DVI KVM & USB, RS232 , IR ,Analog Audio CAT5 Extender over IP

ITEM NO: DKM01B (DKM1BT+VDKM01BR) DVI KVM & USB, RS232 , IR, Audio CAT5 Extender over IP

The DKM01B DVI KVM, USB with Analog audio, RS232, and IR CAT5 extender design for extends and distribute all signals over one CAT5e 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 DVI, 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.

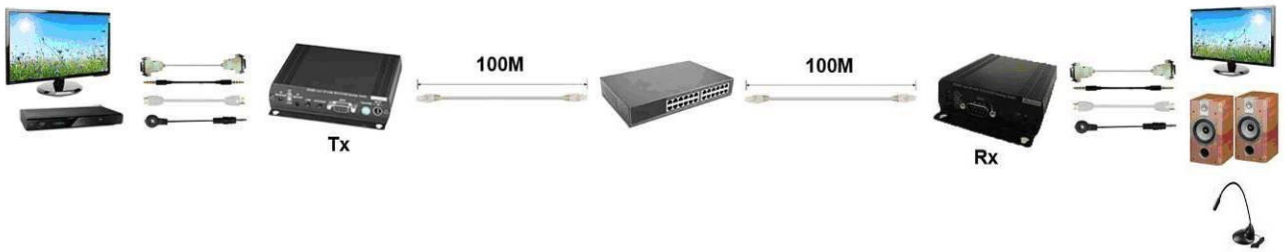
Features:

- Extend and distribute DVI signal with bi-directional RS232, USB signal,IR and analog audio signals over LAN.
- **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.**
- Support window based management software, using PC computer for easy setting input/output link.
- Support Android/iOS APP control.
- Receiver input source select could be from IR remote control or front panel button.
- Built in RS232 distribution function, to send RS232 signal from one TX to multiple RX.
- 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.
- Built in Bi-Directional analog audio transmission (only in point to point mode).
- Built in Bi-Directional IR.
- DKM01BT transmitter unit built in DVI local loop output.
- VDKM01BR receiver unit with 4 ports USB devices (1 port USB 1.1 & 3 Port USB 2.0), to extend USB peripheral devices, such as flash disk, hard disk, keyboard, mouse, etc.
- Use IGMP and Jumbo frame protocol Gigabit Switch Hub to do HD signal distribution and transmission.
- Support point to point and multiple source devices to multi-display connections via Gigabit network switch.
- The system could be works with any combination on HDMI, DVI, VGA transmitters and receivers.
- Support total of transmitter unit up to 16 pieces, receiver unit over 254 pieces based on the number of ports on your network switch.
- Perfect for large scale remote HD content access and security monitoring systems, digital signage applications.
- Optional model:
  SR01: Signal repeater for longer distance application.

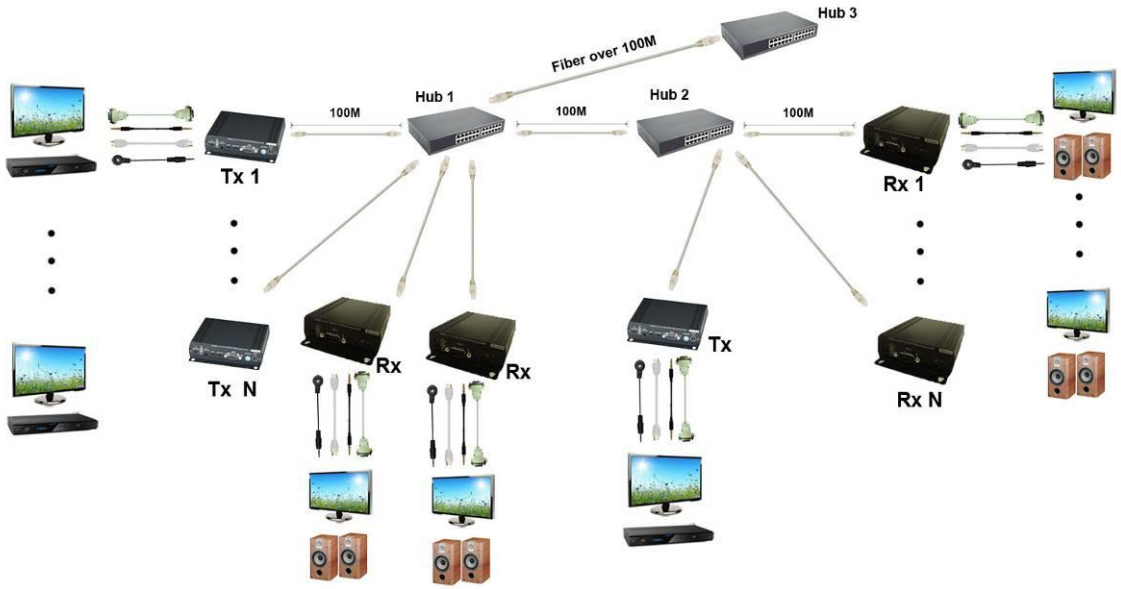
Application and Installation View:

Point to Point Direct Connection: (Extender)

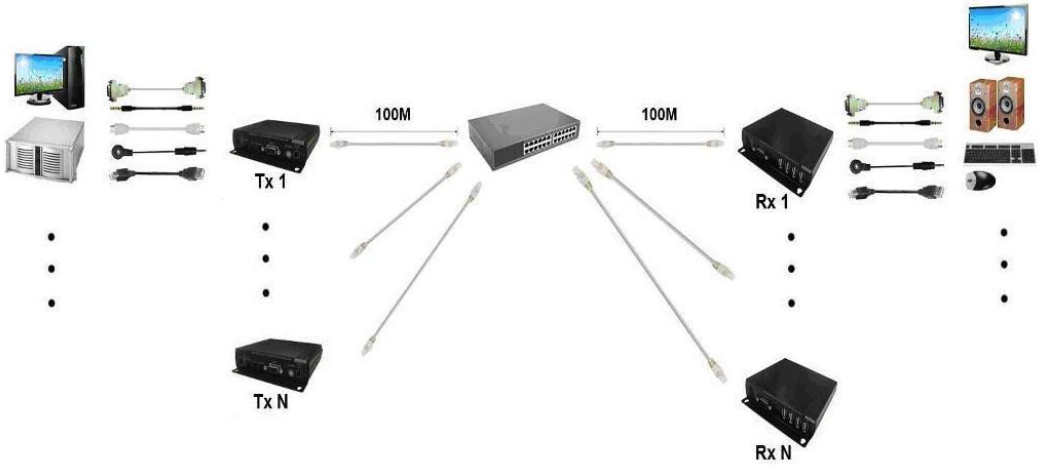
Point to Point With Switch Hub Connection: (Extender over LAN)



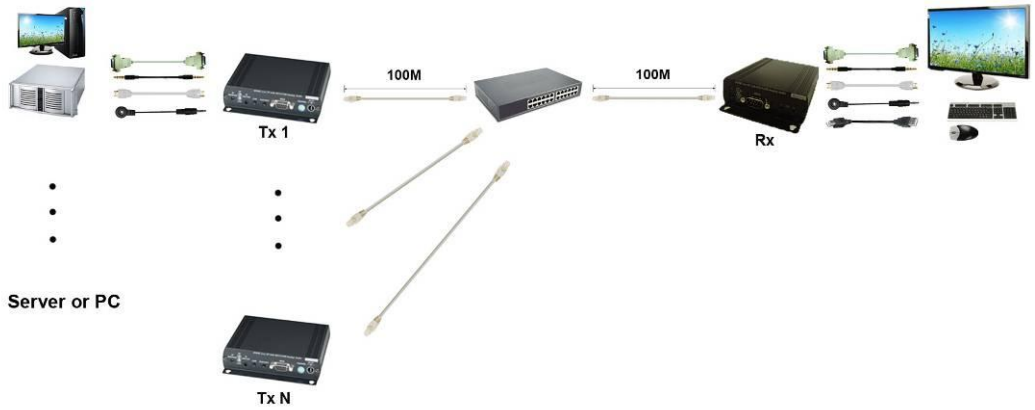
Multiple TX to Multiple RX via Switch Hub Connection



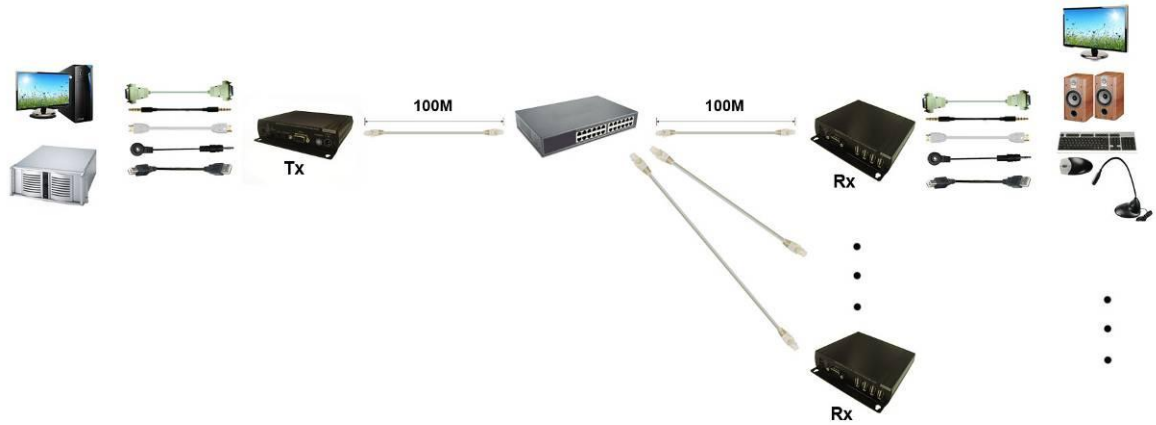
Multiple TX to Multiple RX Connection: (Matrix Switcher)



Multiple TX to One RX r Connection: (KVM Switcher over IP)



One TX to Multiple RX Connection: (Splitter)



Optional Model: (order separately)

SR01 Signal Repeater

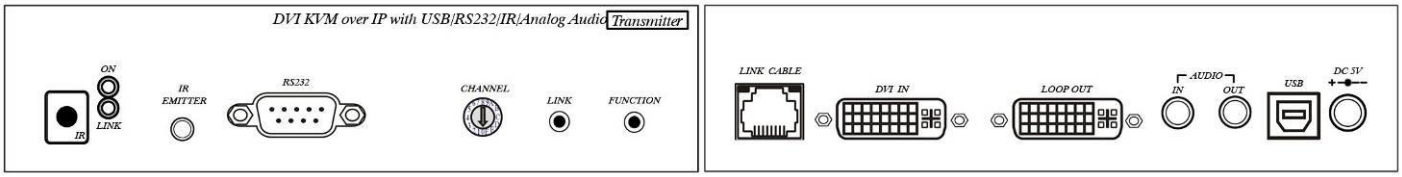
- **Extend data signal for an additional 120meters.**
- Application for DKM01B signals for extra long range transmission.
- Ability to cascade connection with multiple SR01 for long range transmission
- Built in LED status indication.
- External power required.
- Plug and play for easy installation.


CAT.5e 1080p 120M (Max)
CAT.5e 1080p 120M (Max)
Transmitter
SR01 x n
Receiver

Panel View:

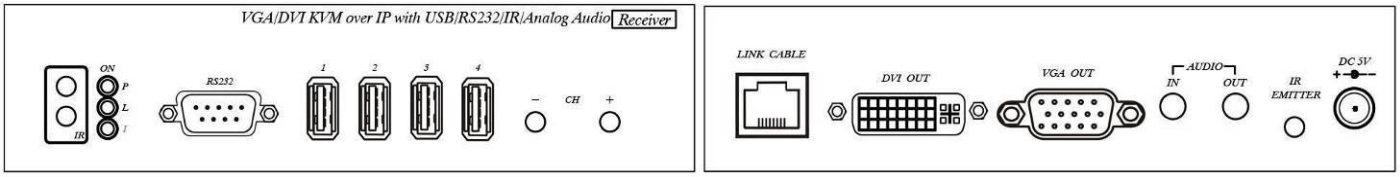
Transmitters

DKM01BT



Receivers

VDKM01BR



Video Output Setting:

VDKM01BR support both DVI and VGA output, default is DVI output only.
To change the output setting please press below button 5 seconds till power LED flash, it will reboot automatically (about 30 seconds to reboot).

[CH-]: VGA output only
[CH+]: DVI output only
[CH-] and [CH+]: DVI and VGA output both

Notice: in both mode the DVI monitor must be connected and power on.

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
Receiver IR (Red LED):	On	Received IR signal
	Flash	IR signal status / Enter IR learning mode

RJ45 LED Indication Status:

Green	Flash	Data transmission
Orange	On	Ethernet connected

Back Panel Rotary Switch Function:

Transmitter and receiver 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.
Transmitter channel setting must be unique to avoid conflict with any other transmitters.

Front Panel Button Function:

ITEM	TRANSMITTER	
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 (Hold until Green LED Flash)	N/A	Update EDID from loop output
Press to power on (Hold until Green and Blue LED Flash)	RESET to Default	N/A

Above "bold font" part as the default

ITEM	RECEIVER	
Button	CH. -	CH. +
Press together	Confirm / Enter menu	
Short Press	Reduce the numbers of Channel/Menu/Value	Increase the numbers of Channel/Menu/Value
Press 5 seconds (VDKM01BR only)	VGA output only	**DVI output only**
Press 5 seconds together (VDKM01BR only)	DVI and VGA output both (DVI monitor must be connected and power on)	

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:

Transmitter / receiver 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)

System scalability is limited only by uplink and stacking connector bandwidths but can accommodate up to 16 Full HD video sources at once.

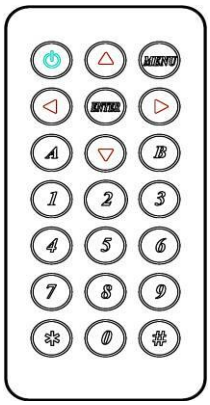
For example under Gigabit Ethernet network, the total flow must not exceed 1000Mbps to avoid any delay on video streaming. If the video play with 1080p resolution, the transmitter allow maximum up to 10pcs for simultaneous video streaming.

Above bandwidth chart not include USB transmission, it cost up to 50 Mbps when transferring mass data.

USB Hot Key Function：

In multicast mode support multi USB keyboard and mouse in each receivers, just plug and play, but only one USB FLASH drive / hard disk could be used at same time.
You have to click “Pause/Break” key three times of the keyboard on the receiver to establish USB FLASH drive /hard disk connection.

Remote Control Function:



If you do not use PC computer management to setup receiver, then you could use the IR infrared remote control to preset channel selection. Using the IR remote control to the front of receiver 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 Remote ID must be using same ID. The default Remote ID is 8.

To setting the Remote 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 Remote ID
	MENU	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	Number 4
	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:

5	Device No	Display device number
6	Group No	Display group number
7	Party No	Display party number
8	Remote ID	Display current Remote ID setting
9	System Version	Display system version
10	Restart Link	Reconnect with Host
11	Stop Link	Stop the connection with Host
12	Video or Graphic Mode	Switch Host Video (default) or Graphic Mode
13	Anti-Dithering	Switch Host Video Anti-Dithering define, default is off
15	Set Device No	Set device number to 0~999
16	Set Group No	Set group number to 0~99
17	Set Party No	Set party number to 0~99
18,	Set Remote ID	Set Remote ID to 0~9
20	Enable Channel Button	Enable Channel Button
21	Disable Channel Button	Disable Channel Button
22	Enable IR Remote	Enable IR Remote
23	Disable IR Remote	Disable IR Remote
24	Enable IR Extender	Enable IR Extender
25	Disable IR Extender	Disable IR Extender
26	Enable RS-232 Assign Mode	Enable RS-232 Assign Mode, auto reboot after setting
27	Disable RS-232 Assign Mode	Disable RS-232 Assign Mode, auto reboot after setting

System Maintains Menu Number:

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

RS-232 Assign Mode：

System default setting of RS-232 is extender, the connection topology same as the channel connection. RS232 ports of receivers only connect to the transmitter with same channel ID.
You could enable RS232 assign mode to fix the connection of RS232 without channel setting.

After the receivers and transmitter you want to keep RS232 connection established then press IR remote button 

to enable RS-232 assign mode.
If IP address of transmitter has been changed you have to enable RS232 assign mode for recovers again.

To disable RS232 assign mode press IR remote button 

RS-232 Control command：

User could use RS-232 port of transmitters at baud rate 115200bps (8-N-1) to operate/setup the receivers at same channel

Command format: >CMD_Address> Command Parameters
All accord receivers will run the command and parameters, we also add 3 kinds of user defined numbers except MAC & IP (Device No、Group No、Party No) for flexible application:

Mxxxx	The last 4 digits of MAC Address	e.g.: 221868860123 = M0123
Ixxxx	The last 2 column of IP Address (HEX)	e.g.: 169.254.012.034 = I0C22
Dxxxx	Device No	e.g.: Device No 1234 = D1234
Gxx	Group No	e.g.: Group No 12 = G12
Pxx	Party No	e.g.: Party No 34 = P34
CHx	Channel No (HEX)	e.g.: Channel 12 = CHC
ALL	All receivers	

Response format: <ACK_Address< Response character
Receivers will response message to transmitter as above format, if multiple receivers operate at the same time they will not response to the transmitter by default.
To enforce response function please add "**!**" before commands and receivers will respond in sequence by device number X 15ms.

Command and Parameters List:

Command	Function	Parameters	Response
CHANNEL	Select Channel	0 ~ 15 (Channel No.) ? (display setting)	OK = Setting successful ERROR = Setting fail
REMOTE_ID	Set Remote ID	0-9 (Remote ID No.) ? (display Remote ID No.)	OK = 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
DEVICE	Set Device Number	0 ~ 9999 (Device No.) ? (display setting)	OK = Setting successful ERROR = Setting fail
GROUP	Set Group Number	0 ~ 99 (Group No.) ? (display setting)	OK = Setting successful ERROR = Setting fail

PARTY	Set Party Number	0 ~ 99 (Party No.) ? (display setting)	OK = Setting successful ERROR = Setting fail
OSD_ON	Display character on screen 60 seconds	Character (alphabet and numbers)	OK = Setting successful ERROR = Setting fail
OSD_OFF	Turn off the OSD	0 ~ 60000 (Delay time , based on ms)	OK = Setting successful ERROR = Setting fail
SCREEN	Turn on/off screen	ON OFF	OK = Setting successful ERROR = Setting fail
REBOOT	System reboot	N/A	SYSTEM REBOOT

※ The maximum of OSD_ON is 30 characters, not support comma sign「, 」, some characters must use \x## format to display, ## means the characters number in ASCII 16 code
e.g.: **\x0a** is change to next line, **\x28** is **(** brackets sign, **\x22** is **"** sign

e.g.:
>CMD_M1234> CHANNEL 12 (Set receivers which last 4 digits MAC Address is 1234 to Channel 12)
<ACK_M1234< OK (Receiver which last 4 digits MAC Address is 1234 response OK)

>CMD_D123> BUTTON OFF (Turn off the button function of the receiver which Device number is 123)
<ACK_D123< OK (Receiver which Device number is 123 response OK)

>CMD_P5> !IR_KEY 31 All receivers which Party number is 5 send IR Key 31 and response.
<ACK_M0219< OK Receiver which last 4 digits MAC Address is 0129 response OK
<ACK_M021B< NO LEARN Receiver which last 4 digits MAC Address is 021B response NO LEARN

>CMD_ALL> !OSD_ON Hello! \x28123\x29 \x22ABC\x22 Show「Hello! (123) "ABC"」to all monitor and send response
<ACK_M0219< OK Receiver which last 4 digits MAC Address is 0129 response OK
<ACK_M021B< OK Receiver which last 4 digits MAC Address is 021B response OK
<ACK_M021C< OK Receiver which last 4 digits MAC Address is 021C response OK
>CMD_ALL> OSD_OFF 10000 All receiver turn off OSD after 10 seconds

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：

Transmitter/receiver 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 Bonjour plug-in installation)

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.

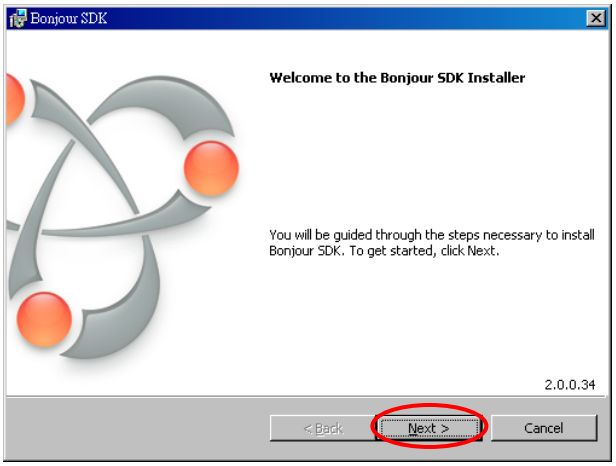
For receivers: press remote control 

to reset to default.

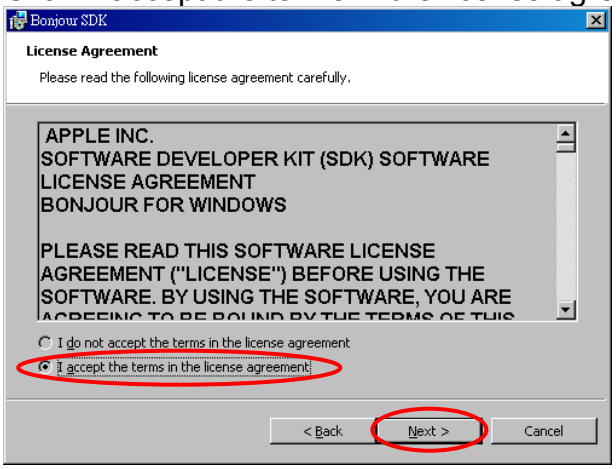
Bonjour plug-in installation:

a. Click “BonjourSDKSetup.exe” to install Bonjour plug-in for Internet Explorer.

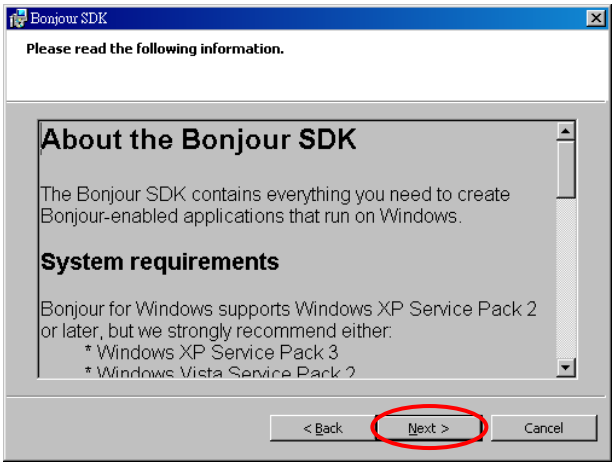
b. Click “Next” to continue.



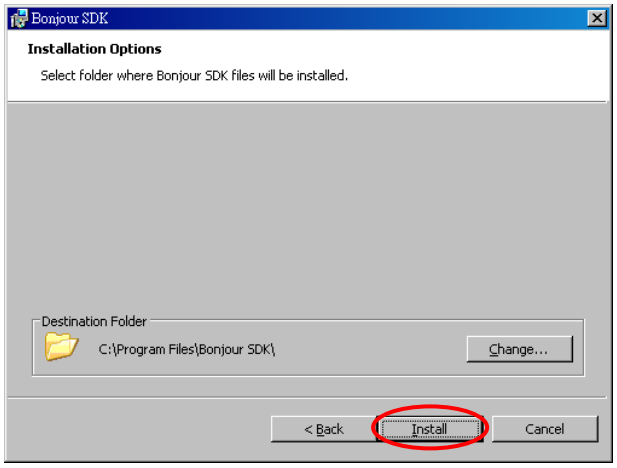
c. Click “I accept the terms in the license agreement” to continue.



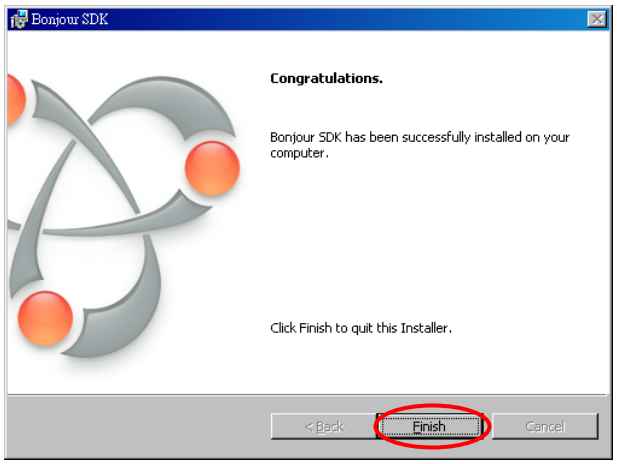
d. Click “Next” to continue.



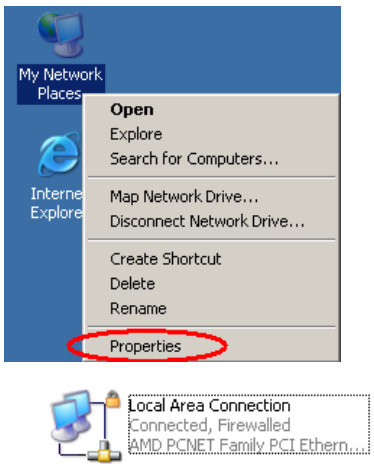
e. Click “Install” to start installation.

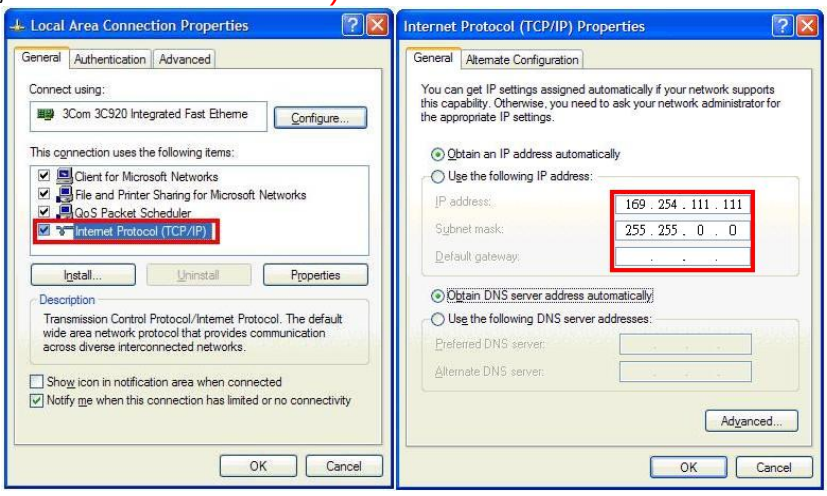


f. Click “Finish” to exit installation.



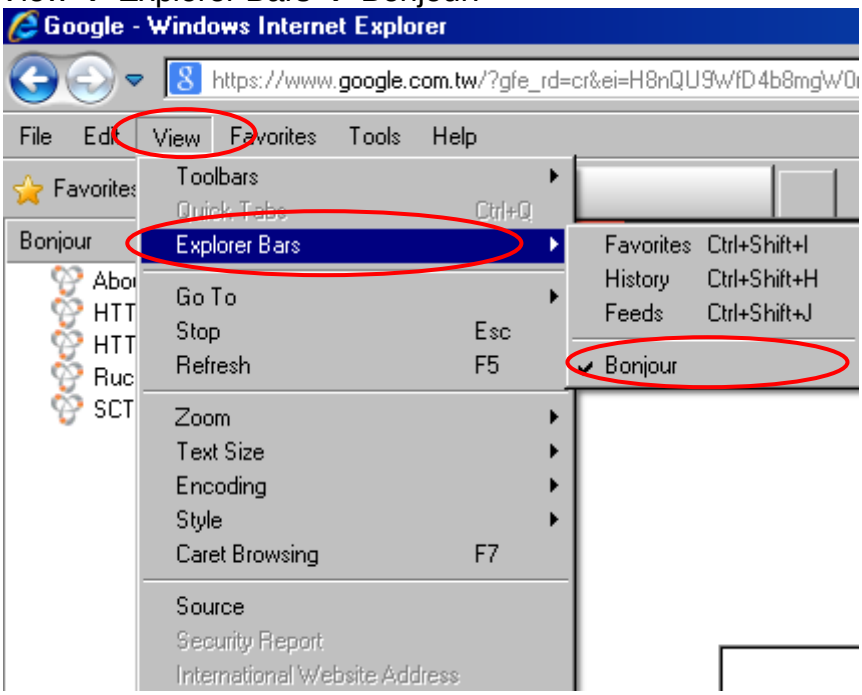
g. Right click on “My Network Place” → “Properties” then right click on “Local Area Connection” → “Properties” then double click on “Internet Protocol (TCP/IP)” to setting as below:
(IP address 169.254.111.111, sub mask 255.255.0.0)



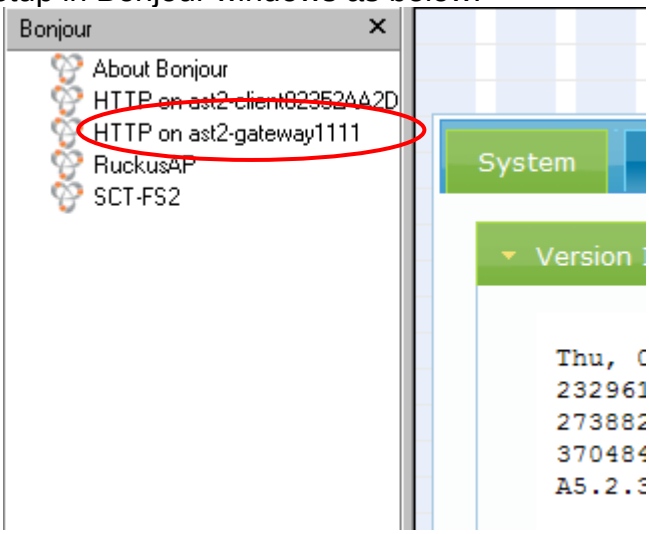


Login in to the web setting:

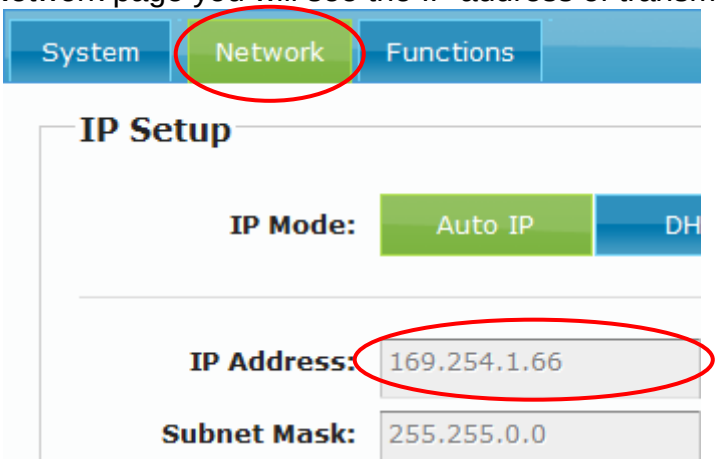
Use CAT5 cable to connect transmitter/receiver RJ45 port to PC LAN port, open IE browser then select View → Explorer Bars → Bonjour.



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

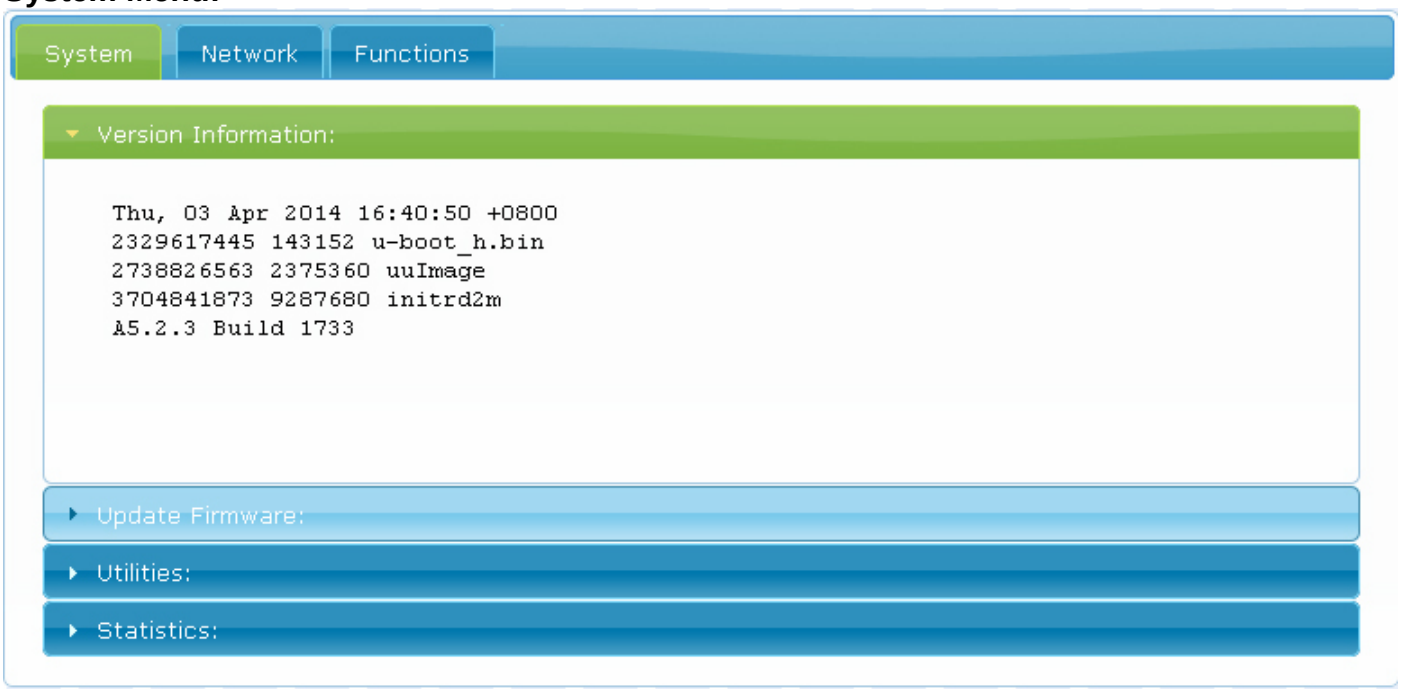


Click Network page you will see the IP address of transmitter/receiver



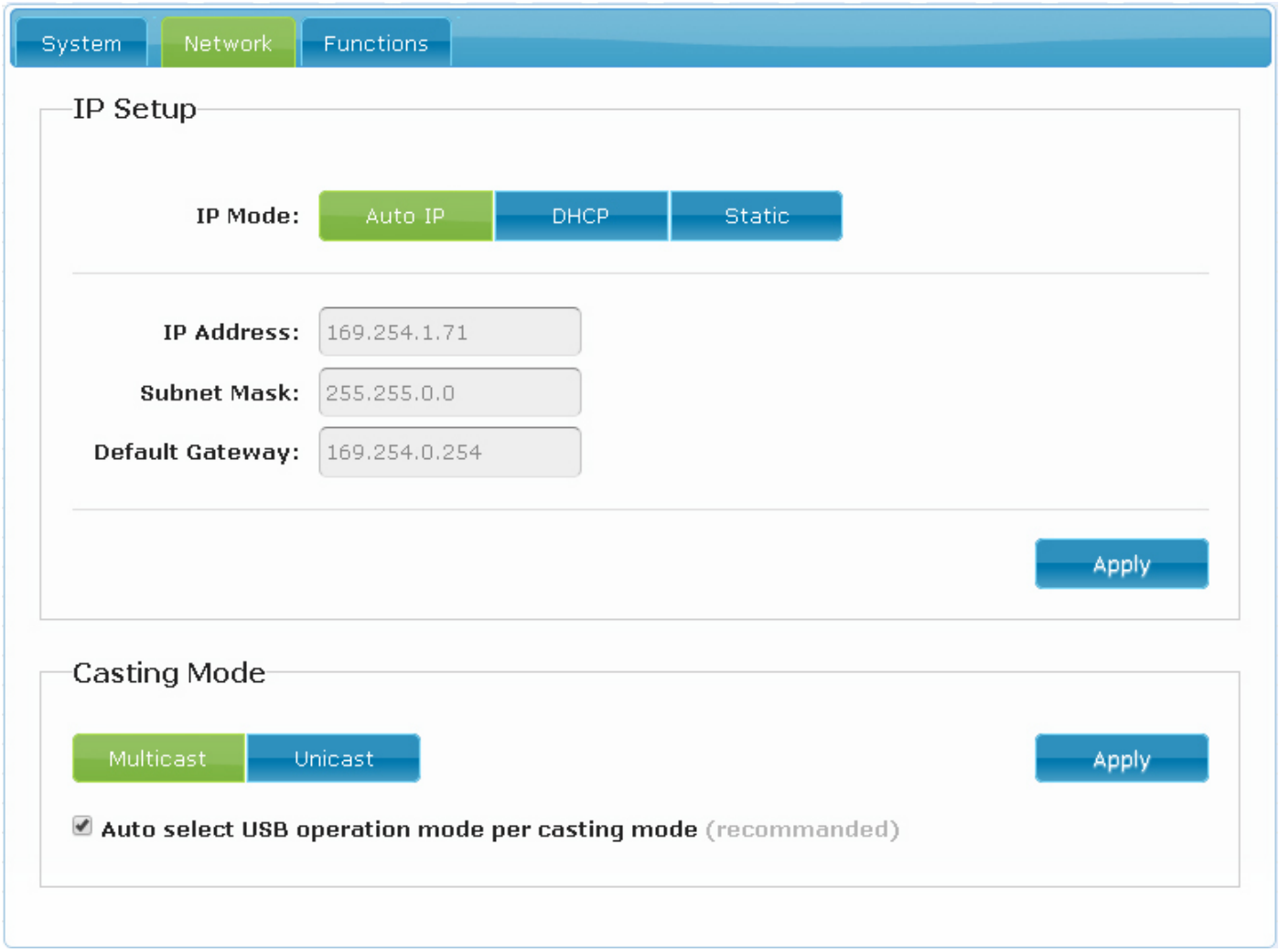
You could also input the IP address of transmitter / receiver at link column of browser if you know the exact IP address of them.

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

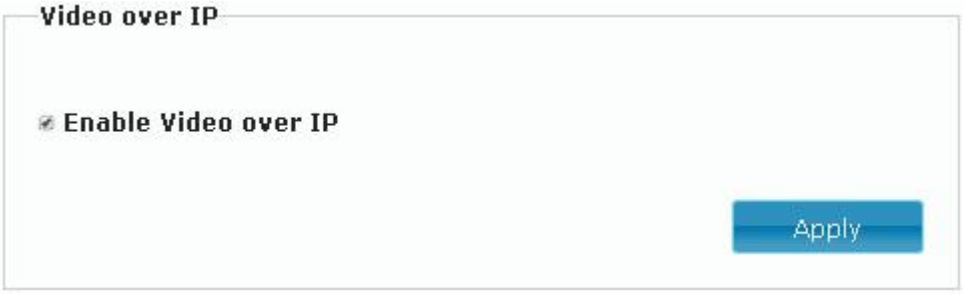
Network Menu:



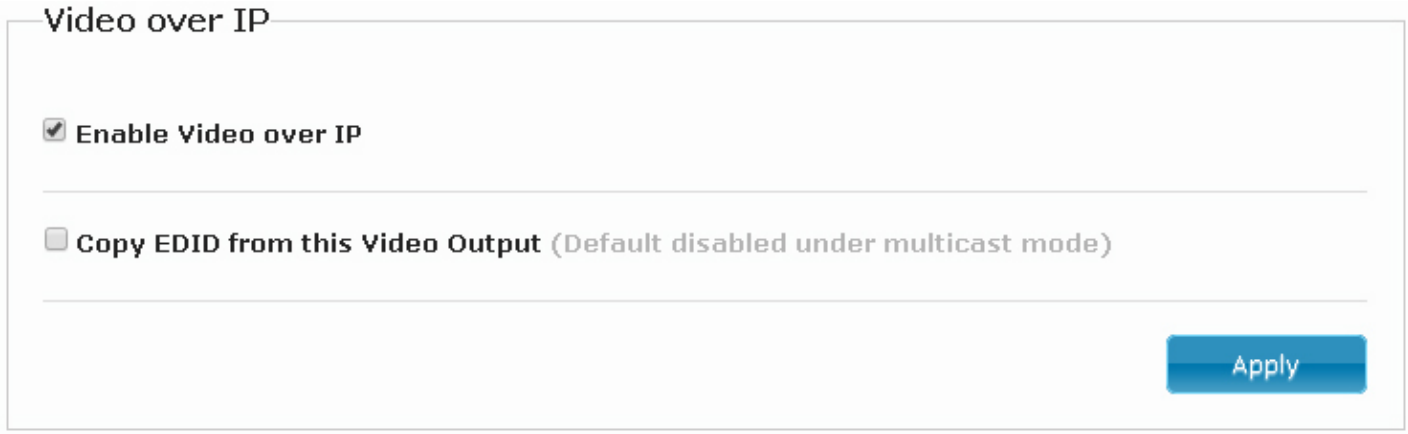
IP Setup:

- IP Mode could be Auto IP, DHCP, Static three mode, default is Auto IP
- Casting Mode : could be Multicast, Unicast mode, default is Multicast，
  When using Multicast mode, please check the “Auto select USB operation mode per casting mode” box

Functions Menu:

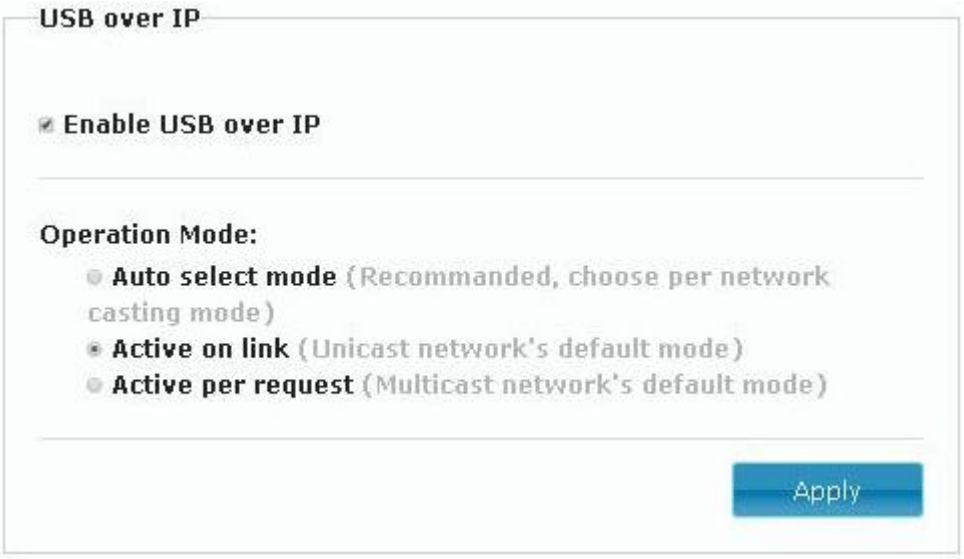


For transmitter:
Video over IP:
This function setup the video signals send from network, default is checked.
Please note it will turn off HDMI output of receivers in same channel if this function be disabled, only analog audio output



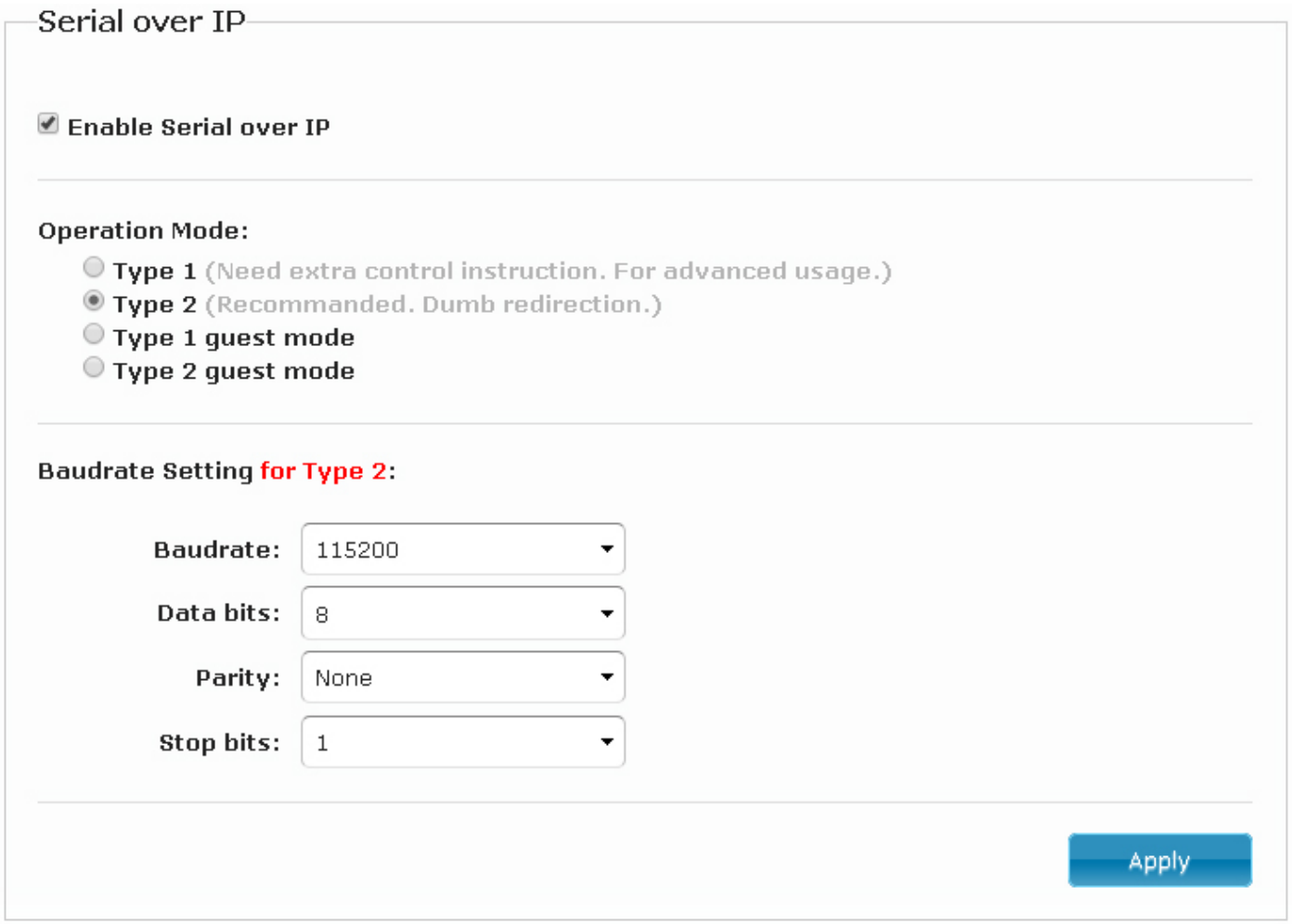
For Receiver:
Video over IP:
This function setup the video signals send from network, default is checked.
Please note it will turn off HDMI output of receiver if this function be disabled, only analog audio output

Copy EDID from this Video Output:
Check this box will auto copy EDID from the TV connected to receiver when receiver booting, default is not checked.
In multiple connections transmitter will use default EDID 1080p with 2 channel audio, to prevent EDID conflict recommend check this box in Unicast mode only.



USB over IP Setup:
This function setup the USB signals send from network, default is checked.

Operation Mode:
USB device operation setting, default is “Auto select mode”
In Unicast mode recommend set to “Active on link”.
In Multicast mode recommend set to “Active per request”.



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 : **default is 115200, 8, None, 1**

DKM01BT Package Include:
Transmitter x 1
USB A to B cable x 1
IR emitter cable x 1
DC 5V 2Amp power adapter x 1
Software CD x1

VDKM01BR Package Include:
Receiver x 1
IR emitter cable x 1
IR remote control x1
DC 5V 2Amp power adapter x 1

Specification:

ITEM NO.	**DKM01BT**
Support Resolution	480i / 480p / 720p / 1080i / 1080p @ 24Hz、25Hz、30Hz、50Hz、60Hz
Transmission Distance	CAT.5e：150M / CAT.6：180M (Max)
USB Connector	USB Type B x 1
RS232 Connector	DB9 (Female) x 1
Video Input Connector	DVI-I x 1 (29 Pin) Digital Only
Video Loop Output Connector	DVI-I x 1 (29 Pin) Digital Only
Link Connector	RJ45 x 1
Audio Connector	3.5 mm Phone Jack x 2 (10KΩ / 1Vpp)
IR Receiver (Internal)	30-60Khz / ±45° / 5M
IR Emitter (External)	3.5mm Stereo Phone Jack
Power Supply	DC 5V 2A
Power Consumption	750mA (Typical) / 1000mA (Max)
Temperature	Operation: 0 to 55℃, Storage: -20 TO 85℃, Humidity: up to 95%
Dimensions mm	167x105.5x40
Weight g	470

ITEM NO.	**VDKM01BR**
Support Resolution	480i / 480p / 720p / 1080i / 1080p @ 24Hz、25Hz、30Hz、50Hz、60Hz
Transmission Distance	CAT.5e：150M / CAT.6：180M (Max)
USB Connector	USB Type A x 4
RS232 Connector	DB9 (Male) x 1
Video Output Connector	DVI-I x 1 (29 Pin) Digital Only /15-pin Mini D-sub
Link Connector	RJ45 x 1
Audio Connector	3.5 mm Phone Jack x 2 (10KΩ / 1Vpp)
IR Receiver (Internal)	30-60Khz / ±45° / 5M
IR Emitter (External)	3.5mm Stereo Phone Jack
Power Supply	DC 5V 2A
Power Consumption	750mA (Typical) / 1000mA (Max) Without USB Power Consumption
Temperature	Operation: 0 to 55℃, Storage: -20 TO 85℃, Humidity: up to 95%
Dimensions mm	167x105.5x40
Weight g	480

RoHS CE FC

Rev. A