



## Quick Start Guide

MX-FR9, MX-FR17, MX-FR33L  
MX-FR33R, MX-FR65R, MX-FR80R

### Important safety instructions

Please read and keep the information in the attached safety instructions supplied with the product before starting using the device.

### Introduction

The MX series matrix routers are the highest performance, modular expandable DVI and HDMI compliant switchers, available in five different frame sizes. The built-in sophisticated software and hardware features make these routers the most flexible integrated solution for AV professionals and high-end home theatre applications.

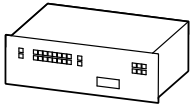
### Hybrid modular matrix concept

Lightware's hybrid modular matrix switchers allow building custom I/O sizes which meet the user's requirements. Different types of input and output boards give the maximum flexibility for rental and installation signal transmission. The hybrid architecture allows signal routing between boards even if they have different connectors. This way any input can be routed to any or more outputs if the output interface is capable of transmitting the signal. For example, a DVI source can be routed to an HDMI sink, but HDCP encrypted sources cannot be routed to non-HDCP capable DVI sinks. The available interface types include DVI-D single- and dual-link, HDMI, fiber, and twisted pair cables as well.

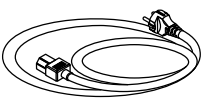
**⚠ Always turn off the matrix before plugging, unplugging the CPU, input-, or output cards.**

### Box contents

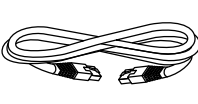
The packaging box includes:



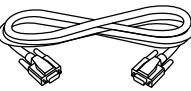
Matrix router frame



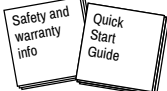
IEC power cable



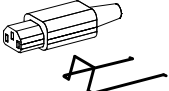
LAN cross-link cable,  
CAT5e type, 3m length



RS-232 straight cable



Safety and warranty info,  
Quick Start Guide



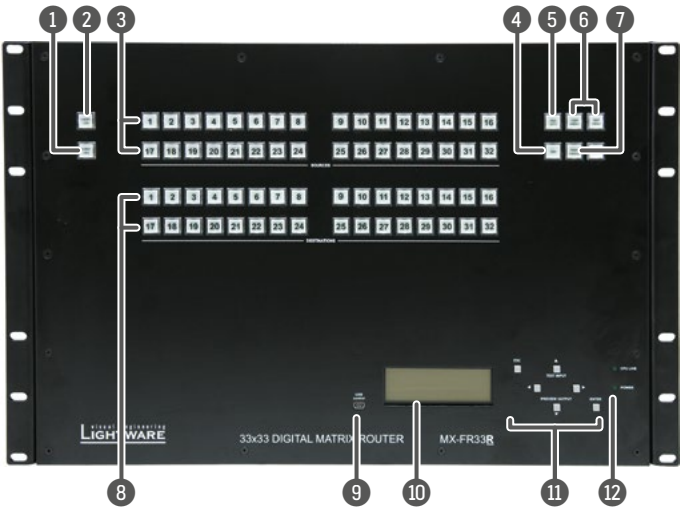
Mountable power plug  
with fixing ear (2x) \*

\* only in the case of MX-FR33R matrix.

The router frame includes:

- Router CPU board (MX-CPU2).
- Router input and output boards (depends on the ordered configuration).
- Power supply units (depends on the ordered configuration).
- Two rack mounting ears (fixed to the frame).

### Front view



**ⓘ** The front panel of the matrices look almost the same. The only difference is the number of source and destination buttons.

### Front view legend

- 1 Output lock**
- 2 Control lock**
- 3 Sources**
- 4 EDID mode**
- 5 Take / Auto**
- 6 Preset buttons**
- 7 Signal present**
- 8 Destinations**
- 9 USB control**
- 10 Menu display**
- 11 Menu navigation**
- 12 Status LEDs**

Locks and protects one or more outputs.

Disables or enables front panel operations. Red light means the switching and function buttons are disabled.

Buttons to select an input, to select a preset number or to view the state of the selected input port.

The EDID mode can be (de)activated by the button. The illuminated button shows that the mode is active.

Switching between Take and Autotake working modes; keep the button pressed for 3 seconds to toggle the modes.

Performing preset operations (Load and Save).

The Signal present mode can be (de)activated by the button. The illuminated button shows that the mode is active.

Buttons to select an output or to see the state of an output.

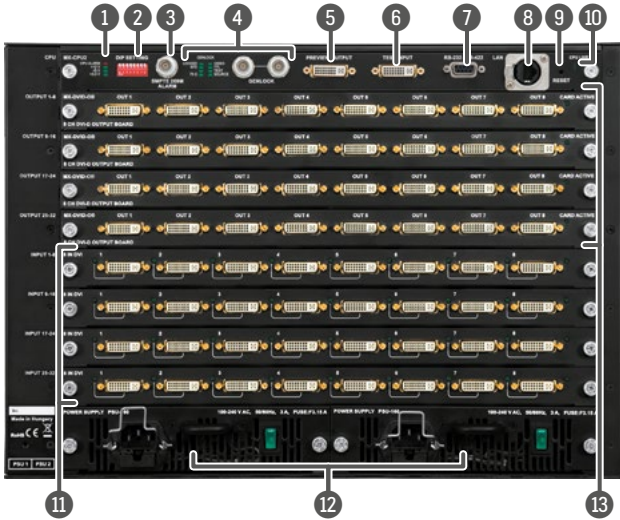
USB connection for Lightware Device Controller Software.

Displays status information and menu operation.

Up, down, left, right, enter, and escape buttons.

Power LED indicates that the unit is powered on. CPU LIVE blinking LED indicates normal operation.

### Rear view



**ⓘ** MX-FR33L, MX-FR17, and MX-FR9 contain a power supply unit that is fixed to the matrix and not redundant.

### Rear view legend

- 1 Status LEDs**
- 2 DIP settings**
- 3 Alarm out**
- 4 Genlock**
- 5 Preview out**
- 6 Test input**
- 7 RS-232 port**
- 8 Ethernet port**
- 9 Reset**
- 10 CPU live**
- 11 Input boards**
- 12 Power supplies**
- 13 Output boards**

LED indicators for internal DC power voltages, and alarm.

Special settings can be made with these switches.

Standard SMPTE 269M alarm output with BNC connector.

LED indicators for genlock status, and BNC receptacles for genlock loop connection.

DVI output connector, which is directly connected to a certain output - see the table below.

DVI input connector, which can be configured as an alternative for a certain input - see the table below.

9 pole D-sub female connector for a standard RS-232 port.

Standard RJ45 connector. This port can be connected to a computer directly or to LAN via switch/router.

Reboots the matrix; the same as switching it off and on again.

CPU live LED blinks to indicate normal operation.

Modular input board slots.

Hot swap slots for power supply units - available in MX-FR80R, MX-FR65R, and MX-FR33R matrices.

Modular output board slots.

### Router frames

Different frame sizes are available from 9x9 up to 80x80. To fit user needs various input and output interface boards are available, that can be mixed in the same frame without limitation.

Frame type	Rack height	Max. input boards	Max. input ports	Max. output boards	Max. output ports
MX-FR9	4U	1	9	1	9
MX-FR17	4U	2	17	2	17
MX-FR33L	6U	4	33	4	33
MX-FR33R	7U	4	33	4	33
MX-FR65R	15U	8	65	8	65
MX-FR80R		15U		10	

**ⓘ** The maximum number of input and output ports includes the Test input and Preview output port of the MX-CPU2 processor board.

### MX-CPU2 processor board

There is a CPU board in the router which is necessary for the frame to work. That board is responsible for controlling the matrix and storing the settings.

### Test input and Preview output ports

The MX-CPU2 board has a **TEST** DVI input, and a **PREVIEW** DVI output port. Although these ports have special functions they can be used as normal I/O ports including HDMI- and HDCP capability.

### MX-FR80R and MX-FR65R

Used in the MX-FR80R (and MX-FR65R) router frame, the Preview output is directly connected to the 80th output port with a DVI splitter. Therefore, that port always outputs the same signal as the 80th output, even if it uses a different interface (TP, OPT, etc.).

The 80th input port of the crosspoint is multiplexed between the Test input port and the 8th port of the 10th input board. This switch is independent from the crosspoint state. The selected port (Test input or Input board #10) will be available as the 80th input on the crosspoint switch.

### Other frames

All other frames use the Test input and Preview output just like any other ports. These ports are referred as the last port in the crosspoint.

### Powering on

Connect the power cords to the power supply units' IEC standard power input connector. After switching the mains switch to the 'I' position the router starts up. If the mains switch is not available or it was in the 'I' position, then the matrix starts up immediately when the power cord is connected to the AC source.

During the initial self-test and loading of the latest settings, **Booting...** appears on the LCD screen. After the self-test, the router reloads its last configuration and it is ready to use. In the case of a hardware failure, an error message is displayed.

**ⓘ** After switching ON, the router reloads the latest settings that were used before it was turned off. The router has an internal emergency memory that stores all current settings and tie configurations. This memory is independent from presets and invisible for the user. This built-in feature helps the system to be ready immediately in the case of a power failure or accidental power down.

### Redundant power supplies

Some frame models have hot pluggable, redundant power supplies. Power supply units (PSU) can be dismounted or installed during operation. Depending on the router's configuration (number and type of I/O boards) one or two PSUs are needed to operate. The extra PSU makes the system redundant. Please consult Lightware support about your system configuration to ensure redundancy.

If more than one PSU is needed for supplying the matrix, please make sure that the second PSU gets power not later than 10 seconds after the first one is plugged in to prevent overload on the first PSU. If one PSU is enough to supply the whole matrix, then the other one(s) can be left unplugged.

### Mounting with front rack ears

Two rack ears are supplied with the product, which are fixed on the left and right side of the frame. These ears allow mounting the device as a standard rack unit installation.

### Ventilation

**⚠ To ensure the correct ventilation and avoid overheating let enough free space around the appliance. Do not cover the appliance, let the ventilation holes free on both sides.**

The following picture shows the direction of the airflow:



### Further information

The document is valid with the following firmware version: 3.4.9  
The User's manual of this appliance is available on [www.lightware.eu](http://www.lightware.eu).  
See the [Downloads](#) section on the website of the product.

### Contact us

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Doc. ver.: 1.0  
19200030



CONTROL LOCK

If the button illuminates in **red** the switching- and function buttons are disabled. Press the **Control lock** button to toggle the state.

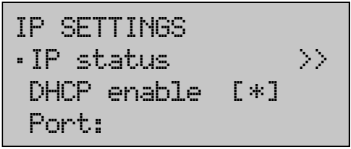


**ⓘ** When the front panel buttons are locked, remote control (RS-232, USB, Ethernet) is still available.

LDC menu - navigation

The front panel LCD has 4 lines and 20 characters in each line. The up and down buttons can be used to scroll between the menu items. The enter button steps in a submenu or save changes. The escape button steps back to the previous menu. The left and right navigation buttons modify the value of the current menu item. The right button steps in the current submenu and the left button steps back to the previous menu.

Menu items can be submenus, values, or checkboxes. The '~' sign shows the currently selected menu item. Submenus are marked with '>>' sign. Changeable values appear between '<' and '>' signs. Checkboxes are shown like '[\*]', where the asterisk indicates if the function is active or not.



Front panel controls in TAKE mode

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



Switching operations	1. First, press and release the desired <b>source button</b> . The pressed source button and all destination buttons which are currently connected to the source lights up.	
	2. Press and release the desired <b>destination buttons</b> which have to be (dis)connected to/from the selected source. The preselected destination buttons will blink.	
	3. Press and release <b>Take</b> button; the selected input is switched to the selected output(s).	
Lock an output	1. Press and release the <b>Output Lock</b> button; it starts to blink and all the buttons of any locked destinations light up (view state).	
	2. Press and release a <b>destination button</b> ; it starts to blink (more destinations can be selected sequentially).	
	3. Press and release <b>Take</b> button. The selected destinations are now locked.	

Front panel controls in AUTOTAKE mode

**Autotake** mode is useful when immediate actions must be done 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.



Switching operations	1. Press and release the desired <b>destination button</b> . The pressed destination button and the actually connected source button light up green. If no source is connected (the output is muted) no source button will light up.	
	2. Press and release the desired <b>source button</b> . The switch action will be executed immediately. Switching between sources to the selected destination can be done directly.	
Lock an output	1. Press and release the required <b>destination button</b> . Now the selected destination button and the currently configured source button light up (view mode).	
	2. Press and release the <b>Output Lock</b> button; it lights up in red, and lock function is activated at once. No source can be changed at the locked destination.	

Remote operation

The matrix can be controlled through various interfaces remotely. The feature allows using functions which are not accessible via the front panel. Also, this helps system integrators and operators to control multiple devices in a complicated system through a single user interface.

Control interfaces

The User can connect to the matrix through the Ethernet, serial, or USB port. After establishing the connection, generally, there is no difference between the connection types.

**ⓘ** Ethernet port can be connected to a LAN hub, switch or router with a UTP patch cable. If connecting to a computer directly, a crosslink UTP cable has to be used!

User interface	Ethernet port	RS-232 port	USB port
Lightware Device Controller	✓	✓	✓
Built-in website	✓	✗	✗
Third party control system	✓	✓	✗

Multiple simultaneous connections

Ethernet and Serial connections can be used at the same time. However, only one connection is allowed for Lightware Device Controller (LDC) via the Ethernet port.

Control protocols

Matrix routers can be controlled with multiple control protocols. Lightware routers have a special protocol, but to interoperate with third-party devices, a secondary protocol is also provided. For detailed information about control protocol, read the User's manual of the device.

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.eu](http://www.lightware.eu) (Support / Downloads section), install it on a Windows PC or a Mac OS X and connect to the device. The following ways are available to connect to the device directly.



Local USB port

Connect a USB cable (with mini B-type connector) between the matrix and the computer and start the LDC. The device is displayed under the USB devices section; press **Connect**.

Local RS-232 port

Connect a serial cable between the matrix and the computer and start the LDC. Press the **Query** button of the connected **COM** port to list the device, select it then press **Connect**.

LAN port

Connect the supplied LAN crosslink cable between the matrix and the computer for direct connection or connect to an Ethernet. The default parameters are listed in the table of **Factory default settings**.

Web control – Using the built-in website

The matrices have a built-in web page, which can be accessed over TCP/IP protocol and offers you full control over all settings even if you don't have the opportunity to install new programs. The router's built-in website is compatible with most widely spread browsers and requires no additional software components. To access the web page just run your preferred web browser and type the IP address of the router as a URL. The computer and the router have to be in the same subnet.

**ⓘ** The IP address of the matrix is displayed on the LCD menu. If there is no chance to access the front panel, the only way to find out the router's IP address is to search for devices with the Lightware Device Controller software. If this is not possible for some reason, the IP address can be reset to factory default (192.168.254.254) with the front panel buttons.

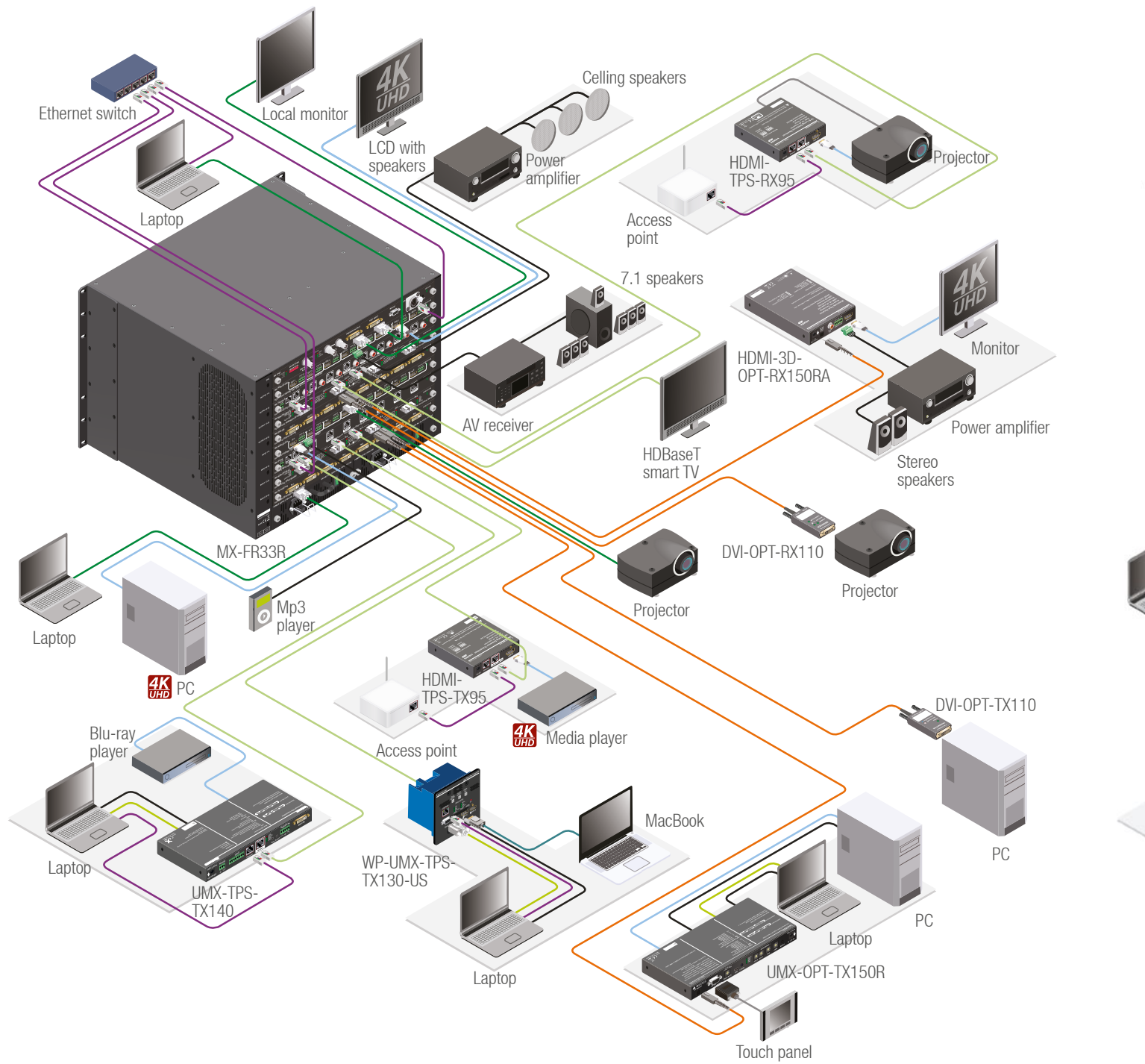
**ⓘ** Only one opened web page is allowed simultaneously. Other TCP/IP connections are prohibited while the web page is opened.

Establishing the connection

**ⓘ** If the computer has multiple Ethernet connections (e.g. Wi-Fi and LAN connections are used simultaneously) you will have to know the IP address for the one that is used for controlling the matrix.

- Connect the matrix switcher and the computer via :
  - Ethernet, with LAN patch cable (to a Hub, Switch or Router), or
  - Directly by a LAN cross-link cable.
- Change to the desired IP settings if it is needed and check it on the display.
- Type the IP address to the address bar of the web browser. After a few seconds, the control menu appears. The current state of the crosspoint switch is displayed.

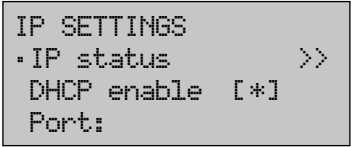
Typical appliation



Network settings on the front panel

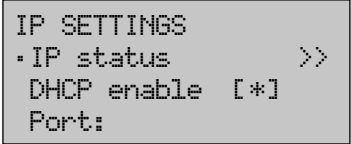
Setting a dynamic IP address

- Navigate to the **IP settings** menu item and press the **enter** button.
- Use the **up** and **down** buttons to navigate to the **DHCP enable** sub-item.
- Press the **enter** to toggle between enable and disable status. If the DHCP is switched off then the IP address can be set by the user.
- To take effect, navigate to **Save settings**, then press the **enter**.
- Any changes made in the IP settings menu come alive only when **Save settings** is executed. To do this, navigate to this item with the **up** and **down** buttons, and press the **enter**.



Setting a static IP address

- Disable DHCP** as described above.
- The four parts of the IP address can be set separately. Use the **left** and **right** buttons to **select** the part, then use the **up** and **down** buttons to change the **value** of that part.
- Any changes made in the IP settings menu come alive only when **Save settings** is executed; navigate to this item with the **up** and **down** buttons, and then press the **enter**.



**ⓘ** New IP settings can be applied while an active connection is alive on the Ethernet port but in this case, the active connection will be closed automatically. To reconnect the Ethernet port needs to be used again.

Factory default settings

The settings and parameters can be set to factory default as follows:

- Navigate to **Factory reset** menu.
- Press the **enter** button to select the desired component (IP reset, IO card reset, EDID reset, HDCP key reset, Protocol reset, All reset).

IP address (static)	192.168.254.254
Subnet mask	255.255.0.0
Static gateway	0.0.0.0
DHCP	disabled
TCP/IP port no.	10001
RS-232 port setting	57600 BAUD, 8, N, 1
Emulated EDID	static F49 at all inputs
Crosspoint settings	all outputs connected to input 1
CPU test input - color range	no change
CPU test input - HDCP enable	yes
CPU preview output - video mode	auto
CPU preview output - colorspace	auto
CPU preview output - color range	auto
CPU preview output - LPCM subsample	auto
CPU preview output - HDCP	auto
Input/Output board setting	depends on the installed board