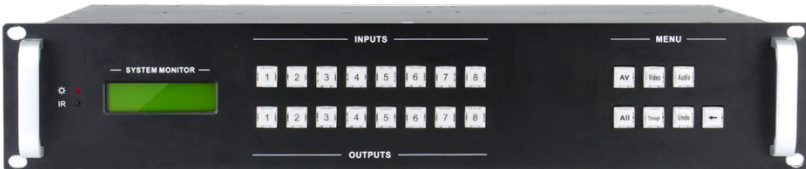


User Manual

WOXCON

MMX88-N

Modular Matrix Switcher 8x8



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Version: MMX88-N_2017V1.0

Modular Matrix Switcher 8x8

Preface

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

This manual is only for operation instruction only, not for any maintenance usage. In the constant effort to improve our product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

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.



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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.

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1. Introduction

1.1. About MMX88-N

The MMX88-N is a high-performance 8x8 video and audio modular matrix switcher. It supports different video signals with cross switching. Every AV signal is transmitted and switched independently to decrease signal attenuation. MMX88-N supports various changeable cards including HDMI, DVI, VGA, SDI and HDBaseT etc. Users can choose to insert different signal card for different application.

MMX88-N has 1 RS232 port and 1 TCP/IP port for convenient control from third-party. With its flexible design, MMX88-N can be used for different project and tend to be an all-in-one solution. It is the combo solution for multimedia conference rooms, control rooms, broadcasting rooms, shopping center etc. It will handle all the audiovisual management, including the switching, driving, scaling etc.

1.2. Features

- Modular chassis with configurable I/O slots, ranging from 4x4 to 8x8
- Various I/O cards, includes HDMI, HDBaseT, SD/HD/3G-SDI, DVI and VGA cards (Compatible with YUV, YC & CVBS.) to configure any matrix
- Truly cross-point switching, any input to any output, regardless signal format
- Support HDMI1.4a, support 3D
- Integrated HDBaseT technology
- Controllable via button, RS232 & optional TCP/IP, also compatible with 3rd parties control
- HDCP compliant
- LCD display

1.3. MMX Signal Card

The MMX88-N supports multiple signal cards as listed in the following charts:

	Spec		
	Models	Inputs	Signal Format
Input Cards	4I-HD	4	HDMI
	4I-HS	4	HDMI& analog audio
	4I-DV	4	DVI
	4I-DS	4	DVI, HDMI, VGA, AV, YPbPr
	4I-VG	4	VGA
	4I-VA	4	VGA& analog audio
	4I-SD	4 inputs& LOOP	SDI
	4I-SS	4 inputs& LOOP	SDI
	4I-TP	4	HDMI TP, IR, RS232
	4I-UH	4	HDMI& analog Audio
	4I-UF	4	Optical Fiber
	4I-BT	4	HDBT, RS232, Audio

	Spec		
	Models	Outputs	Signal Format
Output Cards	4O-HD	4	HDMI
	4O-HS	4	HDMI& analog audio
	4O-DV	4	DVI
	4O-DS	4	DVI, HDMI, VGA, AV, YPbPr
	4O-VG	4 VGA& Stereo audio	VGA, analog audio
	4O-SD	4 outputs& LOOP	SDI
	4O-TP	4	HDMI TP, IR, RS232
	4O-UH	4	HDMI& analog Audio
	4O-UF	4	Optical Fiber
	4O-BT	4	HDBT, RS232, Audio

1.4. Package List

- ✓ 1 x MMX88-N
- ✓ 1 x IR remote (Not include battery)
- ✓ 1 x RS232 cable
- ✓ 1 x Power Cord
- ✓ 4 x Plastic cushions
- ✓ 1 x User manual

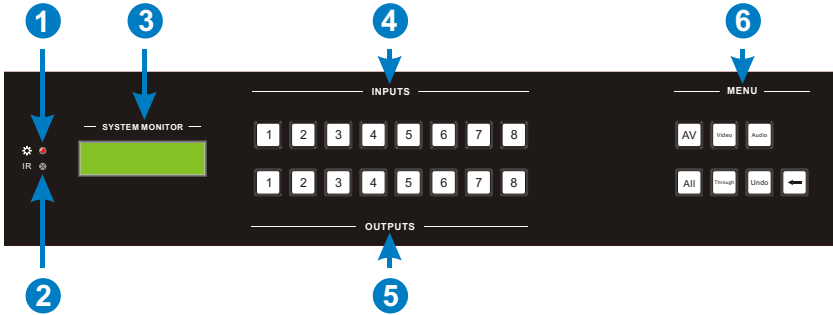
Note: Confirm all the accessories are included, if not, please contact with the dealers.

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2. Panel Description

2.1. MMX88-N

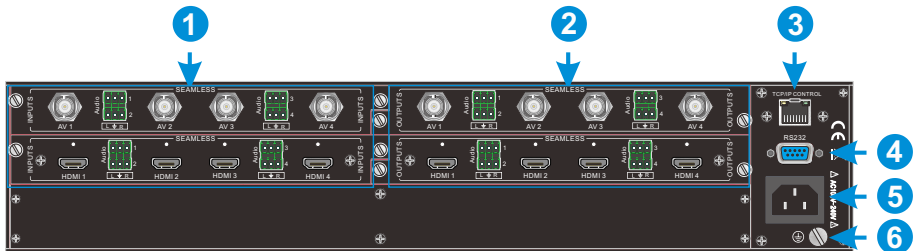
2.1.1. Front Panel



No.	Name	Description
①	IR	IR sensor, receive IR signal sent from IR remote
②	Power LED	Illuminate red once powered on
③	LCD Screen	Display real-time operation status
④	INPUTS	Back-lit buttons for input selection, ranges from 1~8, correspond to 1~8 sources on input signal cards (counting from left to right, top to bottom)
⑤	OUTPUTS	Back-lit buttons for output selection, ranges from 1~8, correspond to 1~8 displays on output signal cards (counting from left to right, top to bottom)
⑥	MENU	AV: Transfer AV signal from AV signal card.
		VIDEO: Transfer AV signal from AV signal card only.
		AUDIO: Unavailable.
		ALL: Select all input/output channel
		THROUGH: To transfer the signals directly to the corresponding output channels.
		UNDO: Undo button, to resume to the status before the command just performed.
		←: Backspace button, to backspace the last press.

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2.1.2. Rear Panel



No.	Name	Description
①	INPUTS	Input signal card slots, 2 in total, insert necessary input cards here
②	OUTPUTS	Output signal card slots, 2 in total, insert necessary output cards here
③	TCP/IP	RJ45 connector for TCP/IP control
④	RS232	Serial control port for RS232 control
⑤	Power port	Connect with household alternating current power
⑥	GND connector	Used for system grounding

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2.2. Changeable Cards

MMX88-N support expansion through various changeable input/ output cards of different signals including DVI, HDMI, VGA, twisted pair, SDI etc. Here is a brief introduction to the changeable cards.

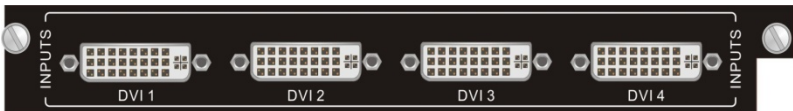
2.2.1. 4I-DV & 4O-DV

DVI signal card. (Please check the specification from 5.2.1)

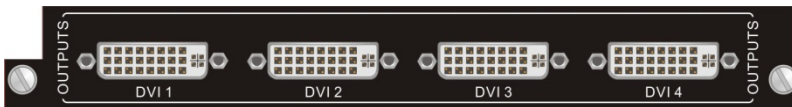
It is fully compatible with HDMI1.3 and HDCP, but not supporting analog signal.

It is embedded EDID management technology, supporting DDC.

4I-DV: input card, maximum four input signal. Input signal can pass to output device through 4O-DV or other kinds of output cards.



4O-DV: output card, maximum four output signal, output signals from 4I-DV, or other kinds of input cards.



Pin Layout of the DVI-I connector (Dual-Link). (Female)



Pin	Function	Pin	Function
1	T.M.D.S.Data2-	13	T.M.D.S.Data3+
2	T.M.D.S.Data2+	14	+5V Power
3	T.M.D.S. Data 2/4 Shield	15	Ground (return for +5V, Hsync and Vsync)
4	T.M.D.S. Data 4-	16	Hot Plug Detect
5	T.M.D.S. Data 4+	17	T.M.D.S. Data 0-
6	DDC Clock	18	T.M.D.S. Data 0+
7	DDC Data	19	T.M.D.S. Data 0/5 Shield
8	Analog Vertical Sync	20	T.M.D.S.Data5-

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9	T.M.D.S.Data1-	21	T.M.D.S.Data5+
10	T.M.D.S.Data1+	22	T.M.D.S. Clock Shield
11	T.M.D.S.Data1/3 Shield	23	T.M.D. S. Clock +
12	T.M.D.S.Data3-	13	T.M.D.S.Data3+
C1	RED	C2	Analog Green
C3	Analog Blue	C4	Horizontal Sync Analog
C5	GND		

Note: Pin C1~C5 are not used in 4I-DV & 4O-DV.

2.2.2. 4I-DS& 4O-DS

Seamless DVI signal card. (Please check the specification from 5.2.2)

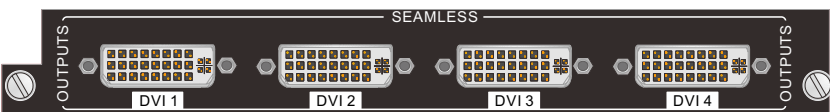
It is fully compatible with HDMI1.3& HDCP, and supports seamless transmission for high-definition DVI, HDMI, VGA, AV, YPbPr signals. Signal format can be modified via RS232 commands.

It boasts embedded EDID management (only for HDMI/ DVI signal), supporting DDC.

4I-DS: seamless input card, maximum four input signal. It can automatically identify the format of input signal. Input signal can pass to output device through 4O-DS, or other kinds of output cards.



4O-DS: seamless output card, maximum four output signal. Automatically recognize output signal (HDMI/ DVI), and output resolution is adjustable. Output signal can come from 4I-DS, or from other kinds of input cards. It supports off memory for resolution, signal format, HDCP compliant status.



Note:

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- When 4O-DS works with input cards except 4I-DS, to ensure reliable seamless output, adjust the input signals to any one of the following 5 resolutions: 1024x768, 1280x720, 1600x1200, 1920x1080, 1920x1200.
- Before using 4O-DS, upgrade the front-board and backboard of MMX88-N. Seek technical assistant from our technical supporters.
- DVI interfaces on the signal card are same with the interfaces on 4I-DV& 4O-DV. Pin C1~C5 are used in 4I-DS & 4O-DS.

When connecting to VGA, YPbPr or C-VIDEO signal, insert converting cables according to specific pin definitions (see the figures below):

DVI- C-VIDEO:



Pin	Signal
C1	Yellow
C5	GND
Other pins are unused.	

DVI- YPbPr:



Pin	Signal	Pin	Signal
C1	RED	C2	GREEN
C3	BLUE	C5	GND
Other pins are unused.			

DVI- VGA (female):



Pin	Signal	Pin	Signal
C1	RED	C2	GND
C3	GREEN	C4	Horizontal Sync Analog
8	Vertical Sync Analog		
Other pins are unused.			

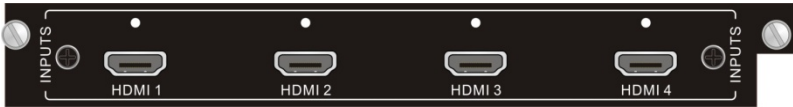
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2.2.3. 4I-HD & 4O-HD

HDMI signal card. (Please check the specification from 5.2.3)

It boasts embedded EDID management, and supports DDC. It's also compliant with DVI signal & HDCP.

4I-HD: input card, maximum four input signal. Input signal can pass to output device through 4O-HD, or other kinds of output cards.

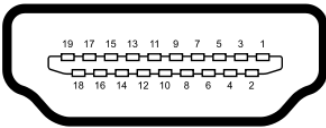


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4O-HD: output card, maximum four output signal, output signals from 4I-HD, or other kinds of input cards.



Pin layout of the HDMI connectors (female).



No.	Signal	No.	Signal
1	TMDS Data 2+	20	SHELL
2	TMDS Data 2 Shield	19	Hot Plug Detect
3	TMDS Data 2-	18	+5V Power
4	TMDS Data 1+	17	Ground
5	TMDS Data 1 Shield	16	DDC Data
6	TMDS Data 1-	15	DDC Clock
7	TMDS Data 0+	14	No Connect
8	TMDS Data 0 Shield	13	CEC
9	TMDS Data 0-	12	TMDS Clock-
10	TMDS Clock+	11	TMDS Clock Shield

2.2.4. 4I-HS & 4O-HS

Seamless HDMI signal card with auxiliary audio port (Please check the specification from 5.2.4)

It boasts seamless switch that provides real-time audio& video switching; support HDMI1.3& HDCP1.2, compliant with DVI signal;

HDMI embeded audio and auxiliary stereo audio supports PCM format, audio source selectable via designed command (default: HDMI embeded audio);

Built in scaler handles various resolution, output resolution adjustable via command.

4I-HS: input card, maximum four input signal. Input signal can pass to output device through 4O-HS, or other kinds of output cards.



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4O-HS: output card, maximum four output signal, output signals from 4I-HS, or other kinds of input cards.



HDMI connectors of 4I-HS & 4O-HS are same with the 4I-HD & 4O-HD.

Note: When 4O-HS works with input cards except 4I-HS, to ensure reliable seamless output, adjust all the input signals to the same designed resolution: 1024x768, 1280x720, 1600x1200, 1920x1080, or 1920x1200.

2.2.5. 4I-VG & 4O-VG

VGA signal card. (Please check the specification from 5.2.5)

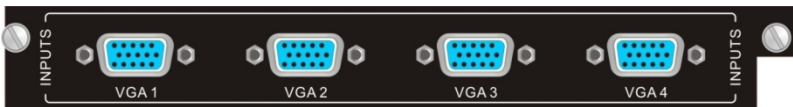
Scale all inputs to 1080p or 1920x1200

The bandwidth is up to 350MHz (-3dB);

Input signal can be VGA (RGBHV), YPbPr, S-video, C-video or CVBS;

Output card only supports VGA output

4I-VG: input card, maximum four input signal, support VGA (RGBHV), YPbPr, S-video, C-video& CVBS. Input signal can pass to output device through any kinds of output cards.

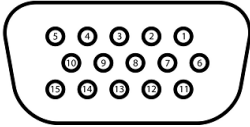


4O-VG: output card, maximum four VGA output signal and 4 stereo audio outputs, output video signal from 4I-VG, or other kinds of input cards, and output audio signal from the audio of the input signal.



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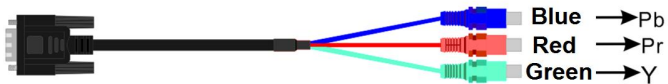
Pin layout of the VGA connectors (female):



Pin	Signal	Pin	Signal
1	RED	9	KEY/PWR
2	GREEN	10	GND
3	BLUE	11	ID0/RES
4	ID2/RES	12	ID1/SDA
5	GND	13	HSync
6	RED_RTN	14	VSync
7	GREEN_RTN	15	ID3/SCL
8	BLUE_RTN		

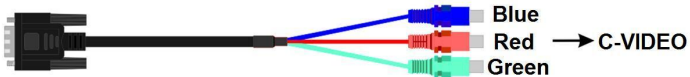
When connecting to YPbPr or C-VIDEO signal, insert converting cables according to specific pin definitions (see the figures below):

VGA- YPbPr:



Pin	Signal	Pin	Signal
1	RED	6	GND
2	GREEN	7	GND
3	BLUE	8	GND
Other pins are not used.			

VGA- C-VIDEO:



Pin	Signal	Pin	Signal
1	RED	6	GND
7	GND	8	GND
Other pins are not used.			

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2.2.6. 4I-VA

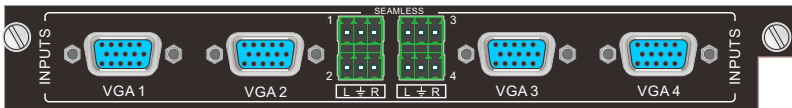
VGA signal card. (Please check the specification from 5.2.6)

Scale all inputs to 1080p or 1920x1200;

Input signal can be VGA (RGBHV), YPbPr, S-video, C-video or CVBS;

4 stereo audio inputs.

4I-VA: input card, maximum four VGA inputs and four stereo audio inputs. Input signal can pass to output device through any kinds of output cards.



The VGA connector and source connection are same with the 4I-VG.

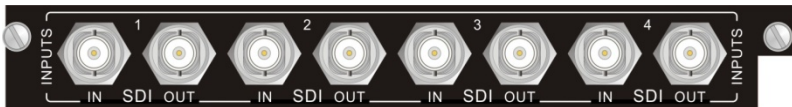
2.2.7. 4I-SD & 4O-SD

SDI signal card. (Please check the specification from 5.2.7)

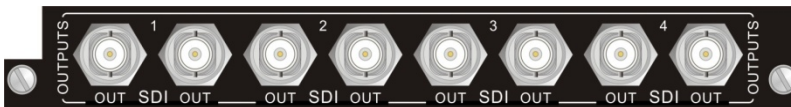
It is compatible with different SDI signal formats, including SD/HD/3G-SDI (adaptive)

Every port has loop output for local monitoring.

4I-SD: input card, maximum four input signal. Input signal can pass to output device through 4O-SD, or other kinds of output cards.



4O-SD: output card, maximum four output signal, output signals from 4I-SD, or other kinds of input cards.



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2.2.8. 4I-SS

Seamless SDI signal card (Please check the specification from 5.2.8)

It is compatible with different SDI signal formats, including SD/HD/3G-SDI (adaptive), support seamless transmission for high-definition signal up to 1080p;

Auto-detect input resolution and scale to 1080p@60Hz (default resolution, adjustable via command);

Every port has loop output for local monitoring.

4I-SS: input card, maximum four input signal. Input signal can pass to output device through 4O-SD, or other kinds of output cards.



BNC connectors are same with 4I-SD & 4O-SD's.

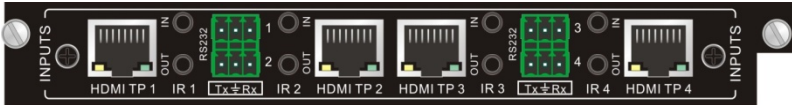
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2.2.9. 4I-TP & 4O-TP

Twisted pair card (HDMI/DVI extender). (Please check the specification from 5.2.9)

Support HDTV, compatible with HDMI1.3 and HDCP

4I-TP: input card, maximum input four HDMI TP signal. Input signal can pass to output device through 4O-TP, or other kinds of output cards, need to work with TPHD402T.



4O-TP: output card, maximum output four HDMI TP signal, output signals from 4I-TP, or other kinds of input cards, need to work with TPHD402R.

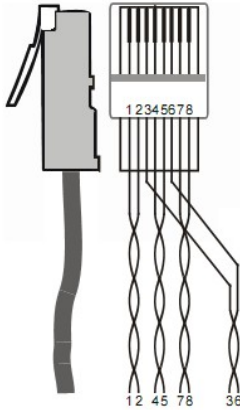


How the indicators work:

Color	Definition	Status
Yellow	Power Indicator	Blink once powered on; Turn off when there is no power.
Green	Link Indicator	Light when the port is connected with CAT5e/6; Turn off when there is no connection.

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Pin layout of the HDBT connector:



Pin	Color
1	orange white
2	orange
3	green white
4	blue
5	blue white
6	green
7	brown white
8	brown

1st Group	4--5
2nd Group	1--2
3rd Group	3--6
4th Group	7--8

Note: Cable connectors MUST be metal one, and the shielded layer of cable MUST be connected to the connector’s metal shell, to well share the grounding.

2.2.10. 4I-UH & 4O-UH

4K HDMI signal card. (Please check the specification from 5.2.10)

Support HDMI 1.4a& HDCP 1.4 compliance; Compatible with DVI signal; Support high-definition HDMI source up to 4kx2k, 1080p 3D compliance;

Provide auxiliary audio port as supplement to HDMI embedded audio, audio source selectable via command “AUDIO[X]||[Z].”, [X] stands for output port, [Z] stands for audio source (0 is for HDMI embedded audio, 1 is for analog audio)

It also boasts embedded EDID management.

4I-UH: input card, maximum four input signal. Input signal can pass to output device through 4O-UH, or other kinds of output cards.



Note: When matching with output cards that do not support 4kx2k, adjust the input resolution to 1080p to enable reliable output.

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4O-UH: output card, maximum four output signal, output signals from 4I-UH, or other kinds of input cards, HDCP compliant status settable via RS232 command



The HDMI connector is same with 4I-HD& 4O-HD's.

2.2.11. 4I-UF & 4O-UF

4K optical signal card. (Please check the specification from 5.2.11)

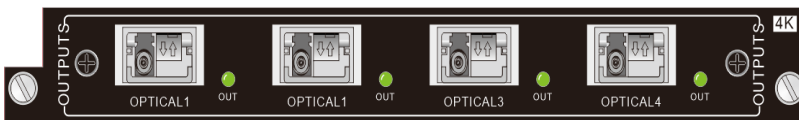
Work with single-mode/ multi-mode module to realize long-distance optical fiber transmission, support multi-mode transmission up to 300m and single mode transmission up to 2km.

High bandwidth: 10.2Gbps; Compliant with HDMI 1.4, capable to transmit 4Kx2K& 1080P 3D (max) signals;

4I-UF: input card with indicators, maximum four input signal, corresponding indicator illuminates green when there is input signal. Input signal can pass to output device through 4O-UF, or pass through other kinds of output cards.



4O-UF: output card with indicators, maximum four output signal, output signals from 4I-UF, or other kinds of input cards; corresponding indicator illuminates green when there is output signal.



Note:

- Use the 4I-UF/ 4O-UF with optical fiber transmitter/ receiver.
- Multi-mode transmission may include the following cases:
Single-mode optical fiber module& Multi-mode optical fiber cable

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Multi-mode optical fiber module& Multi-mode optical fiber cable

- Before using 4I-UF & 4O-UF, upgrade the front-board and backboard of MMX88-N. Seek technical assistant from our technical supporters.

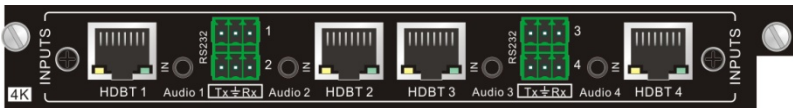
2.2.12. 4I-BT & 4O-BT

4K Twisted pair card (Please check the specification from 5.2.12)

Support HDTV, compatible with HDBT 1.0, HDMI1.4a& HDCP1.4; Wide resolution range from 480p~ 4kx2k, 1080p 3D compliant; Extend HDBT signal up to 70m at 1080p or 40m at 4k; Bi-directional RS232 transmission on single cable; Audio source selectable via corresponding command; Auxiliary audio ports support stereo signal.

It also boasts embedded EDID management.

4I-BT: input card, maximum input four HDBT signal. Input signal can pass to output device through 4O-BT, or other kinds of output cards, need to work with HDBT transmitter (e.g. TPHD402T).



Note: When matching with output cards that do not support 4kx2k, adjust the input resolution to 1080p to enable reliable output.

4O-BT: output card, maximum output four HDBT signal, output signals from 4I-BT, or other kinds of input cards, need to work with HDBT receiver (e.g. TPHD402R).



The indicators and pin layout is the same with 4I-TP & 4O-TP's. Refer to 2.2.9 4I-TP & 4O-TP for detailed information.

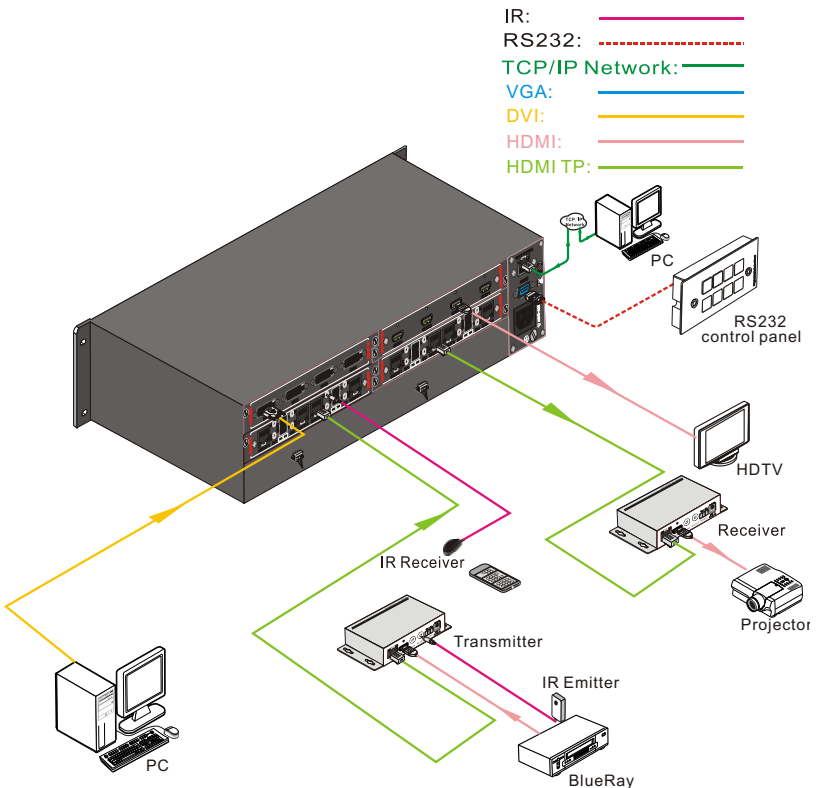
Modular Matrix Switcher 8x8

3. System Connection

3.1. Usage Precautions

- Verify all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All of the power switches, plugs, sockets and power cords should be insulated and safe.
- All devices should be connected before power on

3.2. Connection Diagram



Note: All the input/output signal cards don't support hot-plug while input& output ports on the cards support hot-plug.

4. Control Operations

4.1. Front Panel Button Control

Users can control MMX88-N rapidly and directly with its front panel buttons. Here is a brief operation guide to front panel buttons.

Format: **“Input Channel”** + **“Switch Mode”** + **“Output Channel”**

Note:

1) “Switch Mode”:

AV: Transfer AV signal from AV signal card& audio signal from audio card synchronously

Video: Transfer AV signal from AV signal card

Audio: Transfer audio signal from audio card

- 2) “Input Channel”:** Fill with the number of input channel to be controlled,
- 3) “Output Channel”:** Fill with the number of output channels to be controlled. Press **“All”** to select all the outputs.
- 4) The input/output channels on the rear panel are counting from left to right, top to bottom.**
- 5) The input delay time between two numbers of every input& output channel must be less than 5 seconds; otherwise the operation will be cancelled.**

Example:

- *To transfer input 1 to output 1, press input “1”, output “1”.*
- *To transfer signals from input 1 to all output channels, press buttons in this order: “1”, “All”.*

Functional Buttons:

UNDO button: return to the previous status

Example: Input 6 is connecting with output 6, press input **“6”** + **“AV”**+ output 4 to change the connection. Press **“Undo”** to enable input 6 to reconnect with output 6.

← button: If you press buttons **“1”**, **“AV”**, **“2”**, **“←”** in order, then **“2”** will be canceled.

THROUGH button: get straight I/O connection, e.g. input 1-> output 1, input 2-> output 2.

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Press "Input Channel" + "Through"

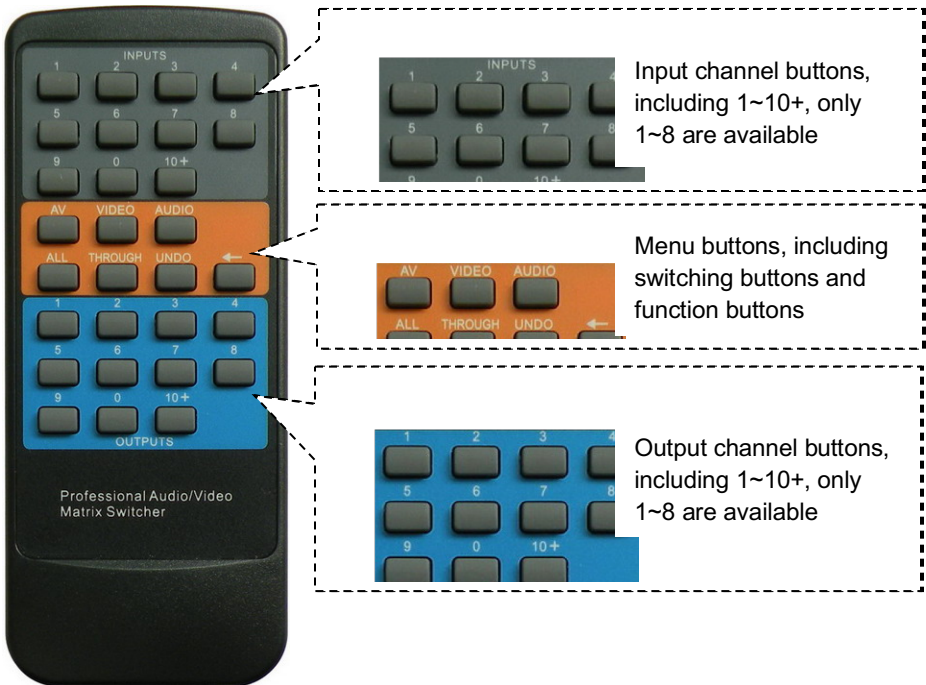
Example: If you press buttons "ALL", "THROUGH" in order, then the result will be like input 1→ output 1, input 2→output 2, input 3→output 3 ... input 8→output 8.

Modular Matrix Switcher 8x8**4.2. IR Remote Control**

With the IR remote, MMX88-N could be controlled remotely. As the function buttons on the IR remote are the same with the ones on the front panel, the IR remote shares the same operations and commands with the control panel.

Press the buttons under below format:

“Input Channel” + “Switch Mode” + “Output Channel”



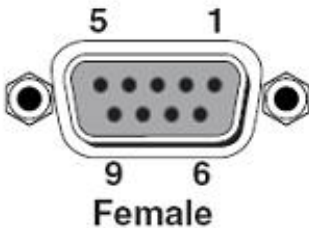
Modular Matrix Switcher 8x8

4.3. RS232 Control

4.3.1. RS232 Connection

Except the front control panel and IR remote, MMX88-N can be controlled by far-end control system or through the Ethernet control via the RS-232 communication port.

This RS-232 communication port is a female 9- D connector. The definition of its pin layout is shown 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

When MMX88-N connects to the RS232 port of a computer with control software, users can control it by that computer. To control the switcher, users need to use RS232 control software.

4.3.2. RS232 Communication Command

With this command system, users are able to control and operate the MMX88-N with RS232 software remotely.

Note:

- 1) Please disconnect all the twisted pairs before sending command EDIDUpgrade[X].
- 2) In the 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 “.” or “;”.
- 4) Type the command carefully, it is case-sensitive.
- 5) Commands pertaining to EDID only avails for signal cards that support EDID management.

Modular Matrix Switcher 8x8

6) MMX88-N boasts 6 in-built EDID data, the chart below illustrates the detailed information:

No.	Detailed Information
1	1080p 2D 5.1CH
2	1080p 2D 2.0CH
3	720p 2D 5.1CH
4	720p 2D 2.0CH
5	4kx2k 2D 5.1CH
6	4kx2k 2D 2.0CH

Update in-built EDID data by sending command **UpgradeIntEDID[x]**..

Communication protocol: Baud rate: 9600; Data bit: 8; Stop bit: 1; Parity bit: none.

Command	Description	Feedback
/*Type;	Inquire the models information.	MMX88-N
/%Lock;	Lock front panel buttons.	System Locked!
/%Unlock;	Unlock front panel buttons.	System Unlock!
/^Version;	Inquire the firmware version.	Vx.x.x
/:MessageOff;	Turn off the feedback command from the com port. It will only show "switcher OK".	Closed The Message Return.
/:MessageOn;	Turn on the feedback command from the com port.	Enabled The Message Return.
Undo.	Cancel the previous operation.	Undo
Demo.	Switch to the "demo" mode, 1->1, 2->2, 3->3 ... and so on.	Demo Mode AV: 01->001
[x]All.	Transfer signals from the input channel [x] to all output channels	01 To All
All#.	Transfer all input signals to the corresponding output channels respectively.	All Through.
All\$.	Switch off all the output channels.	All Closed.
[x]#.	Transfer signals from the input channel [x] to the output channel [x].	01 Through.
[x]\$.	Switch off the output channel [x].	AV: 01 Closed.
All@.	Switch on all the output.	All Open.
[x]@.	Switch on output [x].	01 Open.

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[x1]V[x2].	Transfer the video signals from input [x1] to output [x2].	V: 01->001
[x1]A[x2].	Transfer the audio signals from the input channel [x1] to the output channel [x2].	A: 01->001
[x1]B[x2].	Transfer audio& video signal from input [x1] to output [x2].	AV: 01->001
Status[x].	Inquire the input channel to the output channel [x].	V: 01->001 A: 01->001
Status.	Inquire the input channel to the output channels one by one.	V: 01->001 A: 01->001
Save[Y].	Save the present operation to the preset command [Y]. [Y] ranges from 0 to 9.	Save To F8
Recall[Y].	Recall the preset command [Y].	Recall From F8 V: 01->001 A: 01->001
Clear[Y].	Clear the preset command [Y].	Clear F8
PWON.	Work normally.	PWON
PWOFF.	Enter in standby mode.	PWOFF
HDCPON.	Turn on the HDCP output.	HDCPON
HDCPOFF.	Turn off the HDCP output.	HDCPOFF
/V00.	Inquire the version of backboard software.	Vx.x.x
UpgradeIntEDID[x].	Upgrade built-in EDID data. Supports 6 types of EDID data (see <i>Note 6</i>). When the switcher gets the command, it will show a message to send EDID file (.bin file).	
EDIDUpgrade[x].	Upgrade EDID data of input ports When the switcher gets the command, it will show a message to send EDID file (.bin file). Operations will be canceled after 10 seconds.	

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EDID[x]/[y].	Set the EDID data of input port [x] to built-in EDID data of type [y]. [y]= 1~6.	
EDIDG[x].	Get EDID data from output [x] and display the data on serial port control software.	
EDIDMInit.	Reset factory default EDID for every input channel.	EDIDMInit
EDIDM[X]B[Y].	Manually EDID switching. Enable input [Y] to learn the EDID data of output[X]. If there is problem learning the EDID data, it will automatically set the default EDID data for input [Y].	EDIDM2B1
USER/[Y]/[X]:****;	Custom command for signal cards, [Y]=I/O; [X]= port number; ****: User-definable command, e.g. 0623%	
%0911.	Restore factory default. All I/O connection will be restored to straight through: 1->1, 2->2... saved operation status will remain the same.	
4I-HS		
USER/I/[x]:02xx%;	Set the brightness of input [x] to xx, xx=00~99	02xx%
USER/I/[x]:03xx%;	Set the contrast of input [x] to xx, xx=00~99	03xx%
USER/I/[x]:04xx%;	Set the saturation of input [x] to xx, xx=00~99	04xx%
USER/I/[x]:05xx%;	Set the sharpness of input [x] to xx, xx=00~99	05xx%
USER/I/[x]:0607%;	Set picture's color temperature	0607%
USER/I/[x]:0608%;	Configure image scale	0608%
USER/I/[x]:0614%;	Configure picture mode	0614%
USER/I/[x]:0617%;	Restore input [x] to factory default.	0617%
USER/I/[x]:0619%;	Set the resolution of input [x] to 1360x768, HD	0619%
USER/I/[x]:0626%;	Set the resolution of input [x] to 1024x768, XGA	0626%

Modular Matrix Switcher 8x8

USER/I/[x]:0627%;	Set the resolution of input [x] to 1280x720, 720P	0627%
USER/I/[x]:0628%;	Set the resolution of input [x] to 1280x800, WXGA	0628%
USER/I/[x]:0629%;	Set the resolution of input [x] to 1920x1080, 1080P	0629%
USER/I/[x]:0620%;	Set the resolution of input [x] to 1920x1200, WUXGA	0620%
USER/I/[x]:0621%;	Set the resolution of input [x] to 1600x1200, UXGA	0621%
USER/I/[x]:0698%;	Software update	0698%
USER/I/[x]:0686%;	Set the output signal of input [x] to HDMI	0686%
USER/I/[x]:0711%;	Select HDMI embedded audio as audio source	0711%
USER/I/[x]:0712%;	Select analog audio as audio source	0712%
40-HS		
USER/O/[x]:0804%;	Set the resolution of output [x] to 1280x720P @60Hz	Resolution Out03 1280x720P
USER/O/[x]:0813%;	Set the resolution of output [x] to 1280x1080P @60Hz	Resolution Out03 1920x1080P
USER/O/[x]:0824%;	Set the resolution of output [x] to 1024x768 @60Hz	Resolution Out03 1024x768
USER/O/[x]:0826%;	Set the resolution of output [x] to 1280x1024 @60Hz	Resolution Out03 1280x1024
USER/O/[x]:0837%;	Set the resolution of output [x] to 1920x1200 @60Hz	Resolution Out03 1920x1200
USER/O/[x]:0617%;	Restore output [x] to factory default.	0617%
GetResolution[x].	Capture output resolution of output [x]	
USER/O/[x]:0110%;	Enable analog audio output	0110%
USER/O/[x]:0111%;	Disable analog audio output	0111%
41-VA		
USER/I/[x]:0648%;	Switch on audio of input [x]	0648%
USER/I/[x]:0649%;	Switch off audio of input [x]	0649%
USER/I/[x]:0684%;	Set the color space to YCBCR	0684%
USER/I/[x]:0685%;	Set the color space to RGB	0685%
USER/I/[x]:0686%;	Set the input signal to HDMI	0686%
USER/I/[x]:0687%;	Set the input signal to DVI	0687%

Modular Matrix Switcher 8x8

USER/[/x]:0622%;	Set the signal of input channel [x] to VGA.	0622%
USER/[/x]:0623%;	Set the signal of input channel [x] to YCBCR.	0623%
USER/[/x]:0624%;	Set the signal of input channel [x] to SVIDEO.	0624%
USER/[/x]:0625%;	Set the signal of input channel [x] to CVIDEO.	0625%
USER/[/x]:0626%;	Set the resolution of input [x] to 1024x768@60Hz.	0626%
USER/[/x]:0627%;	Set the resolution of input [x] to 1280X720@60Hz.	0627%
USER/[/x]:0628%;	Set the resolution of input [x] to 1280X800@60Hz.	0628%
USER/[/x]:0619%;	Set the resolution of input [x] to 1360X768@60Hz.	0619%
USER/[/x]:0621%;	Set the resolution of input [x] to 1600X1200@60Hz.	0621%
USER/[/x]:0629%;	Set the resolution of input [x] to 1920X1080@60Hz.	0629%
USER/[/x]:0620%;	Set the resolution of input [x] to 1920X1200@60Hz.	0620%
USER/[/x]:0617%;	Restore input [x] to factory default.	0617%
USER/[/x]:0606%;	Auto-adjust VGA signal	0606%
USER/[/x]:0698%;	Update software	0698%
4I-VG		
USER/[/x]:0622%;	Set the signal of input channel [x] to VGA.	0622%
USER/[/x]:0623%;	Set the signal of input channel [x] to YCBCR.	0623%
USER/[/x]:0624%;	Set the signal of input channel [x] to SVIDEO.	0624%
USER/[/x]:0625%;	Set the signal of input channel [x] to CVIDEO.	0625%
USER/[/x]:0626%;	Set the resolution of input [x] to 1024x768@60Hz.	0626%
USER/[/x]:0627%;	Set the resolution of input [x] to 1280X720@60Hz.	0627%

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USER//[x]:0628%;	Set the resolution of input [x] to 1280X800@60Hz.	0628%
USER//[x]:0629%;	Set the resolution of input [x] to 1920X1080@60Hz.	0629%
4I-SS		
USER//[x]:02xx%;	Set the brightness of input [x] to xx, xx=00~99	02xx%
USER//[x]:03xx%;	Set the contrast of input [x] to xx, xx=00~99	03xx%
USER//[x]:04xx%;	Set the saturation of input [x] to xx, xx=00~99	04xx%
USER//[x]:05xx%;	Set the sharpness of input [x] to xx, xx=00~99	05xx%
USER//[x]:0607%;	Set picture's color temperature	0607%
USER//[x]:0608%;	Configure image scale	0608%
USER//[x]:0614%;	Configure picture mode	0614%
USER//[x]:0617%;	Restore input [x] to factory default.	0617%
USER//[x]:0619%;	Set the resolution of input [x] to 1360x768, HD	0619%
USER//[x]:0626%;	Set the resolution of input [x] to 1024x768, XGA	0626%
USER//[x]:0627%;	Set the resolution of input [x] to 1280x720, 720P	0627%
USER//[x]:0628%;	Set the resolution of input [x] to 1280x800, WXGA	0628%
USER//[x]:0629%;	Set the resolution of input [x] to 1920x1080, 1080P	0629%
USER//[x]:0620%;	Set the resolution of input [x] to 1920x1200, WUXGA	0620%
USER//[x]:0621%;	Set the resolution of input [x] to 1600x1200, UXGA	0621%
USER//[x]:0698%;	Software update	0698%
4I-DS		
USER//[x]:02xx%;	Set the brightness of input [x] to xx, xx=00~99	02xx%
USER//[x]:03xx%;	Set the contrast of input [x] to xx, xx=00~99	03xx%

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USER/I/[x]:04xx%;	Set the saturation of input [x] to xx, xx=00~99	04xx%
USER/I/[x]:05xx%;	Set the sharpness of input [x] to xx, xx=00~99	05xx%
USER/I/[x]:0606%;	Auto-adjust VGA input signal	0606%
USER/I/[x]:0607%;	Set picture's color temperature	0607%
USER/I/[x]:0608%;	Configure image scale	0608%
USER/I/[x]:0614%;	Configure picture mode	0614%
USER/I/[x]:0617%;	Restore input [x] to factory default.	0617%
USER/I/[x]:0619%;	Set the resolution of input [x] to 1360x768, HD	0619%
USER/I/[x]:0626%;	Set the resolution of input [x] to 1024x768, XGA	0626%
USER/I/[x]:0627%;	Set the resolution of input [x] to 1280x720, 720P	0627%
USER/I/[x]:0628%;	Set the resolution of input [x] to 1280x800, WXGA	0628%
USER/I/[x]:0629%;	Set the resolution of input [x] to 1920x1080, 1080P	0629%
USER/I/[x]:0620%;	Set the resolution of input [x] to 1920x1200, WUXGA	0620%
USER/I/[x]:0621%;	Set the resolution of input [x] to 1600x1200, UXGA	0621%
USER/I/[x]:0698%;	Software update	0698%
USER/I/[x]:0686%;	Set the output signal of input [x] to HDMI	0686%
USER/I/[x]:0687%;	Set the output signal of input [x] to DVI	0687%
40-DS		
USER/O/[x]:0201%;	Set the output source of output [x] to YPbPr	0201%
USER/O/[x]:0202%;	Set the output source of output [x] to VGA	0202%
USER/O/[x]:0203%;	Set the output source of output [x] to C-VIDEO	0203%
USER/O/[x]:0804%;	Set the resolution of output [x] to 1280x720P @60Hz	Resolution Out03 1280x720P
USER/O/[x]:0813%;	Set the resolution of output [x] to 1280x1080P @60Hz	Resolution Out03 1920x1080P

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USER/O/[x]:0824%;	Set the resolution of output [x] to 1024x768 @60Hz	Resolution Out03 1024x768
USER/O/[x]:0826%;	Set the resolution of output [x] to 1280x1024 @60Hz	Resolution Out03 1280x1024
USER/O/[x]:0837%;	Set the resolution of output [x] to 1920x1200 @60Hz	Resolution Out03 1920x1200
GetResolution[x].	Capture output resolution of output [x]	
GetVGAPortMode[x].	Inquire the output status of VGA port [x]	
USER/O/[x]:0617%;	Restore output [x] to factory default.	0617%
4I-UH/BT		
AUDIO[X]I[Z].	Select audio source for input [X] [X] is port number; [Z] stands for audio source, can be 0 (embedded HDMI audio) or 1 (analog audio)	AUDIO1I0.

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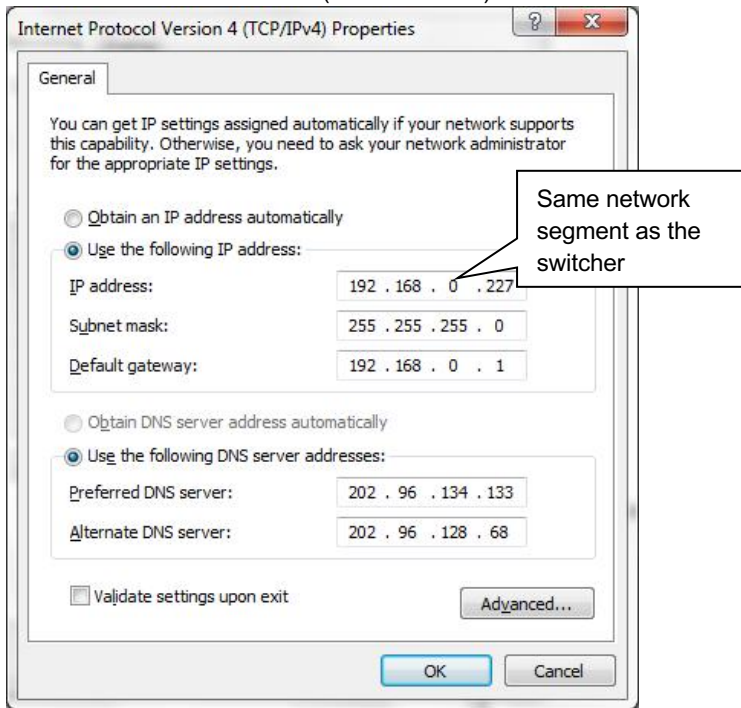
4.4. TCP/IP Control

4.4.1. Control Mode

TCP/IP default settings: IP is 192.168.0.178, Gateway is 192.168.0.1, and Serial Port is 4001. IP & Gateway can be changed as you need, Serial Port cannot be changed.

- **Controlled by Single PC**

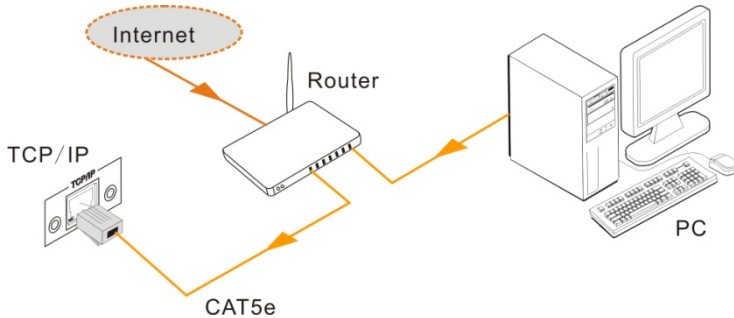
Connect a computer to the TCP/IP port of the MMX88-N, and set its network segment to the same as the default IP of the MMX88-N (192.168.0.178).



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● Controlled by PC(s) in LAN

The MMX88-N can be connected with a router to make up a LAN with the PC(s), this make it able to be controlled in a LAN. When control, just make sure the MMX88-N's network segment is the same with the router. Please connect as the following figure for LAN control.



- Step1.** Connect the TCP/IP port of the MMX88-N to Ethernet port of PC with twisted pair.
- Step2.** Set the PC's network segment to the same as the MMX88-N. Do please remember the PC's original network segment.
- Step3.** Set the MMX88-N's network segment to the same as the router.
- Step4.** Set the PC's network segment to the original one.
- Step5.** Connect the MMX88-N and PC(s) to the router. In the same LAN, each PC is able to control the MMX88-N asynchronously.

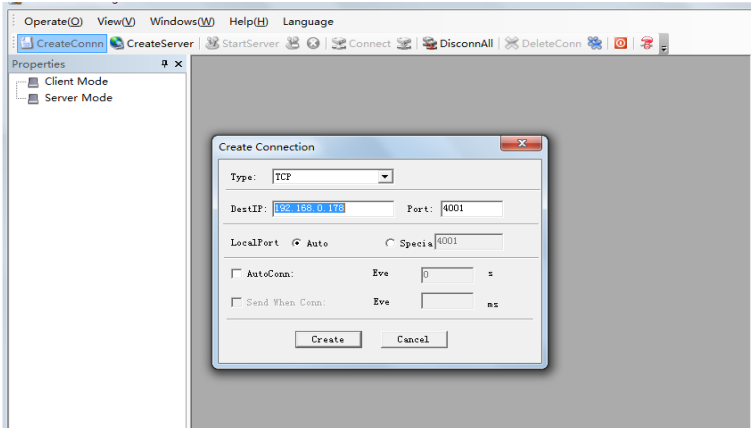
Then it's able to control the device via a TCP/IP communication software.

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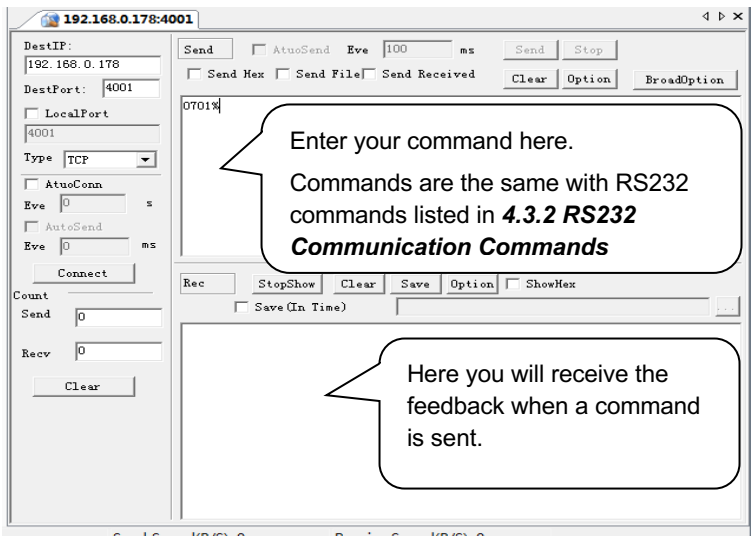
4.4.2. Control MMX88-N via TCP/IP communication software

(Exemplified by TCPUDP software)

- 1) Connect a computer and MMX88-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 MMX88-N (default IP: 192.168.0.178, port:4001):



- 2) After connect successfully, we can enter commands to control the MMX88-N, as below:



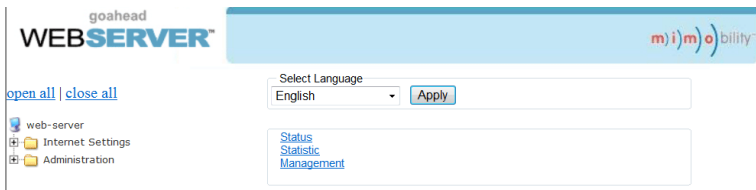
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4.4.3. Port Management

Type the designed website 192.168.0.178:100 in your browser. Enter correct username and password to log in the WebServer:

Username: admin; **Password:** admin

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.

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5. Specification

5.1. Main Unit

Control parts	
Serial Control	RS232, 9- female D connector
Configurations	2 = TX, 3 = RX, 5 = GND
Installation	Rack Mountable
Front Panel Control	Buttons
Options	TCP/IP control
General	
Power Supply	100VAC ~ 240VAC, 50/60Hz
Power Consumption	60W (Max)
Operation Temperature	0 ~ +40°C
Storage Temperature	-10 ~ +55°C
Relative Humidity	10% ~ 90%
Dimension (W*H*D)	483mm x 88mm x 320mm (2U high)
Net Weight	3Kg

5.2. Changeable Card

5.2.1. 4I-DV & 4O-DV

4I-DV	
Input	(4) DVI
Input Connector	(4) Female DB24+5/HDMI
Input Level	T.M.D.S. 2.9V~3.3V
Input Impedance	75Ω
4O-DV	
Output	(4) DVI
Output Connector	(4) Female DB24+5/HDMI
output Level	T.M.D.S. 2.9V~3.3V
Output Impedance	75Ω
General	
Gain	0 dB
Bandwidth	340 MHz (10.2 Gbit/s)
Video Signal	DVI 1.0/HDMI 1.3 full digital T.M.D.S signal
Switching Speed	200ns (Max.)
Max Time-delay	5nS (±1nS)
Crosstalk	<-50dB@5MHz
EDID and DDC	Supports Extended Display Identification Data (EDID) and

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	Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards

5.2.2. 4I-DS & 4O-DS

4I-DS	
Input	(4) DVI
Input Connector	(4) Female DB24+5/HDMI
Input Level	T.M.D.S. 2.9V~3.3V
Input Impedance	75Ω
4O-DS	
Output	(4) DVI
Output Connector	(4) Female DB24+5/HDMI
output Level	T.M.D.S. 2.9V~3.3V
Output Impedance	75Ω
General	
Gain	0 dB
Bandwidth	340 MHz (10.2 Gbit/s)
Video Signal	DVI,HDMI,VGA,C-VIDEO,YPbPr
Switching Speed	200ns (Max.)
Max Time-delay	5nS (±1nS)
Crosstalk	<-50dB@5MHz
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards

5.2.3. 4I-HD & 4O-HD

4I-HD	
Input	(4) HDMI
Input Connector	(4) Female HDMI
Input Level	T.M.D.S. 2.9V~3.3V
Input Impedance	75Ω
4O-HD	
Output	(4) HDMI
Output Connector	Female HDMI
output Level	T.M.D.S. 2.9V~3.3V

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Output Impedance	75Ω
General	
Gain	0 dB
Bandwidth	6.75 Gbps
Video Signal	DVI 1.0/HDMI 1.3 full digital T.M.D.S signal
Max Time-delay	5nS (±1nS)
Switching Speed	200ns (Max.)
Crosstalk	<-50dB@5MHz
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data
HDCP	Compliant with HDCP

5.2.4. 4I-HS & 4O-HS

4I-HS	
Input	(4) HDMI (4) Analog Audio
Input Connector	(4) 19-pin Type-A Female (4) 3-pin pluggable terminal block
Power Consumption	8W
Color Depth	8, 10, 12 bit
4O-HS	
Output	4 HDMI 4 Analog Audio
Output Connector	19-pin Type-A Female 3-pin pluggable terminal block
Power Consumption	12W
Color Depth	8 bit
General	
Video Signal	HDMI, DVI
Audio Signal	PCM
Bandwidth	6.75 Gbps
Standards	HDMI1.3& HDCP1.2
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data

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5.2.5. 4I-VG & 4O-VG

4I-VG	
Input	(4) VGA
Input Connector	(4) Female 15 pin HD
Input Level	0.5 ~ 2.0Vp-p
Input Impedance	75Ω
Video Signal	VGA (RGBHV), YPbPr, S-video, C-video& CVBS.
4O-VG	
Output	(4) VGA
Output Connector	(4) Female 15 pin HD
Output Level	0.5 ~ 2.0Vp-p
Output Impedance	75Ω
Video Signal	VGA
General	
Gain	0 dB
Bandwidth	350MHz (-3dB)
Switching Speed	200ns (Max.)
Crosstalk	<-50dB@5MHz

5.2.6. 4I-VA

Video	
Input	(4) VGA
Input Connector	(4) Female 15 pin HD
Input Level	0.5 ~ 2.0Vp-p
Input Impedance	75Ω
Audio	
Input	(4) Stereo Audio
Input Connector	(4) 3-pin Pluggable Terminal Block
CMRR	>90dB @20Hz ~ 20KHz
Input Impedance	>10KΩ
General	
Gain	0 dB
Bandwidth	YPbPr:170MHz; C-video:150MHz; VGA:170MHz
Video Signal	VGA (RGBHV), YPbPr, S-video, C-video& CVBS

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Switching Speed Crosstalk	200ns (Max.) <-50dB@5MHz
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5.2.7. 4I-SD & 4O-SD

4I-SD			
Input	(4) SDI		
Input Connector	(4) Female BNC		
Input Level	0.8Vp-p ± 10%		
Input Impedance	75Ω		
4O-SD			
Output	(4) SDI		
Output Connector	(4) Female BNC		
output Level	0.8Vp-p ± 10%		
Output Impedance	75Ω		
General			
Gain	Unity		
Maximum Data Rate	4.95Gbps		
Transmission Distance	300M (Max.)		
Data rate Lock	Auto		
Input Return Loss	<-14 dB @ 1 MHz ~ 1.5 GHz		
Input Return Loss	<-14 dB @ 1 MHz ~ 1.5 GHz		
Video Standard	SMPTE 292M, SMPTE 259M, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120		
Data Type	8bit, 10bit, 12bit		
Audio Bits per Sample	18 bits per channel, 2 channels (L, R)		
Switching Speed	200ns (Max.)	Crosstalk	<-50dB@5MHz

5.2.8. 4I-SS

Input	
Input	(4) SDI
Input Connector	(4) Female BNC
Output	
Output	(4) SDI
Output Connector	(4) Female BNC
General	
Audio Signal	SDI, HD-SDI, 3G-SDI

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Color Depth	8, 10, 12 bit
Transmission Distance	1080p≤100M
Max Resolution	1080p
Bandwidth	6.75Gbps
Power Consumption	8.7W

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5.2.9. 4I-TP & 4O-TP

4I-TP	
Input	(4) RJ45
Input Connector	(4) Female RJ45
Input Impedance	75Ω
4O-TP	
Output	(4) RJ45
Output Connector	(4) Female RJ45
Output Impedance	75Ω
Video General	
Transmission Distance	1080p≤70M
Bandwidth	6.75Gbps
Resolution range	800x600 ~ 1920x1200
Transmission Distance	70M(Max)
SNR	>70dB@ 100MHz-100M
Return Loss	<-30dB@ 5KHz
HDMI Standard	Support HDMI1.3 and HDCP
Differential Phase Error	±10° @ 135MHz_100M

5.2.10. 4I-UH & 4O-UH

4I-UH	
Video Input	
Input	(4) HDMI
Input Connector	(4) Female HDMI
Min.~Max. Level	T.M.D.S. 2.9V~3.3V
Input Impedance	100Ω (Differential)
Audio Input	
Input	(4) Analog
Input Connector	(4) 3.5mm pluggable terminal block
Input Impedance	75Ω
Frequency Response	20Hz~20K Hz
4O-UH	
Video Output	
Output	(4) HDMI

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Output Connector	(4) Female HDMI
Min.~Max. Level	T.M.D.S. 2.9V~3.3V
Output Impedance	100Ω (Differential)
Audio Output	
Output	(4) Stereo
Output Connector	(4) 3.5mm Stereo audio connector
Output Impedance	75Ω
Frequency Response	20Hz~20K Hz
General	
Gain	0dB
Max Resolution	4Kx2K
Transmission Distance	1080P≤70m; 4Kx2K ≤ 40m
Switching Speed	200ns (Max.)
SNR	>70dB@ 100MHz-100M
Return Loss	<-30dB@ 5KHz
Supported Audio Format	Embedded HDMI audio: PCM, Dobby Digital, DTS, DTS-HD; Analog audio: PCM
HDMI Standard	Support HDMI1.4& DVI1.0
EDID& HDCP Management	Compliant with HDCP 1.4; Support manual EDID management

5.2.11. 4I-UF & 4O-UF

4I-UF	
Input	(4) Fiber Optical
Input Connector	(4) SPF Fiber Optical Connector
Fiber Type	Multi-mode, Single mode
4O-UF	
Output	(4) Fiber Optical
Output Connector	(4) SPF Fiber Optical Connector
Fiber Type	Multi-mode, Single mode
General	
Data Rate	10.2 Gbps
Color Depth	8bit, 10bit, 12bit, 16bit
Optical Fiber Mode	
Connector	LC connector

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Resolution	Up to 4Kx2K
Transmission Distance	2km (Single mode transmission, using Single Mode Optical Module and OM3 Single Mode Fiber Cable) 300m (Multi-mode transmission, using Single/ Multi mode Optical Module and OM3 Multi-Mode Fiber Cable)
Data Rate	10.2Gbit/s

5.2.12. 4I-BT & 4O-BT

4I-BT	
Video Input	
Input	(4) HDBT
Input Connector	(4) Female RJ45 (with dual-color indicator)
Min. ~Max. Level	T.M.D.S 2.9V~3.3V
Input Impedance	100Ω (Differential)
Audio Input	
Input	(4) Stereo
Input Connector	3.5mm Stereo audio connector
Input Impedance	75Ω
Frequency Response	20Hz~20K Hz
4O-BT	
Video Output	
Output	(4) HDBT
Output Connector	(4) Female RJ45 (with dual-color indicator)
Min. ~Max. Level	T.M.D.S 2.9V~3.3V
Output Impedance	100Ω (Differential)
Audio Output	
Output	(4) Stereo
Output Connector	(4) 3.5mm Stereo audio connector
Output Impedance	75Ω
Frequency Response	20Hz~20K Hz
Control Part	
Control Signal	(4) RS232
Control Connector	(4) 3-pin pluggable terminal block

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Protocol	TCP/IP
General	
Gain	0dB
Bandwidth	10.2Gbps
Max Resolution	4Kx2K
Crosstalk	<-50dB@5MHz
Transmission Distance	1080P≤70m; 4Kx2K ≤ 40m
Switching Speed	200ns (Max.)
Supported Audio Format	Embedded HDMI audio: PCM, Dobyly Digital, DTS, DTS-HD Analog audio: PCM
HDMI Standard	Support HDMI1.4a
EDID& HDCP Management	Compliant with HDCP 1.4; Support manual EDID management

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6. Troubleshooting & Maintenance

Problems	Potential Causes	Solutions
Output image with ghost	Bad quality of the connecting cable	Try another high quality cable
	Improprate image setting of the displayer	Adjust corresponding image settings
Output image with color losing or no video signal output	Fail connection	Reconnect the displayer and the matrix
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
	The switcher is broken	Send it to authorized dealer for repairing.
IR remote does not work	Run out of battery	Change for another battery
	IR remote is broken	Send it to authorized dealer for repairing.
POWER indicator doesn't work or no respond to any operation	Fail connection of power cord.	Make sure the power cord connection is good.
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.
Static becomes stronger when connecting the video	Bad grounding	Check the grounding and make sure it is connected

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connectors		well.
Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters	Type in correct RS232 communication parameters.
	Broken RS232 port	Send it to authorized dealer for checking.
Cannot control the device by front panel buttons while can control it through RS232 port	The front panel buttons are locked	Send command 50605% to unlock the front panel buttons.

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

7. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. These terms and conditions may be changed without prior notice.

1) Warranty

The limited warranty period of the product is fixed three years.

2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) Warranty Exclusions:

- 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 by distributor.
 - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defect has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: For further assistance or solutions, please contact your local distributor.

