visual engineering

LIGHTWARE

Quick Start Guide

MX2M-FR24R

Important Safety Instructions

Please read the supplied safety instruction document before using the product and keep it available for future reference.
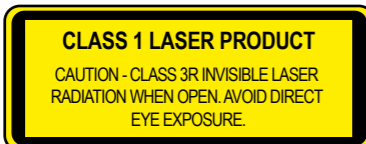
⚠ **CAUTION** - The use of controls or adjustments or any performance of procedures other than those specified herein may result in hazardous radiation exposure.

Introduction

Thank you for choosing Lightware. MX2M-FR24R is a member of the Lightware MX2 modular matrix switcher series, supporting uncompromised 4K UHD resolution at 60Hz with 4:4:4 sampling pattern and with downconversion capabilities to 4:2:2, supporting HDCP 1.x and 2.3, 3D, Dolby TrueHD and DTS-HD Master Audio. The non-blocking matrix architecture distributes and switches 24 video signals to 24 outputs, distributed along six 4-port boards respectively per direction.

Besides the six 4-port input and six 4-port output video boards, there are four low speed installable slots for Dante audio.

Control for connected extenders is served by Ethernet layer. The Ethernet layer can also be used for IP extension, as well as for command injection for IR and serial control by third party devices.

For operation safety power redundancy is available, and PSU drawers are field-exchangeable for ease of maintenance.

Box Contents
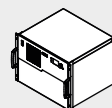
Matrix switcher frame with rack mounting ears	IEC power cable (2x)	UTP patch cable (3 m)
Handle pair with 4 pcs M5 flat head screws	Safety & Warranty Info, Quick Start Guide	

Powering On

Connect the power cords to the AC input of the power supply units and turn it on by the power switch. During the initial self-test and loading of the latest settings, *The matrix is about to start* text appears on the LCD screen and the router reloads its last configuration.

Redundant, Hot-Swappable Power Supplies

The matrix has redundant PSUs which can be switched on and off without interrupting the video transmission. Using one or both of the PSUs at the same time is also possible. The double PSU allows to connect them for two different AC power lines to ensure the continuous power for the matrix. The PSU units are hot-swappable.

Removing of the PSU Units

1. Turn off the PSU using the power switch and disconnect the power cord.

2. Push down the fixing plate on the PSU.

3. Pull out the PSU using the handle.
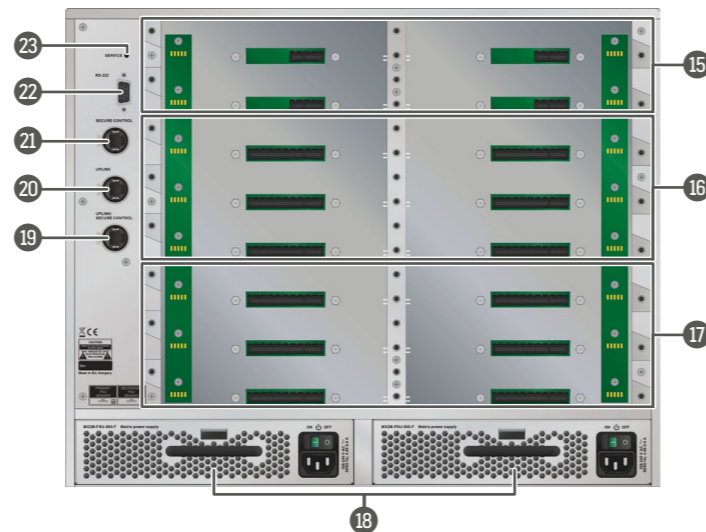

Front View

№		
1	**Output lock**	Locks and protects one or more outputs.
2	**Control lock**	Disables or enables front panel button operations. Red light means the switching and function buttons are disabled.
3	**Destinations**	Buttons to select an output or to see the state of an output.
4	**Sources**	Buttons to select an input, to select a preset number or to view the state of the selected input port.
5	**Take / Auto**	Switching between Take and Autotake working modes; keep the button pressed for 3 seconds to toggle the modes.
6	**Preset buttons**	Performing preset operations (Load and Save).
7	**Reset button**	Reboots the matrix; the same as switching it off and on again.
8	**Status LEDs**	The status LEDs give immediate feedback about the matrix.

LIVE	off	The device is powered off.
	blinking (green)	The unit is on and operates properly.
POWER	off	The unit is powered off or it has internal voltage problem.
	on (green)	The device is powered on.

Rear View

№		
9	**LCD screen**	LCD screen showing the most important settings and parameters in the front panel menu.
10	**Jog dial control knob**	Easy setting and menu navigation by the jog dial control.
11	**USB control**	USB connection for Lightware Device Controller (LDC) software.
12	**Rack ears**	Allowing to mount the device as a standard rack unit installation.
13	**Handles**	Grips on the two sides of the unit for the easier handling.
14	**Ventilation grille and dustfilter**	To ensure the correct ventilation and avoid overheating provide enough free space around the ventilation holes.
15	**Auxiliary board slots**	Board slots for the auxiliary (AUX) I/O boards. These slots support low-speed boards only.
16	**Input board slots**	Board slots for the AV input boards. These slots support high-speed input boards and low-speed boards either.
17	**Output board slots**	Board slots for the AV output boards. These slots support high-speed output boards and low-speed boards either.
18	**Power supply units**	Hot swap slots for power supply units. The matrix has redundant PSUs which can be switched on and off without interrupting the video transmission. Using one or both of the PSUs at the same time is also possible. The double PSU allows to connect them for two different AC power lines to ensure the continuous power for the matrix.
19	**Uplink / Secure control connector**	Neutrik etherCON Ethernet connectors with 1 Gbps Ethernet connections for user Ethernet access or control the matrix switcher.
20	**Uplink connector**	Neutrik etherCON Ethernet connectors with 1 Gbps Ethernet connections for user Ethernet access.
21	**Secure control connector**	Neutrik etherCON Ethernet connector with 1 Gbps Ethernet connection to control the device and firmware upgrade purpose.
22	**RS-232 connector**	9-pole D-SUB connector for serial communication to control the device.
23	**Service button**	Hidden button for special operations.

Mounting Options

Fixing the Handles

Two handles can be mounted on the rack ears of the matrix switcher. Fasten the 2x 2 pcs M5 flat head fixing screws to fix the handles to the rack ears.
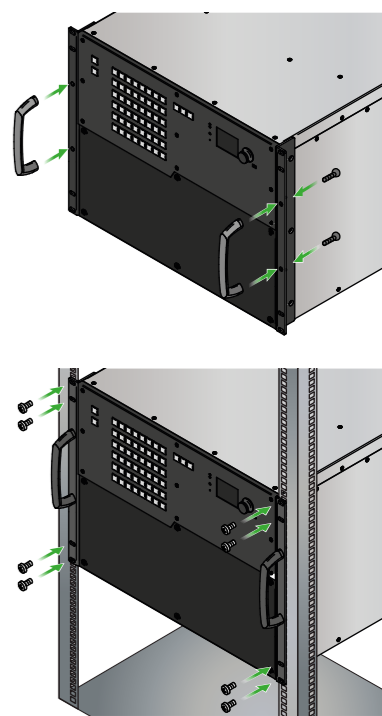
Mounting as a Standard Rack Installation

Two rack ears are supplied with the product, which are fixed on left and right side with 2x 4 pcs fixing screws as shown in the picture. The default position allows mounting the device as a standard rack unit installation.

⚠ Always use all the eight screws for fixing the device ears to the rack rail. Choose properly sized screws for mounting. Keep minimum two threads left after the nut screw.

ℹ The screws for the rack cabinet are not supplied to the device.

ℹ The matrix is rack-size width and 8U high.

Board Replacement

⚠ Please pay attention to the protection against electrostatic discharge when touching a board. Do not touch the electrical components on the board as the electrostatic discharge may damage them.
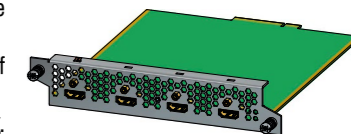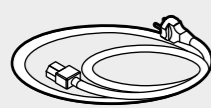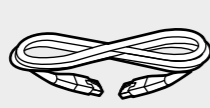
⚠ Please check the orientation of the slots. The AUX, IB and OB cards are assigned to dedicated board slots in the matrix. See the layout of the input/output board slots on the other side of this document.

ℹ The MX2M series I/O boards are **hot-swappable** devices. The matrix switcher is not required powering off before the board replacement procedure.

The steps of replacing an auxiliary, input or output board is the following:

1. Disconnect all the cables from the rear side of the affected board.
2. Loose the fixing screws on the rear side of the board.
3. Pull out the board and put it in an ESD-safe bag.
4. Place the new board into the desired empty slot. Be careful when you insert the board into the socket connector.
5. Tighten the screws to fix the board to the frame.
6. Connect the necessary cables to the boards and switch on the matrix.
7. Wait until the booting procedure of the matrix is completed.
8. Connect to the matrix switcher using Lightware Device Controller (LDC) to set the necessary port parameters.

Connections

Touch controller

RS-232

CATx

Laptop

CATx

Ethernet switch

Power

Power

Interface of AUX

Media player

Interface of IB

4K media server

Interface of OB

4K wall display

Power

Power

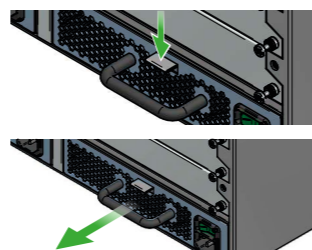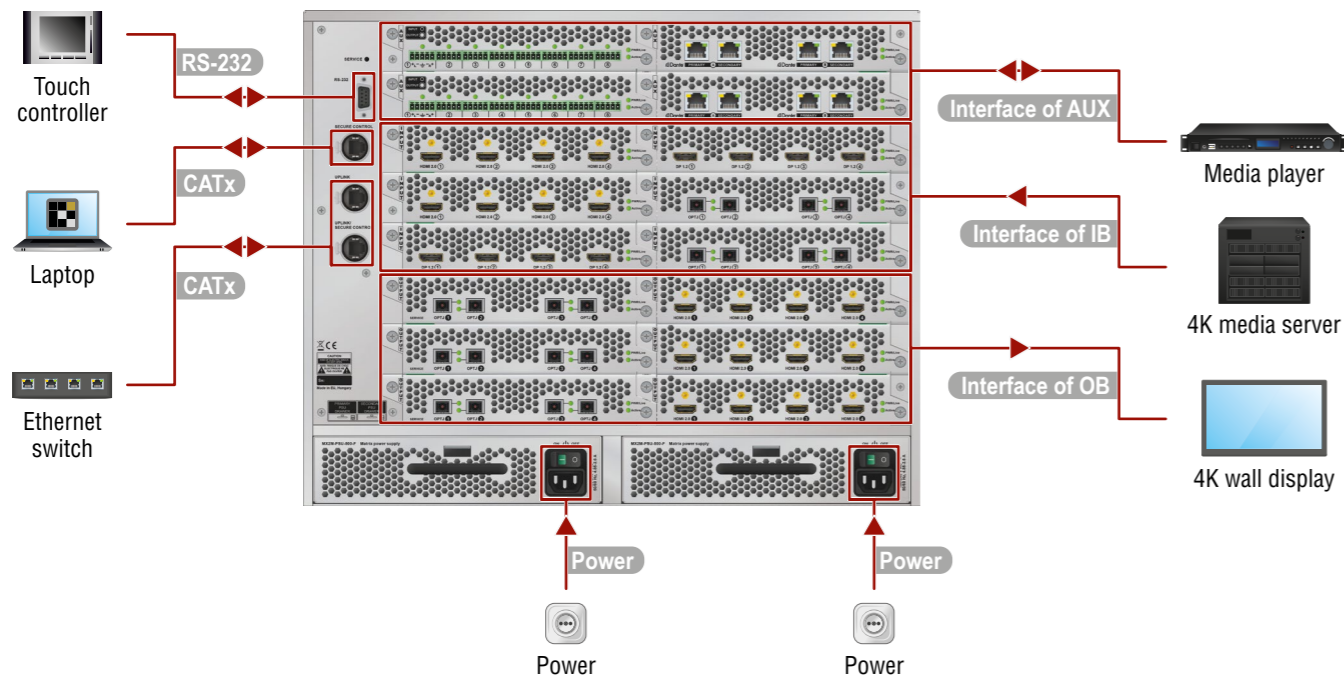| **RS-232**	Optionally for RS-232 control: connect a controller device (e.g. touch panel) to the RS-232 port.
CATx	Connect the matrix switcher to a controller device (e.g. laptop) via the **Secure Control** port over a CATx cable. The port supports 1 GbE data transmission.
CATx	Connect the matrix switcher to a LAN via the **Uplink** and **Uplink / Secure Control** ports over CATx cables. The Uplink port is for user Ethernet access; the Uplink / Secure control port is for user Ethernet access or control the matrix switcher. Both ports support 1 GbE data transmission.
Power	Connect the power cord to the AC power socket and to the matrix. The matrix has redundant PSUs which can be switched on and off without interrupting the video transmission. Using one or both of the PSUs at the same time is also possible. The double PSU allows to connect them for two different AC power lines to ensure the continuous power for the matrix.

Interface of AUX	Connect the source / sink / controlled devices (e.g. media player) to the ports of the MX2M-AUX series boards via the interface of the board.
Interface of IB	Connect the AV source devices (e.g. 4K media server) to the ports of the MX2M-IB series boards via the interface of the board (HDMI, fiber optical, etc.).
Interface of OB	Connect the AV sink devices to the ports (e.g. 4K wall display) of the MX2M-OB series boards via the interface of the board (HDMI, fiber optical, etc.).

Front Panel Operation - LCD Menu

Navigation in the LCD Menu

The front panel has a color LCD showing the most important settings and parameters. The jog dial control knob can be used to navigate between the menu items or change the value of a parameter. The knob can be pressed to enter a menu or edit/set a parameter.

Menu navigation & change parameter — Turn

Menu selection & set parameter — Press
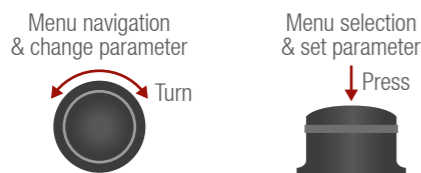
Set Static IP Address

The IP address of the endpoint can be set from the front panel:

1. Navigate to the **System settings / Network / DHCP** menu and check the current state of the DHCP. If the setting is Enabled change it to **Disabled**. After this navigate to **Save** and press Enter.
2. Navigate to the **System settings / Network / Static IP** menu, and select the Static IP address, Subnet mask, Static gateway options. Set the parameters by the front panel buttons according to your network requirements.
3. Navigate to **Save** and press Enter.

NETWORK

• IP	192.168.0.100
Subnet	255.255.255.0
Gateway	192.168.0.1
DHCP	Enabled

« Back   ✔ Save

Set Dynamic IP Address (DHCP)

1. Navigate to the **System settings / Network / DHCP** menu and check the current state of the DHCP. If the setting is Disabled change it to **Enabled**.
2. Navigate to the **Save** submenu (the last one of the **Network** menu) and press Enter.

Restore Factory Default Settings

Navigate to the **System settings / Restore factory defaults** menu and press Enter. After the confirmation the device reboots and the factory default values are reloaded in the device.

Factory Default Settings

IP address	Dynamic (DHCP is enabled)
LW2 control protocol port number	10001
LW2 control protocol port number	6107
HTTP port number	80
RS-232 port setting	115200 BAUD, 8N1
Crosspoint setting	I1 to all outputs
HDCP on input/output	Allow HDCP 2.2 and HDCP 1.4 / Depends on input
Conversion mode	Passthrough
Signal type (HDMI/DVI)	Auto
Emulated EDID	F139 (3840x2160p60 universal HDMI 2.0, UHD, PCM audio)
EDID memory storage	148 factory / 100 User memory slots

Front Panel Operations - Buttons

Take and Autotake Modes

Press and hold the Take button for **two seconds** to change between **Take** and **Autotake** modes. When the Take button continuously illuminates green, Autotake mode is selected.

Switching and Locking Operations in TAKE Mode

Take mode allows the user to connect or disconnect multiple outputs to an input at once. This mode is useful when time delay is not allowed between multiple switching. The commands are only realized when the **Take** button is pressed.

Connection change

1. Press shortly the desired **source button**.
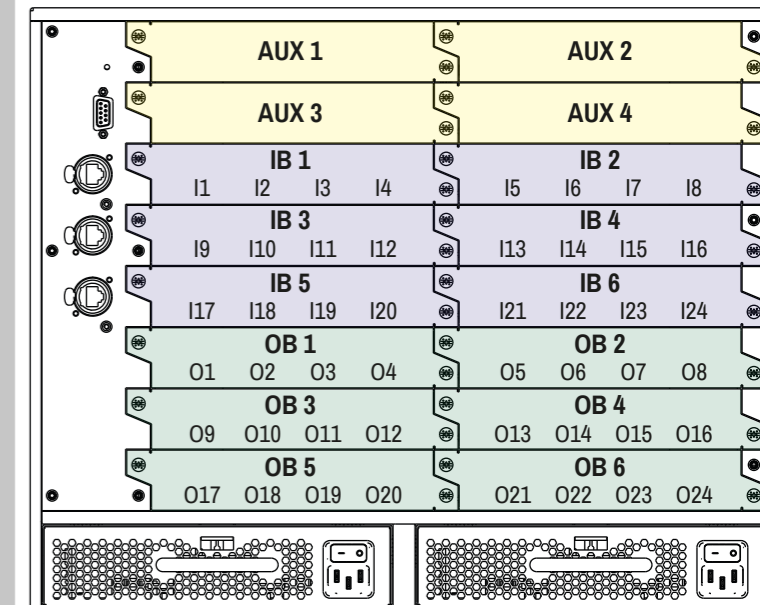2. Press shortly the desired **destination button(s)**.
3. Press shortly the **Take** button.

Output lock

1. Press shortly the **Output Lock** button.
2. Press shortly a **destination button**.
3. Press shortly the **Take** button.

Control Lock

If the button illuminates in red the switching and function buttons, and the jog dial control knob are disabled. Press and hold the **Control lock** button for three seconds to toggle the state.

ⓘ *When the front panel buttons are locked, remote control (RS-232, USB, Ethernet) is still available.*

Switching and Locking Operations in AUTOTAKE Mode

Autotake mode is useful when immediate actions must be taken or fast switching is needed between sources on a particular destination. In this mode switching occurs immediately upon pressing one of the input selector buttons.

Connection change

1. Press shortly the desired **destination button**.
2. Press shortly the desired **source button**.

Output lock

1. Press shortly the **Output Lock** button.
2. Press shortly a **destination button**.

Layout of the Input/Output Board Slots and Port Numbering

The following figure shows the layout of the auxiliary (AUX), input (IB) and output (OB) board slots on the rear side of the matrix and the port numbering of the cards.
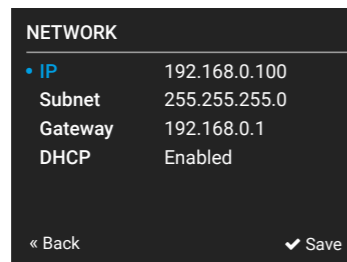

AUX 1				AUX 2			
AUX 3				AUX 4			
IB 1				**IB 2**			
I1	I2	I3	I4	I5	I6	I7	I8
IB 3				**IB 4**			
I9	I10	I11	I12	I13	I14	I15	I16
IB 5				**IB 6**			
I17	I18	I19	I20	I21	I22	I23	I24
OB 1				**OB 2**			
O1	O2	O3	O4	O5	O6	O7	O8
OB 3				**OB 4**			
O9	O10	O11	O12	O13	O14	O15	O16
OB 5				**OB 6**			
O17	O18	O19	O20	O21	O22	O23	O24

Status LEDs of the I/O Boards

PWR/Live		
○	off	The board is not powered.
●	lit at 50% brightness	The board is under booting procedure.
◉	blinking fast between 0% and 100% brightness	The board is fitted in an inappropriate slot (input in an output, output in an input slot). Hence, it is not passing video.
◉	blinking between 50% and 100% brightness	The board is operational (the embedded software is running on the controller).
Active		
○	off	The control sequence has not been completed.
●	on	The control sequence has been completed and the board is being controlled by the matrix switcher.
◉	blinking (slow)	The device is under firmware upgrade procedure (bootload mode).
◉	blinking (fast)	The board is fitted in an inappropriate slot (input in an output, output in an input slot). Hence, it is not passing video.

Software Control – Using Lightware Device Controller (LDC)

The device can be controlled from a computer using the Lightware Device Controller software. The application is available at www.lightware.com (Support / Downloads section), install it on a Windows PC or a macOS and connect to the device via LAN, USB or RS-232.

Software Control – Built-in Web

The built-in website of the matrix allows to connect and control the matrix via a web browser. Open a web browser (Mozilla Firefox or Google Chrome is recommended) and connect the device by writing the IP address of the matrix into the address bar.

The built-in web and Lightware Device Controller Software has the same look and functionality.