
9.1. Transmission Distance .....	15
10. Warranty.....	15
11. Support .....	15

## 1. PRODUCT OVERVIEW

The B-660-EXT-444-40 is a 4K HDR HDBaseT extender with support for 4K@60Hz 4:4:4 8bit including DCI 4K (4096 x 2160), and HDCP 2.2 compatibility. It can transmit 1080P signals up to 60m/197ft and 4K@60Hz signals up to 35m/115ft via Cat 5e/6 cable, and transmit 1080P up to 70m/230ft and 4K@60Hz 4:4:4 8bit signals up to 40m/131t via Cat 6a/7 cable.

The B-660-EXT-444-40 supports bi-directional IR pass through, RS-232 pass through, CEC pass through. With bi-directional PoC support, only one power adapter is needed. It offers the added benefit of an incredibly low-profile, reducing the space needed behind a display for added convenience and ease of installation.

Two independent 4-pin Video and Audio EDID DIP Switches provide a variety of EDID combinations to fit the needs of the installation and operation environment. The 4-pin Function DIP Switch can provide a variety of configurations and upgrading requirements to fit different application scenarios.

## 2. FEATURES

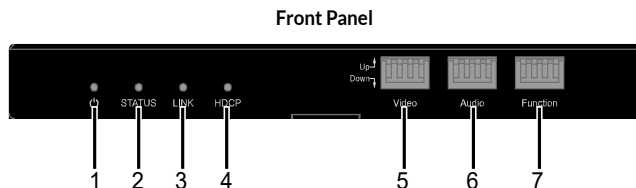
- Supports resolutions up to 4K@60Hz 4:4:4 8bit and HDCP 2.2.
- Supports HDR (High Dynamic Range), including HDR 10, HLG up to 4K@60 and HDR 10+, and Dolby Vision™ up to 4K@30Hz.
- Over a Cat 5e/6 cable, HDBT transmits 4K@60Hz 4:4:4 8bit up to 35m/115ft, and 1080P up to 60m/200ft; Over a Cat 6a/7 cable, HDBT transmits 4K@60Hz 4:4:4 8bit up to 40m/130ft, and 1080P up to 70m/230ft.
- DIP Switches to configure EDID, IR, RS-232 and FW update.
- CEC pass through capable.
- Supports bi-directional IR pass-through and RS-232 pass through.
- Bi-directional PoC, one power adapter at either transmitter or receiver side can power both units.

## 3. PACKAGE CONTENT

- 1 x B-660-EXT-444-40 Extender
- 1 x DC 18V Power Adapter with US Pins
- 4 x Mounting Ears (with Screws)
- 4 x Drywall Screws
- 8 x Rubber Feet
- 1 x User Manual

## 4. DEVICE LAYOUT

### 4.1. B-660-EXT-444-40 Transmitter



#### 1. POWER LED

**On:** Transmitter is powered on

**Off:** Transmitter is powered off.

#### 2. STATUS LED

**Blinking:** The transmitter is working properly.

**Off:** The transmitter is not working properly.

#### 3. LINK LED

**On:** HDBT link is normal.

**Off:** No HDBT link.

#### 4. HDCP LED

**On:** HDCP signal is being transmitted.

**Blinking:** No-HDCP signal is being transmitted.

**Off:** No signal is being transmitted.

#### 5. Video

Video EDID DIP Switch. For more information, see EDID Management Section.

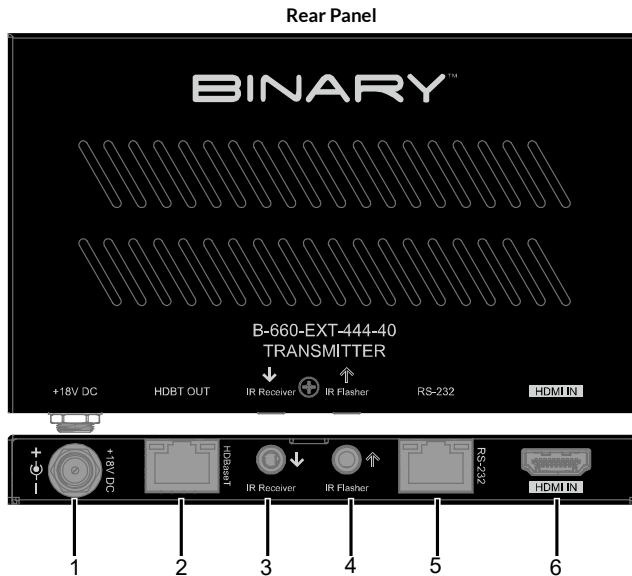
#### 6. Audio

Audio EDID DIP Switch. For more information, see EDID Management Section.

#### 7. Function

Function DIP Switch. For more information, see Function Setting Section.

## 4.2. B-660-EXT-444-40 Transmitter



### 1. +18V DC

Connect the 18V power cord provided.

### 2. HDBT OUT

Connect to the receiver via a Cat 5e/6/6a/7 cable.

### 3. IR Receiver

Connect to an IR receiver cable.

### 4. IR Flasher

Connect to an IR emitter cable.

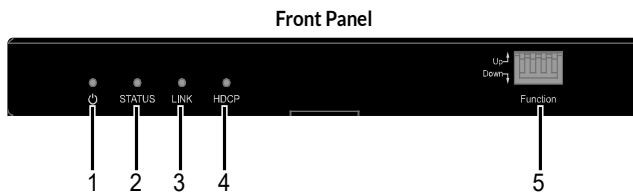
### 5. RS-232

RJ45 port. Connect to a RS-232 control device such as a PC for RS-232 pass through or firmware upgrade.

### 6. HDMI IN

Connect to an HDMI source device.

### 4.3. B-660-EXT-444-40 Receiver



#### 1. POWER LED

**On:** Receiver is powered on

**Off:** Receiver is powered of

#### 2. STATUS LED

**Blinking:** The receiver is working properly.

**Off:** The receiver is not working properly.

#### 3. LINK LED

**On:** HDBT link is normal.

**Off:** No HDBT link.

#### 4. HDCP LED

**On:** HDCP signal is being received.

**Blinking:** No-HDCP signal is being received.

**Off:** No signal is being received.

#### 5. Function

Function DIP Switch. For more information, see Function Setting Section.



#### 4.4. B-660-EXT-444-40 Receiver



**1. +18V DC**

Connect the 18V power cord provided.

**2. HDBT IN**

Connect to the transmitter via a Category cable.

**3. IR Receiver**

Connect to an IR receiver cable.

**4. IR Flasher**

Connect to an IR emitter cable.

**5. RS-232**

RJ45 port. Connect to a RS-232 control device such as a PC for RS-232 pass through or firmware upgrade.

**6. HDMI OUT**

Connect to an HDMI display.

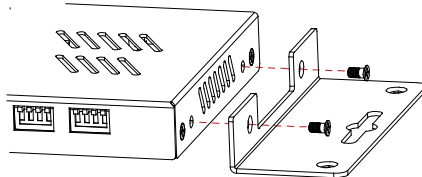
## 5. INSTALLATION & WIRING

### 5.1. Installation

Before installation, please ensure the device is disconnected from the power supply.

#### Steps to install the device in a suitable location:

1. Attach the mounting ear to the enclosure using the screws provided in the package.
2. The mounting ear is attached to the enclosure as shown.



3. Repeat steps 1-2 for the other side of the transmitter.
4. Mount the transmitter in the rack mount with the mounting screws.
5. Repeat steps 1-4 to install the receiver.

### 5.2. Wiring

#### Warnings:

- Before wiring, disconnect the power from all devices.
- During wiring, connect and disconnect the cables gently.

#### Steps for device wiring:

##### 1. Connect HDMI IN

Connect the HDMI sources (such as PC, Blu-ray player, Apple TV, 4K media player, etc) to the HDMI IN of the transmitter.

##### 2. Connect HDBT OUT

Connect HDBT OUT of the transmitter to HDBT IN of the receiver with Cat 5e/6/7 cables.

##### 3. Connect HDMI OUT

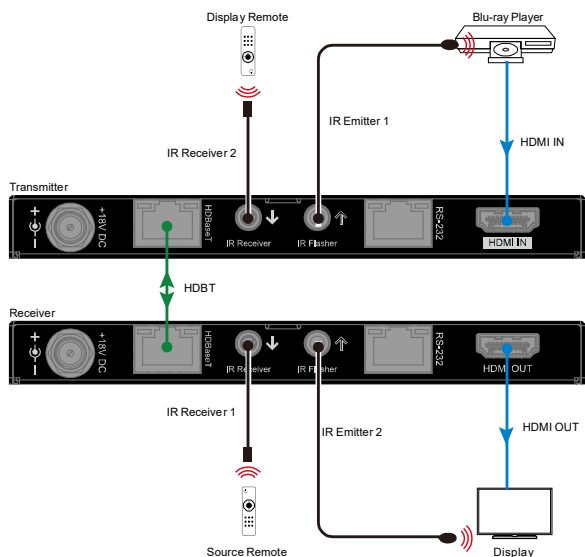
Connect HDMI display device (such as TV, projector) to the HDMI OUT of the receiver.

##### 4. Connect for additional control options:

- IR Pass Through: Connect the IR emitter cable to the IR Flasher port or the IR receiver cable to the IR Receiver port of the transmitter, and connect the IR receiver cable to the IR Receiver port or the IR emitter cable to IR Flasher port of the receiver. The source remote can control the source at receiver side, the display remote can control the display at the transmitter side.
- RS-232 Pass Through: To set RS-232 mode see "Function Setting" section, below. Connect a third party control system to RS-232 ports of transmitter and receiver to realize RS-232 pass through. For details, see RS-232 Control Connections Section.

##### 5. Connect the DC 18V power cord provided.

##### 6. Power on all attached devices.



## 6. EDID MANAGEMENT

EDID is configured by Video and Audio DIP Switch. The default setting is Auto, please refer to the following table to configure.



Video		DIP Switch Position			
EDID	Resolution	1	2	3	4
0	Auto (Default)	Up	Up	Up	Up
1	1080P SDR	Up	Up	Up	Down
2	1080P HDR	Up	Up	Down	Up
3	4K@30 SDR	Up	Up	Down	Down
4	4K@30 HDR	Up	Down	Up	Up
5	4K@60 4:2:0 SDR	Up	Down	Up	Down
6	4K@60 HDR	Up	Down	Down	Down

Audio		DIP Switch Position			
EDID	Resolution	1	2	3	4
0	Auto (Default)	Up	Up	Up	Up
1	2CH (PCM)	Up	Up	Up	Down
2	6CH (PCM)	Up	Up	Down	Up
3	Compressed 5.1	Up	Up	Down	Down
4	8CH (PCM)	Up	Down	Up	Up
5	Compressed 7.1	Up	Down	Up	Down

## 7. FUNCTION SETTING

IR and RS-232 functions can be configured by Function DIP Switch. The default setting is “Up, Up, Up, Up”, please refer to the following table to configure.



TX Function Settings				
IR/RS-232/ FW Update	4-Pin DIP Positions			
	1	2	3	4
IR RCVR PWR OFF (12v)	Up	-	-	-
IR RCVR PWR ON (12v)	Down	-	-	-
DTE (RS-232)	-	Up	-	-
DCE (RS-232)	-	Down	-	-
RS-232 pass-thru	-	-	Up	Up
System f/w update	-	-	Down	Up
HDBT f/w update	-	-	Up	Down
Reserved	-	-	Down	Down

RX Function Settings				
IR/RS-232/ FW Update	4-Pin DIP Positions			
	1	2	3	4
IR RCVR PWR OFF (12v)	Up	-	-	-
IR RCVR PWR ON (12v)	Down	-	-	-
DTE (RS-232)	-	Up	-	-
DCE (RS-232)	-	Down	-	-
RS-232 pass-thru	-	-	Up	Up
System f/w update	-	-	Down	Up
HDBT f/w update	-	-	Up	Down
Reserved	-	-	Down	Down

## 8. CONNECTIONS

### 8.1. HDBaseT Link (RJ45) Connection

This device is designed 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 40 M or 70M depending on the resolution required.

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



HDBaseT RJ45 Connections

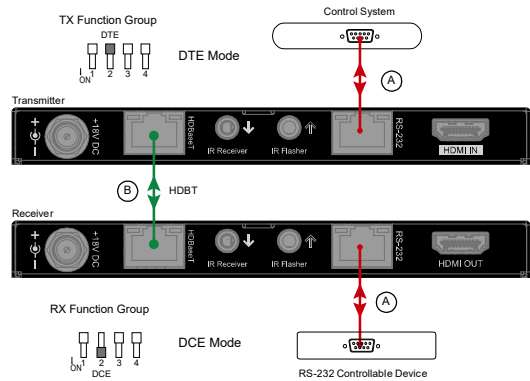
**Note:** The HDBaseT Link RJ45 connection includes a 18V signal. Do not connect anything to this port other than a B-660-EXT-444-40 transmitter or receiver.

## 8.2. RS-232 Control Connections

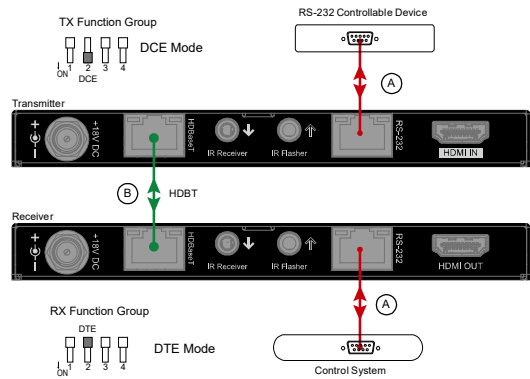
Bidirectional RS-232 signals are transmitted between the device transmitter and receiver over the category cable. The transmitter may be connected to a control system, and the receiver may be connected to an RS-232 controllable device.

(A) RS-232 Control (DB-9) - See Section 8.2.1

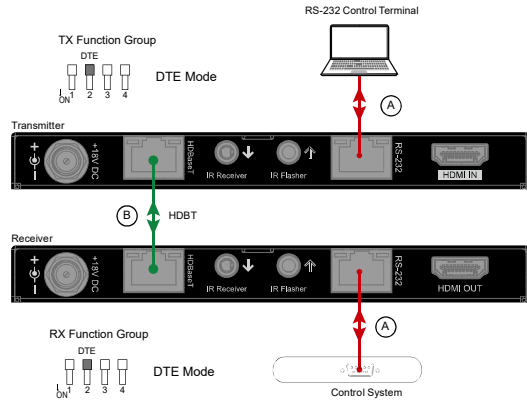
(B) HDBaseT Link Category - See Section 8.1



Example 1



Example 2

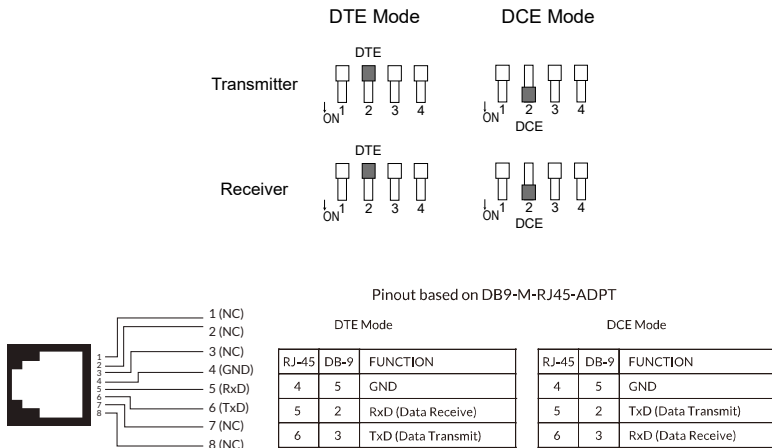


Example 3

### 8.2.1. RS-232 Control (DB-9) Connection

To eliminate the need to make crossover or null modem cables, the RS-232 pinouts can be configured for DCE or DTE. Set switch 2 to DCE if the connected device is DCE, and to DTE if the connected device is DTE.

Typically the control 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 pinout configuration.



RS-232 Modes and Connections

## 9. SPECIFICATIONS

Technical	
Input/Output Port	Transmitter: 1 x HDMI IN, 1 x HDBT OUT, 1 x HDMI OUT, 1 x IR Receiver, 1 x IR Flasher, 1 x RS-232 (RJ45), 1 x AUDIO OUT (3.5mm analog audio out), 1 x SPDIF OUT, 2 x ETHERNET, 1 x DC 12V IN Receiver: 1 x HDMI OUT, 1 x HDBT IN, 1 x IR Receiver, 1 x IR Flasher, 1 x RS-232 (RJ45), 1 x AUDIO OUT, 1 x SPDIF IN, 2 x ETHERNET, 1 x DC 12V IN
Input/Output Signal Type	HDMI with 4K@60Hz YUV 4:4:4, HDCP 2.2, including DCI 4K (4090x2160)
Input/Output Resolution Supported	VESA: 800x600 <sup>8</sup> , 1024x768 <sup>8</sup> , 1280x768 <sup>8</sup> , 1280x800 <sup>8</sup> , 1280x960 <sup>8</sup> , 1280x1024 <sup>8</sup> , 1360x768 <sup>8</sup> , 1366x768 <sup>8</sup> , 1440x900 <sup>8</sup> , 1600x900 <sup>8</sup> , 1600x1200 <sup>8</sup> , 1680x1050 <sup>8</sup> , 1920x1200 <sup>8</sup> , 2560x1440 <sup>8</sup> , 2560x1600 <sup>8</sup> SMPTE: 1280x720P <sup>6,7,8</sup> , 1080i <sup>6,7,8</sup> , 1920x1080P <sup>1,2,3,4,5,6,7,8</sup> , 3840x2160P <sup>2,3,5,6,8</sup> , 4096x2160P <sup>2,3,5,6,8</sup> NOTE: <sup>1</sup> = at 23.98 Hz, <sup>2</sup> = at 24 Hz, <sup>3</sup> = at 25 Hz, <sup>4</sup> = at 29.97 Hz, <sup>5</sup> = at 30 Hz, <sup>6</sup> = at 50 Hz, <sup>7</sup> = at 59.94 Hz, <sup>8</sup> = 60 Hz, <sup>9</sup> = 75 Hz
Audio Format	HDMI IN/OUT: Fully supports audio formats in HDMI 2.0 specification, including PCM 2.0/5.1/7.1, Dolby TrueHD™, Dolby Atmos™, DTS-HD Master Audio™ and DTS:X™ 3.5mm Analog AUDIO OUT: PCM 2.0 SPDIF: PCM 2.0, Dolby Digital™, DTS 5.1™
Maximum Data Rate	HDMI IN & HDMI OUT: 18Gbps
Control Method	IR, RS-232, CEC, DIP Switches
General	
Operating Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Humidity	10% to 90%, non-condensing
ESD Protection	Human-body Model: ±15kV (Air-gap discharge)
Power Supply	DC 18V 1.3A
Power Consumption (Max)	Receiver is powered by transmitter: 16.47W Transmitter is powered by receiver: 14.55W Transmitter and receiver are powered separately: Transmitter: 5.71W, Receiver: 8.46W
Device Dimension (W x H x D)	142mm x 15.4mm x 85mm/5.59" x 0.61" x 3.55" (Transmitter/Receiver, without mounting ears)
Product Weight	0.32kg/0.71lb

### 9.1. Transmission Distance

**Note:** Straight-through category cable wired to T568B standard is recommended.

Cable Type	Range	Supported Video
Cat 5e/6	60m/200ft	Up to 1080P@60Hz 36bpp
Cat 6a/7	70m/230ft	
Cat 5e/6	35m/115ft	1080P@60Hz 48bpp 4K@30Hz 24bpp 4K@60 4:2:0 24bpp 4K@60 4:4:4 24bpp
Cat 6a/7	40m/130ft	
HDMI	recommended max length of 3m/10ft	

### 10. 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 SnapAV or a designated service center with prior notification and an assigned return authorization number (RA).

### 11. SUPPORT

#### Need Help? Contact Tech Support!

If you need further clarification, please call tech support at **800.838.5052**, or email **support@snapav.com**. For other information, instructional videos, support documentation, or ideas, visit our website and view your item's product page at **www.snapav.com**.





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