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ST-IPUSBD-L/R-DH

Dual head DVI-I with USB KVM Extender over IP Setup Guide

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INTRODUCTION

The XTENDEX® Dual Monitor DVI USB KVM Extender provides remote KVM (USB keyboard, USB mouse and two 1080p DVI monitors) access to a dual-head USB computer up to 472 feet (144 meters) away via two CAT6/6a/7 cables.

Each KVM extender consists of a local unit that connects to a dual-head computer, and a remote unit that connects to two DVI monitors, 3.5mm stereo audio speakers and microphone, and up to four USB devices (keyboard, mouse, flash drive, HDD, or touchscreen display).

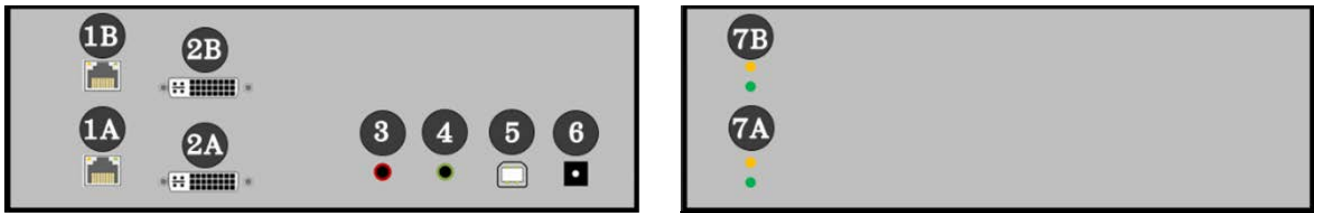
The local and remote units can be connected together for a Point-to-Point connection via CAT6/6a/7 cable, or a Point-to-Many or Many-to-Many connection via a managed Gigabit network switch.

- Signal transmission via two CAT6/6a/7 cables up to 472 feet (144 meters).
- Supports HDTV resolutions to 1080p, and up to 1920x1200 (WUXGA).
    - Extend up to 472 feet in a Point-to-Point connection.
    - Extend up to 944 feet in a Point-to-Point, Point-to-Many, or Many-to-Many connection via a managed Gigabit network switch.
        - The max length between most switches and the local/remote unit is 472 feet.
        - The switch itself will determine the maximum distance.
- HDCP 1.4 compliant.
- USB ports for keyboard, mouse, flash drive, HDD or touchscreen display.
    - Two USB 2.0 and two USB 1.1 connectors.
    - Keyboard and mouse are hot-pluggable.
- Supports video wall installations from 1x2 to 4x4 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 network switch.)
- Support for Point-to-Many or Many-to-Many connections requires a managed Gigabit network 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 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.
- Customizable EDID table on local unit.
- Supports the DDC2B protocol.
- Extracts audio from an HDMI video source connected to the transmitter using DVI-HD-xx-MM cable and outputs through the 3.5mm stereo audio port on the receiver.
    - Selectable through the web interface.
- Easily expandable – add receivers as you add control stations.
- Integrated mounting brackets for easy surface/wall mounting.

Features and Functions

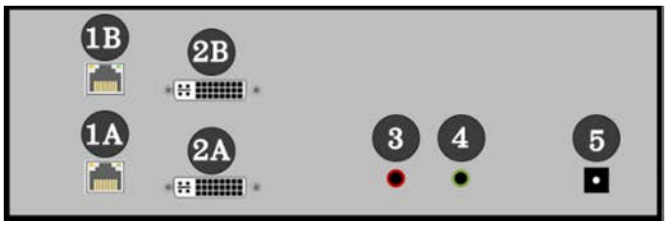
Note: The Local and Remote units each contain 2 processors (A and B). The A processor supports DVI-I, USB, and 3.5mm Audio, while the B processor supports DVI-I only. The A is referred as "Main" and B is referred as "2nd" throughout this manual.

ST-USBD-L-DH Dual Head Transmitter (Local Unit)



No. Connector	Description
1A/1B Ethernet	Main (1A) and 2nd(1B) Gigabit Ethernet ports
2A/2B DVI-I In	Main (2A) and 2nd (2B) DVI-I input ports
3 Line In	3.5mm Stereo Audio input port
4 Line Out	3.5mm Stereo Audio output port (from Mic. In of Rx)
5 USB-to-PC	USB Upstream port, Virtual USB HUB extension
6 DC Power input	System power input, DC 12V.
7A/7B (Main/2nd) Green: System LED Amber: Link LED	**Green Blinking/Amber Off:** System is starting up. **Green On/Amber Off:** System is ready, TX/RX not connected. **Green On/Amber Fast Blinking:** Main/2nd processors are connecting. **Green On/Amber Slow Blink:** Main/2nd processors are internally connected, TX/RX is externally connected, waiting for video input. **Green On/Amber On:**TX/RX connected, video input is ready.

ST-USBD-R-DH Dual Head Receiver (Remote Unit)



No. Connector	Description
1A/1B Ethernet	Main (1A) and 2nd(1B) Gigabit Ethernet ports
2A/2B DVI-I Out	Main (2A) and 2nd(2B) DVI-I output ports
3 Mic. In	Microphone Input, extend to the Line Out of Tx
4 Line Out	3.5mm Stereo Audio output port
5 DC Power input	System power input, DC 12V.
6A/6B Main/2nd Green: System LED Amber: Link LED	**Green Blinking/Amber Off:** System is starting up. **Green On/Amber Off:** System is ready, TX/RX not connected. **Green On/AmberFast Blinking:** Main/2nd processors are connecting. **Green On/AmberSlow Blink:** Main/2nd processors are internally connected, TX/RX is externally connected, waiting for video input. **Green On/Amber On:**TX/RX connected, video input is ready.
7 USB 1.1 Host	2x USB-A 1.1 device ports
8 USB 2.0 Host	2x USB-A 2.0 device ports

CONFIGURATION

Use the C**onfiguration Web page in the Local (TX) and Remote (RX) Units** to configure them. There are **Setup mode and Operation mode** on the Configuration Web page.

To enter TX/RX Operation mode Configuration Web page:

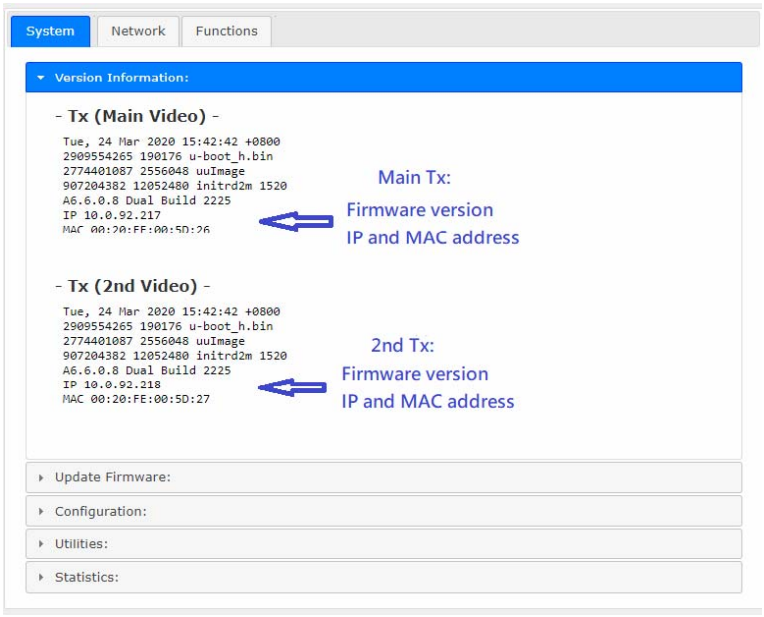
1. Directly connect the TX/RX to a PC LAN port. Set the PC IP address to 10.0.1.1, with Net Mask 255.0.0.0.
2. Open the PC's web browser (we recommend Chrome) and enter TX/RX IP address 10.xx.xx.xx (address is on the bottom of the unit) to enter the units web interface.

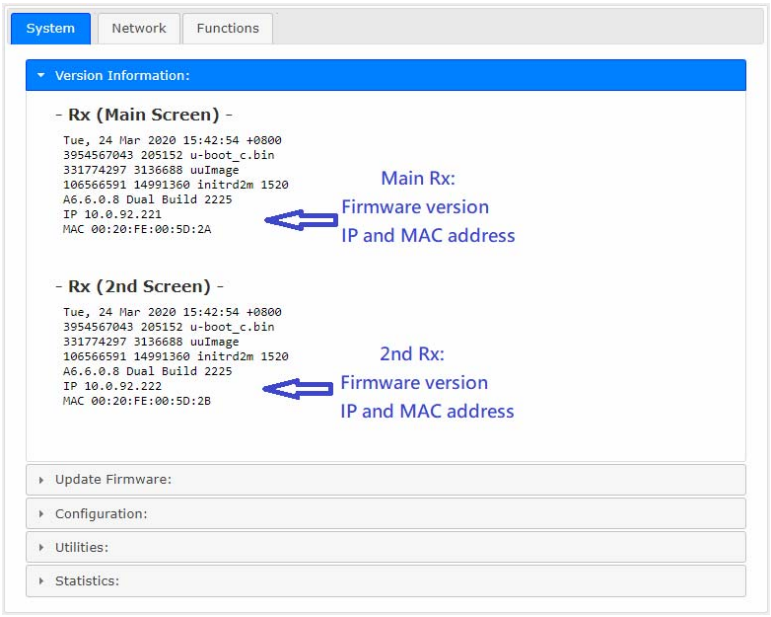
The TX/RX contains 3 subtabs **System, Network, Functions.**

System

Version Information

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

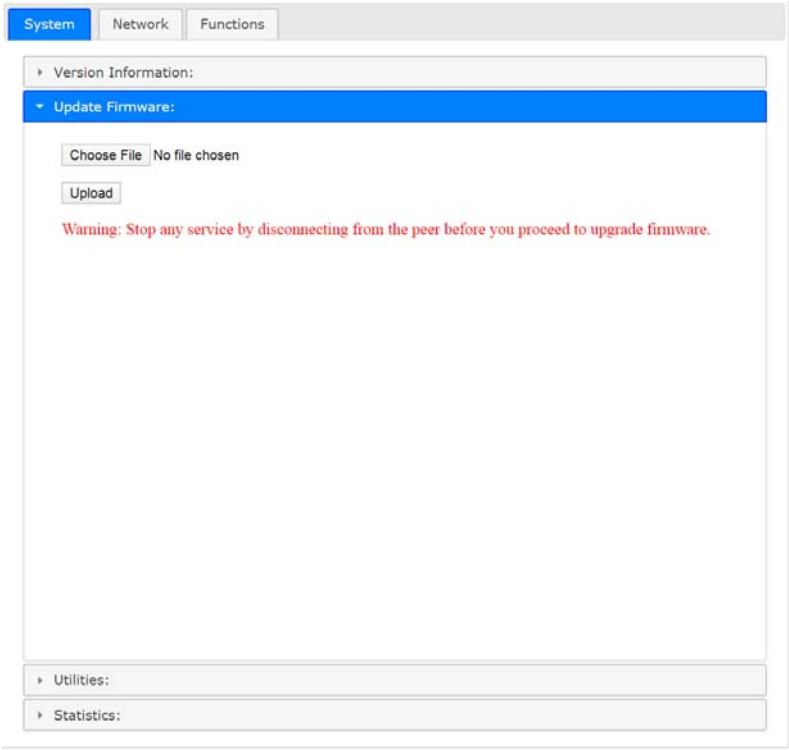




Update Firmware

Update Firmware

To update firmware in both processors simultaneously, navigate to the firmware file (.bin) then click "**Upload"** to start firmware upgrade. The firmware upgrade takes about 3 minutes, after which it will display "DONE Rebooting…" to indicate the unit has been upgraded and rebooted.

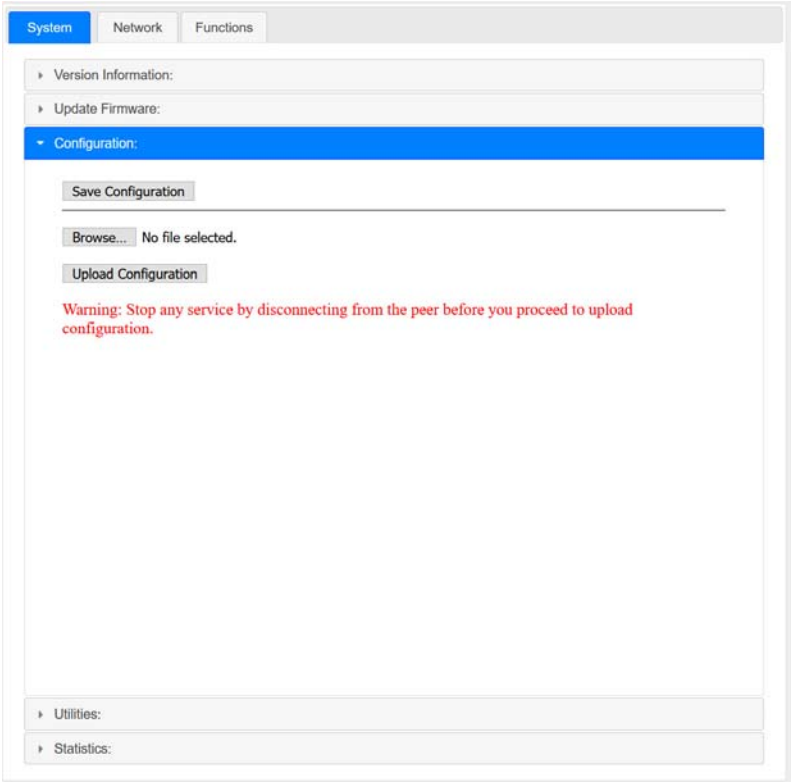


Configuration

You can export the current settings to a configuration file, or import configuration from an external file.

Enter Main/2nd **Configuration** ---> Click **Save Configuration** to export configuration,

Click **Upload Configuration** to import configuration.

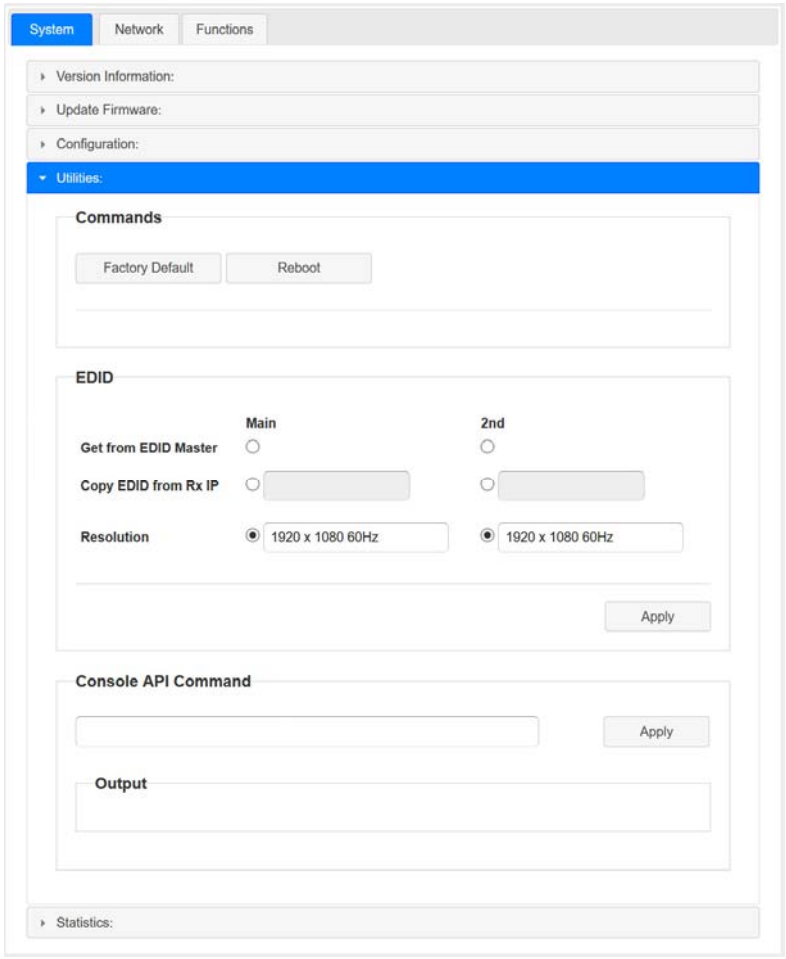


Utilities

Commands

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

Reboot ---> To reboot the device.



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.

Copy EDID from RX IP--->TX will get EDID from a specific RX, enter RX's IP here.

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

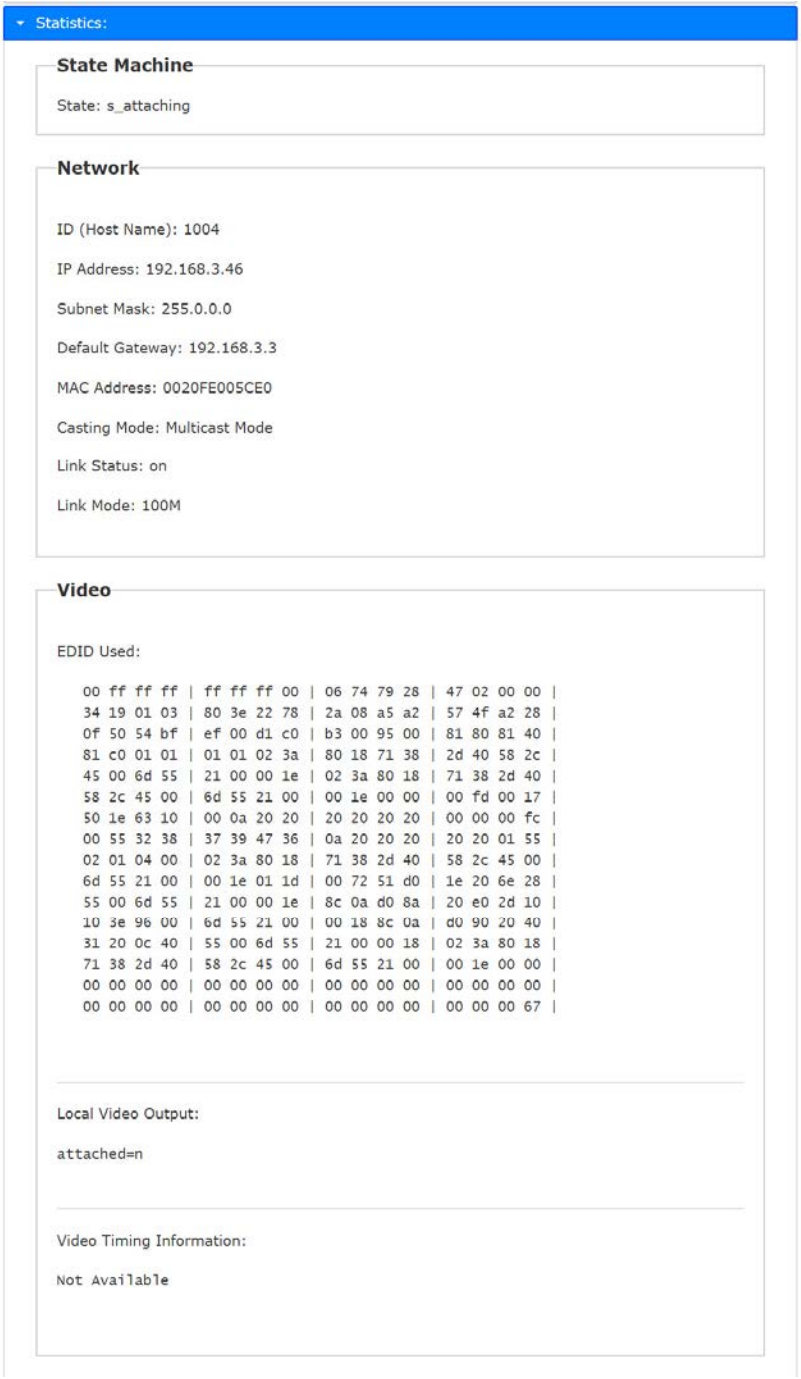
Available resolutions are 1920 x 1200 60Hz, 1920 x 1080 60Hz **(default)**, 1680 x 1050 60Hz, 1440 x 900 60Hz, 1366 x 768 60Hz, 1280 x 1024 60Hz, 1280 x 720 60Hz, 1024 x 768 60Hz, 720 x 480 60Hz.

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

Console API Command --->The feature is not supported.

Statistics

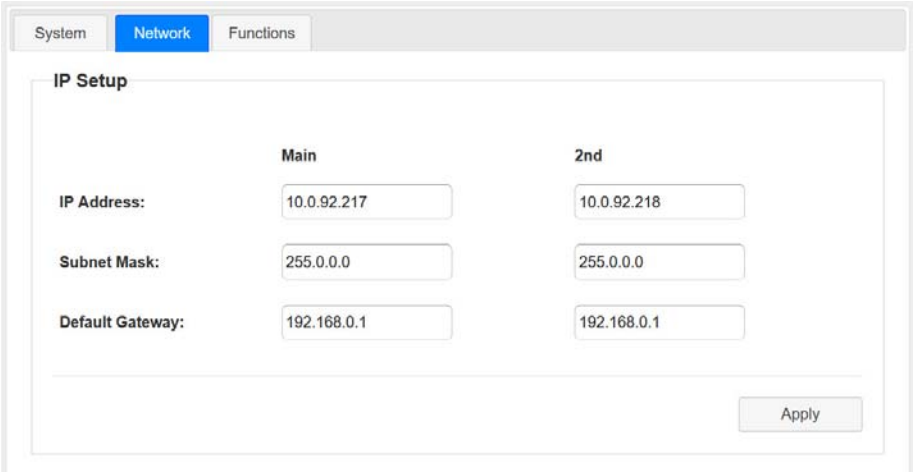
Display system status for State Machine, Network, Video EDID, Video Screen attachment, Video Timing.



Network tab

IP Setup (TX/RX)

The system supports **Static** setup for the IP configuration:
Manually enter an IP Address, Subnet Mask, and Default Gateway for both the Main and 2nd processors. Click "Apply" to save.



Casting Mode (TX only)

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

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

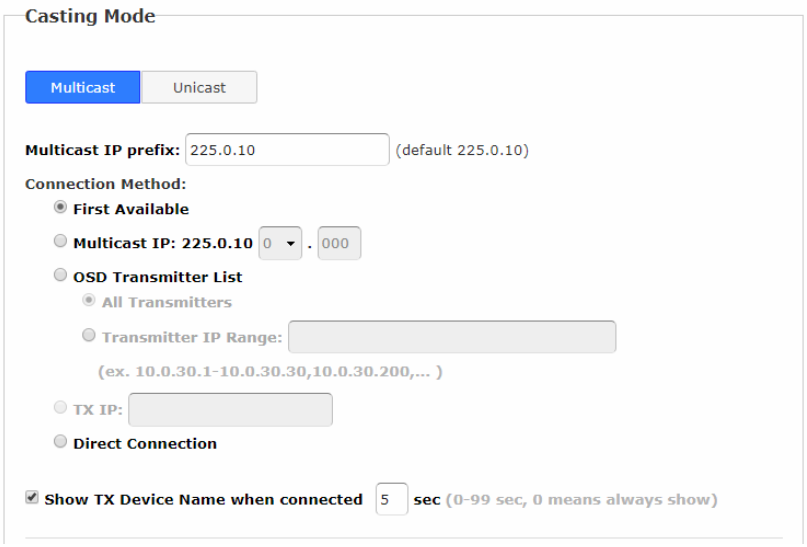
Multicast IP prefix (default 225.0.10)

The Main and 2nd Multicast IP addresses share the prefix but must be configured with different last 4 digits (as seen below).

Casting Mode (RX only)

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

In **Multicast mode**, you can setup the Multicast IP prefix 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.

First Available: the dual head RX will connect to the first available TX when powered ON.

Multicast IP 225.0.10x.xxx: the dual head RX will connect to the TX with the Multicast IP address that is specified here.

OSD Transmitter List: the dual head RX will display the available TXs in the OSD menu for user to select from.

Select "**All Transmitters**" if all of the 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 dual head RX will connect to this specified TX only.

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

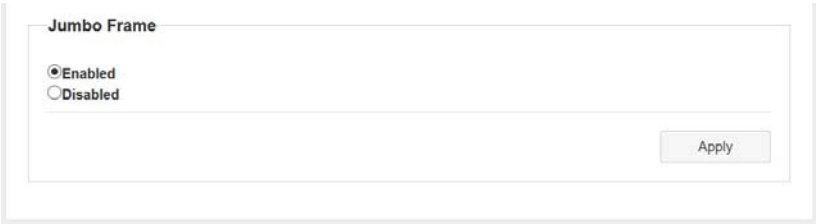
★ **Show TX Device name when connected (RX)**

This feature enables RX to display the TX name (or IP) for the specified period of time when connected. Default is enabled with a 5 second period.

Jumbo Frame (TX/RX)

The TX/RX supports Jumbo Frame (8K bytes) for better video quality. This is enabled by default.

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



Functions

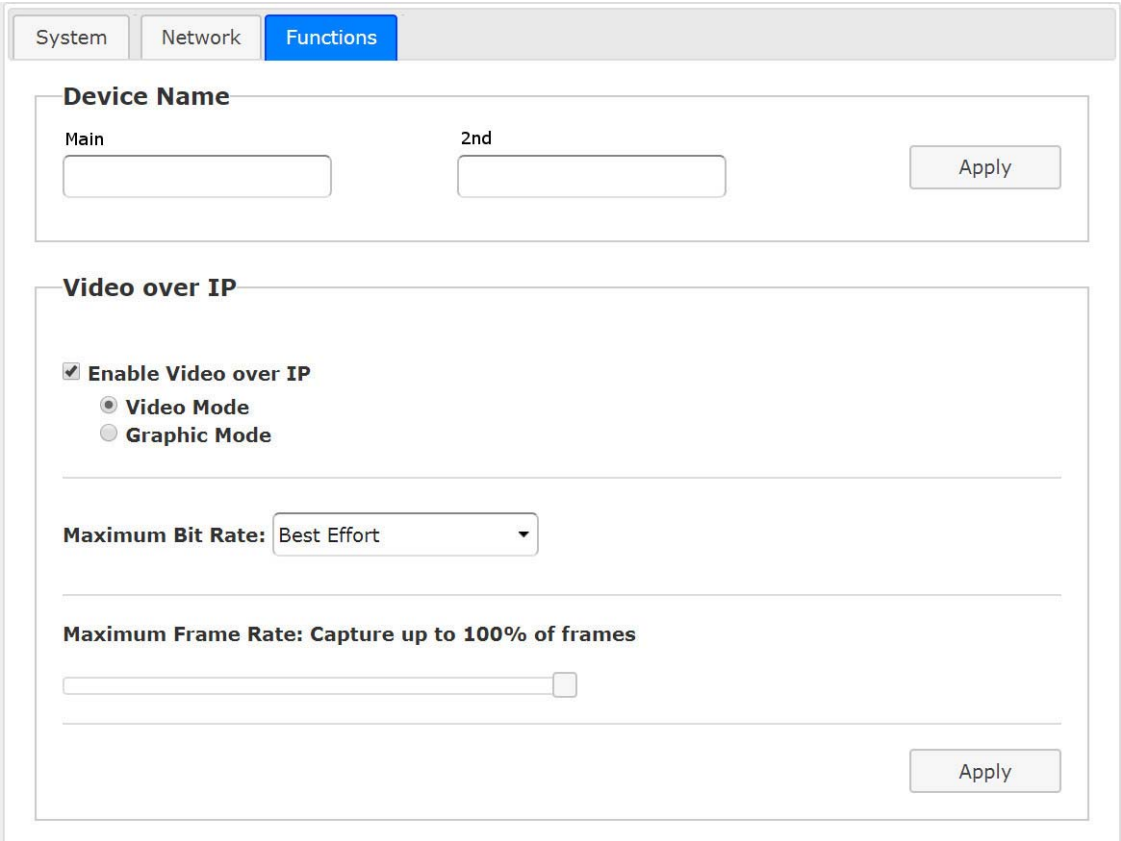


Figure 1- Video over IP Functions for the TX (Local Unit)

Device Name (TX/RX)

To set TX/RX Device name, enter up to 10 characters for Main and 2nd and click “Apply” to save.

Video over IP (TX Only)

Enable Video over IP (**Default: Enabled**)

Video/Graphic Mode: Select Video Mode for video to play smoothly.
Select Graphic Mode for static KVM picture 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 to 100%.
(Default: 100%)

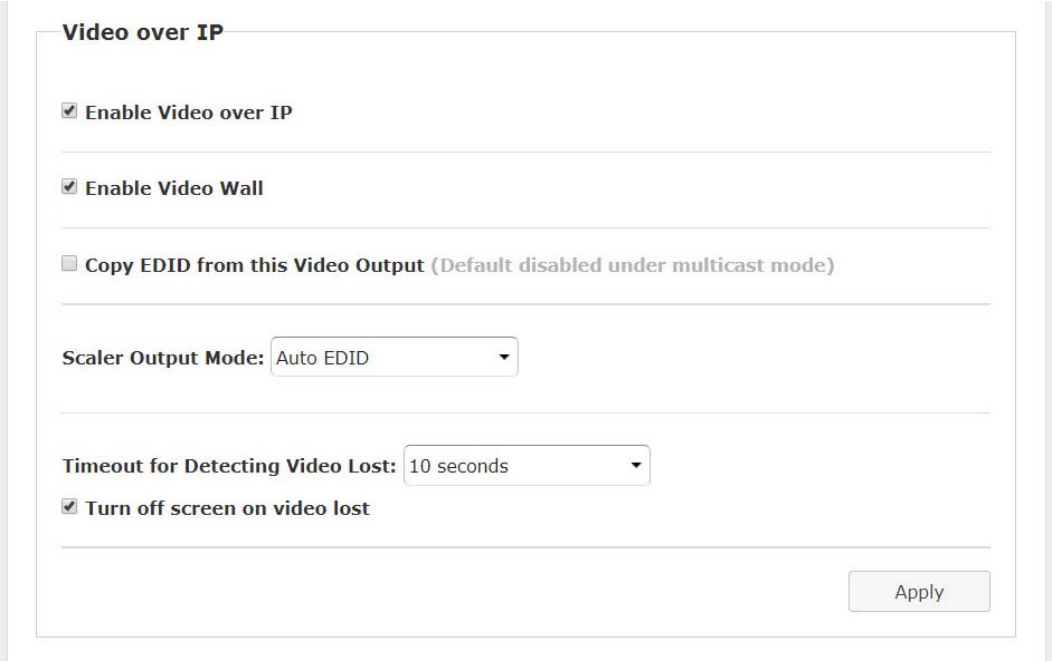


Figure 2- Video over IP Functions for the RX (Remote Unit)

Video over IP (RX Only)

Enable Video over IP (**Default: Enabled**)

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

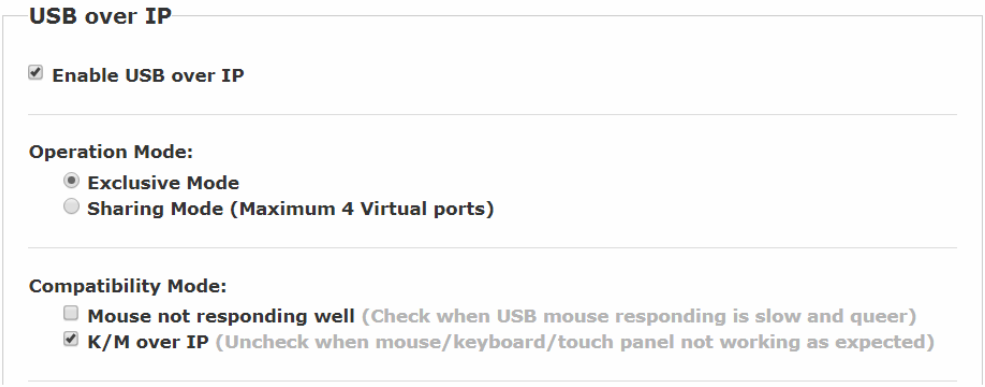
Copy EDID from this Video Output: To assign this RX as the EDID Master.

Scaler Output Mode: The RX built with scaler feature. The output resolution can be selected from these options: Auto EDID, Pass Through, 1080p60, 1080p50, 1920x1200, Customize (**default is Auto EDID**)

Timeout for detecting video lost: The timeout period for detecting the video has been lost (**default is 10 sec.**)

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

USB over IP (TX)



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 PC USB. These 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 port with device attached 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.

Compatibility Mode

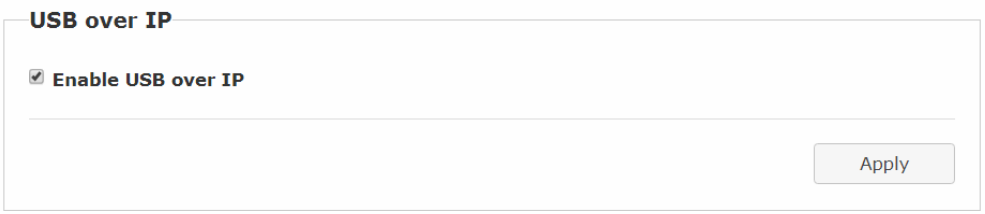
Mouse not responding well ---> enable this setting when mouse is slow and queer.

K/M over IP---> The TX also 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 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 5VirtualUSB 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 device 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:



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

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

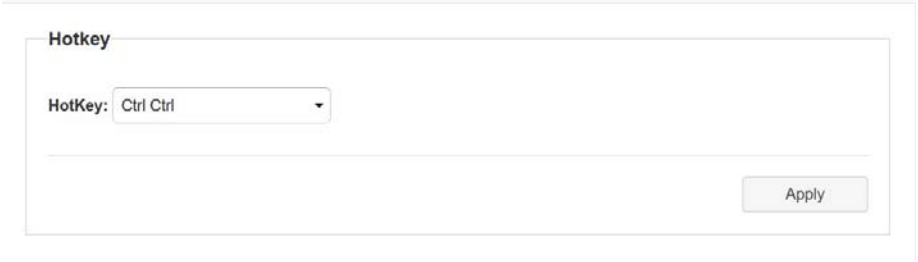
Enable the port #1, 2, 3, 4 for the device to be linked with the TX's K/M over IP HID emulation port. **Default is Port 1 and 2 KMoIP Enabled.**

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

Hotkey (RX Main only)

The dual head 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)**.

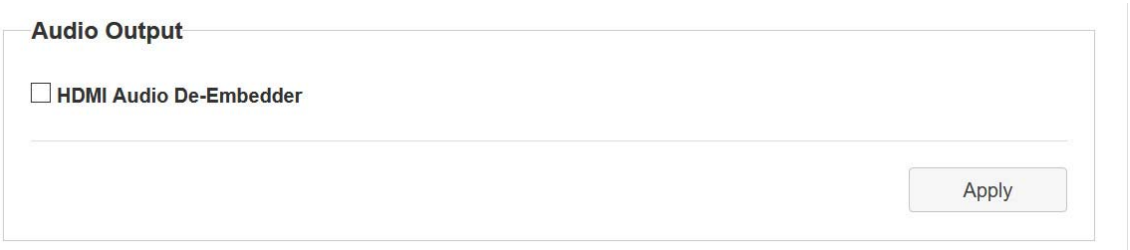


Audio Output (RX)

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

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

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



The DVI Out on the RX will not pass audio through to an HDMI monitor's speakers if one is connected. You must use the "Line Out" port with self-powered speakers to hear audio from an HDMI audio input.

When this feature is disabled, Local Audio Input and Remote Audio Output always work together. Remote Input and Local Output only works when extender units are in Unicast (one Tx pairs with only one Rx) mode.

Multi-Screen Setting (TX Main only)

The system supports Multi-Screen feature which is useful for PC with multiple HDMI screen outputs (above):

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. (This 2nd TX IP will be set when the dual head TX is powered ON.)
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 (RX Main only)

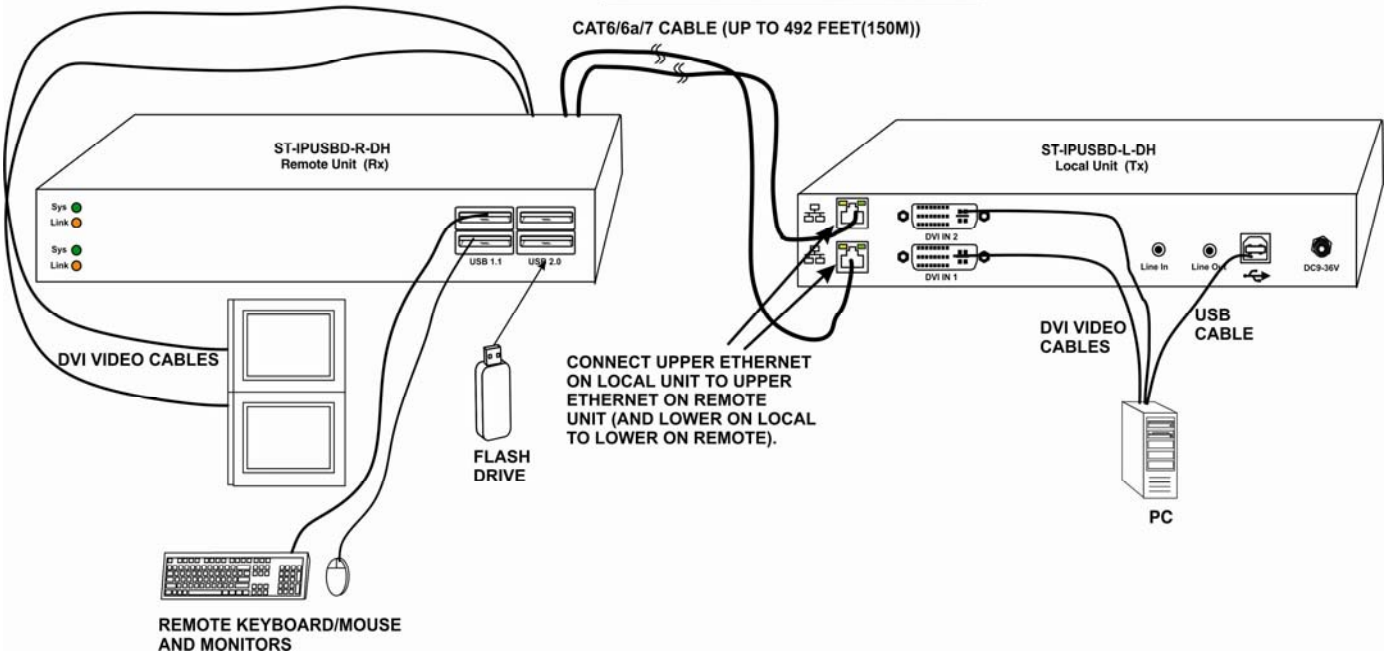
As above in the RX Main Multi-Screen Setting Web page:
2ndScreen RX IP: Type in another RX IP address which is connected to the 2nd screen. (This 2nd RX IP will be set when the dual head RX is powered ON.)
3rd Screen RX IP: Type in another RX IP address which is connected to the 3rd screen.
4th Screen RX 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 only)
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.

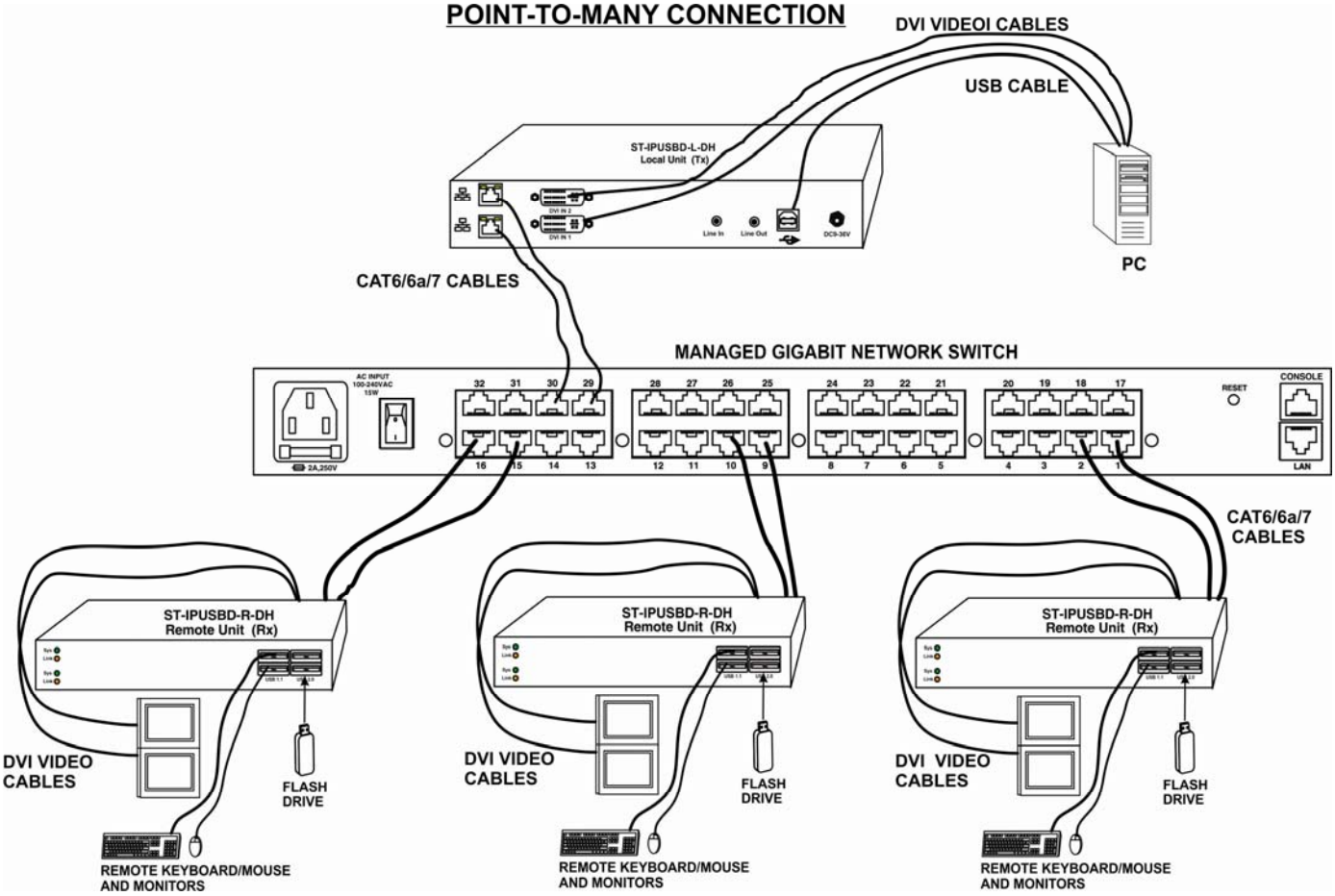
INSTALLATION(TX/RX)

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 (225.0.10x.xxx), and all RXs will find the first available TX for connection.
2. Use a CATx cable (straight, EIA 568B) to directly connect TX/RX as a pair connection, or connect to IGMP enabled Gigabit Ethernet switch for many-to-many installation.
   Note: Each TX comes with individual factory default Multicast IP which is shown on the unit label.
3. Adjust TX/RX D/A switch for HDMI/DVI installation. Connect TX/RX to video source/screen.
4. The TX factory default EDID setting is 1920x1080 60Hz.
   You can change TX to "**Copy EDID from EDID Master**", and perform step 4.1/4.2 to assign a RX as the EDID Master.
   You can change TX to "**Copy EDID from the 1st connected RX**" or "**Copy EDID from RX IP"** and then perform step 4.3 or 4.4.
   Or you can change and use the TX built-in EDID as step 4.5:
   4.1 Press and hold the **Mode** button of the specific RX unit and power ON until **Green** LED blinking then releasing 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 connecting with TX). Then power ON other RX units sequentially.
   4.2 Refer page 11, enable "**Copy EDID from this Video Output**" to assign a specific RX as EDID Master.
   4.3 Refer page 6,enable "**Copy EDID from RX IP**" to set TX EDID from a specific RX.
   4.4 To use TX built-in EDID for specific Resolution, refer to page 6 "**Resolution Selection**".
5. The following start-up messages will be displayed during RX power on:
   FW: 02-Jan-2019 A6.6.0.8(Firmware date and version)
   Local IP: 10.0.34.38 (RX's IP address)
   MAC: 0020FExxxxxx (RX's MAC address)
   Connection Method: First Available
   Remote IP: 10.0.x.x/ 225.0.x.x (Connecting target TX IP / Multicast IP)
6. **To get the best video performance, please refer to page 9 to enable TX/RX Jumbo Frame setting, and set Ethernet Switch Jumbo Frame with minimum 8K bytes.**
7. Attach HDMI/DVI source to the TX's DVI-I connector. 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. As long as TX/RX connection 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, check the correct screen EDID is shown on PC graphic control panel.
10. Activate video with audio source to TX, then check if all RXs are correctly displayed. In this step, both Green and Amber LEDs should be ON to indicate the unit is ready and video source is also ready.

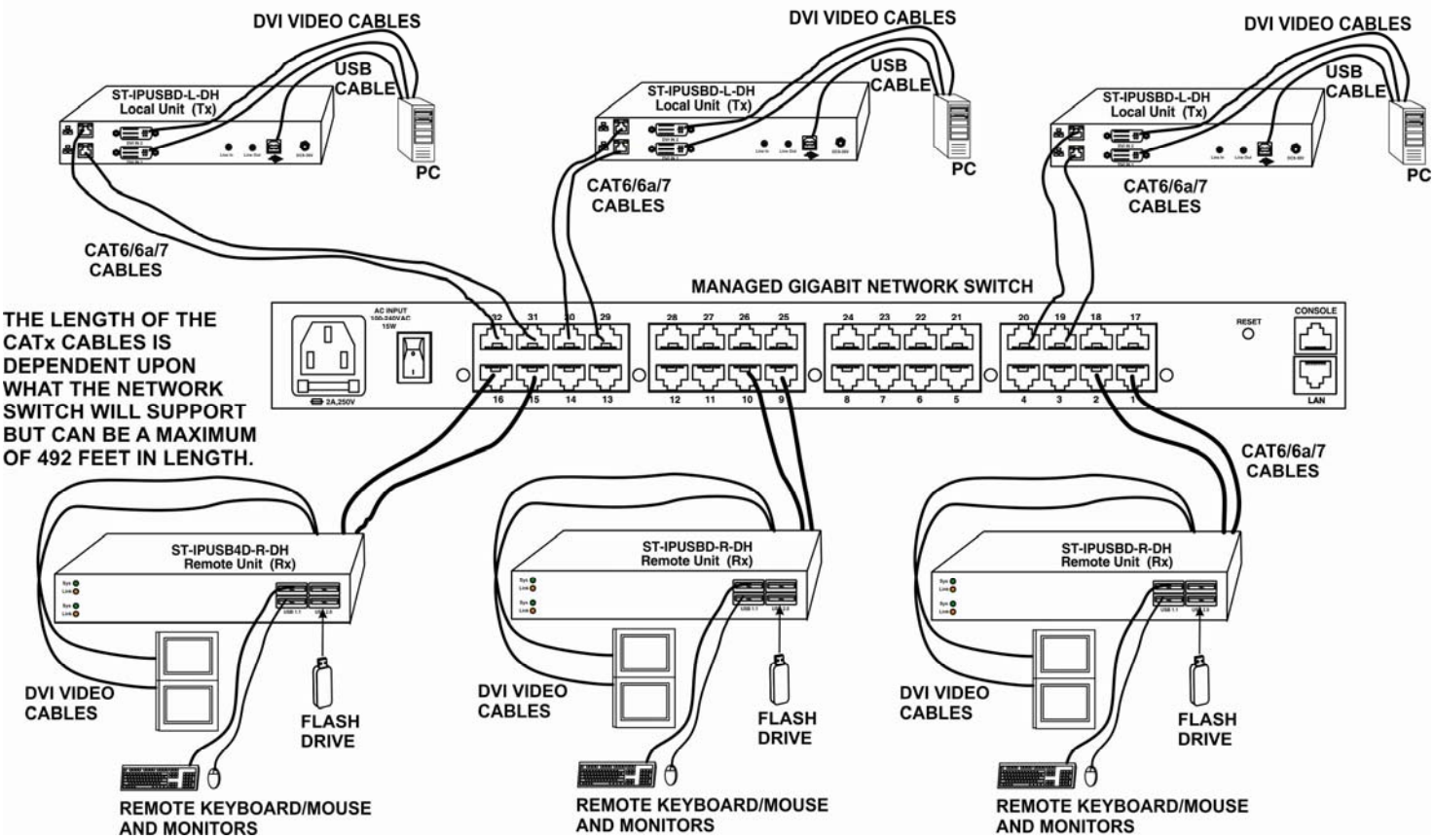
POINT-TO-POINT CONNECTION



POINT-TO-MANY CONNECTION



MANY-TO-MANY CONNECTION



USB over IP and KM over IP installation

1. Connect TX USB-B to PC, OS will detect a Generic USB 2.0 Virtual Hub Device.
2. Refer to the USBoverIP, K/M over IP and KMoIP ports on page 12 to properly configure TX and RX for the USB devices such as keyboard, mouse, Pen Drive, Touch Screen, etc.

   Note: The RS KMoIP 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 right for the KMoverIP port. The TX (PC) can be shared with multiple RXs for keyboard/mouse access in KMoverIP mode.
3. 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; RXUSB-over-IP enabled, USB 1.1 KMoIP enabled and USB 2.0 KMoIP disabled.
4. To gain the access rights for a USB-over-IP port:

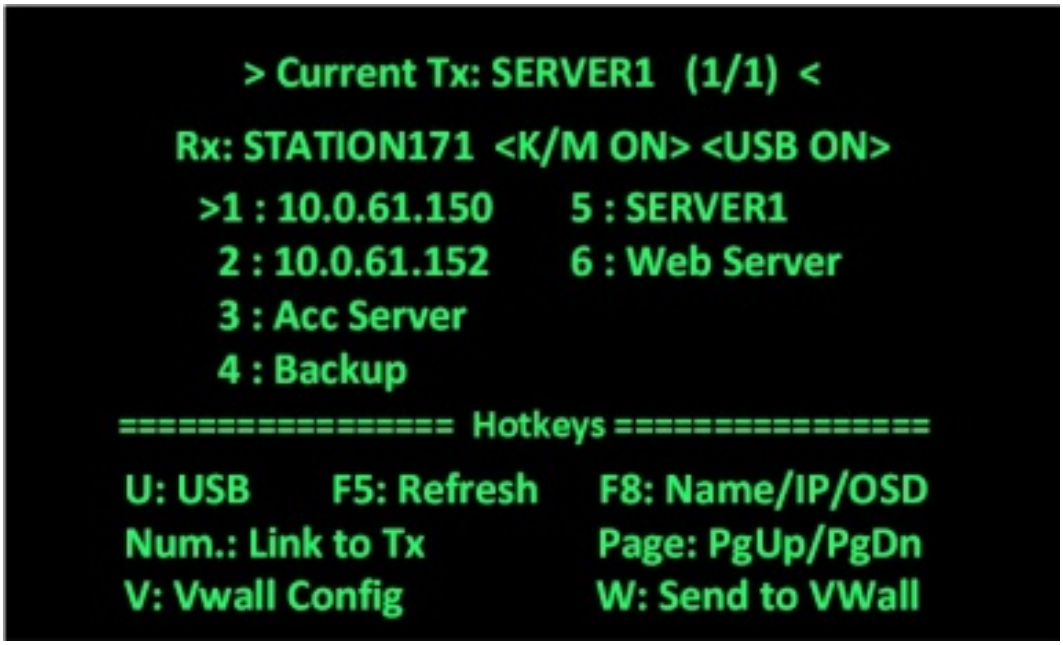
   Press "U" key to toggle during Transmitter List OSD menu.
   The RX display "Requesting USB" to indicate starting USB-over-IP connection, and message of "Starting USB" will be displayed if it successfully gained the USB access rights. Meanwhile, the previous USB Master unit will show an OSD message of "USB Stopping".

Hotkey Operation

RX “Transmitter List OSD Menu” by Hotkey

Pressing <hotkey><hotkey> at the RX keyboard will activate the Transmitter List OSD Menu with maximum 8 Transmitters per page (see image below). The top 2 lines are the current TX and RX IP or name.

You can select the TX by pressing the ↑↓ keys then press <Enter> to connect to the selected TX. You can also press keys 1 ~ 8 to immediately connect to the target TX.



While in the Transmitter List OSD Menu, you can:

Press **U** to request/release USB-over-IP.

Press **F5** to refresh Transmitter List.

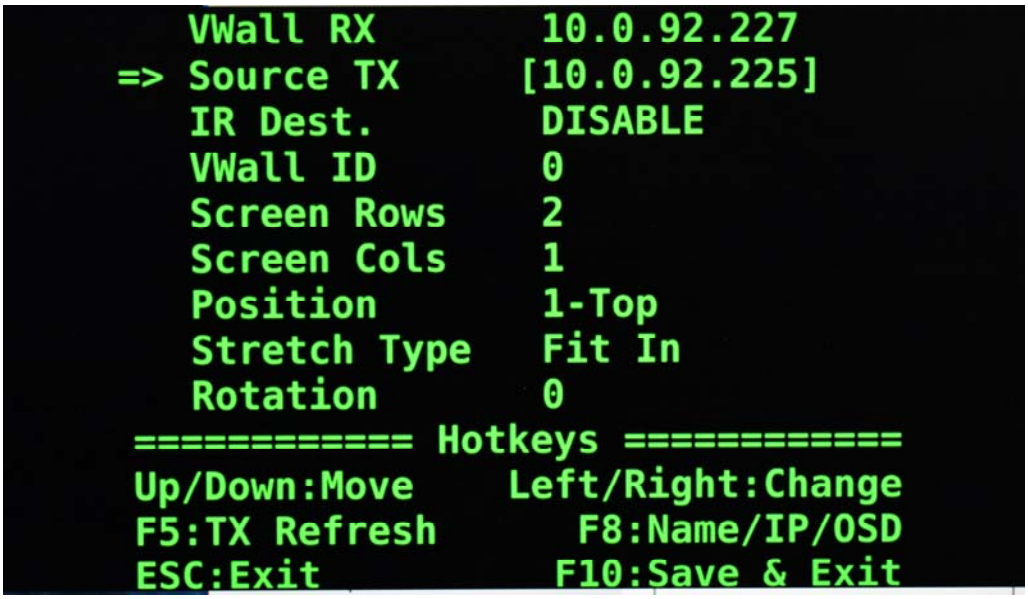
Press **F8** to switch in between Name/IP/OSD modes.

Press **V** to enter Video Wall configuration (below).

Press **W** to send the current display to other RX or RXs with VWall ID.

To end the OSD, press**<ESC>**

While the Video Wall OSD menu is up (below), the characteristics of the RX with the video wall can be adjusted as needed. A video wall with a 4x4 configuration can be configured. The user can go into this page and configure the entire video wall system from any receiver's OSD. Keys to press for the desired changes are indicated at the bottom of the menu.



Using the Vwall Config Menu

1. VWall RX: Use ← and → on the keyboard to toggle between RX's on the network and choose which screen is to be configured. The selections include all IPs for the top and the bottom layer of RX units on the network.
2. Source TX: Use ← and → on the keyboard to toggle between TX's source that this screen will use.
3. VWall ID: Use the same ID for all screens configured for the Video Wall being configured.
4. Screen Rows: How many rows are on this video wall.
5. Screen Cols: How many columns are on this video wall.
6. Position: Select which position this screen will be on the video wall.
   For 1x2 (rows:2, cols:1) VW, the choice will be "1-Top" and "2-Bottom".
   For 2x1 VW, the choice will be "1-Left" and "2-Right".
   For 2x2 VW, the choice will be "1-TopLeft", "2-TopRight", "3-BottomLeft", and "4-BottomRight"
   Configurations up to 4 rows and 4 columns can be configured.
7. Stretch Type- Select "Fit In" to have the image fill your screen, or "Keep Aspect" to keep the image aspect ratio proportions the same as they were transmitted.
8. Rotation: Select between rotating the image 0,180 or 270 degrees.

Don't forget to press <F10> to save any changes you make to the RX configuration before you exit the menu.

To exit the OSD without saving, press**<ESC>**

TECHNICAL SPECIFICATIONS

Local Unit

- Compatible with a dual-head USB computer (PC or MAC) with DVI or HDMI output.
- Multiplatform support: Windows 2000/XP/Vista/7/8/10, Windows Server 2000/2003/2008/2012/2016/2019, Solaris, Linux, FreeBSD, and MAC OS 9/10.
- Two female DVI-I connectors.
- 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.
- Two female RJ45 ports for sending/receiving video, audio, and USB signals

Remote Unit

- Two female DVI-I connectors.
- Four female USB Type A connectors for keyboard, mouse, flash drive, HDD, or touchscreen display.
    - 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.
- Two female RJ45 ports for sending/receiving video, audio, and USB signals.
- Supported video resolutions:
    - HDTV resolutions to 1080p
    - Up to 1920x1200 (WUXGA)

Power

- Local and Remote unit:
    - Input: 100 to 240 VAC at 50 or 60 Hz via AC adapter (included).
    - Output: 12 VDC, 5A
- Power consumption:
    - Local unit: 7.2W
    - Remote unit: 11.4W

Dimensions

WxDxH (in): 6.3x4.33x1.97 (160x110x50 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

- CE, FCC, RoHS
- TAA compliant

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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