



# 3G-SDI ST2110 Over IP Gateway Converter

## Operation Manual 500767-2110



*(Multimode version shown)*

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# 1. Product Overview

## 1.1 Introduction

The 3G-SDI/ST2110 over IP Uncompressed Gateway Converter allows HD-SDI and 3G-SDI equipment to be extended up to 100ft (30m) via UTP Cat 6a/7 cable (model 500767-2110-UTP), or up to 1300ft (400m) via duplex multimode OM4 fiber with LC connectors (model 500767-2110-MM), at up to 1080p resolution @ 60Hz uncompressed, in a point-to-point configuration. A second Media/Data port is provided and can be used to support ST-2022-7 Redundancy (Seamless Protection Switching). Thus a second MuxLab SFP module (model: 500970-UTP for UTP model, or 500970-MM for multimode fiber model) is pre-installed and included.

Point-to-multipoint and multipoint-to-multipoint configurations are also possible by connecting several units to a 10G Ethernet network. The unit provides a 1G Ethernet Switch port for unit management via a RestAPI or NMOS, and an RS232 port for remote control of end devices (for future implementation).

The following diagrams illustrate typical multipoint-to-multipoint LAN configuration.

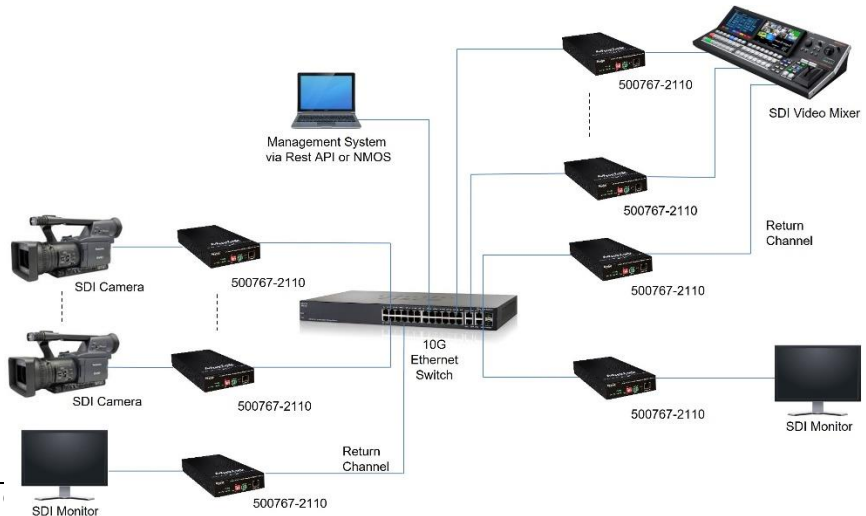
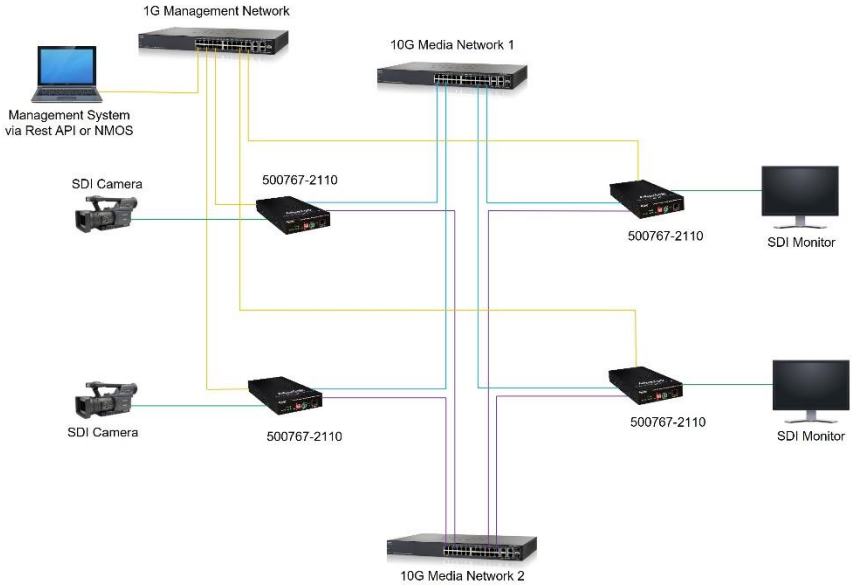


Figure 1a: Application Diagram



**Figure 1b: Application Diagram with redundancy (without Fault)**

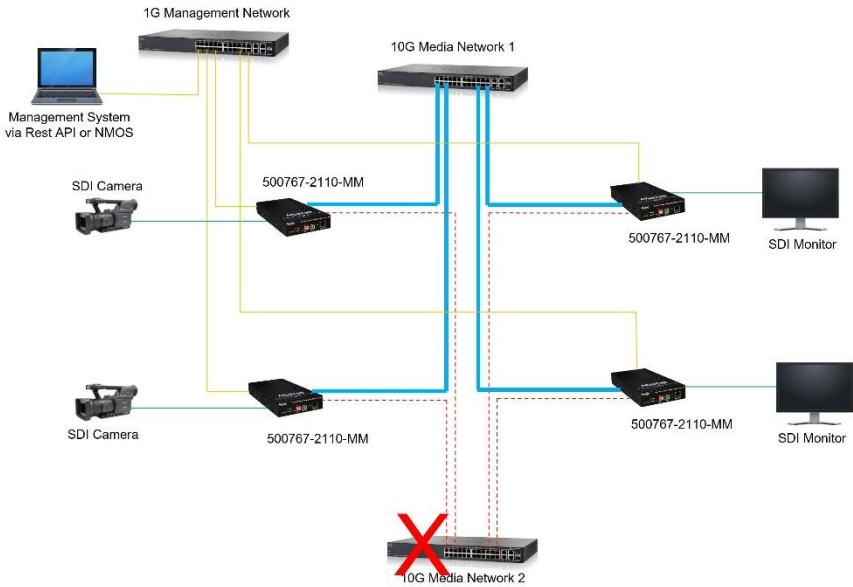


Figure 1c: Application Diagram with redundancy (with Fault)

## 1.2 Applications

The 500767-2110 is an ideal solution for SDI/IP hybrid environments. It allows broadcasters the ability to have a single IP infrastructure rather than two different ones. The 500767-2110 applications include commercial broadcast AV systems, news/sports/TV stations and movie networks.

## 1.3 Key Features

The following are the 500767-2110 key features.

- Supports SMPTE ST-2110 uncompressed SDI video up to 1080@ 60Hz
- Supports SMPTE ST-2022-7 (Class D, supporting up to 150usec delay with no frame lose) AV signal Redundancy (Seamless Protection Switching)
- Extend SDI audio/video over an IP network at up to 100ft (30m) over CAT 6a/7 UTP cable (for 500767-2110-UTP model), or 1300ft (400m) over duplex OM4 fiber (for 500767-2110-MM model) - Note that OM3 fiber may also be used at up to 985ft (300m) on the MM Fiber model.
- This device is a Transceiver and can be configured as a Transmitter (Encoder), or Receiver (Decoder)
- Supports many Transmitters and Receivers depending on network bandwidth
- Supports point-to-point, point-to-multipoint and multipoint-to-multipoint applications
- Supports two (2) 10G Ethernet ports (labelled as: Media 1 & Media 2) for AV Media/Data transmission, and a 1G Ethernet port (labelled as: Console LAN) for device management & control via a RestAPI or NMOS based management platform
- RS232 port in included for future use, to manage end devices
- Audio 3.5mm port is included for future use, for audio insert/extract
- May be managed via a Web interface and third-party control software platforms supporting a RestAPI or NMOS

## 1.4 Specifications

The following are the 500767-2110 specifications.

<b>Environment</b>	Up to 3G-SDI
<b>Devices</b>	Cameras, mixers, media players, monitors, TVs, PCs, laptops, servers supporting up to 3G-SDI
<b>Signals</b>	Up to 3G-SDI (1080p @ 60Hz), supporting ST-2110
<b>Connectors/Switches</b>	Two (2) BNC connectors for SDI Two (2) SFP Connectors for 10G Ethernet ports for redundant AV transmission One (1) RJ45S Connector for 1G Ethernet port for unit control One (1) 3-position Phoenix Connector for RS232 (for future use) One (1) 3.5mm audio connector (for future use) One (1) 2.1mm locking power connector
<b>Max Distance</b>	OM4: 1300ft (400m), for model 500767-2110-MM OM3: 985ft (300m), for model 500767-2110-MM

	UTP: 100ft (30m), for model 500767-2110-UTP
<b>Latency</b>	Zero latency
<b>Compression</b>	None (uncompressed)
<b>Network Bandwidth</b>	Up to 3 Gbps
<b>Network Requirement</b>	10G Ethernet LAN for AV transmission, and 1G LAN for 3 <sup>rd</sup> party management platforms
<b>3<sup>rd</sup> Party Control</b>	Via RestAPI and NMOS (IS-04 for discovery & IS-05 for connectivity management)
<b>Cable</b>	Two (2) Dual multi-mode fiber cables (for MM Fiber version) or Two (2) CAT 6a/7 UTP cables (for UTP version) for AV media/data transmission, and CAT 5e/6 UTP cable for control
<b>Power Consumption</b>	12 Watt
<b>Temperature</b>	Operating: 0° to 40°C                                  Storage: -20° to 85°C Humidity: Up to 95% non-condensing
<b>Enclosure</b>	Aluminum (color: black)
<b>Dimensions</b>	4.4" x 9.9" x 1.3" (11.1 x 25.0 x 3.3 cm)
<b>Weight</b>	1.75 lbs ( 0.8 kg)
<b>Compliance</b>	Regulatory: FCC, CE, RoHS                          Flammability: 94V0
<b>Warranty</b>	3 years
<b>Order Information</b>	500767-2110-MM: 3G-SDI/ST2110 over IP Uncompressed Gateway Converter (Transceiver), MM fiber (UPC: 627699007679)  500767-2110-UTP: 3G-SDI/ST2110 over IP Uncompressed Gateway Converter (Transceiver), UTP (UPC: 627699017678)
<b>Accessories</b> (Sold separately)	500920          16-Port Rackmount Transceiver Chassis 500917          Wall Mount Transceiver Bracket Kit 500970-MM      Multimode 10G SFP Module, 850m (for 2 <sup>nd</sup> Media/Data Port) 500970-UTP     UTP 10G SFP Module, (for 2 <sup>nd</sup> Media/Data Port)



## 1.5 Currently Supported Resolutions

The following are the currently supported 500767-2110 video resolutions and frame rates.

Color Depth	Color Space	1080p							
		60	59.94	50	30	29.97	25	24	23.976
10 Bit	YCbCr 422	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Color Depth	Color Space	1080i			720p		
		60	59.94	50	60	59.94	50
10 Bit	YCbCr 422	Yes	Yes	Yes	Yes	Yes	Yes

## 2. Managing the 500767-2110

The 3G-SDI/ST2110 over IP Uncompressed Gateway can be managed through its Web interface and API. The system supports the ST-2110 protocol, and ST-2022-7 Redundancy for critical applications. This section describes how to set up the 500767-2110 parameters using both the Web interface and the API.

### 2.1 Web interface

Configuring the 500767-2110 from the Web interface requires a TCP/IP connection from the unit 1G Ethernet port to your network. The 500767-2110 default IP address is set to DHCP. If no DHCP is available on your network, as a TX, "Console LAN" port / "Media 1" port / "Media 2" port will be 192.168.168.64/65/66 addresses respectively. As a RX, "Console LAN" port / "Media 1" port / "Media 2" port will be 192.168.168.67/68/69 addresses respectively. **To be able to log in to the 500767-2110 Web interface, your computer has to be in the same subnet.**

The Console LAN port and Media 1 and Media 2 media/data ports are shown below (media ports are shown without the included SFP module).



## 2.1.1 Configuring the 500767-2110 as a TX

This section will describe how to configure the unit as a TX using the Web interface.

Since the 500767-2110 is a Transceiver, it may be set as a Transmitter (TX) or Receiver (RX). To set the unit as a TX, set Dip Switch Pin #1 to the DOWN position. The 4-Pin Dip Switch is located on the front panel as shown below.



## 2.1.2 TX Media Page

To connect into the TX, you may open a Web browser and type its IP address. Once connected, the Media page opens. This page contains both the video and audio settings. See example below:

500767-TX SDI/ST2110 over IP Uncompressed Gateway Converter TX

Blink LED

System Info | **Media** | PTP | Settings

**VIDEO/AUDIO SETTINGS**

SDP Video: http://192.168.168.103:80/api/video/sdp

SDP Audio: http://192.168.168.103:80/api/audio/sdp

NMOS Name:  \*

\* Changes will restart the system

**SFP1:**

Video Address:

Audio Address:

Video Port:

Audio Port:

**SFP2:**

Video Address:

Audio Address:

Video Port:

Audio Port:

Video Format: 1920x1080p 30

Color Depth: 10

Color Space: YCbCr-4:2:2

Force ST2110 to 4:2:2-10Bit:

Audio Channels: 7

Audio Rate: 48000

Audio PKT Duration: 1ms

© MuxLab Inc. 500767 TX SDI 2.0/ST2110 over IP (Version: 01.01; Built: Sep 1 2022 21:43)

**Figure 2: 500767-2110 TX Media Settings**

**Clicking on the Submit button will allow you to apply the new changes while clicking on Cancel will discard any changes.**

The following table describes the Media settings

<b>Settings</b>	<b>Description</b>
SDP Video	SDP File for Video
SDP Audio	SDP File for Audio
Name	Host Name
Video Address	Multicast address for video
Audio Address	Multicast address for audio
ANC Address	Multicast address for ancillary data
Video port	Port number for video
Audio port	Port number for audio
ANC port	Port number for ancillary data
Media	Detected video resolution
Color depth	Detected color depth
Color space	Detected color space
Audio channels	Number of audio channels detected
Audio rate	Detected audio rate
Audio PKT size	Audio packet size detected

### 2.1.3 TX System Info Page

The System Info page displays general product information such model number, firmware and FPGA version, MAC and IP address, RS232 settings (for future use), etc.

**MuxLab**  
500767-TX SDI/ST2110 over IP Uncompressed Gateway Converter TX Blink LED

**System Info** | Media | PTP | Settings

NETWORK		DEVICE	
<b>Management Port</b>		Product Name:	SDI/HDMI OverIP-767
MAC Address:	52:11:49:B2:EF:DE	Model:	500767
IP Address:	192.168.168.103	Custom Name:	SDI/HDMI OverIP-767
Subnet Mask:	255.255.255.0	Firmware Version:	01.01 (Sep 1, 2022, 21:43)
Gateway:	192.168.168.1	FPGA Version:	00.01 (Aug 16, 2022, 11:41)
DHCP:	On	Security Check:	PASS
<b>Media 1 Port (Connected)</b>		Input Signal:	Not Present
MAC Address:	00:04:25:1C:11:02		
IP Address:	192.168.168.68		
DHCP:	Request Failure		
<b>Media 2 Port (Connected)</b>			
MAC Address:	00:04:25:1C:12:02		
IP Address:	192.168.168.69		
DHCP:	Request Failure		

© MuxLab Inc. 500767 TX SDI 2.0/ST2110 over IP (Version: 01.01; Built: Sep 1 2022 21:43)

**Figure 3: 500767-2110 TX System Info Page**

## 2.1.4 TX PTP Page

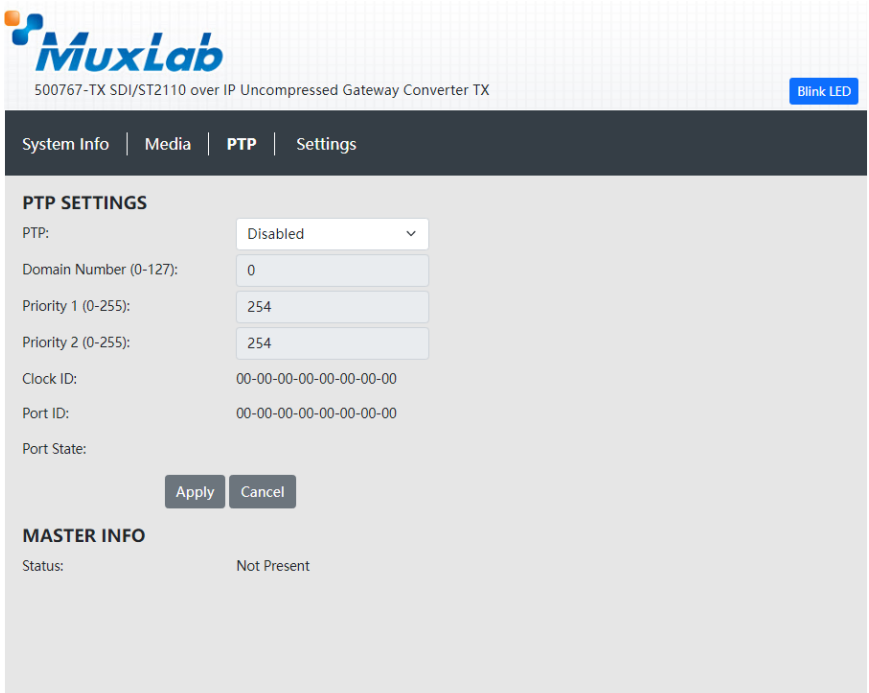


Figure 5: 500767-2110 TX PTP Page

## 2.1.5 TX Settings Page

The Settings page allows the user to configure both the network and the RS232 settings (RS232 is for future use). Additionally, you may load the factory configuration by clicking on the Reset button while the Reboot button will reboot the unit. **Note that performing a Reset will overwrite the unit settings and reset them to their factory default, while performing a Reboot will interrupt any active connection.**

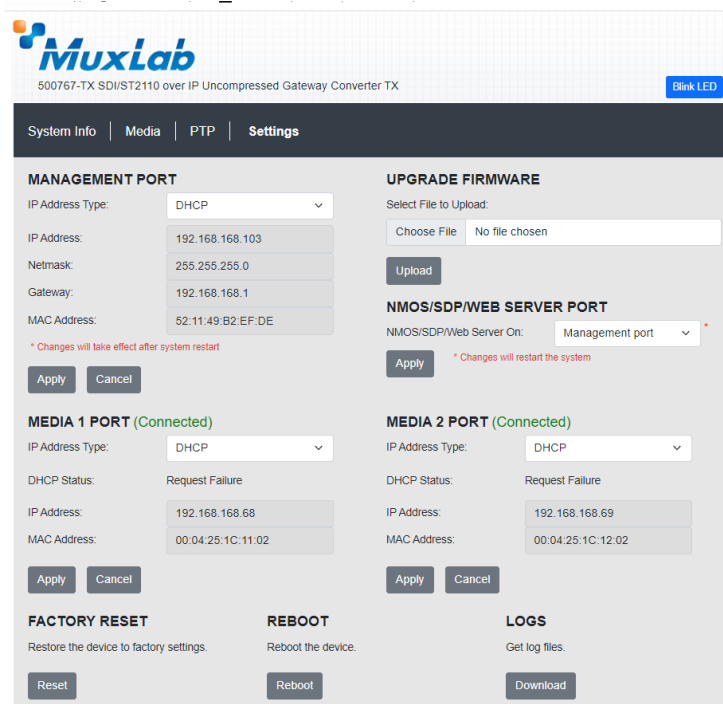


Figure 6: 500767-2110 TX Settings Page



### Firmware Upgrade

The 500767-2110 comes with the firmware pre-installed, please check the MuxLab Web site to verify if a newer version is available. You may go to our support software/firmware page of our Web site to download the required files:

<https://muxlab.com/support?section=software-and-firmware>

**Important Note:** Use the 1G Port (port: Console LAN) to upgrade the unit Firmware.

The 500767-2110 TX has both an FPGA and MCO (Micro-Controller Unit), and each has its own firmware. The user may upgrade the FPGA and MCU firmware from this page as follows:

1. Download the upgrade 500767-2110 firmware file (which includes the FPGA and MCU code) from the MuxLab website (found under the Support Software/Firmware page).
2. Go to the Setting page on the unit Web interface.
3. In the Upgrade Firmware section press on the “Browse” button and locate and select the file you downloaded, and click on the “Chose File” button. It may take 30 seconds or more to install the new version. Allow the process to complete without interruption.

### Network Settings (TX)

The user may set the network parameters of the 500767-2110 TX for the two (2) 10G Media/Data ports (ports: Media 1 & Media 2 is installed) and the one (1) 1G Management/Control port (port: Console LAN), including enabling or disabling DHCP, setting a static IP Address, Netmask Address, and Gateway Address, and then pressing on “Apply”.

The 500767-2110 TX default IP addresses are set to DHCP. If no DHCP server is available on your network the TX will default to the following static IP Addresses:

- 1G Management/Control port (Console LAN): 192.168.168.64
- Media/Data 1 port (Media 1): 192.168.168.65
- Media/Data 2 port (Media 2): 192.168.168.66

Note: If the user changes the static IP addresses from their default values, then the user defined static IP Addresses will be used when do DHCP server is present. However, if the unit is Factory Reset then the default static IP Addresses above will apply.

**Factory Reset**

The user may perform a factory reset, by pressing on the “Reset” button. This will return the unit to the original MuxLab factory settings, and all user settings and data will be lost. Allow the process to complete without interruption.

**Reboot**

The user may reboot the unit (equivalent to a power cycle), by pressing on the “Reboot” button. This will temporarily interrupt normal operation and the unit connection. Allow the process to complete without interruption.

**Logs**

The user may get logs for his unit by pressing on the “Download” button. This may help identify the source of a possible issue you may be having, or to simply get info on the unit operation.

## 2.1.6 Configuring the 500767-2110 as a RX

The following will explain how to configure the 500767-2110 as a RX from the Web interface.

Since the 500767-2110 is a Transceiver, it may be set as a Transmitter (TX) or Receiver (RX). To set the unit as a RX, set Dip Switch Pin #1 to the UP position. The 4-Pin Dip Switch is located on the front panel as shown below.



## 2.1.7 RX Media Page

To connect into the RX, you may open a Web browser and type its IP address. Once connected, the Media page appears. This page contains the main settings to properly receive audio, video and ANC data signals from the 500767-2110 TX. **There are different ways of configuring the unit: Manual SDP and NMOS. Additionally, when using Manual configuration, the Media settings can be either ANC Data or Manual.**

The following example shows settings for Manual input type and ANC Data Media Settings.

The screenshot shows the MuxLab web interface for a 500767-RX SDI/ST2110 over IP Uncompressed Gateway Converter RX. The top navigation bar includes 'System Info', 'Media', 'PTP', and 'Settings'. The 'Media' tab is active. The interface is divided into two main sections: 'VIDEO/AUDIO SETTINGS' and 'MEDIA STATISTICS'.

**VIDEO/AUDIO SETTINGS**

Input Type: Manual

**SFP1:**

Video Address: 239.100.1.1  
Audio Address: 239.100.1.11  
Video Port: 48000  
Audio Port: 48010

**SFP2:**

Video Address: 239.100.1.2  
Audio Address: 239.100.1.12  
Video Port: 48001  
Audio Port: 48011

Video Input Format: 1920x1080i 60  
Color Space: YCbCr-4:4:4  
Color Depth(bpc): 10  
Audio Channels(total): 2  
Audio Rate(Hz): 48000  
Audio PKT Duration: 1ms

Buttons: Apply, Cancel, Clear Statistics

**MEDIA STATISTICS**

**SFP1:**

Video packets total:	4294967295
Audio packets total:	222247245
Video packets per second:	91453
Audio packets per second:	1000
Video packets lost:	0
Audio packets lost:	0
Bad FCS:	0

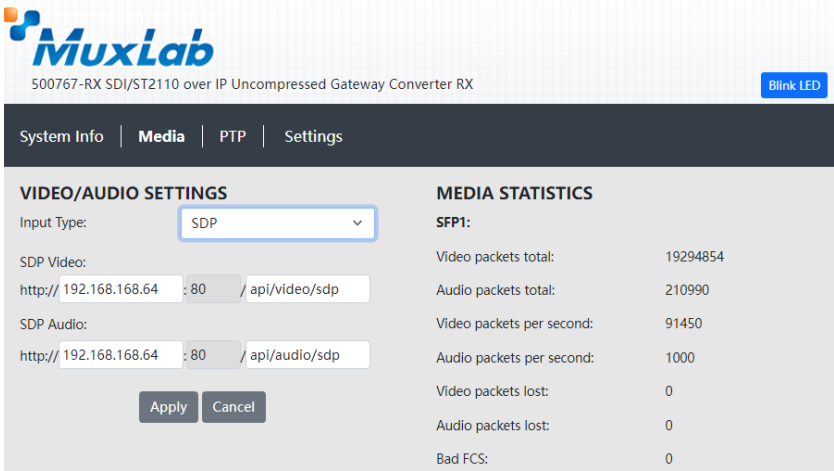
**SFP2:**

Video packets total:	4294967295
Audio packets total:	222247245
Video packets per second:	91453
Audio packets per second:	1000
Video packets lost:	0
Audio packets lost:	0
Bad FCS:	0

© MuxLab Inc. 500767 RX SDI 2.0/ST2110 over IP (Version: 01.01; Built: Sep 1 2022 21:43)

Figure 7: 500767-2110 RX Manual Input Type and ANC Data Settings

SDP input type settings are showed here



**Figure 7: 500767-2110 RX SDP Input Type Settings**

The following table shows the media settings of the 500767-2110 RX

Settings	Description
Input Type	<ul style="list-style-type: none"> <li>Manual: Audio, video and ANC data settings values are entered manually</li> <li>SDP: File containing Audio, video and ANC data information</li> </ul>
Name	Host Name
Video Address	Multicast address for video
Audio Address	Multicast address for audio
ANC Address	Multicast address for ancillary data
Video port	Port number for video
Audio port	Port number for audio
ANC port	Port number for ancillary data

Media Settings	<ul style="list-style-type: none"> <li>• ANC Data: Media information is set automatically</li> <li>• Manual: Media information is entered manually</li> </ul>
Media	Force the RX to specific Video resolution [1920x1080p, 1920x1080i and 1280x720p]
Color depth	Force the RX to specific color depth value [8,10,12 and 16]
Color space	Force the RX to specific color space value [YCbCr4:2:2, YCbCr4:4:4 and RGB]
Audio channels	Force the RX to specific number of audio channels [4, 8,12 and 16]
Audio rate	Force the RX to specific audio rate [44100, 48000 and 96000]
Audio PKT size	Force the RX to specific audio packet size [125us and 1ms]
SDP Video	SDP file for video
SDP Audio	SDP file for audio

### 2.1.8 RX System Info Page

The System Info page of the RX displays information such model number, firmware and FPGA version, MAC and IP address, RS232 settings (for future use), etc.



500767-RX SDI/ST2110 over IP Uncompressed Gateway Converter RX

Blink LED

System Info | Media | PTP | Settings

**NETWORK**

**Management Port**

MAC Address: 52:11:49:82:EF:DE  
IP Address: 192.168.168.101  
Subnet Mask: 255.255.255.0  
Gateway: 192.168.168.1  
DHCP: On

**Media 1 Port (Connected)**

MAC Address: 00:04:25:1C:11:02  
IP Address: 192.168.168.68  
DHCP: Request Failure

**Media 2 Port (Connected)**

MAC Address: 00:04:25:1C:12:02  
IP Address: 192.168.168.69  
DHCP: Request Failure

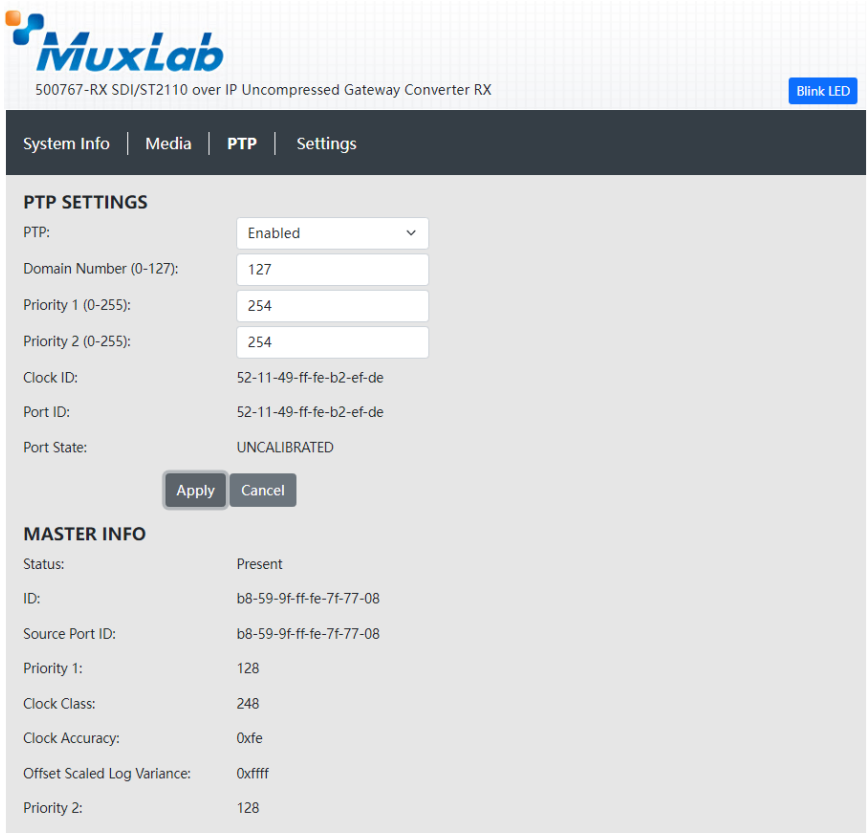
**DEVICE**

Product Name: SDI/HDMI OverIP-767  
Model: 500767  
Custom Name: SDI/HDMI OverIP-767  
Firmware Version: 01.01 (Sep 1, 2022, 21:43)  
FPGA Version: 00.01 (Aug 16, 2022, 11:41)  
Security Check: **PASS**  
ST2110 Signal: **Present**

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**Figure 8: 500767-2110 RX System Info page**

## 2.1.9 RX PTP Page



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Figure 9: 500767-2110 RX PTP page



## 2.1.10 RX Settings Page

The Settings page of the RX allows you to configure both the network and the RS232 settings. Additionally, factory reset is possible by clicking on the Reset button. The Reboot button will reboot the unit. **Note that performing a Reset will overwrite the unit settings and reset them to their factory default, while performing a Reboot will interrupt any active connection.**

**MuxLab**  
500767-RX SDI/ST2110 over IP Uncompressed Gateway Converter RX Blink LED

System Info | Media | PTP | **Settings**

### MANAGEMENT PORT

IP Address Type:

IP Address:

Netmask:

Gateway:

MAC Address:

\* Changes will take effect after system restart

### UPGRADE FIRMWARE

Select File to Upload:

### MEDIA 1 PORT (Connected)

IP Address Type:

DHCP Status:

IP Address:

MAC Address:

### MEDIA 2 PORT (Connected)

IP Address Type:

DHCP Status:

IP Address:

MAC Address:

### FACTORY RESET

Restore the device to factory settings.

### REBOOT

Reboot the device.

### LOGS

Get log files.

© MuxLab Inc. 500767 RX SDI 2.0/ST2110 over IP (Version: 01.01; Built: Sep 1 2022 21:43)

**Figure 10: 500767-2110 RX Settings page****Firmware Upgrade**

The 500767-2110-RX comes with the firmware pre-installed, please check the MuxLab Web site to verify if a newer version is available. You may go to our support software/firmware page of our Web site to download the required files:

<https://muxlab.com/support?section=software-and-firmware>

The 500767-2110 RX has both an FPGA and MCO (Micro-Controller Unit), and each has its own firmware. The user may upgrade the FPGA and MCU firmware from this page as follows:

1. Download the upgrade 500767-2110 firmware file (which includes the FPGA and MCU code) from the MuxLab website (found under the Support Software/Firmware page).
2. Go to the setting page on the unit Web interface.
3. In the Upgrade Firmware section press on the “Chose File” button and locate and select the file you downloaded and click on the “Upload” button. It may take 30 seconds or more to install the new version. Allow the process to complete without interruption.

**Network Settings (RX)**

The user may set the network parameters of the 500767-2110 RX, including enabling or disabling DHCP, setting a static IP Address, Netmask Address, and Gateway Address, and then pressing on “Apply”.

The 500767-2110 RX default IP addresses are set to DHCP. If no DHCP is available on your network the RX will default to the following static IP Addresses:

- 1G Management/Control port (Console LAN): 192.168.168.67
- Media/Data 1 port (Media 1): 192.168.168.68
- Media/Data 2 port (Media 2): 192.168.168.69

Note: If the user changes the static IP addresses from their default values, then the user defined static IP Addresses will be used when do DHCP server is

present. However, if the unit is Factory Reset then the default static IP Addresses above will apply.

**Factory Reset**

The user may perform a factory reset, by pressing on the “Reset” button. This will return the unit to the original MuxLab factory settings, and all user settings and data will be lost. Allow the process to complete without interruption.

**Reboot**

The user may reboot the unit (equivalent to a power cycle), by pressing on the “Reboot” button. This will temporarily interrupt normal operation and the unit connection. Allow the process to complete without interruption.

**Logs**

The user may get logs for his unit by pressing on the “Download” button. This may help identify the source of a possible issue you may be having, or to simply get info on the unit operation.

## 2.2 500767-2110 API (NMOS and RestAPI)

In addition to the Web interface, the 500767-2110 can also be managed through a RestAPI and NMOS management platforms.

### NMOS:

The 500767-2110 supports NMOS IS-04 (for unit discovery) and IS-05 (for unit connectivity management). NMOS is supported via the unit control port, which by default is the 1G Ethernet port (labelled as: Console LAN). Note that control can also be transferred to one of the media ports (labelled as: Media 1 or Media 2) via the web interface if required.

Prior to interfacing with any NMOS control software, please go to the 500767-2110 Receiver web interface, and navigate to the Input Type field under the Media tab, and select NMOS from the pull-down menu. You can then make use of an NMOS control software (please refer to the NMOS control software operation manual for further details on this software). Note that the NMOS control software should be on the same network segment as the control port mentioned above.

### RestAPI:

This section describes the RestAPI commands supported on the 500767-2110. It is intended for users with a programming background. Note that the part number 500767 and 500767-2110 may be used below in the API and in the replies, please take note that this is OK.

#### ***[500767-TX IP Address]/api/[RestAPI Command]***

Enter ***[500767-2110-TX IP Address]/api/***to obtain a list of RestAPI Commands

```
[
  "system",
  "video",
  "audio",
  "sdp",
  "security",
  "ptp",
  "others"
]
```

Enter **[500767-2110-TX IP Address]/api/system** for "System API"

```
{
  "ctrl_ip": "192.168.168.103",
  "nmosName": "500767-RX",
  "ctrl_gateway": "192.168.168.1",
  "fpgaBuilt": "Aug 16 2022 11:41",
  "isTx": 1,
  "name": "SDI/HDMI OverIP-767",
  "videoStatus": 1,
  "reset": 0,
  "sfp2_ip": "192.168.168.69",
  "isHdmi": 0,
  "ctrl_mac": "52:11:49:B2:EF:DE",
  "model": "500767",
  "sfp1_isDhcp": 1,
  "sfp2_mac": "00:04:25:1C:12:02",
  "sfp2_isDhcp": 1,
  "sfp1_ip": "192.168.168.68",
  "fpgaVer": "00.01",
  "built": "Sep 1 2022 21:43",
  "sfp1_mac": "00:04:25:1C:11:02",
  "mediaMode": "None",
  "sfpStatus": 3,
  "ctrl_isDhcp": 1,
  "nmosOnNetwork": 0,
  "product": "SDI/HDMI OverIP-767",
  "webOnNetwork": 0,
  "forceStream": 1,
  "ctrl_mask": "255.255.255.0",
  "ver": "01.01",
  "sdpOnNetwork": 0,
  "reboot": 0,
  "sfpCfg": 3,
  "sfp2DhcpStatus": 2,
  "audioStatus": 1,
  "blinkLed": 0,
  "sfp1DhcpStatus": 2,
  "videoPresence": 1
}
```

Enter **[500767-2110-TX IP Address]/api/video** for “Video API”

```
[
{
  "width": 1920,
  "dest_ip2": "239.100.1.2",
  "dest_ip1": "239.100.1.1",
  "height": 1080,
  "local_port2": 48001,
  "payloadType": 96,
  "colorSpace": "YCbCr-4:2:2",
  "local_port1": 48000,
  "sessionID": "11206761062",
  "intIcE": 3,
  "depth": 10,
  "dest_port2": 48001,
  "TTL": 32,
  "dest_port1": 48000,
  "fps": "30",
  "sdp": "api/video/sdp"
}
]
```

Enter **[500767-2110-TX IP Address]/api/audio** for “Audio API”

```
[
{
  "dest_ip2": "239.100.1.12",
  "dest_ip1": "239.100.1.11",
  "chnReal": 2,
  "local_port2": 48011,
  "payloadType": 97,
  "chnTotal": 8,
  "local_port1": 48010,
  "sessionID": "10206761062",
  "chn3Remap": 3,
  "chn1Remap": 1,
  "chn6Remap": 6,
  "chn7Remap": 7,
  "sdp": "api/audio/sdp",
  "chn2Remap": 2,
  "depth": 24,
}
```

```

"sample": "48000",
"channels": 7,
"chn0Remap": 0,
"pktSize": "1ms",
"chn4Remap": 4,
"TTL": 32,
"chnAlloc": 255,
"dest_port2": 48011,
"chnFilter": 255,
"dest_port1": 48010,
"chn5Remap": 5
}
]

```

Enter **[500767-2110-TX IP Address]/api/sdp** for "SDP API"

```

[
{
  "media": "video",
  "ip": "192.168.168.103",
  "port": 80,
  "uri": "api/video/sdp"
},
{
  "media": "audio",
  "ip": "192.168.168.103",
  "port": 80,
  "uri": "api/audio/sdp"
}
]

```

Enter **[500767-2110-TX IP Address]/api/security** for "Security API"

```

{
  "set_key": "",
  "get_id": "",
  "get_status": 0
}

```

Enter **[500767-2110-TX IP Address]/api/ptp** for "PTP API"

```

{
  "mOffsetScaledLogVariance": "0xffff",
  "clockAccuracy": "0xfe",
  "sourcePortId": "b8-59-9f-ff-fe-7f-77-08",

```

```

"masterID": "b8-59-9f-ff-fe-7f-77-08",
"isEnable": 1,
"portState": "SLAVE",
"mClockAccuracy": "0xfe",
"errCode": 200,
"offset": 18446744073709226000,
"clockId": "52-11-49-ff-fe-b2-ef-de",
"msg": "Begin to access data from server",
"priority1": 254,
"priority2": 254,
"mClockClass": 248,
"clockClass": 248,
"offsetScaledLogVariance": "0xffff",
"mPriority1": 128,
"mPriority2": 128,
"domainNumber": 127,
"portId": "52-11-49-ff-fe-b2-ef-de",
"masterPresent": 1
}

```

Enter **[500767-2110-TX IP Address]/api/others** for "Other (remaining) API"

```

{
  "debugRest": 1,
  "authen": 1,
  "debugCmd": 1,
  "sdpc": [
    "SDP Client is not available on TX"
  ],
  "debugSdp": 1,
  "threads": [
    {
      "PID": 396,
      "name": "muxMain"
    },
    {
      "PID": 442,
      "name": "muxTimer"
    },
    {
      "PID": 446,
      "name": "muxLed"
    }
  ]
}

```



```

    },
    {
      "PID": 445,
      "name": "muxManager"
    },
    {
      "PID": 444,
      "name": "muxBroker"
    },
    {
      "PID": 443,
      "name": "muxPoll"
    }
  ]
}

```

### 500767-2110-RX RestAPI:

The following screen shots show the RestAPI for the 500767-2110-RX (Receiver):

The RestAPI commands can be accessed directly from a browser by entering the 500767-2110-RX IP Address and RestAPI command as follows:

***[500767-2110-RX IP Address]/api/[RestAPI Command]***

Enter ***[500767-2110-RX IP Address]/api/*** to obtain a list of RestAPI Commands

```

[
  "system",
  "video",
  "audio",
  "sdp",
  "security",
  "ptp",
  "statistics",
  "others"
]

```

Enter ***[500767-2110-RX IP Address]/api/system*** for "System API"

```

{

```

```

"sfp1_ip": "192.168.0.101",
"videoPresence": 0,
"nmosOnNetwork": 0,
"sfp1DhcpStatus": 1,
"fpgaBuilt": "Aug 16 2022 11:41",
"ctrl_isDhcp": 1,
"sfp1_mac": "00:04:25:1C:11:02",
"built": "Sep 1 2022 21:43",
"ctrl_ip": "192.168.168.103",
"name": "SDI/HDMI OverIP-767",
"ctrl_mask": "255.255.255.0",
"sdpOnNetwork": 0,
"videoStatus": 1,
"sfp1_isDhcp": 1,
"forceStream": 1,
"mediaMode": "Manual",
"sfp2_ip": "192.168.0.100",
"product": "SDI/HDMI OverIP-767",
"fpgaVer": "00.01",
"blinkLed": 0,
"sfp2_mac": "00:04:25:1C:12:02",
"webOnNetwork": 0,
"audioStatus": 1,
"sfp2DhcpStatus": 1,
"ver": "01.01",
"sfpStatus": 3,
"nmosName": "500767-RX",
"isTx": 0,
"sfpCfg": 3,
"reboot": 0,
"sfp2_isDhcp": 1,
"ctrl_mac": "52:11:49:B2:EF:DE",
"model": "500767",
"isHdmi": 0,
"ctrl_gateway": "192.168.168.1",
"reset": 0
}

```

Enter **[500767-2110-RX IP Address]/api/video** for "Video API"

```

[
{

```

```

"colorSpace": "YCbCr-4:4:4",
"dest_port1": 48000,
"dest_port2": 48001,
"height": 1080,
"dest_ip1": "239.100.1.1",
"dest_ip2": "239.100.1.2",
"sessionID": "11448816542",
"TTL": 32,
"local_port1": 48000,
"local_port2": 48001,
"fps": "30",
"payloadType": 96,
"intIcse": 0,
"depth": 10,
"width": 1920,
"sdp": "api/video/sdp"
}
]

```

Enter **[500767-2110-RX IP Address]/api/audio** for "Audio API"

```

[
{
"channels": 2,
"dest_port1": 48010,
"dest_port2": 48011,
"chn0Remap": 0,
"sessionID": "10448816542",
"chn5Remap": 5,
"chnTotal": 8,
"sdp": "api/audio/sdp",
"local_port2": 48011,
"chn7Remap": 7,
"TTL": 32,
"chn6Remap": 6,
"chn2Remap": 2,
"pktSize": "1ms",
"chn1Remap": 1,
"chnReal": 2,
"local_port1": 48010,
"dest_ip1": "239.100.1.11",
"sample": "48000",

```

```

    "chnFilter": 255,
    "dest_ip2": "239.100.1.12",
    "chn4Remap": 4,
    "chnAlloc": 3,
    "payloadType": 97,
    "chn3Remap": 3,
    "depth": 24
  }
]

```

Enter **[500767-2110-RX IP Address]/api/sdp** for “SDP API”

```

[
  {
    "uri": "api/video/sdp",
    "port": 80,
    "ip": "192.168.168.64",
    "media": "video"
  },
  {
    "uri": "api/audio/sdp",
    "port": 80,
    "ip": "192.168.168.64",
    "media": "audio"
  }
]

```

Enter **[500767-2110-RX IP Address]/api/security** for “Security API”

```

{
  "get_status": 0,
  "set_key": "",
  "get_id": ""
}

```

Enter **[500767-2110-RX IP Address]/api/ptp** for “PTP API”

```

{
  "portId": "52-11-49-ff-fe-b2-ef-de",
  "masterPresent": 1,
  "mPriority1": 128,
  "offset": 18446744073708964000,
  "domainNumber": 127,
  "clockClass": 248,

```

```

"mOffsetScaledLogVariance": "0xffff",
"mClockClass": 248,
"sourcePortId": "b8-59-9f-ff-fe-7f-77-08",
"portState": "SLAVE",
"mPriority2": 128,
"mClockAccuracy": "0xfe",
"msg": "Begin to access data from server",
"errCode": 200,
"isEnable": 1,
"masterID": "b8-59-9f-ff-fe-7f-77-08",
"priority2": 254,
"offsetScaledLogVariance": "0xffff",
"priority1": 254,
"clockAccuracy": "0xfe",
"clockId": "52-11-49-ff-fe-b2-ef-de"
}

```

Enter **[500767-2110-RX IP Address]/api/others** for "Statistics API"

```

{
  "debugSdp": 1,
  "threads": [
    {
      "name": "muxMain",
      "PID": 396
    },
    {
      "name": "muxTimer",
      "PID": 450
    },
    {
      "name": "muxLed",
      "PID": 456
    },
    {
      "name": "muxManager",
      "PID": 455
    },
    {
      "name": "muxBroker",
      "PID": 454
    }
  ]
}

```

```
{
  "name": "muxPoll",
  "PID": 453
},
{
  "name": "muxSdpRecv",
  "PID": 452
},
{
  "name": "muxSdpMngr",
  "PID": 451
}
],
"sdpc": [
  {
    "msg": "",
    "dataErrs": 0,
    "fails": 0,
    "headerErrs": 0,
    "uri": "",
    "pkts": 0,
    "reqs": 0
  },
  {
    "msg": "",
    "dataErrs": 0,
    "fails": 0,
    "headerErrs": 0,
    "uri": "",
    "pkts": 0,
    "reqs": 0
  }
],
"debugCmd": 1,
"authen": 1,
"debugRest": 1
}
```

## 3. Frequently Asked Questions

The following FAQ section provides answers to the most frequent questions you may have regarding the configuration of the 500767-2110.

### What is the default IP address of the 500767-2110?

By default the 500767-2110 is configured in DHCP mode. If no DHCP server is available the unit will fall back to its default static IP address:

As a Tx,

Console LAN port:	192.168.168.64/255.255.255.0
Media 1 port:	192.168.168.65/255.255.255.0
Media 2 port:	192.168.168.66/255.255.255.0

As a Rx,

Console LAN port:	192.168.168.67/255.255.255.0
Media 1 port:	192.168.168.68/255.255.255.0
Media 2 port:	192.168.168.69/255.255.255.0

### How to find the 500767-2110 IP address?

You can check the unit's IP address by using either Wireshark or going to your network switch Web interface.

### Why cannot I connect to the 500767-2110 GUI?

Ensure that your computer is on same subnet. For instance, if the TX's IP address is 192.168.168.64/255.255.255.0 your computer must be configured as follows: 192.168.168.x/255.255.255.0, where x may be 70 or something similar.

**How do I find the software version of the 500767-2110?**

From the Web interface you may go to the System Info page.

**Why is the RX not displaying video?**

First, ensure your video source is valid. If using manual configuration, make sure the Multicast addresses for both audio and video matches the one from the TX. Second, validate your network supports multicast. Double check your wiring as well as UTP cable length.

**What is SDP?**

SDP stands for Session Description Protocol which describes the parameters for both audio and video.

**I am using SDP input type but the RX is not displaying video?**

Ensure you are entering the right information for each field. Please refer to section number 2 for details on the TX SDP file.

**The 500767-2110 RX does not display video from another ST2110 manufacturer?**

Check media parameters and ensure you are entering the right SDP information if using this input type. If it is still not working, email the SDP file to Muxlab support.

**12G-SDI (4K/60) does not work on the 500767-2110?**

The maximum supported resolution on the 500767-2110 is 3G-SDI (1080p60).

If the above does not help you to find a solution to the issue you are experiencing please contact MuxLab Technical Support at 877-689-5228 (toll free in North America) or (+1) 514-905-0588 (International) or email to [info@muxlab.com](mailto:info@muxlab.com). Please have the following information ready:

- Unit model number.



- Cabling layout. Please include the model of the SDI source and sink devices, cable length and type (e.g.: 20m of Cat 6a UTP, etc.).
- Description of problem.
- List of tests performed.

## 4. Product 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 the 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 an 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, along with a dated proof of purchase. 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.

**Warranty Periods**

*This product is under warranty for a period of three (3) years.*

*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 R.M.A.'s issued are subject to inspection by MuxLab, and will be returned to the customer if not properly packaged – units must be returned in the original container or equivalent. MuxLab will not accept any such product for repair without an authorization from its Technical Support department and without a return authorization number issued by the MuxLab Customer Service department. For a credit & replace R.M.A., the customer will be liable to pay replacement invoice if defective products are not returned.*

For Products 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. Customers 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 has a 90 day warranty.*



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