IP-6000TXRX

4K2K/HDCP2.2 Multi-Function Extender with video over IP and KVM

Operation Manual

SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply.

Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.

- Never spill liquid of any kind on or into this product.

- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.

- Do not attach the power supply cabling to building surfaces.

- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.

- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.

- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

REVISION HISTORY

VERSION NO.	DATE DD/MM/YY	SUMMARY OF CHANGE
RDV1	23/11/15	Preliminary Release
RDV2	26/04/16	1. Add Ethernet requirements
		2. Add Web Link Pair Selection and Dip Switch Table
		3. Revised HDMI output resolution
		4. Update Audio table

CONTENTS

1. INTRODUCTION

The 4K2K video and audio extender is multi-function extender supports up to 4K2K ultra high-definition signals transmission. This Transmitter and Receiver solution is developed for any household and/or commercial environment. The input interfaces are HMDI and VGA, further, the DVI interface is compliant. The video and audio are capable to transmit through IP. The transmission distance is 100m through single switching hub, the distance could be extended further once every 100m install with switching hub which offering convenience to share data and set up Receiver apart. Install with compatible Gigabyte switching hub, the transmission rate will up to 1 Gigabyte. Furthermore, this pair of devices includes extra functions like RS232 & IR pass through, line-out and microphone features that allows user to enjoy control over distance and audio sound over favor audio equipment. Moreover, the device allowing user with cascade with the same family type of device to extend the transmission distance up to as long as it demand and without signal loss or delay. For easily operation, the OSD is available plus WebGUI, on-panel control. The video resolution supports up to 4K2K@30Hz for high definition display.

2. APPLICATIONS

- HDMI, USB, Audio, RS-232 & IR Extender
- Broadcasting system over single CAT5e/6
- Multimedia display and multi-data sharing
- Long distance data sending with cascade
- Matrix network system
- System control over RS-232 and equipment control over IR
- KVM control

3. PACKAGE CONTENTS

- HDMI/USB/RS-232/IR over single CAT5e/6 Transmitter
- HDMI/USB/RS-232/IR over single CAT5e/6 Receiver
- 5V/2.6A DC Power Adaptor x 2
- IR Blaster Cable x 2
- Operation Manual

4. SYSTEM REQUIREMENTS

- Input HDMI, VGA and USB source equipment such as DVD, Blu-ray player and PC/Notebook with connection cables.
- Output display such as HDTV, monitor and active speaker or amplifier with connection cables.
- Gigabit Ethernet network is required.
- Gigabit Ethernet switches must support "Jumbo Frames" and "IGMP Snooping".
- 8K Jumbo frame preferred.

5. FEATURES

- HDMI with 4Kx2K supported, HDCP 2.2 compliant
- Supports 1 HDMI and 1 VGA inputs
- Supports video and audio transmission over IP
- Supports input resolution of HDTV up to 4K2K@60Hz YUV 4:2:0 or 4K2K@30Hz YUV 4:4:4
- Supports output resolution up to 4K2K@30Hz YUV4:2:0
- Supports pass-through of audio formats of PCM 2CH, Dolby digital 5.1, DTS
- Supports bitstream data for data transmit over IP
- Supports audio line in for input audio to Transmitter and line out to earphone
- Supports microphone in on Receiver
- Supports USB keyboard and mouse for easily operation
- Device could be controlled via OSD, WebGUI and on panel control
- Supports IR and RS232 bypass
- Compliant with DVI source

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Transmitter
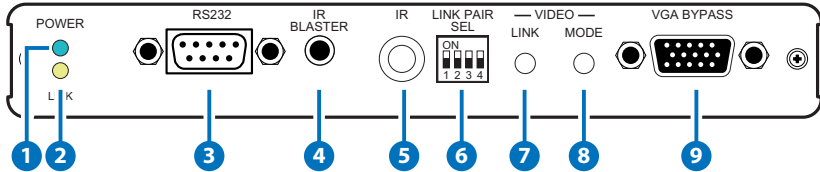
1 POWER LED: Connects with 5V power, the power indicator will flash in blue once power on and illuminate constantly in blue after power on the unit.

2 LINK LED:

   a. When Transmitter disconnects with Receiver or power on, the orange LED indicator will not illuminate.

   b. When Transmitter connects with Receiver and get link without source connection, the LINK LED indicator will flash in orange.

   c. When Transmitter connects with Receiver and get source connection, the indicator will illuminate constantly in orange.

3 RS232: This slot is to connect with D-Sub 9-pin female null modern cable from PC's system, the RS-232 command will pass through from Transmitter to Receiver or Receiver to Transmitter. The default baud rate is setting at 115200. For multicast scenario, every single Receiver unit can pass through RS-232 command to Transmitter. Further, Transmitter is able to pass through RS-232 to all Receivers on same channel.

4 IR Blaster: This slot is to connect with IR Blaster cable included in the package for IR signal emitting and controlling the HDMI input source equipment such as Blu-ray player. For multicast scenario, the IR signal is able to transmit to all Receivers on same channel.

5 IR: This IR window is for receiving the remote control signal and sending it to Receiver side for IR signal blast out.

6 LINK PAIR SEL: This dip switch allows user with matrix setting for link up to 16 pairs of the devices with single IP router. Each pair must have the same dip switch setting in order to pair to the right device setting. The factory default setting is at 0000. Please reboot

Transmitter and Receiver after selecting.

7 **Video LINK:** The link status will be disabled and enable after press button.

Quick Function Keys:

1. Reset to default (auto IP): Presses Link button and release the button until Power and Link LED indicator flashing. Then reconnects the power,the unit will goes to auto IP mode. The IP will be assigned automatically by Transmitter. Please note that the Transmitter and Receiver unit shall at same Network or the connection between Transmitter and Receiver will fail.

2. Loopback function disabled: presses the link button for three seconds, the loopback function will be disabled.

8 **Video MODE:** Selects to video mode for streaming data. Please continue to press this button for 3 seconds to setting Anti-Dither mode 1 bit, 2 bit, or off for ATI Graphic card. Anti-Dithering Mode is design to provide dithering output. Dithering output is used to make coloring looks better than it's original color depth. This presents great difficulty for Video Compression to maintain low bandwidth even if the source display seems static. If the source content does not generate dithering output, please turn off this function or it will create a blocking effect. The video mode improves live video smoothly. Normally, this extender set has capability to automatically final tune the live video. It is require to access to video mode for further setting once video come with slightly latency.

9 **VGA BYPASS:** Connects with VGA terminal block to send video to display in order to monitor the video content simultaneously.

6.1.2 Rear Panel
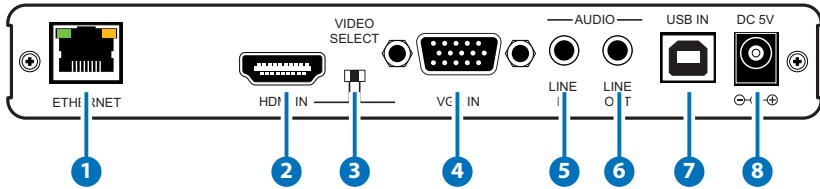
1 **Ethernet:** Connects with Hub or router for sending data to Receiver.

2 **HDMI IN:** Connects with input source such as DVD or Blu-ray player with connection cable.

3 **VIDEO SELECT:** Select source type, source type either HDMI or VGA. Please reboot the system once select new source type.

4 **VGA IN:** Connects with VGA input source such as PC.

5 **AUDIO LINE IN:** Connect from audio source equipment with 3.5mm phone jack cable for audio signal sending to Receiver side.

6 **AUDIO LINE OUT:** Connect to active speaker or Line in microphone of input sound from Receiver end.

7 **USB IN:** Connect with PC for loading Receiver's USB for data transmits to Transmitter over IP.

8 **DC 5V:** Connects with adopter supplied in the package to power on the device.

6.2 Receiver
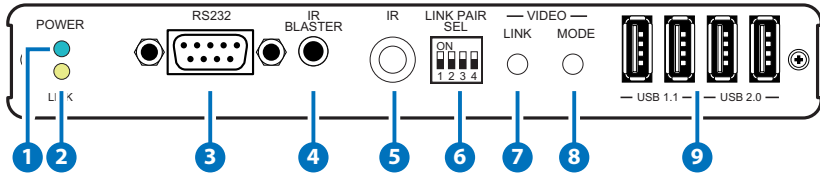
1 POWER LED: Connects with 5V power, the power indicator will flash in blue once power on and illuminate constantly in blue after power on the unit.

2 LINK LED:

   a. When Transmitter disconnects with Receiver or power on, the orange LED indicator will not illuminate.

   b. When Transmitter connects with Receiver and get link without source connection, the LINK LED indicator will flash in orange.

   c. When Transmitter connects with Receiver and get source connection, the indicator will illuminate constantly in orange.

3 RS232: This slot connects with D-Sub 9-pin female null modern cable from PC's system, the RS-232 command will pass through from Transmitter to Receiver or Receiver to Transmitter. The default baud rate is setting at 115200. For multicast scenario, every single Receiver unit can pass through RS-232 command to Transmitter. Further, Transmitter is able to pass through RS-232 to all Receivers on same channel.

4 IR Blaster: Connects with IR Blaster supplied in the package for IR signal received from Transmitter side to blast out and to control the desire device. For multicast scenario, the IR signal is able to pass through to all Receivers on same channel.

5 IR: This IR window is for receiving the remote control signal and sending it to Transmitter side for IR signal blast out.

6 LINK PAIR SEL: This dip switch allows user with matrix setting for link up to 16 pairs of the devices with single IP router. Each pair must have the same dip switch setting in order to pair to the right device setting. The factory default setting is at 0000. Please reboot the Transmitter & Receiver after selecting.

7 Video LINK: Presses button to disable and enable the link status.

Continue to press this button for 3 seconds to enable the link with multi Receivers or multi Transmitters for multicasts applications e.g. matrix. Continuous press the button for Receiver's USB switching and loading, the keyboard and mouse for all Receiver will be work functionality as usual.

Quick Function Key:

1. Reset to default (auto IP): Presses Link button and release the button until Power and Link LED indicator flashing. Then reconnects the power,the unit will goes to auto IP mode. The IP will be assigned automatically by Receiver. Please note that the Transmitter and Receiver unit shall at same Network or the connection between Transmitter and Receiver will fail.

8 **Video MODE:** Selects to video mode for streaming data. Please continue to press this button for 3 seconds to setting Anti-Dither mode 1 bit, 2 bit, or off for ATI Graphic card. Anti-Dithering Mode is design to provide dithering output. Dithering output is used to make coloring looks better than it's original color depth. This presents great difficulty for video compression to maintain low bandwidth even if the source display seems static. If the source content does not generate dithering output, please turn off this function or it will create a blocking effect. Normally, the IP-6000TX & RX has capability to automatically fine tune the live video. It is require to access to video mode for further setting once video come with slightly latency.

USB 1.1: USB1.1 slot allows USB devices such as keyboard, mouse and …etc. for controlling over USB connected devices.

9 **USB 2.0:** USB2.0 slot allows USB devices such as thumb drive, hard disk and …etc. for data sending or control over USB connected devices.

P.S. USB isochronous is not supported such as USB camera and external hard disk with USB interface.

6.2.2 Rear panel
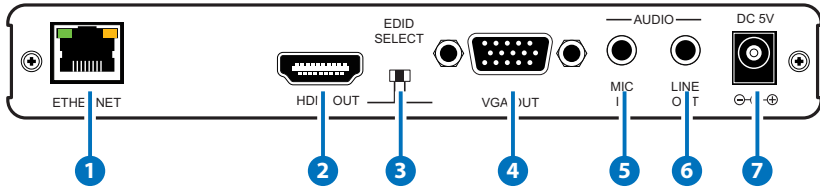
1 **Ethernet:** Connects with Hub or router for sending data to Transmitter.

2 **HDMI Out:** Connects with HDMI display for source output

3 **EDID SELECT:** Selects source type for obtain correct EDID data; please arrange the switch to correct source type. The source types either HDMI or VGA. Please note that the source type of Transmitter and Receiver shall remain the same or the receiving cannot be transmitted to Transmitter properly. Please reboot Transmitter and Receiver after selecting.

4 **VGA Out:** Connects with VGA display for source output

5 **AUDIO MIC IN:** Connect from audio source equipment with 3.5mm phone jack cable for audio signal sending to Transmitter side. This Audio MIC IN will disable which is not able to transmit the microphone audio source to Transmitter when implement multi-case application.

6 **AUDIO LINE OUT:** Connect to active speaker and Line in MIC input sound from Transmitter end.

7 **DC 5V:** Connects with adopter supplied in the package power to power on the device.

7. WEBGUI

Connect both Transmitter and Receiver with active networks through CAT5e/6/7 and make sure both networks are under the same zone.

On the Receiver side connect the display from HDMI output port and the screen will display both Transmitter/Remote IP and Receiver/Local IP.
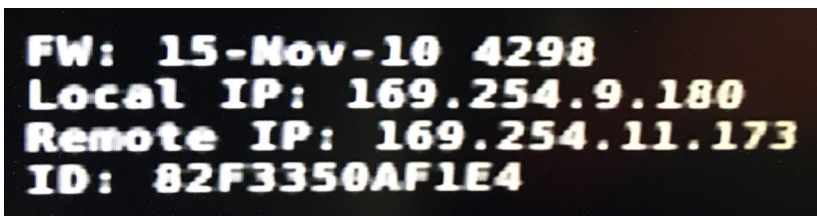
Use this IP address to enter into WebGUI with web page to do the settings, control and information.
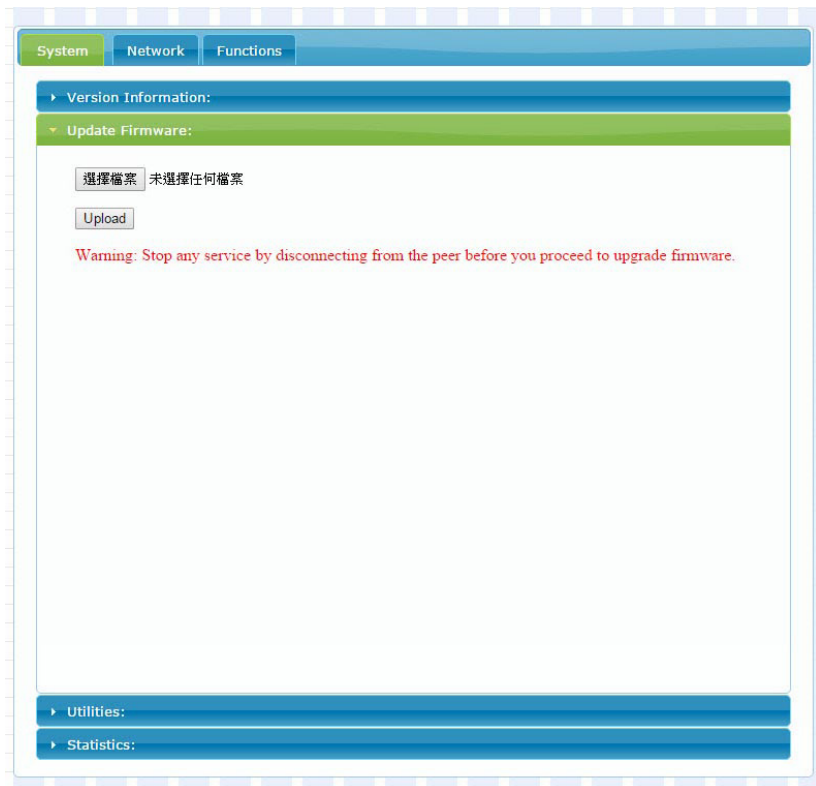
The WebGUI is mainly divided into 3 sections includes System, Network and Functions.

Under System there are 4 items, Version Information, Update Firmware, Utilities and Statistics.

Version Information simply shows the device's firmware version and its WebGUI's firmware version.

System   Network   Functions

▼ Version Information:

```
Mon, 22 Jun 2015 14:45:34 +0800
4187867940 188064 u-boot_h.bin
733225858 2402576 uuImage
668513206 10444800 initrd2m
V2.01 Build 2015
```

▶ Update Firmware:

▶ Utilities:

▶ Statistics:

Update Firmware providing user to upload updated firmware in field.

System   Network   Functions

▶ Version Information:

▼ Update Firmware:

選擇檔案 未選擇任何檔案

Upload

Warning: Stop any service by disconnecting from the peer before you proceed to upgrade firmware.

▶ Utilities:

▶ Statistics:

Utilities allow users to set the device setting back to factory default and or reboot the device. On the Transmitter side only it allows user to set the EDID value according to HDMI and VGA.

Statistics shows all the detail information regards of the device itself and the connected device including network information, link status and link mode.

State Machine
State: s_attaching

Network
ID (Host Name): 0000
IP Address: 192.168.5.82
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.5.254
MAC Address: 023F7C1D376B
Casting Mode: Unicast Mode
Link Status: on
Link Mode: 1G

Network allow user to choose IP mode, IP address and device's mode.

It is required to reboot once resetting the system, casting mode must adjust the hardware LINK PAIR SEL together in order to function properly.

Lastly, Function allows user to choose functions over IP/Transmitter or Receiver. By selecting Video over IP allows Receiver output display video instead of graphic image (When video mute or disconnected with video, it will return to OSD from WebGUI), USB over IP allows the selected device to get hold of the USB control right and Serial over IP is to set RS-232's baud rate setting.

8. CONNECTION DIAGRAM

PC

1.5m 60°

TV or Monitor

Active Speakers

Microphone

PC   PC

DVD or Blu-ray Player

TV or Monitor   TV or Monitor

Microphone

Active Speakers

USB Flash Disk

PC

60° 1.5m

USB Keyboard or Mouse

9. SUPPORT TIMING & AUDIO TABLE

*HDMI Input: Up to 2160p 60Hz YUV420

*HDMI Output: HDMI Will convert 2160p 60Hz YUV420 Input to 2160p 30Hz Output

*VESA VGA up to 1920x1200 60Hz Pixel clock < 150MHz

INPUT RESOLUTION	VGA	HDMI
640x480p@60	✓	✓
720x480p@59/60	-	✓
720x576p@50	✓	✓
800x600p@60	✓	✓
1024x768p@60	✓	✓
1280x720p@50/59/60	✓	✓
1280x768p@60	-	✓
1280x960p@60	✓	✓
1280x1024p@60	✓	✓
1440x480p@60	-	✓
1440x576p@50	-	✓
1366x768p@60	✓	✓
1600x1200p@60RB	✓	✓
1920x1080p@24/25	-	✓
1920x1080p@50/59/60	✓	✓
1920x1200p@60RB	✓	✓
1920x1080i@50/59/60	-	✓
3840x2160p@24/25/30	-	✓
3840x2160p@50/60_YUV420	-	✓
4096x2160p@24/25/30	-	✓
4096x2160@50/60_YUV420	-	✓

OUTPUT RESOLUTION	VGA	HDMI
640x480p@60	✓	✓
720x480p@59/60	-	✓
720x576p@50	✓	✓
800x600p@60	✓	✓
1024x768p@60	✓	✓
1280x720p@50/59/60	✓	✓
1280x768p@60	-	✓
1280x960p@60	✓	✓
1280x1024p@60	✓	✓
1440x480p@60	-	✓
1440x576p@50	-	✓
1366x768p@60	✓	✓
1600x1200p@60RB	✓	✓
1920x1080p@24/25	-	✓
1920x1080p@50/59/60	✓	✓
1920x1200p@60RB	✓	✓
1920x1080i@50/59/60	-	✓
3840x2160p@24/25/30	-	✓
3840x2160p@25/30	-	✓
4096x2160p@24/25/30	-	✓

Audio Table

Unicast:

Audio In			Audio Out		
HDMI In	TX Line In	RX Mic In	HDMI OUT	TX Line Out	RX Line Out
V			V(From HDMI)	None	V(From HDMI)
	V		None	None	V(From TX Line In)
		V	None	None	None
V	V		V(From TX Line In)	None	V(From TX Line In)
V		V	V(From HDMI)	None	V(From HDMI)
	V	V	None	V(From RX Mic In)	V(From TX Line In)
V	V	V	V(From TX Line In)	V(From RX Mic In)	V(From TX Line In)

Multicast:

Audio In			Audio Out		
HDMI In	TX Line In	RX Mic In	HDMI OUT	TX Line Out	RX Line Out
V			V(From HDMI)	None	V(From HDMI)
	V		None	None	V(From TX Line In)
		V	None	None	None
V	V		V(From TX Line In)	None	V(From TX Line In)
V		V	V(From HDMI)	None	V(From HDMI)
	V	V	None	None	V(From TX Line In)
V	V	V	V(From TX Line In)	None	V(From TX Line In)

Audio Format Support List

Dolby
Dolby Digital 5.1 ch
Dolby Digital Plus
Dolby TrueHD
DTS
DTS 5.1 ch
DTS-HD High Resolution Audio
DTS-HD Master Audio
Linear PCM
Linear PCM 2 ch 44.1 kHz
Linear PCM 2 ch 88.2 kHz
Linear PCM 2 ch 176.4 kHz
Linear PCM 2 ch 32 kHz
Linear PCM 2 ch 48 kHz
Linear PCM 2 ch 96 kHz
Linear PCM 2 ch 192 kHz
Linear PCM 5.1 ch 44.1 kHz
Linear PCM 5.1 ch 88.2 kHz
Linear PCM 5.1 ch 176.4 kHz
Linear PCM 5.1 ch 32 kHz
Linear PCM 5.1 ch 48 kHz
Linear PCM 5.1 ch 96 kHz
Linear PCM 5.1 ch 192 kHz
Linear PCM 7.1 ch 44.1 kHz
Linear PCM 7.1 ch 88.2 kHz
Linear PCM 7.1 ch 176.4 kHz
Linear PCM 7.1 ch 32 kHz
Linear PCM 7.1 ch 48 kHz
Linear PCM 7.1 ch 96 kHz
Linear PCM 7.1 ch 192 kHz

10. WEB LINK PAIR SELECTION AND DIP SWITCH TABLE

LINK PAIR DIP Switch (0:OFF 1:ON)				Web PAIR
1	2	3	4	Contrast
0	0	0	0	0
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
0	1	0	0	4
0	1	0	1	5
0	1	1	0	6
0	1	1	1	7
1	0	0	0	8
1	0	0	1	9
1	0	1	0	10
1	0	1	1	11
1	1	0	0	12
1	1	0	1	13
1	1	1	0	14
1	1	1	1	15

11. SPECIFICATIONS

Transmitter

Video transmission format	H264
Input Ports	1 x HDMI
	1 x VGA
	1 x Audio line in
	1 x Audio line out
	1 x USB in (USB2.0)
	1 x IR Blaster
	1 x IR Extender
Output Port	1 x CAT5e/6
Other	1 x RS232 (For bypass only)
IR Frequency	30 ~ 50KHz
Support Resolutions for HDMI input	480i ~ 1080p@24/50/60Hz and 4K2K@60Hz YUV 4:2:0 or 4K2K@30Hz
Support Resolutions for VGA input	1920 x 1200p@60Hz (RB)
Baud Rate	300~230400 bps (default at 115200 bps)
Power Supply	5VDC/2.6A (US/EU standards, CE/FCC/ UL certified)
Chassis Material	Metal
Color	Black
Weight	395 g
Dimensions	180(L)x100(D)x30(H)mm jack excluded
	180(L)x110(D)x30(H)mm jack included

Receiver

Output Ports	1 x HDMI
	1 x VGA
	1 x MIC in
	1 x Line out
	1 x IR Emitter
	1 x IR Extender
	2 x USB 1.1 (for keyboard and mouse)
	2 x USB 2.0 (for thumb drive and USB2.0 supported device, the USB camera or external hard disk with USB interface is not supported)
Input Port	1 x CAT5e/6
Other	1 x RS232 (Bypass only)
IR Frequency	30 ~ 50 kHz
Support Resolutions for HDMI output	480p ~ 1080p@24/50/60Hz and 4K2K@30Hz RGB
Support Resolutions for VAG output	1920x1200P@60Hz (RB)
Baud Rate	300~115200 bps (default at 115200bps)
Power Supply	5VDC/ 4A (US/EU standards, CE/FCC/ UL certified)
Chassis Material	Metal
Color	Black
Weight	395 g
Dimensions	180(L)x100(D)x30(H)mm jack excluded
	180(L)x110(D)x30(H)mm jack included