# MXU-88 Plus

## *User Manual*

8X8 4K HDMI / USB 2.0 Matrix Switch with Remote Control
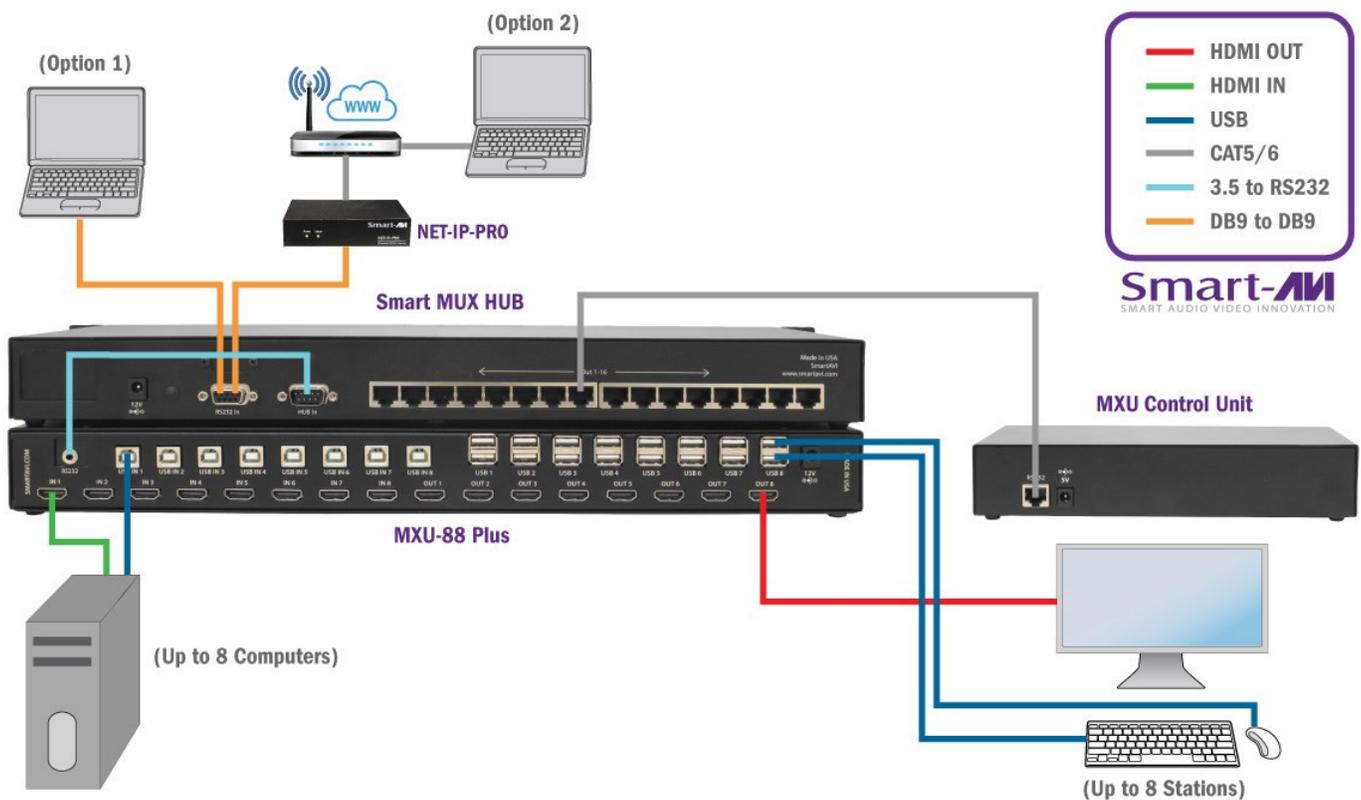


Remote access and control of up to 8 computers with 4K HDMI and transparent USB 2.0 from up to 8 connected stations

# Smart-*AVI*
SMART AUDIO VIDEO INNOVATION

# TABLE OF CONTENTS

# WHAT'S IN THE BOX?

| PART NO. | QTY | DESCRIPTION |
|---|---|---|
| MXU88-S | 1 | 8X8 4K HDMI USB 2.0 Matrix Switch |
| SC-HUB16 | 1 | 16 Port RS232 Selector SmartMux Communication HUB |
| SC-RM8 | 1 | MXU Controller Unit |
| CST2RS232 | 1 | 3.5mm to RS232 cable |
| PS12VD5A | 1 | Power Adapter |
| PS12VD3A | 1 | Power Adapter |
| PS5VD2A | 1 | Power Adapter |
| | 1 | Quick Start Guide |

Brackets for mounting can be ordered from SmartAVI.

# MXU-88



# Front View



# Rear View

# Smart MUX HUB



## Rear View



# MXU-Control Unit

## Front View



## Rear View



# MXU-88 Plus Installed

# INTRODUCTION

The MXU-88 Plus is the latest upgrade to one of SmartAVI's most powerful and efficient matrix switching solutions. This 8X8 switching hub grants up to eight users shared remote access to as many as eight remote work stations and transparent USB 2.0 devices. Great for applications such as multi-user remote supervision or group-based video editing projects, the MXU-88 Plus excels even more at expediting workflow for digital devices of various kinds.

Capable of displaying HDMI-based video at resolutions up to 4K (3840×2160 @ 30Hz), the MXU-88 Plus is perfect for non-emulation KVM operations where a high degree of picture clarity is imperative. Better yet, the MXU-88 Plus is easy to control, outfitted with a simple two-button front panel interface and a web-based command console via Ethernet connection. The MXU-88 Plus's 16-port USB 2.0 output is ideal for transparent peripherals like keyboards, mice, external hard-drives, cameras, printers, scanners, streaming devices, and more. For comprehensive matrix switching and USB 2.0 device control remotely made easy, choose the MXU-88 Plus matrix switch powered by SmartAVI!

The MXU-88 is an ideal solution for medical, industrial, studio and defense applications, where it is not practical or safe to have multiple workstations in close proximity to each other. An operator can switch to any connected computer from any connected station with ease.

# FEATURES

- Remote control via SmartMUX HUB and MUX Control Units
- (8) HDMI inputs with resolutions up to 4K (3840x2160 @ 30Hz)
- (8) HDMI outputs with resolutions up to 4K (3840x2160 @ 30Hz)
- (8) USB 2.0 Type B inputs—(8) Dual USB 2.0 Type A outputs
- Supports digital audio over HDMI
- Supports DVI-D with adapters
- Supports USB keyboard-mouse control (NO EMULATION)
- Supports USB peripheral devices (external hard-drives, scanners, printers, etc...)
- Simple two-button front panel control with LCD display for control and status
- Full web-based control console over Ethernet
- Learns and stores EDID information
- HDMI 1.4 & HDCP Compliant
- Control Sun, Mac or PC computers from one workstation
- Plug-and-play ready for immediate use

# APPLICATIONS

- Audio/Visual Presentations
- Schools & Universities
- Retail Store Displays
- Conference Centers
- Server Collocation
- Business Lobbies
- Shopping Centers
- Control Rooms
- Digital Signage
- Dealer Rooms
- Wall Displays
- Restaurants
- Education
- Hospitals
- Security

# TECHNICAL SPECIFICATIONS

| VIDEO | |
|---|---|
| Supported Resolutions | 4Kx2K (3840x2160@30Hz), 1080p, 1080i, 720p, 480p, Supports all DVI-D Resolutions |
| Video Bandwidth | 300 MHz |
| HDMI Version | HDMI 1.4 |
| Input Interface | (8) HDMI Type A 19-pin Female TMDS (DVI-D with adapter) |
| Output Interface | (8) HDMI Type A 19-pin Female TMDS (DVI-D with adapter) |
| Max Cable length | Up to 20 ft. |
| Audio | Stereo Embedded in HDMI signal |
| **USB** | |
| Signal Type | USB 2.0, 1.1 and 1.0 |
| Input | (8) USB Type B Female (No Emulation) |
| Output | (16) USB Type A Female |
| **CONTROL** | |
| Front Panel | Buttons |
| Ethernet (TCP/IP) | (1) RJ-45 |
| **OTHER** | |
| Power Adapter | PS12VDC5A |
| Dimensions | 17.06" W x 2" H x 10.4" D |
| Weight | 8.8 lbs. |
| Working Temp. | 32 to 122°F (0 to 50 °C ) |
| Working Humidity | Up to 85% RH (no condensation) |
| Storage Temp. | -4 to 149 °F (-20 to 65 °C ) |
| Storage Humidity | Up to 90% RH (no condensation) |

# TECHNICAL SPECIFICATIONS Continued

| Smart MUX Communication HUB | |
|---|---|
| CE Approval | Yes |
| Control Connectors | DB9 Male / DB9 Female |
| Signal | RS232 half duplex +/- 12V |
| User Connector | 16 RJ45, RS232 TTL +/5V |
| Remote Power | POE |
| Data Format | 5 to 8 bits |
| Interface | RS-232 async |
| Speed | 300 bps to 76.8 kbps |
| Power | 115/230 TO 12vdc 3a |
| Switches | Code Operated |
| Weight | 3.8 lbs |
| **MUX Controller** | |
| CE Approval | Yes |
| Signal | RS232 half duplex +/- 12V |
| User Connector | 16 RJ45, RS232 TTL +/5V |
| Remote Power | POE |
| Optional | 5VDC |
| Data Format | 5 to 8 bits |
| Interface | RS-232 async |
| Speed | 300 bps to 76.8 kbps |
| Power | Internal via POE |
| Switches | Code Operated |
| Weight | 2 lbs |

# HARDWARE INSTALLATION

**Connecting the Smart Mux Hub to the MXU-88 Is quick and easy.**
1) Connect the 3.5mm proprietary serial cable to the MXU-88 round serial connection located on the back far left, looking at the back of the unit. Connect the other end, to the db9 connection on the "Smart Mux Hub" labeled RS232 located to the left of the RJ 45 connections.
2) Connect the ac adapter.

**Connecting the "Mux Control Units" to the "Smart Mux Hub" is just as easy.**
Only the first 8 RJ connections are active. The rest are for future development.
1) Connect a CAT5 or 6 utp cable to any of the active RJ45 connections. Connect the other end to the "Mux Control Unit". That's it!! Maximum cable length is 200'. Ac adapters are not necessary in most situations when connecting to the "Mux Control Units". Power is supplied through the attached cabling.

**Using the "Mux Control Units"**
Once everything is connected and powered on, the buttons on the "Mux Control Unit" are illuminated. Pressing any of the 8 buttons will display the content of that connection on your screen.
For mouse and keyboard control of the input you are watching, long press the button. The button led will flash. And you are now have total control of the computer you are viewing.
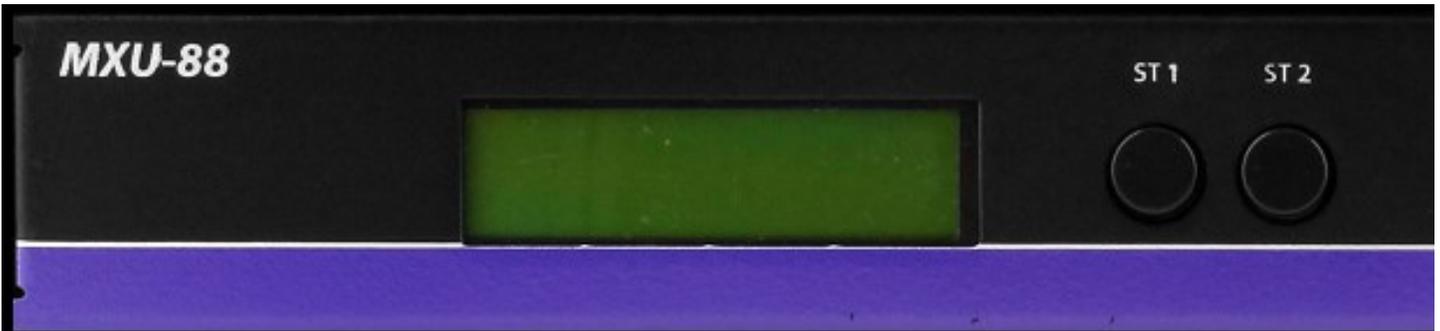
KVM extenders can be used to extend placement of Displays and USB devices.
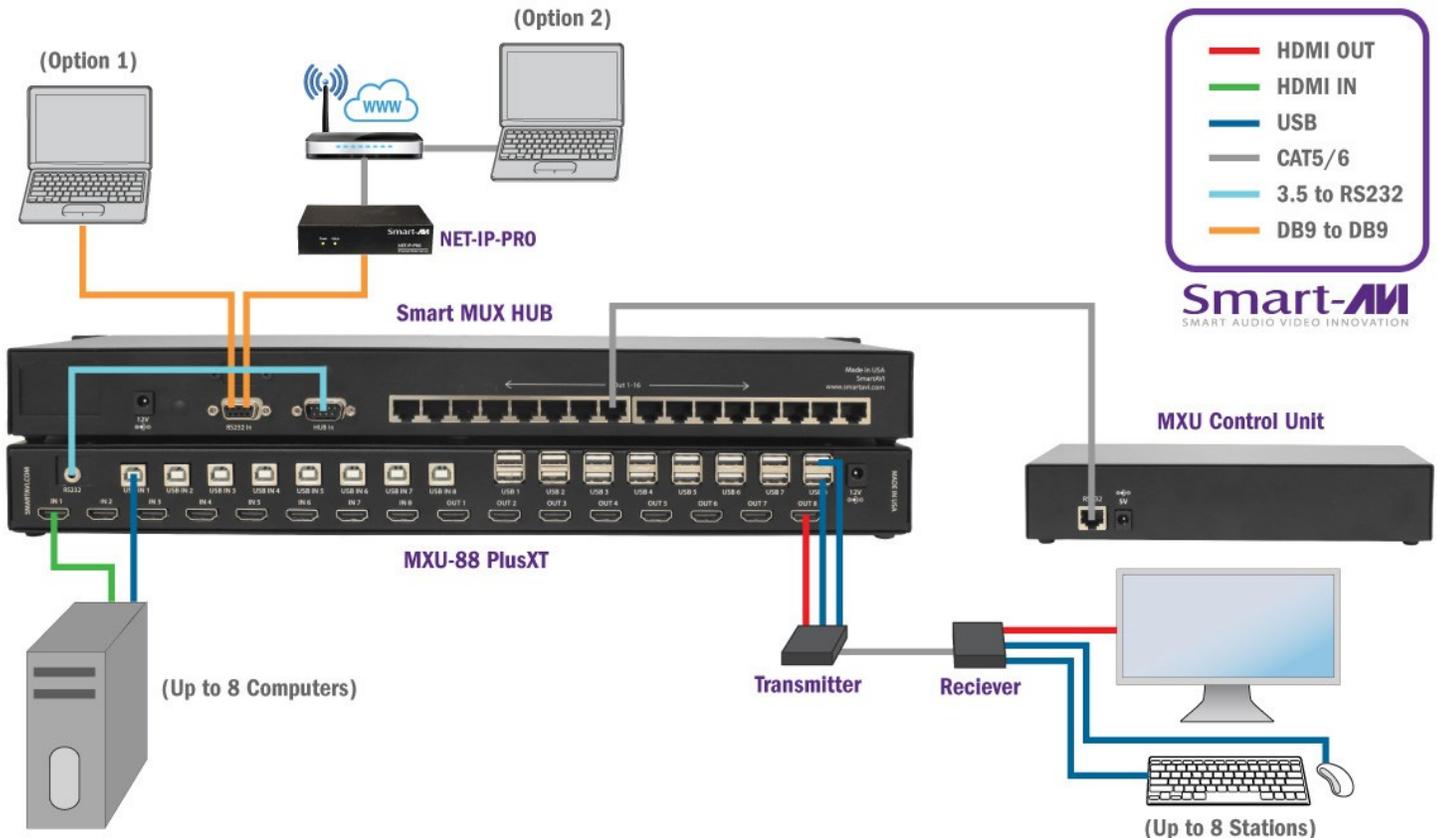
# FRONT PANEL CONTROL

Use the ST2 button to navigate to the desired menu item. Pressing ST1 and ST2 at the same time will execute the selection.



USB:

Change which computer is connected to which keyboard / mouse.

Press ST2 to move from IN port to IN port.
Press ST1 when the cursor is on the IN port you want to change the OUT port # connected to it.
Press ST1 & ST2 simultaneously to connect the ports.
Press ST2 to move to another IN port or press ST1 & ST2 simultaneously to exit back to the main menu.

Video:

Change which computer is connected to which monitor.

Press ST2 to move from IN port to IN port.
Press ST1 when the cursor is on the IN port you want to change the OUT port # connected to it.
Press ST1 & ST2 simultaneously to connect the ports.
Press ST2 to move to another IN port or press ST1 & ST2 simultaneously to exit back to the main menu.

EDID:

Press ST2 to move from menu item to item. Press ST1 and ST2 simultaneously to enter the EDID sub menu.

Learn: Will load and store the EDID from the display connected to port 1.
Info:   Will display the name of the EDID currently in use.
Exit:   Will exit back to the main menu.

IP:

Press ST1 & ST2 simultaneously to display the IP address in use by the MXU-88.

# CONTROL VIA ETHERNET

On the front panel of the MXU-88 press the ST2 button until the cursor is by the IP selection. Press ST1 & ST2 simultaneously to display the IP address in use by the MXU-88. Enter the IP address into a web browser of your choice. You should see the MXU-88 login page. **The username is admin and the password is admin.** Then the main webpage will display as shown in Figure 7-1. The left column of numbers represents the output port. The top row of numbers represent the input ports. Using your mouse click on the box at the intersection of the input with the output to execute the desired connection. The video and usb connections can be changed independently.

There is also a button you can click on to learn the EDID of the monitor connected to output port 1 and a button that will display the EDID in use.



Figure 7-1

# CONTROL VIA ETHERNET (Continued)

From the main webpage you can select IP Config and a webpage will display with fields allowing to set the network settings for the MXU-88.
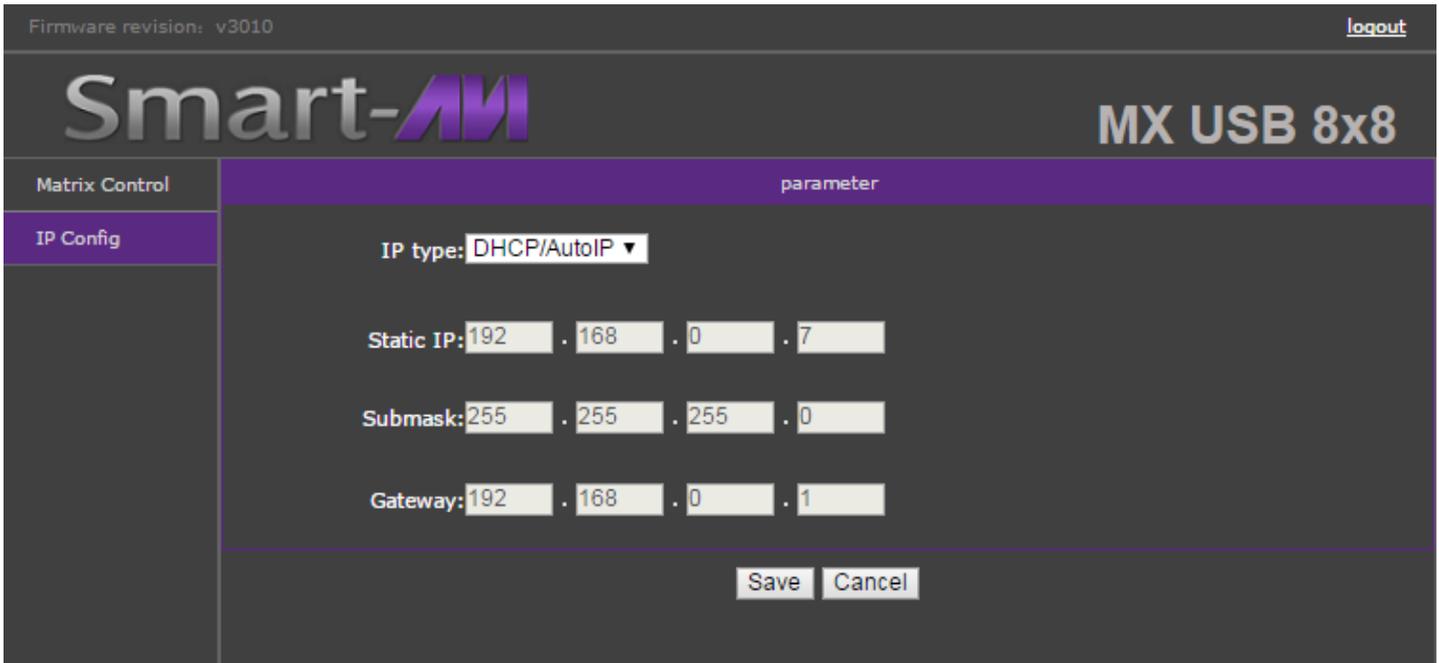


Figure 8-1

# LIMITED WARRANTY STATEMENT

**A.      Extent of limited warranty**

Smart-AVI Technologies, Inc. warrants to the end-user customers that the Smart-AVI product specified above will be free from defects in materials and workmanship for the duration of 1 year, which duration begins on the date of purchase by the customer. Customer is responsible for maintaining proof of date of purchase.

Smart-AVI limited warranty covers only those defects which arise as a result of normal use of the product, and do not apply to any:
>        a. Improper or inadequate maintenance or modifications
>        b. Operations outside product specifications
>        c. Mechanical abuse and exposure to severe conditions

If Smart-AVI receives, during applicable warranty period, a notice of defect, Smart-AVI will at its discretion replace or repair defective product. If Smart-AVI is unable to replace or repair defective product covered by the Smart-AVI warranty within reasonable period of time, Smart-AVI shall refund the cost of the product.

Smart-AVI shall have no obligation to repair, replace or refund unit until customer returns defective product to Smart-AVI.

Any replacement product could be new or like new, provided that it has functionality at least equal to that of the product being replaced.

Smart-AVI limited warranty is valid in any country where the covered product is distributed by Smart-AVI.

**B.      Limitations of warranty**

To the extant allowed by local law, neither Smart-AVI nor its third party suppliers make any other warranty or condition of any kind whether expressed or implied with respect to the Smart-AVI product, and specifically disclaim implied warranties or conditions of merchantability, satisfactory quality, and fitness for a particular purpose.

**C.      Limitations of liability**

To the extent allowed by local law the remedies provided in this warranty statement are the customers sole and exclusive remedies.

To the extant allowed by local law, except for the obligations specifically set forth in this warranty statement, in no event will Smart-AVI or its third party suppliers be liable for direct, indirect, special, incidental, or con-sequential damages whether based on contract, tort or any other legal theory and whether advised of the possibility of such damages.

**D.      Local law**

To the extent that this warranty statement is inconsistent with local law, this warranty statement shall be considered modified to be consistent with such law.

## NOTICE

The information contained in this document is subject to change without notice. SmartAVI makes no warranty of any kind with regard to this material, including but not limited to, implied warranties Of merchantability and fitness for particular purpose. SmartAVI will not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material. No part of this document may be photocopied, reproduced, or translated into another language without prior written consent from SmartAVI Technologies, Inc.

20180219

Designed and Manufactured in the USA

**800.AVI.2131**

Tel: (818) 503-6200 **|** Fax: (818) 503-6208
11651 Vanowen St. North Hollywood, CA 91605

**SmartAVI.com**