KVM DVI over IP PoE Extender Kit

Operation Manual

# 500771

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1 Introduction

The KVM DVI over IP PoE Extender Kit allows DVI & USB equipment to be connected up to 330ft (100m) over an Ethernet LAN, supporting 1920x1200 and 1080p resolution @ 60Hz via Cat5e/6 cable in multiple point-to-point and point-to-multipoint configurations. The Transmitter (500771-TX) and Receiver (500771-RX) support PoE (PD) if used with a PoE (PSE) Ethernet Switch.

The Transmitter terminates to a computer server/workstation via a DVI & USB port, The Receiver terminates to a DVI display and up to 4 USB devices such as a keyboard, mouse, printer, drawing pad, storage device, camera, etc., via a 4 port USB hub. A single Receiver can be switched via hotkey sequences to any Transmitter on the network, allowing a single operator to manage numerous servers/workstations, in a distributed KVM application.
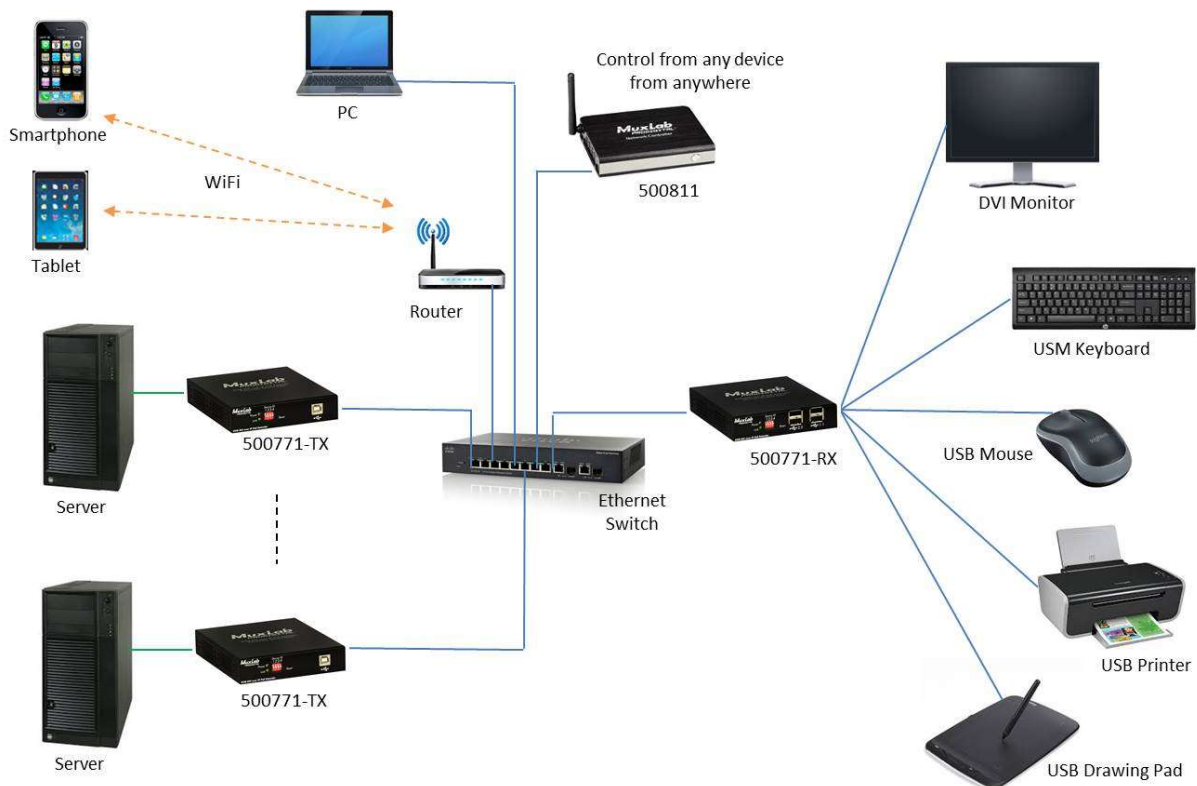
There are two hotkey methods to switch from one workstation to another. There is a Direct Switching Method and an On Screen Display (OSD) Switching Method. This manual explains how to control the switching from one workstation to another, as detailed below.

Key Features:

- One operator can manage multiple servers/workstations
- Supports DVI up to 1920x1200 and 1080p @ 60Hz
- Receiver side includes a 4-port USB hub, for KVM applications

- Up to 330ft (100m) over Cat5e/6
- Supports 100's of Transmitters & Receivers depending on network bandwidth
- Supports multiple point-to-point, and point-to-multipoint applications
- Supports audio insert & mic-out (TX), and audio extract & mic-in (RX)

Please reference the 500771 Installation Guide for specifications and instructions on how to connect Transmitters to workstations and the Receiver to a DVI display, USB keyboard and USB mouse (plus two additional USB devices, if required). Note that the USB keyboard and USD mouse should be connected to the USB 1.1 ports. The remaining two USB 2.0 ports may be connected to other USB devices, such as an external hard disk, USB memory stick, USB printer, USB drawing pad, etc.

2 Direct Switching Method

This method of switching from one workstation to another supports up to 16 workstations. It supports a quick and simple method of switching to different workstations. If more than 16 workstations is required, then the On Screen Display (OSD) Switching Method must be used.

Each Transmitter must have a unique Dip Switch setting (ranging from 0 to 15) which will automatically correspond to the workstation ID. The Dip Switch represents a binary count as follows:

ID 0	ID1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7	ID 8	ID 9	ID 10	ID 11	ID 12	ID 13	ID 14	ID 15
0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111

To quickly switch from one workstation to another, say to switch from workstation ID 1 to workstation ID 4, press and hold the "CTRL" key and while doing so quickly press "4" three times.

This will automatically switch the client operator to the workstation with ID 4.

Note that the hotkey keyboard mapping for ID 0 to ID 15 is as follows:

ID 0	ID1	ID 2	ID 3	ID 4	ID 5	ID 6	ID 7	ID 8	ID 9	ID 10	ID 11	ID 12	ID 13	ID 14	ID 15
CTRL + 0	CTRL + 1	CTRL + 2	CTRL + 3	CTRL + 4	CTRL + 5	CTRL + 6	CTRL + 7	CTRL + 8	CTRL + 9	CTRL + Q	CTRL + W	CTRL + E	CTRL + R	CTRL + T	CTRL + Y

3 On Screen Display (OSD) Switching Method

The OSD Switching Method does not rely on the Dip Switch setting and thus is not limited to only 16 workstations. This method supports 100's of workstations.

To activate the OSD, quickly press "Scroll Lock" three times. This brings up the KVM OSD Menu, with a pulldown tab to select from many workstations (scroll through the pulldown menu to select the desired workstation). In addition, each KVM Transmitter can have a user defined alpha numeric name that is representative of the attached workstation. For example the KVM Transmitter that is connected to the main email server can have the name "Email Server 1" or "Main Email Server".

The main KVM OSD Menu offers the operator a simple and clean menu selection as shown below. Note that while the OSD is active, the operator is not connected to any workstation.
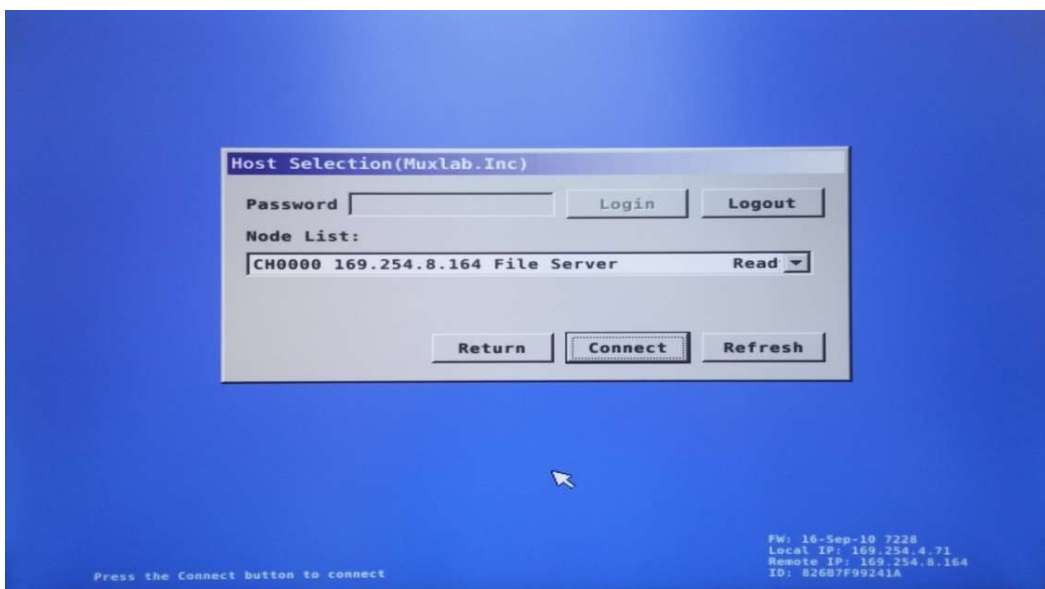

- **Password Field:** The user must enter his or her password in this field in order to login and be provided system access. The default password is "admin".

- **Login:** Type in a valid password and click on "Login". If accepted, then access is granted.

- **Logout:** Click on "Logout", to log out of the system. Access is denied while logged out.

- **Node List:** This field shows the previous workstation selected. When clicking on the pulldown arrow, a listing of all workstations that may be selected for control is presented. Use the scroll bar to view all workstations.

- **Return:** Returns control of the previous workstation (prior to bringing up the OSD).

- **Connect:** After selecting a workstation in the Node List, then pressing "Connect" provides control over the selected workstation (assuming it is not already under the control of another client).

- **Refresh:** Pressing "Refresh" updates the Node List of available workstations.

3.1 Login to the KVM Device

Once the KVM Receiver is powered up it will present the operator with a Login screen as shown below, as an On Screen Display (OSD), which is originating from the attached KVM Receiver, and not from the computer.
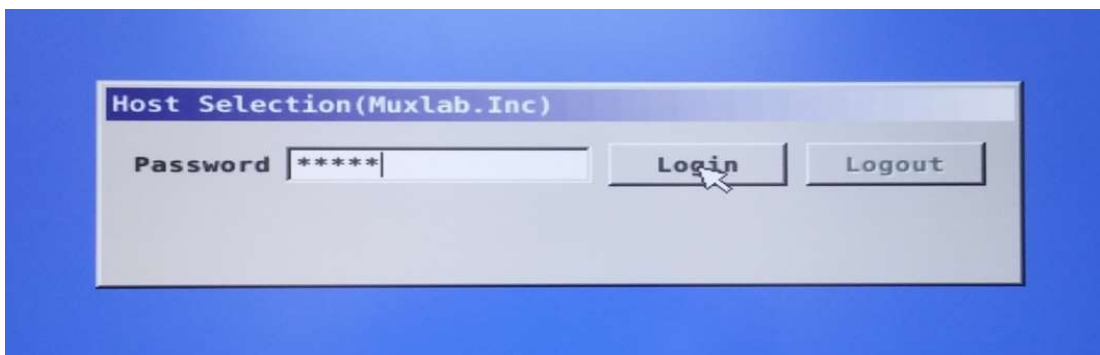
Type in your password and click on Login with your mouse. The default password is "admin".

The following screen will be displayed and is ready for you to select a workstation to connect with. Note that the previously connected workstation is displayed by default in the Node List field.
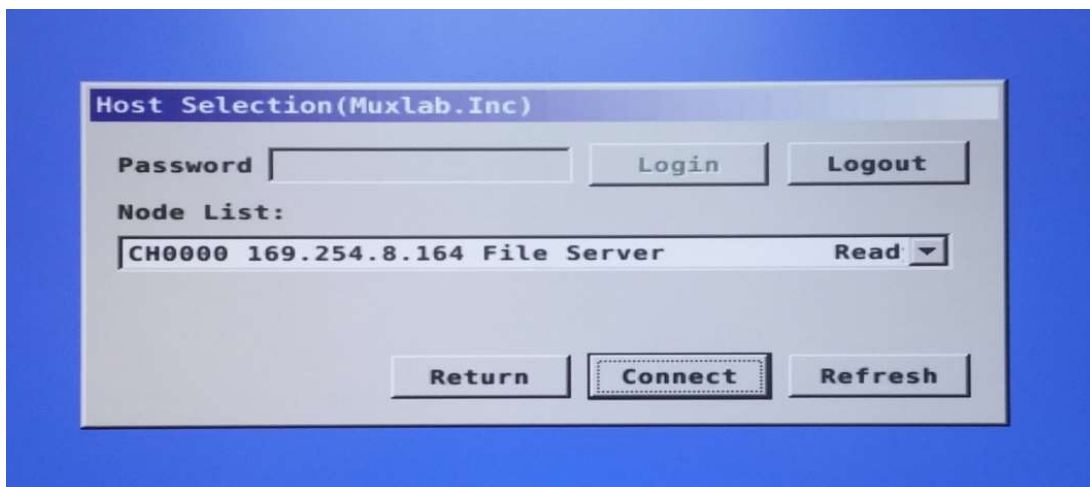
3.2 Logout from the KVM Device

To Logout, simple click on "Logout", and the login screen will be displayed. You will be required to login, should you wish to take control of the KVM device and connect with available workstations.

3.3 Bring up the KVM OSD Menu

To bring up the KVM OSD Menu at any time, quickly press "Scroll Lock" three times. The OSD will be displayed.

Note that this display is generated directly from the KVM Receiver, and is not being generated by any workstation.

3.4 Selecting a Workstation to control

If the KVM OSD Menu is not currently being displayed, then do so at this time.

Before selecting a workstation to control, it is a good practice to click on "Refresh" first, just in case a new workstation was recently added since the last time "Refresh" was executed.

To select a workstation, click on the dropdown arrow, as shown below, to list the workstations which are controllable via the KVM device.
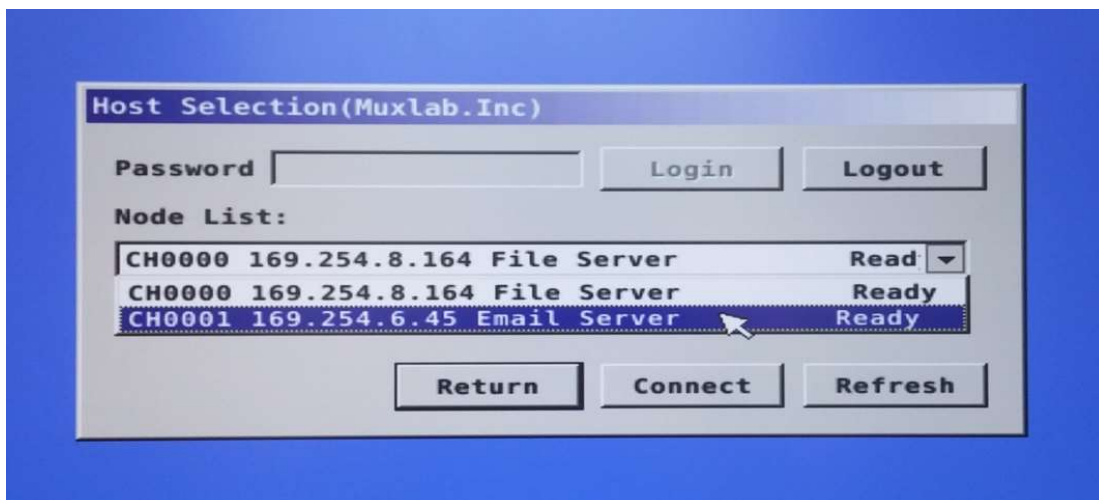

Note that the list includes the following information respectively:

- The Dip Switch setting selected on a given KVM Transmitter, where "CH0000" means Dip Switch setting "0000".
- The IP address of the KVM Transmitter.

  The given name for the KVM Transmitter, which is generally a name that is representative of the attached workstation.

Note: The KVM Transmitter name can be set via the web interface of the said KVM Transmitter. To do so, follow the procedure in the section "Setting the Transmitter/Receiver Name".

To actually select a workstation to control, use the mouse to click on the desired workstation from the provided "Node List". Workstations that indicate a status of "Ready" are available for control, while workstations that have a status of "Busy" are already being controlled by another client and are not available to you at this time. Click on a free workstation to highlight it and then click on "Connect" to connect with that workstation.
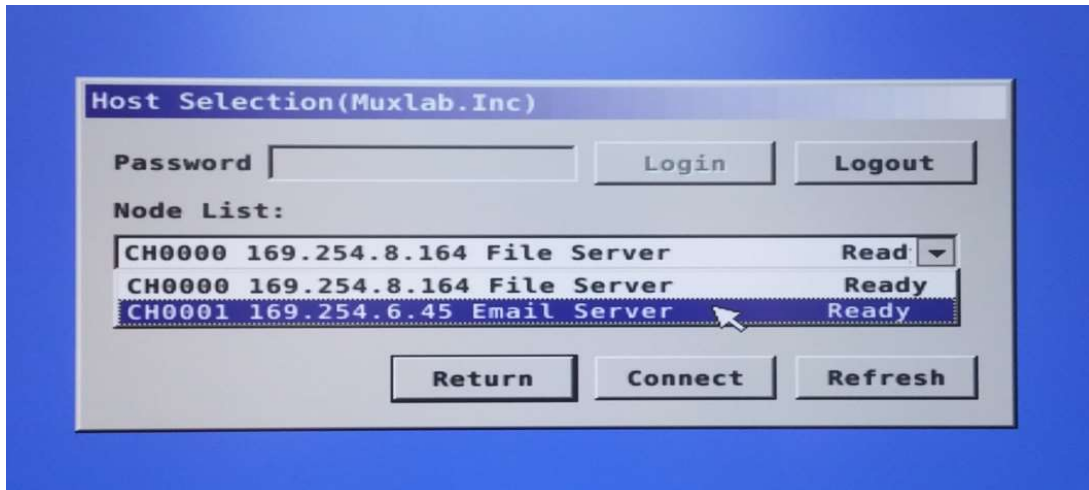
Once connected, the workstation screen will be displayed and the mouse and keyboard will function normally, just as if you were directly connected and located next to the workstation.

Note: If you accidently try to connect to a workstation with a "Busy" status (meaning that it is already connected to another client), then the KVM OSD Menu will return within a few seconds, rather than presenting the operator with the workstation screen.

3.5 Returning

Clicking on "Return", will return you to the previous workstation you were controlling. Note that if another client connected to your previous workstation, while your OSD KVM Menu was active, then you will not have access to this workstation until it is free, or instead you can simply connect with another workstation that is currently free (in "Ready" state). Note that when you active the OSD, you lose control of the workstation you were controlling.

3.6 Refresh

Pressing "Refresh" updates the Node List of available workstations. Note that during power up, a refresh is automatically performed by the system.

4 KVM Transmitter/Receiver Settings

The following section describes how to set and configure the KVM Transmitter and Receiver via their web interface. To access either the KVM Transmitter or Receiver web interface, begin by entering the KVM Transmitter/Receiver IP address into a computer web browser and press enter. Make sure the computer is connected to the same subnet as the KVM Transmitter/Receiver, and that it has an IP address that is within the same subnet range. Login, if required, with the appropriate password (the factory default password is "admin").

4.1 Firmware Version Information

To access the Firmware version information, press on the "System" tab, and then on the "Version Information" sub tab. This will bring up the firmware version information for the given KVM Transmitter/Receiver. An example KVM Transmitter version information screen is shown below.
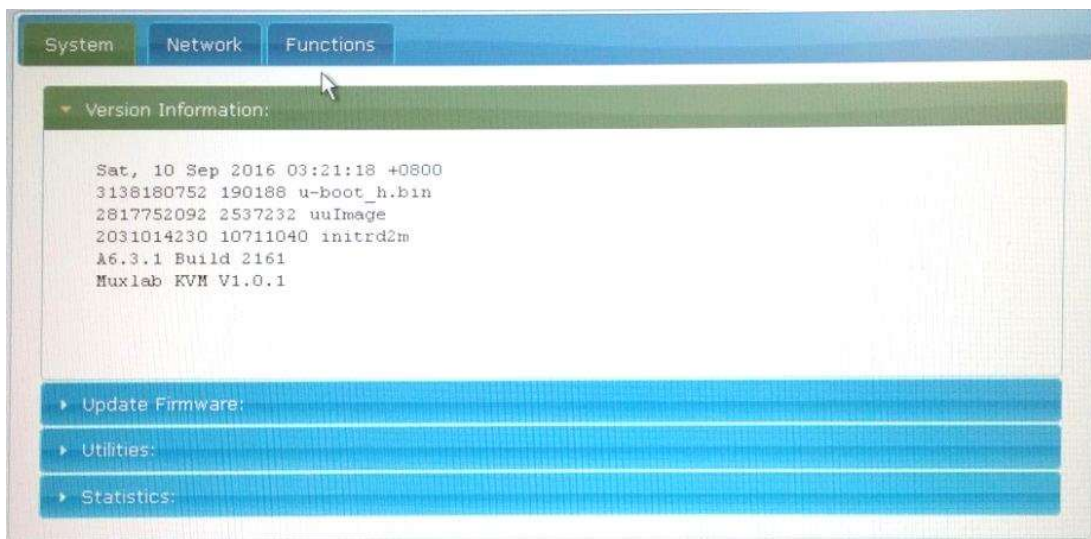
4.2 Upgrading Firmware

To upgrade the firmware, begin by verifying your current KVM Transmitter and Receiver firmware versions. To do this, follow the steps in the "Firmware Version Information" section. Then search for the latest version of the KVM Transmitter and Receiver firmware on the MuxLab website in the "Support" page section. If a newer version exists, then proceed to download it.

To upgrade the KVM Transmitter/Receiver, from the device web interface click on the "System" tab and then on the "Upgrade Firmware" sub tab, see the example below. Press the "Browse" button to browse for the file previously downloaded, and once selected, press the "Upload" button to upgrade the KVM Transmitter/Receiver.
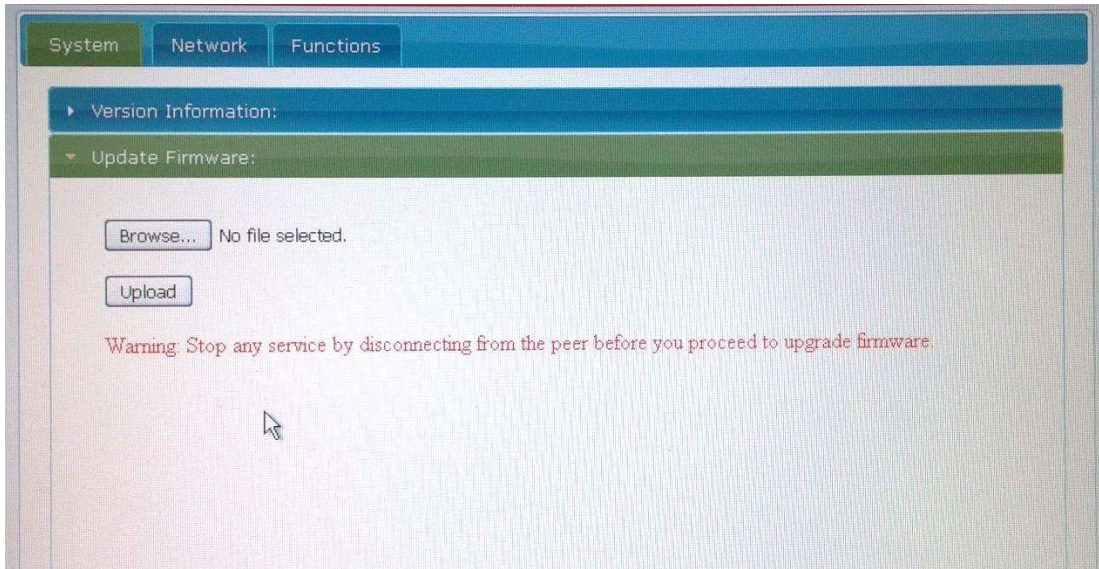
4.3 Changing the OSD Login Password

The default OSD Login password is "admin", but may be changed via the KVM Receiver web interface. From within the "System" tab and then "Utilities" sub tab, scroll down to the "Console API Command" field. This field may be used to set the new password.

As an example to set the password to "12345", from within the "Console API Command" field, type "astparam s ui_password=12345", and then press "Apply", as shown below.
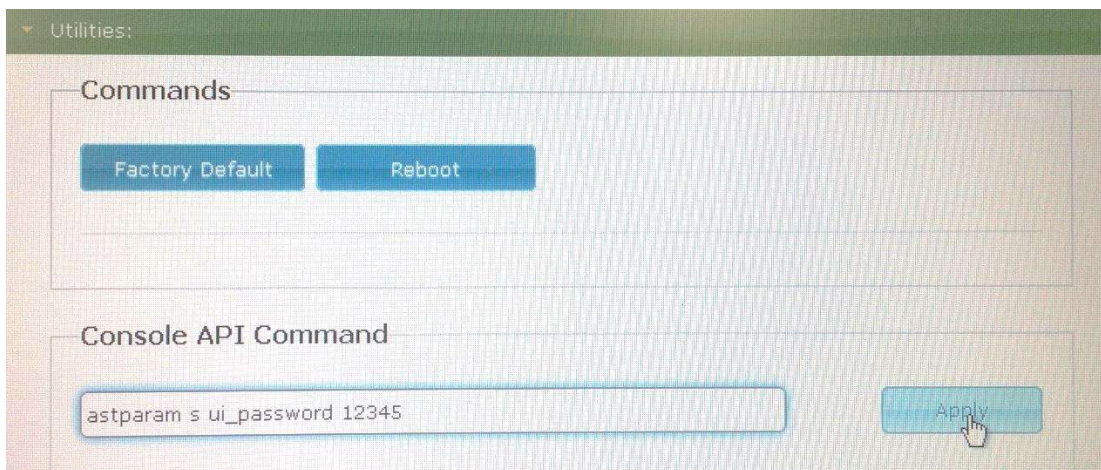
To save the new password, type "astparam save" in the "Console API Command" field, and press "Apply", as shown below.
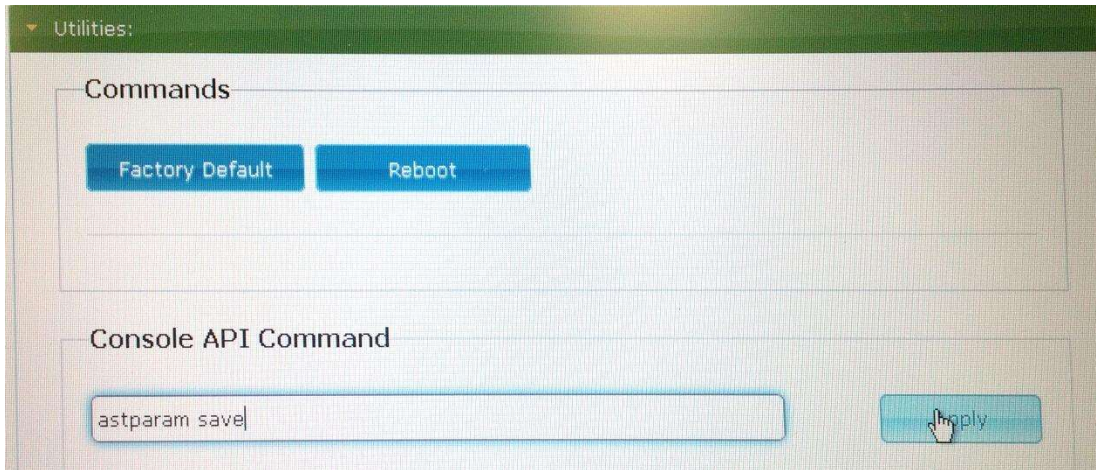
The Login password is now set to "12345". Record the new password in a safe place as a reference.

4.4 KVM Device Statistics

The KVM Transmitter/Receiver statistics is available via the device web interface by clicking on the "System" tab and the "Statistics" Sub tab. See the example screens below.

```
Video

Local Video Output:

attached=y

Checksum: ok
CEA Ext: y
CEA Ext Checksum: ok
Input Signal: digital
Support Features:
    yuv: y
    hdr: n
Preferred Timing:
    1360x768@60Hz,Prog (idx 152, sn 16412)

EDID:
    00 ff ff ff | ff ff ff 00 | 1e 6d 01 00 | 01 01 01 01 |
    01 15 01 03 | 80 73 41 78 | 0a cf 74 a3 | 57 4c b0 23 |
    09 48 4c a1 | 08 00 81 c0 | 01 01 01 01 | 01 01 01 01 |
    01 01 01 01 | 01 01 66 21 | 50 b0 51 00 | 1b 30 40 70 |
    36 00 7e 8a | 42 00 00 1e | 01 1d 00 72 | 51 d0 1e 20 |
    6e 28 55 00 | 7e 8a 42 00 | 00 1e 00 00 | 00 fd 00 39 |
    3f 1f 3c 09 | 00 0a 20 20 | 20 20 20 20 | 00 00 00 fc |
    00 4c 47 20 | 54 56 0a 20 | 20 20 20 20 | 20 20 01 1b |
    02 03 1c f1 | 47 10 22 20 | 05 84 03 02 | 23 09 07 07 |
    67 03 0c 00 | 10 00 80 2d | e3 05 03 01 | 02 3a 80 18 |
```

4.5 Network Settings

The KVM Transmitter and Receiver network setting can be managed by pressing the "Network" tab. There are three sub tabs for additional control, "Auto IP", "DHCP" and "Static". The default setting is "Auto IP", and it is recommended that this mode be set.
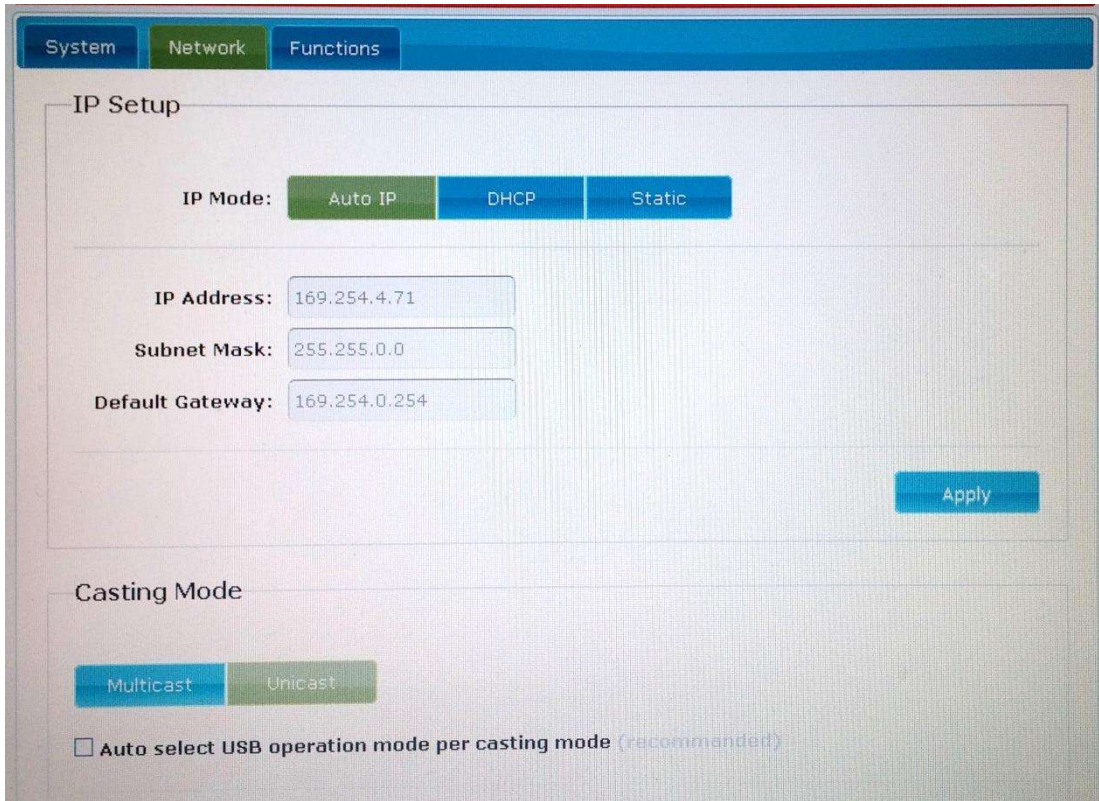
4.6 Setting the KVM Transmitter/Receiver Name

The following steps illustrate how to set the name for each KVM Transmitter/Receiver. From the main web interface home page click on the "Function" Tab and scroll down to the bottom. Enter the KVM Transmitter/Receiver name in the "KVM unit name" field as shown below, and click on "Apply". It is best to select a name for the KVM Transmitter that is representative of the attached workstation, such as File Server, Email Server, etc., or for the KVM Receiver that is representative of the client operator desktop. The below screen shows an example of the KVM Transmitter screen.
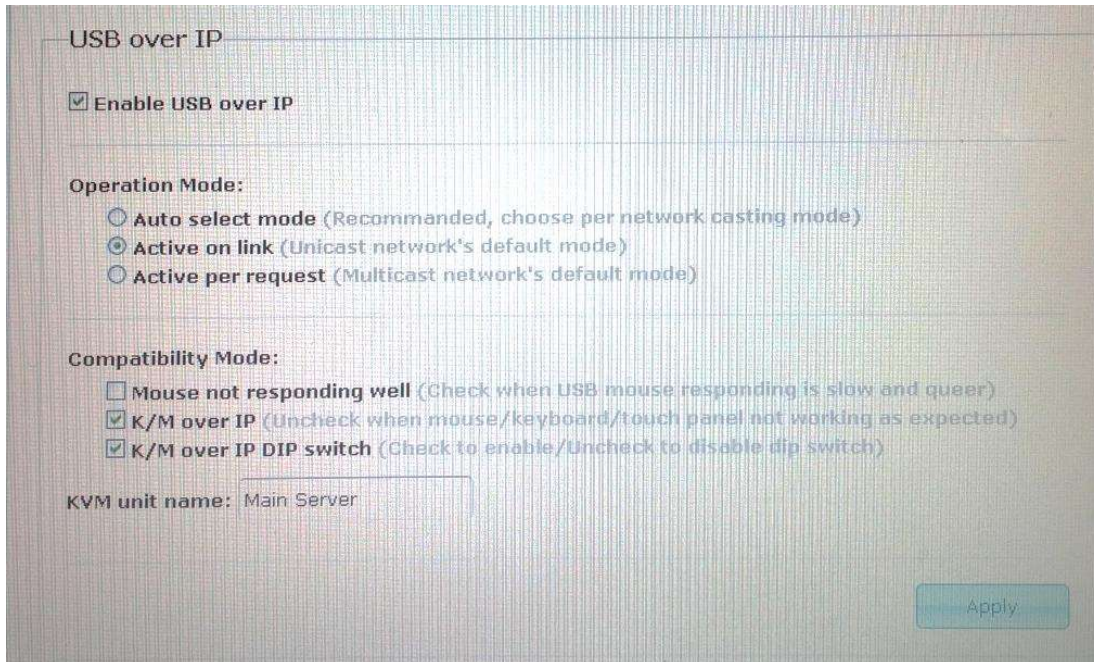
4.7 Selecting the OSD HotKey Sequence

In order to set the OSD hotkey sequence, go to the KVM Receiver web interface and press the "Function" tab and scroll down to the bottom. See the example screen below.
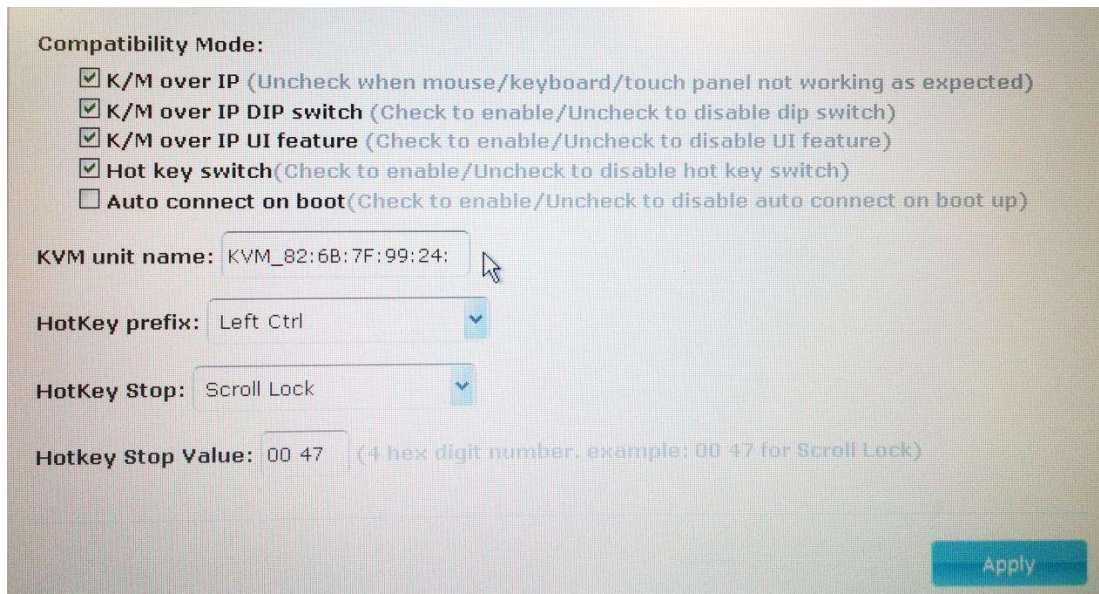
Click on the "HotKey prefix" pull-down arrow to select the hotkey prefix setting from the provided options.
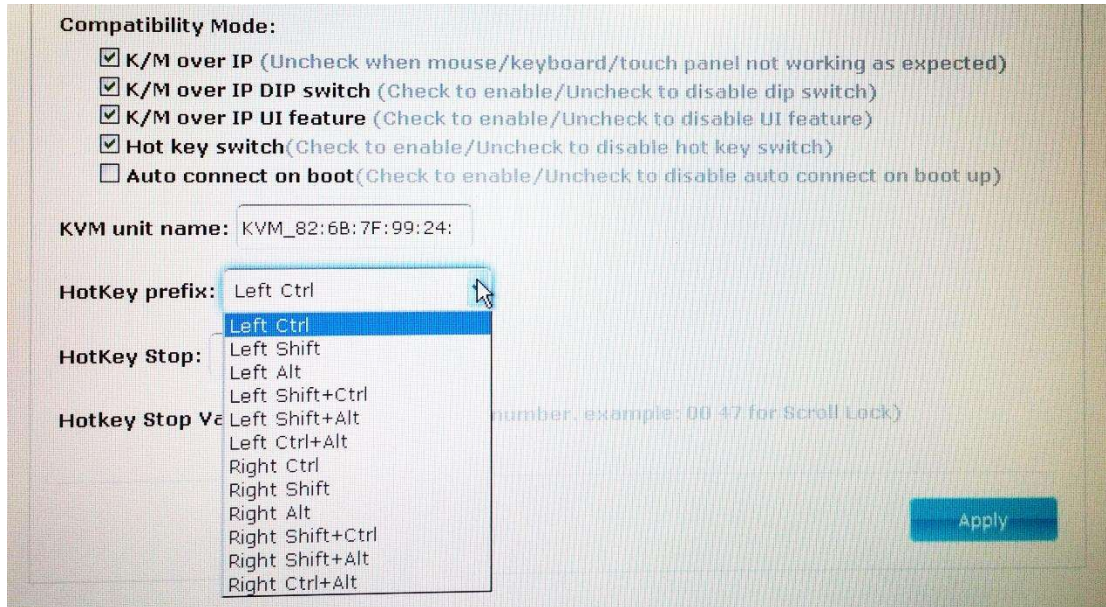
Click on the "HotKey Stop" pull-down arrow to select the hotkey stop setting from the provided options.
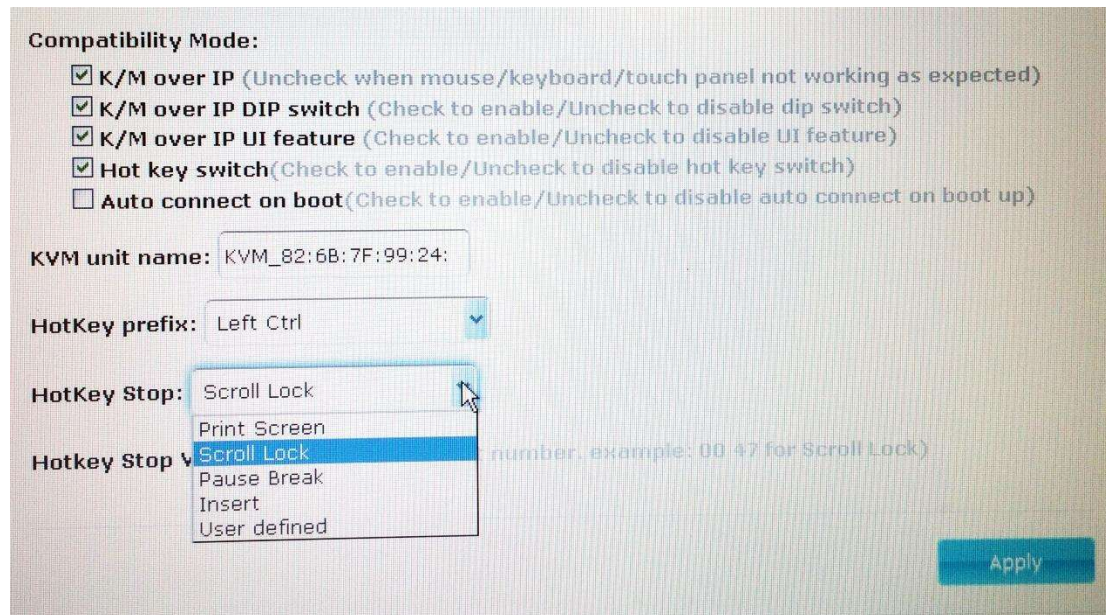
If the "User Defined" option is selected, then enter the value for this hotkey stop in the "Hotkey Stop Value" field, as "00xy", where "xy" is the hotkey stop key value.

NOTE: When keyboard and mouse are connected in to USB 2.0 ports, they need to be activated in order to use the hot key sequence. You may follow these steps:

1. Go to System tab and then "Utilities" sub tab, scroll down to the "Console API Command" field.
2. Enter the following command: astparam s kmoip_ports 1 2 3 4
3. Click in the Apply button

4. Enter the following command to save it: astparam save
5. To validate the new configuration was properly saved type: astparam dump
6. The following should be displayed

```
Console API Command

astparam dump                                          Apply

Output

CRC = 0x7474F647
muxlab_name=KVM_00:15:25:35:66:90
ui_feature=y
multicast_on=n
ip_mode=dhcp
no_soip=n
soip_type2=y
soip_guest_on=n
s0_baudrate=115200-8n1
no_usb=n
share_usb_auto_mode=n
no_kmoip=n
reset_ch_on_boot=y
hotkey_switch=y
hotkey_prefix=01
hotkey_stop=00 47
kmoip_hotkeys=00 47 00 48 00 49 00 00 01 1e 01 1f 01 20 01 21 01 22 01 23
ui_password=admin
share_usb=n
kmoip_ports=1 2 3 4
```

7. To modify the "Hotkey Stop" go to the functions page
8. In HotKey Stop, select User defined
9. Change the HotKey Stop Value to: 01 47
10. Click the Apply button
11. Settings should look like:

```
USB over IP

☑ Enable USB over IP

Operation Mode:
    ○ Auto select mode (Recommanded, choose per network casting mode)
    ● Active on link (Unicast network's default mode)
    ○ Active per request (Multicast network's default mode)

Compatibility Mode:
    ☑ K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)
    ☑ K/M over IP DIP switch (Check to enable/Uncheck to disable dip switch)
    ☑ K/M over IP UI feature (Check to enable/Uncheck to disable UI feature)
    ☑ Hot key switch(Check to enable/Uncheck to disable hot key switch)
    ☐ Auto connect on boot(Check to enable/Uncheck to disable auto connect on boot up)

KVM unit name:  KVM_00:15:25:35:66:90

HotKey prefix:  Left Ctrl          ▼

HotKey Stop:  User defined         ▼

Hotkey Stop Value: 01 47     (4 hex digit number. example: 00 47 for Scroll Lock)

                                                       Apply
```
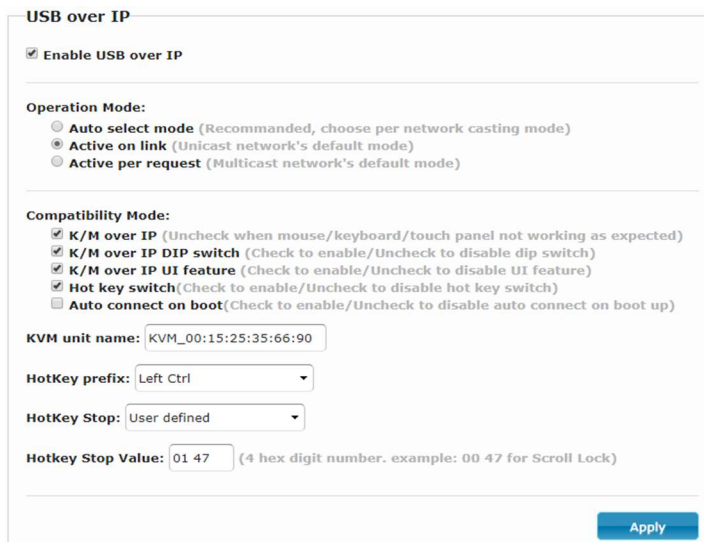
12. Reboot the unit so that new changes get applied
    NOTE: If the unit is restored to its original state (due to a factory reset), the above will be wiped out and will need to be configured again.

5 Specifications

Environment	DVI 1.0
Devices	Computers and servers with DVI monitor ports.
Transmission	Transparent to the user
Bandwidth	300MHz
Signals	DVI 1.0 protocol, HDCP 1.4
Connectors *Note: Cables not included.*	One (1) DVI receptacle. One (1) RJ45S for Cat 5e/6 unshielded or shielded twisted pair. Two (2) 3.5mm jacks for audio insert (on TX)/audio extract (on RX). One (1) 2.1mm locking barrel jack for power One (1) or Four (4) USB Connector(s) for Host (on TX)/Client (on RX) Four (4) DIP Switches for device ID addressing.
Maximum Distance *Based on a maximum length of 6.6ft (2m) of DVI cable per end.*	Cat5e/6: 330ft (100m) up to 1920x1200 and 1080p @ 60Hz *Note: When installed in an electrically noisy environment, an STP cable must be used. Also, cross-connection reduces the effective distance depending on the grade of twisted cable used.*
Latency	Typical one (1) Frame (16ms), maximum 2 frames (33ms)
Compression	JPEG 2000
Bandwidth	Up to 315Mbps
Network Requirement	1000BaseT with PoE
RJ45 Pin Configuration *Reverse Polarity Sensitive. Use EIA/TIA 568A or 586B straight-through wiring.*	**RJ45 Link** Pin 1 (R) Pin 2 (T) Pin 3 (R) Pin 6 (T) Pin 4 (R) Pin 5 (T) Pin 7 (R) Pin 8 (T) Pair 3 Pair 1 Pair 2 Pair 4 Pair 2 Pair 1 Pair 3 Pair 4 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 EIA568A EIA568B
Cable	One (1) Cat 5e/6 or better twisted pair cables required
Power Source	This device supports PoE (PD), an external power supply is not included. It is intended to be powered via a PoE (PSE) Ethernet Switch. If required, an optional power supply (500993) may be purchased separately.
PoE Standard	IEEE 802.3af
Power Consumption	Transmitter: 2.85Watt Receiver: 2.55Watt
Temperature	Operating: 0° to 40°C Storage: -20° to 85°C

	Humidity: Up to 95% non-condensing
Dimensions	4.40" x 5.08" x 1.00" (112mm x 129mm x 25mm)
Weight	1.5lbs (0.68kg)
Compliance	Regulatory: FCC, CE, RoHS Flammability: 94V0
Warranty	3 years
Order Information	500771 KVM DVI over IP PoE Extender Kit (UPC: 627699007716)
	500771-TX KVM DVI over IP PoE Extender TX (UPC: 627699907719)
	500771-RX KVM DVI over IP PoE Extender RX (UPC: 627699807712)
Accessories (These items are sold separately)	500920 16-Port Rackmount Transceiver Chassis
	500917 Wall Mount Transceiver Bracket Kit
	500993 Univ. Locking Power Supply 5VDC/2.6A US/UK/EU Blade

6 Warranty Policy

Items Under Warranty - Company Policy

MuxLab guarantees its products to be free of defects in manufacturing and workmanship for the warranty period from the date of purchase. If this product fails to give satisfactory performance during this warranty period, MuxLab will either repair or replace this product at no additional charge, except as set forth below. Repair and replacement parts will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of MuxLab. This limited warranty does not include repair services for damage to the product resulting from accident, disaster, misuse, abuse, or unauthorized modifications or normal decay of battery driven devices. Batteries, if included with the product, are not covered under this warranty.

Limited warranty service can be obtained by delivering the product during the warranty period to the authorized MuxLab dealer from whom you purchased the product, or by sending it to MuxLab. MuxLab will not accept any such product for repair without a Return Material Authorization number (RMA#) issued by its Customer Service Department and a proof of purchase date. If this product is delivered to MuxLab by mail, you agree to assume risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or equivalent.

THE ABOVE LIMITED WARRANTY IS THE ONLY WARRANTY COVERING YOUR MUXLAB PRODUCT. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SOME STATES DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER, YOUR SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED FOR ABOVE. IN NO EVENT SHALL MUXLAB BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING ANY LOSS OF PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR INABILITY TO USE THIS PRODUCT, EVEN IF MUXLAB OR AN AUTHORIZED MUXLAB DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES; NOR WILL MUXLAB BE LIABLE FOR ANY CLAIM BY ANY OTHER PARTY. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES FOR CONSUMER PRODUCTS, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS. YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

6.1 Warranty Period

Any product found to be defective within three (3) months of invoice, including one (1) month shelf life, may be returned for replacement by a new unit or a satisfactory repair within one (1) month of receiving any returned product. The customer must provide MuxLab with the serial number and proof of purchase of the defective unit being returned. All RMA's issued are subject to inspection by MuxLab, and will be returned to customer if not properly packaged – units must be returned in original container or equivalent. MuxLab will not accept any such product for repair without an authorization from its Technical Support department and without an RMA# issued by MuxLab Customer Service department. For a credit & replace RMA, the customer will be liable to pay replacement invoice if defective products are not returned.

For Product more than six months old, including shelf life. The defective unit must be returned prepaid to MuxLab and then the unit will be repaired or if repair is not possible, replaced by an equivalent unit and returned to the customer within one (1) month of receiving any returned product. There is no charge for repair (parts and labor) during the full warranty period.

Items Defective and not under Warranty

For products which are no longer under warranty the policy is repair and return. An amount of 25% of the products published list price at the time of purchase will be charged. Customer must issue a purchase order to cover the cost of repair.

Each unit will be returned to the customer within one (1) month from receipt of the unit by MuxLab. The defective unit must be returned prepaid to MuxLab. The repaired unit will be returned to the customer FOB MuxLab. The repaired unit includes a 90 day warranty.

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