

HDR-16x16 Plus V3

USER MANUAL

16 Port 4K 30Hz HDMI Matrix Switch



Smart-AVI
SMART AUDIO VIDEO INNOVATION

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WHATS IN THE BOX?

Model Number	Description
HDR-16x16 Plus V3-S	16 Port HDMI Matrix Switch, Power Cord, Manual

NOTICE:

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INTRODUCTION

The HDR-16x16 Plus V3 conforms to the HDMI (High Definition Media Interface) standard with HDCP compliance and provides a connection to view any of sixteen HDMI video sources on any combination of sixteen video displays. The HDR-16x16 Plus V3 provides HDMI output up to 40 feet away at resolutions up to **3840x2160 (4k) @30Hz**. The system works with Blu-ray players, TiVo systems, HTPCs, and satellite set-top boxes that connect to an HDMI display. Users can switch to any source locally using the Front Panel or remotely via RS-232 with Windows®-based software that is easy to understand and simple to use, a cornerstone of all SmartAVI products. It can also be controlled via TCP/IP.

FEATURES:

- 4K 30Hz HDMI 16x16 router switches 16 HDMI inputs with 16 HDMI outputs
- Sources can be routed independently to displays
- Switching controlled via the front panel, RS-232 and TCP/IP
- Supports high definition video resolutions of 720p, 1080i, 1080p and 3840x2160 (4k) @ 30Hz
- Supports 7.1 Digital Surround Sound Audio
- HDCP and HDMI 1.4 compliant
- Supports EDID for total control of compliant displays
- Learn EDID from any display
- Delivers uncompressed digital video with zero signal loss
- Outputs HDMI up to 40 feet (with high quality active cables)
- Rack-mountable

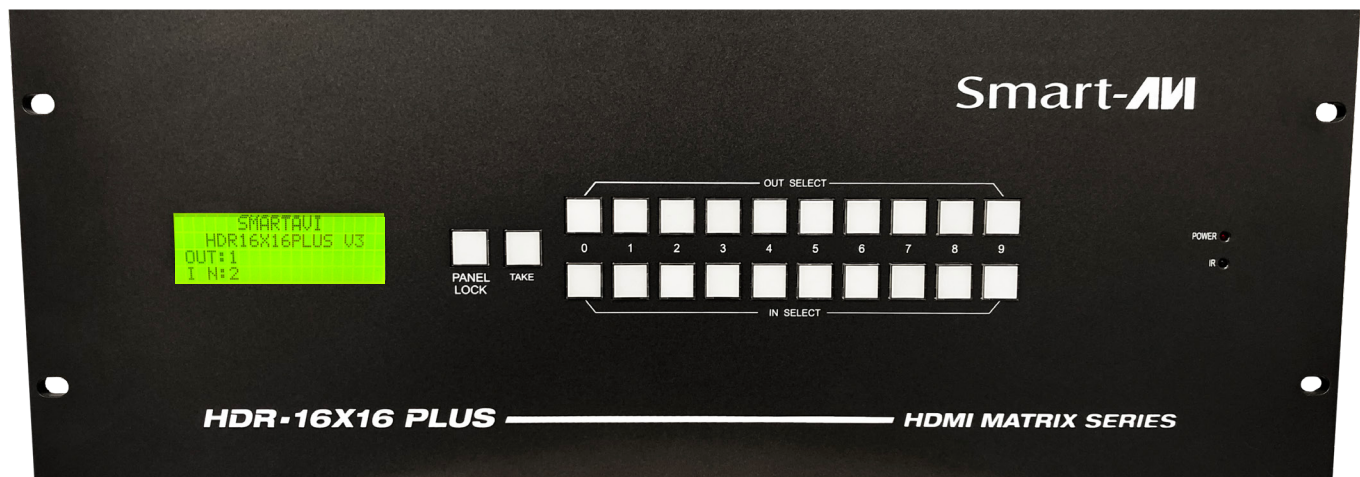
APPLICATIONS:

- Wall Displays
- Digital Signage
- Airports
- Dealer Rooms
- Control Rooms
- Audio/Visual Presentations
- Shopping Centers
- Security
- Point-of-Sale
- Hotels/Resorts



TECHNICAL SPECIFICATIONS:

VIDEO	
HDTV Resolutions	480p, 720p, 1080i, 1080p and 3840x2160 (4k) @30Hz
SDTV Resolutions	480i
Input Interface (TX)	(16) HDMI Type A 19-pin Female TMDS
Output Interface (RX)	(16) HDMI Type A 19-pin Female TMDS
Input Cable Length	Up to 40 ft.
Output Cable Length	Up to 40 ft.
CONTROL	
Front Panel	Buttons & LCD Display
RS-232	DB9 Female, 9600 bps, N, 8 1, No flow control
TCP/IP	On-Board LAN
OTHER	
Warranty	Limited 1 Year Parts and Labor
Power	Internal 100-240 VAC
Dimensions	17"W x 7 1/8"H x 15"D Front Panel is 19" wide to fit a 19" rack
Weight	24.45 lbs. (Unit only)
ENVIRONMENTAL	
Operating Temp.	0 to +40° C (+32° to 104° F)
Storage Temp.	-20° to +60° (+20° to +140° F)
Operating Humidity	10% to 85% (Non-condensing)
Storage Humidity	10% to 85% (Non-condensing)



HDR-16x16 Plus
V3 Front

HARDWARE INSTALLATION

1. Turn off all input devices and displays.
2. Connect male to male HDMI cables to the input devices or sources and the “IN” ports on the HDR-16x16 Plus V3.
3. Connect the displays to the “OUT” ports on the HDR-16x16 Plus V3.
4. Power on the input devices and the displays.
5. Connect the power cord and power-on the HDR-16x16 Plus V3.

IMPORTANT:

Each input and output can support up to 10mA/5VDC.

Do not connect extenders that are powered by HDMI.



HDR-16x16 Plus
V3 Rear

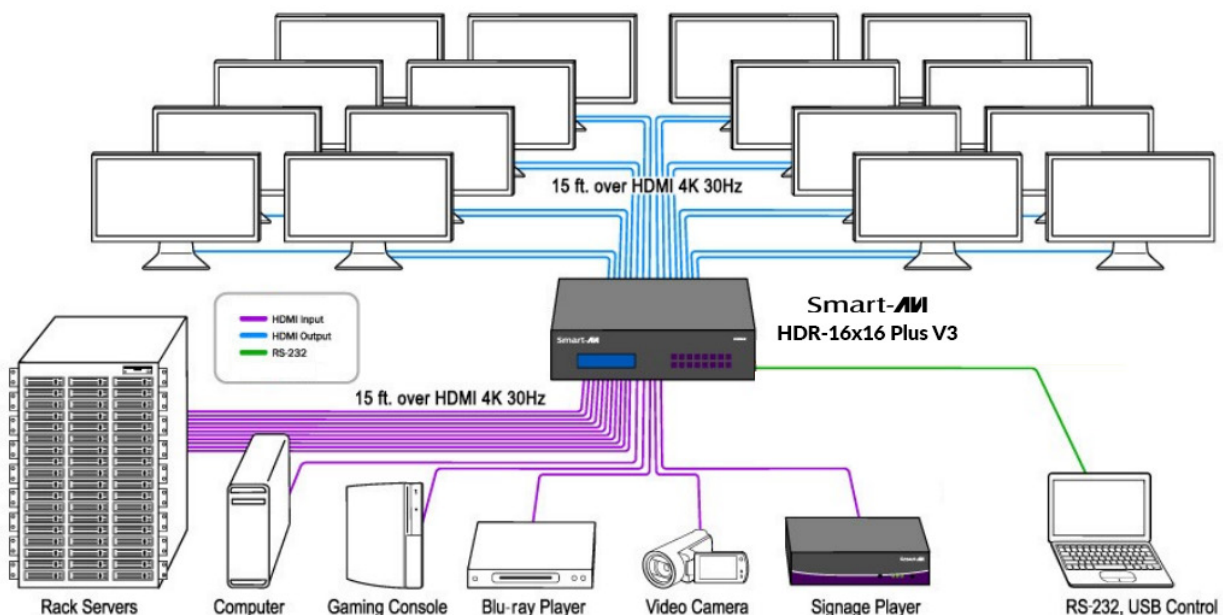
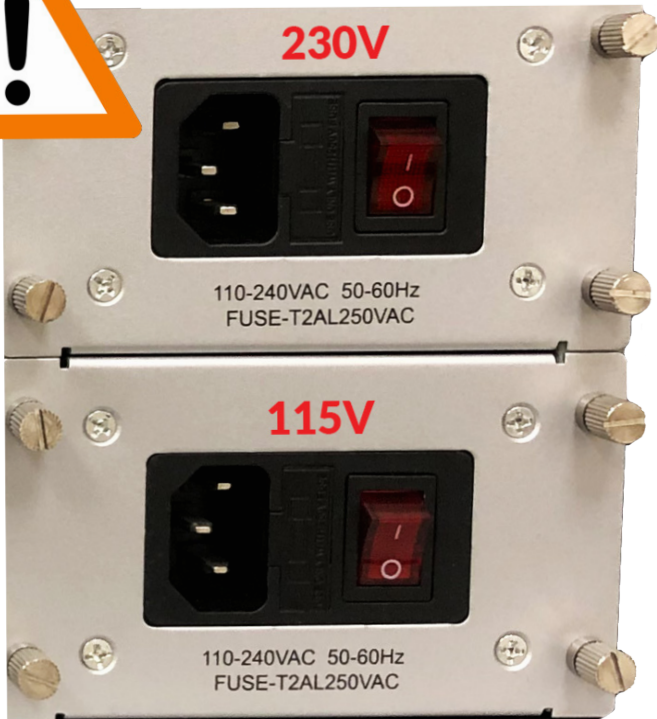


Figure 5-1



WARNING

**CHECK VOLTAGE BEFORE
PLUGGING IN UNIT. THIS
UNIT IS EQUIPPED WITH
230V and 115V PORTS.**



The top power-plug is 230V and is intended for use within the EU or countries where 230V is the standard. Please check all voltages and inputs before proceeding with powering on the unit.

The bottom power-plug is 115V and is intended for the United States or countries where 110-115V is the standard. Please check all voltages and inputs before proceeding with powering on the unit.

FRONT PANEL CONTROL

There are multiple ways to control the HDR-16x16 Plus V3: via the front panel, via RS-232 using the SmartControl software, via RS-232 commands (with AMX, Crestron), and with a TCP-IP module.

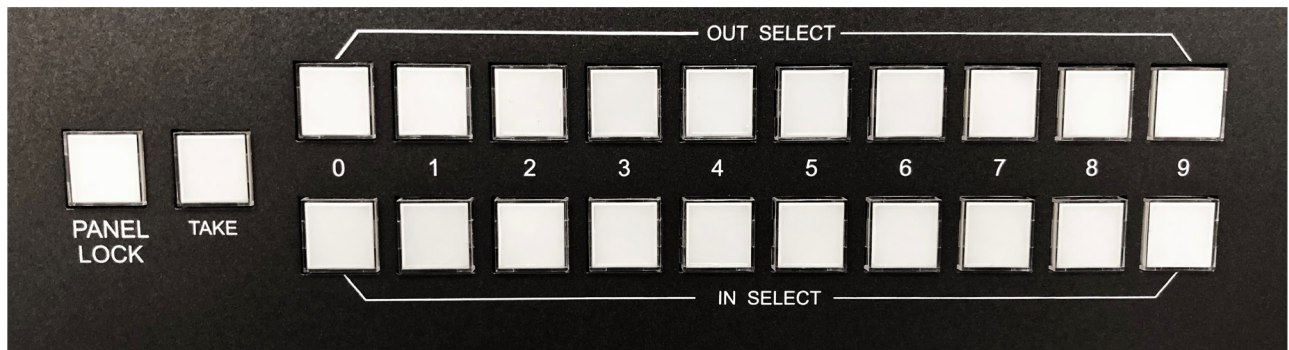


Figure 6-1

Input and output are relative to the HDR-16x16 Plus V3. Output refers to displays or monitors. Input refers to video sources such as DVD players or computers.

During normal operation, you will see a list of ports on the front panel display. See Figure 6-2.

DEFAULT DISPLAY HDR-16X16 PLUS V3

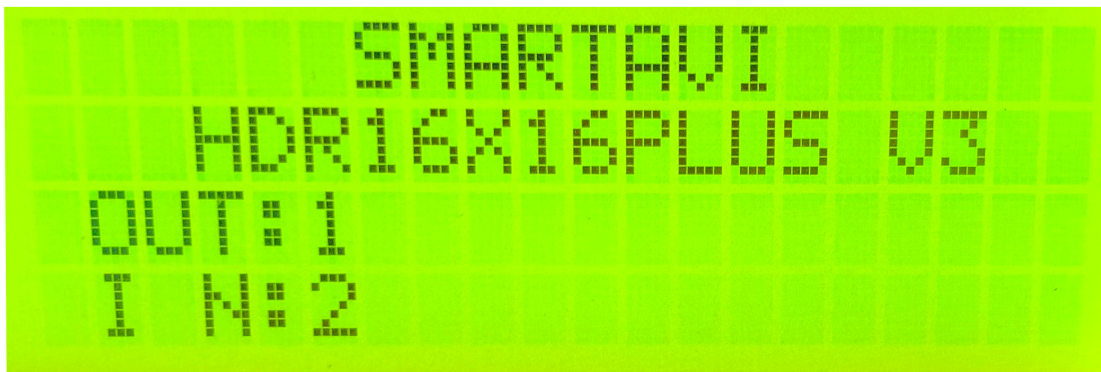


Figure 6-2

To select INPUT/OUTPUT for display: Press the desired number into the Out Select row; for example Monitor 1 will be "01"; Once you have selected the output, enter the desired input from the In Select row (bottom row), then press **TAKE** to confirm.

Display Input Status: This displays the status of the inputs. If no input is present, the display will read NONE.

PANEL LOCK: This mode prevents any button commands from being entered while the PANEL LOCK is active. Press the PANEL LOCK button again to disable the LOCK.

ESTABLISHING AN RS-232 CONNECTION

Before you start:

Controlling a Smart-AVI device via RS-232 requires an RS-232 card installed on your computer or a USB to RS-232 adapter. Below are instructions on how to create an RS-232 connection between a PC and the Smart-AVI device.

Use terminal client software such as the PuTTY to connect to the Smart-AVI device. Make sure to use communication settings 9600 bps, N, 8, 1, No flow control.

Check the device and your PC to determine if you need a male to male or a male to female cable and how long it needs to be. The Smart-AVI device requires a straight through cable. You can use a Null Modem Adapter to convert a crossed cable to a straight through cable. Examples of crossed and straight through cable pin-outs are shown below. The standard maximum length for an RS-232 cable is 50 feet. Call our Smart-AVI Support Engineer if you require more information.

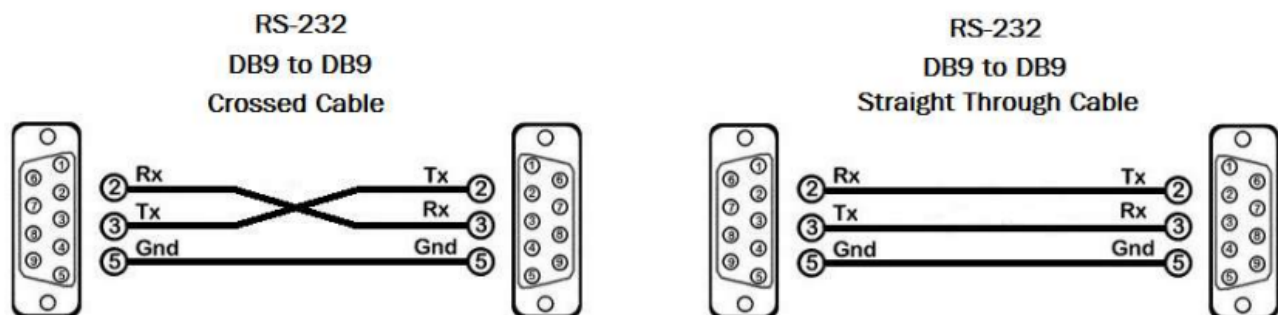


Figure 9-1
Examples of 9 pin RS-232 Straight Through and Crossed Cables

Establish a connection to the Smart-AVI device:

1. Connect an RS-232 cable to the RS-232 connector on the PC.
2. Connect the other end of the cable to the RS-232 port of the Smart-AVI device.
3. Use Windows Control Panel / Device Manager to identify the Com port number. See instructions and Figure 9-2 below.
4. Power on the device.

If you are using a USB to COM port adapter on a Windows PC and need to identify the COM port used, do the following:

1. Click on the start button.
2. Click on Control Panel.
3. Click on Device Manager.
4. Click on the arrow next to Ports (COM & LPT). You should see the name of your adapter and the COM port number in use.

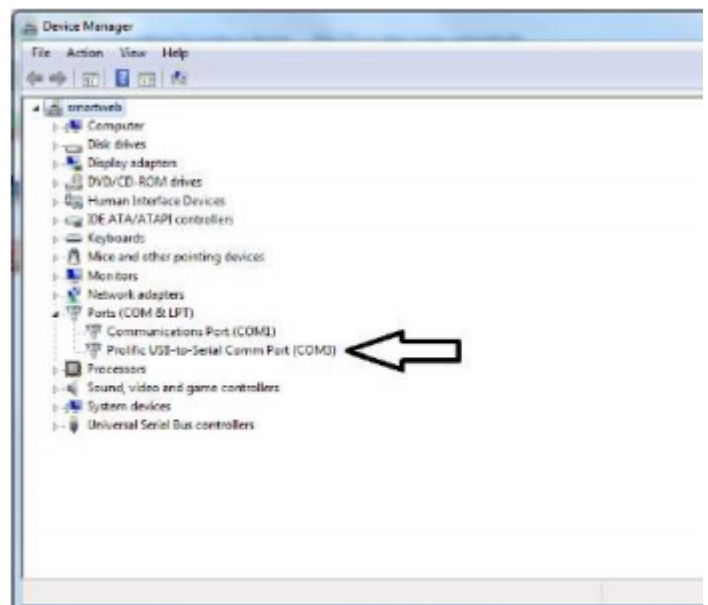


Figure 9-2

USING THE SMARTCONTROL SOFTWARE

RS-232: Controlling the HDR-16x16 Plus V3 has never been simpler with SmartControl software. With SmartControl, you can assign a unique name to each port on the HDR-16x16 Plus V3, as well as each display, customizing projects to meet your needs. Although all the functions of the matrix are available locally on the front panel of the HDR-16x16 Plus V3, using SmartControl allows for customization of all the matrix functions.

- Download the Smart Control Pro software from the Smart-AVI website. www.smartavi.com
- Double click SmartControlPro-v5-0-03_Installer.exe in order to initiate software installation.
- Click Install. After installation has completed, click CLOSE.
- In order to use the software, click on the START button>Programs>SmartControl Pro.
- There you should see a help file, the SmartControl Pro launcher as well as a shortcut to uninstall SmartControl Pro.

Click on SmartControl Pro in order to launch the software. When the software starts you will see a screen like this:

Advanced Configuration:

If you have more than one Router installed you will want to check this box.

Router Type:

Select HDR-16x16 Plus V3

Inputs/Outputs:

Enter the number of Inputs/Outputs your HDR-16x16 Plus V3 has.

The HDR-16x16 Plus V3 can have up to 16 inputs and 16 outputs.

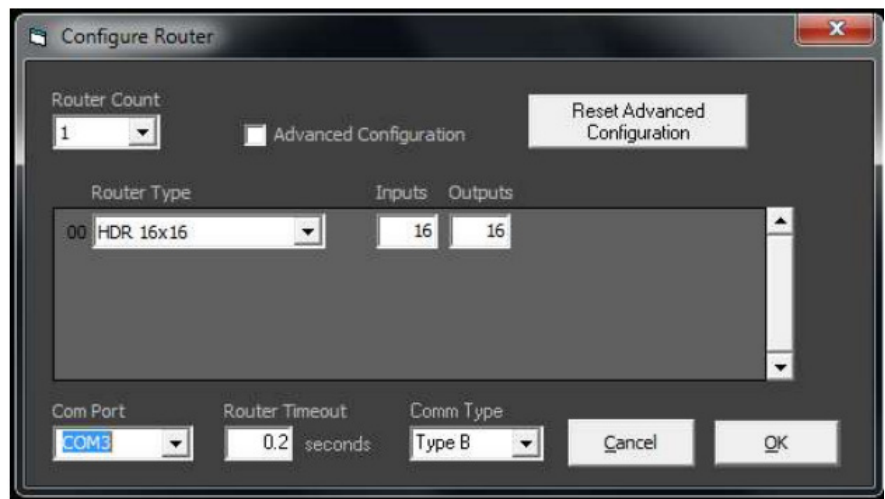


Figure 10-1

Com Port:

Select the appropriate com port that your computer is using to access the router.

To find the com port number that your computer is using click on the Start Menu. Right click on computer. Click on Properties. Click on Device Manager. Click on the symbol next to Ports (COM & LPT). Your com port number should be listed here.

Router Time out:

This field is set to 0 by default, meaning the computer acknowledges commands almost instantly. Sometimes a computer takes longer to respond. This setting should be left at 0. If you need to change it, it should be no higher than 0.2.

After you have entered in the necessary information click OK. This will now take you to the Main Routing Window where you can route the different video/audio connections.

USING THE SMARTCONTROL SOFTWARE

Main Routing Window

The Main Routing Window enables you to control the router(s) connections by means of the Crosspoint panel, the button panel, or with pre-recorded routes called macros.

Crosspoint Panel: This is the simplest way to route the connections. Simply click on the cross point itself. The input on the left will then be routed to the output above.

Note: Inputs can be routed to several different outputs, but each output can only have a single input.

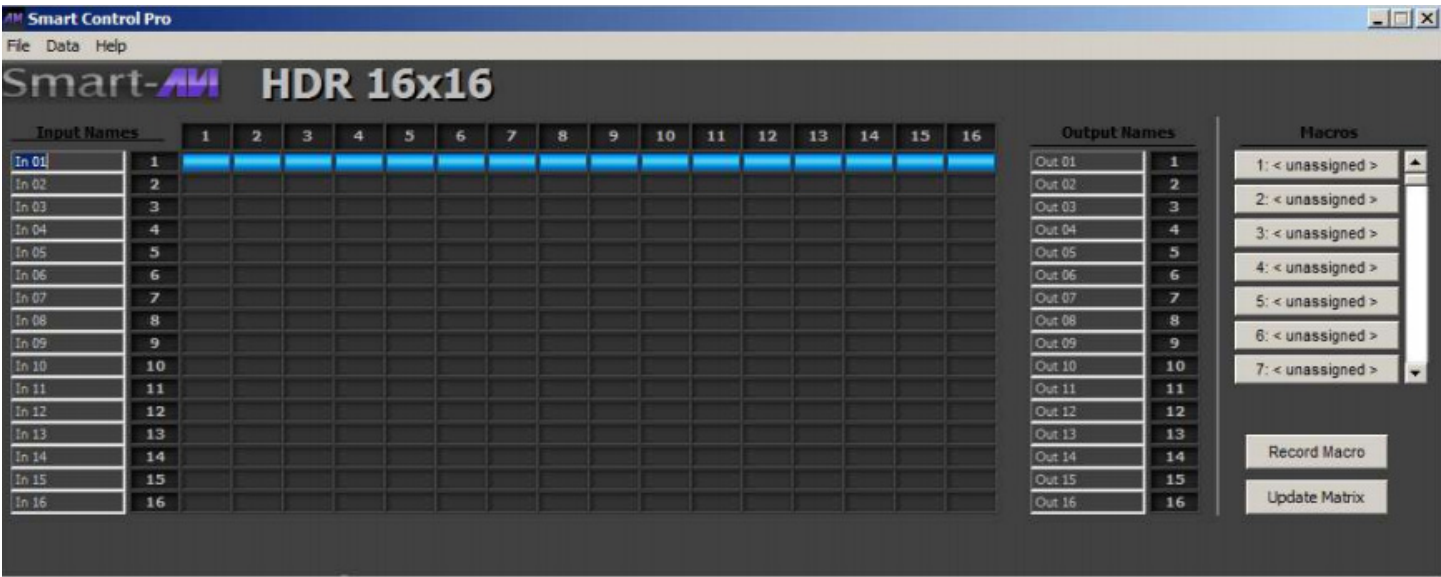


Figure 11-1

On the screen shown in figure 11-1 the input buttons run down the left side and the output buttons run across the top. They're each labeled 1 through 16. This configuration directs video from source 1 to be displayed on all 16 displays

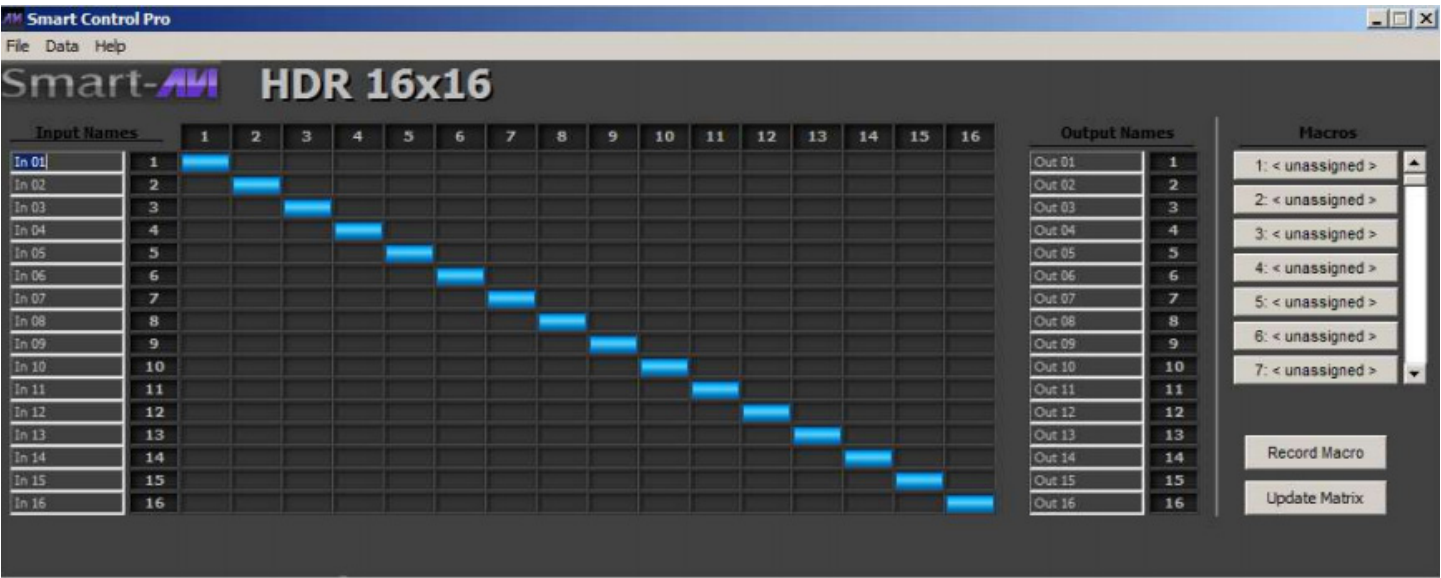


Figure 11-2

USING THE SMARTCONTROL SOFTWARE (CONTINUED)



Figure 12-1

The Button Panel:

Output Options:

To select multiple outputs, in the row for any input or source, click the button under the desired outputs or displays.

Input Options:

To route an input to all the outputs at once, hold the control key down and click on an input.

Macros: This section of the window is used to save and play back macros. Macros store a set sequence of routes.

To record a macro:

1. Click on the Record button (last button shown). A blinking “recording” message below this button will be displayed to indicate that all routes are being recorded.
2. Select the desired crosspoints. There is no limit on the number of routes you may record. If you click a macro button while in the record mode, the macro will be executed, and these routes will be added to the recording. This makes it possible to combine the routes of two or more macros into one bigger macro.
3. When finished, click the “Save Macro” button. You will be instructed to then click on one of the macro buttons. Doing this will save the recorded routes to that button. To cancel saving the macro, click the “Cancel Save” button.
4. To play back a macro, simply click on one of the 50 macro buttons. Use the scroll bar to bring any of these into view.

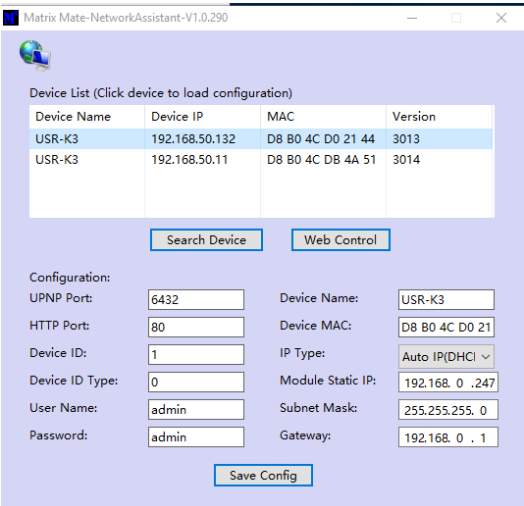
The macros are automatically saved in the current configuration file. They are also saved when you select the File/Save Configuration... menu.

To save macros in a separate file for a special purpose, select the File/Save Macros...menu.

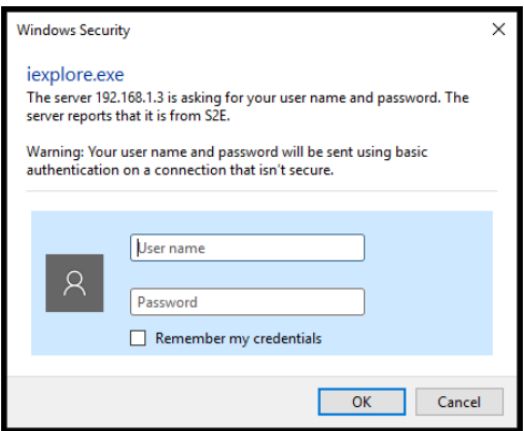
LAN (TCP-IP) CONTROL

To enable TCP-IP control, connect an ethernet cable to the HDR-16X16-Plus ethernet port. By default, the HDR-16X16-Plus will connect to the network using DHCP.

Download Matrix Mate-NetworkAssistant software and execute to locate your IP address. Click the Search button. After a few seconds your IP address should appear



Enter the IP address in a browser of your choice and the Web Control login screen should appear as shown.

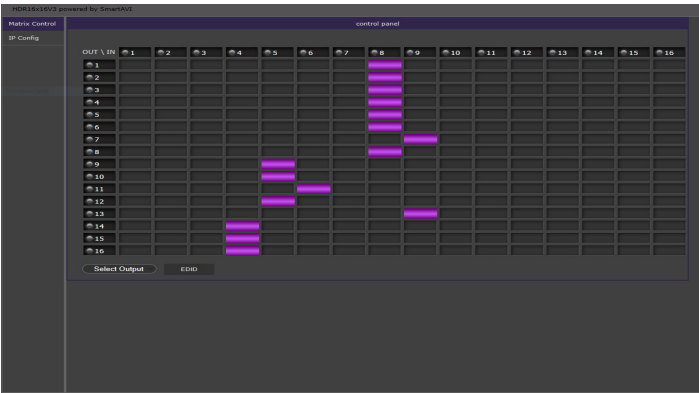


SmartAVI HDR-16X16-Plus Login Webpage

The default Username and Password is admin. After logging in successfully, you will be brought to the control screen shown in Figure 5-2.

Control Webpage

To switch an input for an output, select the desired input to the right of the desired output.



To control the HDR-16X16 remotely via the internet, connect an SMTCP controller (optional accessory) to the RS-232 port. The SMTCP-2 is an RS-232 control module that allows most SmartAVI switching matrixes to be controlled remotely via HTTP or TELNET. Manage the switching functions of your matrix with ease from anywhere in the world. With the SMTCP-2 web interface via HTTP, configuring your matrix switch is simple. Users can save up to 10 preset input/output configurations for easy access. TELNET access provides transparent command control of your matrix, perfect for use with automated third-party control software.

COMMAND MODE

Sending Commands WITHOUT CHECKSUM

1) To set a video crosspoint:

`\\FxxMyyIzz<CR>`

e.g. to set video input 3 to output 12 on a router with frame address "0"
send the command: `\\F00M12I03<CR>`

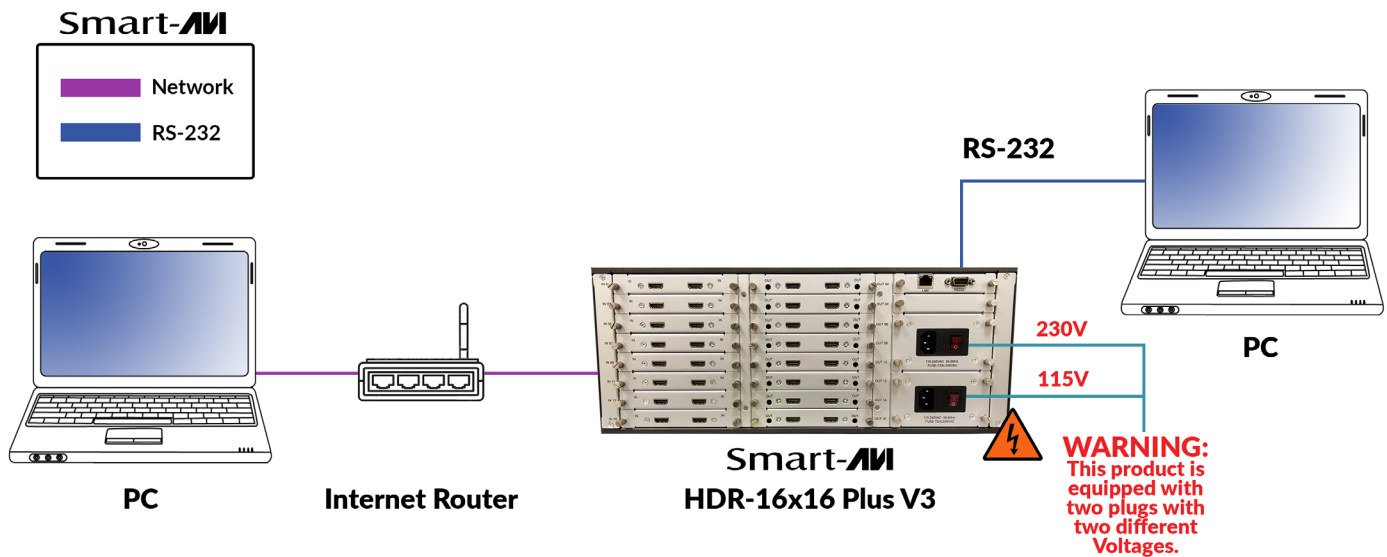
5) To query crosspoints from PC:

`\\FxxU<CR>`

- If all outputs are connected to input 1 then a 4x4 Matrix will respond with
`<0x80><0x80><0x80><0x80><CR>`
- The router will send back one byte for each output and the string ends with a `<CR>`. The first byte sent is
Output #1. In the example above, since there are 5 bytes total, we know that there are 4 outputs.
- To calculate the input number, the router sends the input number with the 7th bit set.
0x80 = "1000 0000" input 0
0x81 = "1000 0001" input 1
...
0x8F = "1000 1111" input 15

Using TCP/IP Control

To connect to the HDR-16x16 Plus V3 using HTTP or Telnet you need an Ethernet / RS-232 server or adapter.



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 extent 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 extent 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 consequential 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 the law.

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