



TEK-MUHD44TP 79055 4K 4x4 HDMI Matrix with HDBaseT Lite Outputs



User's Manual

May 14, 2018

This manual only includes operational instructions and specifications, and is not intended to be used for service. Specifications are subject to change without notice. Please ask your local dealer for detailed information.

© Copyright 2018 - TEKVOX, Inc. No part of the contents of this book may be transmitted or reproduced in any form or by any means without the written permission of TEKVOX, Inc. All rights reserved.

Please check website or contact local supplier for updates.
www.tekvox.com

Operation Notice

In order to ensure the proper use of the product and the user's safety, please comply with the following items during installation and maintenance:

①

The system must be properly connected to earth ground. Do not use ungrounded or two bladed plugs and ensure the alternating power supply ranged from 100v to 240v and from 50Hz to 60Hz.

②

Do not operate the device in locations above 100° F and below 30°F.

③

To avoid any damage by over heat, please provide adequate ventilation to radiate the heat when operating the device.

④

The device should be turned off when in wet or humid areas.

⑤

The AC power supply line should be disconnected from main power during the following operations:

- Remove or reinstall any component on the device.
- Disconnect or re-connect any connector on the device.

⑥

Please do not attempt to remove the cover on the device. There are no serviceable components and high-voltage is present inside with risk of the electric shock.

⑦

Do not splash any chemical product or liquid on or near the equipment.

Table of Contents

1. DESCRIPTION	1
2. FEATURES	1
3. PACKAGE CONTENTS	1
4. FRONT AND REAR PANEL DESCRIPTION	2
4.1 FRONT PANEL OPERATION	2
4.2 REAR PANEL OPERATION	3
4.4 HDBASET TWISTED PAIR CABLE CONNECTION	4
5. SYSTEM DIAGRAM	5
6. SYSTEM OPERATION	6
6.1 FRONT PANEL BUTTON CONTROL.....	6
FRONT PANEL BUTTON CONTROL	6
<i>Switching I/O connection</i>	6
<i>EDID Management</i>	6
<i>Inquiry</i>	8
<i>Clear operation</i>	8
6.2 IR CONTROL	9
6.2.1 IR Remote Operation	9
<i>Usage of IR Remote</i>	9
6.2.2 IR Operations	10
<i>Force Carrier</i>	10
<i>Control Far-end Device locally</i>	10
<i>Control Local Device Remotely</i>	11
RS232 CONTROL	12
<i>Connection with RS232 Communication Port</i>	12
<i>Control through 9-pin RS232 port</i>	12
<i>Control through 3-pin RS232 port</i>	12
<i>Installation/uninstallation of RS232 Control Software</i>	13
6.3 RS-232 CONTROL	14
6.3.1 <i>Commands</i>	14
6.4 TCP/IP OPERATION - OPTIONAL	18
6.5 IP CONFIGURATION	18
6.6 CONNECTION AND CONTROL	18
<i>GUI for TCP/IP control</i>	19
<i>GUI Update</i>	20
7. FIRMWARE UPDATING	21
8. TECHNICAL SPECIFICATION	22
6 PANEL DRAWING	23
9. TROUBLESHOOTING & MAINTENANCE	23
10. WARRANTY	23

TEK-MUHD44TP 4x4 HDBaseT Matrix

1. Description

The TEK-MUHD44TP 79055 is a unique 4K 4x4 HDMI matrix switcher with HDBaseT outputs, RS232 and IR control of end-points, and EDID & HDCP management. Included in the unit are IR and RS-232 inserters for the HDBaseT connections, and audio de-embedders with both analog and digital outputs. Any input can be routed to any output with support for high resolution 1080P and HD-3D. Breakaway audio is not supported. The HDBaseT output supports PoC and works with TPHD412R to transmit HDMI, IR and RS-232 over a single Cat6A cable up to 200 feet.

2. Features

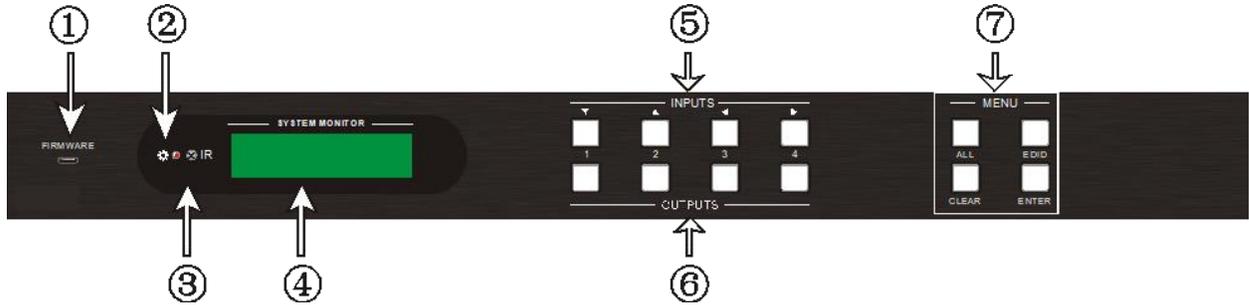
- HDMI resolution up to 4Kx2K
- HDCP Compliant and DVI compatible, supporting DVI 1.0
- Powerful EDID and HDCP management
- HDBaseT Lite outputs, to transmit HDMI, IR & RS-232 up to 200' @ 1080 or 130' at 4K over a single Cat 6A cable
- Output PoC provides power for all the receivers connected to the HDBaseT outputs
- Front panel Menu operation for configuration, control and status
- RS-232 control with simple ASCII commands
- IR control
- TCP/IP control
- IR OUT signal switching follows with video signal, or can break away from video switching
- Supports remote control from receiver by IR & RS-232
- Supports centralized IR control to control all the remote display devices
- Supports PCM, Dolby, and DTS 5.1 surround
- Source detection to provide power control for DVDs and Blur-rays.
- Standby mode operation to reduce energy and extend life.

3. Package Contents

- 1 MUHD44TP
- 2 Mounting ears
- 1 Power adapter (DC 24V 2.71A)
- 1 IR remote
- 1 Power cord
- 1 RS-232 cable
- 8 Captive screw connectors
- 4 table mount cushions

4. Front and Rear Panel Description

4.1 Front Panel Operation



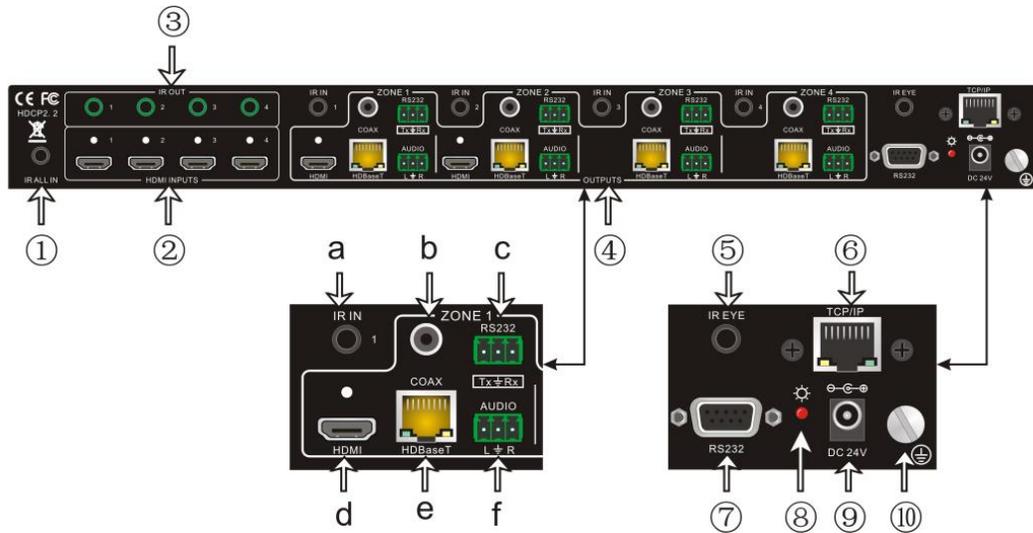
No.	Name	Description
①	Firmware	Micro USB port for update firmware.
②	Power Indicator	Keep light when power on.
③	IR Receiver	Receive control signal from IR remote.
④	LCD Indicator	Real-time shows system status.
⑤	INPUTS/Menu buttons	Normal mode: Input buttons, ranging from "1" to "4". Inquire mode: Press "AV" more than 3 seconds to enter this mode. ◀▶ to change different menus, ▲▼ to change different channels.
⑥	Function buttons	▶ AV button: To transfer AV and IR signal synchronously by the switcher. Example: To transfer both AV and IR signals from input channel No.1 to output channel No.3. Operation: Press buttons in this order "1", "AV", "3".
		▶ ALL outputs button: To transfer one input to all outputs. Example: To transfer both AV and IR signals from input channel No.1 to all output channels. Operation: Press buttons in this order "1", "ALL"
		▶ EDID management button: manually capture and copy the EDID data from an HDBaseT output device to input port. Do not use the Local HDMI outputs. Example: To capture and copy the EDID data from output channel No.4 to input channel No.2. Operation: Press buttons in this order "EDID", "2", "4"
⑦	OUTPUTS	Output buttons, ranging from "1" to "4".

To control the matrix from the front panel controls do the following:

- "Input Channel" + "AV" + "Output Channel"
- "Input Channel": Fill with the number of input channel to be controlled.
- "Output Channel": Fill with the number of output channels to be controlled.

TEK-MUHD44TP 4x4 HDBaseT Matrix

4.2 Rear Panel Operation



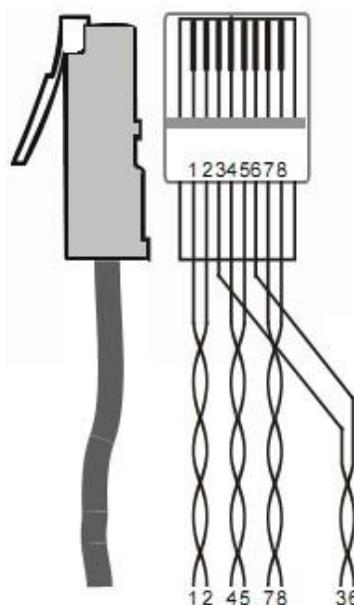
No.	Name	Description
①	IR ALL IN	Input port for IR control signal, connect with IR receiver, deliver IR signal to all the HDBaseT ports to control the remote devices.
②	HDMI INPUTS	HDMI input ports, 4 in total, type A female HDMI connector, connect with HDMI input source devices.
③	IR OUT	Connect with IR transmitter, to emit the IR signal sent from the HDBaseT ports of the far-end Receiver. These IR OUT sockets make up an IR matrix with the IR IN sockets on the HDBaseT receivers, and all IR signals can be switched synchronously with the AV signal, or separately switched.
④	OUTPUTS	<p>a. IR IN: Connect with IR receiver, fixed IR input for the output, cannot be switched separately. It makes up an IR bi-directional transmission with the IR OUT on the corresponding HDBaseT receiver.</p> <p>b. COAX: HDMI de-embedded digital audio output.</p> <p>c. RS232: Serial port to communicate with the RS232 port on corresponding HDBaseT receiver. When controlled by HDBaseT receiver, the communication protocol must be the same with MUHD44TPR2-N.</p> <p>d. HDMI: HDMI output port, connect with HDMI displays, deliver same input signals with HDBaseT ports, split HDMI output for local monitoring.</p> <p>e. HDBaseT: Works with HDBaseT receivers, such as TPHD402PR. It can extend AV, IR</p>

		and RS232 signal to 70m distance. Meanwhile, it can provide power for the receivers which support PoC. f. AUDIO: HDMI de-embedded stereo audio output
⑤	IR EYE	Connect with extended IR receiver, use the IR remote to control MUH44TPR2-N.
⑥	TCP/IP	TCP/IP port for unit control
⑦	RS232	Serial port for unit control, 9-pin female connector, connects with control device such as a PC.
⑧	Power Indicator	Illuminate red when powered on.
⑨	DC 24V	Connect with DC 24V power adaptor.
⑩	GROUND	Connect to grounding, make the unit ground well.

4.4 HDBaseT Twisted Pair Cable Connection

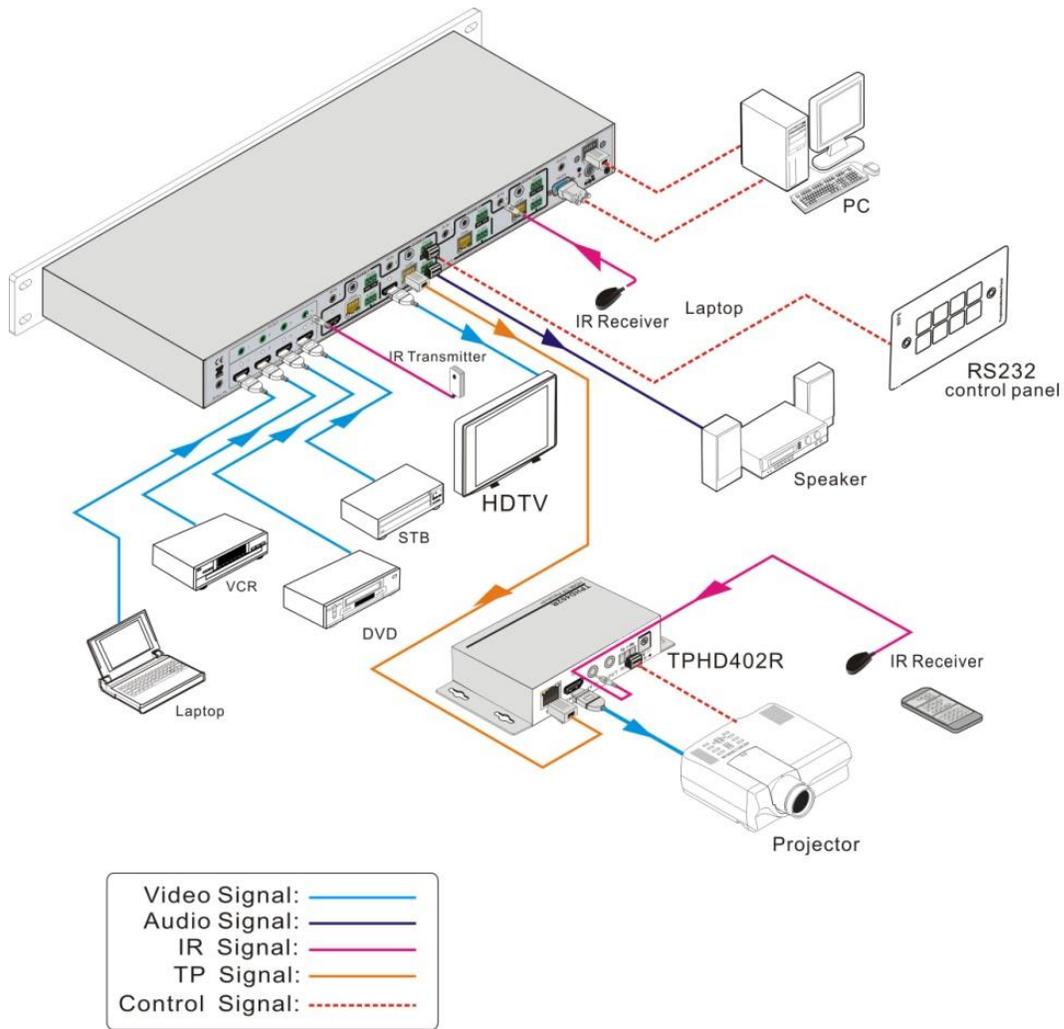
Always use a minimum of 30 feet Cat 5E or Cat 6 solid twisted pair cable.

TIA/EIA T568A		TIA/EIA T568B	
Pin	Cable color	Pin	Cable color
1	green white	1	orange white
2	green	2	orange
3	orange white	3	green white
4	blue	4	blue
5	blue white	5	blue white
6	orange	6	green
7	brown white	7	brown white
8	brown	8	brown
1st Ground	4--5	1st Ground	4--5
2nd Ground	3--6	2nd Ground	1--2
3rd Group	1--2	3rd Group	3--6
4th Group	7--8	4th Group	7--8



TEK-MUHD44TP 4x4 HDBaseT Matrix

5. System Diagram



6. System Operation

6.1 Front Panel Button Control

Front Panel Button Control

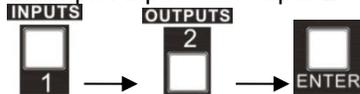
MUH44TPR2-N provides with convenient front panel button control. Here we make a brief introduction to the system operations.

Switching I/O connection

To convert one input to an output:

Operation: "input"+"output"+"ENTER"

Example: input 1 to output 2

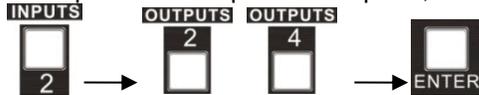


Note: In default status, 4 IR OUT sockets correspond with 4 HDMI INPUTS. When you convert an HDMI input to an output, the corresponding IR OUT will be switched synchronously.

To convert an input to several outputs:

Operation: "input" + "output" + "output" + ... + "ENTER"

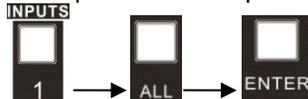
Example: Switch input 2 to output 2, 4



To convert an input to all outputs:

Operation: "input" + "ALL" + "ENTER"

Example: Convert input 1 to all outputs



Note: Indicators of the pressed buttons will blink green for three times if the conversion is done, then it will be off. If the conversion failed, they will be off immediately.

EDID Management

MUH44TPR2-N features EDID management to maintain compatibility between all devices. It can be controlled via EDID learning and EDID invoking.

EDID Learning (from output):

One input port learns the EDID data of one output port

Operation: Press "EDID", "INPUTS"+"OUTPUTS"+"ENTER".

Example: Input 2 learns EDID data from output 4



All input ports learn EDID data from one output port

Operation: Press "EDID", "ALL"+"OUTPUTS"+"ENTER"

Example: All input ports learn EDID data from output 4



Note: Indicators of the pressed buttons will blink green for three times if the conversion is done, then it will be off. If the conversion failed, they will be off immediately.

TEK-MUHD44TP 4x4 HDBaseT Matrix

EDID invoking:

There are five types of embedded EDID data. The chart below illustrates the detailed information of the embedded EDID data:

No.	EDID Data
1	1080P 2D 2CH
2	1080P 3D 2CH
3	1080P 2D Multichannel
4	1080P 3D Multichannel
5	3840x2160 2D (30Hz)

Press and hold “**EDID**” for 3 seconds to enter EDID invoking mode, in this mode, use output buttons 1/2 to switch among the 5 embedded EDID data. Then press “**ENTER**” to confirm invoking.

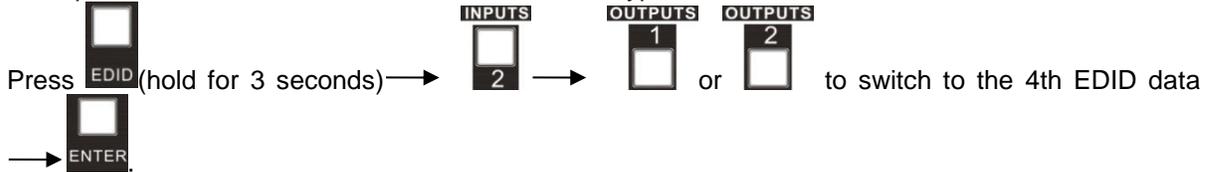
Format: Press and hold “EDID” for 3 seconds, “INPUTS”+“OUTPUTS 1/2”+“ENTER”.

Operations:

Invoke embedded EDID data for one input

Operation: Press “EDID” (hold for 3 seconds to enter in EDID setting status), “INPUTS”+“OUTPUTS”+“ENTER”.

Example: Set the EDID data of INPUT 2 to the fourth type of embedded EDID data:



Note: If the conversion is successful, indicators of the pressed buttons will blink green for three times at normal speed; if the conversion failed, they will blink for three times quickly.

Inquiry

Check status

Press and hold the button “ENTER” for 3 seconds, it will enter into system inquiry menu. Use Left and Right direction button to navigate checking the previous/next items.

Function Items	Example	Description
Check the connection status of inputs	In 01 02 03 04 Connct Y Y N N	Y means the corresponding port is connected with input device, N means not.
Check the connection status of outputs	Out 01 02 03 04 Connct Y Y N N	Y means the corresponding port is connected with output device, N means not.
Correspondence between inputs and outputs	Out 01 02 03 04 In 01 02 03 04	Shows the correspondence between the 4 inputs and 4 outputs.
Check if the input is with HDCP	In 01 02 03 04 HDCP Y Y N N	Y means the input signal is with HDCP, N means not.
Check if the output is with HDCP	Out 01 02 03 04 HDCP Y Y N N	Y means the output signal is with HDCP, N means not.
Check the output resolution	Resolution Out 1 1920x1080	Use the UP and DOWN direction button to check all the 4 output resolutions.

➤ Output check

Press any output button to check its corresponding input.

Example: Check which one is the corresponding input for output 2. (Presume Output 2 corresponds to Input 1.)

Operation: Press Output 2 button, LCD screen display “AV: 1->2 IR: 1->2”, and indicators of input 1 and output 2 turn on and last for 3 seconds. Then output 2 corresponds to input 1.

Clear operation

When you switch output channel, learn EDID data, or set EDID data, press **Clear** button to withdraw the operation before you press “ENTER” to carry it on. When you press it,

TEK-MUHD44TP 4x4 HDBaseT Matrix

6.2 IR Control

The HDBaseT 4x4 matrix switcher can be controlled by its built-in IR receiver, through the IR EYE port by connecting with extended IR receiver or controlled remotely by a far-end IR device through one of its receivers. By using IR & HDBaseT transmission technology the HDBaseT 4x4 matrix switcher has the following features:

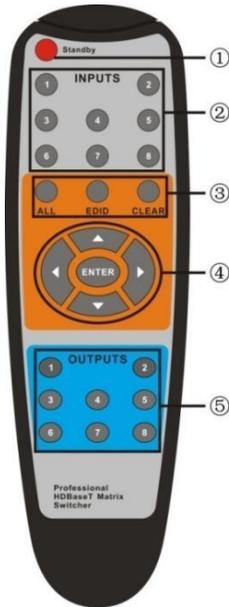
- Control far-end output device from local.
- Control local input/output device remotely.
- Control the HDBaseT 4x4 matrix switcher locally/remotely.

6.2.1 IR Remote Operation

By using IR & HDBaseT transmission technology, the MUH44TPR2-N has some functions as follows:

- 1) Control far-end output device from local.
- 2) Control local input/output device remotely.
- 3) Control the MUH44TPR2-N locally/remotely.

Usage of IR Remote



- ① Standby button, press it to enter/ exit standby mode
- ② Input channels, range from 1~4 (buttons 5~8 are not available), corresponding IR signal switched synchronously when switching input channels.
- ③ Menu buttons, **ALL**, **EDID** and **CLEAR**, same with the corresponding front panel buttons. Please refer to 4.1 Front Panel Button Control for details.
- ④ ▲▼◀▶: Navigation buttons.
ENTER: Confirm button.
- ⑤ OUTPUTS (buttons 5~8 are not available)
In normal mode: output channel selection buttons, each channel has 1 IR IN, 1 HDBaseT, 1 RS232, and 1 AUDIO outputs, and channel 1~4 have HDMI outputs.
In EDID invoking mode: press button 1/2 to switch among the 5 embedded EDID data

Note: With this IR remote, MUH44TPR2-N can be controlled by the built-in IR, the extended IR receiver connected to the "IR EYE"/"IR ALL IN" and the IR receiver on the far-end receiver.

6.2.2 IR Operations

Force Carrier

- Only if the IR receiver connected to HDBaseT receiver is with IR carrier, can the received IR signal be transferred to IR OUT port of the matrix.
- Only if the IR receiver connected to **IR ALL IN** port of the matrix is with IR carrier, can the received IR signal be transferred to IR OUT port of the matrix.
- If the IR receiver connected with HDBaseT receiver or IR ALL IN port of the matrix is not with IR carrier, send the command “%0901.” to enter infrared carrier enforcing mode, and then IR signal can be transferred to IR OUT port.

Control Far-end Device locally

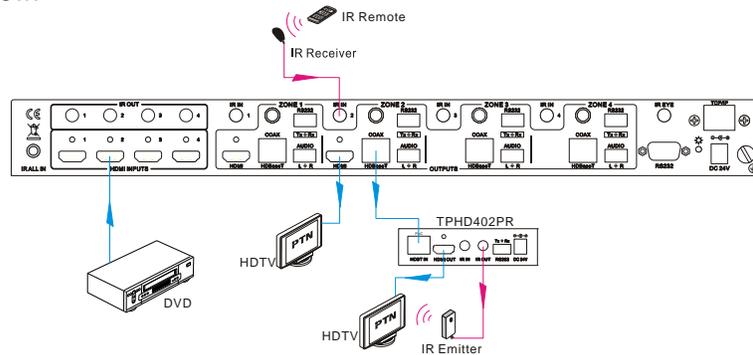
Connect an IR receiver to IR IN/ IR ALL IN on the switcher, and use the IR Remote of far-end device to control the device locally.

- **1 to 1: (through IR IN)**

Connect an IR receiver with IR carrier to the IR IN port of MUH44TPR2-N; users can control far-end output displayer via its IR remote from local.

In that case, the IR signal is transferred via twisted pair. Only the corresponding IR OUT port can emit control signals to the remote display.

See the figure below:

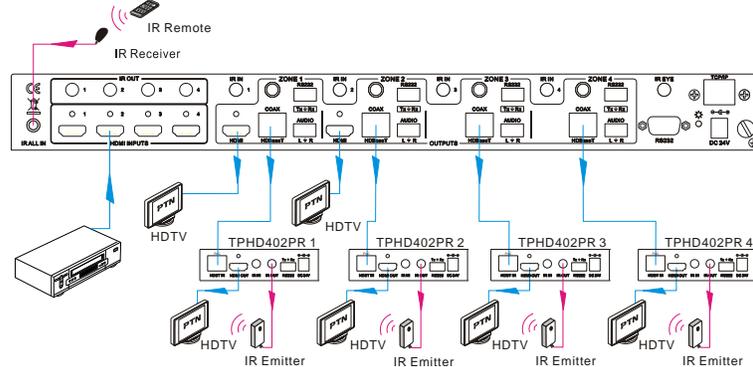


Control far-end device from Local

Note: The IR receiver connected to **IR IN** must be with IR carrier

- **1 to All: (through IR ALL IN)**

Connect an IR receiver to the IR ALL IN port of MUH44TPR2-N, the IR signal received from IR ALL IN port will be transmitted to all the 4 connected far-end HDBT receivers. See as below:



Control far-end device through IR ALL IN port

Note: Send command “%0901.” to enter infrared carrier enforcing mode if the IR Receiver connected to IR ALL IN is not with carrier.

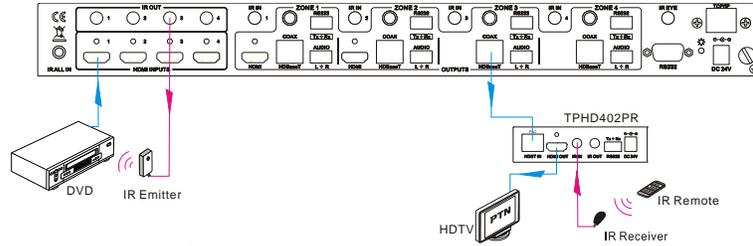
TEK-MUHD44TP 4x4 HDBaseT Matrix

Control Local Device Remotely

Connect IR receiver(s) to IR IN on far-end HDBT receiver(s), and IR Emitter(s) to IR OUT port of the switcher, and use the IR Remote of local source to control the device remotely.

- 1 to 1:

Connect an IR receiver to IR IN on far-end HDBT receiver, and an IR Emitter to IR OUT port of the switcher. Use the IR Remote of local source to control the device remotely. See below:

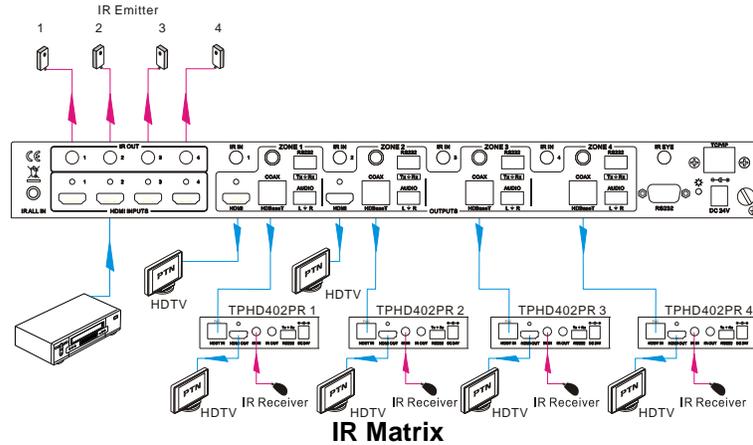


Control local device from remote

Note: Send command “%0901.” to enter infrared carrier enforcing mode if the IR Receiver connected to IR IN of the receiver is not with carrier.

- Multiple to Multiple: (IR Matrix)

The 4 “IR OUT” ports and the 4 “IR IN” ports on the far-end receivers make up a 4x4 IR matrix. See as below:



IR Matrix

The IR signal is sent by corresponding IR remote, then it is transferred to HDBaseT receiver, then to corresponding zone of the matrix through the twisted pair, finally it is transferred to IR OUT port and received by controlled device.

Switching Operation: (4 IR IN ports correspond with 4 HDMI input ports separately in default mode.)

- a) **Sending command (reference to 4.3 RS232 Control):** [x1]R[x2].

x1: Corresponding to the 4 IR OUT ports of the matrix, the IR transmitter connected to this port can be placed at IR receiving area of output device or MUH44TPR2-N itself.

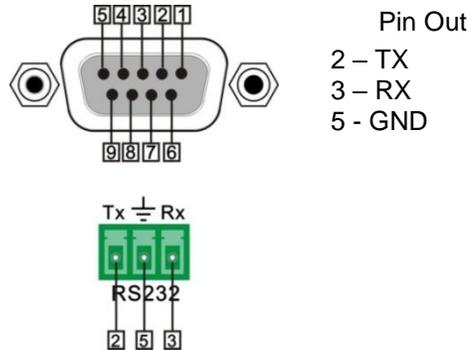
x2: Corresponding to the zone (receive IR signal from HDBaseT receiver with IR IN port connects with IR receiver) number of MUH44TPR2-N.

Example: Send command “3R2.” to transfer IR signal received from zone 2 to IR OUT port 3.

RS232 Control

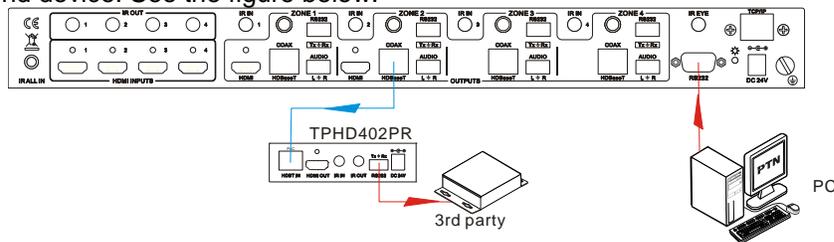
Connection with RS232 Communication Port

The MUH44TPR2-N can be controlled by far-end control system through the RS232 communication port. You cannot type in the commands using HyperTerminal or PuTTY. They must be entered using a program like Hercules, where the command is sent by the computer. This RS232 communication port is a female 9-pin D connector. The definition of its pins is listed in the table below.



Control through 9-pin RS232 port

Connect a control device to the 9-pin RS232 port of the switcher; users are able to control the switcher & far-end device. See the figure below:



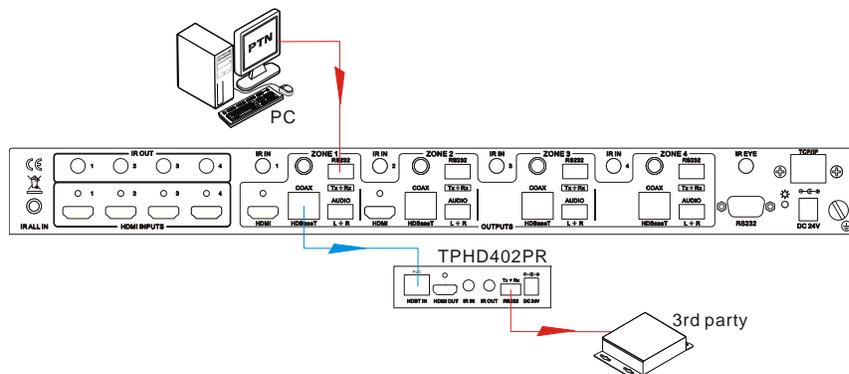
Control the switcher & 3rd party Device through 9 pin female RS232 port

- Control the switcher: send RS232 commands directly
- Control 3rd party: send command: `"/+[Y]/[X]:*****"`. (Refer to for detailed information.)

Control through 3-pin RS232 port

- Control 3rd party device from local

Connect the RS232 (3-pin pluggable terminal block) port in any zone to PC, and connect the controlled RS232 device (3rd party device) to the corresponding (same zone as PC) receiver, see below:

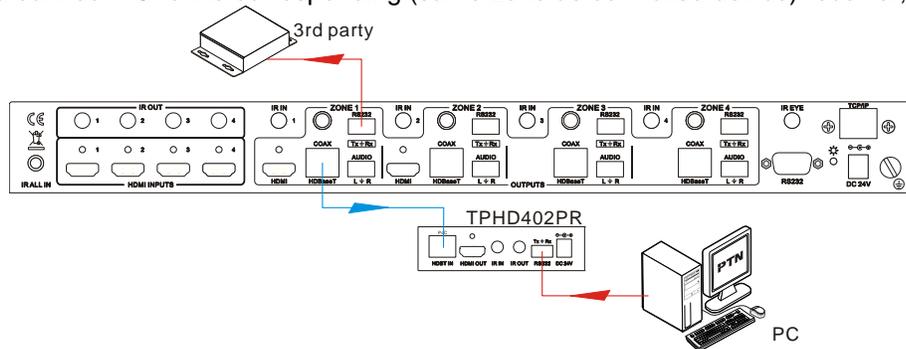


Control 3rd party device from local

TEK-MUHD44TP 4x4 HDBaseT Matrix

Control 3rd party device from remote

Connect the RS232 (3-pin pluggable terminal block) port in any zone to controlled device (3rd party device), and connect PC to the corresponding (same zone as controlled device) receiver, see below:



Control 3rd party device from remote

Installation/uninstallation of RS232 Control Software

- **Installation** Copy the control software file to the computer connected with MUH44TPR2-N.
- **Uninstallation** Delete all the control software files in corresponding file path.

6.3 RS-232 Control

These same commands are used for IP communication.

Communication protocol:

Baud rate: 9600

Data bit: 8

Stop bit: 1

Parity bit: none

Connector type: DB9 FM (Use Straight through cable)

6.3.1 Commands

Command	Function	Feedback Example
System Commands		
/*Type;	Inquire the models information.	MUH44TPR2-N
/%Lock;	Lock the front panel buttons on the Matrix.	System Locked!
/%Unlock;	Unlock the front panel buttons on the Matrix.	System Unlock!
/^Version;	Inquire the version of firmware	VX.X.X
Demo.	Switch to the "demo" mode, convert input and output in turn like 1B1, 1B2, ...4B3, 4B4, 1B1... and so on .The switching interval is 2 seconds.	Demo Mode AV:01->01 IR:01->01 AV:01->02 IR:01->02 AV:04->04 IR:04->04
Undo.	To cancel the previous operation.	Undo Ok! Out 01 02 03 04 In 01 01 01 01
Operation Commands		
[x]All.	Transfer signals from the input channel [x] to all output channels	X To All. (X=01~04)
All#.	Transfer all input signals to the corresponding output channels respectively like 1->1, 2->2...	All Through.
All\$.	Switch off all the output channels.	All Closed.
[x]#.	Transfer signals from the input channel [x] to the output channel [x].	X Through. (X=01~04)
[x]\$.	Switch off the output channel [x].	X Closed. (X=01~04)
[x]@.	Switch on the output channel [x].	X Open. (X=01~04)
All@.	Switch on all output channels.	All Open.
[x1]V[x2].	Transfer the AV signal from the input channel [x1] to one or several output channels ([x2], separate output channels with comma).	AV: X1-> X2 (X1/X2=01~04)
[x1]B[x2].	Transfer the AV and IR signal from input channel [x1] to one or several output channels ([x2], separate output channels with comma).	AV: X1-> X2 (X1/X2=01~04)
[x1]R[x2].	Transfer the IR signal from output [x1] to input [x2].	IR: X1-> X2(X1、 X2=01~04)
Status[x].	Check the I/O connection status of output [x]	AV: Y-> X (X=01~04, Y=01~04)
Status.	Inquire the input channel to the output channels one by one.	AV:01->01

TEK-MUHD44TP 4x4 HDBaseT Matrix

Command	Function	Feedback Example
		AV: 04->04 IR: 01->01 IR: 04->04
Save[Y].	Save the present operation to the preset command [Y], ranges from 0 to 9.	Save To FY (Y=0-9)
Recall[Y].	Recall the preset command [Y].	Recall From FY (Y=0-9)
Clear[Y].	Clear the preset command [Y].	Clear FY (Y=0-9)
PWON.	Work in normal mode.	PWON
PWOFF.	Enter into standby mode and cut off the power supply to HDBaseT receivers.	PWOFF
STANDBY.	Enter into standby mode. (Do not cut off the power supply to HDBaseT receivers, press other buttons or send other commands to start.)	STANDBY
/%[Y]/[X]:[Z].	HDCP management command. [Y] is for input (value: I) or output (value: O); [X] is the number of the port, if the value of X is ALL, it means all ports; [Z] is for HDCP compliant status, the value may be 1 (HDCP compliant) or 0 (not HDCP compliant).	/%[Y]/[X]:[Z].
DigitAudioON[x].	Enable HDMI audio output of port x. X=1, 2, 3, 4, enable this port. X=5, enable all the 4 ports.	DigitAudio ON with [x]
DigitAudioOFF[x].	Disable HDMI audio output of port x. X=1, 2, 3, 4, disable this port. X=5, disable all the 4 ports.	DigitAudio OFF with [x]
/+[Y]/[X].*****.	Set communication between PC and HDBaseT receiver. Y is for RS232 port (connect with RS232 port of HDBaseT receiver) Y= 1~5 or A~H, The value of Y is defined into the following meanings (in a given baud rate depended by the value of X): Y = 1~4, send this command to the corresponding HDBaseT receiver to control far-end device. Y = 5, send this command to all HDBaseT receivers to control all far-end devices. Y = A, B, C, or D Y = E, F, G, or H For items c or d, send this command, it will be saved to the matrix switcher but taken without action to corresponding HDBaseT receiver. And its command function will be effective almost at the same time when you send the command PWON (for item c) or PWOFF (for item d). Note: A & E are for port 1. B & F are for port 2. C & G are for port 3. D & H are for port 4. X is for baud rate, its value ranges from 1 to 7 (1--2400, 2--	*****

Command	Function	Feedback Example
	4800, 3--9600, 4--19200, 5--38400, 6--57600, 7--115200) ***** is for data (max 48 Byte)	
EDIDH[x]B[y].	Input port [y] learns the EDID from output port [x]. If the EDID data is available and the audio part supports not only PCM mode, then force-set it to support PCM mode only. If the EDID data is not available, then set it as initialized EDID data.	EDIDH[x]B[y]
EDIDPCM[x].	Set the audio part of input port [x] to PCM format in EDID database.	EDIDPCM[x]
EDIDG[x].	Get EDID data from output [x] and display the output port number.	Hexadecimal EDID data and carriage return character
EDIDMInit.	Restore the factory default EDID data of every input.	EDIDMInit.
EDIDM[X]B[Y].	Manually EDID switching. Enable input[Y] to learn the EDID data of output[X]. If the EDID data is not available, then set it as initialized EDID data.	EDIDM[X]B[Y]
EDIDUpgrade[x].	Upgrade EDID data via the RS232 port. [x] is the input port, when the value of X is 9, it means to upgrade all input ports. When the switcher receives the command, it will show a message to prompt you to send EDID file (.bin file). Operations will be canceled after 10 seconds. Please cut off all connections of HDBaseT ports.	Please send the EDID file
EDID/[x]/[y].	Set the EDID data of input port [x] to built-in EDID No.[y]. [y]=1~5, correspond to the 5 embedded EDID data separately	EDID/[x]/[y]
UpgradeIntEDID[x].	Upgrade one of the 5 embedded EDID data, x is the serial number for EDID data: 1. 1080P 2D 2CH 2. 1080P 3D 2CH 3. 1080P 2D Multichannel 4. 1080P 3D Multichannel 5. 3840x2160 2D (30Hz) When the switcher gets the command, it will show a message to send EDID file (.bin file). Operations will be invalid after 10 seconds.	Please send the EDID file
GetIntEDID[x].	Return the embedded EDID data ranked x, [x]=1~5	
GetInPortEDID[X].	Return the EDID data of input [x], [x]=1~4	
%0801.	Auto HDCP management, activate carrier native mode	%0801
%0900.	Switch to carrier native mode.	Carrier native
%0901.	Switch to force carrier mode.	Force carrier
%0911.	Reset to factory default.	Factory Default
%9951.	Check the command sent by port 1 when PWON.	Port 1:data when PWON
%9952.	Check the command sent by port 2 when PWON.	Port 2:data when PWON
%9953.	Check the command sent by port 3 when PWON.	Port 3:data when PWON
%9954.	Check the command sent by port 4 when PWON.	Port 4:data when PWON
%9955.	Check the command sent by port 1 when PWOFF.	Port 1:data when

TEK-MUHD44TP 4x4 HDBaseT Matrix

Command	Function	Feedback Example
		PWOFF
%9956.	Check the command sent by port 2 when PWOFF.	Port 2:data when PWOFF
%9957.	Check the command sent by port 3 when PWOFF.	Port 3:data when PWOFF
%9958.	Check the command sent by port 4 when PWOFF.	Port 4:data when PWOFF
%9961.	Check the system locking status.	System Locked/ Unlock!
%9962.	Check the power status	STANDBY/PWOFF/ PWON
%9963.	Check the working mode of infrared carrier.	Carrier native/ Force carrier
%9964.	Check the IP address.	IP:192.168.0.178 (default)
%9971.	Check the connection status of the inputs.	In 01 02 03 04 Connect Y Y Y Y
%9972.	Check the connection status of the outputs.	Out 01 02 03 04 Connect Y Y Y Y
%9973.	Check the HDCP status of the inputs.	In 1 2 3 4 HDCP N N N N
%9974.	Check the HDCP status of the outputs.	Out 1 2 3 4 HDCP N N N N
%9975.	Check the I/O connection status.	Out 01 02 03 04 In 04 04 04 04
%9976.	Check the output resolution.	Out 1 1920x1080 Out 2 1920x1080 Out 3 1920x1080 Out 4 1920x1080
%9977.	Check the status of digital audio of output channels.	Out 1 2 3 4 Audio Y Y Y Y
%9978.	Check the HDCP compliant status of the inputs.	In 01 02 03 04 HDCPEN Y Y Y Y

Notes:

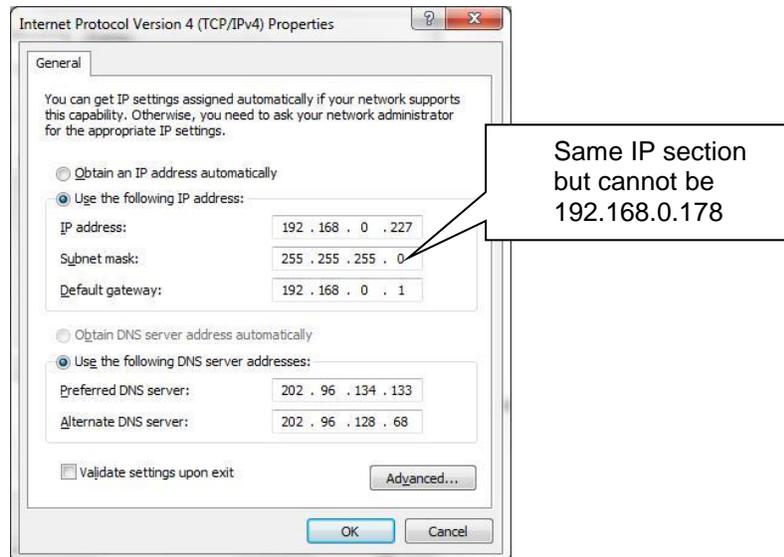
1. Disconnect all the HDBaseT cables before sending command EDIDUpgrade[X].
2. In above commands, “[” and “]” are symbols for easy reading and do not need to be typed in actual operation.
3. Please remember to end the commands with the ending symbols “.” and “;”.
4. Commands are case-sensitive.

6.4 TCP/IP Operation - Optional

The optional network port of TEK-MUHD44TP is used for sending commands using TCP/IP control. These commands are sent the same as when using RS-232 control at TCP/IP port 4001. There is no Web based control for the unit. The Web interface is used for network configuration only.

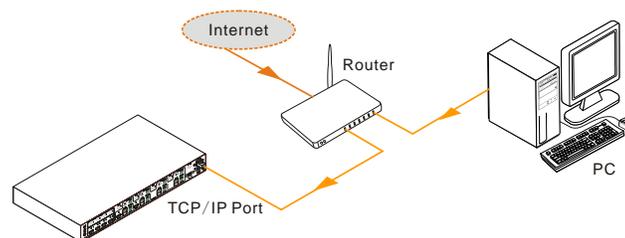
6.5 IP Configuration

To connect a computer to the network port you must use a crossover network cable or network switch. Set its IP address of the PC to the same IP VLAN as the default IP is address or the unit (192.168.0.178).



6.6 Connection and Control

To send IP commands to the TEK-MUHD44TP connect using TCP/IP port 4001 and the set IP address of the unit. Use the standard serial commands from a control system or program that can send a complete command line. You cannot type the command using a Telnet program.

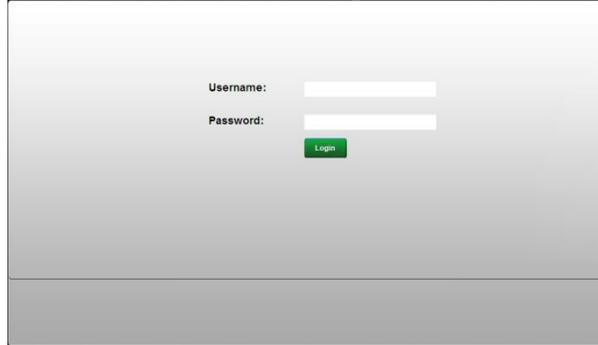


TEK-MUH44TP 4x4 HDBaseT Matrix

GUI for TCP/IP control

MUH44TPR2-N provides a built-in GUI for convenient TCP/IP control. GUI allows users to interact with MUH44TPR2-N through graphical icons and visual indicators.

Type 192.168.0.178 in your browser, it will enter the log-in interface shown as below:



There are 2 selectable usernames – admin (default password: admin) and user (default password: user). Log in as admin can access more configuration interfaces than user. Enter username and the right password. Here is a brief introduction to the interfaces.

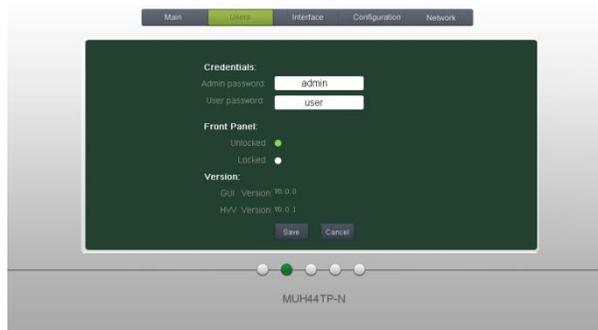
Main: Interface shown after logging in, provide intuitive I/O connection switching. See the screenshot below:



The button matrix displays every possible connection between every input and output, users can carry on the connections by clicking corresponding button.

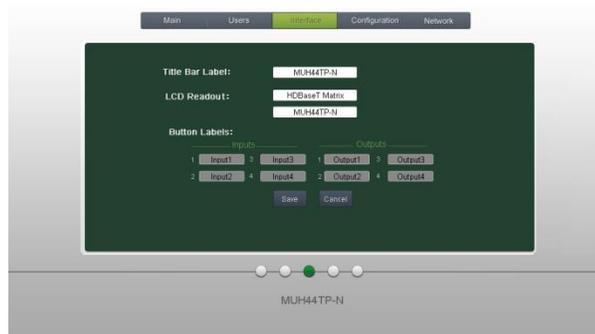
Buttons 1~9 at the right-bottom corner provides quick saving and recall for overall connection status.

Users: Display or modify credential settings, front panel lock, and GUI version.



If there is any modification, press Save to restore the settings, or press Cancel to withdraw.

Interface: Set title bar label, LCD readout, and button labels, press Save to save the settings



Configuration: Set HDCP Compliance status for every input, and manage EDID. See the screenshot below:



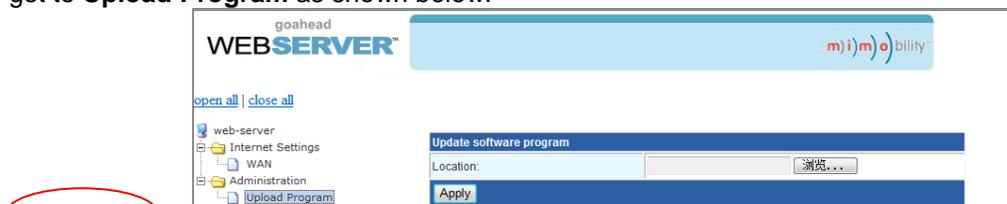
Network: Inquire and configure network settings including MAC address, IP address, subnet mask, and Gateway



Note: Log in as user access main interface only.

GUI Update

GUI for MUH44TPR2-N supports online update in <http://192.168.0.178:100>. Type the username and password (the same as the GUI log-in settings, modified password will be available only after rebooting) to log in the configuration interface. After that, click **Administration** at the source menu to get to **Upload Program** as shown below:

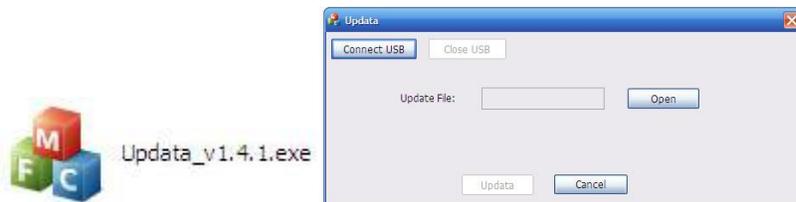


Select the desired update file and press Apply, it will start upgrading then.

TEK-MUHD44TP 4x4 HDBaseT Matrix

7. Firmware Updating

To meet with the request of different users or add function in future, the firmware of TEK-MUHD44TP can be upgraded via USB. When you need to upgrade it, download the latest upgrade file and use the update EXE software. Copy the EXE software to the PC and double click the program to run the program. Connect a Micro USB, like the one for a Samsung Smartphone, to the front of the unit and cycle power. Click on Open and select the firmware file and then press Connect USB. If the USB connection is successful, press the update button.



8. Technical Specification

Video Input		Video Output	
Input	4 HDMI	Output	2 HDMI 4 HDBaseT
Input Connector	Female HDMI	Output Connector	Female HDMI Female RJ45(with LED indicators)
Input Level	T.M.D.S. 2.9V/3.3V	Output Level	T.M.D.S. 2.9V/3.3V
Input Impedance	100Ω (Differential)	Output Impedance	100Ω (Differential)
Video General			
Gain	0 dB	Bandwidth	10.2Gbit/s
Video Signal	HDMI (or DVI-D)		
Resolution Range	Up to 4Kx2K@60Hz	Switching Speed	200ns (Max.)
Transmission Distance	200' @ 1080 or 130' at 4K		
EDID Management	EDID data and manual EDID management		
HDCP	Supports HDCP 2.2, auto and manual HDCP management.		
Audio General			
Output Signal	Stereo audio Digital audio	Output Connector	4 3p captive screw connectors 4 Coax (RCA)
Stereo Output	200 ohm	Coax Output	Supports PCM, Dolby, DTS 5.1
Frequency Response	20Hz~20KHz		
Control Parts			
Control Ports	4 IR OUT (green) 4 IR IN (black) 1 IR EYE (black) 1 TCP/IP (female RJ45) 1 RS-232 (9 pin female D) 4 RS-232 (3p captive screw connectors)	Panel Control	Front panel buttons
IR	Default IR remote Extend IR EYE	TCP/IP Control	Works with PTNET2.2
General			
Power Supply	DC 24V 2.71A	Power Consumption	48W
Temperature	-20 ~ +70°C	Humidity	10% ~ 90%
Case Dimension	W19 x H1.73 x D9.25 IN. (1U high, full rack wide)	Product Weight	2.0Kg

Specifications are subject to change without notice.

TEK-MUHD44TP 4x4 HDBaseT Matrix

6 Panel Drawing



9. Troubleshooting & Maintenance

Most video issues are due to bad cables or the cable lengths are too long. Please check all connections before sending unit back for repair. Other issues may include improper EDID configuration.

10. Warranty

TEKVOX, Inc. warrants this product against defects in workmanship and materials for a period of Three Years from the date of purchase. During the warranty period, if failure is caused from faulty workmanship and/or materials, TEKVOX, Inc. will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction.

This Limited Warranty does not apply if fault is caused by misuse, improper handling, electrical or mechanical abuse, abnormal operating conditions or non-TEKVOX authorized modifications to said product.

If it has been determined product is defective, please call TEKVOX and ask for an Applications Engineer at 830.460.9099 (USA) (support@tekvox.com) to receive an RMA # (Return Material Authorization Number) to begin the repair process as quickly as possible.

Units must be returned with prepaid shipping charges. Please insure package. If not insured you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the contact person in case there are any questions.

TEKVOX, Inc. makes no further warranties either expressed or implied with respect to said product, or its quality, performance, or operation for any particular use. In no event will TEKVOX, Inc. be liable for direct, indirect, or consequential damages resulting from any defect in this product even if TEKVOX, Inc. has been advised of such damage. Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.