# MPM-88-IR-N

## 4K HDBaseT 8x8 Matrix Switcher



## All Rights Reserved

**Version: MPM-88-IR-N_2016V1.0**

## Preface

Read this user manual carefully before using this product. Pictures shown in this manual is for reference only, different model and specifications are subject to real product.

This manual is only for operation instruction only, not for any maintenance usage.

## Trademarks

Product model and logo are trademarks. Any other trademarks mentioned in this manual are acknowledged as the properties of the trademark owner. No part of this publication may be copied or reproduced without prior written consent.

## FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

# SAFETY PRECAUTIONS

To insure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment

- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.

- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.

- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.

- Refer all servicing to qualified service personnel.

- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.

- Do not put any heavy items on the extension cable in case of extrusion.

- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.

- Install the device in a place with fine ventilation to avoid damage caused by overheat.

- Keep the module away from liquids.

- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.

- Do not twist or pull by force ends of the optical cable. It can cause malfunction.

- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

- Unplug the power cord when left unused for a long period of time.

- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

# **Contents**

# 1. Introduction

## 1.1 Introduction to the MPM-88-IR-N

MPM-88-IR-N is a professional 8x8 HDBaseT Matrix Switcher that accommodates 8 HDMI IN (HDMI1.4 & HDCP2.2 compliant) & 8 IR IN.

Select HDMI input by front panel buttons, IR, RS232, or GUI. The selected source is delivered to HDMI Output 1~4 (switched synchronously with HDBaseT output 1~4) & HDBaseT outputs 1~8 (easy extension to 70m at 1080p and 40m at 4Kx2K on a single CAT5e/6 connection with HDBaseT receivers, with PoC).

It also features EDID management.

## 1.2 Features

- 8 HDMI Input support HDMI 1.4 &HDCP2.2, and compliant with lower standards, capable to transmit 4Kx2K@60Hz & 1080p 3D
- Support manual input HDCP auto-detecting and output manual HDCP management
- 4 HDMI Output support HDMI1.4& HDCP1.4, transmit 4Kx2K signal for 8m
- 8 HDBaseT outputs for easy extension to 70m at 1080p and 40m at 4Kx2K over single CAT5e/6 cable, support PoC
- LCD screen shows real-time I/O connection status, switching status, HDCP status, and output resolution.
- Controllable via front panel, TCP/IP, and bi-directional IR& RS232
- Built-in GUI for TCP/IP control
- Powerful EDID management
- Support off memory for reliable operation
- Convenient firmware upgrade through Micro USB port
- Easy installation with rack-mounting design

## 1.3 Package List

- ➢ 1 x MPM-88-IR-N
- ➢ 1 x RS232 cable
- ➢ 4 x Rubber Feet (4 x Screws)
- ➢ 1 x Power cord
- ➢ 1 x User manual

- ➢ 2 x Mounting ears (6 x Screws)
- ➢ 1 x IR Receiver (5V, with carrier)
- ➢ 1 x IR remote
- ➢ 16 x Pluggable Terminal Blocks

📖 Confirm if the product and the accessories are all included, if not, please contact with the dealers.

# 2. Product Appearance of the MPM-88-IR-N

## 2.1 Front Panel



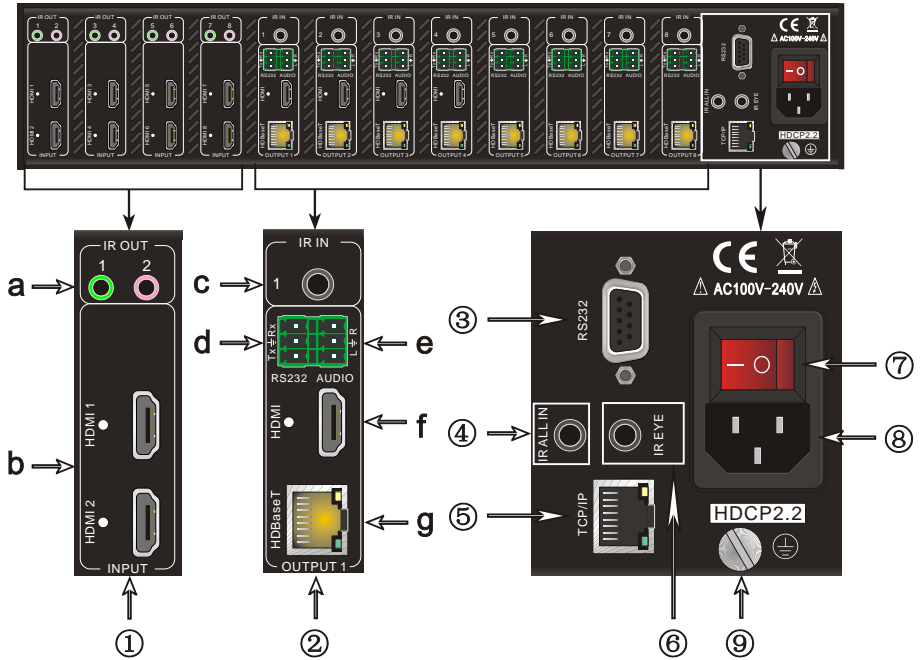| No. | Name | Description |
|-----|------|-------------|
| ① | Firmware | Micro USB port for firmware updating |
| ② | Power Indicator | Illuminate red when power on; light yellow in standby mode |
| ③ | IR | In-built IR sensor, receive IR signals sent from IR remote. |
| ④ | LCD Screen | Display real-time operation status. |
| ⑤ | INPUTS/ Menu buttons | ➢ Normal mode: input selection buttons ranging from 1~8.<br>➢ Inquiry mode (buttons 1~4): Press "ENTER" for more than 3 seconds to enter this mode. Dial ◄ ► to select different menus, ▲▼ to select different options. |
| ⑥ | OUTPUTS buttons/ EDID Management buttons | ➢ Normal mode: output selection buttons ranging from 1~8<br>➢ EDID Invoking mode: press and hold EDID button for 3 seconds or more to enter this mode, buttons 1~6 correspond to the 6 embedded EDID data separately. Press any of the 6 buttons to invoke embedded EDID data. |
| ⑦ | Function buttons | **ALL**: Select all inputs/ outputs |
| | | **EDID**: EDID management button |
| | | **CLEAR**: Withdraw an operation before it comes into effect |
| | | **ENTER:**<br>➢ Confirm operation<br>➢ Press for 3 seconds to enter in Inquiry mode. |

## 2.2 Rear Panel



| No. | Name | Description |
|-----|------|-------------|
| ① | INPUTS | a. **IR OUT:** connect with IR emitters, making up an IR matrix with the IR IN sockets on the far-end receivers. IR signal can be switched synchronously with the AV signal, or separately.<br>In default setting, the 8 IR OUT corresponds with the 8 IR IN throughly, i.e. IR OUT1→IR IN1,…IR OUT8→IR IN8. |
| | | b. **HDMI:** HDMI input ports, connect with HDMI sources. |
| ② | OUTPUTS | c. **IR IN:** Connect with IR receiver (with carrier), work with IR OUT on the corresponding far-end receiver, cannot be switched separately. |
| | | d. **RS232**: serial control ports, support bi-directional control with RS232 port on corresponding HDBT receiver, cannot be switched separately. |
| | | e. **AUDIO**: stereo audio output ports, output de-embedded HDMI audio |
| | | f. **HDMI**: Local HDMI output ports, synchronously switched with HDBaseT Output 1~4 |
| | | g. **HDBaseT:** work with HDBaseT receivers to extend |

| | | signals and energize far-end HDBaseT receiver on a single CAT5e/6 cable. |
|---|---|---|
| ③ | RS232 | Serial control port, connect with control device such as a PC. |
| ④ | IR ALL IN | Input port for IR control signal, connect with IR receiver (with carrier), delivers the received IR signal to all the 8 far-end receivers. |
| ⑤ | TCP/IP | TCP/IP port for unit control |
| ⑥ | IR EYE | Connect with extended IR receiver, use the IR remote to control the MPM-88-IR-N. |
| ⑦ | Power Trigger | Press the button to turn on/off the matrix. The indicator turns red when power on. |
| ⑧ | Power port | Connect to an AC 100V~240V power adapter via the included power cord |
| ⑨ | GROUND | Connect to grounding, make the unit ground well. |

**Note:** Pictures shown in this manual are for reference only, different model and specifications are subject to real product.

# 3. System Connection

## 3.1 System Applications

As its good performance in control and transmission, the MPM-88-IR-N can be widely used in computer realm, monitoring, large screen displaying, conference system, television education and bank securities institutions etc.

## 3.2 Usage Precautions

**1)** System should be installed in a clean environment and has a prop temperature and humidity.
**2)** All of the power switches, plugs, sockets and power cords should be insulated and safe.
**3)** All devices should be connected before power on.

## 3.3 Connection Diagram
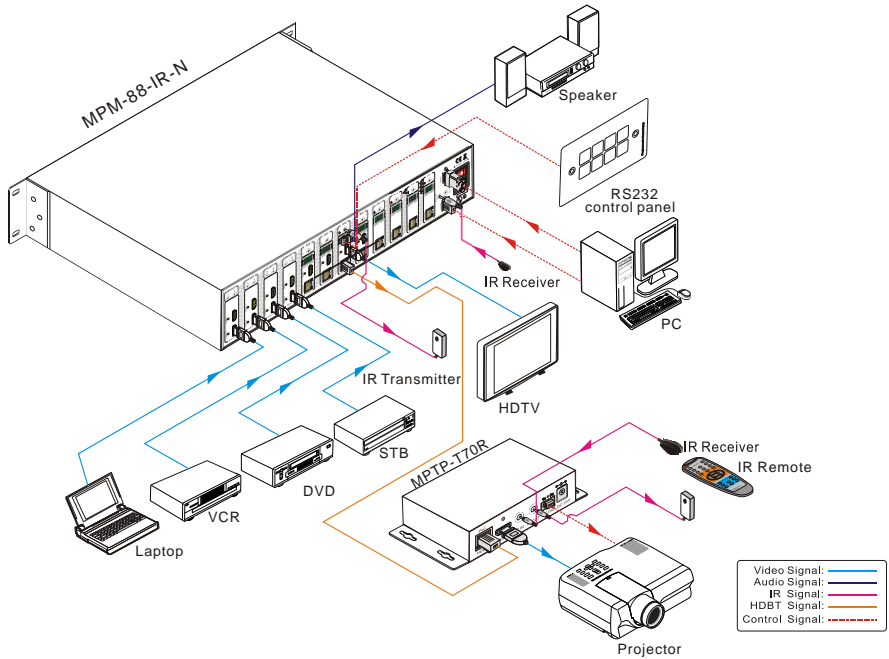
## 3.4 Connection Procedure

**1)** Connect HDMI sources (e.g. DVD) to HDMI inputs of the MPM-88-IR-N with HDMI cables.

**2)** Connect HDBaseT receivers (e.g. MPTP-T70R) to the HDBaseT Output ports with straight-through CAT5e/6.

**3)** Connect HDMI displays (e.g. HDTV) to HDMI outputs of the MPM-88-IR-N or the receivers with HDMI cables

**4)** Connect speakers/earphones to AUDIO output ports

**5)** Connect control device (e.g. a PC) to the RS232 port of either MPM-88-IR-N or far-end receivers. RS232 signal can be transmitted bi-directionally between MPM-88-IR-N and far-end receivers.

**6)** MPM-88-IR-N can collect IR signal sent by the included IR remote via its built-in IR sensor or through external IR receiver connected to the IR IN/ IR EYE/ IR ALL IN port. The IR signal can be transmitted bi-directionally between MPM-88-IR-N and far-end receivers.

**7)** Insert AC 100V~240V power outlet to power port of MPM-88-IR-N and switch on the power trigger.

**Note:** IR receivers connected to IR IN should be with carrier. If not, send

command %0900. or %0901.to activate native carrier mode or force carrier mode in the IR matrix launched between MPTP-88-IR-N and far-end receivers.

## 3.5 Connection with HDBaseT Receiver

MPM-88-IR-N boasts 8 HDBaseT output ports which support PoC solution, through which AV signal, IR& RS232 control signal, as well as power are transmitted on single CAT5e/6.
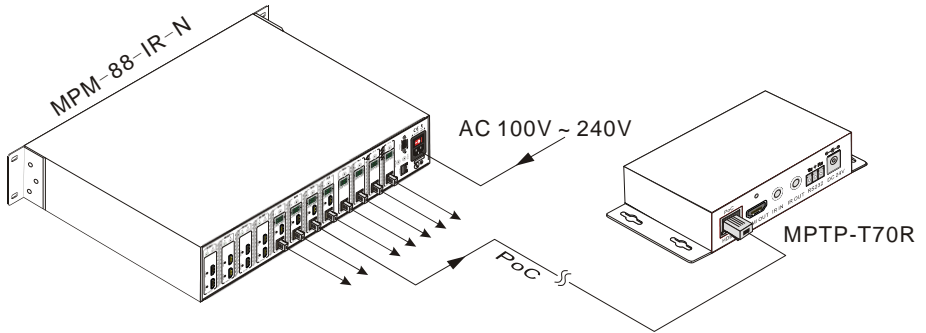
# 4. System Operations
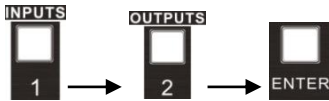
## 4.1 Front Panel Button Control

The operation examples are showed in *2.1 Front Panel.* Here we make a brief introduction to the system operations.

### 4.1.1 Switching I/O connection

1)    To convert one input to an output:

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

Example: input 1 to output 2



Note: In default status, 8 IR OUT sockets correspond with 8 HDMI INPUTS. When you convert an HDMI input to an output, the corresponding IR OUT will be switched synchronously.

2)    To convert an input to several outputs:

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

Example: Switch input 2 to output 2, 4
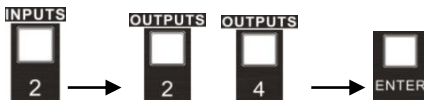


3)    To convert an input to all outputs:

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

Example: Convert input 1 to all outputs
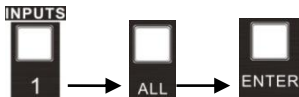


**Note:**  Indicators of the pressed buttons will blink green for three times if the conversion is done, then it will be off. If the conversion failed, they will be off immediately.

### 4.1.2 EDID Management

MPM-88-IR-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



**EDID invoking:**

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

| Output Button | EDID Data |
| --- | --- |
| 1 | 1080P 3D 2CH |
| 2 | 1080P 3D Multichannel |
| 3 | 1080P 2D 2CH |
| 4 | 1080P 2D Multichannel |
| 5 | 3840x2160 2D（30Hz） |
| 6 | 4096x2160 2D（30Hz） |

Format: Press and hold "EDID" for 3 seconds, "INPUTS"+"OUTPUTS"+"ENTER".

Operations:

➢ Set 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 4 to the forth type of embedded EDID data:

Press (hold for 3 seconds) ⟶ 4 ⟶ 4 ⟶ ENTER.
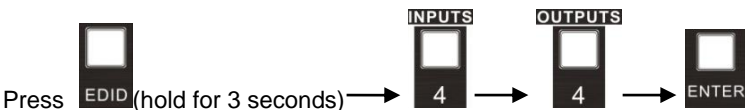
### 4.1.3 Inquiry

➢ 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　　　 1 2 3 4<br>Connect　Y Y N N | Y means the corresponding port is connected with input device, N means not. |
| Check the connection status of outputs | Out　　　 1 2 3 4<br>Connect　Y Y N N | Y means the corresponding port is connected with output device, N means not. |
| Correspondence between inputs and outputs | Out　　　 1 2 3 4<br>In　　　 1 2 3 4 | Shows the correspondence between the 8 inputs and 8 outputs. |
| Check if the input is with HDCP | In　　　 1 2 3 4<br>HDCP　　 Y Y N N | Y means the input signal is with HDCP, N means not. |
| Check if the output is with HDCP | Out　　　 1 2 3 4<br>Connect　Y Y N N | Y means the output signal is with HDCP, N means not. |
| Check the output resolution | Resolution<br>Out 1　1920x1080 | Use button ▲▼ to check the 8 output resolutions separately. |

➢ 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.

### 4.1.4 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, the matrix will return to the previous status.

## 4.2 IR Control

By using IR & HDBaseT transmission technology, the MPM-88-IR-N has some functions as follows:

**1)** Control far-end output device from local.

**2)** Control local input/output device remotely.

**3)** Control the MPM-88-IR-N locally/remotely.

### 4.2.1 Usage of IR Remote
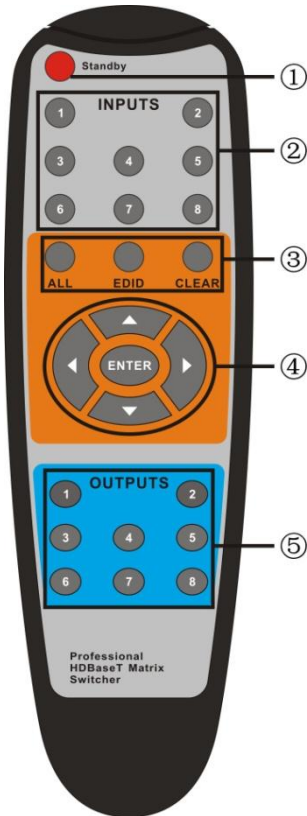
① Standby button, press it to enter/ exit standby mode

② Input channels, range from 1~8, 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 Output channels, range from 1~8.
Each channel has 1 IR IN, 1 HDBaseT, 1 RS232, and 1 AUDIO outputs, and channel 1~4 have HDMI outputs.

**Note:** With this IR remote, MPM-88-IR-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.

### 4.2.2 IR Carrier

IR receivers connected to IR IN of HDBT receiver& IR ALL IN of MPM-88-IR-N can be with carrier or without carrier.

IR signals to be emitted via IR OUT port of the switcher should be with carrier. So, it is recommended to utilize IR receivers with carrier. If the IR receiver is not with carrier, send command "%0901." to enter infrared carrier enforcing mode.

### 4.2.3 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 carrier to the IR IN port of MPM-88-IR-N, users can control far-end output display via its IR remote locally. See the figure below:
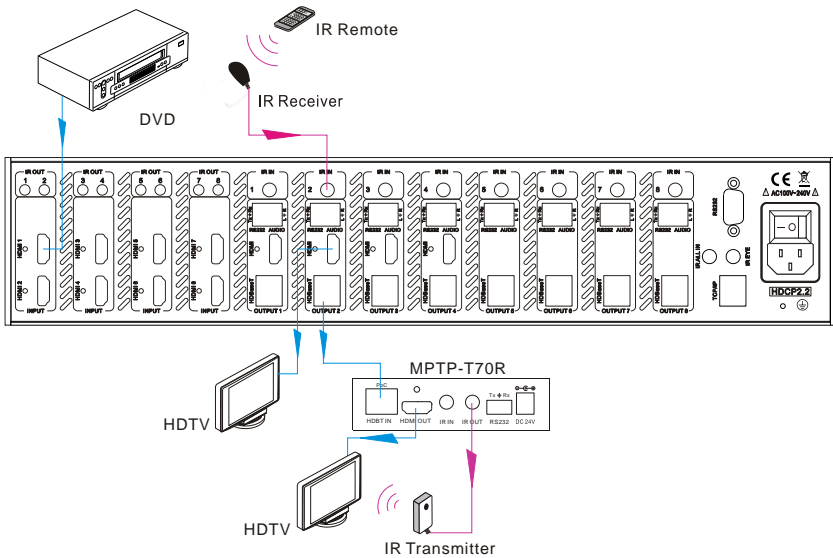


**Control far-end device from Local**

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 MPM-88-IR-N, the IR signal received from IR ALL IN port will be transmitted to all the 8 connected far-end HDBT receivers. See as below:
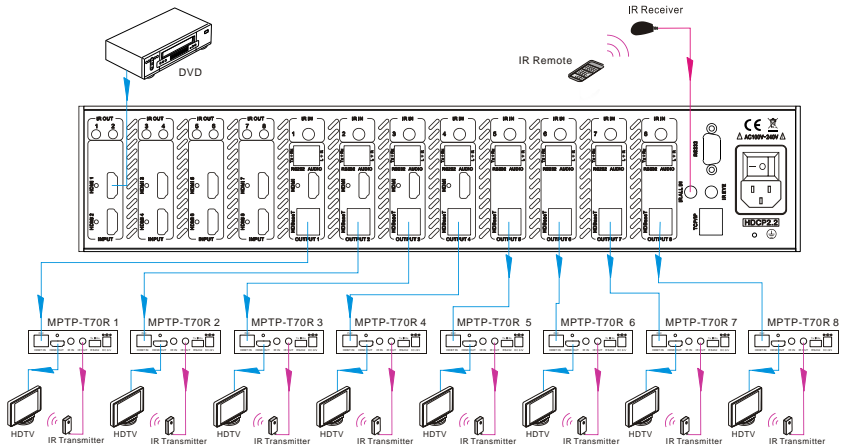
**Control far-end device through IR ALL IN port**

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

### 4.2.4 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.
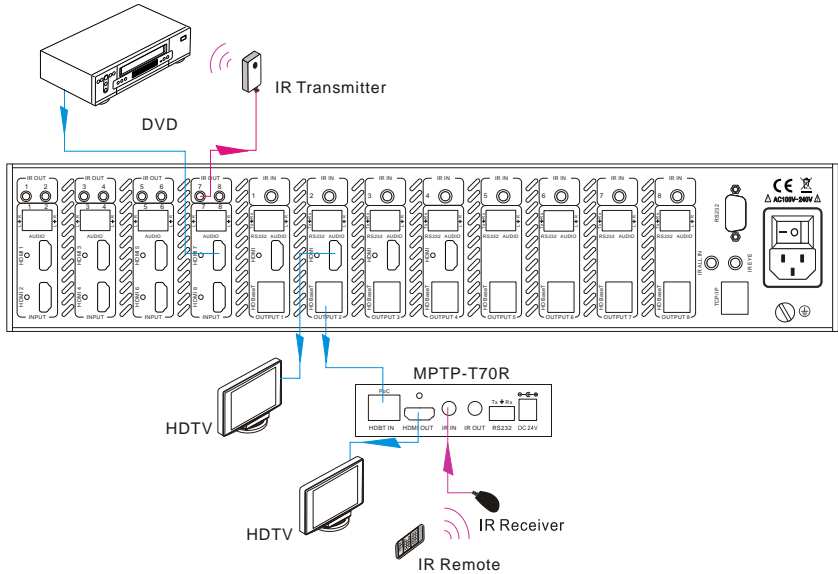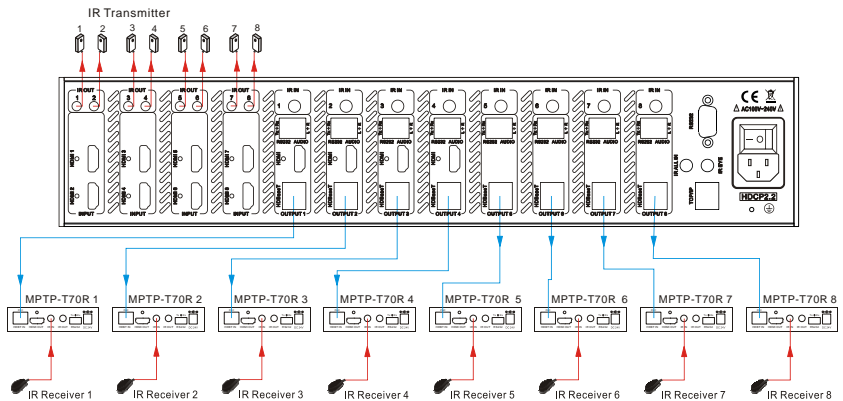
● Multiple to Multiple: (IR Matrix)

The 8 "IR OUT" ports and the 8 "IR IN" ports on the far-end receivers make up an 8x8 IR matrix. See as below:



**IR Matrix**

The 8 IR IN ports correspond with 8 HDMI input ports separately in default mode.

**Switching Operation**: [x1]R[x2]

> x1: Corresponding to the 8 IR OUT ports of the matrix

> x2: Corresponding to the IR IN port at the 8 far-end HDBT receivers

> Example: Send command "3R2." to emit IR signal received from IR Receiver connected to the 2nd HDBT receiver via IR OUT 3.

## 4.3 RS232 Control

### 4.3.1 Connection with RS232 Communication Port

MPM-88-IR-N boasts 3-pin pluggable terminal block for serial control. The definition of its pins is listed in the table below.
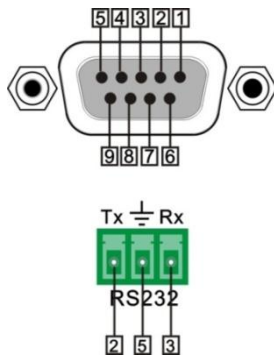
| No. | Pin | Function |
|-----|-----|----------|
| 1 | N/u | Unused |
| 2 | Tx | Transmit |
| 3 | Rx | Receive |
| 4 | N/u | Unused |
| 5 | Gnd | Ground |
| 6 | N/u | Unused |
| 7 | N/u | Unused |
| 8 | N/u | Unused |
| 9 | N/u | Unused |

Connect MPM-88-IR-N to the control device (e.g. a PC) with RS232 cable and set the parameters in the right manner, the control device is capable to control MPM-88-IR-N via designed software.

### 4.3.2 Installation/uninstallation of RS232 Control Software

● **Installation** Copy the control software file to the computer connected with MPM-88-IR-N.

● **Uninstallation** Delete all the control software files in corresponding file path.

### 4.3.3 Basic Settings

Firstly, connect MPM-88-IR-N with an input device and an output device. Then, connect it with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as example. The icon is showed as below:

CommWatch.exe

The interface of the control software is showed as below:

Parameter Configuration area

Monitoring area, indicates whether the command sent works.

Command Sending area
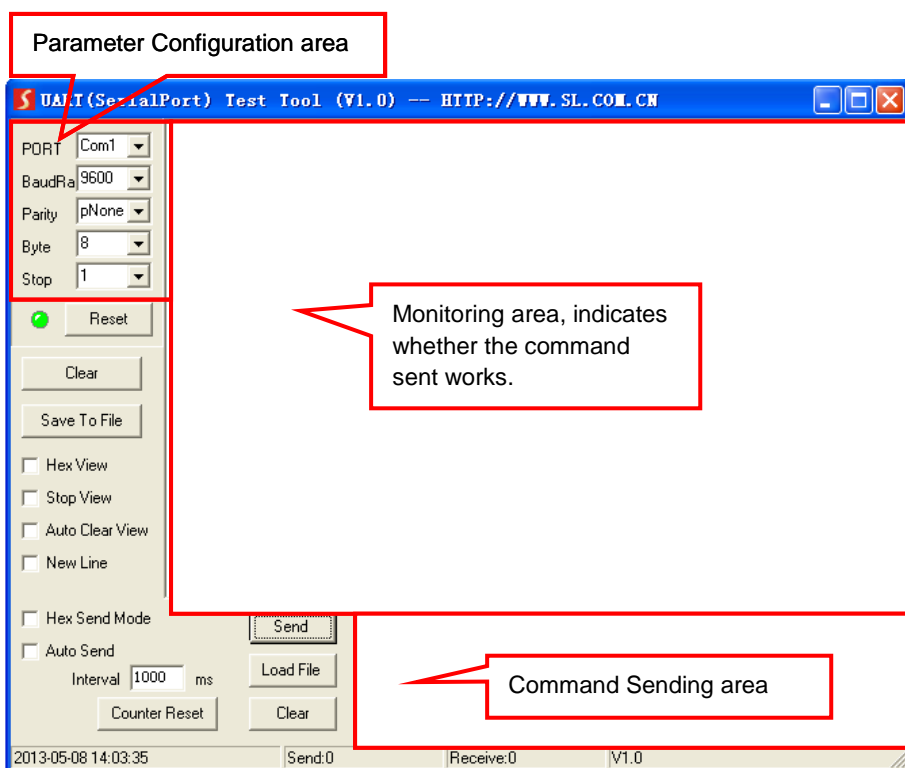
Please set the parameters of COM number, baud rate, data bit, stop bit and the parity bit correctly, only then will you be able to send command in Command Sending Area.

### 4.3.4 RS232 Communication Commands

**Note**:

**1)** Case-sensitive.

**2)** Please disconnect all the twisted pairs before sending command EDIDUpgrade[X].

**3)** In the commands, "["and "]" are symbols for easy reading and do not need to be typed in actual operation.

**4)** End the commands with the ending symbols "." and ";".

Baud rate: 9600          Data bit: 8          Stop bit: 1          Parity bit: none

| Command | Function | Feedback Example |
|---------|----------|------------------|
| **System Commands** | | |

| Command | Function | Feedback Example |
|---|---|---|
| /*Type; | Inquire the models information. | MPM-88-IR-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 |
| /:MessageOff; | Turn off the feedback command from the com port. It will only show simple words like "SWITCH OK!". | /:MessageOff; |
| /:MessageOn; | Turn on the feedback command from the com port. | /:MessageOn; |
| Demo. | Switch to the "demo" mode, convert input and output in turn like1B1, 1B2, …8B7, 8B8, 1B1… and so on .The switching interval is 2 seconds. | Demo Mode<br>AV:  1-> 1<br>AV:  1-> 2<br>AV:  1-> 3<br>AV:  1-> 4<br>AV:  1-> 5<br>AV:  1-> 6<br>AV:  1-> 7<br>AV:  1-> 8<br>AV:  2-> 1<br>… |
| Undo. | To cancel the previous operation. | Undo Ok!<br>Out   1 2 3 4<br>In     1 1 1 1<br>Out   5 6 7 8<br>In     1 1 1 1 |
| **Operation Commands** | | |
| [x]All. | Transfer signals from the input channel [x] to all output channels | X To All. (X=1~8) |
| All#. | Transfer all input signals to the corresponding output channels respectively like 1->1, 2->2… | All Through. |
| All$. | Switch off all the output channels. | All Closed. |
| [x]#. | Transfer signals from the input channel [x] to the output channel [x]. | X Through. (X=1~8) |
| [x]$. | Switch off the output channel [x]. | X Closed. (X=1~8) |
| [x]@. | Switch on the output channel [x]. | X Open. (X=1~8) |
| All@. | Switch on all output channels. | All Open. |

| Command | Function | Feedback Example |
|---|---|---|
| [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<br>(X1/X2=1~8) |
| [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<br>(X1/X2=1~8) |
| Status[x]. | Check the I/O connection status of output [x] | AV:   Y-> X<br>(X=1~8, Y=1~8) |
| Status. | Inquire the input channel to the output channels one by one. | AV:   1-> 1<br>AV:   2-> 2<br>AV:   3-> 3<br>AV:   4-> 4<br>AV:   5-> 5<br>AV:   6-> 6<br>AV:   7-> 7<br>AV:   8-> 8 |
| Save[Y]. | Save the present operation to the preset command [Y], ranges from 0 to 9. | Save     To     FY<br>(Y=0-9) |
| Recall[Y]. | Recall the preset command [Y]. | Recall   From   FY<br>(Y=0-9) |
| Clear[Y]. | Clear the preset command [Y]. | Clear            FY<br>(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.<br>[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]. |
| [x1]R[x2]. | Transfer the IR signal from output channel [x1] to input channel [x2]. | IR: X1-> X2<br>(X1/ X2=1~8) |

| Command | Function | Feedback Example |
|---|---|---|
| DigitAudioON[x]. | Enable HDMI audio output of port x.<br>● X=1, 2, 3, 4, 5, 6, 7, 8, enable this port.<br>● X=9, enable all the 8 ports. | DigitAudio ON with [x]<br>x=1~8 or ALL |
| DigitAudioOFF[x]. | Disable HDMI audio output of port x.<br>● X=1, 2, 3, 4, 5, 6, 7, 8, disable this port.<br>● X=9, disable all the 8 ports. | DigitAudio OFF with [x]<br>x=1~8 or ALL |
| /+[Y]/[X]:******. | Set communication between PC and HDBaseT receiver.<br>① Y is for RS232 port (connect with RS232 port of HDBaseT receiver)<br>**a.** Y = 1~8, send this command to the corresponding HDBaseT receiver to control far-end device.<br>**b.** Y = 9, send this command to all HDBaseT receivers to control all far-end devices.<br>**c.** Y = A~H, send this command to the corresponding HDBaseT receiver connected to HDBT OUT 1~8 when the switcher is powered on<br>**d.** Y = I~P, send this command to the corresponding HDBaseT receiver connected to HDBT OUT 1~8 when the switcher is powered off<br>② X is for baud rate, its value ranges from 1 to 7 (1--2400, 2--4800, 3--9600, 4--19200, 5--38400, 6—57600, 7--115200)<br>③ ***** is for data (max 48 Byte) | ****** |
| EDIDH[x]B[y]. | Input port [y] learns the EDID from output port [x].<br>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] |

| Command | Function | Feedback Example |
|---------|----------|------------------|
| 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]=1~6, correspond to the 6 embedded EDID data | EDID/[x]/[y] |
| UpgradeIntEDID[x]. | Upgrade one of the 6 embedded EDID data, x is the serial number for EDID data 1. 1080P 3D 2CH 2. 1080P 3D Multichannel 3. 1080P 2D 2CH 4. 1080P 2D Multichannel 5. 3840x2160 2D (30Hz) 6. 4096x2160 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]=1~6 | |
| GetInPortEDID[X]. | Return the EDID data of input [x], [x]=1~8 | |
| %0801. | Auto HDCP management, activate carrier native mode | %0801 |

| Command | Function | Feedback Example |
|---------|----------|------------------|
| %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 5 when PWON. | Port 5:data when PWON |
| %9956. | Check the command sent by port 6 when PWON. | Port 6:data when PWON |
| %9957. | Check the command sent by port 7 when PWON. | Port 7:data when PWON |
| %9958. | Check the command sent by port 8 when PWON. | Port 8:data when PWON |
| %9941. | Check the command sent by port 1 when PWOFF. | Port 1:data when PWOFF |
| %9942. | Check the command sent by port 2 when PWOFF. | Port 2:data when PWOFF |
| %9943. | Check the command sent by port 3 when PWOFF. | Port 3:data when PWOFF |
| %9944. | Check the command sent by port 4 when PWOFF. | Port 4:data when PWOFF |
| %9945. | Check the command sent by port 5 when PWOFF. | Port 5:data when PWOFF |
| %9946. | Check the command sent by port 6 when PWOFF. | Port 6:data when PWOFF |
| %9947. | Check the command sent by port 7 when PWOFF. | Port 7:data when PWOFF |
| %9948. | Check the command sent by port 8 when PWOFF. | Port 8:data when PWOFF |
| %9961. | Check the system locking status. | System Locked/ Unlock! |
| %9962. | Check the status while in standby mode. | STANDBY/PWON/ PWOFF |

| Command | Function | Feedback Example |
|---------|----------|------------------|
| %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        1 2 3 4<br>Connect  N Y Y Y<br>In        5 6 7 8<br>Connect  N Y Y Y |
| %9972. | Check the connection status of the outputs. | Out      1 2 3 4<br>Connect  N Y Y Y<br>Out      5 6 7 8<br>Connect  N Y Y Y |
| %9973. | Check the HDCP status of the inputs. | In        1 2 3 4<br>HDCP     N N Y Y<br>In        5 6 7 8<br>HDCP     N N Y Y |
| %9974. | Check the HDCP status of the outputs. | Out      1 2 3 4<br>HDCP     N N Y Y<br>Out      5 6 7 8<br>HDCP     N N Y Y |
| %9975. | Check the I/O connection status. | Out      1 2 3 4<br>In       1 2 3 4<br>Out      5 6 7 8<br>In     5 6 7 8 |
| %9976. | Check the output resolution. | Resolution<br>Out  1    0000x0000<br>Out  2    1920x1080<br>Out  3    1920x1080<br>Out  4    1920x1080<br>Out  5    0000x0000<br>Out  6    1920x1080<br>Out  7    1920x1080<br>Out 8   1920x1080 |
| %9977. | Check the status of digital audio of output channels. | Out      1 2 3 4<br>Audio    Y Y Y Y<br>Out      5 6 7 8<br>Audio    Y Y Y Y |

| Command | Function | Feedback Example |
|---------|----------|------------------|
| %9978. | Check the HDCP compliant status of the inputs. | In      1 2 3 4<br>HDCPEN   Y Y Y Y<br>In      5 6 7 8<br>HDCPEN   Y Y Y Y |

### 4.3.5 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:
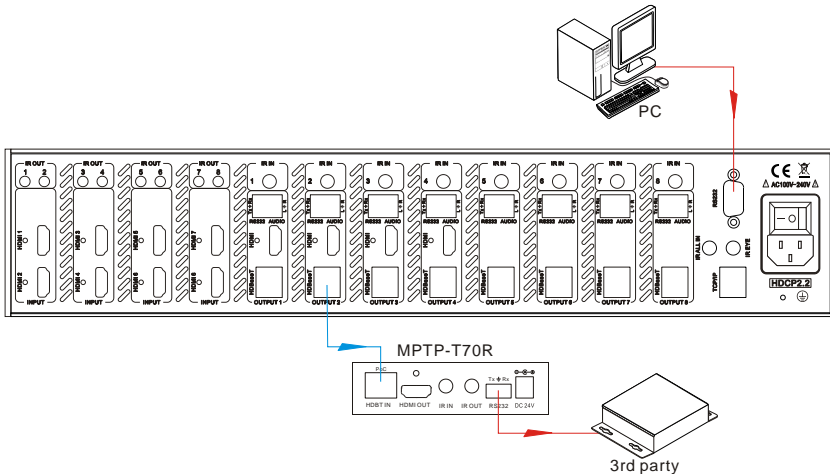


#### Control the switcher& 3rd-party Device through 9 pin female RS232 port

● Control the switcher: send RS232 commands directly

● Control 3rd party: send command: "**/+[Y]/[X]:******.**" (Refer to     for detailed information.)

### 4.3.6 Control through 3-pin RS232 port

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:
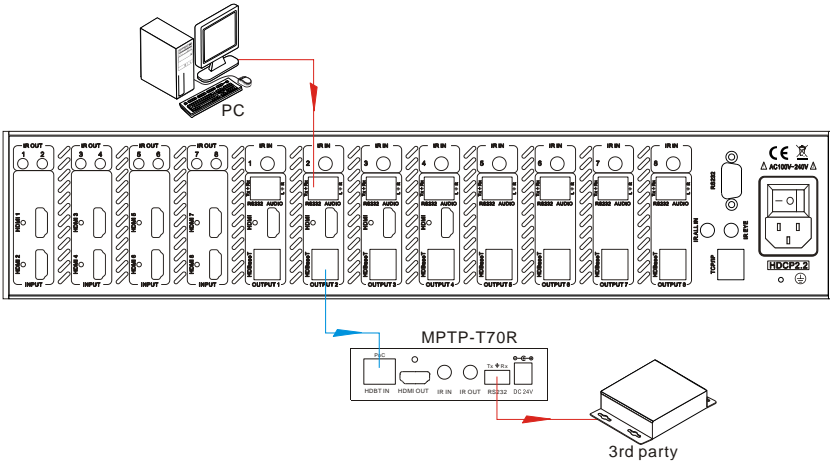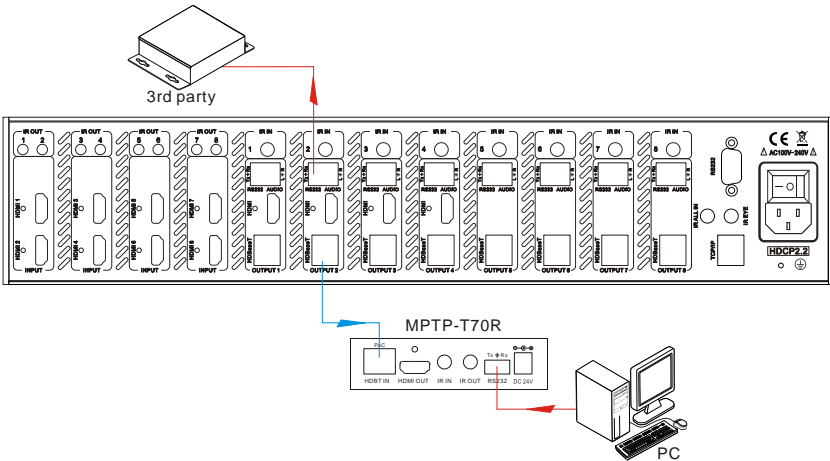
**Control far-end device from local**

● **Control the MPM-88-IR-N 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 local device from remote**

## 4.4 TCP/IP Control

MPM-88-IR-N boasts option TCP/IP port for IP control.

Default settings: IP: 192.168.0.178; Subnet Mast: 255.255.255.0; Gateway: 192.168.0.1; Serial Port: 8080.

IP& gateway can be changed as you need, Serial Port cannot be changed.

Connect the ethernet port of control device and TCP/IP port of MPM-88-IR-N, and set same network segment for the 2 devices, users are able to control the device via web-based GUI or designed TCP/IP communication software.

### 4.4.1 Control Modes

MPM-88-IR-N can be controlled by PC without ethernet access or PC(s) within a LAN.

● **Controlled by PC without ethernet access**
Connect a computer to the TCP/IP port of the MPM-88-IR-N, and set its network segment to the same as the MPM-88-IR-N's.
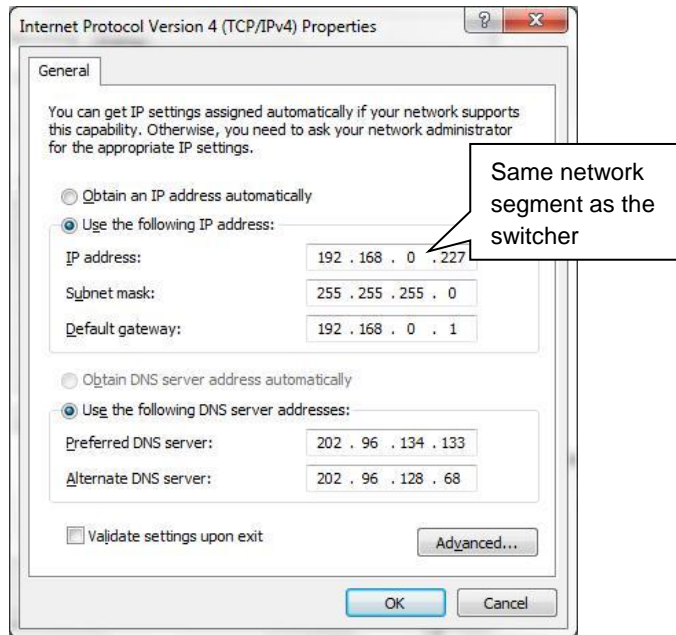


● **Controlled by PC(s) in LAN**
Connect MPM-88-IR-N, a router and several PCs to setup a LAN (as shown in the following figure). Set the network segment of MPM-88-IR-N to the same as the router's, then PCs within the LAN are able to control MPM-88-IR-N.
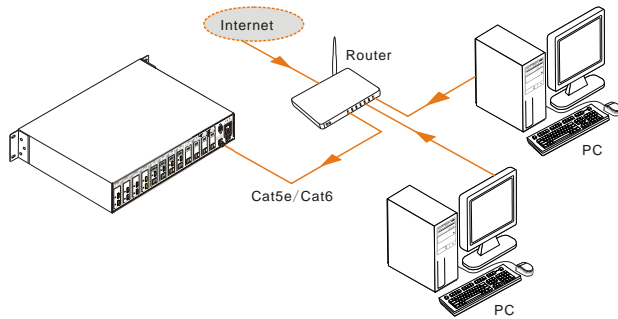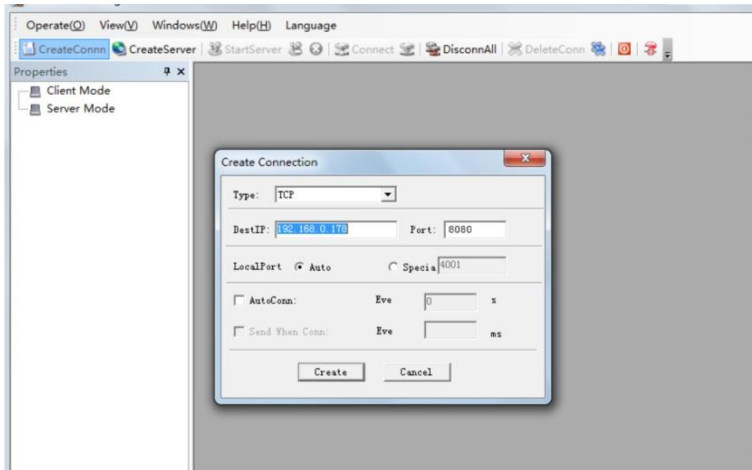
Follow these steps to connect the devices:

**Step1.** Connect the TCP/IP port of the MPM-88-IR-N to Ethernet port of PC with twisted pair.

**Step2.** Set the PC's network segment to the same as the MPM-88-IR-N's. Do please remember the PC's original network segment.

**Step3.** Set the MPM-88-IR-N's network segment to the same as the router.

**Step4.** Set the PC's network segment to the original ones.

**Step5.** Connect the MPM-88-IR-N and PC(s) to the router. PC(s) within the LAN is able to control the MPM-88-IR-N asynchronously.
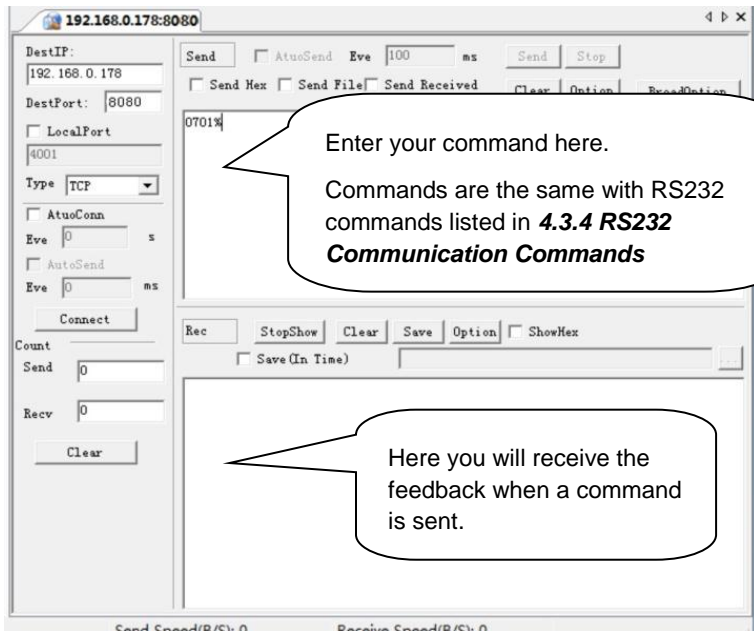
### 4.4.2 Control via TCP/IP communication software

(Exampled by TCPUDP software)

**1)** Connect a computer and MPM-88-IR-N to the same network. Open the TCPUDP software (or any other TCP/IP communication software) and create a connection, enter the IP address and port of MPM-88-IR-N (default IP: 192.168.0.178, port:8080):

**2)** After connect successfully, we can enter commands to control the MPM-88-IR-N, as below:



Enter your command here.

Commands are the same with RS232 commands listed in *4.3.4 RS232 Communication Commands*

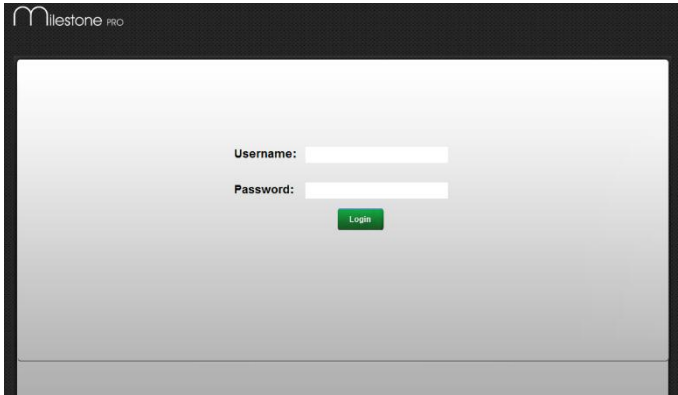Here you will receive the feedback when a command is sent.

### 4.4.3 GUI for TCP/IP control

MPM-88-IR-N provides with built-in GUI for convenient TCP/IP control. GUI allows users

to interact with MPM-88-IR-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 accounts to log in. Type the right name and password in relative column and click **Login** to enter the main interface.

- ➢ **Name**: admin; **Password**: admin (default setting, changeable via GUI)
- ➢ **Name**: user; **Password**: user (default setting, changeable via GUI)

Log in as admin can access more configuration interfaces than user.

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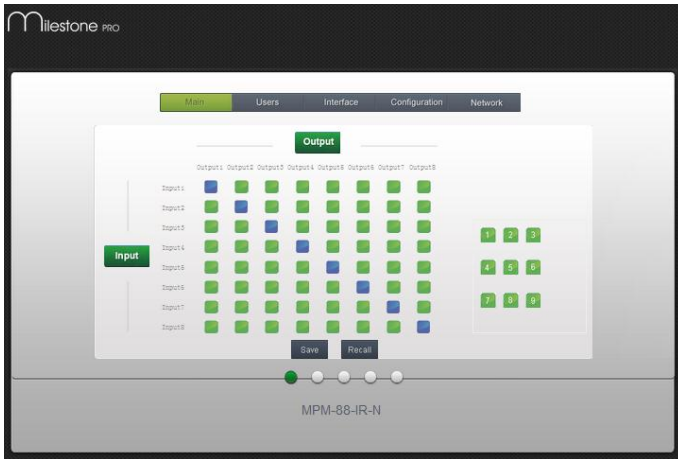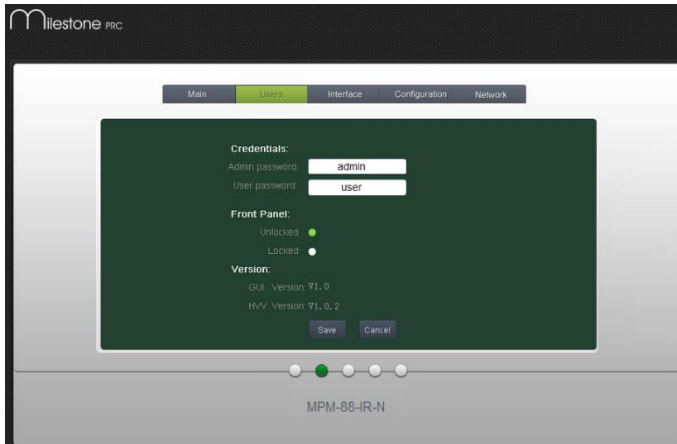


The button matrix displays every possible connection between every input and output, users can carry on the connections by clicking corresponding button.

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

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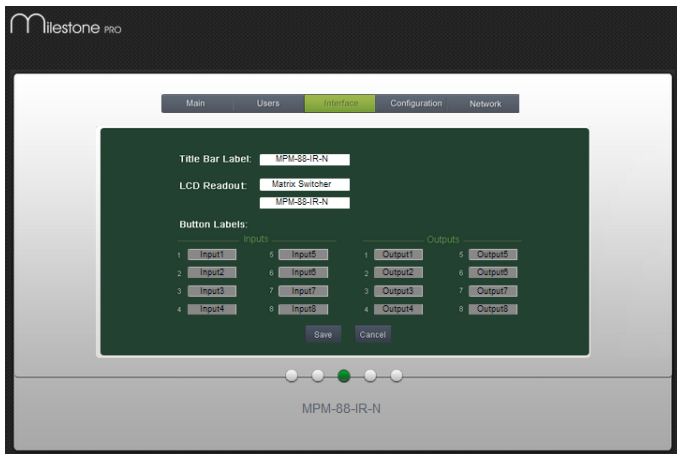
**Users:** Display or modify credential settings, front panel lock, and GUI version.
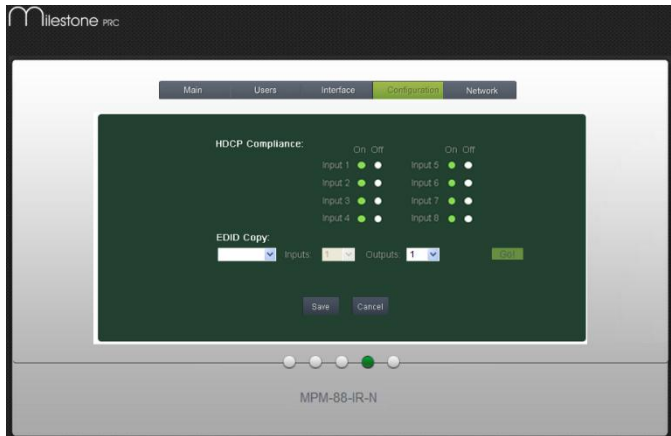


If there is any modification, press Save to restore the settings, or press Cancel to withdraw.

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



**Configuration:** Set HDCP Cmpliance 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
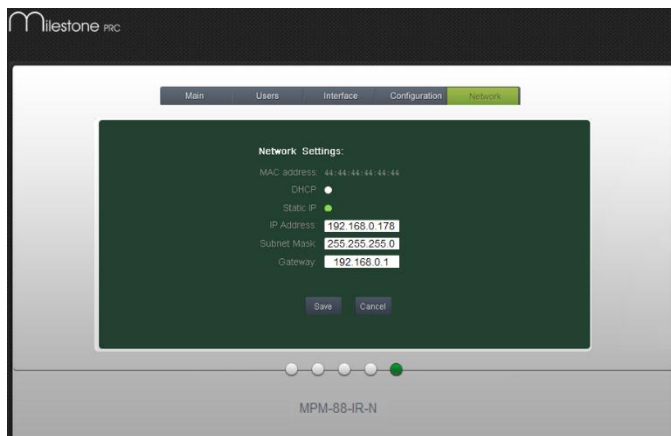


**Note:** Log in as user access main interface only.

### 4.4.4 Port Management

Type the designed website 192.168.0.178:100 (Default, changeable via GUI) in your browser. Enter correct username and password (same with GUI name and password) to log in the WebServer:

Here is the main configuration interface of the WebServer:

**In this interface, you can:**

➢ Change website display language
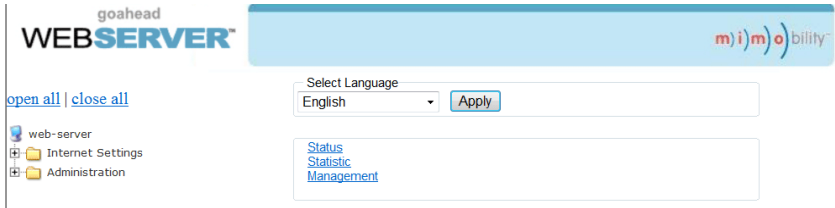
➢ Modify network settings: Go to Internet Settings -> WAN

➢ Upgrade TCP/IP module: Go to Administration -> Upload Program -> Select
program file -> Start upgrading

Reboot the device after upgrading.

## 4.5 Firmware Update via USB

MPM-88-IR-N boasts a USB port for online firmware upgrade on the front panel. Follow
these steps to upgrade firmware:

**Step1.** Copy the upgrade software and the latest upgrade file (.bin) to PC.

**Step2.** Connect the USB ports of MPM-88-IR-N and the PC via USB cable.

**Step3.** Double-click the update software icon (see as below).



It will enter the upgrade interface shown as below:
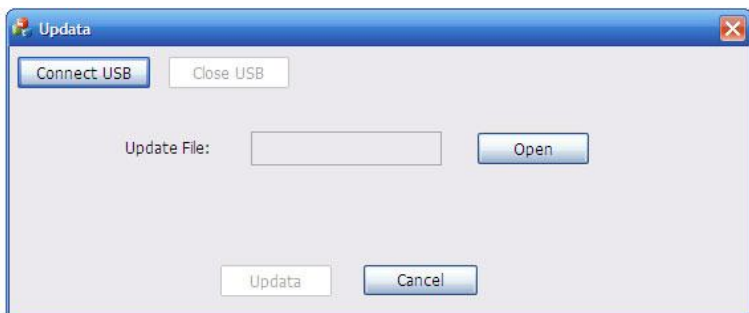


**Step4.** Click **Connect USB**.

**Step5.** Click **Open** to load the upgrade file, then click **Updata** to start firmware
upgrading.

**Note:** To ensure available control, the COM number of the PC should be 1~9.

## 5. Specification

| Video Input | | Video Output | |
|---|---|---|---|
| Input | 8 HDMI | Output | 4 HDMI<br>8 HDBaseT |
| Input Connector | Female HDMI | Output Connector | Female HDMI<br>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) |
| | | HDBaseT Output | Up to 70m1080P@60Hz/ 40m4Kx2K@30Hz |
| **Video General** | | | |
| Gain | 0 dB | Bandwidth | 10.2 Gbit/s |
| Video Signal | HDMI (or DVI-D) | Maximum Pixel Clock | 225MHz |
| Resolution Range | Up to 4Kx2K, 1080P 3D | Switching Speed | 200ns (Max.) |
| Max Pixel Clock | 225MHz | EDID Management | In-built EDID data and manual EDID management |
| **Audio General** | | | |
| Output Signal | Analog audio | Output Connector | 3-pin pluggable terminal block |
| PCM Format | Distortion: 0.1% 32Ω/70mW@1KHz, 0.1% 16Ω/105mW @1KHz | Frequency Response | 20Hz~20KHz |
| CMRR | >90dB @20Hz ~ 20KHz | | |
| **Control Parts** | | | |
| Control Ports | 8 IR OUT (green and red)<br>8 IR IN (black)<br>1 IR EYE (black)<br>1 IR ALL IN (black)<br>1 TCP/IP (female RJ45)<br>1 RS232 (9 pin female)<br>8 RS232s (3-pin pluggable terminal | Panel Control | Front panel buttons |

| | blocks) | | |
|---|---|---|---|
| IR Control | In-built IR sensor, Extended IR receiver | RS232 Control | 9 pin female |
| TCP/IP Control | Works with In-built web GUI | | |
| **General** | | | |
| Power Supply | 100V~240V AC | Power Consumption | 110W (full load) |
| Temperature | -10 ~ +40℃ | Reference Humidity | 10% ~ 90% |
| Dimension (W*H*D) | 437 x 87.8 x 380 mm | Weight | 5.4Kg |

# 6. Troubleshooting & Maintenance

| Problems | Causes | Solutions |
|---|---|---|
| Color losing or no video signal output | The connecting cables may not be connected correctly or it may be broken. | Check whether the cables are connected correctly and in working condition. |
| | Fail or loose connection | Make sure the connection is good |
| No output image when switching | No signal at the input / output end | Check with oscilloscope or multimeter if there is any signal at the input/ output end. |
| | Fail or loose connection | Make sure the connection is good |
| | Input source is with HDCP while the HDCP compliance is switched off. | Send command /%[Y]/[X]:1. or change HDCP compliance status in GUI. |
| | The display doesn't support the input resolution. | Switch for another input source or enable the display to learn the EDID data of the input. |
| Cannot control the device via front panel buttons | Front panel buttons are locked. | Send command /%Unlock; or select unlock in GUI interface to unlock |
| Cannot control the device via IR remote | The battery has run off. | Change for new battery. |
| | The IR remote is broken. | Send it to authorized dealer for repairing. |
| | Beyond the effective range of the IR signal or not pointing at the IR receiver | Adjust the distance and angle and point right at the IR receiver. |
| | The IR receiver connected to IR IN/ IR ALL IN port is not with carrier | Change for an IR receiver with carrier. |
| Power Indicator remains off when powered on | Fail or loose power connection | Check whether the cables are connected correctly |

| EDID management does not work normally | The HDMI cable is broken at the output end. | Change for another HDMI cable which is in good working condition. |
|---|---|---|
| There is a blank screen on the display when switching | The display does not support the resolution of the video source. | Switch again. |
| | | Manage the EDID data manually to make the resolution of the video source automatically compliant with the output resolution. |
| Cannot control the device by control device (e.g. a PC) through RS232 port | Wrong connection | Check to ensure the connection between the control device and the unit |
| | Wrong RS232 communication parameters | Type in correct RS232 communication parameters: Baud rate:9600; Data bit: 8; Stop bit: 1; Parity bit: none |
| | Broken RS232 port | Send it to authorized dealer for checking. |
| Static becomes stronger when connecting the video connectors | Bad grounding | Check the grounding and make sure it is connected well. |
| Cannot control the device by RS232 / IR remote / front panel buttons | The device has already been broken. | Send it to authorized dealer for repairing. |

If your problem persists after following the above troubleshooting steps, seek further help from authorized dealer or our technical support.

# 7. After-sales Service

If there appear some problems when running the device, please check and deal with the problems reference to this user manual.

1) **Product Limited Warranty:** We warrant that our products will be free from defects in materials and workmanship for **three years,** which starts from the first day the product leaves warehouse (check the SN mark on the product).
   Proof of purchase in the form of a bill of sale or receipted invoice must be presented to obtain warranty service.

2) **What the warranty does not cover:**
   - Warranty expiration.
   - Factory applied serial number has been altered or removed from the product.
   - Damage, deterioration or malfunction caused by:
     - Normal wear and tear
     - Use of supplies or parts not meeting our specifications
     - No certificate or invoice as the proof of warranty.
     - The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
     - Damage caused by force majeure.
     - Servicing not authorized
     - Other causes which does not relate to a product defect
   - Delivery, installation or labor charges for installation or setup of the product

3) **Technical Support:** Email to our after-sales department or make a call, please inform us the following information about your cases.
   - Product version and name.
   - Detailed failure situations.
   - The formation of the cases.

**Remarks**: For any questions or problems, please try to get help from your local distributor.