MM3 Series
MM3-0808/MM3-1616
Multi Format Matrix Switcher

User Manual

Introduction

MM3 is the new 4K series modular matrix from VitBest. It's available in 8x8, 16x16, 36x36 and 72x72 matrix card based frame and offer a full multimedia input and output cards such as the HDMI/ HDBT/ VGA/ SDI/ Fiber and mix video format versions. The MM3 matrix also offers audio breakaway function to able to switch audio to any output without following the video. It providing crystal clear clarity at its best but also to manage and control the external devices with the unique control card.

The entire input and output cards support hot plug, allowing full service ability while the unit power on. The system could be control with the front 7" LCD touch screen, RS232 or LAN. There is web server build in with the unit to provide easy management for the EDID, HDCP and port status monitor. The MM3 matrix is a unique and one of the advance card cage matrix on the market today.

Package Contents

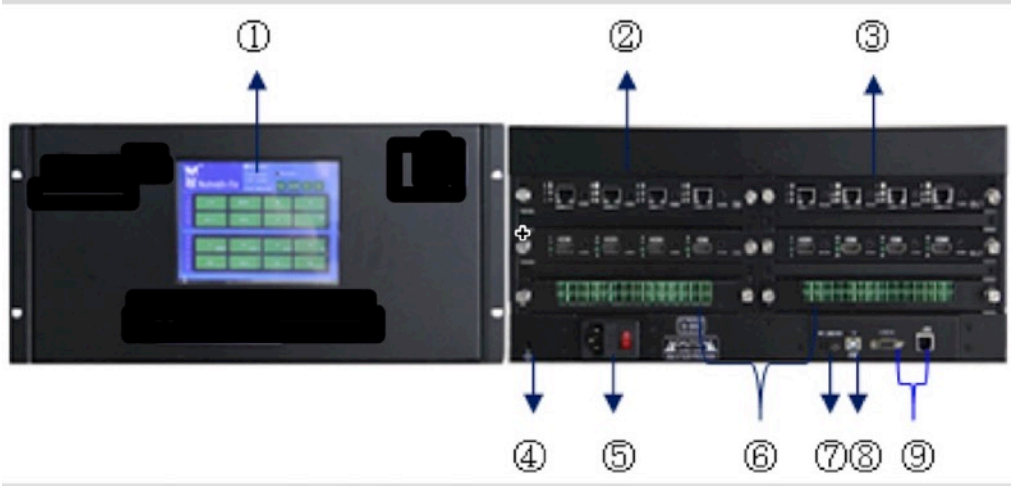
- 1 X Matrix
- 1 X Power Cable
- 1 X RS232 Cable

Features

- 6.5G backplane bandwidth, support HDMI 2.0, DP1.2;
- Available in 8x8, 16x16, 36x36 and 72x72;
- Support Audio breakaway switching;
- Support RS232, LAN control;
- Support audio embedded and de-embedded for HDMI and HDBT cards;
- Support EDID management;
- Support RS232, LAN, IR and front LCD touch screen control;
- Support Web Server for easy management, control and configuration;
- Special control card to control and manage external device;
- Bootloader for ease FW upgrade;

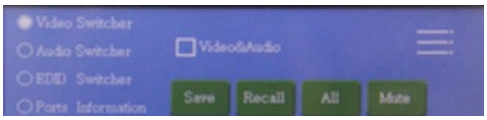
- Front 7” LCD touch screen.

Front Panel Description



NO.	Name	Description
1	Display	7” LCD touch screen, for ease control and configuration
2	Signal input	For install input cards
3	Signal output	For install output cards
4	Ground connection	Ground connection with M4 screw
5	Power connection	IEC AC 250V 10A
6	Control	For install control card
7	IR learner	IR receiver for learning
8	Type B USB	Space Reservation, not enable
9	Control connection	RS-232、TCP/IP Connect port
10	System size	482.6mm(L)×396.0mm(W)×133.5mm(H)
11	System weight	8 KG（IO cards not inculded）

Capacitive Touch Panel



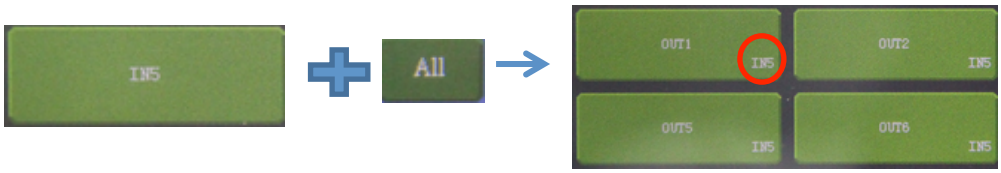
Button	Function
Video Switcher	Select the Video Switcher function
Audio Switcher	Select the Audio Switcher function
EDID Switcher	Select the EDID Switcher function
Ports Information	View Ports Information
Video&Audio	Select audio follow video when switching
All	One input switch to all output
Save	Save current channels status
Recall	Recall the stored status
Mute	Mute output channel
	System seating menu

	Select input channel
	Select output channel

Signal Switching

Switch one input to all output channels

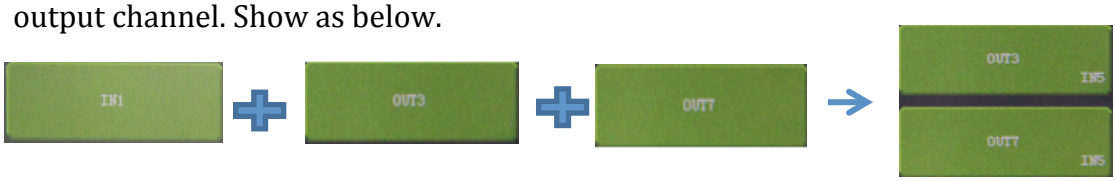
Select 'Video Switcher' on touch panel, select one input channel and press all. Then the bottom right corner of all output channels will show the input channel. Picture below shows how to switch one input to all output channels.



Switch one input to any output channel

Press one input channel, then press one output channel the signal input channel will switch to the output channel. Picture below shows how to switch one input to any output.

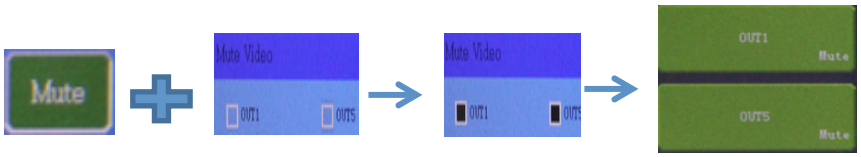
Press one input and press multi output channels the signal will switch to the output channel. Show as below.



In all case above when switching succeed the output channel's bottom right will show the input channel label.

Mute output channel

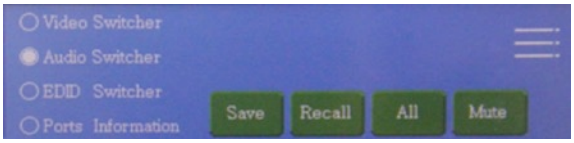
MM3 matrix switcher allow mute all output channels and individual output channel. Select the Mute button and select all output channel, the bottom right of all channel will show Mute.



And also can select individual output channel and mute it. The bottom right also shows Mute.

Audio Switcher

MM3 matrix supports audio video breakaway switching. For HDMI and HDBaseT I/O cards, each card has 2 audio channels embedded audio and external audio. For the audio switcher 'IN1A' is input channel one embedded audio and 'IN1B' is input channel one external DC 3.5 audio.



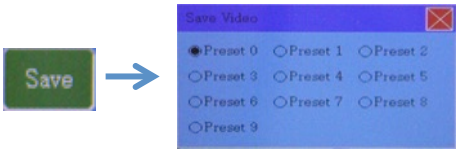
Notice:

MM3-0808 supports 16 channels audio switching.

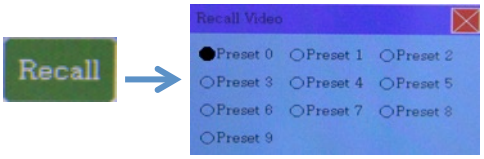
MM3-1616 supports 32 channels audio switching.

Save and Recall

Press ‘Save’ and select the number of the store unit to save current I/O configuration and MM3 matrix supports save 10 I/O configuration. Showed as picture below. (Video, audio store unit is separate, select ‘Video Switcher ’ and press ‘Save’ to save video configuration. Same step to save audio.)

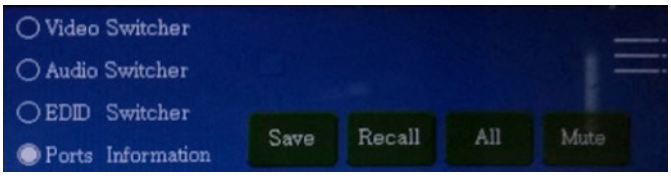


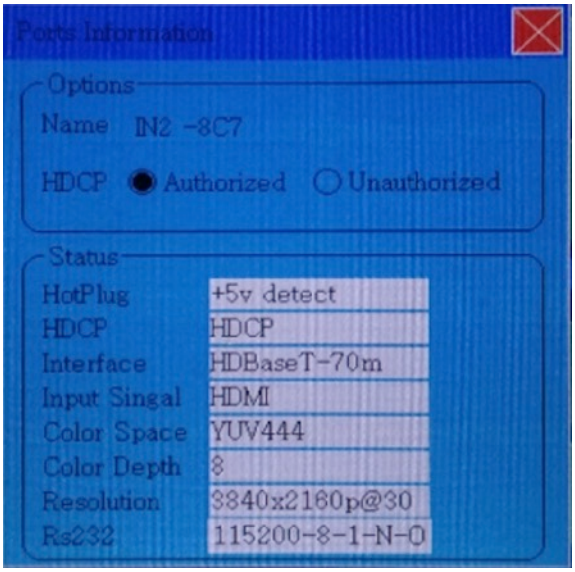
Press ‘Recall’ and select the number or the store unit to recall the present. When click ‘Video&Audio’ and recall video configuration, the internal audio will fallow video. The external audio will no change.



Port Information

View port information is a main advantage of MM3 matrix switcher. It will show all information of the port for user easily troubleshoots.





Label:

Name: input output port name, every channel name can rename on web sever.

HDCP: Authorized means HDCP Authorized, switcher requires HDCP comply signal, the output also will comply HDCP. Unauthorized means HDCP unauthorized, HDCP signal will not send out signal, like Blue ray play. For Mac the signal can comply and not comply HDCP, in the mode the signal will not comply HDCP.

Hot plug: hot plug detect, when cable connected it will show '+5V detect'.

HDCP: detect current port signal HDCP comply or not.

Input signal: input signal type, for example like HDMI, DVI.

Color space: Color space of the signal, like RGB, YUV.

Color depth: color depth, 8 bits, 12 bits, or 16 bits.

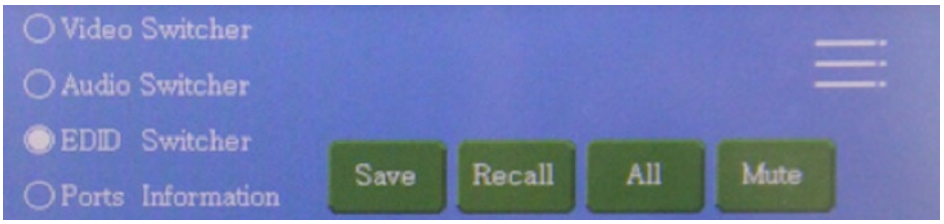
Resolution: resolution and FPS of the signal.

Rs232: HDBaseT card RS232 baud rate, data bits, stop bits, parity bits and RX. 11520-8-1-N-O, baud 11520, 8 bits data, 1 stop bit, no parity bit and RX on.

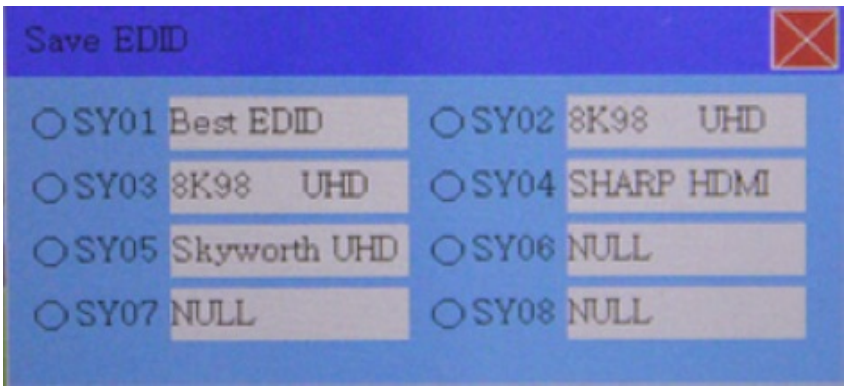
EDID Management

Every output channel will automatic update display EDID to the input port. If user want to use another EDID form the screen, the EDID can be switch manually from input port to output port. Click 'EDID Switcher' and select the output port (the EDID want to switch). Then click the input ports, the EDID will update successful.

If EDID from output need to switch to all input, click the output channel and click all.


Video Switcher
Audio Switcher
EDID Switcher
Ports Information
Save
Recall
All
Mute

MM3 matrix switcher can save 8 EDID data, and also can recall the saved EDID. In EDID switcher, click output channel then click save and select the store unit.

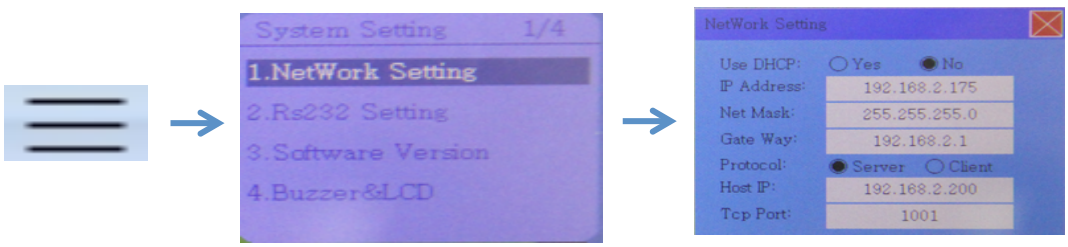


Recall EDID, in EDID switcher click input channel then click recall, select the store unit, the EDID be recalled.

Best EDID means system take all EDID of current output channel, and take the common resolution make a EDID called best EDID.

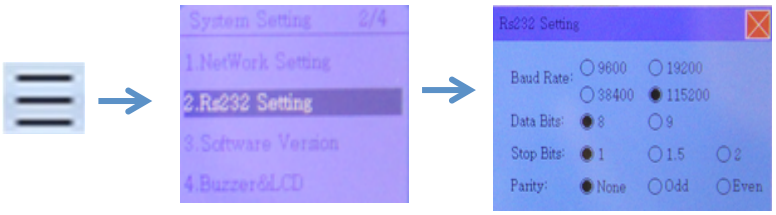
Internet setting

Open system menu, click 'NetWork Setting', in NetWork Setting can view and change IP address, net mask, gate way. Show as picture below.



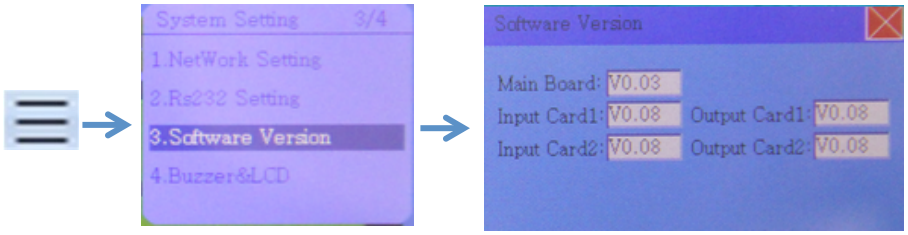
RS232 Setting

In the system menu can select RS232 Setting and change baud rate, data bits stop bits, parity bits and Rx on/off.



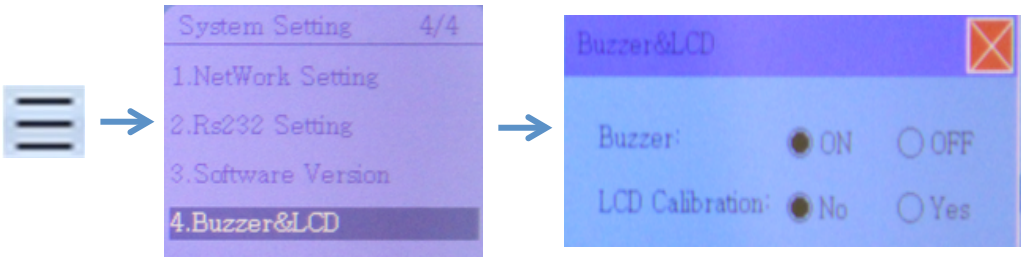
Software Version

In system menu select 'Software Version' can view main board, input card, and output card system version.



Buzzer and LCD Setting

In system menu select 'Buzzer&LCD', buzzer can be on or off and LCD calibration can be reset.



RS232 Command Table

MutliVideo Plus matrix switcher can control by RS232 and the factory setting is baud rate 115200bps, 8 data bits, 1 stop bit and no parity bit

Command	String	Example
Video Route Command	>Cxtoz<cr> X=1-16,Z=1-16 For mare than one port number use a comma to separate.	send：>C1to2,3,4,5<cr> response：<C1to2,3,4,5<cr> Route Input 1 to output 2, 3, 4 and 5.
Audio Route Command	>TXtoZ X=1A-16A or 1B-16B Z=1A-16A or 1B-16B For mare than one port number use a comma to separate.	send：>T1Ato2B,3A,4B,5A<cr> response：< T1Ato2B,3A,4B,5A<cr> Route Input 1A to output 2B, 3A, 4B and 5A.
EDID Copy Command	>Extoz<cr> X=1-16,Z=1-16 For mare than one port number use a comma to separate.	send：>E1to2,3,4,5<cr> response：<E1to2 ...ok<cr> <E1to3 ...ok<cr> <E1to4 ...ok<cr> <E1to5 ...ok<cr> Copy 1 output EDID to input 2,3,4,5.
Video Preset Save Command	>SX<CR> X=0-9	send：>S3<CR> response：<S3<CR> Save current video configuration into preset 3.
Video Preset Recall Command	>PX<CR> X=0-9	send：>P3<CR> response：<P3<CR> Recall preset 3 video configuration.
Audio Preset Save Command	>ASX<CR> X=0-9	send：>AS3<CR> response：<AS3<CR> Save current audio configuration into preset 3.
Audio Preset Recall Command	>APX<CR> X=0-9	send：>AP3<CR> response：<AP3<CR> Recall preset 3 audio configuration
HDBaseT Serial Transmit Input Command	>RSINYTXnns<CR> Y=1-16, for more than one port use a space to separate. nn=00-99，byte count for string s=string in ASII, the digit must be same as ‘nn’	send：>RSIN1 2 3 16TX05Hello<CR> response：<RSIN1 2 3 16TX05Hello<CR> System sends ‘Hello’ in ASII to input port 1, 2, 3, 16 and send to HDBaseT transmitter.

HDBaseT Serial Transmit Output Command	>RSOUTYTXnns<CR> Y=1-16, for more than one port use a space to separate. nn=00-99，byte count for string s=string in ASII, the digit must be same as 'nn'	send：>RSOUT1 2 3 16TX05Hello<CR> response：<RSOUT1 2 3 16TX05Hello<CR> System sends 'Hello' in ASII to input port 1, 2, 3, 16 and send to HDBaseT receiver.
HDBaseT Baud Rate Setup Input Command	>BRabINx<CR> a=9600/19200/38400 ，baud rate b=8N1/8E1/8O1, bits, parity, stop x=1-16, for more than one port use a space to separate.	send：>BR96008N1IN1 2<CR> response：<BR96008N1IN1 2<CR> Set HDBaseT input port 1,2 baud rate to 9600, 8 bits no parity and 1 stop.
HDBaseT Baud Rate Setup Input Command	>BRabOUTx<CR> a=9600/19200/38400 ，baud rate b=8N1/8E1/8O1, bits, parity, stop x=1-16, for more than one port use a space to separate.	send：>BR96008N1OUT1 2<CR> response：<BR96008N1OUT1 2<CR> Set HDBaseT input port 1,2 baud rate to 9600, 8 bits no parity and 1 stop.

Query Input Card Baud Rate, Data Bits, Parity and Stop Bit Command.	#BRINx<CR>
	x=1-16, for more than one port use a space to separate.
		send：#BRIN1 2<CR>
		response：&BRIN1 2<CR>
		Query input 1, 2 port RS232 information.

Query Output Card Baud Rate, Data Bits, Parity and Stop Bit Command.	#BROUTx<CR>
	x=1-16, for more than one port use a space to separate.
		send：#BROUT1 2<CR>
		response：&BROUT1 2<CR>
		Query output 1, 2 port RS232 information.

HDBaseT Input p Port Rx Off Command	>RXOFFINx<CR> x=1-16, for more than one port use a space to separate.	send：>RXOFFIN1 2 16<CR> response：<RXOFFIN1 2 16<CR> Close HDBBaseT input port 2, 16 Rx channel.
HDBaseT Output Port Rx Off Command	>RXOFFOUTx<CR> x=1-16, for more than one port use a space to separate.	send：>RXOFFOUT1 2 16<CR> response：<RXOFFOUT1 2 16<CR> Close HDBBaseT output port 2, 16 Rx channel.

Query HDBaseT Input Port Rx Channel Command	#RXINx<CR>
	x=1-16, for more than one port use a space to separate.
		send：#RXIN1 2<CR>
		response：
		Query HDBaseT input port1,2 Rx channel.

Query HDBaseT Output Port Rx Channel Command	#RXOUTx<CR>
	x=1-16, for more than one port use a space to separate.
		send：#RXOUT1 2<CR>
		response：
		Query HDBaseT out port1,2 Rx channel.

Input Port HDCP Authorized Command	>HDCPAINx<CR> x=1-16, for more than one port use a space to separate.	send：>HDCPAIN1<CR> response：<HDCPAIN1<CR> Set input port 1 HDCP authorized.
Input Port HDCP Unauthorized Command	>HDCPWINx<CR> x=1-16, for more than one port use a space to separate.	send：>HDCPWIN1<CR> response：<HDCPWIN1<CR> Set input port 1 HDCP unauthorized.
Output Port HDCP Authorized Command	>HDCPAOUTx<CR> x=1-16, for more than one port use a space to separate.	send：>HDCPAOUT1<CR> response：<HDCPAOUT1<CR> Set output port 1 HDCP authorized.
Output Port HDCP Unauthorized Command	>HDCPAOUTx<CR> x=1-16, for more than one port use a space to separate.	send：>HDCPAOUT1<CR> response：<HDCPAOUT1<CR> Set output port 1 HDCP unauthorized.
Set System IP Command	>IP:x<CR> x=IP address	send：>IP:192.168.2.175<CR> response：<IP:192.168.2.175<CR>
Query System IP Command	#IP<CR>	send：#IP<CR> response：<IP:192.168.2.175<CR>
Set System Mask Command	>Mask:x x=mask	send：>Mask:255.255.255.0<CR> response：<Mask:255.255.255.0<CR>
Query System Mask Command	#Mask<CR>	send：#Mask<CR> response：<Mask:255.255.255.0<CR>
Set System Gateway Command	>Gate:x x=gateway	send：>Gate:192.168.2.1<CR> response：<Gate:192.168.2.1<CR>
Query System Gateway Command	#Gate<CR>	send：#Gate<CR> response：<Gate:192.168.2.1<CR>
Set System TCP Port Command	>Tcp Port:x<CR> x=TCP port	send：>Tcp Port:1001<CR> response：<Tcp Port:1001<CR>
Query System TCP Port Command	#Tcp Port:<CR>	send：#Tcp Port:<CR> response：<Tcp Port:1001<CR>
Set System TCP Port Mode Command	>Tcp Protocol:x<CR> x=Serve or Client	send：>Tcp Protocol:Server<CR> response：<Tcp Protocol:Server<CR>

Query System TCP Port Mode Command	#Tcp Protocol<CR>	send：#Tcp Protocol<CR> response：<Tcp Protocol:Server<CR>
Set Client Target IP Address	>HsIP: x<CR> x=IP address	send：>HsIP:192.168.2.200<CR> response：<HsIP:192.168.2.200<CR>
Query Client Target IP Address	#HsIP<CR>	send：#HsIP<CR> response：<HsIP:192.168.2.200<CR>
Set System Network Configuration	>Net:x/y/z<CR> x=IP address y=mask z=gateway	send： >Net:192.168.2.175/255.255.255.0/192.168.2.1<CR> response： <Net:192.168.2.175/255.255.255.0/192.168.2.1<CR>
Query Firmware Main Processor	#FM0<CR>	send：#FM0<CR> response：<FM-0.0.1<CR>

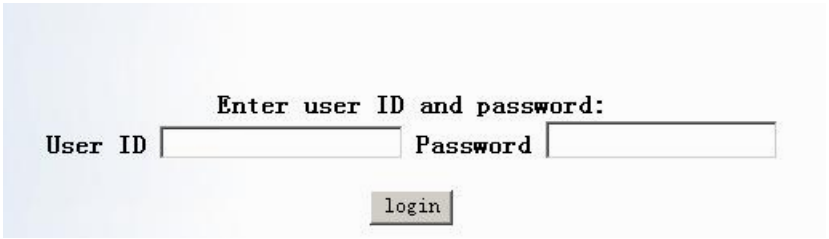
Query Firmware Input Card	#FMINx<CR>
	x=1-16
		send：#FMIN1<CR>
		response：<FMIN1-V0.0.1<CR>

Query Firmware Output Card	#FMOUTx<CR>
	x=1-16
		send：#FMOUT1<CR>
		response：<FMOUT1-V0.0.1<CR>

	>- Command, #- Query,< Response, <cr>=0x0D Hex/ 13 Decimal	

Web Management

MM3 matrix switcher support web sever for ease management. Set PC IP to static IP to march matrix IP. Then open web browser and type IP address.



Notice:

The factory default:

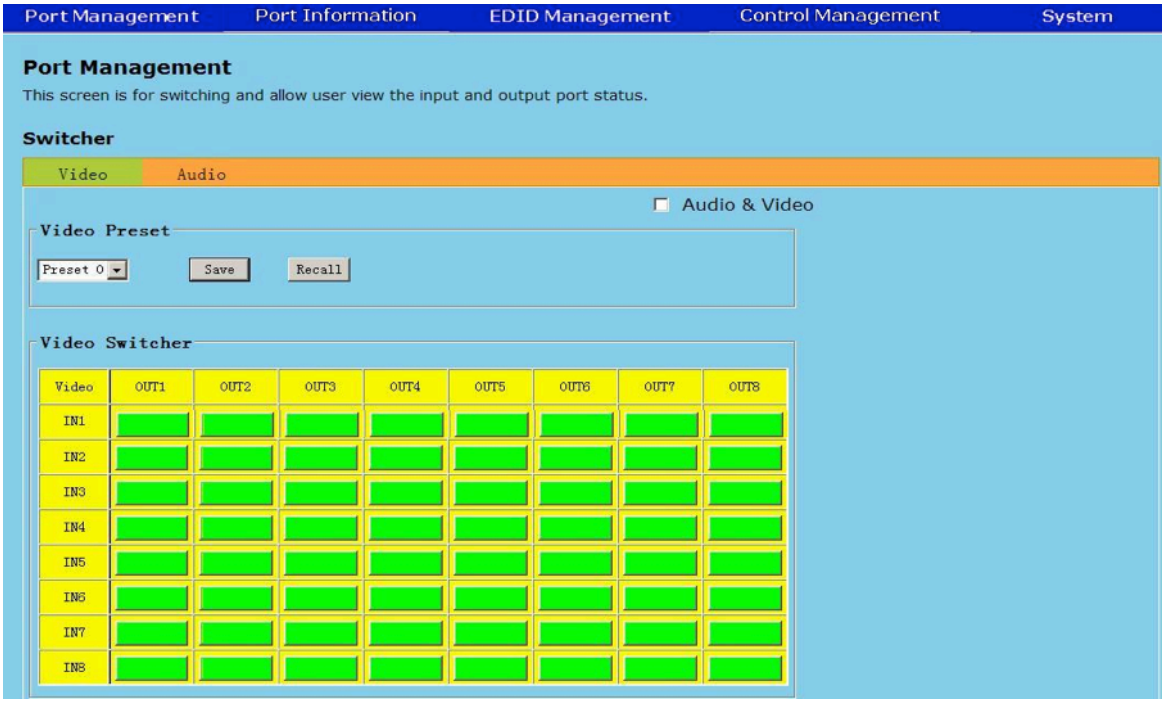
IP: 192.168.2.245

User: user

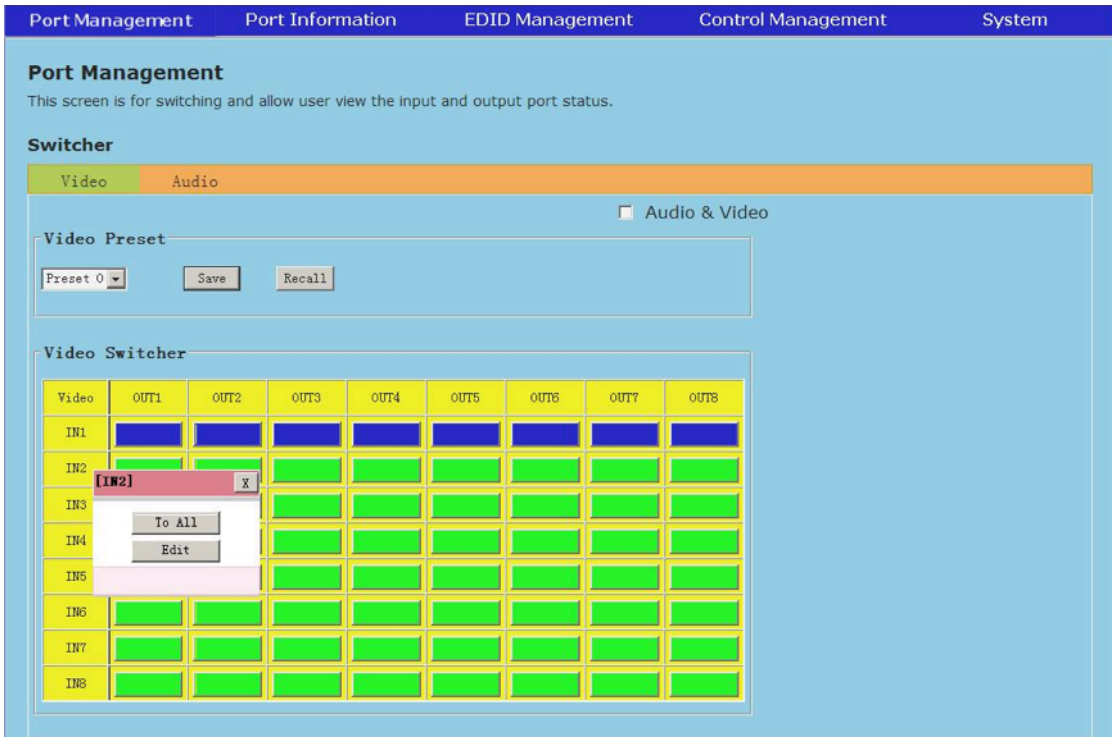
Password: 123456

Port Management

Click Port Management, in this page user can switch video, audio, edit some sample setting, view port information, save present and recall present.



1. Video switcher: output ports are in row input ports are in column, click the green bar the input labeled in column switch to output labeled in row. The green bar changed to blue, means switching is succeed. Click the input label, there is a menu, and click to all, that input will switch to all output.



2. Click ‘Audio&Video’, the internal audio of the input will also switch to output channel.

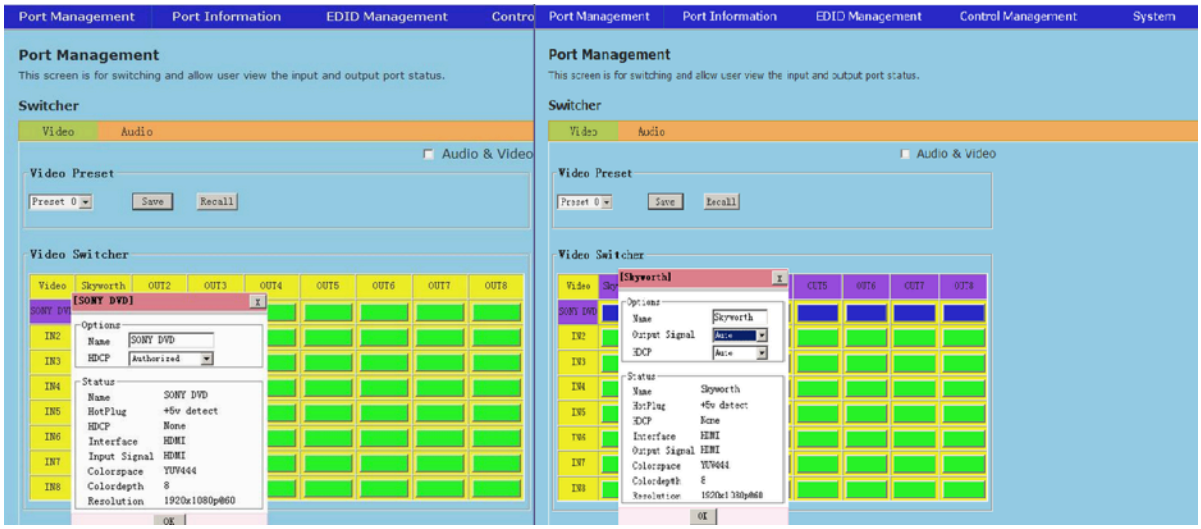
3. Click input put or output port and click ‘Edit’, can edit and view some information as picture below.

① Rename input output ports.

② Edit input output ports’ HDCP authorized or unauthorized.

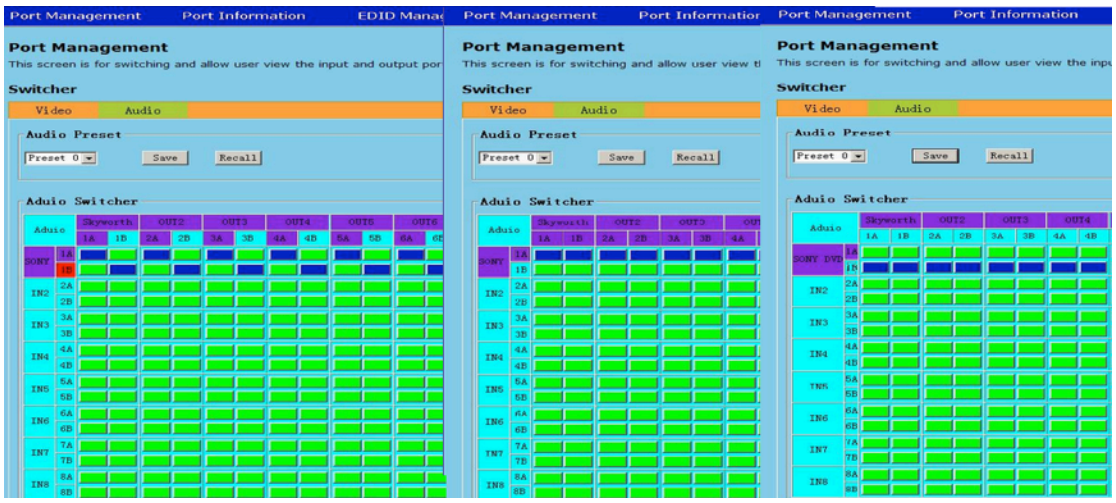
③ Output signal select, AUTO, DVI or HDMI.

④ View +5V cable detection, HDCP, signal type, color space, color depth and resolution.



4. Present save and recall, click ‘present’, select the present number and click save, the present should be saved. Click ‘present’ select the present number, which has saved, the present will be recalled.

5. Audio switching has the same step as audio switching. A means internal audio, B means external audio. The save and recall is same as video.



Port Information

View input and output information for easily troubleshoot.

Port Information

This screen is for set HDCP,video format and allow user view the input and output port status.

Input Port

PortName	Interface	HotPlug	HDCP State	HDCP Unauthorized	Resolution	Color Space	HDBT Link	HDBT Mode	Cat Cable Length	HDBT Channel State
IN1	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN2	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN3	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN4	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN5	HDMI	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN6	HDMI	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN7	HDMI	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN8	HDMI	+5v detect	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN9	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN10	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN11	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN12	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN13	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN14	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN15	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----
IN16	None	None	None	☐	NULL	None	----	☐ Long Reach	----	A:---- B:---- C:---- D:----

Output Port

PortName	Interface	HotPlug	HDCP State	HDCP Option	Resolution	Color Space	HDBT Link	HDBT Mode	Cat Cable Length	HDBT Channel State
OUT1	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT2	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT3	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT4	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT5	HDMI	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT6	HDMI	+5v detect	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT7	HDMI	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT8	HDMI	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT9	HDBT	None	None	☐ Always	NULL	None	None	☐ Long Reach	<20m	A:Failed B:Failed C:Failed D:Failed
OUT10	HDBT	None	None	☐ Always	NULL	None	None	☐ Long Reach	<20m	A:Failed B:Failed C:Failed D:Failed
OUT11	HDBT	None	None	☐ Always	NULL	None	None	☐ Long Reach	<20m	A:Failed B:Failed C:Failed D:Failed
OUT12	HDBT	None	None	☐ Always	NULL	None	None	☐ Long Reach	<20m	A:Failed B:Failed C:Failed D:Failed
OUT13	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT14	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT15	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----
OUT16	None	None	None	☐ Always	NULL	None	----	☐ Long Reach	----	A: ---- B: ---- C: ---- D: ----

Port Name: show port name

Interface: connect type

Hot Plug: detect cable connection

HDCP State: detect signal HDCP state

HDCP Unauthorized: click it means this port will not support HDCP signal

Resolution: the resolution and FPS of the video

Color Space: Current signal color space

HDBT Link: Check HDBT connection

HDBT Mode: Long Reach, MVPI-4-HDBT2 at 1080P and 8 bits color depth support 130m long distant transmission. But it wont support 4K or 1080P in 12 bits color depth.

Cat Cable Length: detect current cable length 10% error and if cable less than 20m system cannot detect.

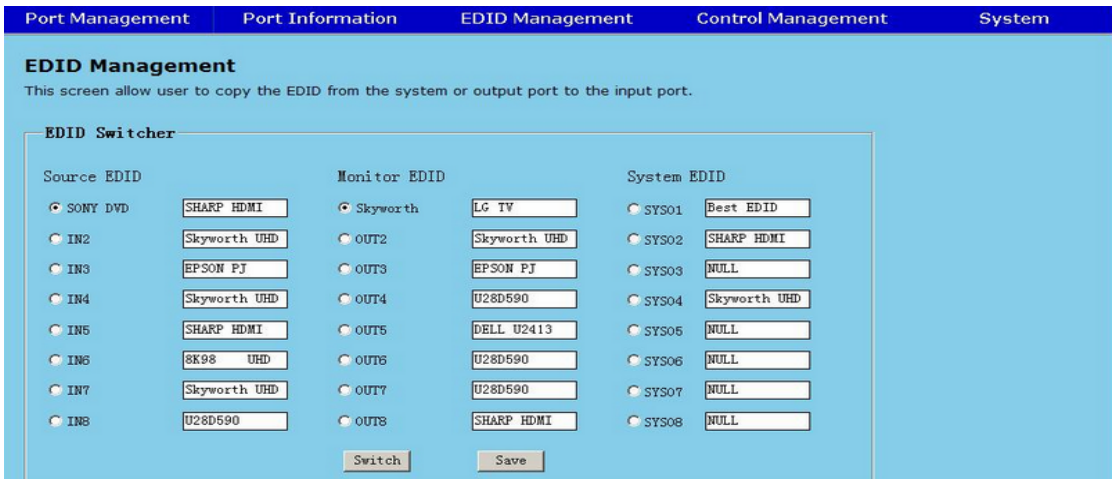
HDBT Channel State: current cable 4 pair cable connection, PASS or FAIL.

For the output port 'HDCP Unauthorized' change to 'HDCP Option.

Click it the matrix will add HDCP in the output signal.

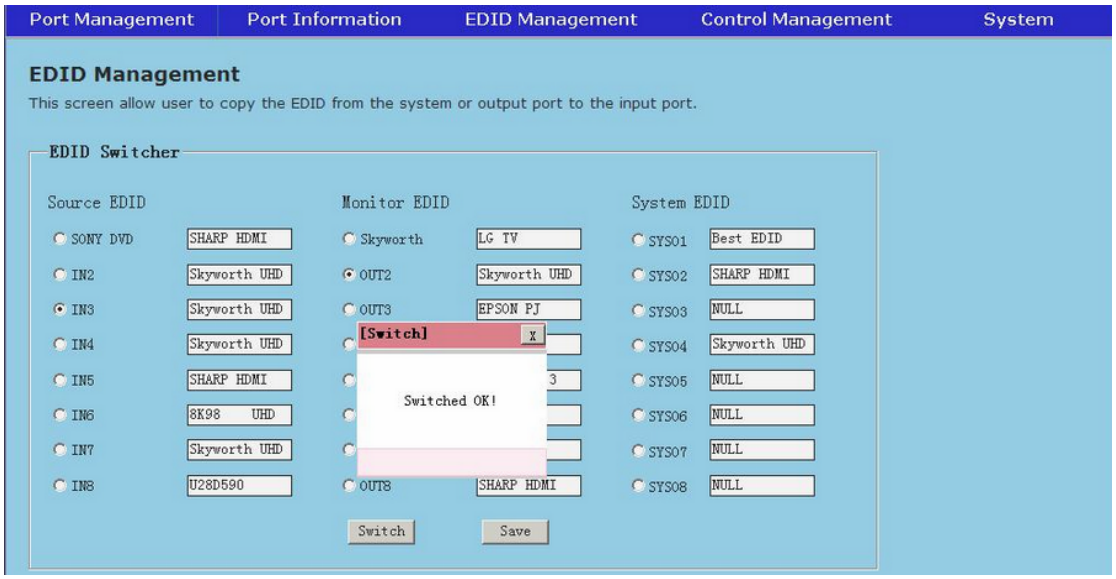
EDID Management

1. Source EDID means EDID saved in output port.
2. Monitor EDID means EDID read by input port.
3. System EDID means matrix saved the best EDID.

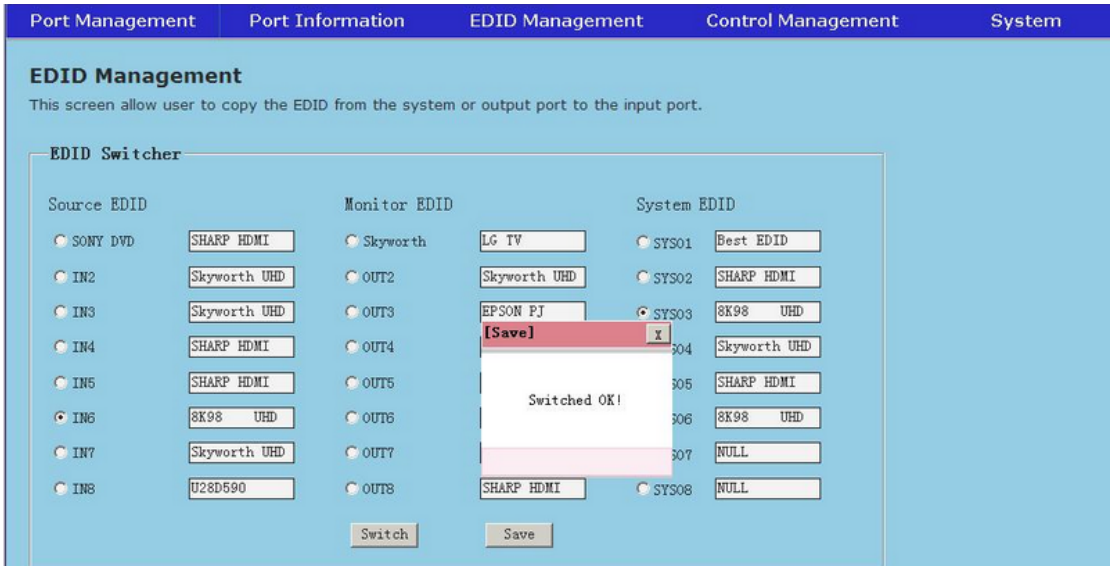


EDID Switching and save

1. Select input channel, output channel or system EDID, then click Switch. When 'Switched OK' shows up the EDID switching is succeed.

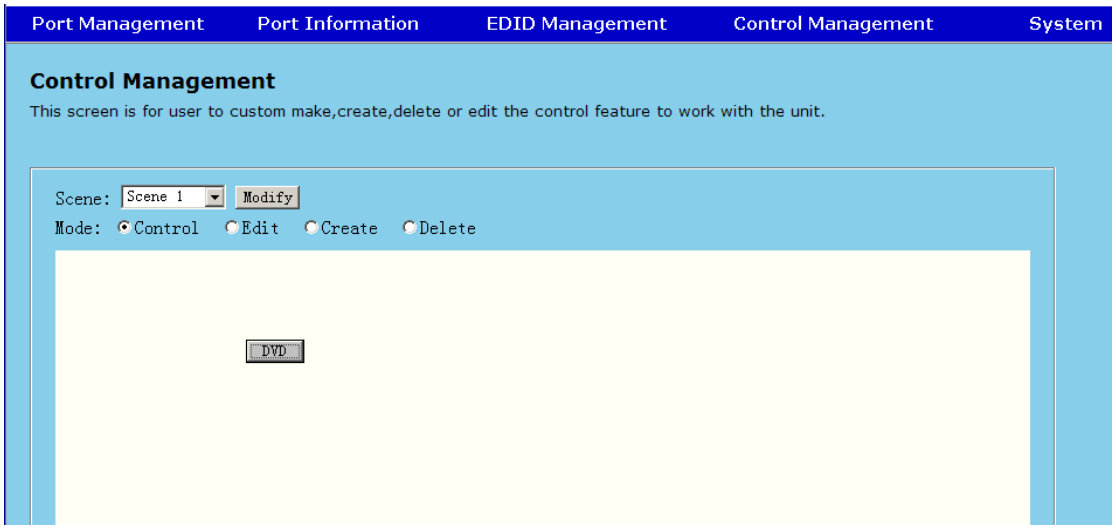


2. EDID save, select input channel and system EDID, then click save. The EDID saved in system EDID.



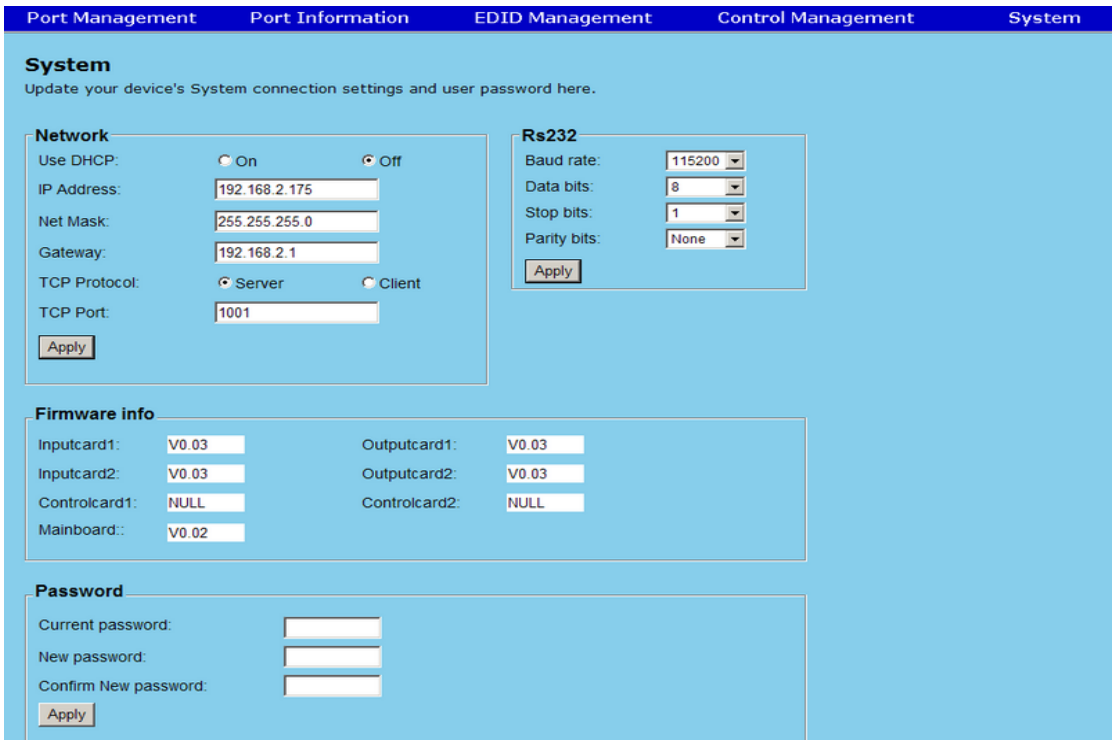
Control Management

HDBT cards support IR and RS232 control. Add a button and edit the button, use it to control RS232 or IR. The button also can be deleted.



System Menu

Network, RS232, Firmware information and Password set or view.



I/O Card

HDBT

MVPI-4-HDBT1/MVPI-4-HDBT2

MVPO-4-HDBT1/MVP0-4-HDBT2

LED	Description	Status
L	Link LDE	Always off — No HDBT connected Always on — HDBT connected
V	Video LED	Always off — No video signal input or output Always on — Video signal input or output
A	Audio (external) LED	Always off — No audio signal input or output Always on — audio signal input or output

MVPI-4-HDMI

MVPO-4-HDMI

LED	Description	Status
V	Video LED	Always off — No video signal input or output Always on — Video signal input or output

A	Audio (external) LED	Always off — No audio signal input or output Always on — audio signal input or output