

ZEROTIME

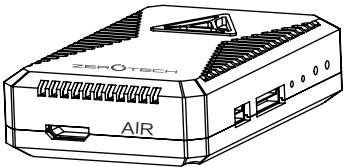



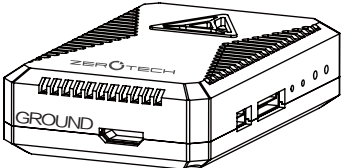





User's Guide

V1.0

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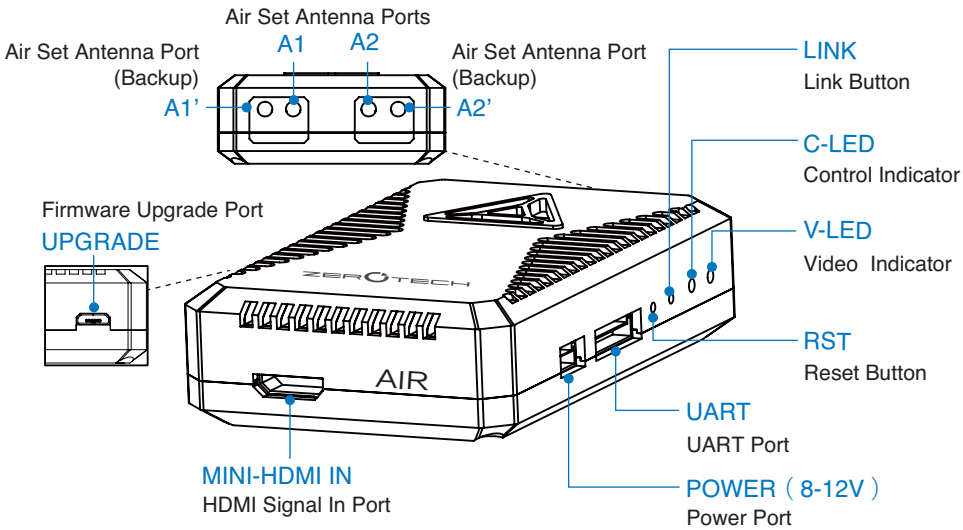
Package Contents

| | |
|---|---|
| <p>ZEROTIME Air Set (ZT3024A) x1</p>  | <p>Air Set Power Cord x1</p>  |
| | <p>Air Set Antenna x2</p>  |
| | <p>UART Connector x1</p>  |
| <p>ZEROTIME Ground Set (ZT3024G) x1</p>  | <p>Ground Set Power Cord x1</p>  |
| | <p>Ground Set Antenna x2</p>  |
| | <p>Ground Set Antenna Extension x2</p>  |
| | <p>UART Connector x1</p>  |
| <p>Backup Power Cord x2</p>  | |

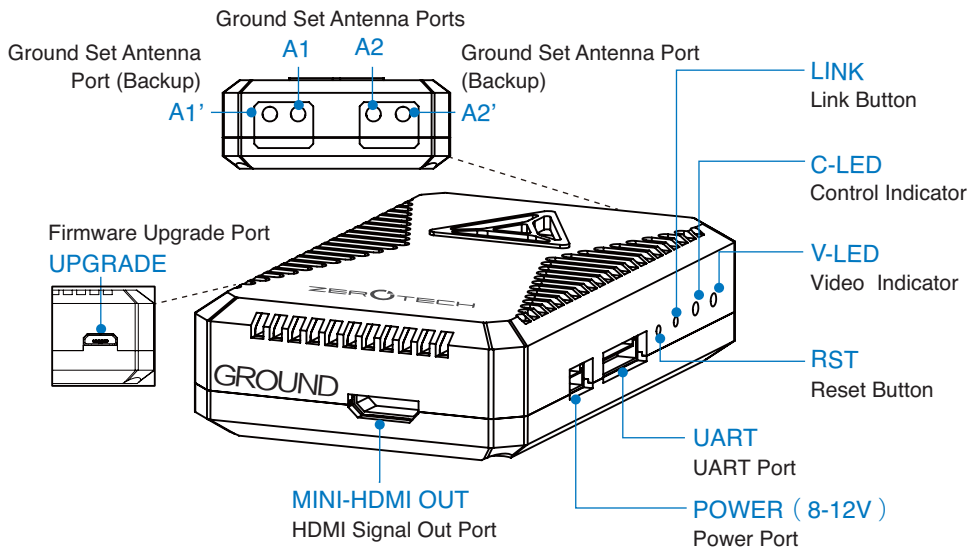
Product Overview

ZEROTIME is an HD image transmission device. It contains an Air Set and a Ground Set, both of which are compact and work smoothly with low signal transmission delay and high sending and receiving sensitivities. ZEROTIME uses wireless links to transfer collected videos and images, flight control signals and commands emitted from the Ground Set. ZEROTIME features a 2.4 GHz working frequency, low signal delays (within 45ms), and long ranges of transmission (up to 2 km), and the device supports 1080P HD video transmission.

Air Set



Ground Set






Labels, Buttons and Ports


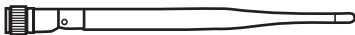

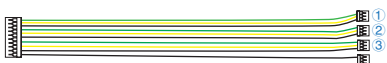

| Air Set | |
|------------------|---|
| AIR | The Air Set carries the label "AIR". |
| MINI-HDMI IN | HDMI Signal In Port Connect this port to the HDMI signal out port on a camera. |
| POWER | Power Port Connect to 8V-12V DC power. |
| UART | UART Port |
| A1A2 / A1 ' A2 ' | Air Set Antenna Ports A1 and A2 are default antenna ports. A1' and A2' are backup antenna ports. |
| UPGRADE | Firmware Upgrade Port Connect this port to a smart phone or a computer for firmware upgrade. |
| RST | Reset Button Reset the device to facotry default settings. |
| LINK | Link Button Push to link the Air Set to the Ground Set. |
| C-LED | Control Indicator Indicates the connecting status of the Air and the Ground Sets. |
| V-LED | Video Indicator Indicates the status of video transmission. |
| Ground Set | |
| GROUND | The Ground Set carries the label "GROUND". |
| MINI-HDMI OUT | HDMI Signal Out Port Connect this port to an HDMI display. |
| POWER | Power Port Connect to 8V-12V DC power. |
| UART | UART Port |
| A1A2 / A1 ' A2 ' | Ground Set Antenna Ports A1 and A2 are default antenna ports. A1' and A2' are backup antenna ports. |
| UPGRADE | Firmware Upgrade Port Connect this port to a smart phone or a computer for firmware upgrade. |
| RST | Reset Button Reset the device to facotry default settings. |
| LINK | Link Button Push to link the Ground Set to the Air Set. |
| C-LED | Control Indicator Indicates the connecting status of the Air and the Ground Sets. |
| V-LED | Video Indicator Indicates the status of video transmission. |

Cords, Cables and Connectors

For the Air Set

| | |
|---|--|
|  | <p>Air Set Power Cord</p> <p>Plug one end into the Power Port on a ZEROTIME Air Set and plug the other end into a DC power outlet.</p> |
|  | <p>Air Set Antenna</p> <p>Plug into the Air Set Antenna Ports A1 and A2 (default ports), or A1' and A2' (backup ports).</p> |
|  | <p>UART Connector</p> <p>Insert ② of the split end into the COM port on the flight controller and insert the other end into the UART port of the Air Set.</p> |

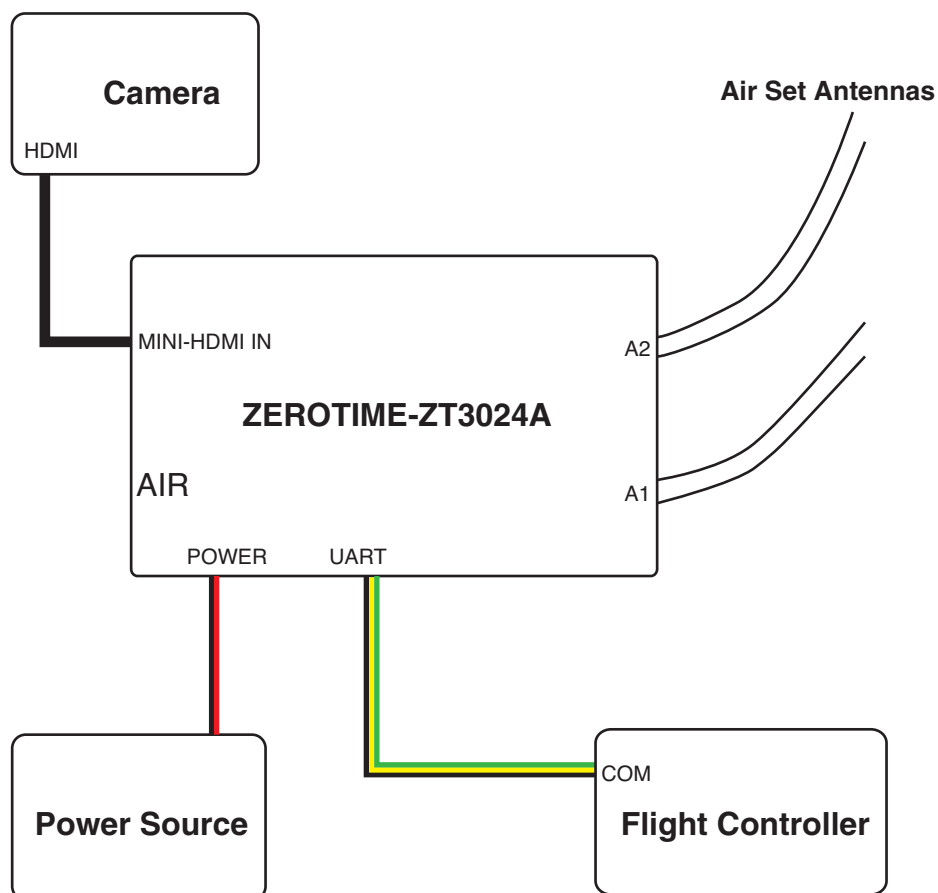
For the Ground Set

| | |
|---|---|
|  | <p>Ground Set Power Cord</p> <p>Connect one end to the Ground Set Adapter. Plug the other end into the Power Port of the Ground Set.</p> |
|  | <p>Ground Set Antenna</p> <p>Attach this to a Ground Set Antenna Extension.</p> |
|  | <p>Ground Set Antenna Extension</p> <p>Connect one end to a Ground Set Antenna and plug the other end into a Ground Set Antenna Port.</p> |
|  | <p>UART Connector</p> <p>Insert ② of the split end into the COM port on the flight controller and insert the other end into the UART port of the Ground Set.</p> |
|  | <p>Backup Power Cord</p> <p>Connect one end to a power source and the other end to an Air or Ground Set Power Port. Use compatible adapters when necessary.</p> |

Installation Guide

Air Set Installation (with UART port for flight controller)

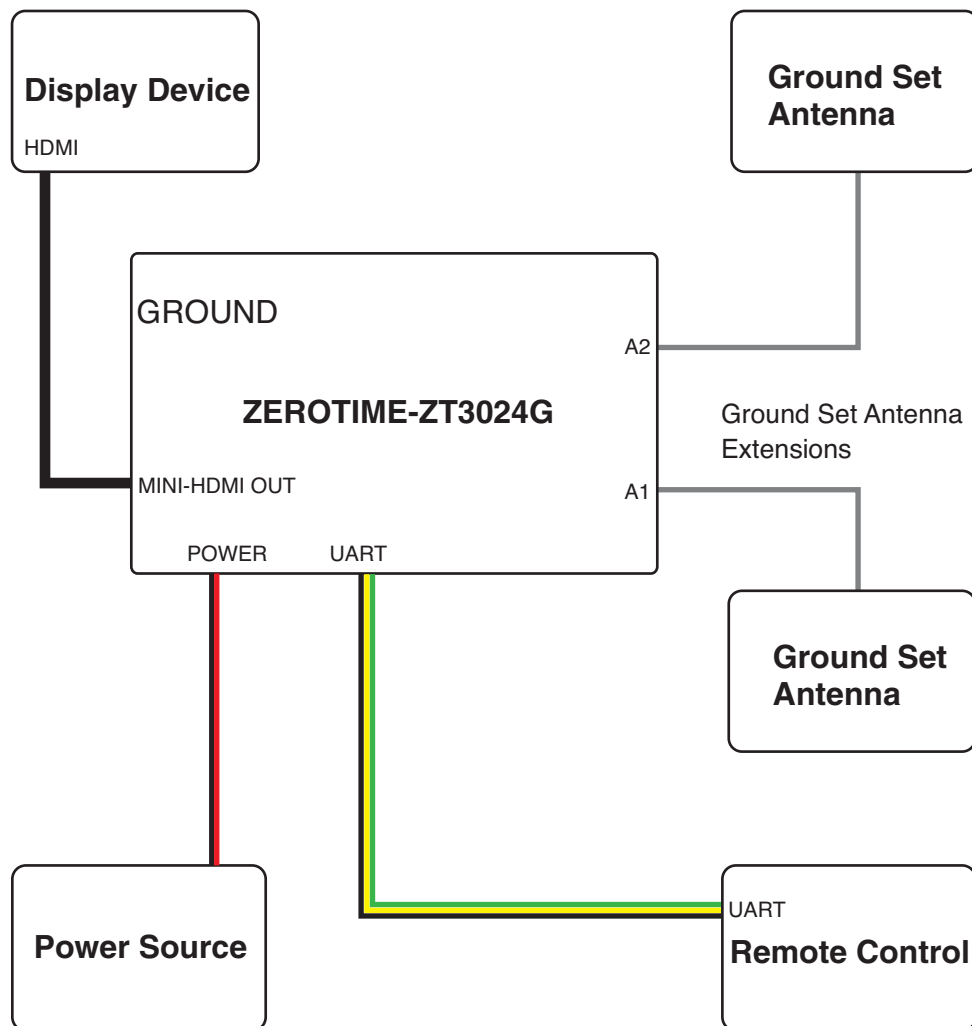
- ① Connect the MINI-HDMI Signal In Port on the Air Set to the HDMI port of a camera.
- ② Plug the Air Set Antennas into the Air Set Antenna Ports A1 and A2.
- ③ Connect the UART port on the Air Set to a flight controller using a UART Connector.
- ④ Connect the Air Set to a power source.



- Set the camera's outgoing signal to HDMI format and make sure its resolution matches that of the Air Set. The Air Set's default resolution is 720P60, which can be changed using the ZEROTIME Mobile App.
- Use only the antennas designed for this device and install them carefully.
- To protect the circuit and hardware, install antennas before connecting the device to power.
- Use power source between 8V-12V. The manufacturer recommended power is 12V DC.
- After connecting to power, check the fan of the Air Set. If the fan is not spinning properly, unplug the Power Cord and check the installation.

Ground Set Installation (with UART port for remote control)

- ① Connect the MINI-HDMI Signal Out Port on the Ground Set to a display device.
- ② Attach the Ground Set Antennas to the Ground Set Antenna Extensions and then push the Extension Cords firmly into the Ground Set Antenna Ports A1 and A2.
- ③ Connect the UART Port on the Ground Set to a remote control using the UART Connector.
- ④ Connect the Ground Set to a power source using the Power Cord and the Adapter.



- Use only the antennas designed for this device and install them carefully.
- To protect the circuit and hardware, install antennas before connecting the device to power.
- Use power source between 8V-12V.
- After connecting to power, check the fan of the Ground Set. If the fan is not spinning properly, unplug the Power Cord and check the installation.

Setup and Calibration

Signal lights

● Green ● Flashing Green ● Red ● Flashing Red

① C-LED Indicator

| Pattern | Status | Operation |
|---------|---------------|---|
| ● | Linking. | The Link Button has been pressed. The Air Set is in the process of linking to the Ground Set. |
| ● | Communicating | Wait for the linked Sets to communicate. |
| ● | Linked. | No futher operation is needed. |
| ● | Initializing. | Wait for the device to finish initializing. |

② V-LED Indicator

| Pattern | Status | Operation |
|---------|-----------------------|-----------|
| ● | Functioning normally. | / |



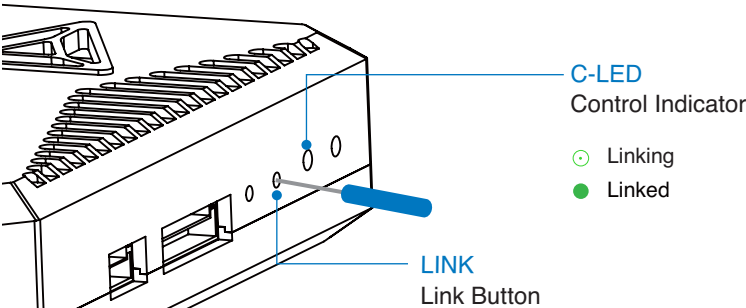
Corresponding indicators on the Air Set and on the Ground Set specify the same status.

Linking

- ① Keep the distance between the Air Set and the Ground Set between 1 and 2 meters. Connect both Sets to power.
- ② Press the Link Buttons on the Air and the Ground Sets for 3 seconds until the C-LED indicators turn flashing green. Linking begins.
- ③ Linking is successful if the C-LED indicators on the Air and Ground Sets turn green.



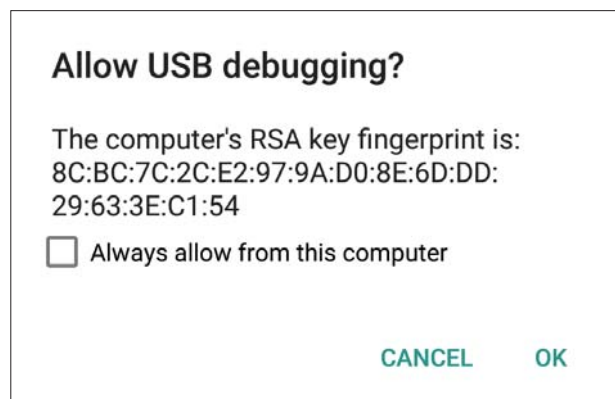
The Ground Set is linked to the Air set by default. Linking is required when a new Ground Set is used. After linking an Air Set to a new Ground Set, the Air Set's previous linking to another Ground Set is automatically abolished.



ZEROTIME Mobile App

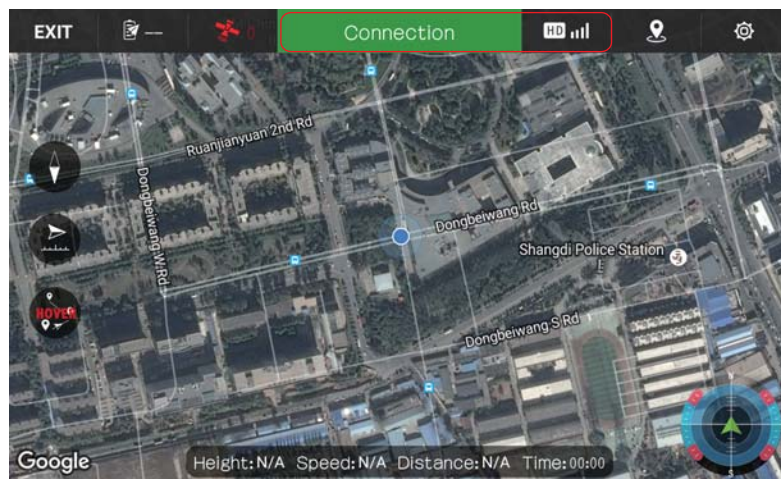
Using the Mobile App

- ① Install ZEROTIME App on a mobile device and connect the device to the Ground Set with an OTG Cable.
- ② Turn on power for both the Ground and the Air Sets.
- ③ The Air and the Ground Sets are communicating normally when the C-LED indicators on them turn green.
- ④ Wait until the USB Calibration screen appears.




USB Calibration Screen

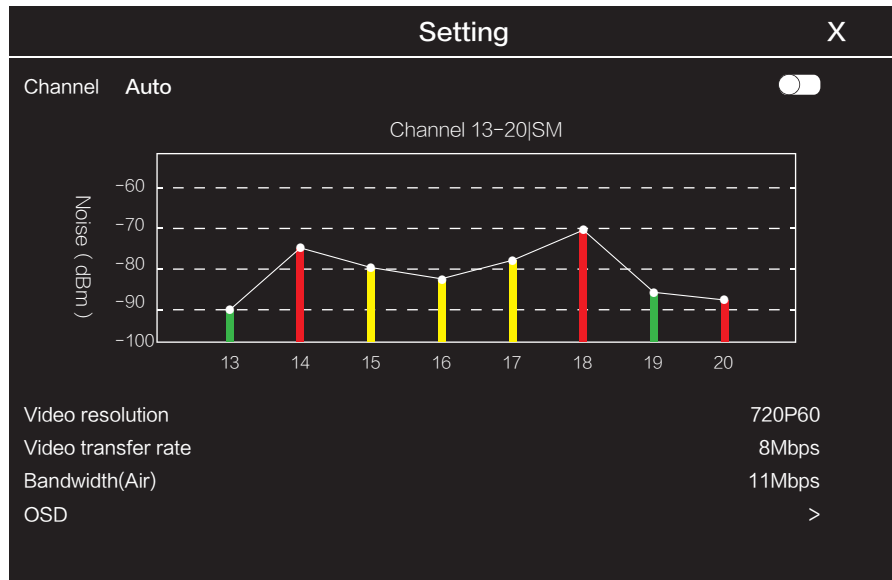
- ⑤ Press "OK" to enter the main page. When the video transmission icon appears white, connection is made and ZEROTIME is working properly. With functioning flight control, the Mobile App shows realtime flying data.



Main Page

ZEROTIME Video Transmission Settings

In the main menu, press  to enter the settings page and adjust video transmission settings.



- Channel Selection

The current video transmission data is illustrated graphically. Signal strength in each channel is plotted. Channel settings may be done automatically (Auto) or they may be customized (Custom).

- Auto (default): When switched to Auto, the Ground Set selects the channel with the strongest signal and adjusts the video transmission quality as distance changes.
- Custom: When switched to Custom, video transmission channel and image quality are set manually.

- Video Resolution

The video quality can be set to 720P30, 720P60, 1080P30, or 1080P60. The default quality is 720P60.

- Image Bit Rate

Set the bit rate to adjust video transmission quality.

Note: The value of image bit rate must be smaller than that of the channel bandwidth.

- Channel Bandwidth

Set the bandwidth to adjust video transmission quality. Small bandwidth corresponds to large transmission distance and low image quality. Large bandwidth corresponds to small transmission distance and high image quality.

Note: The value of the channel bandwidth must be larger than that of image bit rate.

- OSD Settings

Enable on-screen display for flight information including altitude, distance, battery percentage, photo/video switch, GPS satellite data, image signal strength, flight time, vertical speed, horizontal speed, flying mode etc..

Users can add, remove or arrange icons on the display.

Firmware Upgrade

The way of upgrading the firmware of the Air Set or Ground Set is totally the same, let's take the Air Set as an example.

Step 1: Before upgrading

- ① Download the ZEROTIME setup package (ZEROTIME.zip) from ZEROTECH's official website (<http://www.zerotech.com>).
- ② Extract the package and save it to a USB storage.

Step 2: Upgrade

- ① Use an OTG cable to connect the USB storage to the Firmware Upgrade Port on the Air Set. Turn on the power for the Air Set.
- ② The Video Transmission System automatically loads the firmware and installs the upgrade. Upgrade is completed when the C-LED indicator is green.

Appendix

Specifications

| Items | Parameters |
|--------------------------------|--|
| General | |
| Maximum Transmission Distance | 2 km |
| EIRP | 100mW @ 2.4GHz |
| Operating Frequency | 2 406 -- 2476MHz |
| Receiving Sensitivity | -90dBm@15Mbit/s; -93dBm@10Mbit/s; -96dBm@5Mbit/s |
| Frequency Setting Mode | Frequency scanning, Manual frequency setting, Frequency adjustment, Device linking |
| Power | ≤10W |
| Air Set | |
| Size | 56mm*86mm*23mm |
| Weight | 120g |
| Antenna Gain | 2±0.7dBi@ 2.450GHz |
| Operating Current | 650mA |
| Operating Voltage | 8-12V |
| Operating Temperature | -10-40°C |
| Antenna Connector | MMCX*4 |
| Video Connector | Mini-HDMI |
| Ground Set | |
| Size | 56mm*86mm*23mm |
| Weight | 120g |
| Antenna Gain | 5±0.7dBi@ 2.450GHz |
| Operating Current | 650mA |
| Operating Voltage | 8-12V |
| Operating Temperature | -10-40°C |
| Antenna Connector | MMCX*4 |
| Video Connector | Mini-HDMI |
| Supported ZEROTECH Products | |
| Gimbals | T30、T36、T-M43、T-BMPCC (BM series) |
| Flight Control Systems | S4-V6 |
| Flying Platforms | EAGLEEYE MINI, T-M43 Carrier |
| Supported Video Input Formats | |
| HDMI | 720P30, 720P60, 1080P30, 1080P60 |
| Supported Video Output Formats | |
| HDMI | 720P30, 720P60, 1080P30, 1080P60 |



This content is subject to change.

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Made in China

FCC Caution:

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

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator& your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: 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.