

XTENDEX® Series

ST-IPFOUSB4K-L/R-LCVW

4K HDMI USB KVM Extender with Video Wall Support Over IP via Two LC Singlemode/Multimode Fiber Optic Cables



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CHANGES

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INTRODUCTION

The XTENDEX® 4K(30Hz) HDMI USB KVM Extender over IP via Fiber provides remote KVM (USB keyboard, USB mouse (USB1.x/USB2) and 4Kx2K UHD HDMI monitor) access to a USB computer up to 9,842 feet (3,000 meters) away via a duplex LC singlemode fiber optic cable and 1,804 feet (550 meters) using duplex LC multimode fiber optic cable.

Each KVM extender consists of a local unit that connects to a computer and also supplies video to a local monitor, and a remote unit that connects to an HDMI monitor, 3.5mm stereo audio speakers and microphone, RS232, and up to four USB devices (keyboard, mouse, flash drive, HDD, or touchscreen display). The local and remote units can be connected together for a Point-to-Point connection via fiber cable, or a Point-to-Many or Many-to-Many connection via a managed Gigabit SFP switch.

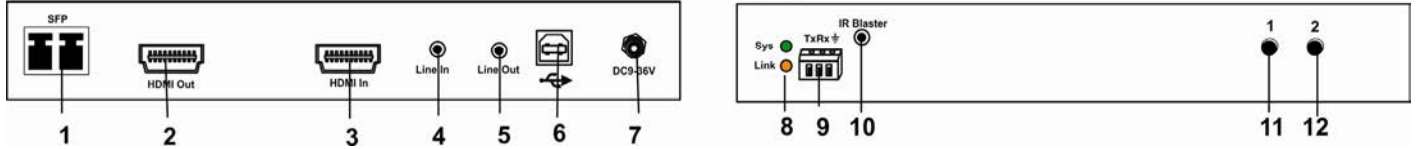
Features:

- Signal transmission via two-strand singlemode LC fiber optic cable.
 - Using singlemode 9-micron cable, extend to 9,842 feet (3,000 meters).
 - Using multimode 50-micron cable, extend to 1,804 feet (550 meters).
- Supports Ultra-HD 4Kx2K resolutions to 3840x2160 (30Hz), 2K resolution 2048x1080, HDTV resolutions to 1080p, and up to 1920x1200 (WUXGA).
- HDMI features supported:
 - HDMI 1.4
 - x.v.Color, sYCC601 color, Adobe RGB Color and Adobe YCC601 color
 - Dolby TrueHD, LPCM 7.1, DTS-HD Master Audio, Dolby Digital, and DTS
 - Bandwidth up to 340 MHz (10.2 Gbps)
 - Lip Sync
 - HDCP 1.4 compliant.
- Transparent USB ports for self-powered and/or bus-powered USB peripheral devices (security cameras, printers, scanners, touch screen monitors, game controllers, flash drives, keyboards, mice, etc.).
 - Two USB 2.0 and two USB 1.1
 - Keyboard and mouse are hot-pluggable.
- Supports video wall installations from 1x2 to 8x16 screens.
 - Displays can be rotated 180 and 270°.
- Plug-and-Play installation allows receivers to find the transmitter automatically on the same network. (Network configuration may be required for managed SFP switch.)
- Support for Point-to-Many or Many-to-Many connections requires a managed Gigabit SFP switch with IGMP support and Jumbo frame support.
 - Manage transmitter/receiver connections and video wall configuration with web interface or network switch that supports VLAN; Each VLAN group acts as a separate HDMI Over IP Channel on the network.
- When using multiple remote units, there are two USB control modes - Exclusive Mode and Sharing Mode.
 - USB Exclusive Mode: Only one remote unit can have USB control over the source computer at any time.
 - USB Sharing Mode: Multiple remote units share the control of the source computer.
 - Up to 5 USB devices will be recognized by the computer.
- Full Infrared Remote (IR) control of HDMI source from remote HDTV using existing source remote control.
- Supports full-duplex RS232 up to 115200 baud.
- Customizable EDID table on local unit.
- Supports the DDC2B protocol.

- Easily expandable – add receivers as you add control stations.
- Integrated mounting brackets for easy surface/wall mounting.

FEATURES AND FUNCTIONS

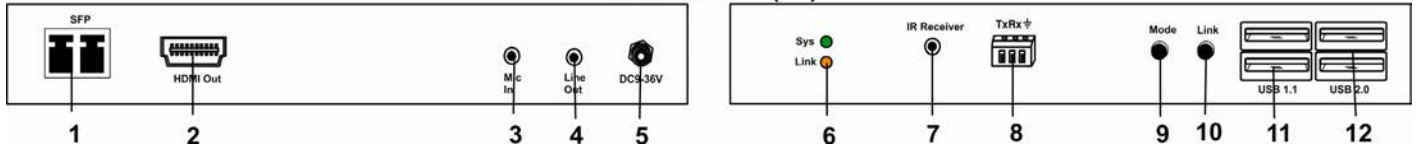
ST-IPFOUSB4K-L-LCVW Local Unit (Tx)



No.	Connector	Description
1	SFP Port	Connect to managed Gigabit SFP Switch port or directly to RX using duplex LC fiber optic cable with pre-installed transceiver
2	HDMI OUT	Local HDMI loop-out
3	HDMI IN	Supports HDMI input video source up to 4K30Hz
4	Line in	3.5mm input audio will be extended to the Line Out of RX
5	Line out	3.5mm Line Out audio is extended from Microphone of RX
6	USB-to-PC	USB-B to PC USB port for USB 2.0 Virtual HUB extension
7	DC 9~36V In	System power input.
8	System LED (Green) Link LED (Amber)	Green Blinking Slowly/Amber Off: System is starting up. Green On/Amber Off: System is ready, but TX/RX not connected. Green Blinking Rapidly: TX/RX connected and communicating. Amber On: Video input is ready. Amber Blinking Slowly: Video input is not ready
9	RS-232 (terminal block)	Serial-over-IP function, pin assignment: TxD-RxD-GND
10	IR Blaster	Connect to external IR Emitter (sold separately)
11	Button 1	Press and Hold at Power ON until Green and Amber LEDs are blinking: Reset to Factory default and enter 192.168.0.88 setup mode.
		Press and hold for 3 sec.: To Lock RX's keyboard and mouse.
12	Button 2	Press: To select Video/Graphic mode
		Press and hold for 3 sec.: To Enable/Disable Anti-Dither.

Note: If any 3.5mm audio jacks on the TX or RX are used, the HDMI cable from the Receiver to the monitor will not include digital audio to the speakers in or connected to the monitor.

ST-IPFOUSB4K-R-LCVW
Remote Unit (Rx)



No.	Connector	Description
1	SFP Port	Connect to managed Gigabit SFP switch port or directly to TX using duplex LC fiber optic cable with pre-installed transceiver
2	HDMI Out	Connect to HDMI screen by HDMI-to-HDMI cable
3	Mic. IN	3.5mm Mic. In, extended to Line Out of TX (Unicast mode)
4	Line OUT	3.5mm Line Out, can be Line In or HDMI audio of source TX
5	DC 9~36V In	System power input.
6	System LED(Green) Link LED (Amber)	Green Blinking Slowly/Amber Off: System is starting up. Green On/Amber Off: System is ready, but TX/RX is not connected. Green Blinking Rapidly: TX/RX connected and communicating. Amber On: Video input is ready. Amber Blinking Slowly: Video input is not ready
7	IR Receiver	Remote Universal IR receiver(optional-sold separately)
8	RS-232 (terminal block)	Serial-over-IP function. (Pin assignment: TxD-RxD-GND)
9	Mode button	Press: To select Video/Graphic mode
		Press and hold for 3 sec.: To Enable/Disable Anti-Dither
		Press and Hold at Power ON until Green LED is blinking: Set this RX as EDID Master
10	Link button	Press: To enter OSD Transmitter List menu
		Press and hold for 3 sec.: To request USB access right.
		Press and Hold at Power ON until Green and Amber LEDs are blinking: Reset to Factory default and enter 192.168.0.88 Setup mode
11	USB 1.1 Host	2 x Transparent USB 1.1 ports (left) for Keyboard, Mouse
12	USB 2.0 Host	2 x Transparent USB 2.0 ports (right) for Disk, Touchscreen, etc ...

CONFIGURATION

Use TX/RX Configuration Web page to configure. There are Setup mode and Operation mode for the Configuration Web page. Setup mode can be used in the event you change the IP address of the unit in Operation mode and forget what it is. The Setup Mode IP address cannot be changed. By entering Setup mode, the Version Information screen will tell you what the current Operation Mode IP address is.

Setup Mode Configuration

To enter TX/RX Setup Mode Configuration Web page, press and hold the Button 1 (on Tx) or Link button (on Rx) and Power ON until the Green and Amber LEDs start blinking, then release the button. This will force the TX/RX to enter **Setup mode**.

1. Directly connect TX/RX to a PC SFP port and set the PC IP to 192.168.0.1, Net Mask 255.255.255.0. (If your PC does not have an SFP port, you will need to connect through a Managed Gigabit SFP switch.)
2. Open PC's Web Browser (we recommend the latest version of Chrome) and enter IP address 192.168.0.88 to enter the Setup Mode Configuration Web page.

The Setup Mode Configuration Web page contains a System tab with sub-tabs Version Information, Update Firmware, Configuration, Utilities, and Statistics. For determining the IP address, you only need the System tab and Version Information (below).

Version Information

Provides information for "Tx" or "Rx", Firmware version, IP address, MAC address:



Operation Mode Configuration

To enter TX/RX Operation mode Configuration Web page:

Set PC IP 10.0.1.1, Net Mask 255.0.0.0.

Open Browser (we recommend Chrome), then enter TX/RX IP address 10.xx.xx.xx (the IP address can be found on the bottom of the unit).

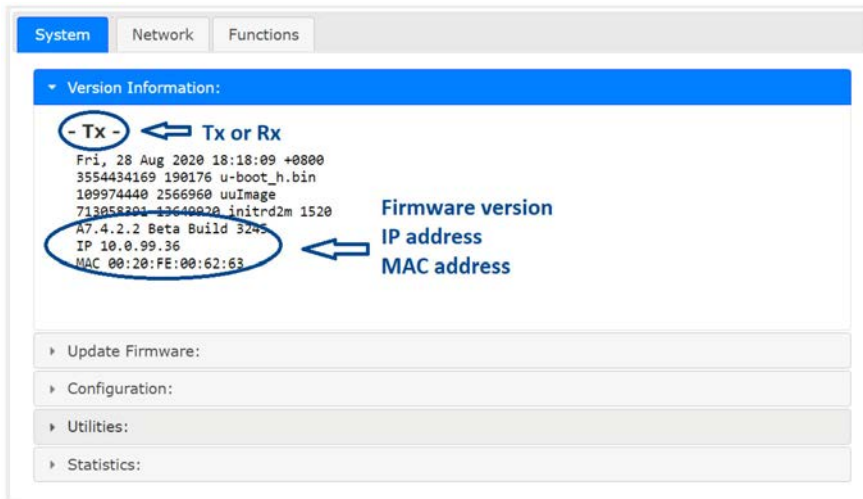
The TX Configuration Web Page contains 3 subtabs: **System** , **Network** , **Functions** .

The RX Configuration Web Page contains 4 subtabs: **System** , **Video Wall** , **Network** , **Functions** .

System

Version Information

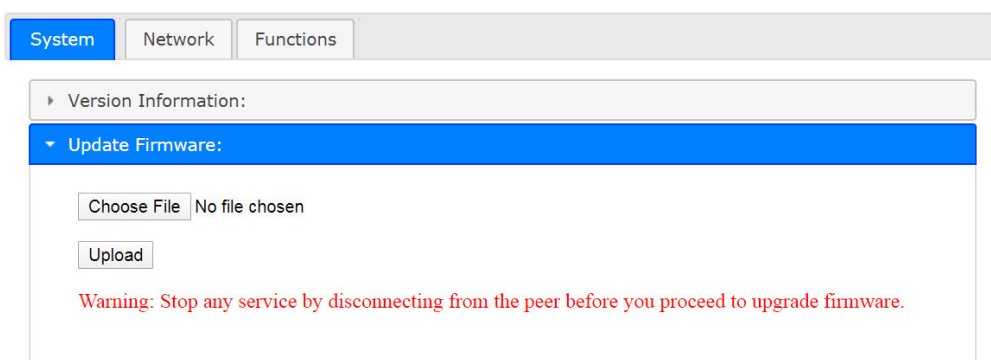
Provides information for “Tx” or “Rx”, Firmware version, IP address, MAC address:



Update Firmware

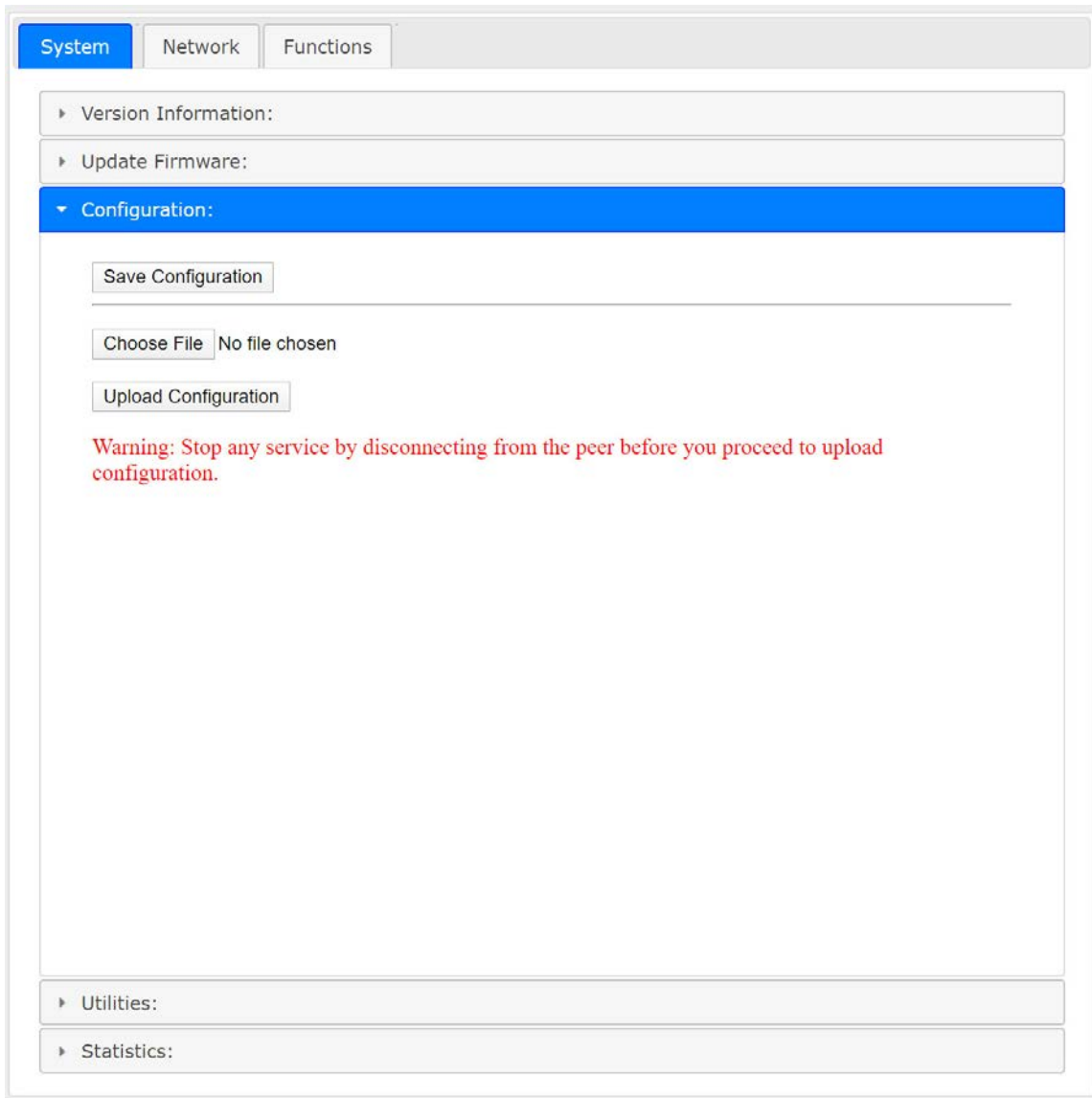
Enter **Update Firmware** ---> navigate to the firmware file (.bin) then click **Upload** to start a firmware upgrade. The TX and RX each need to be logged into and upgraded with firmware file specific to the TX and RX respectively. The firmware upgrade takes about 3 minutes, after which it will display “DONE Rebooting...” to indicate the unit has been upgraded and rebooted. After the TX or RX reboots, you will need to return to Setup Mode (page 4) in order to confirm the firmware version update or configure the unit. Be sure your PC is running the latest version of its browser (we recommend Chrome) as older versions will not report the new firmware version.

Firmware files can be downloaded from <https://www.networktechinc.com/4k-hdmi-usb-extend-fiber.html> .



Configuration

You can export the current settings to a configuration file, or import configuration from an external file. Enter **Configuration** ---> Click **Save Configuration** to export configuration, click **Upload Configuration** to import configuration.



The screenshot shows a web interface with three tabs: "System", "Network", and "Functions". The "System" tab is active. Underneath, there are three expandable sections: "Version Information:", "Update Firmware:", and "Configuration:". The "Configuration:" section is expanded and highlighted in blue. It contains a "Save Configuration" button, a "Choose File" button with the text "No file chosen" next to it, and an "Upload Configuration" button. Below these buttons is a red warning message: "Warning: Stop any service by disconnecting from the peer before you proceed to upload configuration." At the bottom of the interface, there are two more expandable sections: "Utilities:" and "Statistics:".

Utilities

Commands ---> **Factory Default** ---> To reset the device to the factory default.

Command ---> **Reboot** ---> To reboot the device.

Compatibility mode ---> Not applicable to this product

EDID (TX only, not in RX)

The TX provides flexible EDID selections:

Copy EDID from EDID Master --->TX will get EDID from the RX with EDID Master setting.

Resolution--->You can set TX with a specific resolution from the drop-down menu.

Available resolutions are 3840x2160 30Hz, 2560x1440 50Hz, 1920 x 1200 60Hz, 1920 x 1080 60Hz(**default**), 1680 x 1050 60Hz, 1440 x 900 60Hz, 1366 x 768 60Hz, 1280 x 1024 60Hz, 1280 x 720 60Hz, 1024 x 768 60Hz, 720 x 480 60Hz.

Note: This Resolution option will be overwritten by the RX EDID Master if the TX is set on Unicast.

Console API Command --->Not applicable to this product

Statistics

Display system status for State Machine, Network, Video EDID, Video Screen attachment, Video Timing.

The screenshot displays the 'Statistics' page with three main sections: State Machine, Network, and Video. The State Machine section shows the current state as 's_attaching'. The Network section provides details such as Host Name (1004), IP Address (192.168.3.46), Subnet Mask (255.0.0.0), Default Gateway (192.168.3.3), MAC Address (0020FE005CE0), Casting Mode (Multicast Mode), Link Status (on), and Link Mode (100M). The Video section shows the EDID Used as a hex dump and indicates that Local Video Output is 'attached=n' and Video Timing Information is 'Not Available'.

```
Statistics:
State Machine
State: s_attaching

Network
ID (Host Name): 1004
IP Address: 192.168.3.46
Subnet Mask: 255.0.0.0
Default Gateway: 192.168.3.3
MAC Address: 0020FE005CE0
Casting Mode: Multicast Mode
Link Status: on
Link Mode: 100M

Video
EDID Used:
00 ff ff ff | ff ff ff 00 | 06 74 79 28 | 47 02 00 00 |
34 19 01 03 | 80 3e 22 78 | 2a 08 a5 a2 | 57 4f a2 28 |
0f 50 54 bf | ef 00 d1 c0 | b3 00 95 00 | 81 80 81 40 |
81 c0 01 01 | 01 01 02 3a | 80 18 71 38 | 2d 40 58 2c |
45 00 6d 55 | 21 00 00 1e | 02 3a 80 18 | 71 38 2d 40 |
58 2c 45 00 | 6d 55 21 00 | 00 1e 00 00 | 00 fd 00 17 |
50 1e 63 10 | 00 0a 20 20 | 20 20 20 20 | 00 00 00 fc |
00 55 32 38 | 37 39 47 36 | 0a 20 20 20 | 20 20 01 55 |
02 01 04 00 | 02 3a 80 18 | 71 38 2d 40 | 58 2c 45 00 |
6d 55 21 00 | 00 1e 01 1d | 00 72 51 d0 | 1e 20 6e 28 |
55 00 6d 55 | 21 00 00 1e | 8c 0a d0 8a | 20 e0 2d 10 |
10 3e 96 00 | 6d 55 21 00 | 00 18 8c 0a | d0 90 20 40 |
31 20 0c 40 | 55 00 6d 55 | 21 00 00 18 | 02 3a 80 18 |
71 38 2d 40 | 58 2c 45 00 | 6d 55 21 00 | 00 1e 00 00 |
00 00 00 00 | 00 00 00 00 | 00 00 00 00 | 00 00 00 00 |
00 00 00 00 | 00 00 00 00 | 00 00 00 00 | 00 00 00 67 |

Local Video Output:
attached=n

Video Timing Information:
Not Available
```

Network

IP Setup (TX/RX)

The system supports Auto IP, DHCP, and Static(default) for the IP configuration:

Auto IP ---> 169.254.xxx.xxx (Auto), Subnet Mask 255.255.0.0, Default Gateway 192.168.0.1

DHCP ---> Get IP from DHCP Server

Static ---> Enter IP Address, Subnet Mask, Default Gateway, click Apply .

The screenshot shows a web interface for network configuration. At the top, there are three tabs: 'System', 'Network' (which is highlighted in blue), and 'Functions'. Below the tabs is a section titled 'IP Setup'. Inside this section, there are three radio buttons for 'IP Mode': 'Auto IP', 'DHCP', and 'Static'. The 'Static' button is selected and highlighted in blue. Below the radio buttons, there are three input fields: 'IP Address' with the value '192.168.3.46', 'Subnet Mask' with the value '255.0.0.0', and 'Default Gateway' with the value '192.168.3.3'. At the bottom right of the 'IP Setup' section, there is an 'Apply' button.

Casting Mode (TX)

TX can be set in **Multicast (default)** or Unicast mode.

In Multicast mode, the Multicast IP prefix can be configured:

The screenshot shows a web interface for casting mode configuration. At the top, there is a section titled 'Casting Mode'. Below this title, there are two radio buttons: 'Multicast' (which is selected and highlighted in blue) and 'Unicast'. Below the radio buttons, there are two input fields: 'Multicast IP prefix' with the value '225' and '(default 225)', and 'Multicast IP' with the value '225.2.40.69'. At the bottom, there is a checkbox labeled 'Multicast stop video streaming when no client connected' which is currently unchecked.

Multicast IP prefix: range is 224-239 (default is 225)

The second digit is fixed at 2.

The third and 4th digits are configurable with a range of 00 to 99.

Place a checkmark in "Multicast stop video streaming when no client connected" if you want the Transmitter to automatically stop casting the video when no source is detected.

Casting Mode (RX)

The RX can be set in **Multicast (default)** or Unicast mode as the below.

In **Multicast mode**, you can setup the Multicast IP prefix (default is 225) and select the Connection Method from:

- First Available (**default**),
- Multicast IP,
- OSD Transmitter List, and
- Direct Connection.

In **Unicast mode**, you can select the Connection Method from

- First Available,
- OSD Transmitter List,
- TX IP and
- Direct Connection.

RX supports the following Connection Methods:

First Available: the RX will connect to the first available TX when powered on.

Multicast IP 225.2.xx.xx: the RX will connect to the TX with the same Multicast IP address specified here.

OSD Transmitter List: the RX will display the available TXs in the OSD menu for user to select. Select “All Transmitters” if all of TXs are permitted. Select “Transmitter IP Range” and input the IP range with “-” and “,”. For example, “10.0.92.101 – 10.0.92.120, 10.0.92.135, 10.0.92.188, ...”

TX IP: the RX will connect to this specified TX only.

Direct Connection: this setting enables RX to connect TX by the same subnet, same Casting Mode, Jumbo Frame and EDID Master will be automatically enabled.

Show TX Device name when connected (RX)

This feature enables RX to display the TX name (or IP) when connected. Default is enabled with 5 seconds.

Casting Mode

Multicast Unicast

Multicast IP prefix: 225 (default 225)

Connection Method:

- First Available
- Multicast IP: 225.2.00.00
- OSD Transmitter List
 - All Transmitters
 - Transmitter IP Range: [] (ex. 10.0.30.1-10.0.30.30,10.0.30.200,...)
- TX IP: []
- Direct Connection

Show TX Device Name when connected 5 sec (0-99 sec, 0 means always show)

Jumbo Frame

Enabled Disabled

Apply

Jumbo Frame (TX/RX)

The TX/RX supports Jumbo Frame (8K bytes) for better video quality, default **Enabled**.

Note: The SFP Switch also must be set with Jumbo Frame enabled (at least 8K) if TX has been enabled.

Functions

Device Name (TX/RX)

To set TX/RX Device name, enter ---> **Functions** ---> **Device Name** --->input name (20 characters max) ---> **Apply** to save the Device Name.

Video over IP (TX)

Features Include:

Enable Video over IP (Default: Enabled)

Video/Graphic Mode :Select Video Mode for video play smoothly.

Select Graphic Mode for static picture KVM application.

Maximum Bit Rate :Options are “Best Effort”, “200, 150, 100, 50, and 10 Mbps” for the TX bandwidth selection. **(Default: Best Effort).**

Maximum Frame Rate :This provides the maximum % of the TX frames rate capture up **(Default: 100%).**

The screenshot shows a web interface with three tabs: System, Network, and Functions. The Functions tab is active. It contains two main sections:

- Device Name**: A text input field and an Apply button.
- Video over IP**: A section with a checked checkbox for "Enable Video over IP". Below it are two radio buttons: "Video Mode" (selected) and "Graphic Mode". A "Maximum Bit Rate" dropdown menu is set to "Best Effort". A "Maximum Frame Rate" slider is set to 100%, with the text "Capture up to 100% of frames" above it. An Apply button is at the bottom right.

Video over IP (RX)

Functions ---> Video over IP :

Video over IP

Enable Video over IP

Enable Video Wall

Copy EDID from this Video Output (Default disabled under multicast mode)

Scaler Output Mode:

Timeout for Detecting Video Lost:

Turn off screen on video lost

Enable Video over IP (Default Enabled).

Enable Video Wall : Enable this setting for the Video Wall output.

Copy EDID from this Video Output : To assign this RX as the EDID Master.

Scaler Output Mode : The RX includes a scaler feature.

The output resolution can be selected from these options:

Auto EDID (**default**),
Pass Through,
2160p30, 2160p25, 1080p60, 1080p50, 1920x1200, and others
Customize.

Auto EDID means the RX will output to screen resolution according to screen's EDID.

Timeout for detecting video lost : The timeout period for lost video detection (**default 10 sec.**)

Turn off screen on video lost : Stop the video output when video source is lost (**default Enabled**)

USB over IP (TX)

USB over IP

Enable USB over IP

Operation Mode:

Exclusive Mode

Sharing Mode (Maximum 4 Virtual ports)

Compatibility Mode:

Mouse not responding well (Check when USB mouse responding is slow and queer)

K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

Enable USB over IP ---> Check to enable TX's USB over IP feature (**default Enabled**). It works as a 5-port Virtual HUB when TX is attached to a USB port on the PC. Up to 5 Virtual USB ports will be sequentially linked to the connected RX USB devices. There are 4 USB ports on each RX, but only the ports with devices attached (up to 5 total) will occupy the TX's Virtual USB port.

Operation Mode --->The TX USB-over-IP supports the following 2 operation modes:

Exclusive Mode: All of TX's 5 Virtual USB ports will be exclusively assigned to the RX which has the USB access right. The other RXs can request USB access right manually.

Sharing Mode: The TX's 5 Virtual USB ports can be shared by multiple RXs. Depending on the number of USB devices on each RX, it is possible to have maximum 5 RXs sharing the same TX's Virtual USB. If more than 5 devices are connected, the TX will randomly select the 5 ports that will work. The remaining devices will be ignored.

Note: *In Sharing Mode, using more than one mouse or keyboard at the same time from two different RXs will have undesirable results, as the PC will try to respond to both.*

Compatibility Mode

Mouse not responding well ---> enable this setting when mouse is slow and not very responsive.

K/M over IP ---> The TX also has built in K/M over IP HID emulation for multiple RXs to share the same TX's keyboard/mouse. This feature will occupy one TX's Virtual USB port when it is enabled (**default: Enabled**).

USB over IP KMoIP ports (RX)

There are 2 x USB 1.1 and 2 x USB 2.0 ports on each RX. These 4 transparent USB ports can be configured for USB-over-IP or KM-over-IP devices. The USB-over-IP devices will be virtually linked to the TX's 5 Virtual USB ports; the KM-over-IP devices will be linked and shared with the TX's K/M over IP HID emulation port.

The advantage of USB-over-IP is devices have better USB compatibility, for example USB Touch, Disk, ... devices must be configured with USB-over-IP. The advantage of KM-over-IP device is to have multiple RXs sharing the same TX's K/M over IP HID emulation port. It is recommended to configure the 2 x USB 1.1 (keyboard/mouse) as KMoIP ports and 2 x USB 2.0 as USB over IP ports (for Touch, Disk).

The RX **USB over IP** Configuration Web page:

USB over IP

Enable USB over IP

Apply

This **USB over IP** setting must be enabled for any USB devices to be attached with TX's Virtual USB HUB.

The RX **KMoIP ports** Configuration Web page:

KMoIP ports



1. 2. 3. 4.

USB 1.1 USB 2.0

Please select the ports you want to be KMoIP ports:

1 2 3 4

Enable the port #1, 2, 3, 4 for the device to be linked with the TX's K/M over IP HID emulation port. **Default Port 1 and 2 KMoIP Enabled.**

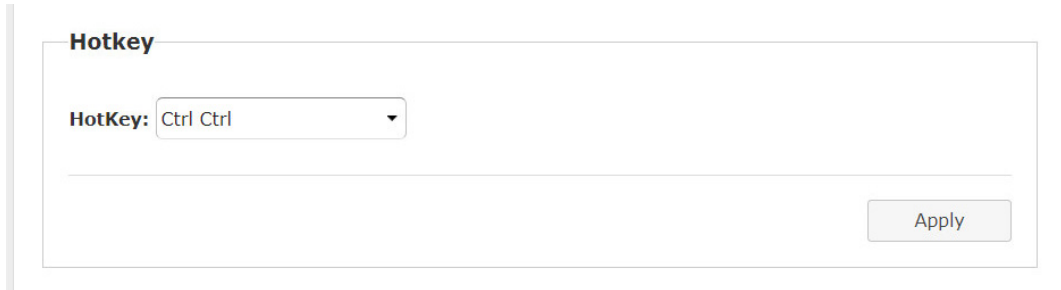
Note: All of RX's 4 x USB ports will be configured as KMoIP if the "USB over IP" is disabled.

Hotkey (RX)

The RX supports Hotkey for OSD Menu.

To choose the RX OSD Hotkey:

Functions ---> **Hotkey** ---> select the Hotkey from the list: <Ctrl><Ctrl>, <Shift><Shift>, <Alt><Alt>, or <Scroll><Scroll> (default: Ctrl Ctrl).



The screenshot shows a configuration window titled "Hotkey". Inside the window, there is a label "HotKey:" followed by a dropdown menu that currently displays "Ctrl Ctrl". Below the dropdown menu is a horizontal line. In the bottom right corner of the window, there is a button labeled "Apply".

Serial over IP

Enable Serial over IP

Operation Mode:

- Type 1 (Need extra control instruction. For advanced usage.)
- Type 2 (Recommended. Dumb redirection.)
- Type 1 guest mode
- Type 2 guest mode

Baudrate Setting for Type 2:

Baudrate:	115200	▼
Data bits:	8	▼
Parity:	None	▼
Stop bits:	1	▼

Serial over IP (TX/RX)

Serial over IP ---> Enable/Disable (default Enabled).

Operation Mode

Type 1: for Unicast application where user can dynamically link with any target RX.

Type 2: for Multicast application where TX RS-232 will link with all of connected RXs (default).

Type 1 guest: similar to type 1 but using PC to link with RX's RS-232.

Type 2 guest: similar to type 2 but using PC to link with RX's RS-232.

Baudrate Setting for Type 2

Set RS-232 Baudrate, Data bits, Parity, Stop bits. (default 115200, 8-n-1)

Point-to-Many connection via RS232

If one local unit pairs with multiple remote units, then point-to-many RS232 is supported.

When the Tx unit sends RS232 message, all Rx units receive the same message.

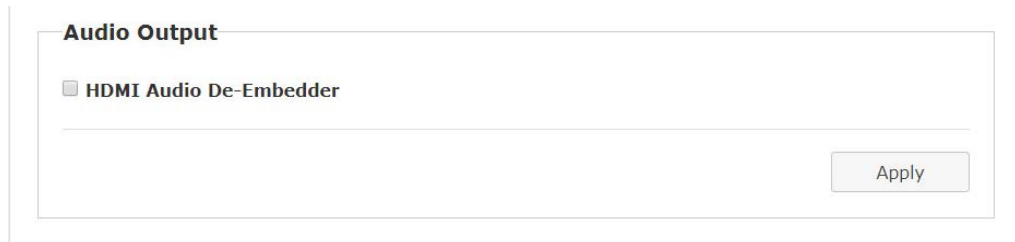
When multiple Rx units send an RS232 message at the same time, the fastest Rx will take control. The Tx unit will only receive that Rx's message and reject messages sent from other Rx units. Once the controlling Rx stops sending messages for about 1~2 seconds, the control authority will be released and all Rx units will be competing for priority again.

Audio Output (RX)

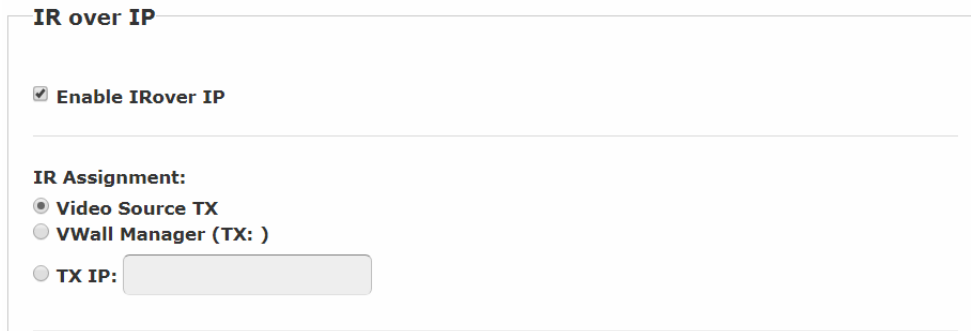
If the TX's input audio is in HDMI, you can route the audio output on Line Out of the RX:

Functions ---> Audio Output ---> check "HDMI Audio De-Embedder".

Click Apply to save the setting and reboot. (default Disabled)



Note: If any 3.5mm audio ports on the TX or RX are used, audio will not be routed through the HDMI cable at the RX.



IR over IP (RX)

It is possible to assign the IR signal routing path:

Enable IR over IP (default Enabled)

IR Assignment --->Select IR routing path from the following 3 options:

Video Source TX --->Send the RX's IR input signals to the TX of current video source.

VWall Manager (TX:) --->**Not applicable**

TX IP: --->Send the RX's IR input signals to this specified TX.

Multi-Screen Setting

Main Video

2nd Video TX IP:

3rd Video TX IP:

4th Video TX IP:

Multi-Screen Setting (TX)

The system supports Multi-Screen feature which is useful for computers with multiple screen outputs. As above TX Multi-Screen Setting Web page:

- Main Video : Enable this setting if this TX is connected to the PC’s main video output.
- Note: Any TX with Main Video setting disabled will not be shown on the OSD Transmitter List.**
- 2nd Video TX IP : Type in another TX IP address which is connected to the PC’s 2nd video output.
- 3rd Video TX IP : Type in another TX IP address which is connected to the PC’s 3rd video output.
- 4th Video TX IP : Type in another TX IP address which is connected to the PC’s 4th video output.

Multi-Screen Setting

2nd Screen RX IP: **Mirror**

3rd Screen RX IP: **Mirror**

4th Screen RX IP: **Mirror**

Multi-Screen Setting (RX)

Similar to the TX Multi-Screen Setting page, in the above RX Multi-Screen Setting Web page:

- 2nd ScreenRX IP : Type in another RX IP address which is connected to the 2nd screen.
- 3rd ScreenRX IP : Type in another RX IP address which is connected to the 3rd screen.
- 4th ScreenRX IP : Type in another RX IP address which is connected to the 4th screen.

When the Main RX switches to a new TX, its associated RXs will also be switched to the new TX’s associated TXs automatically.

Mirror (RX)

When the “Mirror” option is enabled, the associated RXs will connect to the same TX as the Main RX is connected to. This splitter function enables multiple RXs to display the same TX.

Video Wall Functions

Remote Unit function only (RX)

The RX comes with a Video-Wall feature. Multiple RXs can receive the same video stream and display on multiple screens in a grid. You can setup the Video-Wall either by using OSD (On Screen Display) or the Web page.

Note: All TX and RX must be running the same firmware version to be compatible with each other.

The following section provides information for the Web page method of Video Wall setup.

▼ Basic Setup:

Bezel and Gap Compensation

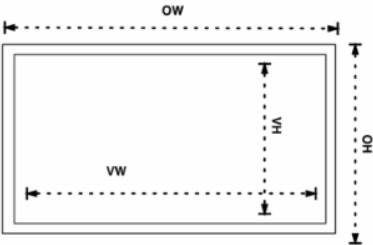
OW:

OH:

VW:

VH:

UNIT: 0.1mm



The diagram shows a rectangular monitor with dashed lines indicating dimensions. OW is the total width including bezel, OH is the total height including bezel, VW is the width of the active display area, and VH is the height of the active display area.

Wall Size and Position Layout

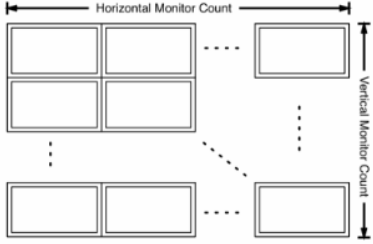
Vertical Monitor Count:

Horizontal Monitor Count:

Row Position:

Column Position:

UNIT: Panel



The diagram shows a grid of monitors. Horizontal Monitor Count is the number of monitors in a row, and Vertical Monitor Count is the number of monitors in a column. Row Position and Column Position indicate the starting index of the grid.

Preferences

Stretch Type:

Clockwise Rotate:

Apply To: "All" device(s) in the list

Show OSD

Basic Setup

Enter RX Web page ---> Video Wall ---> Basic Setup .

Bezel and Gap Compensation

Enter the value for OW (Outside Width), OH (Outside Height), VW (View Width), VH (View Height) in 0.1mm units ---> Apply .

Wall Size and Position Layout

Select the value for Vertical Monitor Count, Horizontal Monitor Count, Row Position, Column Position from the drop-down menu ---> Apply .

Preferences

Stretch Type --->Select "Fit In" or "Keep Aspect Ratio" ---> Apply

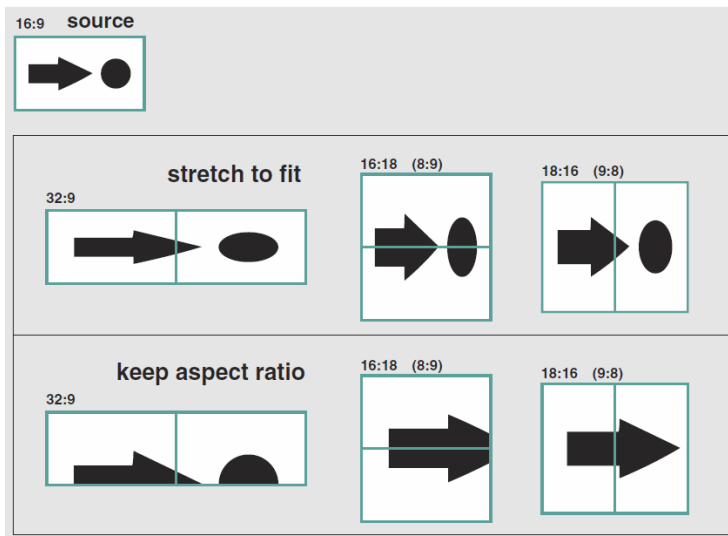
Clockwise Rotation ---> Select 0, 180, 270 --> Apply

Notes:

Fit In: Stretches or compresses the broadcast screen to fill the whole wall.

Keep Aspect Ratio: keeps strict picture aspect ratio. If there is a mismatch, some image may fall beyond screen edges.

The following screenshot shows couple examples of Fit In and Keep Aspect Ratio:



Show OSD

To identify the screen, check the "Show OSD" and select the device then click Apply button.

Video-Wall Advanced Setup

The Advanced Setup can be used for special effects which are not included in Basic Setup. There are two steps in advanced setup:

Step 1: Choose one or more target RXs to apply setup to.

Step 2: After the targets are selected, changes can be applied in Step 2.

Advanced Setup:

Step 1: Choose Control Target

0229 This

Show OSD

Step 2: Control Options

Reset to Basic Setup:

Reset

Stretch Type:

Fit In Apply

Clockwise Rotate:

0 Apply

Show OSD

To identify the screen, check the “Show OSD” and select the device then click Apply button.

Reset to Basic Setup --->Reset the target(s) to the setting of “Basic Setup”.

Stretch Type

Fit In: Stretch the full screen to the whole wall.

Keep Aspect: keeps picture aspect ratio; some image may spill off screen if needed.

Clockwise Rotate

0: No rotation

180: clockwise rotate 180 degrees

270: clockwise rotate 270 degrees

Screen Layout (Row x Column):
 X Apply

Row Position:
 Apply

Column Position:
 Apply

Horizontal Shift:
 Apply

Vertical Shift:
 Apply

Horizontal Scale Up (N pixels/column_count):
 Apply

Vertical Scale Up (N pixels/row_count):
 Apply

Console API Command:
 Apply

Screen Layout (Row x Column)

Define the Video Wall size, select the Row and Column count from the drop-down menu.

Row Position : Set the Row position for the selected target RX. (start from 0)

Column Position :Set the Column position for the selected target RX. (start from 0)

Horizontal Shift :Shift target screen horizontal to left/right in 1 pixel units.

Vertical Shift :Shift target screen vertically up or down in 1 pixel units.

Horizontal Scale Up (N pixels/column_count) : Scale up the target screen horizontally, by pixels (1/column count).

Vertical Scale Up (N pixels/column_count) : Scale up the target screen vertically, by pixels (1/row count).

INSTALLATION(TX/RX)

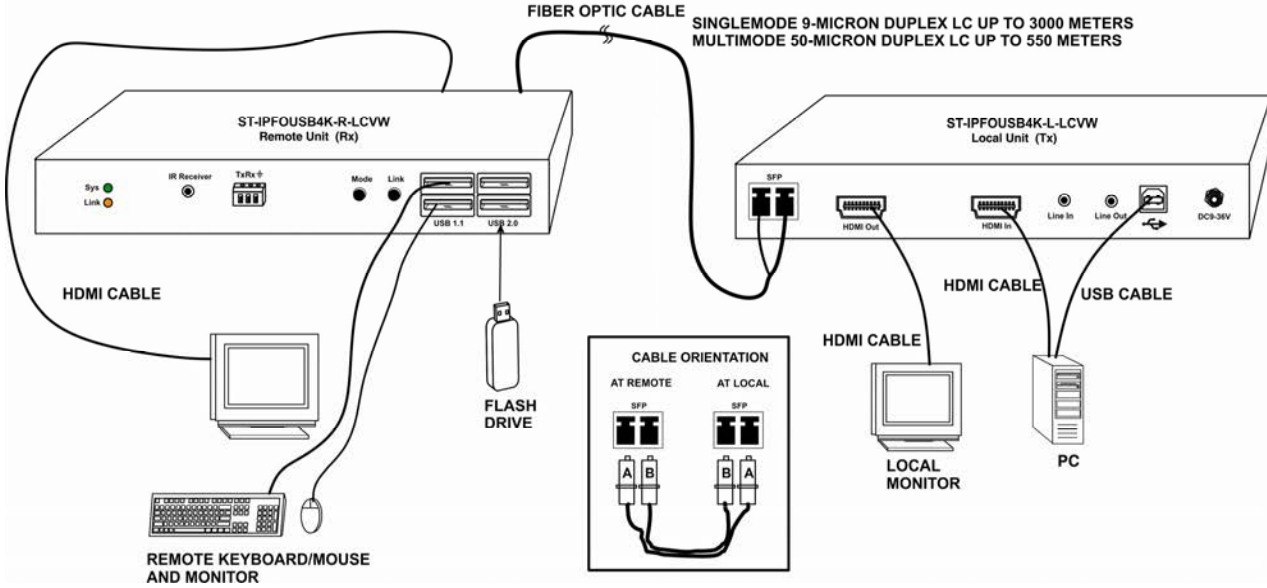
1. The factory default Connection Method for RX is “First Available”, and TX is in Multicast mode with its default Multicast IP (shown on the label). It means all TXs will send packets with default Multicast IP (225.2.xx.xx), and all RXs will find the first available TX for connection.
2. Use an Optical Fiber cable to directly connect TX/RX as a pair connection, or connect to an IGMP-enabled Gigabit SFP switch for many-to-many installation.
Note: Each TX comes with individual factory default Multicast IP which is shown on the unit label.
Note: All TX and RX must be running the same firmware version to be compatible with each other.
3. Connect TX/RX to a video source/screen using an HDMI cable.
4. The TX factory default EDID setting “**Copy EDID from EDID Master**”, and perform step 4.1/4.2 to assign a RX as the EDID Master. (The TX has a built-in EDID with resolution of 1080p if there is no RX set as EDID Master.) You can change TX to a specific resolution using “**Resolution Selection**” on page 7.
 - 4.1 Press and hold the **Mode** button of the specific RX unit and power ON until **Green** LED starts blinking, then release the **Mode** button. This RX will be assigned as EDID Master (RX’s **Green** LED will blink, then steady ON, and **Amber** LED Off to indicate it is ready and waiting for connection with TX). Then power ON other RX units sequentially.
 - 4.2 Refer page 9, enable “**Copy EDID from this Video Output**” to assign a specific RX as EDID Master.
5. The following start-up messages will be displayed during RX power on:
FW: 20-Aug-28 A7.4.2.2 (Firmware date and version)
Local IP: 10.0.99.33 (RX’s IP address)
MAC: 0020FExxxxxx (RX’s MAC address)
Connection Method: First Available
Remote IP: 10.0.x.x/ 225.2.x.x (Connecting target TX IP / Multicast IP)
6. **Enable TX/RX Jumbo Frame setting (see page 10), and set SFP Switch Jumbo Frame with minimum 8K bytes.**
7. Attach HDMI/DVI source to the TX’s HDMI In. Then power ON the TX unit. The **Green** LED will blink , then go steady ON to indicate ready and waiting for connecting with RX.
8. Until TX/RX connection is established, both TX and RX Amber LED will start to blink, indicating waiting for video input source (Green LED is ON).
9. If you are using PC as video source, verify the correct screen EDID is shown on PC’s graphic control panel.
10. Activate the video with audio source connected to TX, then check if all RXs are correctly displayed. In this step, both Green and Amber LEDs should now be ON to indicate the unit is ready and video source is also ready.

USB over IP and KM over IP installation

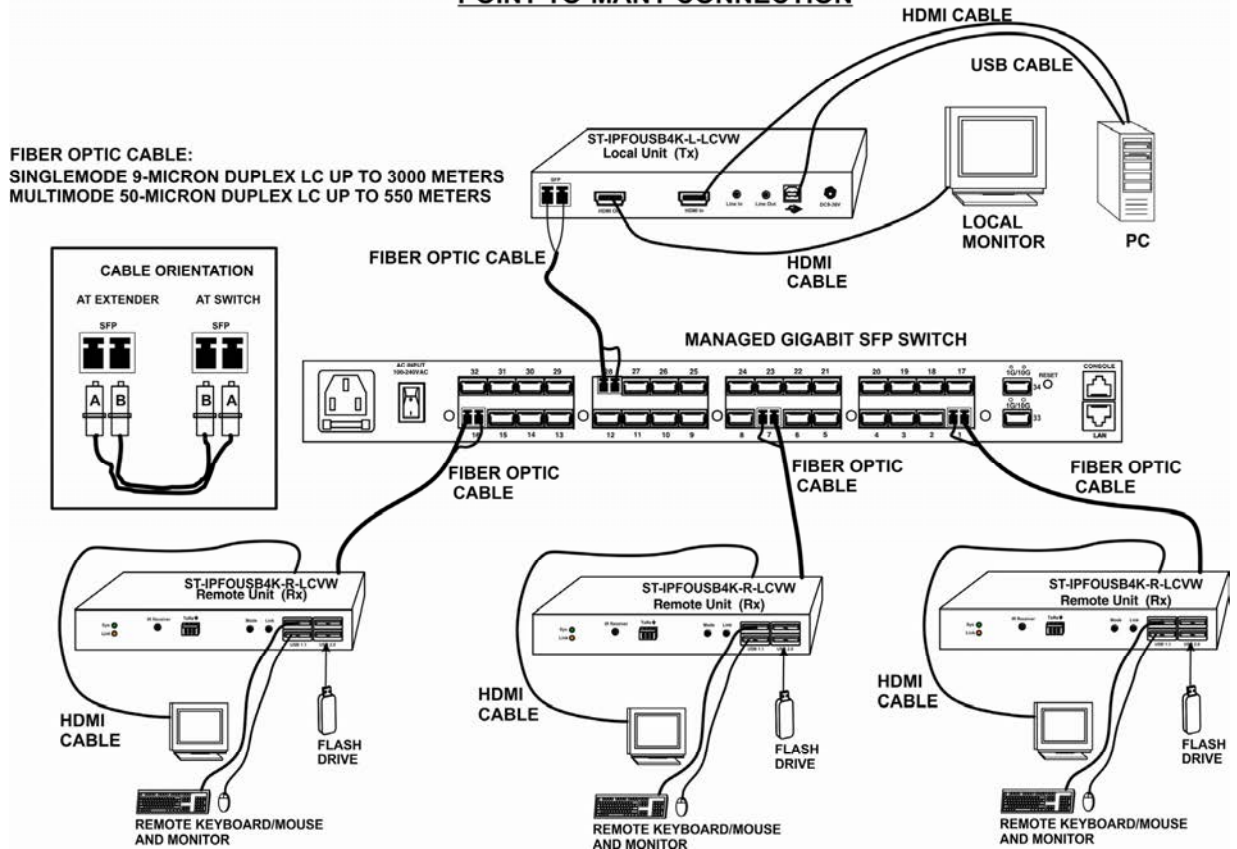
11. Connect TX USB-B port to the PC, the OS will detect a Generic USB 2.0 Virtual Hub Device.
12. Refer to the USB over IP , K/M over IP and KMolP ports on page 13 to properly configure TX and RX for the USB devices such as keyboard, mouse, Pen Drive, Touch Screen, etc.
Note: The RX KMolP ports will be linked to TX’s KM over IP HID emulation; RX USB-over-IP ports will be linked to TX’s Virtual USB ports.
It is not necessary to gain USB access rights for the KMoverIP port. The TX (PC) can be shared with multiple RXs for keyboard/mouse access in KMoverIP mode.
13. There are 4 USB-A ports on the RX. The factory default setting for the TX is both USB-over-IP and KM-over-IP enabled; all 4 RX USB ports are USB-over-IP enabled and KM-over-IP disabled.
14. There are 2 methods to gain the access rights for a USB-over-IP port:
 - 14.1 Pressing and hold the RX **Link button** for 3 sec. .
 - 14.2 Press “U” key to toggle when the Transmitter List OSD menu is displayed.

The RX monitor will display “Requesting USB” to indicate starting a USB-over-IP connection, and message of “Starting USB” will be displayed if it successfully gained the USB access rights. Meanwhile, the previous USB Master unit will show an OSD message of “USB Stopping”.

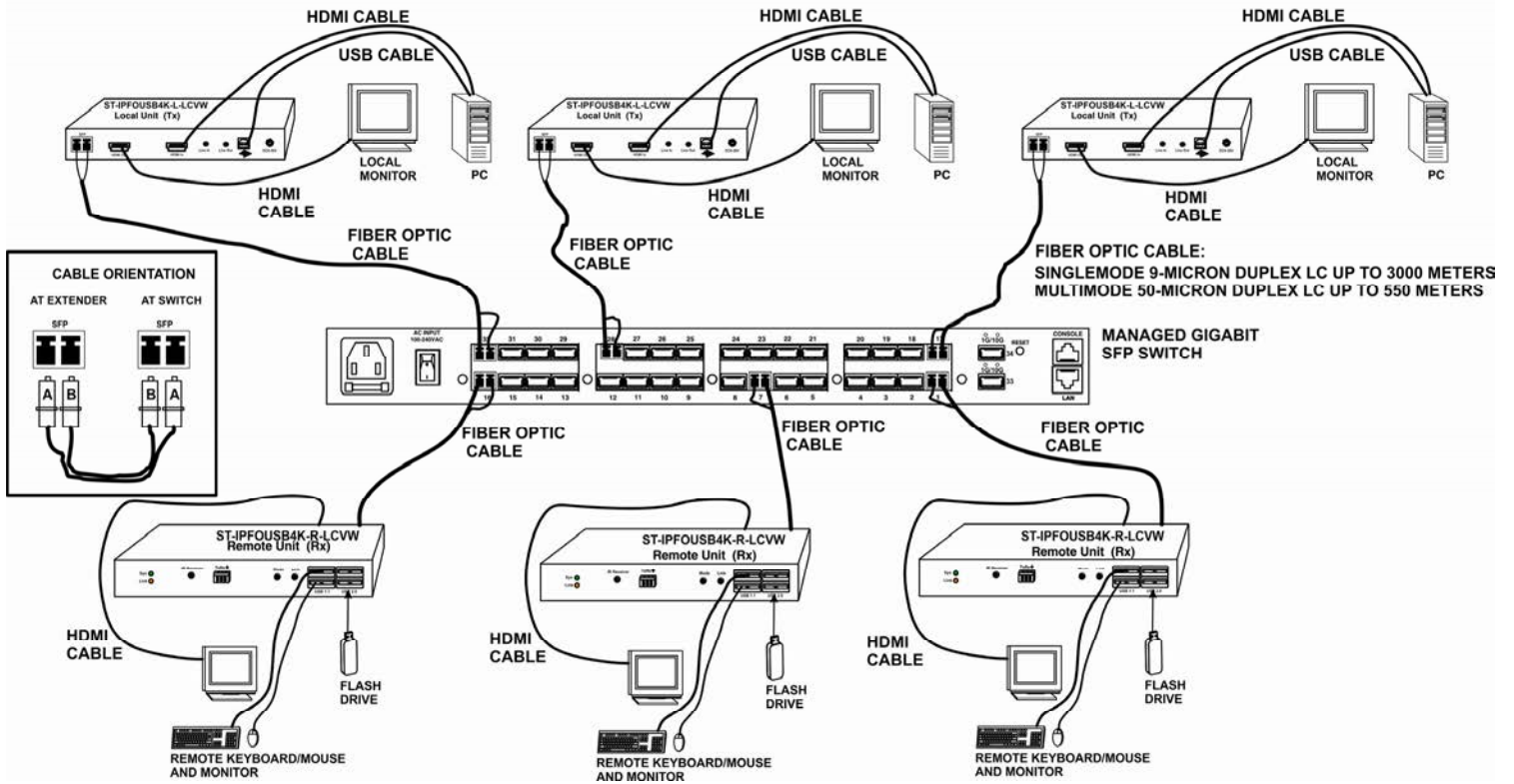
POINT-TO-POINT CONNECTION



POINT-TO-MANY CONNECTION



MANY-TO-MANY CONNECTION



Panel Button and Hotkey Operation

Press TX “Button 1” button to lock/unlock RX

Keep pressing TX “Button 1” button for 3 seconds to lock/unlock the RX’s USB and KMoIP ports. The RX will display “Locked by TX” OSD message on the screen when it is locked.

Press TX “Button 2” or RX “Mode” button to select Video/Graphic mode

Press TX “Button 2” or RX “Mode” button to set RX in Video or Graphic mode. The RX will display “Graphic Mode” or “Video Mode” OSD message on the screen.

Press and hold RX “Link” button for 3 seconds to request/release USB access rights.

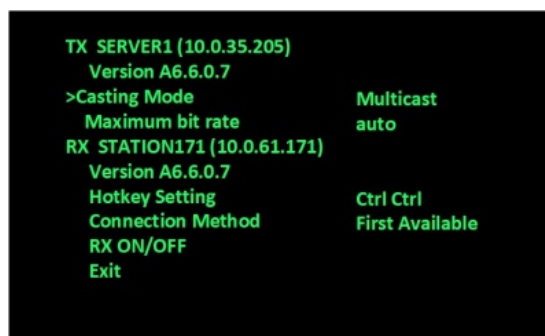
The RX user can manually request/release USB access rights when a TX is connected with multiple RXs. Press and hold RX “Link” button for 3 seconds to request USB access rights, the RX will display “Starting USB” OSD message. Pressing again will release and display “Stopping USB”.

Press RX “Link” button for the “Transmitter List” and “Simple Configuration” OSD Menu

Press RX’s “Link” button for the Transmitter List OSD Menu as shown in the below left screenshot. Briefly press the button again to move the highlighting arrow“>”to select the TX. The RX will connect to the selected TX after 3 seconds.

From the Transmitter List OSD Menu, press and hold the RX’s “Link” button for 3 seconds to enter the Simple Configuration OSD Menu as shown in the below right screenshot. Briefly press the button to move the highlighting arrow“>” to select the settings to change. You can change Casting Mode, TX Maximum bit rate, Connection Method and RX ON/OFF (temporary Connect/Disconnect with TX).

Move the highlighting arrow “>”to Hotkey Setting , wait a few seconds, and a sub-menu will show up with 4 possible selections: “Ctrl Ctrl”, “Shift Shift”, “Alt Alt”, or “Scroll Scroll”. Press the “Link” button to move the highlighting arrow “>”to the desired selection. The RX unit will be re-booted.



Rx Hotkey OSD Menu

The Rx supports a Graphic OSD Menu beginning with firmware version A7.4.2.3. The firmware for Rx unit now supports an **OSD Tx List** .

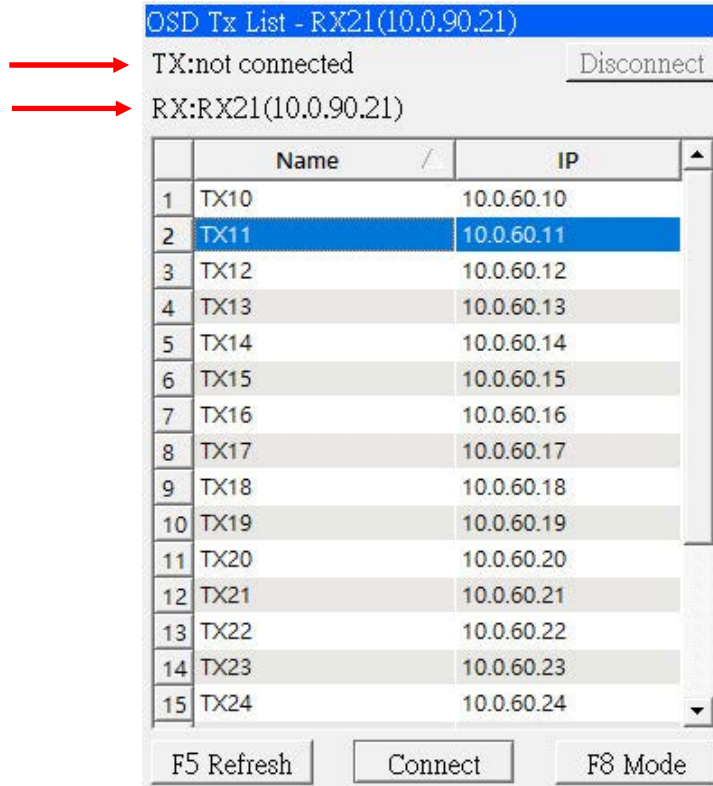
Note: The keyboard and mouse that control this OS menu should be connected to the two USB 1.1 ports (page 3) on the Rx.

Rx with “OSD Tx List” firmware

Press <hotkey> + <hotkey> (selected on page 15) at the Rx keyboard to activate the graphic **OSD Tx List** menu.

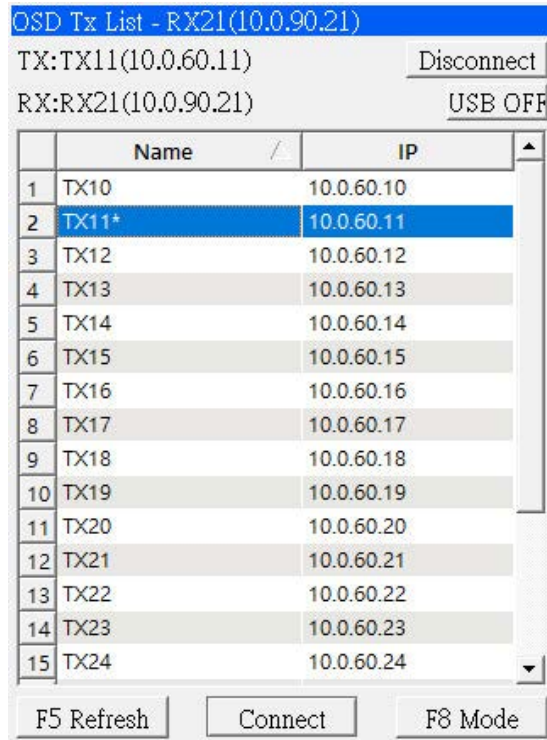
Note: If the menu fails to open, try pressing the <Esc> key first, then the <hotkey> + <hotkey>.

If the Rx has not yet been connected with any Tx, the OSD Tx List menu will display as shown below, where the 1st line shows “**TX:not connected**”, the 2nd line shows the current Rx name and IP address.



To connect to a Tx: Select a Tx using a mouse or $\uparrow\downarrow$, then click the **Connect** button to make a connection.

If the Rx is already connected with a Tx, the OSD Tx List Menu will appear as seen below, wherein the 1st line shows the connected TX name and IP address with a "Disconnect" button, and the button, the 2nd line shows the current Rx name and IP address with a "USB ON/OFF" button.



To Start/Stop the USB connection with the current Rx USB over IP: Press "USB ON/OFF" button.

To refresh this Tx List: Press the "F5 Refresh" button.

To switch OSD in Transparency/Background Mode: Press "F8 Mode" button.

To Disconnect with the current Tx: Press the "Disconnect" button.

To end the OSD: Press <ESC> key.

SPECIFICATIONS

Local Unit

- Compatible with a USB computer (PC, SUN and MAC) with Ultra-HD HDMI output.
- Multiplatform support: Windows 2000/XP/Vista/7/8/10, Windows Server 2000/2003/2008/2012, Solaris, Linux, FreeBSD, and MAC OS 9/10.
- One female HDMI connector for source.
- One female HDMI connector for display.
- One female USB Type B connector.
- Two female 3.5mm stereo jacks for audio out and mic in.
- Speaker only works when in a point-to-point connection.
- One female 3.5mm port for IR emitter (sold separately).
- Screw terminal for RS232.
- One duplex female LC fiber optic port for sending video/audio, USB, IR, and RS232 signals.

Remote Unit

- One female HDMI connector.
- Four transparent female USB Type A connectors for keyboard, mouse, flash drive, HDD, touchscreen display, etc.
- Two USB 2.0 and two USB 1.1
- Two female 3.5mm stereo jacks for audio out and mic in.
- Microphone only works when in a point-to-point connection.
- One female 3.5mm port for IR receiver (sold separately).
- Screw terminal for RS232.
- One duplex female LC fiber optic port for sending video/audio, USB, IR, and RS232 signals.

Supported video resolutions:

- Ultra-HD 4Kx2K resolutions (3840x2160 @ 30Hz)
- 2K Cinema (2048x1080 @ 60Hz)
- HDTV resolutions to 1080p
- Up to 1920x1200 (WUXGA)
- Supports embedded digital audio through HDMI compatible TVs or audio receivers.

RS232

- Supports TXD and RXD.
- Baud rate: 9600/14400/19200/38400/57600/115200.

Power

- Local and Remote unit:
 - Input: 100 to 240 VAC at 50 or 60 Hz via AC adapter (included).
 - Output: 12 VDC, 2A

Dimensions

WxDxH (in): 6.1x4.33x1.18 (155x110x30 mm).

Environmental

- Operating temperature: 32 to 122°F (0 to 50°C).
- Storage temperature: -4 to 185°F (-20 to 85°C).
- Operating/storage relative humidity: 0 to 80% non-condensing RH.

Regulatory Approvals

- RoHS
- TAA compliant

Max Distance

- Using singlemode 9-micron cable, extend to 9,842 feet (3,000 meters).
- Using multimode 50-micron cable, extend to 1,804 feet (550 meters).

WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at **(800) 742-8324** (800-RGB-TECH) or **(330) 562-7070** or visit our website at <http://www.networktechinc.com> for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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