HDMI over IP with RS232, IR, Analog Audio

ITEM NO: HE05BT, HE05BR HDMI over IP with RS232, IR, Analog Audio

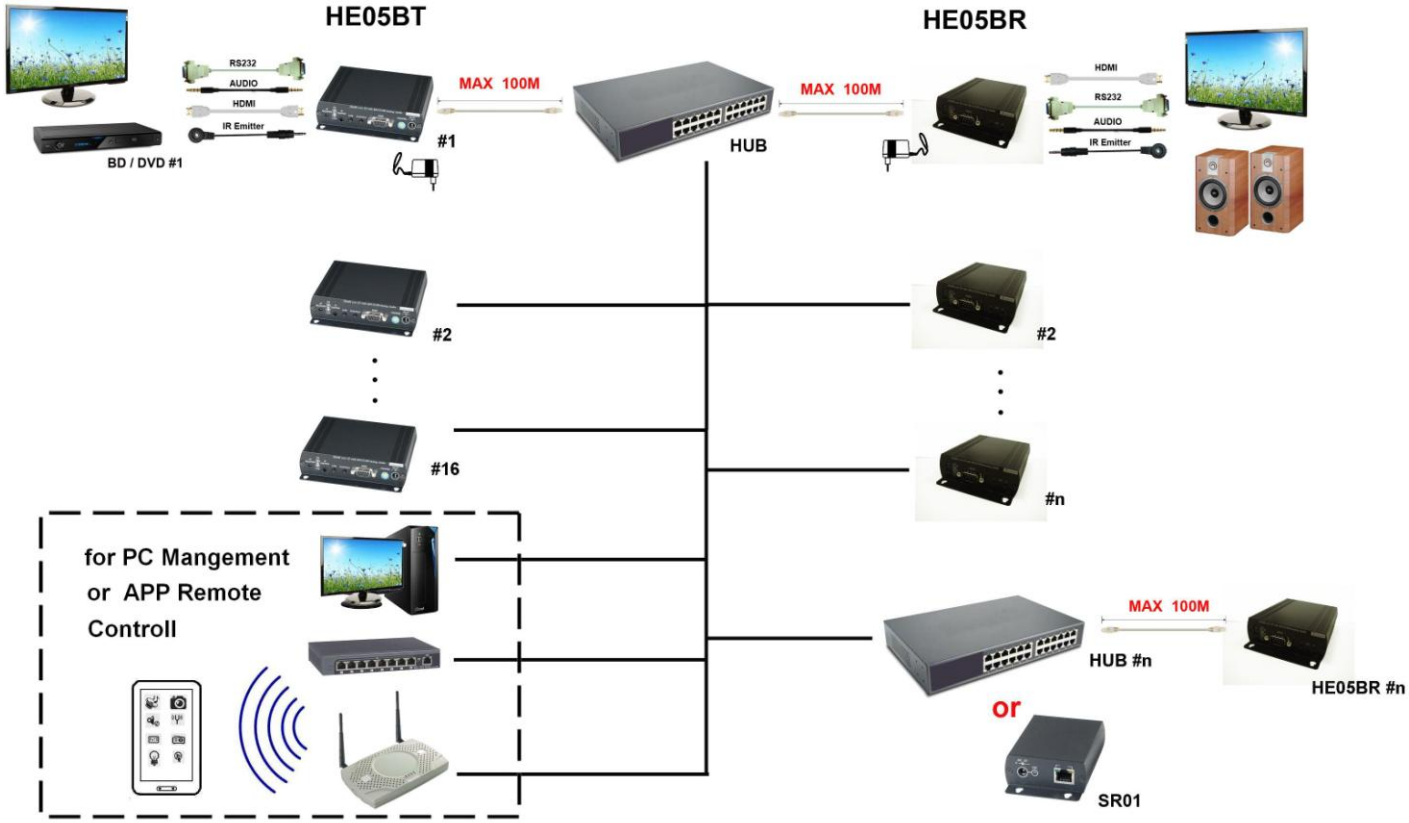
The HE05B HDMI with Analog audio, RS232, and IR CAT5 extender design for extends and distribute all signals over one CAT5 up to 150 meters, with local HDMI monitor output. It provides superior video quality up to 1920 x 1200 resolutions, and using cost effective Cat5e cable, instead of HDMI, RS232 cables, for an easy, neater and reliable installation. The local and remote units can be connected together for a Point-to-Point connection via CAT5e/6 cable or a Point-to-Many connection via a managed network switch. It is optimized for applications at broadcasting system, multimedia display and multi-data sharing, digital signage, home network integration, and industrial control, hospital, education, security, Matrix network system and system control over RS232 and equipment control over IR.

Features:

- Extend HDMI, RS232, IR signals over one CAT5E/CAT6 cable.
- **Supports resolutions up to 1080p Full HD and 1920 x 1200 (WUXGA) 32bpp@ 60 Hz**
- Transmission range up to 150M over CAT5e, 180M over CAT6.
- Supports 2-way RS232 commands at baud rate 115200 (control software on a PC, or other automated control system hardware) to control devices attached to the matrix using RS232. Full Duplex data communication.
- HDMI 1.3b and HDCP compliant.
- HDMI audio support up to LPCM 7.1@192Khz
- Built in Bi-Directional analog audio.
- Built in Bi-Directional IR.
- Use IGMP and Jumbo frame protocol Gigabit Switch Hub to do HD signal distribution and transmission.
- **Support PC software and Android/iOS APP control.**
- **HE05BR receiver input source select could be from IR remote control or front panel button.**
- **HE05BT transmitter unit built in HDMI loop output.**
- **HE05BR receiver built in IR programmable module, allow using IR remote control to do IR/RS232 command.**
- **Support point to point and multiple source devices to multi-display connections via Gigabit network switch.**
- **Work with HE05BER, HKM01B (HDMI), DKM01B (DVI), VKM03B (VGA) serials products.**
- Perfect for control remote machines and security monitoring systems, digital signage application.
- Optional model: SR01 signal repeater for longer distance application.

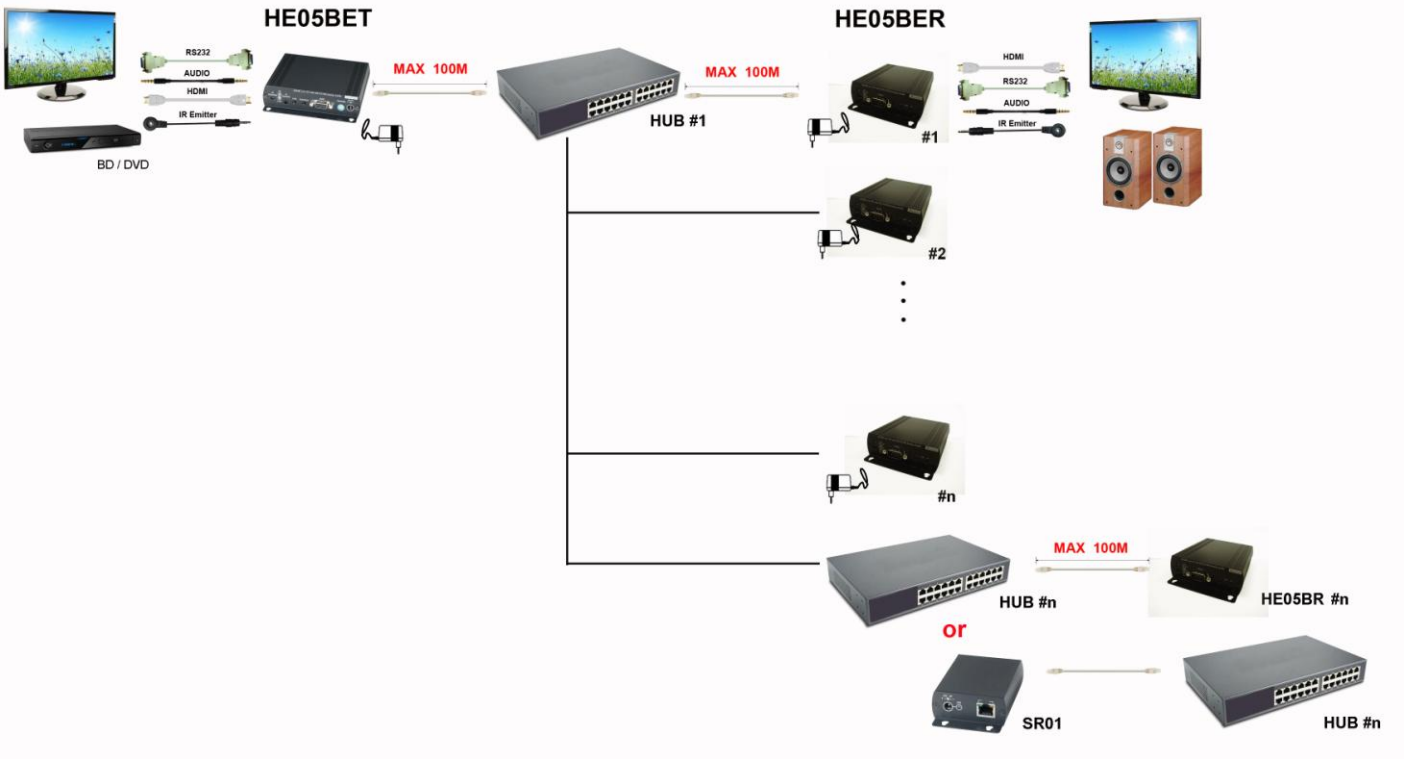
Installation View:

Multiple Transmitters to Multiple Receivers Connection: (Matrix Switcher)

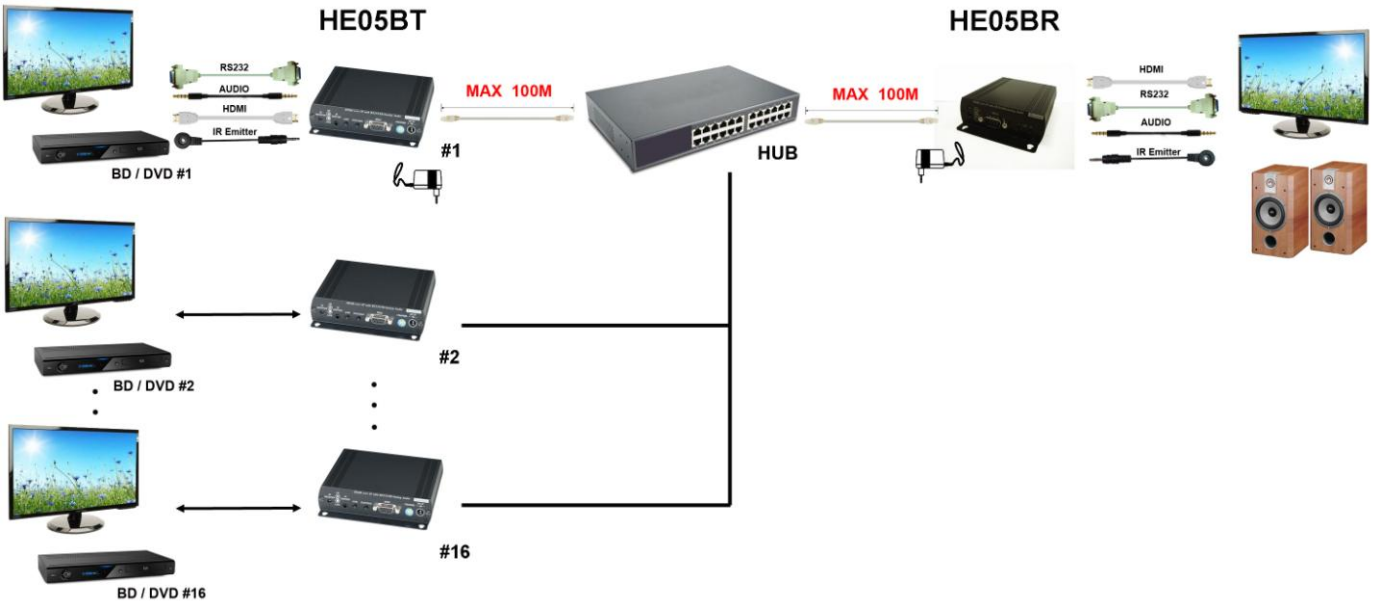


Point to Point Direct Connection: (Extender)

One Transmitter to Multiple Receivers Connection: (Splitter)



Multiple Transmitters to One Receiver Connection: (Switcher)



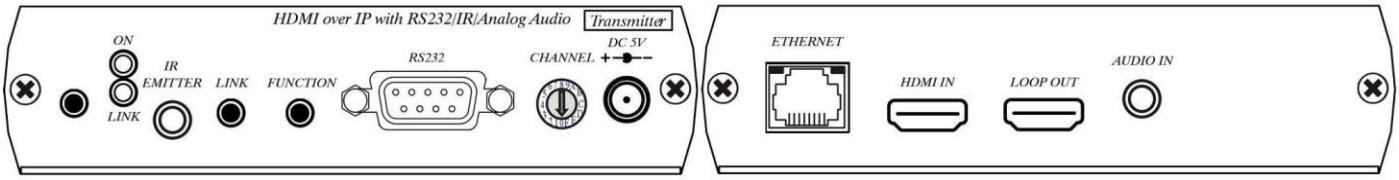
Optional Model: SR01 Signal Repeater (order separately)

- Extend data signal for an additional 120meters.
- Application for HE05B signals for extra long range transmission.
- Ability to cascade connection with multiple SR01 for long range transmission
- Built in LED status indication.
- External power required.
- Plug and play for easy installation.

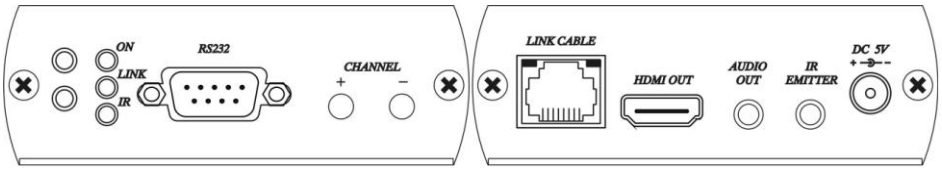
Work with HE05B CAT5 Extender:

Panel View:

Transmitter



Receiver



LED Indication Status:

Power (Green LED):	Flash	Booting
	ON	Boot completed
Link (Blue LED):	Flash	Connecting or connected but no HDMI input
	ON	Transmitter connected with Receiver
RJ45 LED:	Green Flash	Data transmission
	Orange On	Ethernet connected
Receiver IR (Red LED):	On	Received IR signal
	Flash	Enter IR learning mode

Back Panel Rotary Switch Function:

HE05BT and HE05BR must setting at same channel in order to do mutual transmission.
Rotary switch to be follow 16 HEX, could switch " 0 ~ F " total 16 channels, A = channel 10, B = channel 11, others channel same as 16 hex conversion.
HE05BT channel setting must be unique to avoid conflict with any other transmitters.

Front Panel Button Function:

ITEM	HE05BT	
Button	LINK	FUNCTION
Short Press	Remote output (**on** / off)	**Video Mode** / Graphic Mode*
Long Press (3 seconds)	Loop output (**on** / off)*	Anti-Dither (1/2/**off**)*
Press to power on (Press and hold until Green LED Flash)	N/A	Update EDID from loop output
Press to power on (Press and hold until Green and Blue LED Flash)	RESET to Default*	N/A

ITEM	HE05BR	
Button	CH. -	CH. +
Press together	Confirm / Enter menu	
Short Press	Previous channel or menu item	Next channel or menu item

Above "bold font" part as the default

RJ45 pin define:

Link Cable (TIA/EIA-568-B)

1. Orange-white Data 1 +
2. Orange Data 1 -
3. Green-white Data 2 +
4. Blue Data 3 +
5. Blue-white Data 3 -
6. Green Data 2 -
7. Brown-white Data 4 +
8. Brown Data 4 -

Cable & Transmission Distance:

Link Cable use high quality Cat.5e UTP/STP/FTP or Cat.6 UTP cable

Transmission distance will be affected by equipment (Switch HUB), cable quality…etc. When using CAT.5e the max. Transmission distance up to 150M, using CAT.6 cable up to 180M.

You can also use model no: SR01 repeater for extended longer distance or using Gigabit Switch hub which support **IGMP** protocol and **Jumbo Frame 8K** for signal distribution or extend distance.

System Default Settings:

HE05B support **Unicast** and **Multicast** two mode, default is Multicast.
In Multicast mode it could be one to one, one to multi, multi to on or multi to multi applications.

The analog audio output of transmitter and input of receiver will be off in this mode, analog audio only from transmitters send to receivers.
Analog audio bi-direction transmission only in Unicast mode, please refer to the web setting chapter: Casting Mode

System default IP setting is Auto IP, it will assign 169.254.X.X (submask 255.255.0.0) to transmitters and receivers, you could also set to DHCP or Static IP, please refer to web setting chapter: IP Setup.

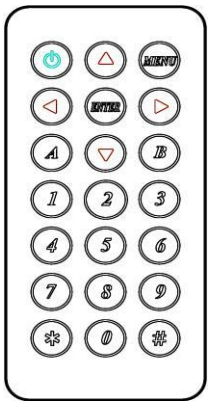
Bandwidth Chart:

The bandwidth will be varied based on different resolution. Higher resolution may not request bigger bandwidth. Below Chart is the resolution and bandwidth status for reference.

Resolution (@60Hz)	Average Bandwidth (Mbps)
1080p	77 (24 ~ 91)
720p	46 (29 ~ 150)
480p	63 (36 ~ 73)
1600x1200 (UXGA)	59 (24 ~ 73)
1280x1024 (SXGA)	58 (31 ~ 76)
1024x768 (XGA)	118 (56 ~ 138)
800x600 (SVGA)	83 (64 ~ 107)

Under Gigabit Ethernet network, the total flow must not exceed 1000Mbps to avoid any delay on video streaming. If the video play with 1080p resolution, the HE05BT Transmitter allow maximum up to 10pcs for simultaneous video streaming.

Remote Control Function:



If you do not use PC computer management to setup HE05BR, then you could use the IR infrared remote control to preset channel selection. Using the IR remote control to the front of HE05BR will be ok.

Initial at first time use the remote control or after change battery of remote control, the IR remote control and the equipment IR ID must be using same ID. The default IR ID is 8.

To setting the IR ID, Press and hold power button, then press button 8 to complete the setting.  +  .(for example)

Remote Control Button Function:

Symbol		Function
	Power	Temporarily turn off the screen output /setup remote control IR ID
	MENU	Quick menu selection, input numbers after press menu button
	LEFT	previous channel
	RIGHT	next channel
	UP	previous quick Menu selection
	DOWN	next quick Menu selection
	ENTER	Confirmation / display the current channel
	1	number 1
	2	number 2
	3	number 3
	4	numuber4

	5	number 5
	6	number 6
	7	number 7
	8	number 8
	9	number 9
	0	number 0
	*	cancel / exit
	#	clear input number
	A	no function
	B	no function

Remote Control Operation:

Select Channel：

Mode 1: use  or  select channel, if no any action after 3 seconds then it is the select channel or press  immediately to confirm the input channel.

Mode 2: select the channel number and press  to confirm the input channel.

Select Function：

Mode 1: use  or  select function, press  to confirm.

Mode 2: press  , then input function number as below , press  to confirm.

Basic Menu Number:

0	MAC Address	Display equipment MAC Address.
1	IP Address	Display equipment IP Address
2	Host IP Address	Display current connected Host IP Address
3	Enable advance menu	Enable advance menu
4	Disable advance menu	Disable advance menu

Advance Menu Number:

8	IR ID	Display current IR ID setting
9	IR Control Version	Display IR control software version
10	Restart Link	Reconnect with Host
11	Stop Link	Stop the connection with Host
20	Graphic or Video Mode	Switch Host Video or Graphic(default) Mode
21	Anti-Dithering	Switch Host Video Anti-Dithering define, default is off
30	Enable Channel Button	Enable Channel Button
31	Disable Channel Button	Disable Channel Button
32	Enable IR Remote	Enable IR Remote
33	Disable IR Remote	Disable IR Remote
34	Enable IR Extender	Enable IR Extender
35	Disable IR Extender	Disable IR Extender
50	Set IR ID to 0	Set IR ID to 0
51	Set IR ID to 1	Set IR ID to 1
52	Set IR ID to 2	Set IR ID to 2

53	Set IR ID to 3	Set IR ID to 3
54	Set IR ID to 4	Set IR ID to 4
55	Set IR ID to 5	Set IR ID to 5
56	Set IR ID to 6	Set IR ID to 6
57	Set IR ID to 7	Set IR ID to 7
58	Set IR ID to 8	Set IR ID to 8
59	Set IR ID to 9	Set IR ID to 9
300	Force Update EDID of a Target Client	Set host EDID from current monitor
333	Reset to Factory Default	Reset to Factory Default
999	Reboot	Restart the system

IR Module Advance Menu Number: (display when IR module be installed)

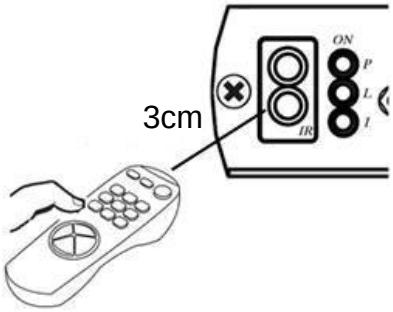
200 Delete All IR Key Delete all learned IR key

100~147:

No.	Function	No.	Function	No.	Function	No.	Function
100	Learn IR KEY 0	112	Learn IR KEY 4	124	Learn IR KEY 8	136	Learn IR KEY 12
101	Send IR KEY 0	113	Send IR KEY 4	125	Send IR KEY 8	137	Send IR KEY 12
102	Delete IR KEY 0	114	Delete IR KEY 4	126	Delete IR KEY 8	138	Delete IR KEY 12
103	Learn IR KEY 1	115	Learn IR KEY 5	127	Learn IR KEY 9	139	Learn IR KEY 13
104	Send IR KEY 1	116	Send IR KEY 5	128	Send IR KEY 9	140	Send IR KEY 13
105	Delete IR KEY 1	117	Delete IR KEY 5	129	Delete IR KEY 9	141	Delete IR KEY 13
106	Learn IR KEY 2	118	Learn IR KEY 6	130	Learn IR KEY 10	142	Learn IR KEY 14
107	Send IR KEY 2	119	Send IR KEY 6	131	Send IR KEY 10	143	Send IR KEY 14
108	Delete IR KEY 2	120	Delete IR KEY 6	132	Delete IR KEY 10	144	Delete IR KEY 14
109	Learn IR KEY 3	121	Learn IR KEY 7	133	Learn IR KEY 11	145	Learn IR KEY 15
110	Send IR KEY 3	122	Send IR KEY 7	134	Send IR KEY 11	146	Send IR KEY 15
111	Delete IR KEY 3	123	Delete IR KEY 7	135	Delete IR KEY 11	147	Delete IR KEY 15

IR Key Learning：

IR KEY function is use IR module which built-in HE05BR receiver to learn IR signal of TV remote control and saved in the module, then you could use programmable RS232 command from HE05BT transmitter to control the IR module send and IR signal to TV.
It could control all kinds of TV but do not need RS232 port on it.



How To Learn IR KEY :

First, press the menu: e.g. IR KEY 0 press 

, the screen OSD will show “Start Learn”, press the button of the remote control you want to learn and closed to (3cm) IR receiver of HE05BR receiver in 10 seconds. It will shows “Learn Succeed” or “Learn Error” after learning.

After learning you could double check if it works correctly, e.g. press 

, it will send the IR KEY 0 immediately.

IR Module Command：

Control receivers IR module in same transmitter channel by RS-232, settings: 115200bps (8-N-1)

Parameters and format:
>IRM_MAC ADDRESS> command parameters
Send command to receiver of specific MAC Address

>IRM_CHANNELx> command parameters
Send command to receivers of specific channel
x equals 0~ F or * , A = channel 10, B = channel 11, and so on, * = all channels

Response format:
<IRM_MAC ADDRESS< response character
Response message from receiver of specific MAC Address
If use >IRM_ CHANNELx> command, receivers will not response.

Command List:

Command	Function	Parameters	Response
MODULE	Display installed module	N/A	US / EU = module installed NI / no response = module not installed
SEND	Send IR KEY	0-15 (IR KEY No.)	OK = IR KEY Send completed ERROR = module not installed NOT LEARN = the IR KEY not learned
IR_ID	Set IR ID	0-9 (IR ID No.) ? (display IR ID No.)	OK = IR ID Setting successful ERROR = Setting fail
BUTTON	Set button	ON OFF ? (display setting)	OK = Setting successful ERROR = Setting fail
IR_REMOTE	Set IR remote	ON OFF ? (display setting)	OK = Setting successful ERROR = Setting fail
IR_EXTENDER	Set IR Extender	ON OFF ? (display setting)	OK = Setting successful ERROR = Setting fail
REBOOT	System reboot	N/A	SYSTEM REBOOT

e.g.:

>IRM_AABBCCDDEEFF> MODULE	(ask receiver at MAC Address AABBCCDDEEFF IR module status)
<IRM_AABBCCDDEEFF< EU	(response “EU” from receiver at MAC Address AABBCCDDEEFF)
>IRM_AABBCCDDEEFF> SEND 0	(make receiver at MAC Address AABBCCDDEEFF send IR KEY 0)
<IRM_AABBCCDDEEFF< OK	(response “OK” from receiver at MAC Address AABBCCDDEEFF)
>IRM_AABBCCDDEEFF> SEND 1	(make receiver at MAC Address AABBCCDDEEFF send IR KEY 1)
<IRM_AABBCCDDEEFF< NO LEARN	(response “NO LEARN” from receiver at MAC Address AABBCCDDEEFF)
>IRM_CHANNEL5> SEND 0	(make receivers at Channel 5 send IR KEY 0)
>IRM_CHANNELA> SEND 1	(make receivers at Channel A (10) send IR KEY 1)
>IRM_CHANNEL*> BUTTON OFF	(disable button operation of all receivers)

Caution：

1. Not recommend to work with general LAN connection to avoid large video, data transmission or multicast packets to slow down your other LAN devices.
2. Gigabit switch hub muse use support IGMP protocol and Jumbo Frame over 8K Ethernet Switch Hub in order to achieve the best transmission quality
3. If monitor shows green screen or video not smooth, please check if the switch running under gigabit and Jumbo Frame function enabled.
4. Using computer or mobile APP management the IP address should be set in same network segment.
5. Computer software operation, please refer to software operating instruction.

Web Setting Function：

HE05B provide detail settings over web browser, you have to know the IP address before setting.

There are three ways to get the IP address of receiver:

1.Local IP shows on right bottom screen when booting.

2.Press remote control button 

(IP Address)

3.Install Internet explorer plug-in: Bonjour , click device name to enter web setting page to get the IP address(please refer software installations manual)

There are two ways to get the IP address of transmitter:

1.Connect a transmitter and receiver and set in the same Channel, press remote control button 

at receiver side (Host IP Address), it will shows the transmitter IP Address on screen(must remove the HDMI cable of transmitter or turn off the video source).

2. Install Internet explorer plug-in: Bonjour , click device name to enter web setting page to get the IP address(please refer software installations manual)

System default IP setting is Auto IP, it will assign 169.254.X.X (subnet mask 255.255.0.0) to transmitters and receivers, you could also set to DHCP or Static IP.
You computer must set in same subnet mask to enter the web setup page.

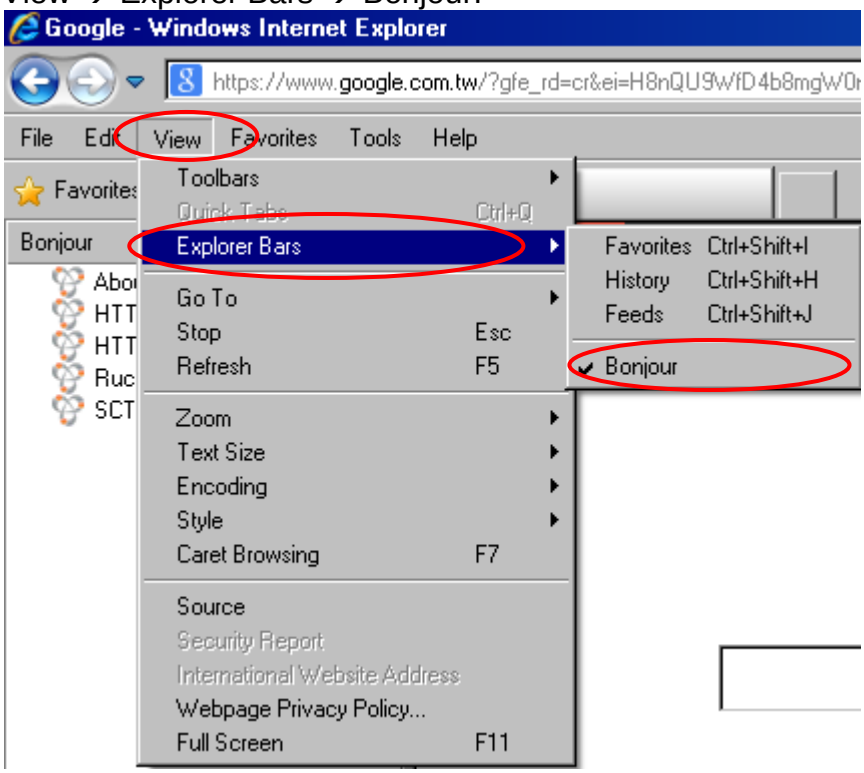
If you do not sure the IP address of transmitters/receivers you could reset the transmitters and receiver to default.
For transmitters: press the LINK button to power on (Press and hold until Green and Blue LED Flash) to reset to default.

For receivers: press remote control 

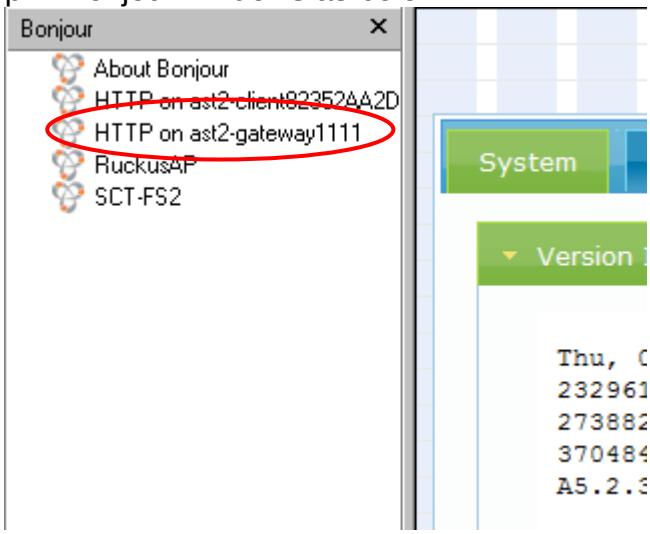
to reset to default.

Login in to the web setting:

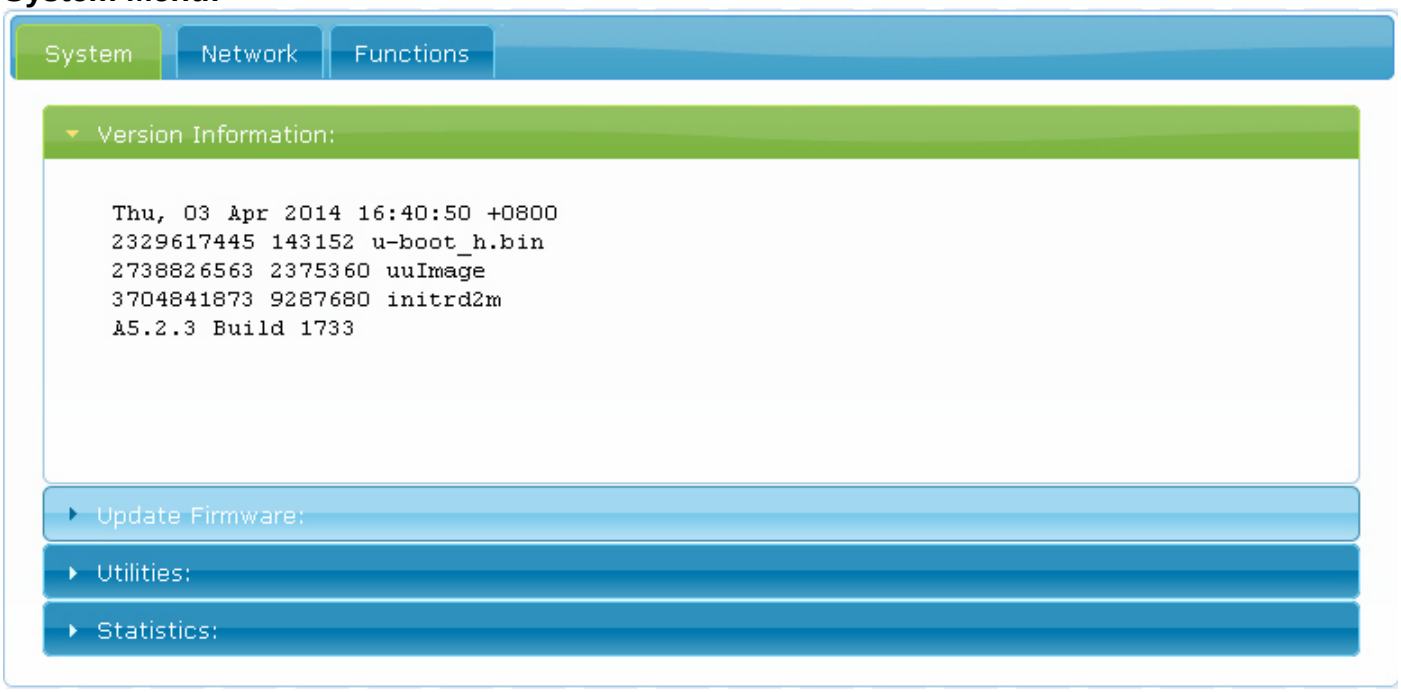
Use CAT5 cable to connect transmitter/receiver RJ45 port to PC LAN port, open IE browser then select View → Explorer Bars → Bonjour.



Double click on “HTTP on ast-gateway(HE05BT)” or “HTTP on ast-client (HE05BR)”, it will pop up web setup in Bonjour windows as below:

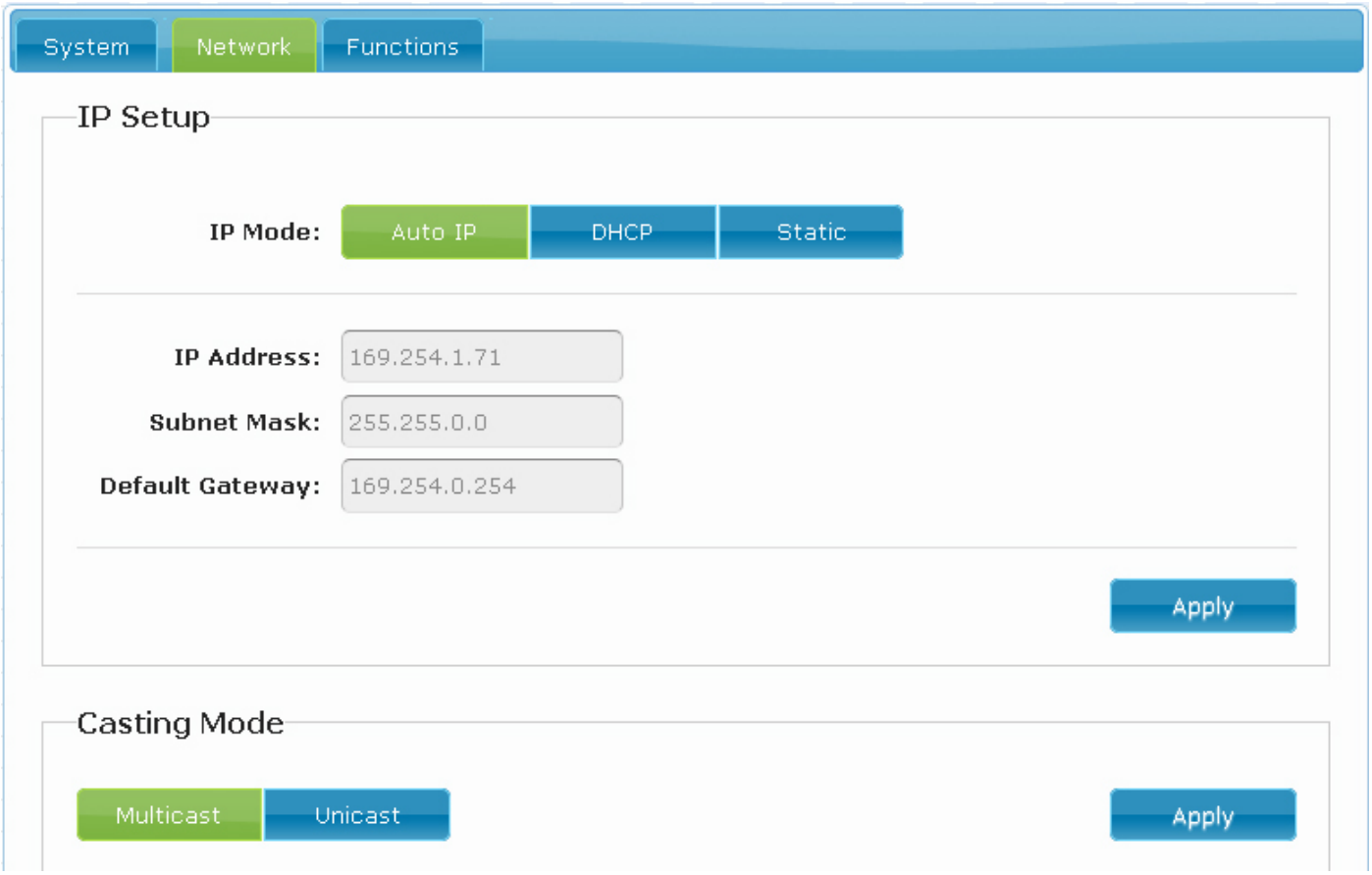


System Menu:



- Version Information — Firmware version information
- Update Firmware — Update system firmware
- Utilities — System tools
  - Factory Default — Set system to factory default
  - Reboot — Reboot system
  - Default EDID — Set EDID to default
  - Console API Command — Run Console API command
- Statistics — System status

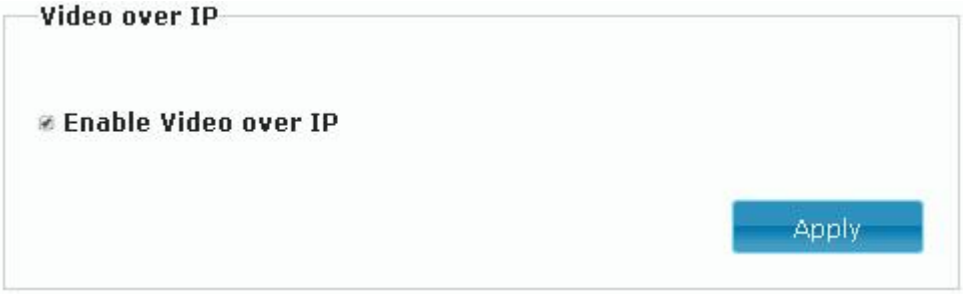
Network Menu:



IP Setup:

- IP Mode could be Auto IP, DHCP, Static three mode, default is Auto IP
- Casting Mode : could be Multicast, Unicast mode, default is Multicast，

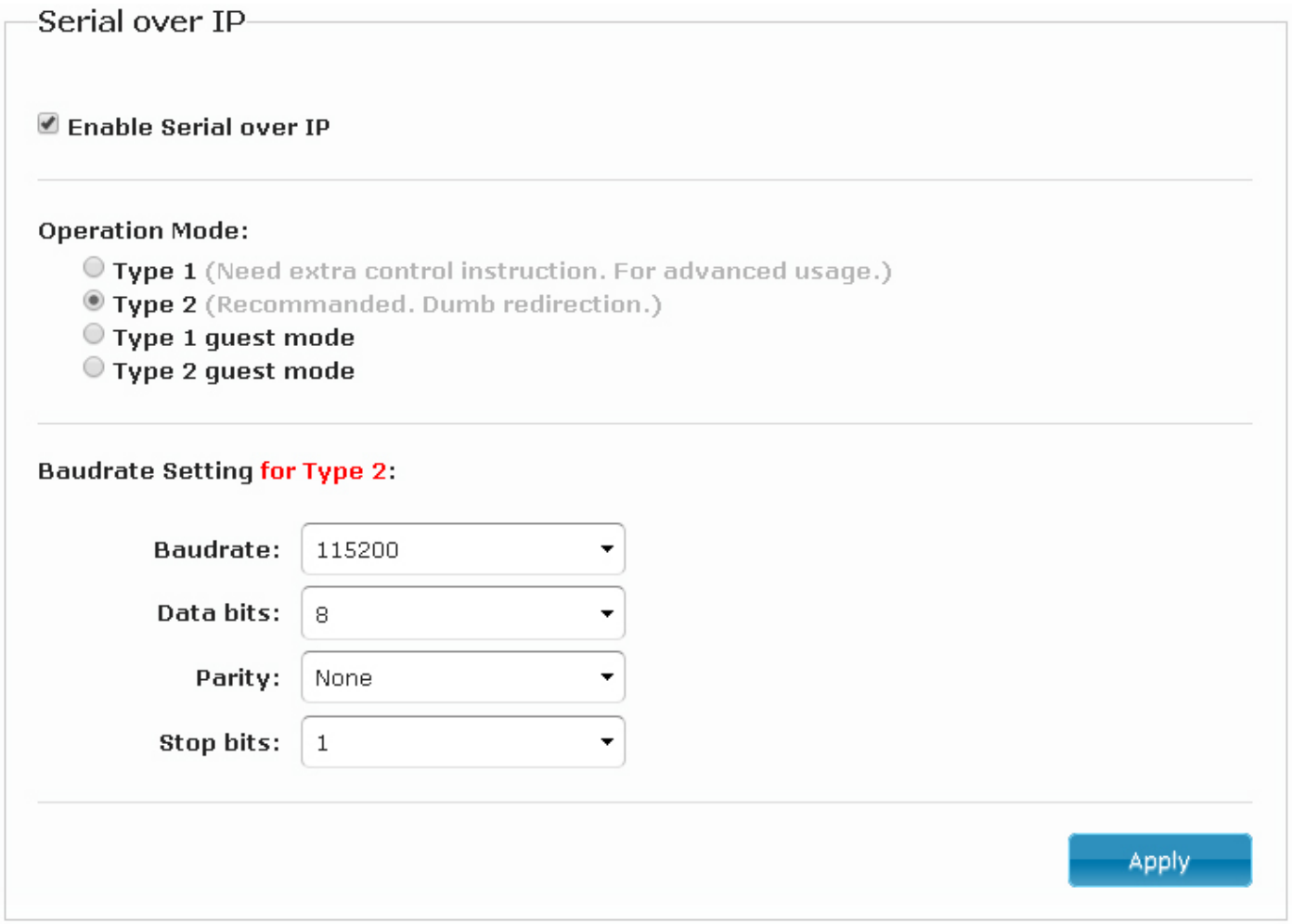
Functions Menu:



For HE05BT Transmitter:
Video over IP:
This function setup the video signals send from network, default is checked.
Please note it will turn off HDMI output in same channel if this function be disabled, only analog audio output

For HE05BR Receiver:
Video over IP:
This function setup the video signals send from network, default is checked.
Please note it will turn off HDMI output of receiver if this function be disabled, only analog audio output

Copy EDID from this Video Output:
Check this box will auto copy EDID from the TV connected to HE05BR when receiver booting, default is not checked.
In multiple connections the EDID will copy from the last connected receiver, to prevent EDID conflict recommend check this box in Unicast mode only.



Serial over IP：

This function setup Serial (RS232) signal sends from network

- Operation Mode:
  Default is “Type 2 (Recommended. Dumb redirection.)”
- Baudrate Setting for Type 2 :
  It could change Baud rate as below : 300, 600, 1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 230400, **default is 115200**

Package Include:

HE05BT Transmitter x 1
HE05BR Receiver x 1
IR emitter cable x 1
DC 5V 2Amp power adapter x 2

Specification:

ITEM NO.	HE05BT	HE05BR
Support Resolution	480i / 480p / 720p / 1080i / 1080p @ 24Hz、25Hz、30Hz、50Hz、60Hz	
Transmission Distance	CAT.5e：150M / CAT.6：180M (Max)	
HDMI Connector	HDMI Type A x 2	HDMI Type A x 1
RS232 Connector	DB9 (Female) x 1	DB9 (Male) x 1
Link Connector	RJ45 x 1	
Audio Connector	3.5 mm Phone Jack x 1 (10KΩ / 1Vpp)	
IR Receiver (Internal)	30-60Khz / ±45° / 5M	38Khz / ±45° / 5M
IR Emitter (External)	3.5mm Stereo Phone Jack	
Power Supply	DC 5V 2A	
Power Consumption	1.3 Amp (Max.)	
Temperature	Operation: 0 to 55℃, Storage: -20 TO 85℃, Humidity: up to 95%	
Dimensions mm	125 * 140 * 30	88 * 130 * 30
Weight g	380	270

RoHS CE FC

Rev. A