



4K Video over IP System Vy-Net2

User's Guide

Before connecting, operating or adjusting this product, please read this instruction booklet carefully and completely.

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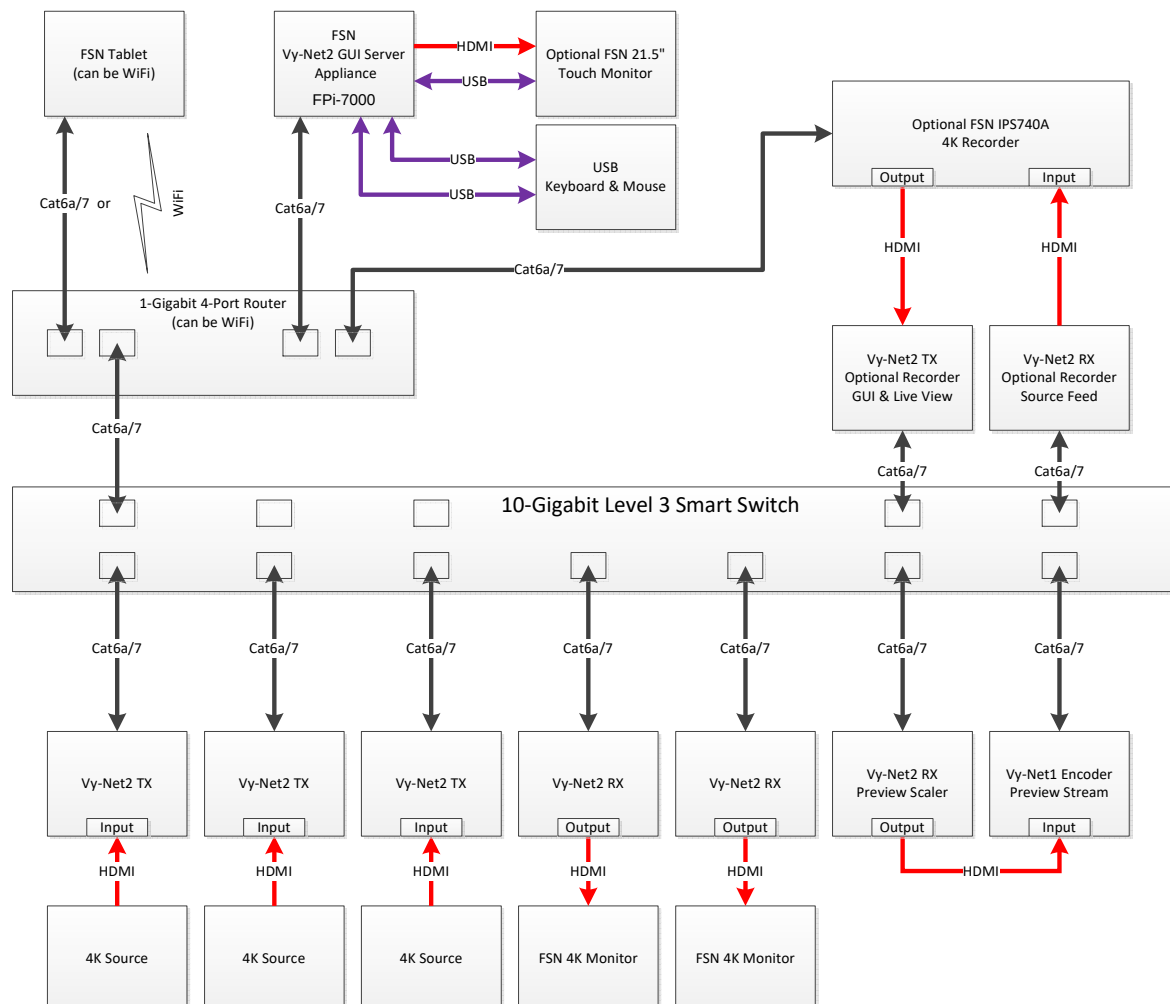
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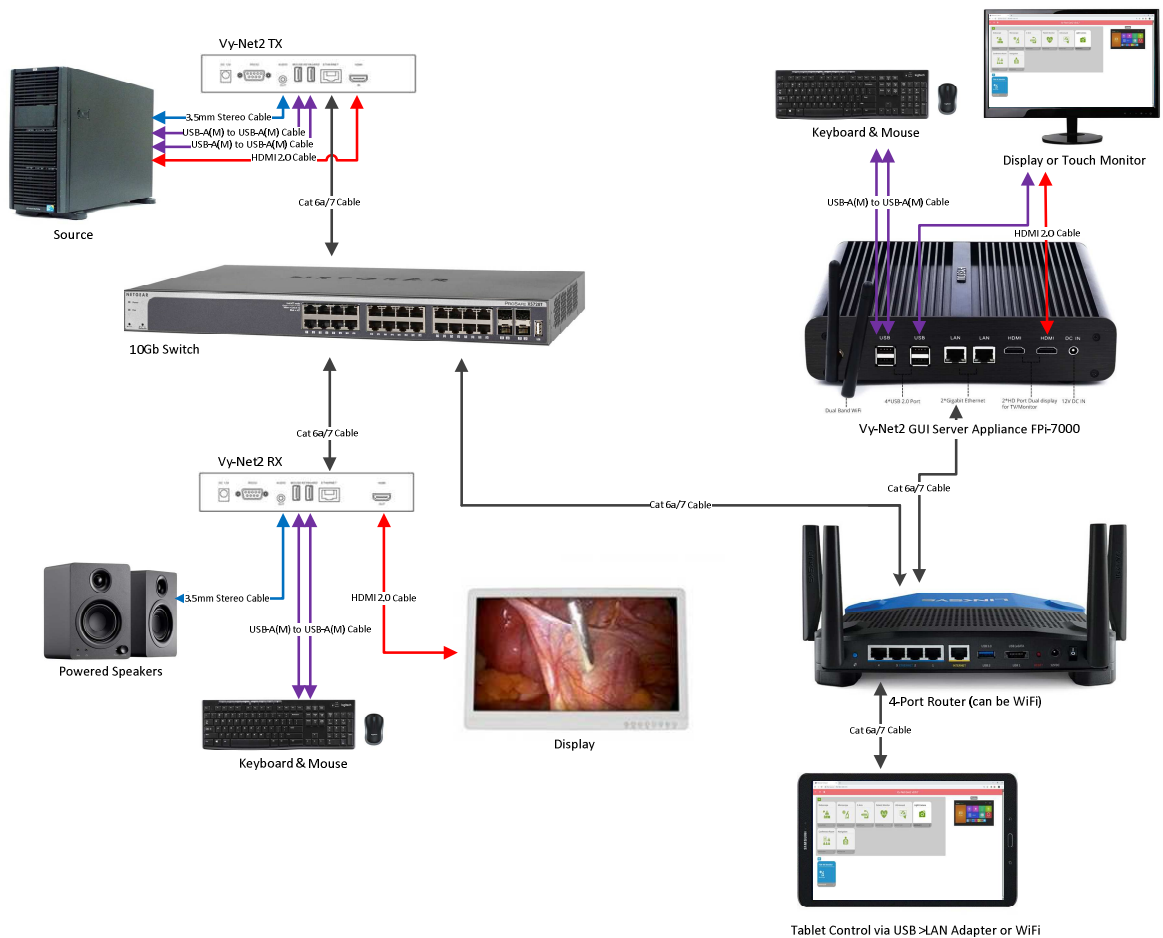
1. Vy-Net2 (Hardware)

1.1. Introduction

4K Vy-Net2 video over IP system is made up of a dedicated 10-Gigabit copper network; Vy-Net2 TX's (encoder) and RX's (decoder) and Cat6a/Cat7 interconnect cables. The Vy-Net2 GUI control system is available on the FPi-7000 mini PC appliance and can be accessed via a Chrome web browser (PC or tablet) or a directly connected touch monitor. Preview is available with the use of a Vy-Net1 encoder. The system can be expanded just by adding more TX's and RX's and is limited only by the number of ports on the 10-Gigabit switch. A 1-Gigabit router is required for control and to serve DHCP IP addresses. **Note:** Connection to tablet can be WiFi if desired.

1.2. Connection Diagrams





1.3. Components

The following components are available through FSN Medical Technologies.

- Vy-Net2 TX/RX 4K video over IP devices.
- Vy-Net2 GUI server appliance FPi-7000.
- Vy-Net1 encoder for preview stream.
- FSN 4K medical monitors.
- 10.1" tablet.
- Optional 21.5" or 27" touch monitor.
- Optional IPS740A 4K medical recorder (available in 2020).

Additional required **"off the shelf"** components can be sourced locally.

- Level 3, 10-Gigabit smart managed network switch.
 - o Recommended - Netgear XS708T, XS712Tv2, XS716T, XS728T, and XS748T with 8, 12, 16, 24, or 44 10-Gigabit Copper ports.

- o See **Appendix 2** for additional switches and configuration procedure.
- 4-port 1-Gigabit WiFi router.
 - o Recommended - Linksys WRT1900ac.
- USB Keyboard & Mouse with scroll wheel.
- Cat6a/Cat7 network cabling.
- HDMI 2.0 video cabling.

1.4. Vy-Net2 GUI Server Appliance FPi-7000



2. Vy-Net2 GUI (software)

2.1. Introduction

Vy-Net2 GUI can control FSN Vy-Net2 video over IP devices and route up to 4K@60 fps video sources to one, many or all outputs (monitors, capture and streaming devices etc.). Audio and RS232 functions are also available, but require a separate utility for control at this time, see Appendix 5.

The GUI web server is a mini PC running Linux O/S and is typically located in or near the operating room with network access to Vy-Net2 encoder/decoder devices it will be controlling. The intuitive GUI is web based and can be accessed from any device running Chrome browser with access to the Vy-Net2 network.

2.2. Configuration

Make sure all components have been connected per connection diagram and are powered ON before continuing with GUI configuration.

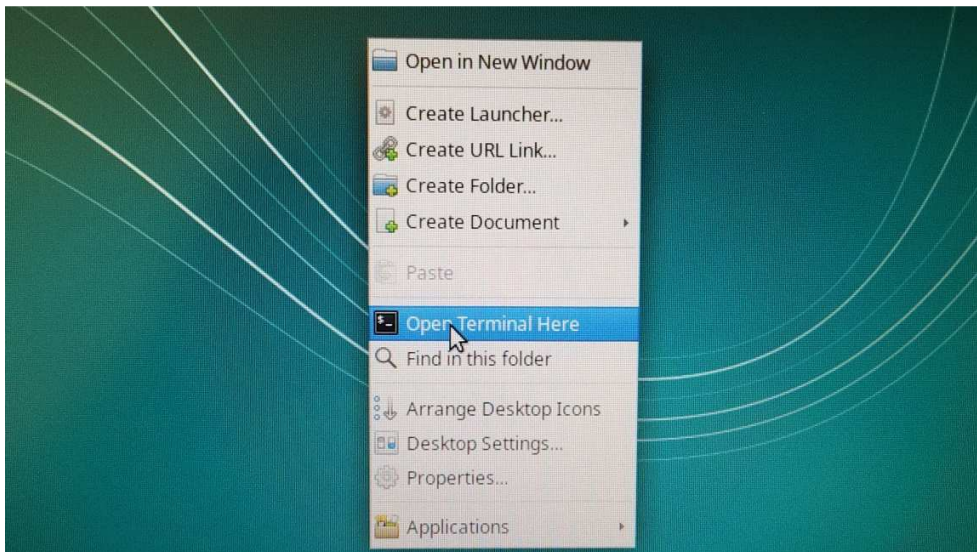
The following items have to be configured before using the GUI.

- Configure Vy-Net1 box for preview stream (See appendix 3)
- Blueriver server IP address.
- Vy-Net1 IP address (for preview stream).
- Vy-Net2 IP address (for preview scaling).
- Source and output naming.

2.2.1. Attach keyboard/mouse and monitor to FPi-7000 mini PC GUI appliance and power it ON using front panel power button. You should see the following screen.

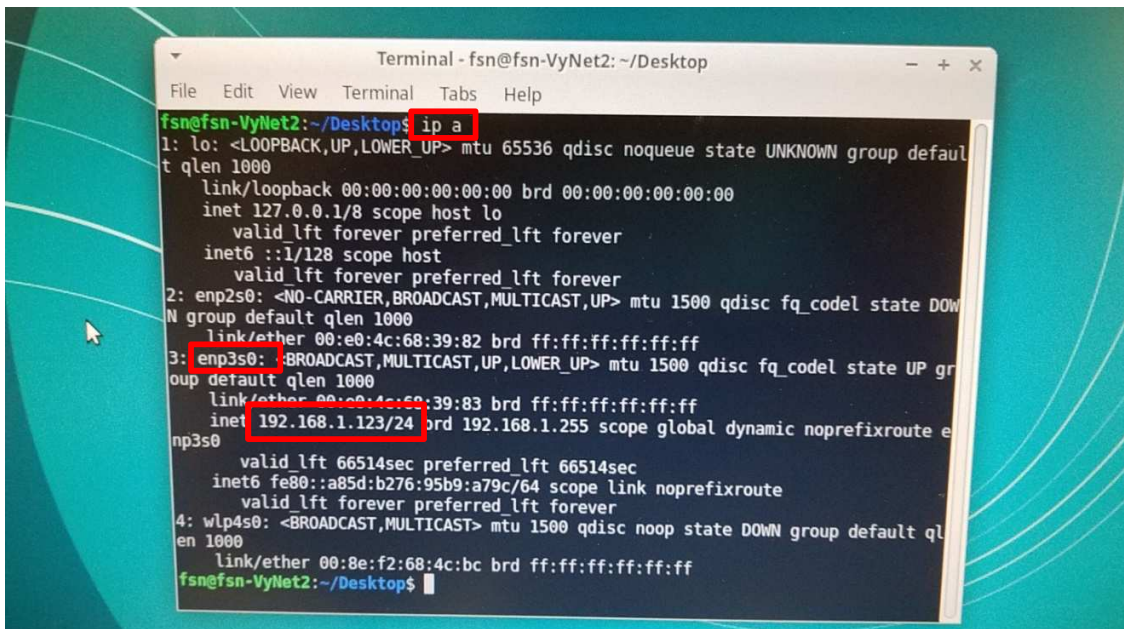


2.2.2. Right click on desktop and select **Open Terminal Here**.

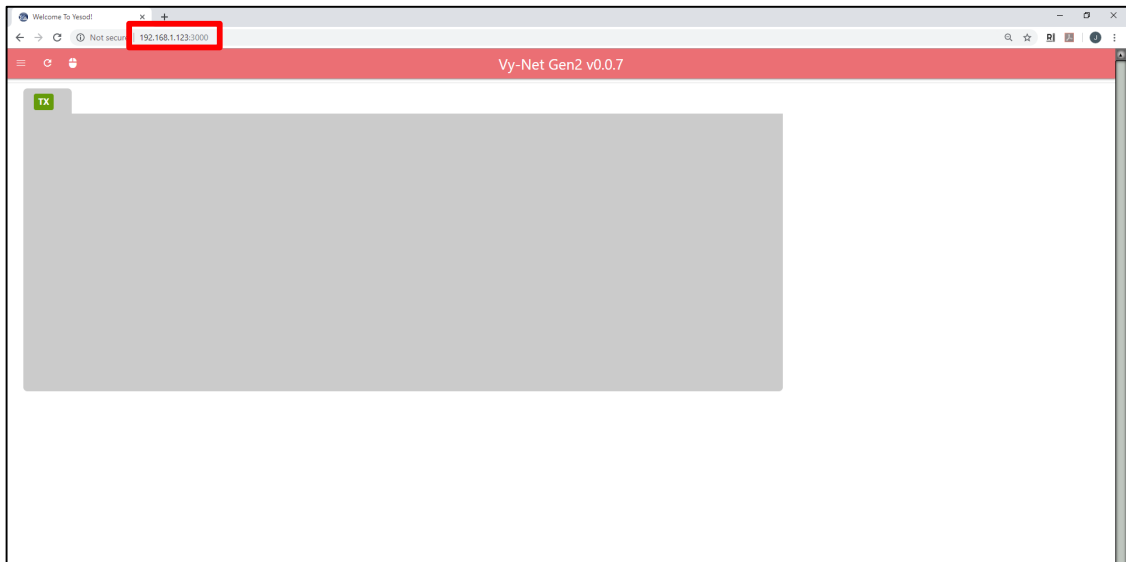


2.2.3. Type **ip a**<enter> to determine IP address of Vy-Net2 GUI web server.

Note: There are 2 network ports on the mini PC, depending on which port you are plugged into will determine which line you look at for IP address. In the example below we are plugged into the left port which is “enp3s0” with an IP address of 192.168.1.123. The “/24” at the end of the IP address signifies a netmask of 255.255.255.0.



2.2.4. Launch Chrome browser on a device connected to this network and go to ***ip_address_from_step_3:3000*** to access GUI. **Note:** “:3000” is the port number.



2.2.5. Click on the 3 Lines (menu) in the upper right.



2.2.6. Click on **Server Configuration**.



2.2.7. The Blueriver control server is running on the mini PC appliance, enter the IP address obtained in **step 3** and click **NEXT**.

The screenshot shows the 'Vy-Net Gen2 Server Configuration' interface. The first step is 'Blue River Server IP'. The instruction says 'Enter blue river control server ip address.' Below this, the IP address '192.168.1.123' is entered in a text field, which is highlighted with a red box. A green 'NEXT' button is visible below the text field. The interface also shows links for 'Preview RX' and 'Preview VyNet1 IP'.

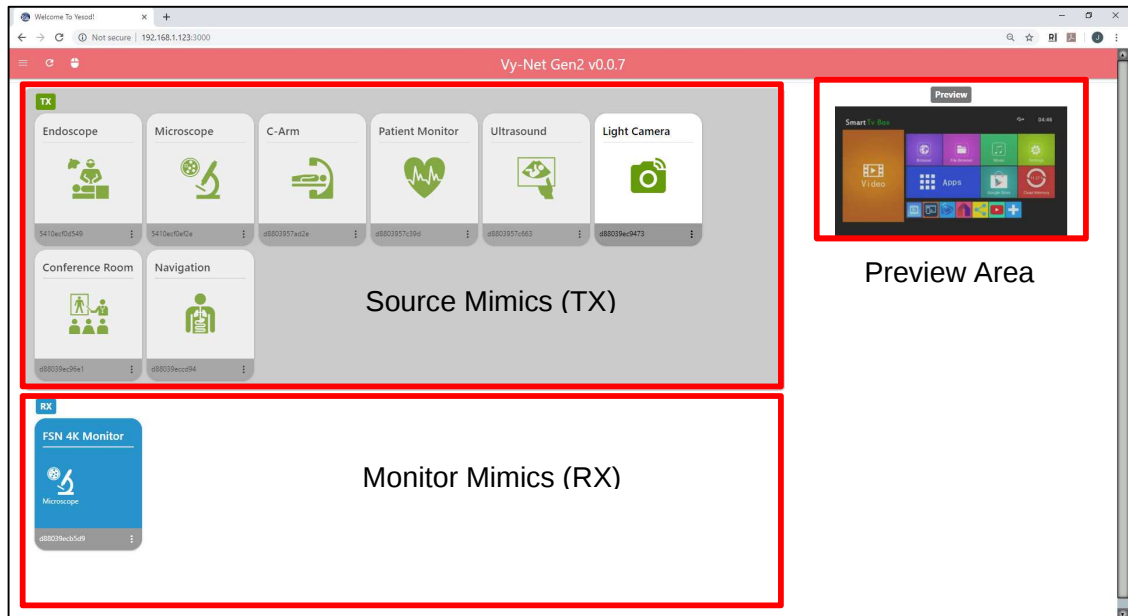
2.2.8. Now click on the MAC address of the Vy-Net2 RX that will be used for the preview scaler. **Note:** A unique MAC address is listed on the bottom of each RX and TX. In the example below, MAC address D88039ECB566 is used.

The screenshot shows the 'Vy-Net Gen2 Server Configuration' interface. The second step is 'Preview RX'. The instruction says 'Choose preview RX'. Below this, two MAC addresses are listed: 'D88039ECB566' and 'D88039ECB5D9'. The first MAC address, 'D88039ECB566', is highlighted with a red box. A green 'NEXT' button is visible below the MAC addresses. The interface also shows links for 'Blue River Server IP' and 'Preview VyNet1 IP'.

2.2.9. Enter the IP address of the Vy-Net1 encoder used for preview stream and click **DONE**. **Note:** The default is 192.168.1.10 after factory reset. See **Appendix 3** for Vy-Net1 configuration.

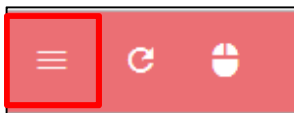
The screenshot shows the 'Vy-Net Gen2 Server Configuration' interface. The third step is 'Preview VyNet1 IP'. The instruction says 'Enter VyNet1 preivew ip address.' Below this, the IP address '192.168.1.10' is entered in a text field, which is highlighted with a red box. A green 'DONE' button is visible below the text field. The interface also shows links for 'Blue River Server IP' and 'Preview RX'.

2.2.10. If the configuration was successful you should see the main page populated with all connected and powered on Vy-Net2 devices TX/RX.

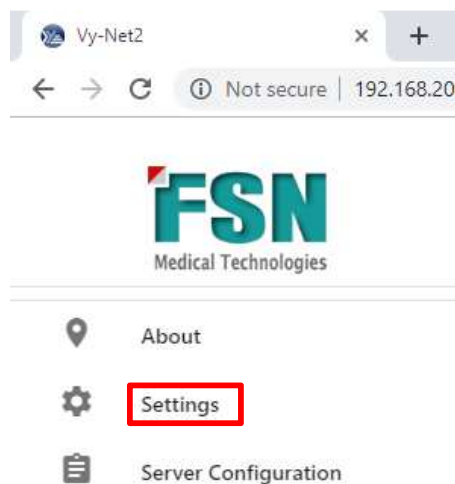


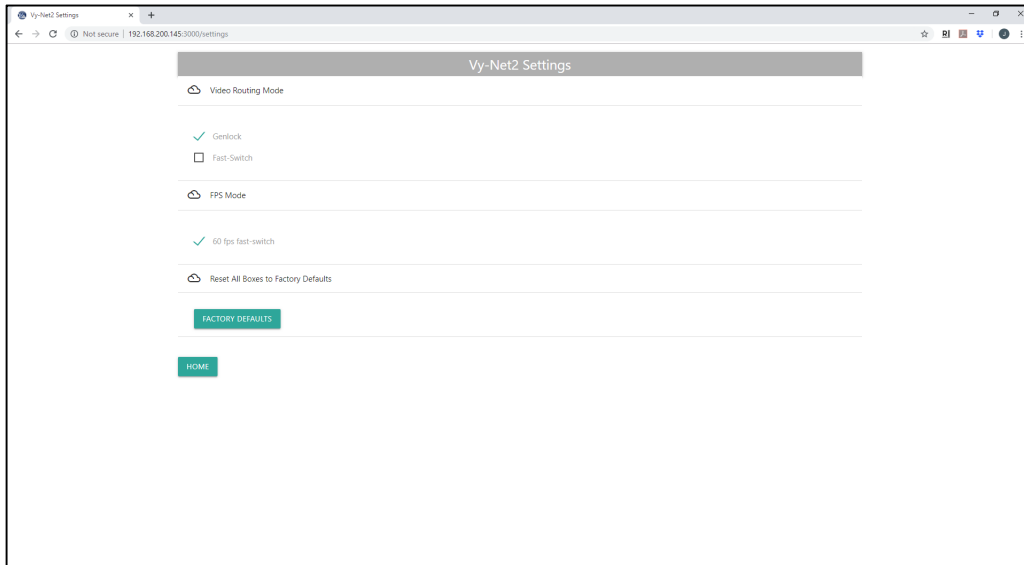
2.3. Settings

2.3.1. Click on the 3 Lines (menu) in the upper left of browser window.



2.3.2. Click on **Settings** to display the settings page.





2.4. Video Routing Mode

- 2.4.1. **Genlock** mode will provide lowest latency with slightly increased routing time.
- 2.4.2. **Fast Switch** mode will give quickest routing time with slightly increased latency.

2.5. FPS Mode (frames per second)

- 2.5.1. **60 fps fast-switch** will force 60 frames per second in fast-switch mode, the default is 30fps. In this mode there may be some compatibility issues with some sources.

2.6. Reset All Boxes to Factory Defaults

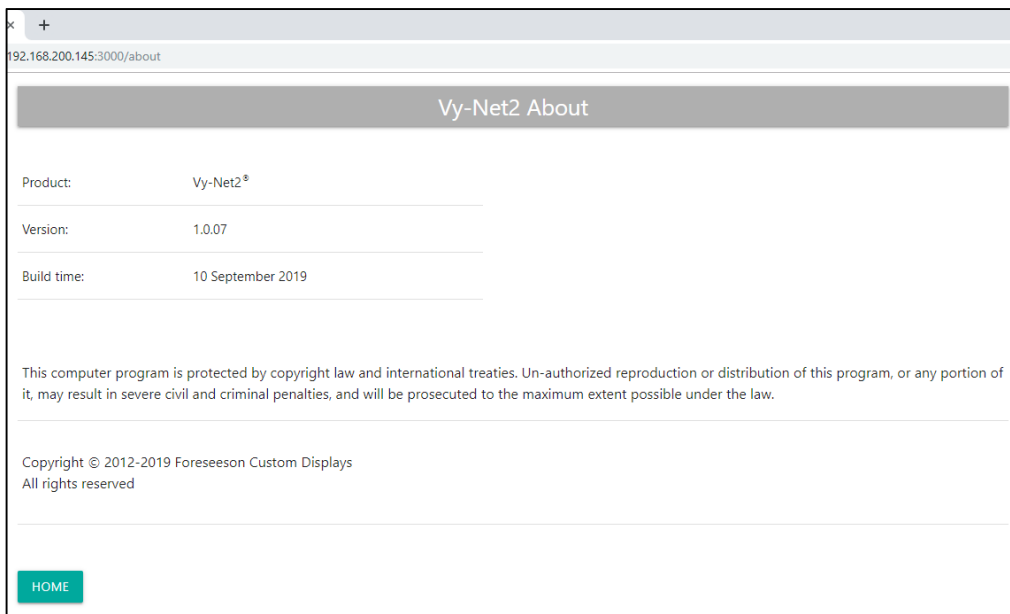
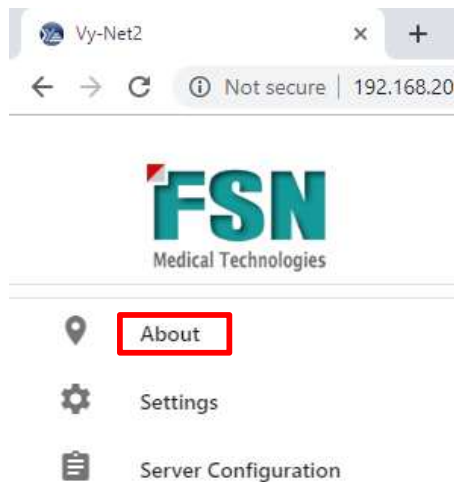
- 2.6.1. Clicking **FACTORY DEFAULTS** will reset all Vy-Net2 TX's and RX's to factory defaults and will un-route all sources. This is used to reset all boxes to a known state.
- 2.6.2. Click **HOME** to return to home page.

2.7. About

2.7.1. Click on the 3 Lines (menu) in the upper right.



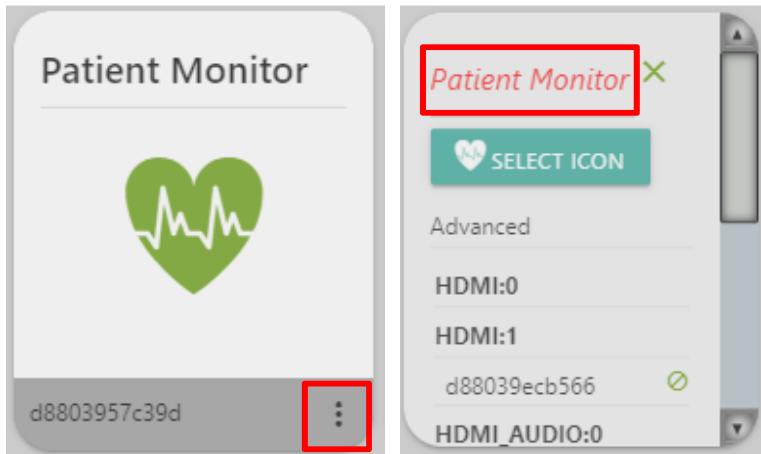
2.7.2. Click on **About** to display software version, date and copyright information.



2.7.3. Click **HOME** to return to home page.

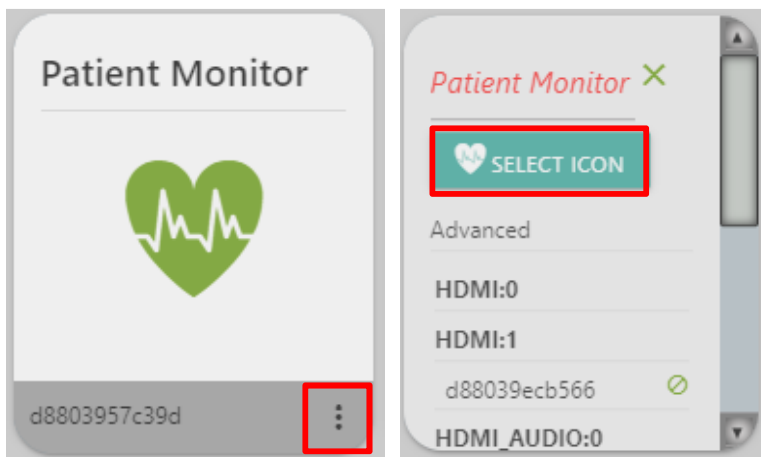
2.8. Naming

- 2.8.1. Click on 3 dots in bottom right of a TX or RX mimic, click on top line and enter new name, click **X** to save. **Note:** Make sure no sources are routed at the time of naming sources, otherwise the name may revert back to original name.

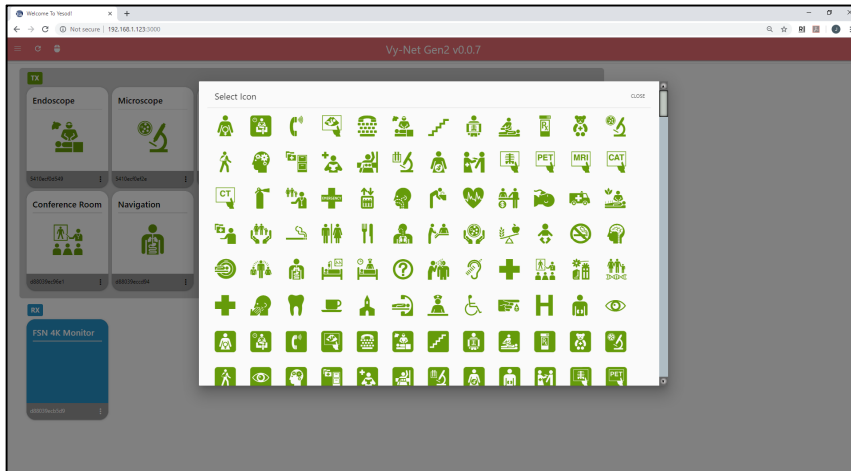


2.9. Icons

- 2.9.1. Click on 3 dots in bottom right of TX or RX mimic, click on **Select Icon**.

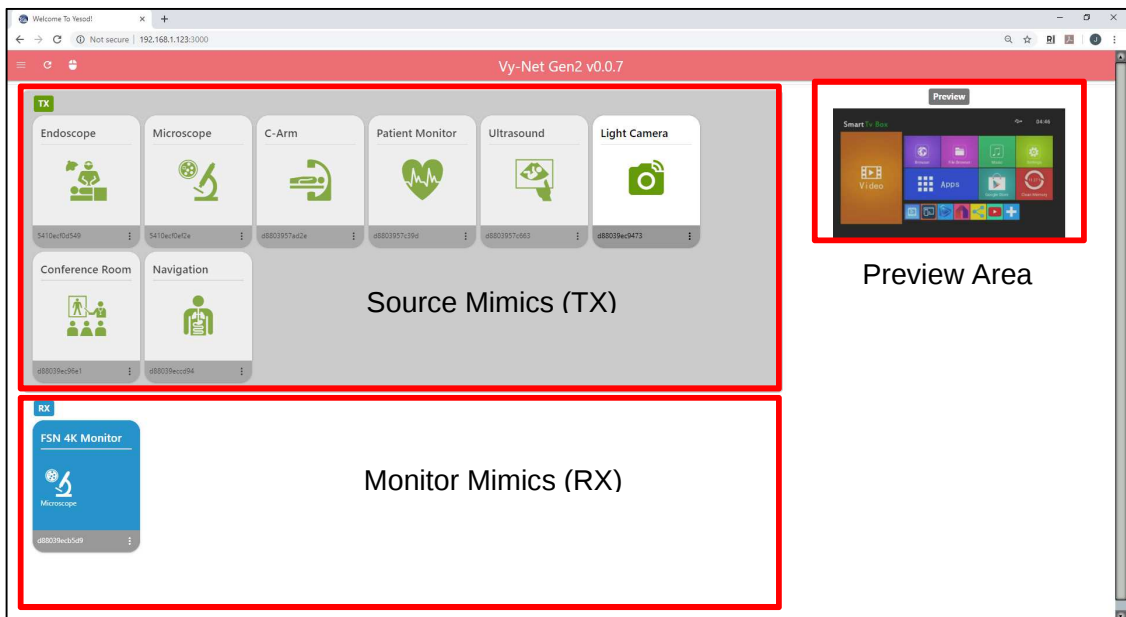


- 2.9.2. Select new icon from expandable list, click **X** to save. **Note:** Make sure no sources are routed at the time of changing icons, otherwise the icon may revert back to original icon.



3. Operation

3.1. Main Page



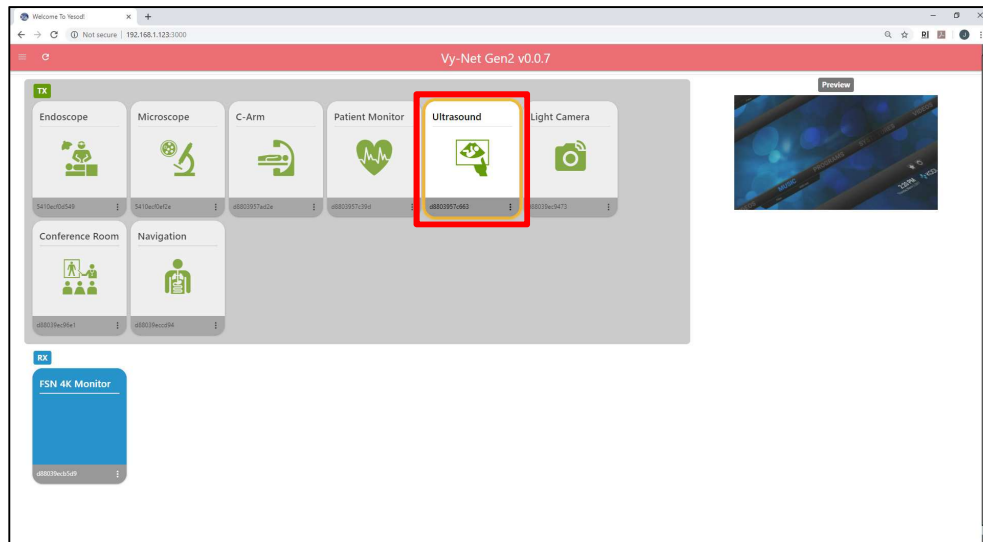
Note: No simultaneous streaming of scaled and un-scaled images, i.e. you cannot stream one source to a single display and to a multiview (scaled) display at the same time. If you attempt this, the duplicate image will be removed from the first route and routed to the new destination. Also, one source cannot be used in two different multiview outputs at the same time.

Note: **Interlaced** signal sources are not compatible with **Multiview** or **PIP** display and will be blurred out when one or more sources have been selected.

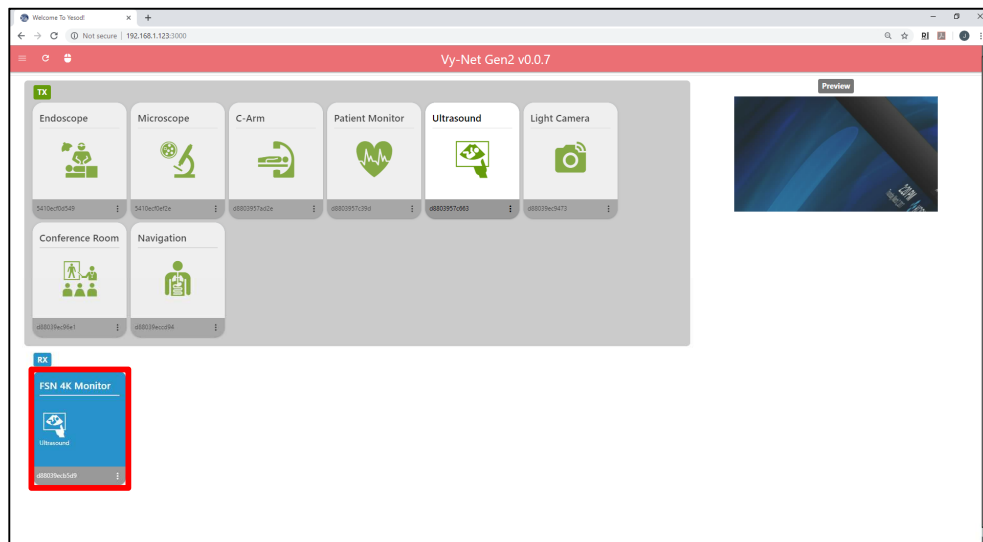
3.2. Routing

3.2.1. One to One

- 3.2.1.1. Click on a source mimic (TX). The source will be highlighted with yellow frame. **Note: Preview** will be displayed of the selected source (or just by hovering over the source mimic if using mouse for control).



- 3.2.1.2. Then click on a monitor mimic (RX), the source icon will now be displayed in the monitor mimic and routed to the appropriate monitor.



Or the reverse can be done by clicking on a monitor mimic (RX) first and then clicking on a source mimic (TX).

3.2.2. One to Many

3.2.2.1. Click on multiple monitor mimics and then click on a source mimic.

3.3. Un-select

Left click anywhere on the background to un-select any previously selected TX's/RX's or click on the selected TX/RX again to un-select mimics individually.

3.4. Un-route

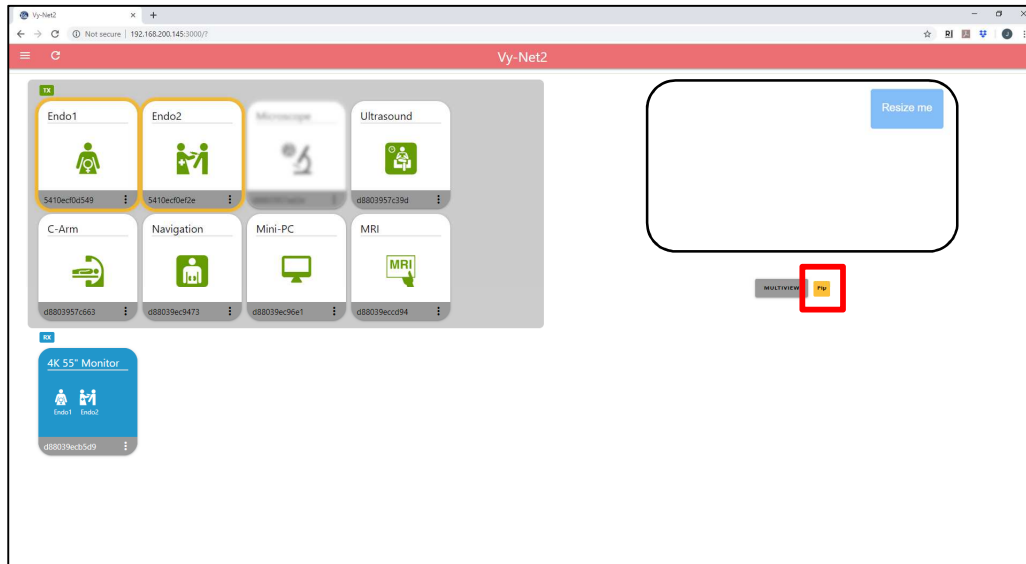
Click on 3 dots in lower right of RX mimic, click on any **Ø** to un-route all sources from this output, and click **X** when done.

Note: make sure no sources are selected at the time of un-routing.



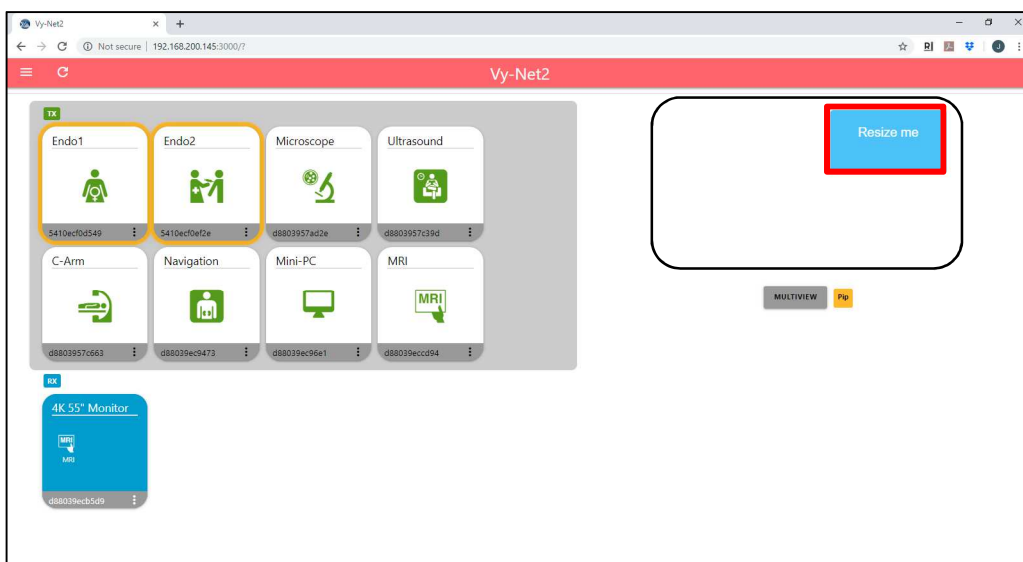
3.5. PIP

3.5.1. Click on **two sources** and click **PIP** in the preview area.

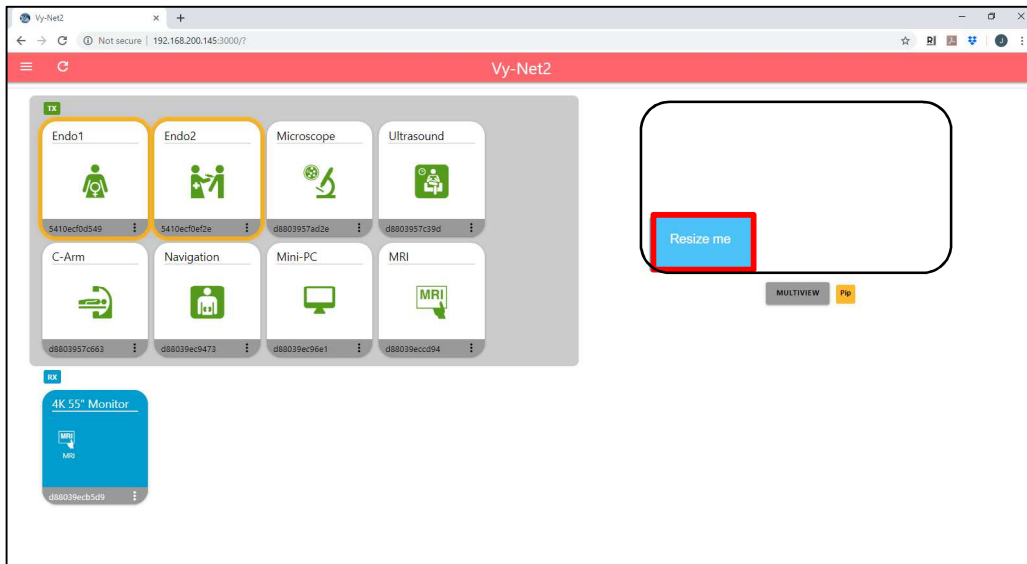


Note: Interlaced signal sources are not compatible with PIP display and will be blurred out when one or more sources are selected.

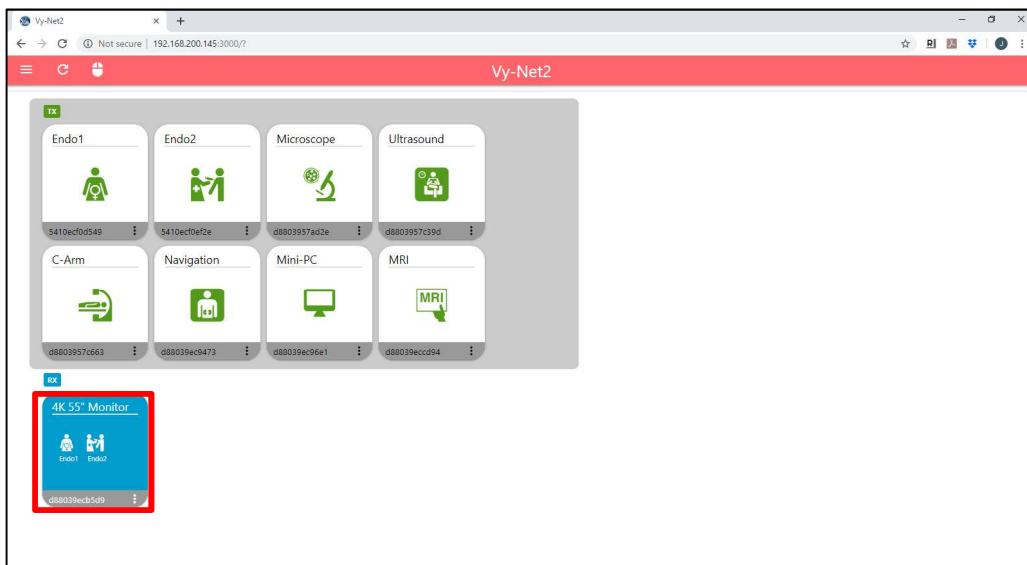
3.5.2. To adjust the **PIP window size**, click and hold on the edge of the PIP mimic and drag to the desired size.



3.5.3. To adjust the **PIP window location**, click and hold on the PIP mimic and drag to the desired location



3.5.4. Click on a RX to route the PIP image to monitor. The monitor mimic will display the two icons of the selected sources.



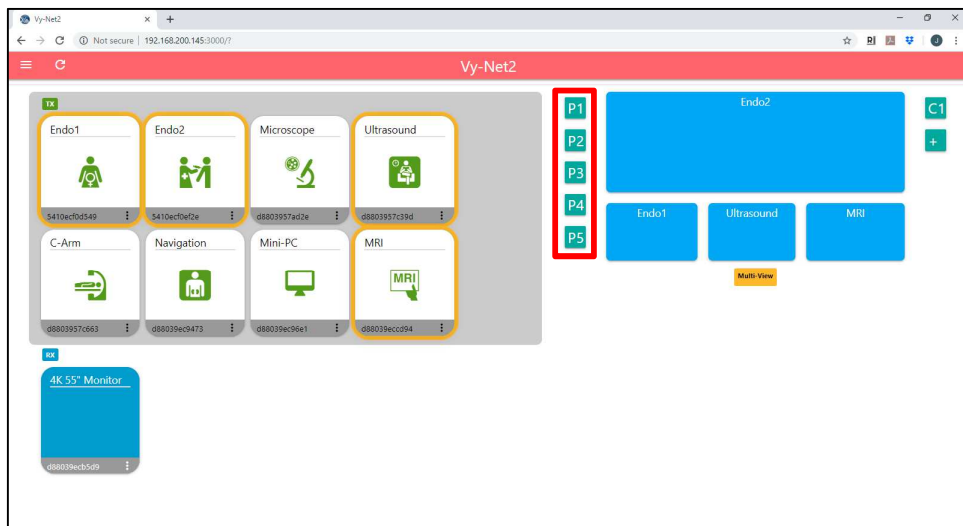
3.6. Multiview

- 3.6.1. Multiview layout window will automatically be displayed by selecting 2 or more sources (up to max of 8).

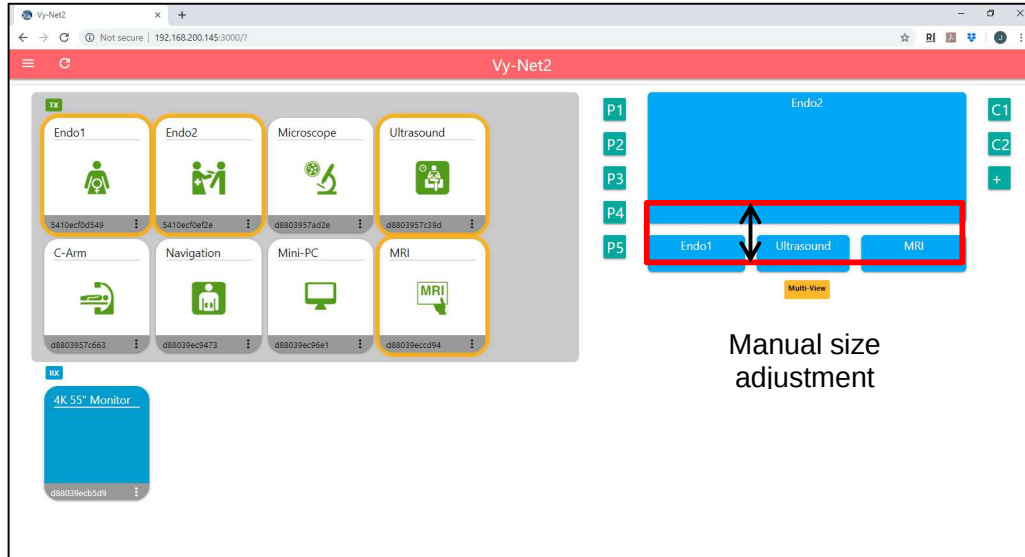


Note: Interlaced signal sources are not compatible with multiview display and will be blurred out when one or more sources are selected.

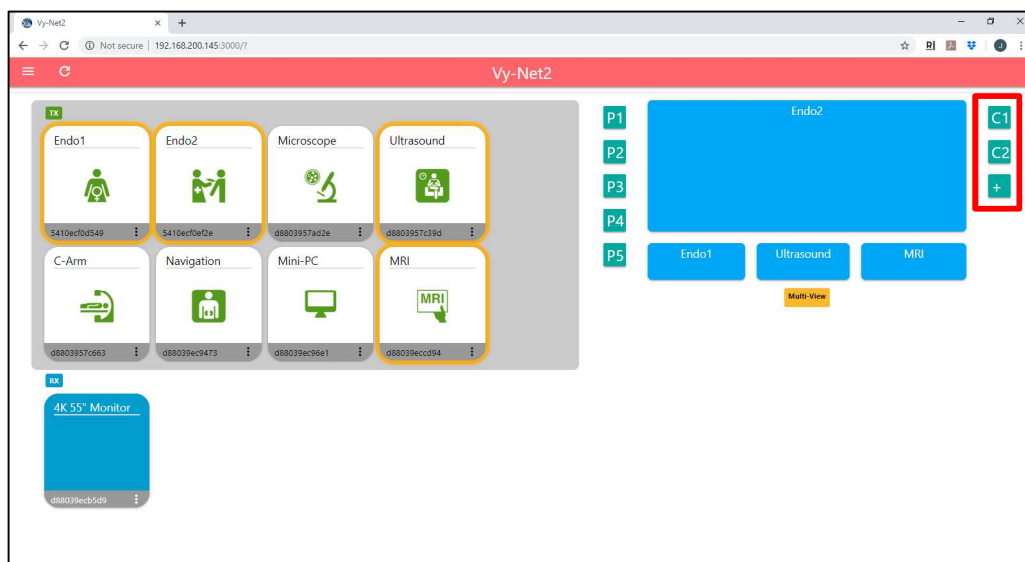
- 3.6.2. You can select a **Predefined multiview layout** by clicking on **P1, P2, P3** etc.



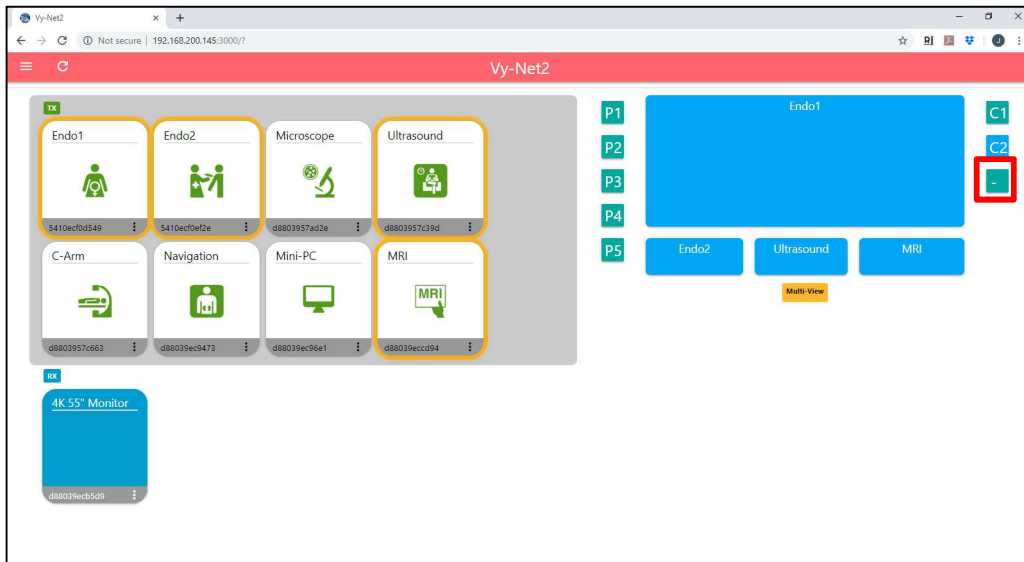
3.6.3. Or you can **create your own Custom multiview layout**. To adjust size, click on separation lines between sources in the multiview layout window and drag to desired size. Source position can also be swapped by clicking and dragging a source to a new location in the multiview window.



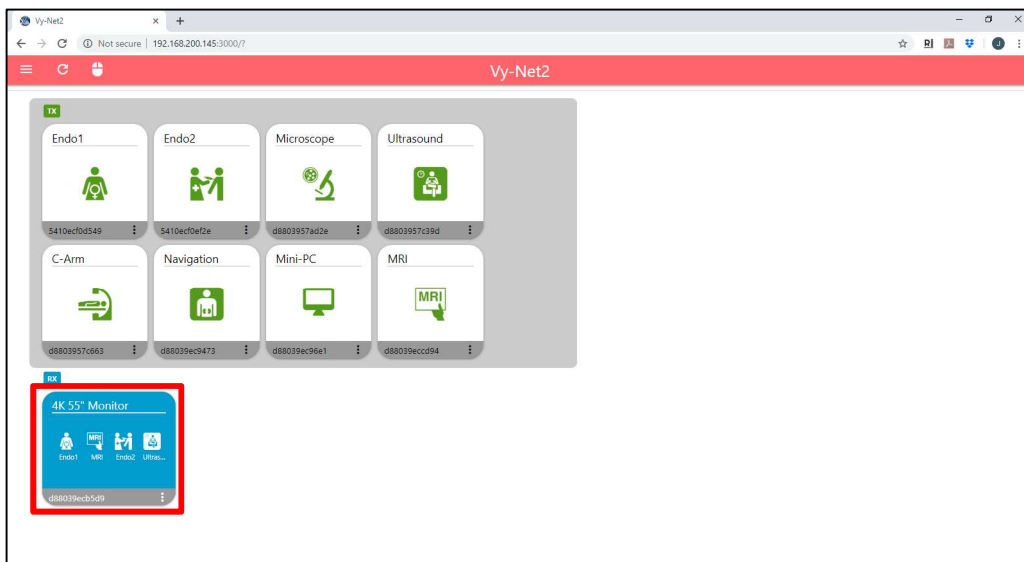
3.6.4. You can also **save the Custom layout** you just created by clicking the **+** in the upper right. This will create **C1, C2, C3** etc. and can be recalled at any time by clicking on **C1, C2, C3** etc.



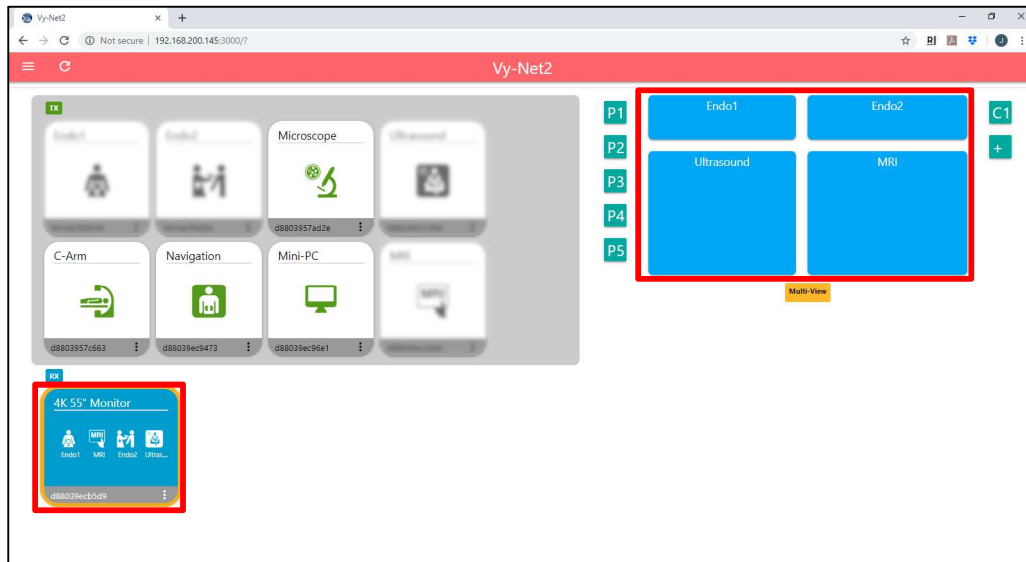
3.6.5. Custom layouts can be deleted by selecting a layout (C1, C2, C3 etc.) and clicking on the – in the upper right.



3.6.6. Once you have defined the multiview layout, click on a monitor mimic to **route multiview** image. The source icons will be displayed in the monitor mimic for all sources included in the multiview.



3.6.7. You can change the **multiview layout** by clicking on the monitor mimic again and readjusting in the multiview window as in previous steps. click on the monitor mimic again to route new layout to monitor.



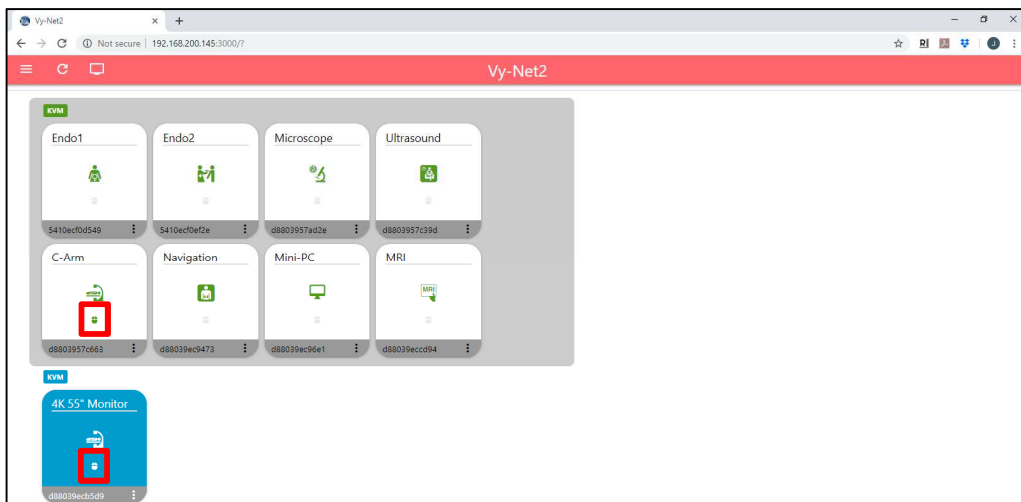
3.7. KVM

Keyboard/Video/Mouse can be used to remote control any source device that requires keyboard/mouse input.

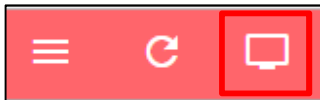
3.7.1. Select Mouse icon in upper left of browser window.



3.7.2. Click on the monitor RX that has mouse and keyboard connected, then click source TX you want to control remotely. The mouse icons will appear in monitor and source mimics. **Note:** KVM routing will be remembered until it is changed.



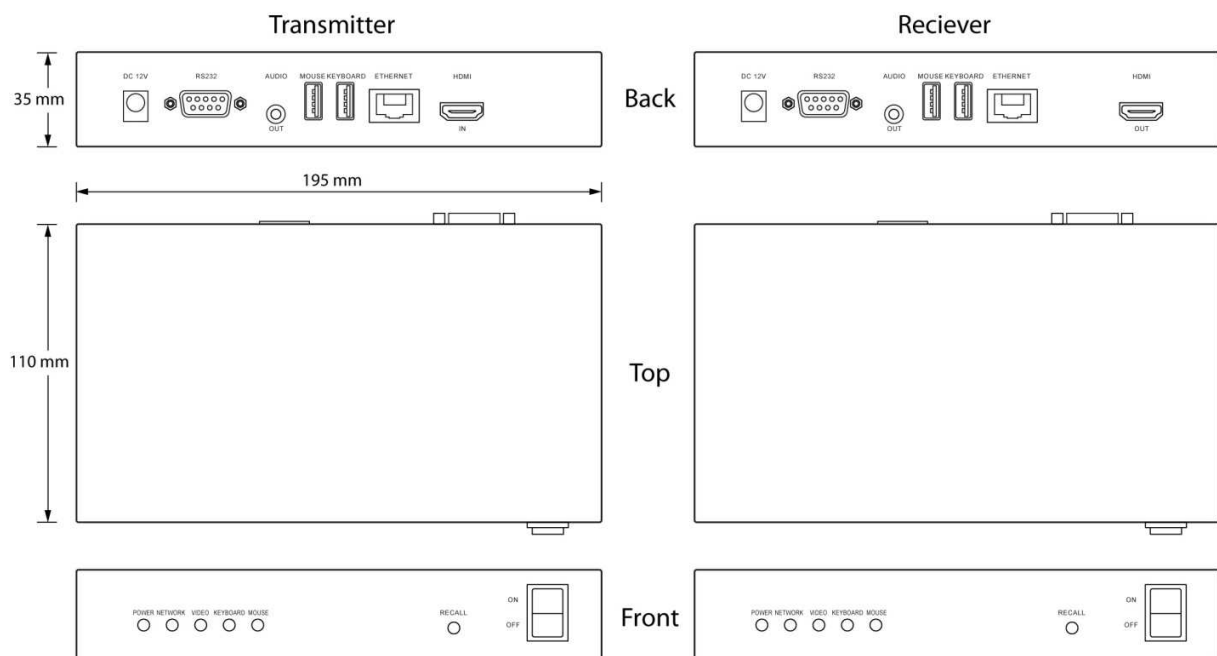
3.7.3. Click on display icon when done to go back to routing mode.



4. Appendix 1

4.1. Specifications

Item	TX	RX	Description
Input Signal	•		HDMI 2.0
		•	10GbE (copper)
Output Signal	•		10GbE (copper)
		•	HDMI 2.0
Maximum Resolution	3840 x 2160 @ 60Hz		
Keyboard Connector	USB A-Type x 1		
Mouse Connector	USB A-Type x 1		
Audio Connector	Phone Jack, 3.5 mm		
Unit Dimension	195(W) x 35(H) x 110(D) mm 7.68(W) x 1.38(H) x 4.33(D) inch		
Power Supply	DC + 12V		
Operating Temperature	0° - 40° C		
Relative Humidity	1 - 80%, non-condensing		
Recommended Cable	CAT6A/CAT7		
Weight	•		600g, 1.32 lbs.
		•	605g, 1.33 lbs.



5. Appendix 2

5.1. Switch Selection and Configuration

10G switch features required

- IGMP version 2 support
- Enable IGMP Snooping (on VLAN1 or other VLAN if being used)
- Enable Filter/Drop unregistered Multicast traffic
- Disable Unregistered Multicast Flooding
- Enable FASTLEAVE (for VLAN1 or other VLAN if being used)
- Enable IGMP Querier (for VLAN1 or other VLAN if being used)

Non-blocking will depend on the capacity of the switches internal backplane, which needs to be enough to handle a full 10Gbps from all ports. Most switches will be non-blocking in this regard, but for lower end switches we advise the customer/integrator to check the specs.

6. Appendix 3

6.1. Vy-Net1 Preview Configuration

- 6.1.1. Plug in external power supply into Vy-Net1 device and wait 1 minute for unit to complete boot process.

LED Indicators

*After power on and boot process is complete, VyNet unit should have solid green **Ready** LED, flashing green **Streaming** LED and **Power** LED green if powered by external power supply (included with each VyNet unit).*

Note: If any LED's (except power) are amber, restart the unit by cycling power or momentarily pressing the **RESET** button on front panel.

- 6.1.2. Press and hold the **Factory** button for 6 seconds (all front panel LED's will go solid amber), then release **Factory** button. Wait 1 minute for unit to reboot.



Note: This will reset all settings to factory default including static IP address to **192.168.1.10**.

- 6.1.3. Open Chrome browser and go to **192.168.1.10**. Enter credentials, (default) username: **admin** and password: **admin**, click **Login**.

Authentication required

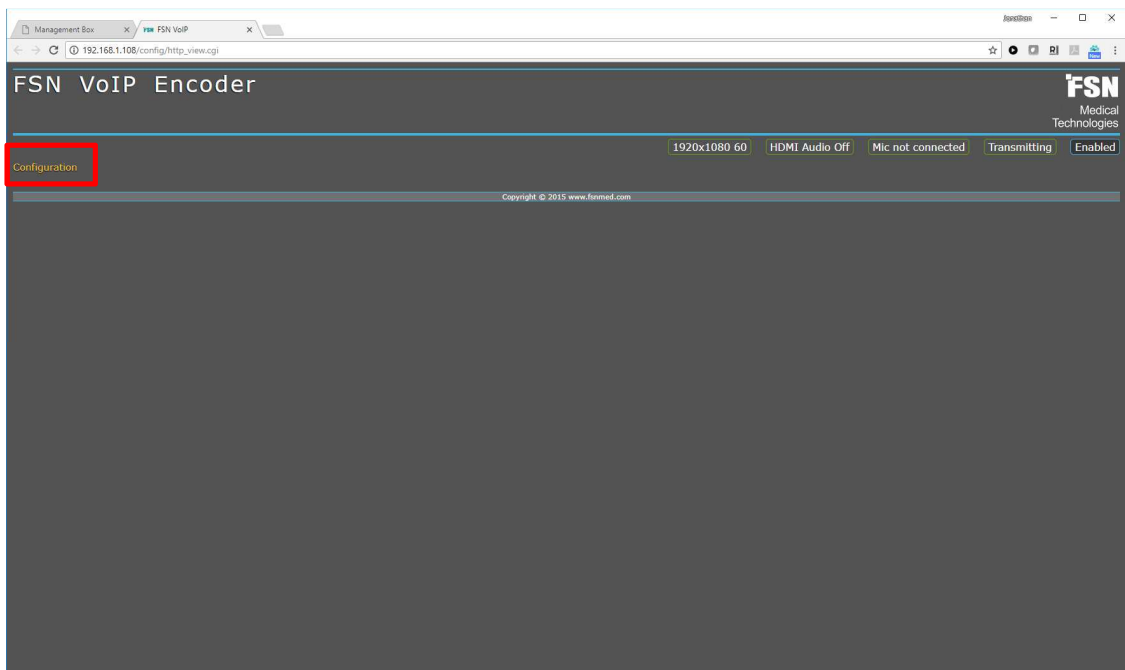
<http://192.168.1.10>

Your connection to this site is not private

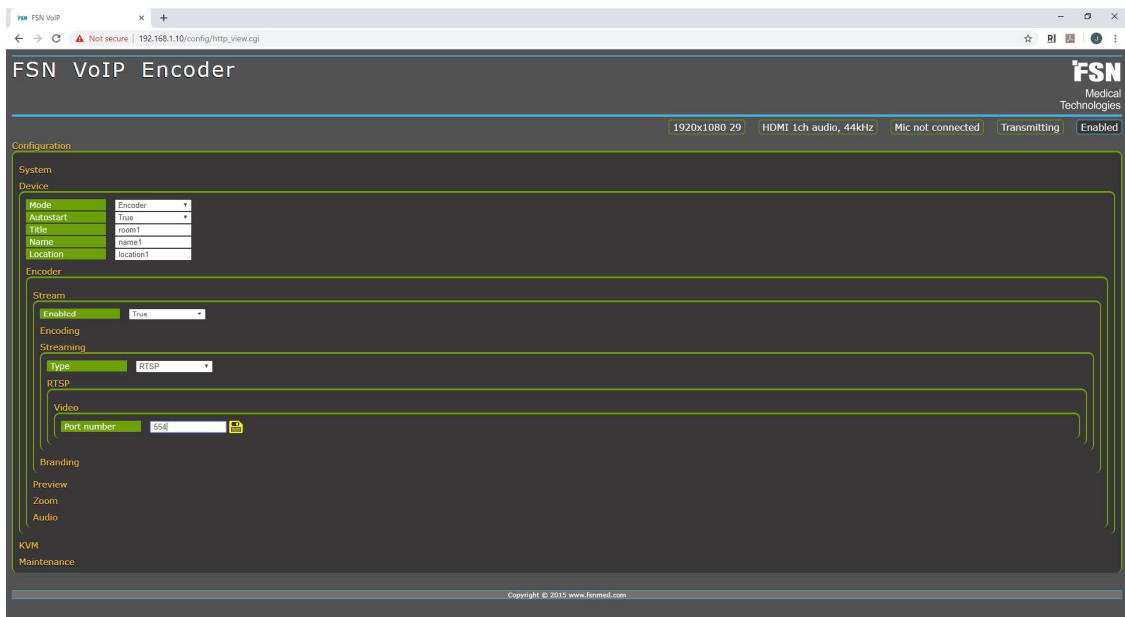
Username

Password

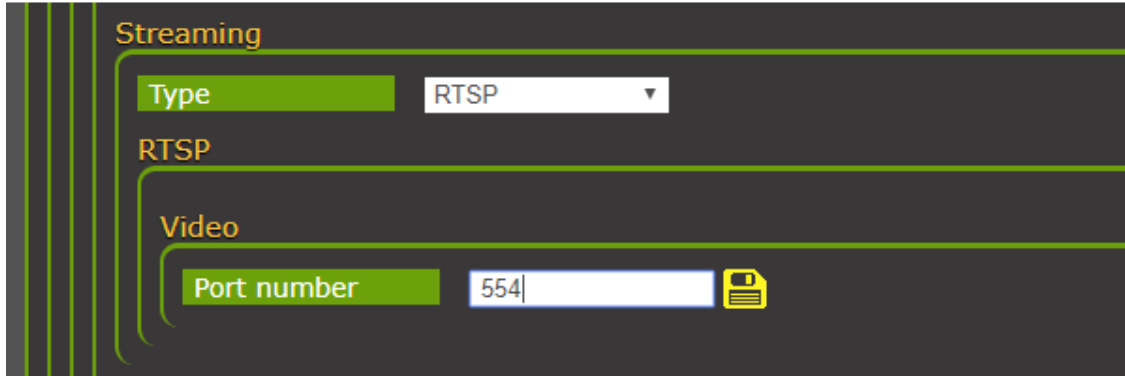
6.1.4. The advanced configuration page will be displayed, click on **Configuration**.



6.1.5. Click on **Device > Encoder > Stream > Streaming**.



6.1.6. Set Streaming Type to **RTSP** and Video Port Number to **554**, Click yellow disk icons to save settings.

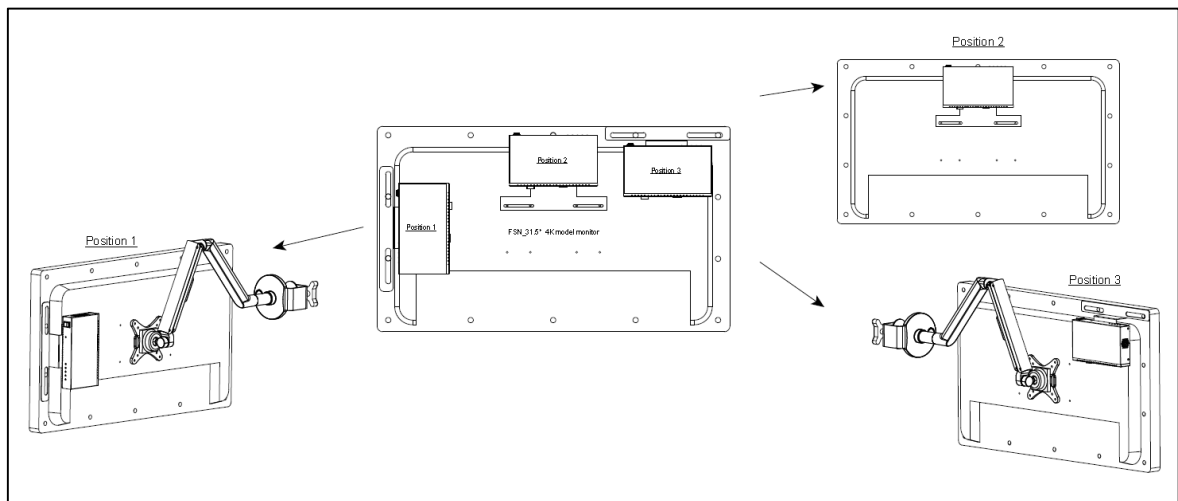
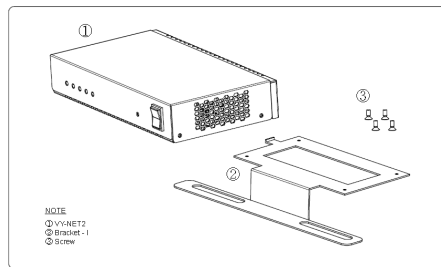


6.1.7. Reboot Vy-Net1 device by momentarily pressing the front panel **Reset** button to complete configuration.

7. Appendix 4

7.1. Mounting Vy-Net2 Hardware

7.1.1. A bracket is available from FSN for mounting Vy-Net2 RX to back of a monitor as shown below.



8. Appendix 5

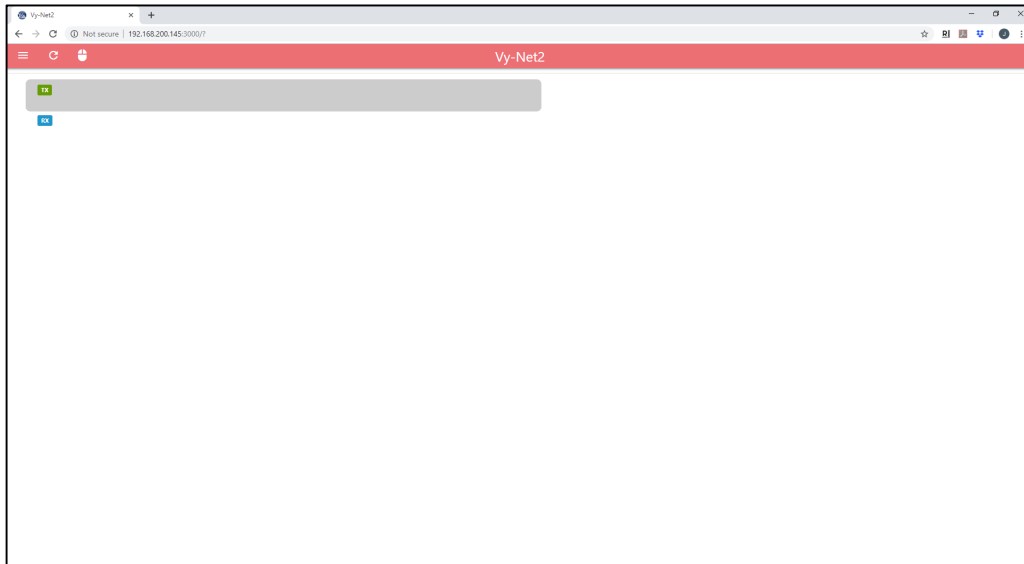
8.1. Audio and RS232 Control

8.1.1. Audio and RS232 control must be done using a separate utility called **Vy-Net2 Manager**. The utility and documentation are available from FSN Medical Technologies. Eventually these controls will be included in future versions of the GUI software.

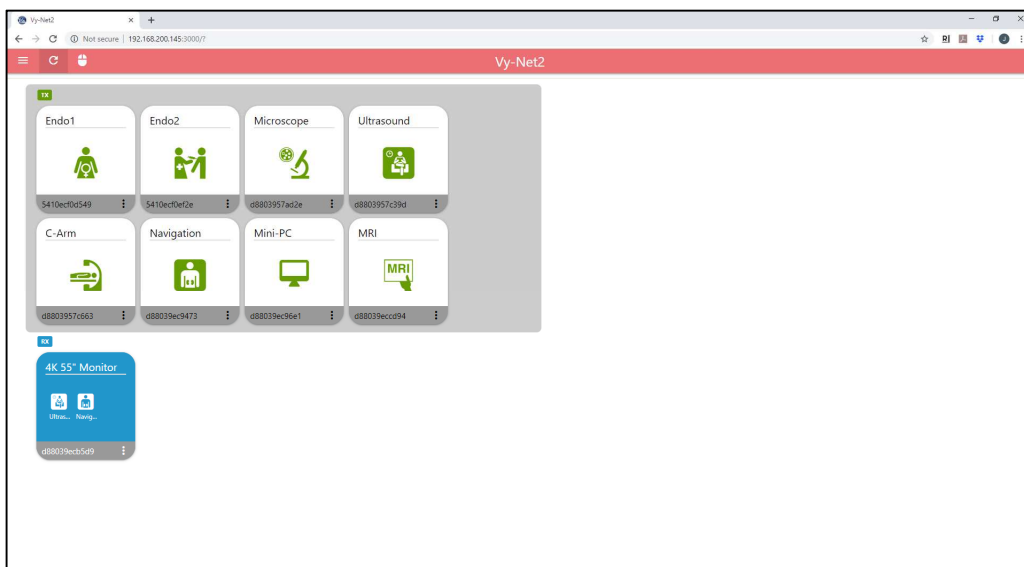
9. Appendix 6

9.1. Troubleshooting

9.1.1. No mimics are displayed after a settings change or after reboot.



9.1.2. Click the **Refresh** icon in upper left of browser window.



9.1.3. If refresh does not resolve, **Reboot** Vy-Net2 GUI server appliance FPi-7000.

9.2. Source or Monitor Naming/Icons revert back to original.

9.2.1. **Note:** Make sure no sources are routed at the time of naming or select new icon for sources/monitors; otherwise the name may revert back to original name/icon.

9.3. Some sources do not display in Genlock mode, but do display in Fast-switch mode.

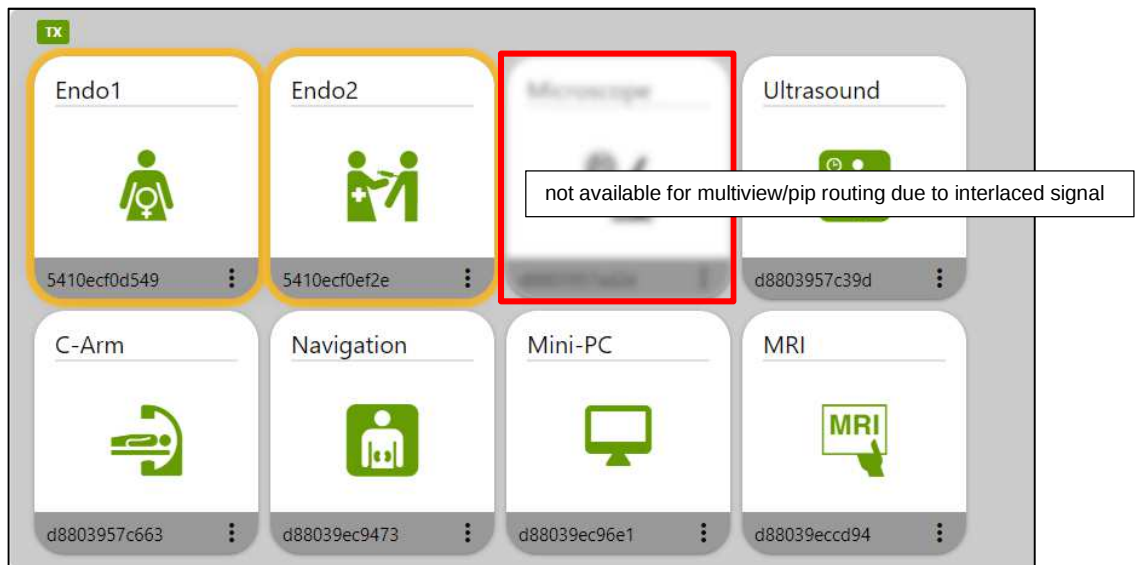
9.3.1. Power-cycle all Vy-Net2 boxes to refresh EDID links.

9.4. Source is removed from Multiview or PIP display.

9.4.1. No simultaneous streaming of scaled and un-scaled images, i.e. you cannot stream one source to a single display and to a multiview/PIP (scaled) display at the same time. If you attempt this, the duplicate image will be removed from the first route and routed to the new destination. Also, one source cannot be used in two different multiview/PIP outputs at the same time.

9.5. Some source mimics blurred out and are not selectable, after selecting one or more sources.

9.5.1. **Interlaced** signal sources are not compatible with **Multiview** or **PIP** display and will be blurred out when one or more sources have been selected.



Thank you for choosing our product, “MSV 2”.

Service

Please contact our customer service if you need any information or help with our products.

USA

Foreseeson USA
2210 E. Winston Road
Anaheim, California, 92806, USA
E-mail: info@ophitusa.com

KOREA

Foreseeson Korea
B-408, U-Space2,
670 Daewangpangyo-ro, Bundang-gu,
Seongnam-si, Gyeonggi-do,
Republic of Korea
Tel: +82-31-8017-0780
Fax: +82-31-8018-0786

EUROPE

Foreseeson GmbH
Industriestrasse 38a
63150 Heusenstamm, Germany
Tel: +49 6104 64398 0
Fax: +49 6104 64398 11

China

Foreseeson (Shanghai)
Medical Equipment Co., Ltd.
Room 1010, Build
1439 Wuzhong Road
Rhein Hongjing Center
Minhang District, Shanghai, China
Tel: 18521095596

Warranty

One year, parts and labor.

Specifications are subject to change with or without notice.



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