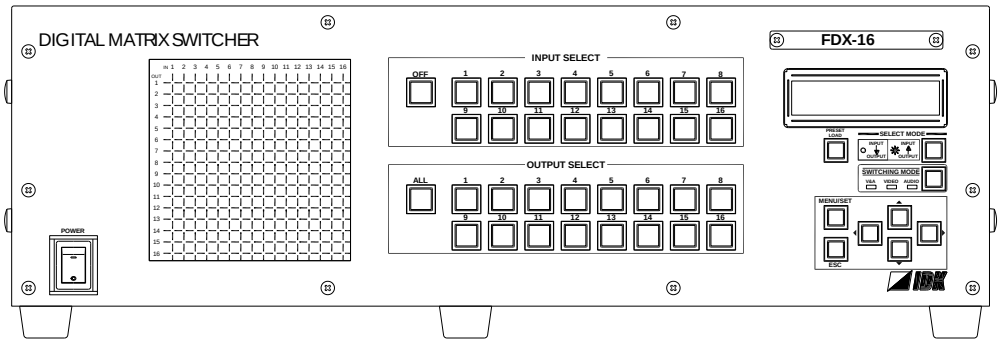
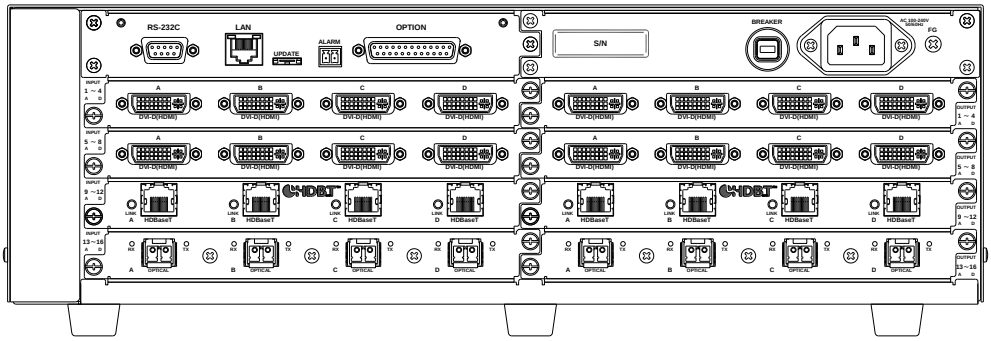
Digital Matrix Switcher

FDX-16

User's Guide Ver.1.0.0





- Thank you for choosing our product.
- To ensure the best performance of this product, please read this User's Guide fully and carefully before using it and keep this manual beside this product.

IDK Corporation

Trademarks

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Before reading this manual

- Some of the contents in this User's Guide such as appearance diagrams, menu operations, communication commands, and so on may differ depending on the version.
- This User's Guide is subject to change without notice. You can download the latest version from IDK's website at: http://www.idk.co.jp/en/index.html

The reference manual for FDX-16 consists of the following two volumes:

■ User's guide (this document):
Provides explanations and procedures for operations, installation, connections among devices, I/O adjustment and settings.

■ Command guide:
Please download the command guide from the website above.
Provides explanations and procedures for external control using serial and LAN communications.

The lasers in this product meet Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 laser safety standards which specify design safety.

FCC STATEMENT
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.
Note: This equipment was tested with shielded cables on the peripheral devices. Shielded cables must be used with the equipment to ensure compliance with FCC emissions limits.

CE MARKING
This equipment complies with the essential requirements of the relevant European health, safety and environmental protection legislation.

WEEE MARKING

Waste Electrical and Electronic Equipment (WEEE), Directive 2002/96/EC
(This directive is only valid in the EU).
This equipment complies with the WEEE Directive (2002/96/EC) marking requirement.
The left marking indicates that you must not discard this electrical/electronic equipment in domestic household waste.

If an HDBaseT input slot board (4 channels) or HDBaseT output slot board (4 channels) is mounted, use an STP cable for the twisted pair cable in order to meet the VCCI standard. It can reduce the noise caused by the cable.

Safety instructions

Read and understand all safety and operating instructions before using this device. Follow all instructions and cautions as detailed in this document.

Enforcement Symbol	Description
Warning	Indicates the presence of a hazard that may result in death or serious personal injury if the warning is ignored or the equipment is handled incorrectly.
Caution	Indicates the presence of a hazard that may cause minor personal injury or property damage if the caution is ignored or the equipment is handled incorrectly.

Symbol	Description	Example
Caution	This symbol is indicated to alert the user. (Warning and caution)	**Electrical Hazard**
Prohibition	This symbol is intended to prohibit the user from actions.	**Do not disassemble**
Instruction	This symbol is intended to instruct the user.	**Unplug**

⚠Warning

Prohibition	**Do not place the product in any unstable place.** Install the product to a horizontal and stable place. Otherwise, it may fall/turn over and lead to injury.
	Do not place the product in any environment with vibration. Otherwise, it may move/fall and lead to injury.
	Keep out any foreign objects. In order to avoid fire or electric shock, do not allow foreign objects, such as metal and paper, to enter the product from the vent holes.
	For power cable/ plug: ・ **Do not scratch, heat, or modify, including extending them.** ・ **Do not pull, put heavy stuff on them, or pinch them.** ・ **Do not bend, twist, or tie them together forcefully.** If they are used in those states continuously, it may cause fire or electric shock. If power cables/plugs become damaged, contact IDK.
Do not disassemble	**Do not repair, modify or disassemble.** Since the product includes high-voltage parts, those actions may cause fire or electric shock. For internal inspections or repairs, contact IDK.
Do not touch	**In the event of lighting or thunder, do not touch the main unit or cables such as power cable and LAN cable.** Contact may cause electric shock
Instruction	**For installation:** The product is intended to be installed by skilled technicians. For installation, please contact a system integrator or IDK. Otherwise, it may cause fire, electric shock, injury, or property damage.
	Set the power plug in a convenient place to unplug easily. You can easily unplug in case of any extraordinary failure or abnormal situation, and it also helps for unplugging when you do not use it for a long period.
	Plug the power plug into appropriate outlet completely. If the plug is plugged incompletely, it may overheat which causes electrical shock or fire. Do not use damaged plug or loosened outlet.
	Clean the power plug regularly. If the plug is covered in dust, it may cause fire due to reduced insulating power.
Unplug	**Unplug immediately if the product smokes, makes unusual noise, or smells.** If you continue to use the product under those situations, it may cause electric shock or fire. After confirming that the product stops smoking, contact IDK.
	Unplug immediately if you drop the product or if the cabinet is damaged. If you continue to use the product under those situations, it may cause electrical shock or fire. For maintenance and repair, contact IDK.
	Unplug immediately if water or other objects are directed inside. If you continue to use it under those situations, it may cause electrical shock or fire. For maintenance and repair, contact IDK.
For connection	
Instruction	Differences in ground potential among the product and peripheral devices may cause electric shock or damage of the devices. When using cables to connect devices, including connection of long-distance transmission, unplug the power cables of all related devices. After connecting signal/control cables of each device, plug in the power cables of each device.

Caution	
Prohibition	**Do not place the product in any place where it will be subjected to high temperatures.** If the product is subjected to direct sunlight or high temperatures, it may cause fire.
	Do not place the product in humid, oil smoke, or dusty place. If the product is placed near humidifiers or dusty area, it may cause fire or electric shock.
	Do not block the vent holes. If ventilation slots are blocked, it may cause fire or failure due to internal heat.
	Do not put heavy items on the product. It may fall/turn over and lead to injury.
	Do not exceed ratings of outlet and wiring devices. If several plugs are put in an outlet, it may cause fire and electric shock.
	Use only the provided AC adapter and power cable. If non-compliant adapter or power cables is used, it may cause fire or electrical shock. Use the provided AC power connection cable. If you want to use your product in other countries that use different AC power cables, contact IDK.
No wet hands	**Do not plug or unplug with wet hands.** It may cause electrical shock.
Instruction	**Use and store the product within the specified temperature/humidity range.** If the product is used outside the range continuously, it may cause fire or electric shock.
	Turn off devices when they are connected to another device. It may cause fire or electric shock.
Unplug	**Unplug the power plug if you do not use the product for a long period.** In case of defect, it may cause fire.
	Unplug the power plug before cleaning. It may cause electric shock.

For installation	

For rack mount devices:

Instruction	Mount the product to the rack meeting EIA standards, and maintain spaces above and below for air cooling. For your safety, attach an L-shape bracket in addition to the mount bracket kit for the front panel in order to balance the weight.

For devices with rubber feet:

Instruction	Never insert only the screws into the holes after removing the rubber feet. It may lead to damage when the screws contact electrical circuit or parts inside of the product. To put the rubber feet back on, use only provided rubber feet and screws.

Altitude:

Instruction	Do not place the product at elevations of 2,000 meters (6562 feet) or higher above sea level. Failure to do so may shorten the life of the internal parts and result in malfunctions.

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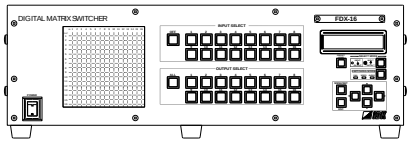
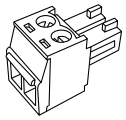
1 Included items

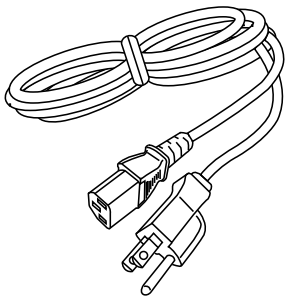
Make sure all items below are included in the package.
If any items are missing or damaged, please contact IDK.



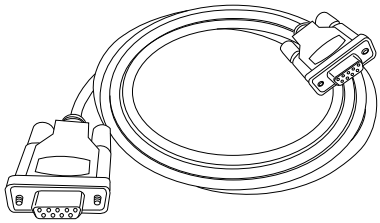
FDX-16 main unit x 1



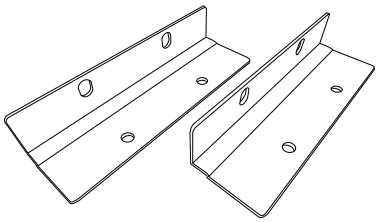
Terminal block (2 pin) x 1



Power cable (1.8m/5.9 feet) x1



RS-232C cable (1.8 m/5.9 feet) x 1



Rack mounting bracket x 2

[Fig. 1.1] Included items

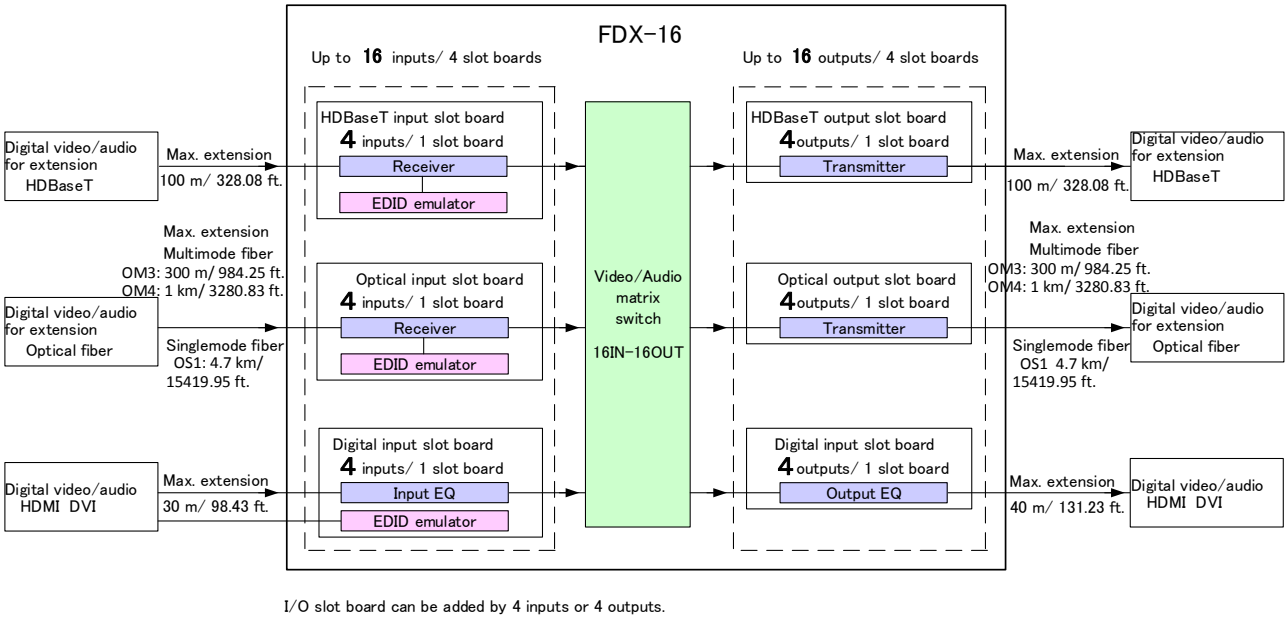
You can download the latest version of the User’s Guide from IDK’s website at:
http://www.idk.co.jp/en/index.html

2 Product outline

Caution: The FDX-16 outputs continuous invisible light, which may be harmful to your eyes. Please follow the following cautions.

- Do not look into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

FDX-16 has 16 inputs and 16 outputs. Since this HDMI/DVI Digital Matrix Switcher supports HDCP, video whose copyright is protected, such as Blu-ray, can be input. HDMI signals can also be input via a conversion cable.
Combining a twisted pair or optical I/O slot board that supports a long-distance extension enables simple configurations around the matrix switcher.
The FDX has RS-232C and LAN as its communication ports for external control so that you can control each setting remotely.



[Fig. 2.1] I/O diagram

- Digital input slot board (4 inputs)
  Four DVI-I connectors are mounted that can input both HDMI (a conversion cable is needed) and DVI signals.
- HDBaseT input slot board (4 inputs)
  Four RJ-45 connectors are mounted that can extend digital (video/audio) signals up to 100 m/328.08 ft. when the HDC-T series and FDX series are used together.
- Optical input slot board (4 inputs)
  Up to four SFP (LC connector x 2) modules can be mounted. Digital signals can be extended up to 4.7 km/15419.95 ft. (singlemode fiber) when the OPF-TH1000 and FDX are used together.
- Digital output slot board (4 outputs)
  Four DVI-I connectors that are mounted can output video and audio signals of the selected input channel.

- HDBaseT output slot board (4 outputs)

  Four RJ-45 connectors are mounted that can output video and audio signals of the selected input channel. Those digital (video/audio) signals can be extended up to 100 m/328.08 ft. when the HDC-R series and FDX series are used together.
- Optical output slot board (4 outputs)

  Up to four SFP (LC connector x 2) modules are mounted that can output video and audio signals of the selected input channel. Those digital signals can be extended up to 4.7 km/15419.95 ft. (singlemode fiber) when the OPF-RH1000 and FDX are used together.

3 Features

■ **For video**

・The maximum resolution: QWXGA*1 (RB)*2, 1080p

・Digital cable equalizer function (digital I/O slot board)

Input: Up to 10 m to 30 m/32.8 to 98.43 ft.

Output: Up to 10 m to 40 m/32.8 to 131.23 ft.

・Extension: Up to 100 m/328.08 ft. via a Cat6 cable (HDBaseT I/O slot board)

・Long-distance transmission via an optical fiber cable (Optical I/O slot board)

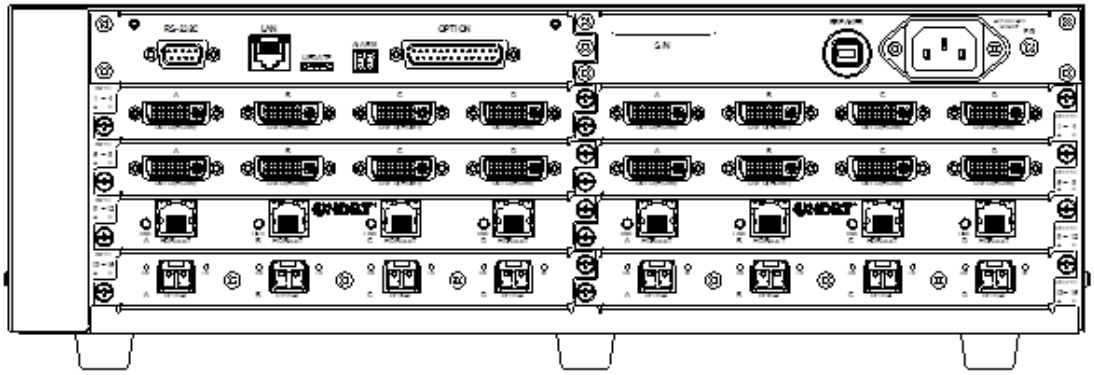
Multimode fiber (OM 3): Up to 300 m/984.25 ft.

Multimode fiber (OM 4): Up to 1 km/3280.83 ft.

Singlemode fiber (OS 1): Up to 4.7 km/15419.95 ft.

・Anti-snow

・The number of inputs and outputs can be customized using 4 inputs or 4 outputs.



[Fig. 3.1] Example of slot board combination

■ **Control input:** RS-232C, LAN

■ **Others**

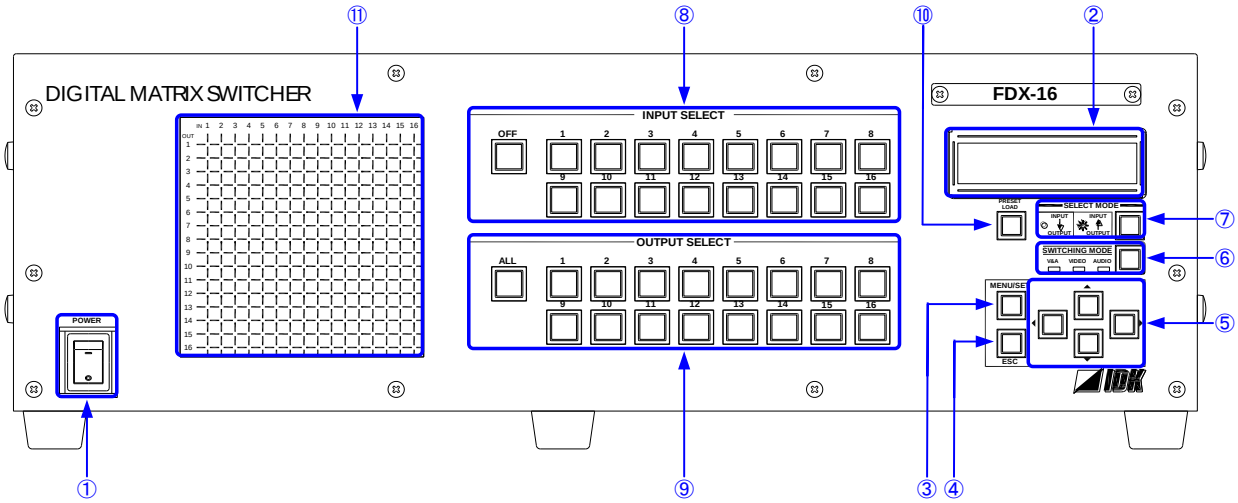
- EDID emulation (with copy function)
- Switching video and audio separately (when optional MAU-1616 is connected)
- I/O slot board and CPU slot board can be replaced without removing from the rack.
- Alarm output (Monitoring power and fans)
- Start-up memory
- Preset memory
- Last memory
- Connection reset
- Key lock

*1 The maximum resolution of optical I/O slot board: WUXGA (RB)

*2 (RB): Reduced Blanking

4 Panels

4.1 Front panel

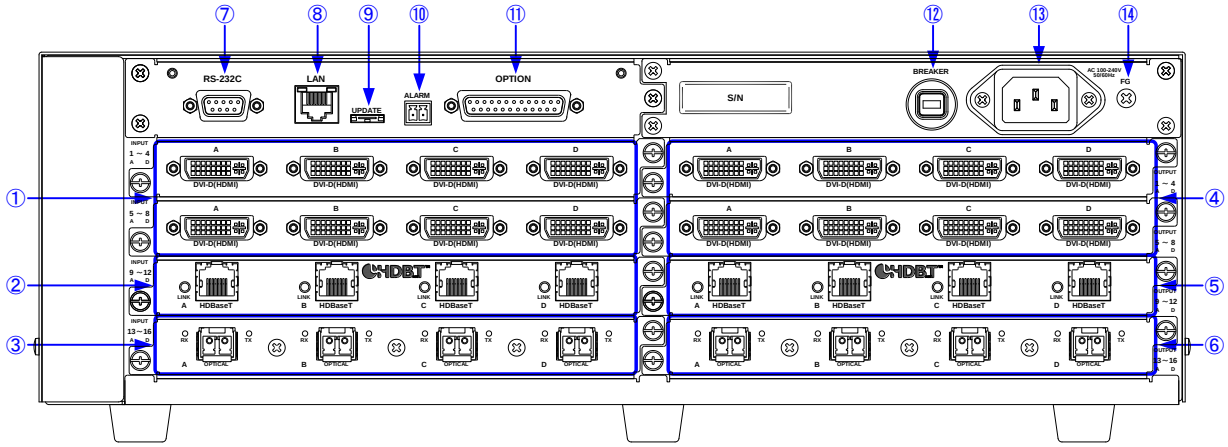


[Fig. 4.1] Front panel drawing

[Table 4.1] Part names and functions

#	Part name	Function
①	Power supply switch (POWER)	Turns on/off the FDX.
②	LCD screen	Displays menus and settings.
③	MENU/SET key	Displays menus and applies settings.
④	ESC key	Goes back to the previous page.
⑤	Arrow keys (▲, ▼, ◄, ►)	Switches menus, moves cursors and changes set values.
⑥	SWITCHING MODE key	Selects a switching mode: V&A (FDX and optional MAU-1616), VIDEO (only FDX-16), or AUDIO (only MAU-1616) when channels are being set.
⑦	Switching direction selection key	Selects a switching direction (INPUT→OUTPUT or OUTPUT→INPUT) when channels are being set.
⑧	Input channel selection keys (INPUT SELECT)	Selects an input channel when I/O channels are being set. Selects a preset memory number when ⑩ (PRESET LOAD key) is enabled.
⑨	Output channel selection keys (OUTPUT SELECT)	Selects output channels when I/O channels are being set.
⑩	Loading preset memory key (PRESET LOAD)	Enables/disables the loading preset memory mode.
⑪	I/O channel status display	Displays selected I/O channels.

4.2 Rear panel



[Fig. 4.2] Rear panel drawing

[Table 4.2] Part names and functions

#	Part name	Function
①	DVI input connectors (DVI-D HDMI)	For DVI-I cables and DVI-D cables (analog signals cannot be used). HDMI signals can be input using an HDMI-DVI conversion cable.
②	HDBaseT input ports (HDC)	Digital (video/audio) signals can be extended up to 100 m/328.08 ft. using the HDC transmitter and FDX together.
③	Optical input ports (OPTICAL)	Digital (video/audio) signals can be extended up to 4.7 km/ 2.9 miles (singlemode fiber) using the OPF-TH1000 and FDX together.
④	DVI output connectors (DVI-D HDMI)	For DVI-I cables and DVI-D cables (analog signals cannot be used). HDMI signals can be input using an HDMI-DVI conversion cable.
⑤	HDBaseT output ports (HDC)	Digital (video/audio) signals can be extended up to 100 m/328.08 ft. using the HDC receiver and FDX are used together.
⑥	Optical output ports (OPTICAL)	Digital (video/audio) signals can be extended up to 4.7 km/2.9 miles (singlemode fiber) using the OPF-RH1000 and FDX together.
⑦	RS-232C port (RS-232C)	For external control using communication commands.
⑧	LAN port (LAN)	For external control by communication commands or web browsers.
⑨	Maintenance port (UPDATE)	Not used. Keep this connector free.
⑩	ALARM port (ALARM)	When the FDX detects an serious problem (alarm), the relay contact will be closed.
⑪	Option port (OPTION)	If the MAU-1616 (optional) is used, use the special cable. Normally, please do not connect anything.

#	Part name	Function
⑫	BREAKER	Turned OFF if a circuit is broken or a problem in circuit parts occurs for some reason in order to prevent overcurrent into the FDX. If the breaker is turned off, press the breaker. However, if the breaker is turned off again, problems may have occurred in the device. Please contact us.
⑬	AC power connector	For the provided power cable.
⑭	Frame ground (FG)	For indoor ground terminal. An M4 screw is used.

5 Connecting external devices

5.1 Preparation

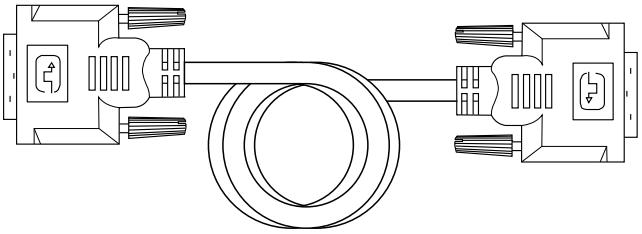
Prepare necessary cables before connecting external devices such as source and sink devices.

- For digital I/O slot board: DVI cable
- For HDBaseT I/O slot board: Twisted pair cable
- Optical I/O slot board: Optical fiber cable

■ DVI cable

For DVI input and output, please use a single-link cable of DVI-I or DVI-D (male connector). Analog signals cannot be input or output, and dual link is not supported. If you use a 5 m/16.4 ft. or longer cable for input or output, please use an IDK's cable (AWG24).

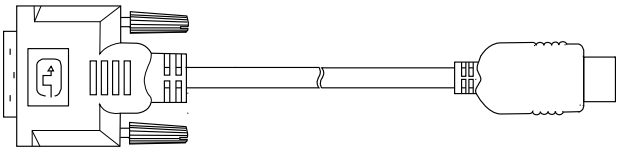
Part number	Length
DVIP/DVIP-S10	10 m/32.8 ft.
DVIP/DVIP-S15	15 m/19.21 ft.
DVIP/DVIP-S20	20 m/65.62 ft.
DVIP/DVIP-S30	30 m/98.43 ft.
DVIP/DVIP-S40	40 m/131.23 ft.
DVIP/DVIP-S50	50 m/164.04 ft.



[Fig. 5.1] Single sink long cable

For HDMI connectors, please use one of the following conversion cables.

Part number	Length
CBL-DH-015A	1.5 m/4.92 ft.
CBL-DH-03A	3 m/9.84 ft.
CBL-DH-05A	5 m/16.4 ft.



[Fig. 5.2] Conversion cable (HDMI-DVI conversion)

Note: Since DVI signals are very fast, use a cable meeting the DVI Rev1.0 standard. (IDK's cables meet the standard.)

■ Twisted pair cable

Use a UTP/STP cable meeting Cat5e/Cat6 standard.

■ Optical fiber cable

Use a duplex fiber whose both sides have a LC connector or two simplex fibers. The length of the cable must meet the standard of the extended distance.

5.2 Precautions before connection

■ For installation:

- If connecting a cable to the FDX or an external device that connected to the FDX, touch grounded metal to remove electricity from your body before holding the cable.
- Do not block vent holes.
  Keep 30 mm/1.18 inches or bigger space from the FDX.
- Do not install the FDX in a closed space.
  If you must install the FDX in a closed space (EIA rack mount), install an additional ventilation space in order to keep the ambient temperature at 40 degrees C/104 degrees F or less. If inadequately vented, the life of parts may be shortened and operations may be affected.

■ Cabling

- Read manuals of the external devices.
- Turn off devices and then connect them.
- Be sure to plug cables in completely and install them without any stress on connectors.

■ Twisted pair cable <Read the following precautions when installing a HDBaseT I/O slot board.>

Even though the connector for a long-distance transmission is the same as eight-core connector that is used for Ethernet, the transmission method is different. As a result, the connector for a long-distance transmission cannot be connected to Ethernet.
Please use a correct twisted pair cable and install it correctly to maximize the performance of this product.

- We recommend a Cat6 UTP/STP cable for the twisted pair cable between the transmitter and receiver. If using an STP cable, connect the FG connector to an earth ground source. Otherwise, the shielding function does not work correctly. When using a UTP cable, we still recommend that you use the ground connector.
- For 50 m/164.04 feet or shorter transmissions, Cat5e UTP/STP cable also can be used.
- The shielded STP cables are less affected by interference or external noise than UTP cables.
- The maximum extension distance of Cat5e/Cat6 UTP/STP cable is the shortest maximum extension distance of the connected HDC transmitter, HDC receiver and sink device.
- For pin assignments, apply T568A or T568B straight through cabling.
- Do not give connection cables a strong pull. The allowable tension of the twisted pair cable is 110 N.
- Do not bend the connection cable at a sharp angle. Keep the bend radius four times of the cable diameter or more.
- Keep the twisted pair cable as straight as you can. If you coil the cable, it is easily affected by noise.
- Do not tie the cable tightly; leave a space allowing the cable to move slightly.
- If you use the same cables, we recommended keeping distance between the cables or not to place the cables closely in parallel.
- Do not place this product in an electrically noisy environment, since high-speed signals are transmitted. Video or audio may be interrupted especially when you use a high-output radio around the FDX.
- If the distance between the FDX and transmitter/receiver is 100 m/328.08 ft. or less, a cable joint can be used. Up to two cable joints are allowed and joints supporting Cat6A (10GBase-T) are recommended.

Note: If there is a problem in the transmission path, video or audio may be interrupted. Please check the items above. If the problem still cannot be resolved, shorten the length of the twisted pair cable.

■ **Optic fiber cable [Read this instruction when mounting an optical I/O slot board.]**

To ensure the best performance of the FDX, select the appropriate optical fiber cable for a long- distance transmission and connect it correctly.

- Use a duplex fiber or two simplex fiber cables with LC connectors at both ends.
  To polish connectors:
  For SFP module for multimode: PC polishing is recommended.
  For SFP module for singlemode: UPC polishing is recommended.
  Note: APC polishing is not supported.
- Make sure that the fiber optical cable to be connected between the FDX and transmitter/receiver meets the standard of the desired extension distance.
- Extension distance varies depending on attenuation of the fiber, connector and other contact portions.
- Before inserting or removing the fiber, make sure to first turn the FDX off and not to touch the ends of the fiber. Clean them up before inserting the cable again.

♦ Simplex fiber and duplex fiber:
Simplex fiber has an optic fiber and a connector at both ends while duplex fiber has two fibers and two connectors. The duplex fiber cable is recommended for the FDX, but signals can be transmitted using two simplex fiber cables.

♦ LC connector:
One of connectors for fiber optical cables. (Example: SC connector, FC connector, ST connector, MU connector)

■ **SFP module [Read this instruction when mounting an optical I/O slot board.]**

The fiber type and extension distance to be used vary depending on the SFP module.

[Table 5.1] Specifications of standard SFP modules

	Multimode fiber	Singlemode fiber
Wave length	850 nm (Oxide VCSEL laser*)	1310 nm (Fabry-Perot laser*)
Maximum extension distance	OM3: 300 m/984.25 feet OM4: 1 km/3280.84 feet	OS1: 4.7 km/15419.94 feet
Input level	-13 dBm or higher	-18 dBm or higher
Output level	-9 dBm to -2.5 dBm	-8.4 dBm to -3 dBm
Connector	LC (Duplex)	

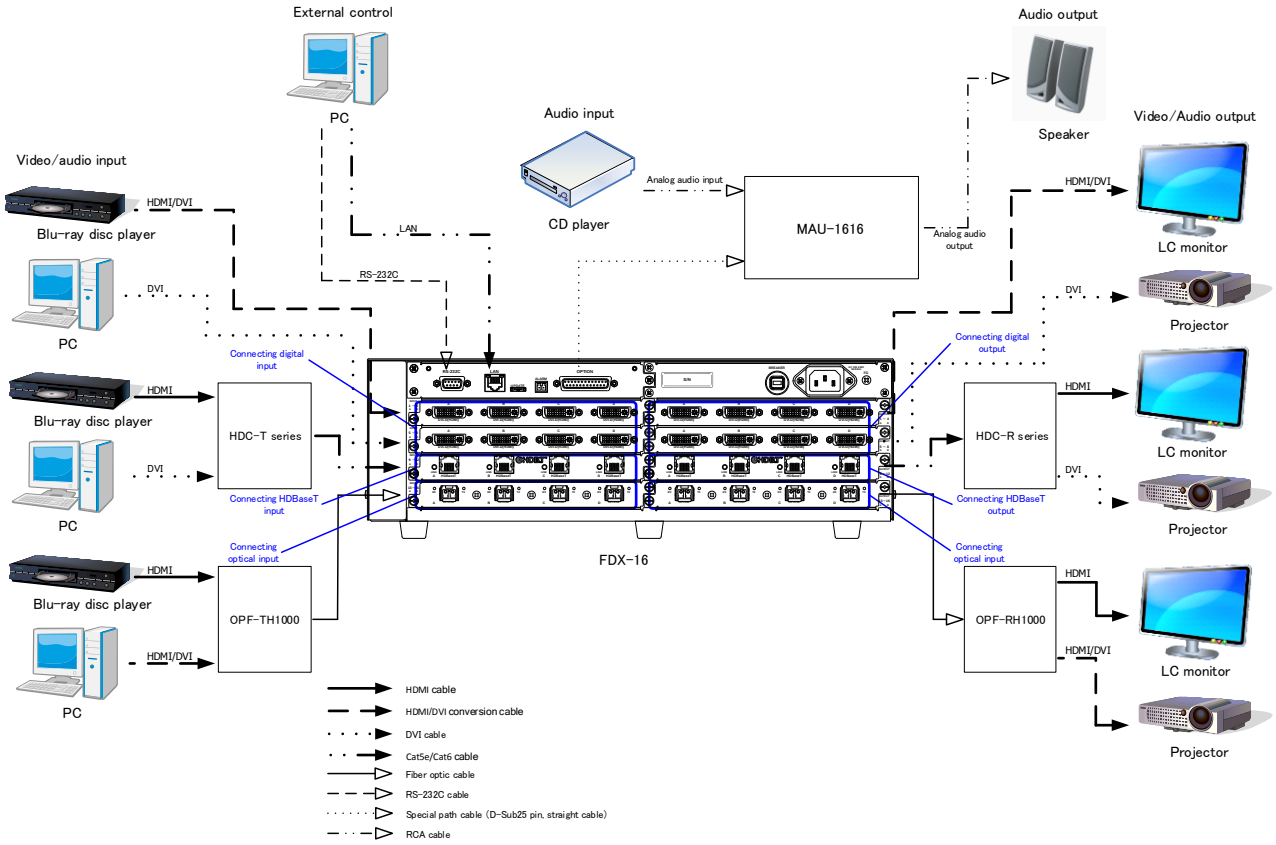
* Some SFP modules for singlemode can extend the transmission distance up to 30 km with OS1. Please contact us if needed.

Notes:

- Plug the dust cap to the fiber optical cable if you do not use it.
- Do not use the SFP module for other devices. Do not connect the optic fiber cable that is connected to other devices to the SFP module; otherwise, the SFP module may be broken. The maximum receiving optical level of the SFP module in the FDX is 0 dBm
- If you need to replace the SFP module, please contact us.

5.3 Connection

The FDX is able to connect devices having various interfaces.



[Fig. 5.3] Example application

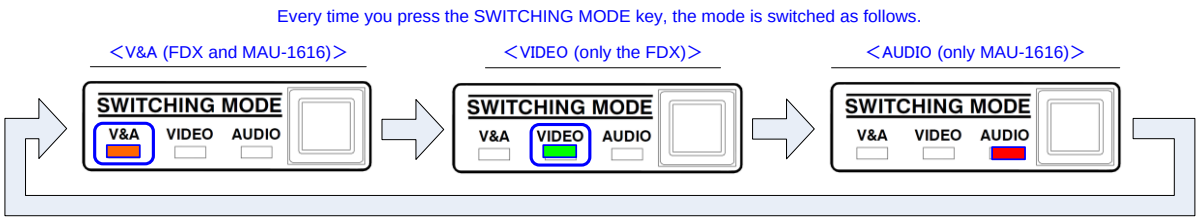
Note: If you connect an HDC device to send DVI signals that are protected by HDCP, use IDK's twisted pair cable extender that supports DVI signals.

6 Basic operation

6.1 Setting switching mode

You can select whether channels of the FDX and optional MAU-1616 are switched in tandem with each other from the following three modes using the SWITCHING MODE key.

- V&A mode: Turns orange; switching I/O channels of both the FDX and MAU-1616 together.
- VIDEO mode: Turns green; switching I/O channels of only the FDX.
- AUDIO mode: Turns red; switching I/O channels of only the MAU-1616.



[Fig. 6.1] Selecting switching mode

6.2 Selecting I/O channel

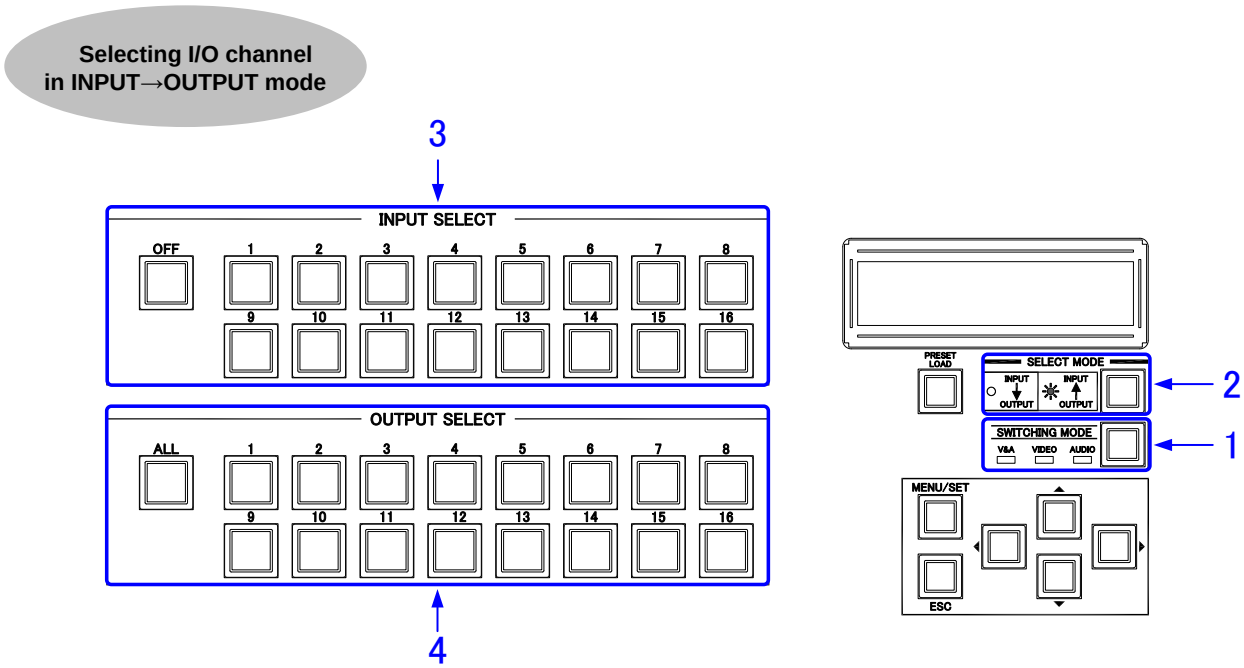
You can select I/O channels using INPUT SELECT and OUTPUT SELECT keys. If you want to select an input channel first, select "INPUT→OUTPUT" mode; in the opposite case (you want to select output channels first), select "OUTPUT→INPUT" mode.

If you do not operate these keys for 60 seconds, the power saving function will be enabled.

【Reference:7.9.3 Power saving [POWER SAVE]】

6.2.1 Selecting I/O channel in INPUT→OUTPUT mode

Selecting an input channel first and then selecting output channels:



Procedure

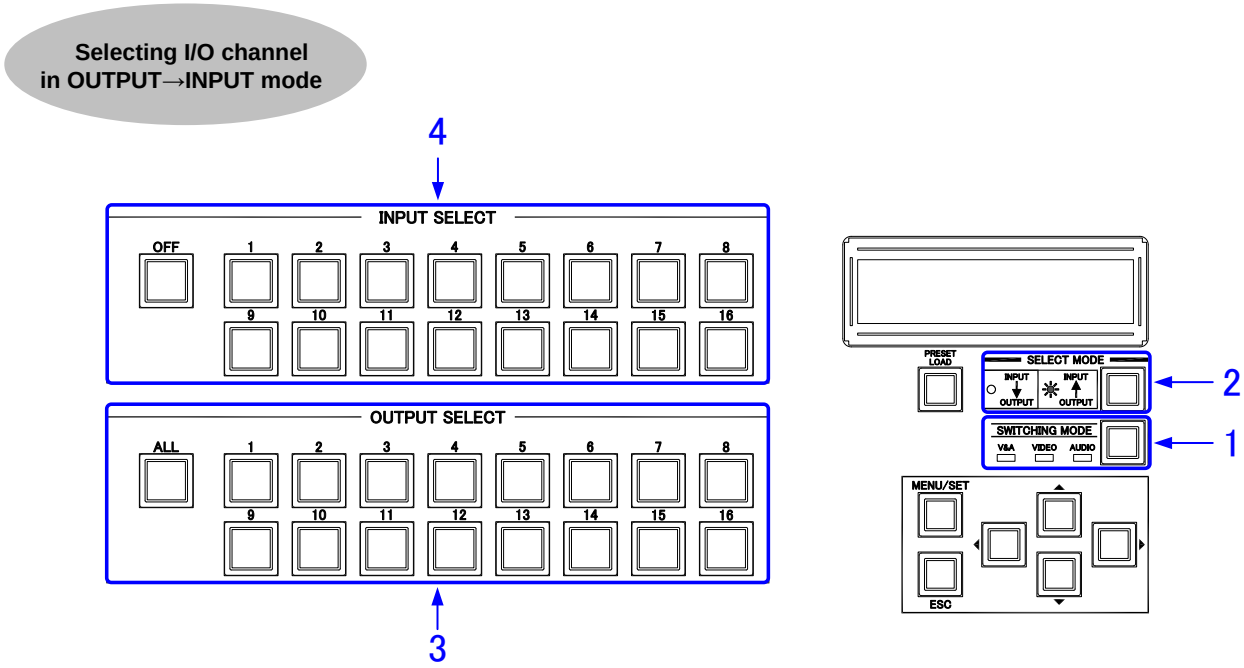
1	Select the desired mode by pressing the SWITCHING MODE key. (LEDs of input and output channel keys that corresponding to the selected mode will be turned on.)
2	Select " INPUT→OUTPUT" mode by pressing the SELECT MODE key. (The LED of the SELECT MODE key will be turned off.)
3	Select an input channel by pressing an INPUT SELECT key ("1" to "16" or "OFF"). (LEDs of the currently selected output channels will be turned on.)*
4	Select output channels by pressing OUTPUT SELECT keys ("1" to "16" or "ALL").*

Notes for channel selection:

- Channels that do not have a slot board cannot be selected.
- The selected output channels can be OFF (no signal) by pressing the "OFF" key.
- The selected input channel can be output to all output channels by pressing the "ALL" key..

6.2.2 Selecting I/O channels in OUTPUT→INPUT mode

Selecting output channels first and then selecting an input channel:



Procedure

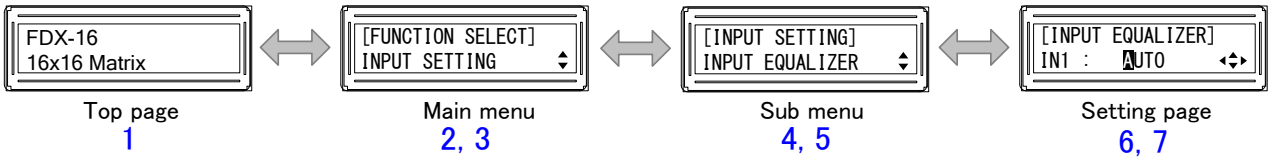
1	Select the desired mode by pressing the SWITCHING MODE key. (LEDs of input and output channel keys that corresponding to the selected mode will be turned on.)
2	Select " OUTPUT→INPUT" mode by pressing the SELECT MODE key. (The LED of the SELECT MODE key will be turned on.)
3	Select output channels by pressing OUTPUT SELECT keys ("1" to "16" or "ALL"). (The LED of the currently selected input channel will be turned on.)*
4	Select an input channel by pressing an INPUT SELECT key ("1" to "16" or "OFF").*

Notes:

- Channels that do not have a slot board cannot be selected.
- The selected output channels can be OFF (no signal) by pressing the "OFF" key.
- The selected input channel can be output to all output channels by pressing the "ALL" key.

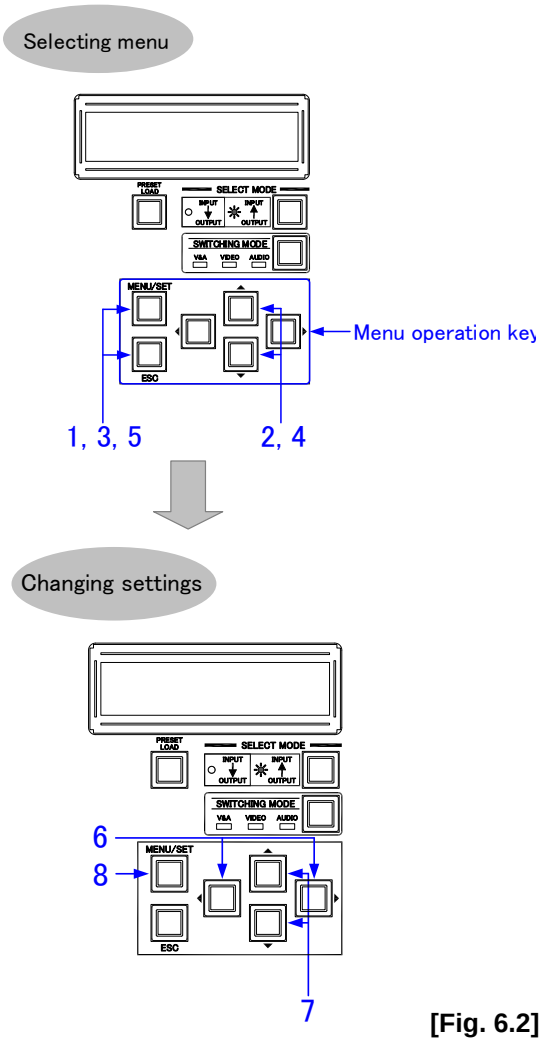
6.3 Menu operation key

The menu consists of the top page, main menu, sub menu, and setting page.



The screen backlight is turned off if no operation is performed for 60 seconds (power saving function).
If you do not operate these keys for 60 seconds, the power saving function will be enabled.

【Reference:7.9.3 Power saving [POWER SAVE]】



Procedure

1	Press the "MENU/SET" key to open the main menu.*1
2	Select the desired main menu using "▲" and "▼" keys.
3	Select the "MENU/SET" key to move to the sub menu. The top page can be opened again by pressing the "ESC" key.
4	Select the desired sub menu using "▲" and "▼" keys.
5	Select the "MENU/SET" key to move to the setting page. The main menu can be opened again by pressing the "ESC" key.
6	Select the channel using "◀" and "▶" keys. The sub menu can be opened again by pressing the "ESC" key.
7	Change the setting using "▲" and "▼" keys.*2 The sub menu can be opened again by pressing the "ESC" key
8	If the "MENU/SET" key blinks, press the key to apply the setting.

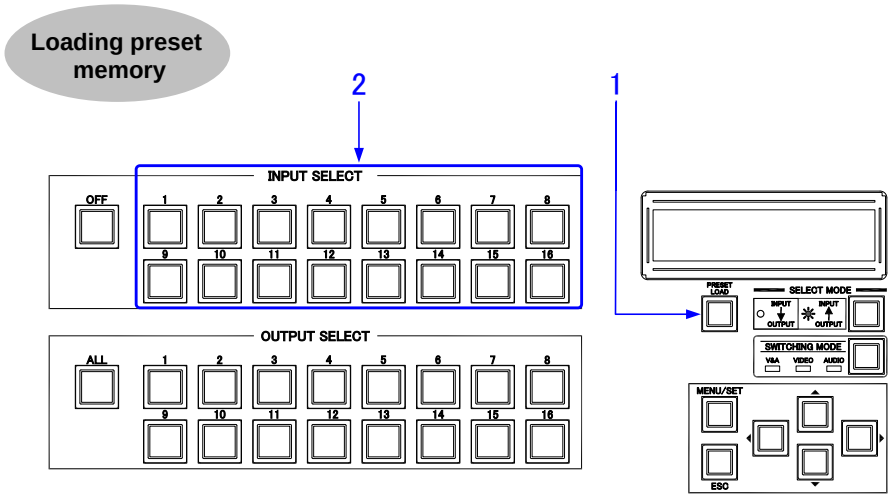
[Fig. 6.2] Menu operation

*1 Available "▲", "▼", "◀", and "▶" keys are displayed at the lower right of the LCD screen and the key LED lights.
A channel that does not have its slot board cannot be set.

*2 The set value will be saved after the operation.

6.4 Loading preset memory

You can apply settings of I/O channels registered in the preset memory.
Front panel: up to preset memories 1 to 16
Menu (PRESET LOAD): up to preset memories 1 to 32



[Fig. 6.3] Loading preset memory

Procedure

1 Press the "PRESET LOAD" key.*

2 Select the desired preset memory number using "1" to "16" keys.

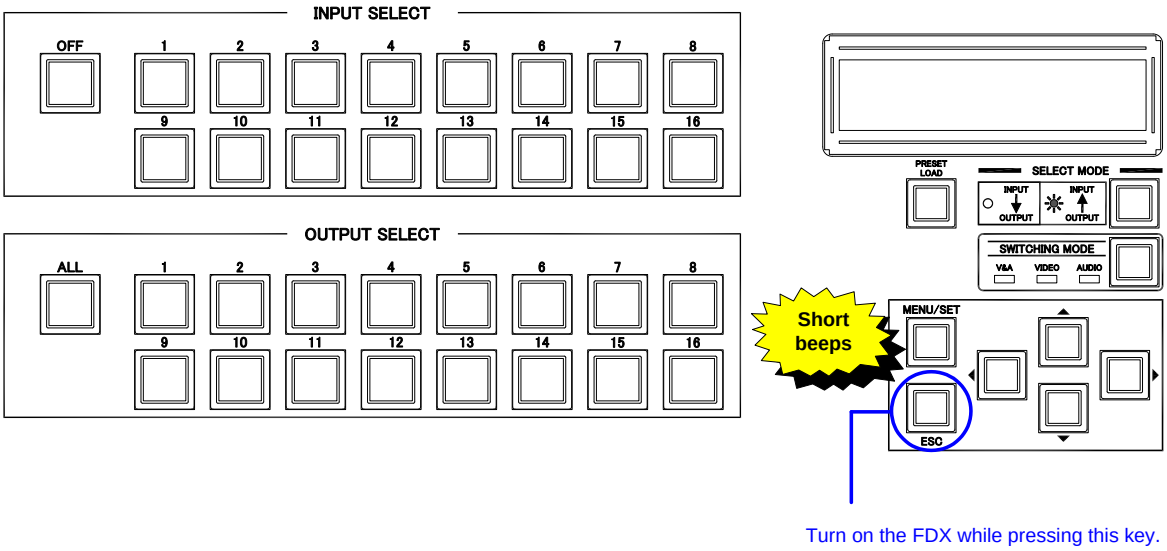
Notes:

- Once you press the "PRESET LOAD" key, the LED is turned on and the loading preset memory mode is enabled.
- Press the "PRESET LOAD" key again or "ESC" key in order to cancel the mode. If you do not operate the key for 60 seconds after the loading preset memory mode is enabled, the mode will be canceled because of power saving function.

【Reference:7.9.3 Power saving [POWER SAVE]】

6.5 Initialization

All settings can be reset to factory default values by turning on the FDX while pressing the "ESC" key.
Press and hold the "ESC" key until you hear short beep sounds.
Note: Once you have initialized the settings, they cannot be reversed.



[Fig. 6.4] Initialization

[Table 6.1] Factory default list

Function	Factory default	Setting for
Input channel	INPUT OFF	Each output
Switching mode	V&A	–

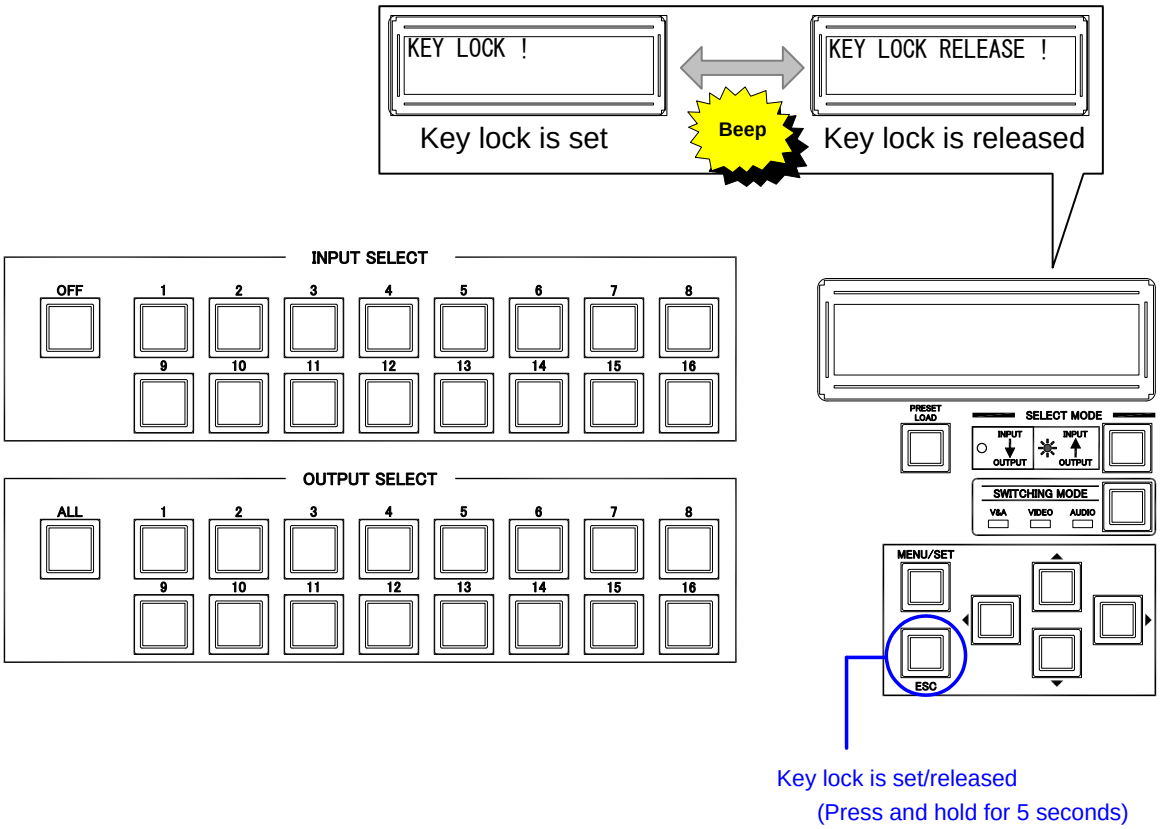
For other factory defaults, see "**7.1 Menu list**".

6.6 Setting/Releasing key lock

The key lock of front keys can be set/released by pressing the "ESC" key for five seconds (approx.). Press and hold the "ESC" key until you hear a long beep sound.
Front keys are divided into some groups, and you can select the target group.

【Reference:7.9 Setting other functions [OTHERS]

Each message is displayed for one second.



[Fig. 6.5] Setting/Releasing key lock

7 Menus

Menus that can be set in the FDX are divided into the following groups:

- Setting input: INPUT SETTING
- Setting output: OUTPUT SETTING
- Setting audio: AUDIO
- Setting EDID: EDID
- Setting RS-232C communication: COM PORT
- Setting LAN communication: LAN
- Setting preset memory: PRESET MEMORY
- Setting other functions: OTHERS

Menu hierarchy:

```
Top page   ──→ FDX-16
               16x16 Matrix
Main menu  ──→ ├──INPUT SETTING
Sub menu   ──→ │   ├──INPUT EQUALIZER
               │   ├──INPUT SIGNAL CHECK
               │   └──INPUT HDCP
               │
               ├──OUTPUT SETTING
               │   ├──OUTPUT EQUALIZER
               │   ├──OUTPUT MODE
               │   ├──OUTPUT HDMI MODE
               │   └──OUTPUT HPD MASK
               │
               ├──AUDIO
               │   └──AUDIO DIGITAL OUT
               │
               ├──EDID
               │   ├──EDID DATA
               │   ├──EDID SAVE
               │   ├──EDID EXTERNAL CH
               │   ├──EDID DEEP COLOR
               │   ├──EDID SPEAKER CH
               │   ├──EDID LINEAR PCM
               │   ├──EDID AC-3/Dolby D
               │   ├──EDID AAC
               │   ├──EDID Dolby D+
               │   ├──EDID DTS
               │   ├──EDID DTS-HD
               │   ├──EDID Dolby TrueHD
               │   └──EDID WXGA SELECT
               │
               ├──COM PORT
               │   └──COM PORT SETUP
               │
               ├──LAN
               │   ├──IP ADDRESS
               │   ├──SUBNET MASK
               │   ├──CONTROL PORT
               │   └──MAC ADDRESS
               │
               ├──PRESET MEMORY
               │   ├──PRESET LOAD
               │   ├──PRESET SAVE
               │   ├──PRESET EDIT
               │   └──PRESET START UP
               │
               └──OTHERS
                   ├──KEY LOCK
                   ├──BUZZER
                   ├──POWER SAVE
                   ├──COMMAND FORMAT
                   ├──ALARM
                   ├──TOP DISPLAY
                   ├──INPUT STATUS
                   ├──MONITOR STATUS
                   ├──BOARD STATUS
                   ├──FAN STATUS
                   ├──POWER STATUS
                   └──VERSION
```

[Fig 7.1] Menu hierarchy

7.1 Menu list

■ Setting input (INPUT SETTING)

Menu name	Function	Setting		
		Set value	For	Default value
INPUT EQUALIZER	Input equalizer	AUTO (Automatic correction)/ OFF (Without automatic correction)	Each input	AUTO (Automatic correction)
INPUT SIGNAL CHECK	No-signal input monitoring time	OFF/3 to 15 [second]	Each input	10 [second]
INPUT HDCP	HDCP input enabled/disabled	ENABLE/DISABLE	Each input	ENABLE

■ Setting output (OUTPUT SETTING)

Menu name	Function	Setting		
		Set value	For	Default value
OUTPUT EQUALIZER	Output equalizer	OFF (Without automatic correction)/LOW/ MEDIUM/HIGH	Each output	OFF (Without correction)
OUTPUT MODE	Output mode	AUTO/HDMI RGB/HDMI 422/HDMI 444/DVI	Each output	AUTO
OUTPUT HDMI MODE	Forced HDMI signal output	OFF (normal operation)/ ERROR (HDMI output only when EDID loading fails)/ALWAYS (HDMI output at all times)	Each output	OFF (Normal operation)
OUTPUT HPD MASK	Time for ignoring video output request signals	OFF/2 to 15 [second]	Each output	OFF

■ Setting audio (AUDIO)

Menu name	Function	Setting		
		Set value	For	Default value
AUDIO DIGITAL OUT	Digital audio output	ON/OFF	Each output	ON

■ Setting EDID (EDID)

Menu name	Function	Setting		
		Set value	For	Default value
EDID DATA	EDID resolution	00: EXTERNAL (external EDID)/ 01: Copied EDID 01 to 04: Copied EDID 04/ 05: 1080p (59.94/60)/ 06: 720p/07: 1080i/ 08: 1080p (24/25/30/50)/ 09: SVGA/ 10: XGA/ 11: VESA720/ 12:WXGA/ 13:WXGA/ 14: Quad-VGA/ 15:SXGA/ 16:WXGA/ 17:SXGA+/ 18: WXGA+/ 19:WXGA++/ 20:UXGA/ 21:WSXGA/ 22: VESA1080/ 23:WUXGA/ 24:QWXGA	Each input	05:1080p (59.94 / 60)
EDID SAVE	Copying EDID	OUT1 to OUT16	Each save area	05:1080p (59.94 / 60)
EDID EXTERNAL CH	Loading EDID channel	OUT1 to OUT16	Each input	OUT1
EDID DEEP COLOR	Deep Color	24 / 30 / 36 [bit / pixel]	Each input	24 [bit / pixel]
EDID SPEAKER CH	Audio channel	2 / 2.1 / 5.1 / 7.1 [channel]	Each input	2 [Channel]
EDID LINEAR PCM	Linear PCM Audio	32 / 44.1 / 48 / 88.2 / 96 / 192 [kHz]	Each input	48 [kHz]
EDID AC-3/Dolby D	AC-3/Dolby Digital Audio	OFF / 32 / 44.1 / 48 [kHz]	Each input	OFF
EDID AAC	AAC Audio	OFF / 32 / 44.1 / 48 / 88.2 / 96 [kHz]	Each input	OFF
EDID Dolby D+	Dolby Digital Plus Audio	OFF / 32 / 44.1 / 48 [kHz]	Each input	OFF
EDID DTS	DTS Audio	OFF / 32 / 44.1 / 48 / 96 [kHz]	Each input	OFF
EDID DTS-HD	DTS-HD Audio	OFF / 44.1 / 48 / 88.2 / 96 / 176.4 /192 [kHz]	Each input	OFF
EDID Dolby TrueHD	Dolby TrueHD Audio	OFF / 44.1 / 48 / 88.2 / 96 / 176.4 /192 [kHz]	Each input	OFF
EDID WXGA SELECT	WXGA	1360x 768 / 1366x 768	Each input	1360x 768

■ Setting RS-232C communication (COM PORT)

Menu name	Function	Setting		
		Set value	For	Default value
COM PORT SETUP	RS-232C communication	Baud rate: 4800/9600/14400/19200/38400 [bps] Data bit length: 7/8 [bit] Parity check: NONE/ODD/EVEN Stop bit: 1/2 [bit]	–	Baud rate: 9600 [bps] Data bit length : 8 [bit] Parity check: NONE Stop bit: 1 [bit]

■ Setting LAN communication (LAN)

Menu name	Function	Setting	
		Set value	Default value
IP ADDRESS	IP address	0.0.0.0 to 255.255.255.255	192.168.1.199
SUBNET MASK	Subnet mask	0.0.0.0 to 255.255.255.254	255.255.255.0
CONTROL PORT	TCP port number	Port number: 1100/6000 to 6999 8 connections: ON (Up to 8 connections can be used) OFF (Up to 4 connections can be used)	Port number: 1100 8 connections: OFF
MAC ADDRESS	Displaying MAC address	–	–

■ Setting preset memory (PRESET MEMORY)

Menu name	Function	Setting		
		Set value	For	Default value
PRESET LOAD	Loading preset memory	Preset memory number: 01 to 32	–	Channels are not controlled.
PRESET SAVE	Saving preset memory	Preset memory number: 01 to 32 Writing method: [C] (CONTINUE)/[D] (DELETE) Preset memory name: [xxxxxxxxxx] (in ASCII code, up to 10 characters)	–	Channels are not controlled.
PRESET EDIT	Editing preset memory	Preset memory number: 01 to 32 Preset memory name: [xxxxxxxxxx] (in ASCII code, up to 10 characters) Selecting output channel: OUT1 to OUT16 Setting input channel of the FDX: 1 to 16 / OFF / --- Setting input channel of the MAU-1616 (Optional): 1 to 16 / OFF / ---	–	Channels are not controlled.
PRESET START UP	I/O channel at start-up	PRESET MEMORY 01 to 32/ DEFAULT MEMORY/LAST MEMORY	–	LAST MEMORY

■ Setting other functions (OTHERS)

Menu name	Function	Setting		
		Set value	For	Default value
KEY LOCK	Grouping keys for key lock	MENU KEY : LOCK/UNLOCK CH KEY : LOCK/UNLOCK PRESET : LOCK/UNLOCK	–	MENU KEY : LOCK CH KEY : LOCK PRESET : LOCK
BUZZER	Beep sound	ON/OFF	–	ON
POWER SAVE	Power saving	ON/OFF	–	ON
COMMAND FORMAT	Compatible-mode communication command	STANDARD/OPTION	–	STANDARD
ALARM	Alarm	ON/OFF	–	ON
TOP DISPLAY	Top page	ON/OFF	–	OFF
INPUT STATUS	Displaying input signal status	–	–	–
MONITOR STATUS	Displaying sink device status	–	–	–
BOARD STATUS	Displaying slot board status	–	–	–
FAN STATUS	Displaying cooling fan status	–	–	–
POWER STATUS	Displaying supply voltage status	–	–	–
VERSION	Displaying firmware and hardware versions	–	–	–

Note: If "ALL" is selected in "**Selecting I/O channel**" setup menu and each channel setting is not the same, the set value of the first channel is displayed and a "∗" appears on the left.

7.2 Setting input [INPUT SETTING]

7.2.1 [INPUT EQUALIZER]

If you select "AUTO", signals are corrected automatically depending on the amount of signal attenuation.

Using menu

INPUT SETTING → INPUT EQUALIZER

For

Each input connector (IN1 to IN16)

Set value

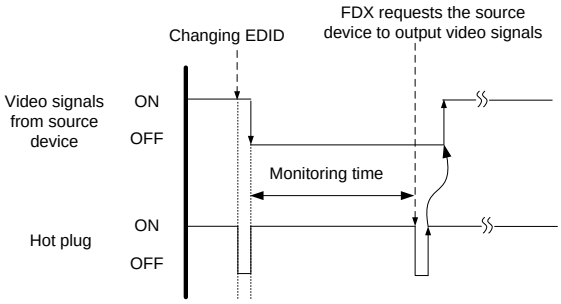
AUTO: Automatic correction [Default]
OFF: Without correction

Notes:

- If you do not press the "SET" key, the setting is not changed.
- If you use a 5 m/16.4 ft. or longer cable, we recommend testing the configuration beforehand since it is greatly affected by the quality of the output signals and the like.
- Set this menu before operating the FDX, since the image may be disturbed when the setting is switched.
- A channel that does not have its digital input slot board cannot be selected in this menu.

7.2.2 No-signal input monitoring time [INPUT SIGNAL CHECK]

Monitoring time for when the source device does not output video signals due to the changes of EDID or turning on/off the FDX
Use this menu to set the monitoring time which is from when a source device stops outputting signals to when the FDX requests the source device to output video signals.



[Fig. 7.2] Monitoring time

Using menu

INPUT SETTING → INPUT SIGNAL CHECK

For

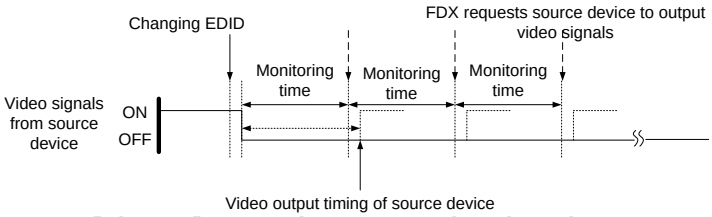
Each input connector (IN1 to IN16, ALL)

Set value

OFF, 3Sec to 15Sec [Default]: 10Sec

Notes:

- If you use the power-saving function or dual monitor of the PC (source device), set this menu to "OFF". PCs may release or cancel those functions if they receive the request to output video signals.
- If the set time is shorter than the timing that the source device outputs video, the source device may not output video signals because it sets the output signals repeatedly. In these cases, set the monitoring time longer.

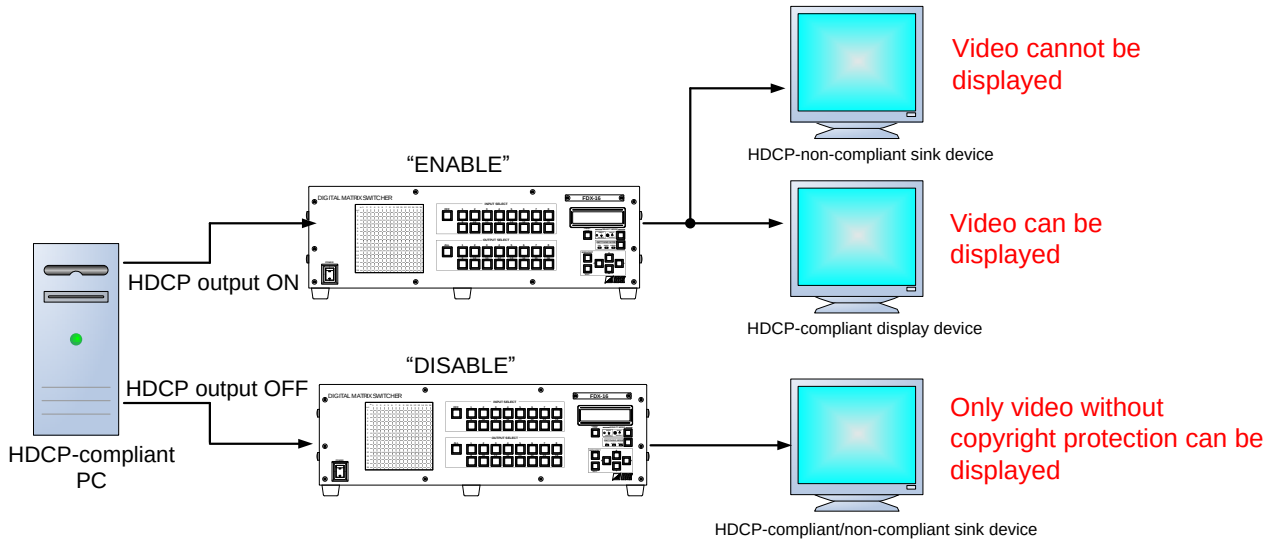


[Fig. 7.3] Repeating output signal setting

- Channels that do not have an input slot board cannot be selected in this menu.

7.2.3 HDCP input enabled/disabled [INPUT HDCP]

Some source devices check whether the connected device supports HDCP and then determine whether they encrypt HDCP signals or not. Since the FDX is HDCP compliant, if it is connected to a sink device that is not HDCP compliant, the sink device may not display video.
In this menu, you can set whether the FDX encrypts HDCP to the source device. "ENABLE" is set by default, but if you want to connect the FDX to a sink device that is not HDCP compliant, select "DISABLE" to disable the encryption of HDCP output from the source device.



[Fig. 7.4] Enabling/disabling HDCP input

Using menu

INPUT SETTING → INPUT HDCP

For

Each input connector (IN1 to IN32, ALL)

Set value

ENABLE: To enable HDCP encryption [Default]
DISABLE: To disable HDCP encryption

Notes:

- In order to display contents whose copyright is protected, set this menu to "ENABLE".
- Channels that do not have an input slot board cannot be selected in this menu.

7.3 [OUTPUT SETTING]

7.3.1 Output equalizer [OUTPUT EQUALIZER]

Using menu

OUTPUT SETTING → OUTPUT EQUALIZER

For

Each output connector (OUT1 to OUT16, ALL)

Set value

OFF: No correction [Default]
LOW
MEDIUM
HIGH

Notes:

- If you use a 5 m/16.4 ft. or longer cable, we recommend that you test the configuration beforehand since it is greatly affected by the quality of the output signals and the like.
- Set this menu before operating the FDX, since the image may be disturbed when the setting is switched.
- Channels that do not have a digital output slot board cannot be selected in this menu.

7.3.2 Output mode [OUTPUT MODE]

The sink device automatically selects the appropriate color space according to the color space of the input video. If the sink device cannot select the color space for some reason, the color space can be manually selected using this menu.

Using menu

OUTPUT SETTING → OUTPUT MODE

For

Each output connector (OUT1 to OUT16, ALL)

Set value

AUTO: Automatic [Default]
HDMI RGB: RGB output
HDMI 422: YCbCr 4:2:2 output
HDMI 444: YCbCr 4:4:4 output
DVI: DVI output
Note: Channels that do not have an output slot board cannot be selected in this menu.

7.3.3 Forced HDMI signal output [OUTPUT HDMI MODE]

The FDX acquires EDID from the sink device and determines if the sink device is an HDMI device or DVI device in order to output HDMI signals. However, if the FDX cannot acquire EDID for some reason, problems such as no audio input and the like may occur. In these cases, use this menu to output HDMI signals forcibly.

Using menu

OUTPUT SETTING → OUTPUT HDMI MODE

For

Each output connector (OUT1 to OUT16, ALL)

Set value

OFF: Normal operation [Default]
ERROR: HDMI output when EDID loading error occurs
ALWAYS: Always HDMI output

Notes:

- If you use this setting for forced HDMI signal output, set the resolution of the EDID to a resolution other than "EXTERNAL (External EDID)" and set the EDID according to the resolution of the targeted sink device.
- Problems may occur, if for example, correct video or audio cannot be output when the source device cannot correct the EDID may occur.

【Reference:7.5.1 EDID resolution [EDID DATA]

Channels that do not have an output slot board cannot be selected in this menu.

7.3.4 Time for ignoring video output request signals [OUTPUT HPD MASK]

Time for ignoring the video output request signals sent from the sink device.
If the request signals are repeated in a short cycle, the FDX processes video output from the first cycle. As a result, video may not be output. This problem can be solved by setting the ignoring time.

Using menu

OUTPUT SETTING → OUTPUT HPD MASK

For

Each output connector (OUT1 to OUT16, ALL)

Set value

OFF: Not ignoring the request signals [Default]
2 sec. to 15 sec.

Note: Channels that do not have an output slot board cannot be selected in this menu.

7.4 [AUDIO]

7.4.1 Digital audio output [AUDIO DIGITAL OUT]

Using menu
AUDIO → AUDIO DIGITAL OUT

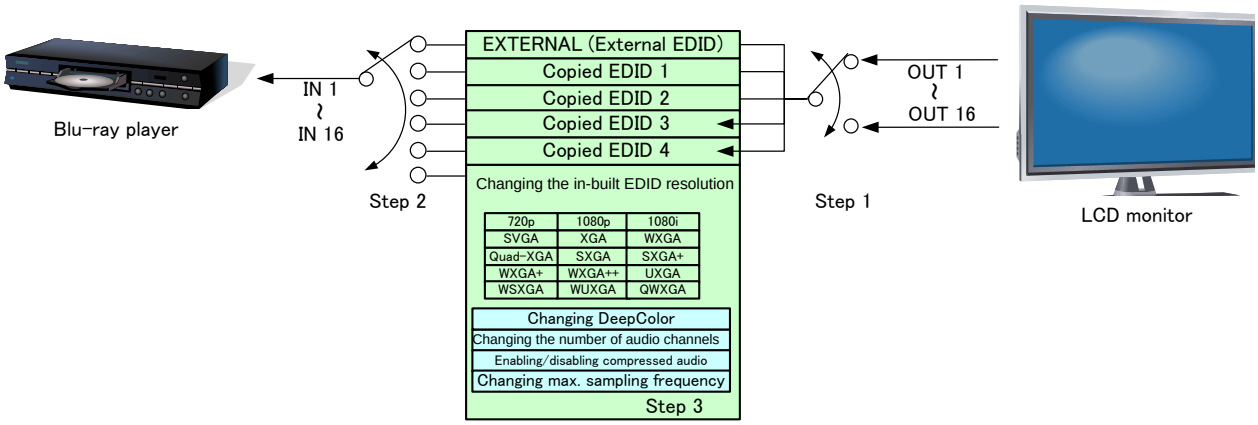
For
Each output connector (OUT1 to OUT16)

Set value
ON [Default]
OFF

Note: Channels that do not have an output slot board cannot be selected in this menu.

7.5 [EDID]

You can customize the EDID to be sent to the source device as needed.



[Fig. 7.5] Setting EDID

(1) Select and register the sink device to which the EDID is copied from the output connector.
Skip this step if the built-in EDID is used.

【Reference: 7.5.2 Copying EDID [EDID SAVE]】
【Reference: 7.5.3 Loading EDID channel [EDID EXTERNAL CH]】

(2) Set the EDID to be sent to the source device.

【Reference: 7.5.1 EDID resolution [EDID DATA]】

(3) If the built-in EDID is used, customize it depending on the intended use.

【Reference: 7.5.4 Deep Color [EDID DEEP COLOR] to 7.5.13 WXGA [EDID WXGA SELECT]】

7.5.1 EDID resolution [EDID DATA]

EDID to be sent to the source device
In order to use values "05" to "24" which are built-in EDID, set the maximum resolution supported by the sink device.

Using menu
EDID → EDID DATA

For
Each input connector (IN1 to IN16)

Set value

[Table 7.1] Max. resolution of EDID

Set value	Max. resolution	Pixels	Standard	Remarks
00	EXTERNAL (External EDID)	–	–	If no acquired data, the default is 05.
01	Copied EDID1	–	–	If no acquired data, the default is 05.
02	Copied EDID2	–	–	If no acquired data, the default is 05.
03	Copied EDID3	–	–	If no acquired data, the default is 05.
04	Copied EDID4	–	–	If no acquired data, the default is 05.
05	1080p (59.94/60)	1920×1080	HDTV	Default
06	720p	1280×720		
07	1080i	1920×1080		
08	1080p (24/25/30/50)	1920×1080		
09	SVGA	800×600	VESA	
10	XGA	1024×768		
11	VESA720	1280×720	CVT	For DVI device input
12	WXGA	1280×768	VESA	
13	WXGA	1280×800		MAC supported
14	Quad-VGA	1280×960		
15	SXGA	1280×1024		
16	WXGA	1360×768, 1366×768		The number of pixels is set in "**Selecting WXGA**".
17	SXGA+	1400×1050		
18	WXGA+	1440×900		
19	WXGA++	1600×900		(RB)
20	UXGA	1600×1200		
21	WSXGA	1680×1050		
22	VESA1080	1920×1080	CVT	(RB), for DVI device input
23	WUXGA	1920×1200	VESA	(RB)
24	QWXGA	2048×1152		(RB)

(RB):Reduced Blanking

【Reference: 7.5.2 Copying EDID [EDID SAVE]】
【Reference: 7.5.3 Loading EDID channel [EDID EXTERNAL CH]】
【Reference: 7.5.13 WXGA [EDID WXGA SELECT]】

[Fig. 7.2] Max. resolution and number of EDID-supported pixels

Max. resolution \ EDID supported pixels		640 N 480	800 N 600	1024 N 768	1280 N 720	1280 N 768	1280 N 800	1280 N 960	1280 N 1024	1360 N 768 *	1366 N 768 *	1400 N 1050	1440 N 900	1600 N 900	1600 N 1200	1680 N 1050	1920 N 1080	1920 N 1200	2048 N 1152
00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
03	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
04	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
05	1080p (59.94/60)	S	S	S	N	N	S	S	S	S	S	S	S	S	S	S	S	N	N
06	720p	S	S	N	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N
07	1080i	S	S	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
08	1080p (24/25/30/50)	S	S	S	N	N	S	S	S	S	S	S	S	S	S	S	S	N	N
09	800N600	S	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
10	1024N768	S	S	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
11	1280N720	S	S	S	S	N	N	N	N	N	N	N	N	N	N	N	N	N	N
12	1280N768	S	S	S	S	S	N	N	N	N	N	N	N	N	N	N	N	N	N
13	1280N800	S	S	S	S	S	S	N	N	N	N	N	N	N	N	N	N	N	N
14	1280N960	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	N	N	N
15	1280N1024	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N	N	N
16	1360N768	S	S	S	S	S	S	S	S	S	S	N	N	N	N	N	N	N	N
17	1400N1050	S	S	S	S	N	S	S	S	S	S	S	N	N	N	N	N	N	N
18	1440N900	S	S	S	S	N	S	S	S	S	S	S	S	N	N	N	N	N	N
19	1600N900	S	S	S	S	N	S	S	S	S	S	S	S	S	N	N	N	N	N
20	1600N1200	S	S	S	S	N	S	S	S	S	S	S	S	S	S	N	N	N	N
21	1680N1050	S	S	S	S	N	S	S	S	S	S	S	S	S	S	S	N	N	N
22	1920N1080	S	S	S	N	N	S	S	S	S	S	S	S	S	S	S	S	N	N
23	1920N1200	S	S	S	N	N	S	S	S	N	N	S	S	S	S	S	S	S	N
24	2048N1152	S	S	S	N	N	N	S	S	N	N	S	S	S	S	S	S	S	S

S: Supported, N: Not supported, —: Not used

* The number of EDID-supported pixels for 1360×768 and 1366×768 can be set in "7.5.13 WXGA [EDID WXGA SELECT]". The default value is 1360×768.

Notes:

- If you do not press the "SET" key, the setting is not changed.
- Optical I/O slot board does not support QWXGA.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.2 Copying EDID [EDID SAVE]

EDID of the sink device can be read and saved, and the copied EDID can be registered in the FDX that is the same as built-in EDID.

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID SAVE

For

Each copied EDID save area (1[xxx] to 4[xxx])

Set value

OUT1[xxx]* to OUT16[xx]*: EDID data of OUT1 to OUT16
[Default]: 05:1080p (59.94/60), built-in EDID, for all save areas
* "xxx": Vendor code of the saved EDID

Notes:

- If you do not press the "SET" key, the setting is not changed.
- Channels that do not have an output slot board cannot be selected in this menu.

7.5.3 Loading EDID channel [EDID EXTERNAL CH]

If the EDID type is set to "EXTERNAL (External EDID)" for EDID resolution setting, set the output connector value that loads the EDID.

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID EXTERNAL CH

For

Each input connector (IN1 to IN16)

Set value

OUT1 to OUT16 [Default]: OUT1

Notes:

- If you do not press the "SET" key, the setting is not changed.
- This menu is valid if you select "00" for the resolution of EDID.
- Channels that do not have an input or output slot board cannot be selected in this menu. (Both input and output slot boards have to be mounted.)

7.5.4 Deep Color [EDID DEEP COLOR]

Deep Color (color depth) output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID DEEP COLOR

For

Each input connector (IN1 to IN16)

Set value

24Bit: 24 bit/pixel (8 bit/component) [Default]
30Bit: 30 bit/pixel (10 bit/component)
36Bit: 36 bit/pixel (12 bit/component)

Notes:

- If you do not press the "SET" key, the setting is not changed.
- If you set "30 bit / pixel (10 bit / component)" or "36 bit/pixel (12 bit / component)", the transmission clock frequency is increased. As a result, noise appears on image when a bad-condition cable or long cable is connected. In such a case, set this menu to "24 bit / pixel (8 bit/component)". If EDID resolution is set to "05" to "24", this menu will be valid.
- Since optical I/O slot boards do not support Deep Color, 24 bit/pixel (8 bit/component) is used.
- Channels that do not have an output slot board cannot be selected in this menu.

7.5.5 Audio channel [EDID SPEAKER CH]

The number of channels to the audio of multi-channel output that is from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID SPEAKER CH

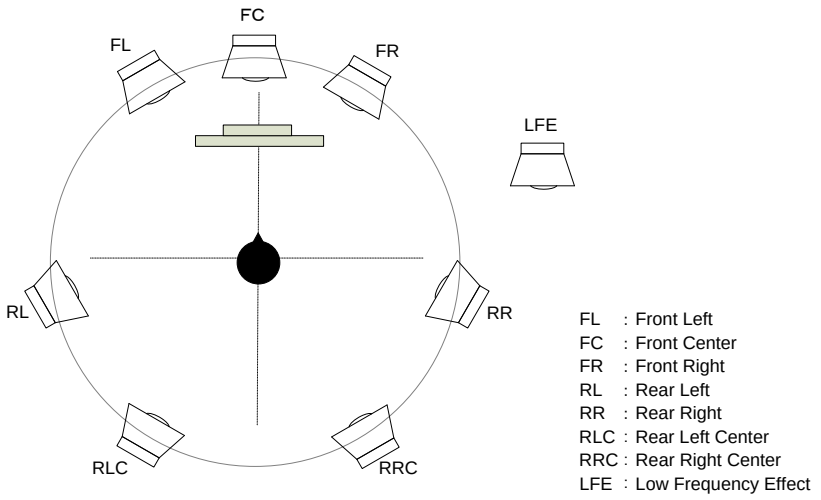
For

Each input connector (IN1 to IN16)

Set value

2CH [Default]
2.1CH
5.1CH
7.1CH

■ The number of channels and speaker configuration



The number of channels	FL/FR	LFE	FC	RL/RR	RLC/RRC
2 channels	ON	OFF	OFF	OFF	OFF
2.1 channels	ON	ON	OFF	OFF	OFF
5.1 channels	ON	ON	ON	ON	OFF
7.1 channels	ON	ON	ON	ON	ON

[Fig. 7.6] The number of channels and speaker configuration

Notes:

- If you do not press the "SET" key, the setting is not changed.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.6 Linear PCM Audio [EDID LINEAR PCM]

The maximum sampling frequency of PCM audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID LINEAR PCM

For

Each input connector (IN1 to IN16)

Set value

32kHz: 32 kHz
44.1kHz: 44.1 kHz
48kHz: 48 kHz [Default value]
88.2kHz: 88.2 kHz
96kHz: 96 kHz
192kHz: 192 kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.7 AC-3 Dolby Digital Audio [EDID AC-3/Dolby D]

The maximum sampling frequency of AC-3 Dolby Digital Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID AC-3/Dolby D

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
32kHz
44.1kHz
48kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.8 AAC Audio [EDID AAC]

The maximum sampling frequency of AAC Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID AAC

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
32kHz
44.1kHz
48kHz
88.2kHz
96kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.9 Dolby Digital Plus Audio [EDID Dolby D+]

The maximum sampling frequency of Dolby Digital Plus Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID Dolby D+

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
32kHz
44.1kHz
48kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.10 DTS Audio [EDID DTS]

The maximum sampling frequency of DTS Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID DTS

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
32kHz
44.1kHz
48kHz
96kHz

Notes:

- If you do not press the “SET” key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to “05” to “24”, this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.11 DTS-HD Audio [EDID DTS-HD]

The maximum sampling frequency of DTS-HD Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID DTS-HD

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
44.1kHz
48kHz
88.2kHz
96kHz
176.4kHz
192kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.12 Dolby TrueHD Audio [EDID Dolby TrueHD]

The maximum sampling frequency of Dolby TrueHD Audio that is output from the source device

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID Dolby TrueHD

For

Each input connector (IN1 to IN16)

Set value

OFF [Default]
44.1kHz
48kHz
88.2kHz
96kHz
176.4kHz
192kHz

Notes:

- If you do not press the "SET" key, the setting is not changed.
- For LCD monitors and the like, some audio formats are not supported. Select the audio format and sampling frequency that are supported by the connected devices.
- If EDID resolution is set to "05" to "24", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.5.13 WXGA [EDID WXGA SELECT]

Set the number of pixels of WXGA according to the resolution setting of EDID

【Reference:7.5.1 EDID resolution [EDID DATA] 】

Using menu

EDID → EDID WXGA SELECT

For

Each input connector (IN1 to IN16)

Set value

1360x 768 [Default]
1366x 768

Notes:

- If you do not press the "SET" key, the setting is not changed.
- If EDID resolution is set to "05", "08", "16" to "22", this menu will be valid.
- Channels that do not have an input slot board cannot be selected in this menu.

7.6 Setting RS-232C communication [COM PORT]

7.6.1 RS-232C communication [COM PORT SETUP]

Using menu

COM PORT → COM PORT SETUP

Set value (baud rate)

4800bps
9600bps [Default]
14400bps
19200bps
38400bps

7: data bit length is 7 bits
8: data bit length is 8 bits [Default]

NONE: No parity check [Default]
ODD: Parity check (odd number)
EVEN: Parity check (even number)

1: 1 stop bit [Default]
2: 2 stop bits

Note: If you do not press the "SET" key, the setting is not changed.

7.7 LAN communication [LAN]

7.7.1 IP address [IP ADDRESS]

Using menu

LAN → IP ADDRESS

Set value

0.0.0.0 to 255.255.255.255 [Default] 192.168.1.199

Note: If you do not press the "SET" key, the setting is not changed.

7.7.2 [SUBNET MASK]

Using menu

LAN → SUBNET MASK

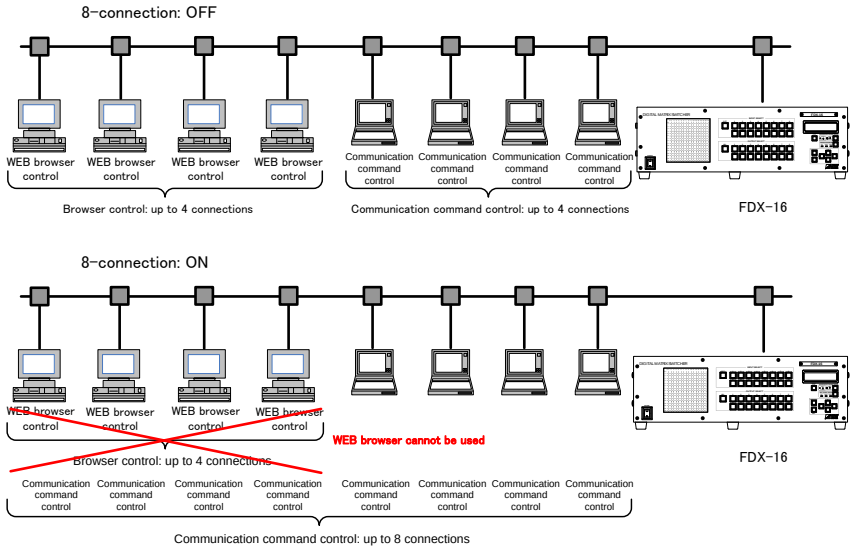
Set value

0.0.0.0 to 255.255.255.254 [Default] 255.255.255.0

Note: If you do not press the "SET" key, the setting is not changed.

7.7.3 TCP port number [CONTROL PORT]

If you set the 8-connection configuration to OFF, 8 connections will be divided into 4 connections for web browser control and 4 connections for communication command control, and the HTTP port number will be "80" (fixed).
If you set the 8-connection configuration to ON, up to 8 connections can be connected simultaneously. Select one of "1100", "6000"to "6999" for connections for communication command control.



[Fig. 7.7] Setting for 8 connections

Using menu

LAN → CONTROL PORT

Set value

1: 1100, 6000 to 6999 [Default] 1100
2: OFF: up to 4 connections can be used [Default]
ON: up to 8 connections can be used
Select "1" or "2" first. If you select "2", then select "OFF" or "ON"

Notes:

- If you do not press the "SET" key, the setting is not changed.
- If you select "3" (8 connections ON), the web browser cannot be used.

7.7.4 Displaying MAC address [MAC ADDRESS]

Using menu

LAN → MAC ADDRESS

7.8 Setting preset memory [PRESET MEMORY]

7.8.1 Loading preset memory [PRESET LOAD]

Loading registered preset memory and apply the I/O channel setting

Using menu

PRESET MEMORY → PRESET LOAD

Set value

01 to 32: Preset memory number 1 to 32 for loading [Default] All memory channels are not controlled.*

* <All memory channels are not controlled>: one of setting options in the "7.8.3 Editing preset memory [PRESET EDIT]" menu. "V" and "A" are set to "---" (not controlled) by default. See "7.8.3 Editing preset memory [PRESET EDIT]" for details.

Note: If you do not press the "**SET**" key, the setting is not changed.

7.8.2 Saving preset memory [PRESET SAVE]

You can save the current I/O channel status into the preset memory.

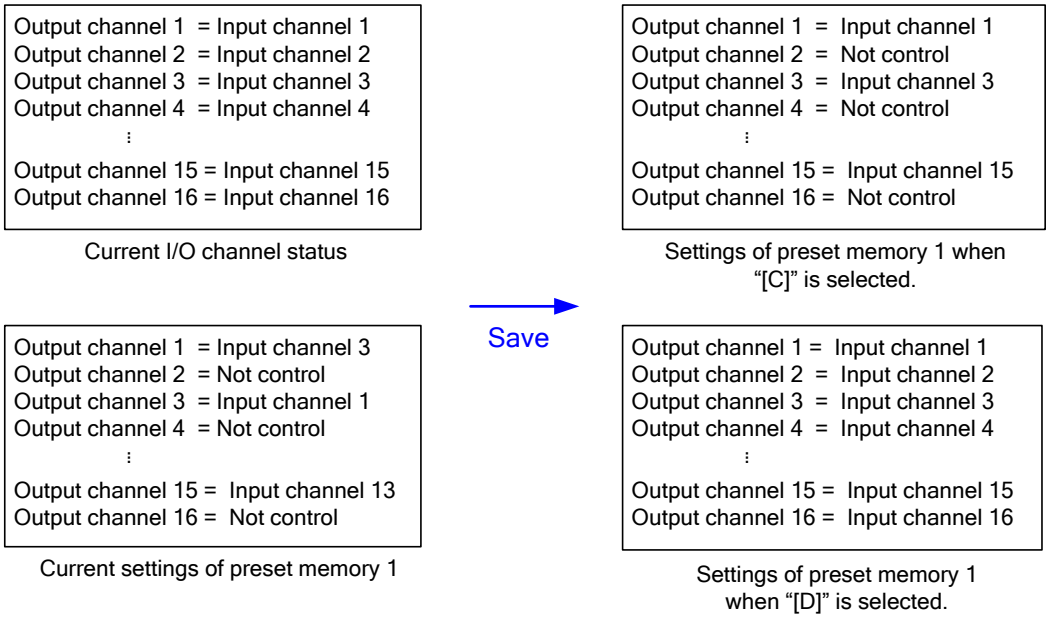
Using menu

PRESET MEMORY → PRESET SAVE

Set value

01 to 32: Preset memory number 1 to 32 [Default] All memory channels are not controlled.*
[C]: CONTINUE
[D]: DELETE
[xxxxxxxxxx]: Preset memory name (up to 10 characters in ASCII code)
* <All memory channels are not controlled>: one of setting options in the 7.8.3 Editing preset memory [PRESET EDIT] menu. "V" and "A" are set to "---" (not controlled) by default.
See 7.8.3 Editing preset memory [PRESET EDIT] for details.

If you select the memory whose setting is "-" (not controlled), you can select a writing method. For these settings (not controlled), if you select "C" (CONTINUE), the settings will be kept; if "D" (DELETE) is selected, the settings will be overwritten.



[Fig. 7.8] Saving preset memory

Notes:

- If you do not press the "SET" key, the setting is not changed.
- Do not turn off the FDX while "Saving." is displayed, otherwise, the setting information may be lost.

7.8.3 Editing preset memory [PRESET EDIT]

Using menu

PRESET MEMORY → PRESET EDIT

Set value

The first page

01 to 32: Preset memory number 1 to 32

[xxxxxxxxxx]: Preset memory name (up to 10 characters in ASCII code)

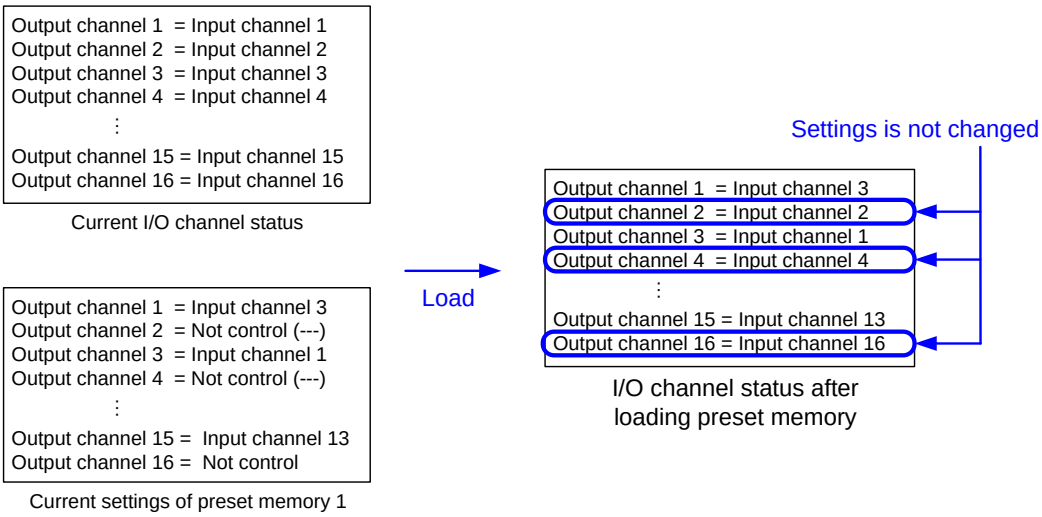
The second page

OUT1 to OUT16: Selecting output channel

V: ---, 1 to 16, OFF: Setting input channel of the FDX [Default] "**---**" (not controlled)

A: ---, 1 to 16, OFF: Setting input channel of the MAU-1616 (optional) [Default] "**---**" (not controlled)

When preset memory is loaded, output whose setting is "**---**" (not controlled) is not switched.
All preset memories are set to "**---**" (not controlled) by factory default.



[Fig. 7.9] Loading edited preset memory

Notes:

- If you do not press the "SET" key, the setting is not changed.
- Do not turn off the FDX while "Saving." is displayed, otherwise, the setting information may be lost.

7.8.4 I/O channel at start-up [PRESET START UP]

Settings other than the channels are automatically saved at the time of menu operation or setting change from the communication command, and the saved settings will be applied for the next start-up. You can select the setting for channels as follows.

Using menu

PRESET MEMORY → PRESET START UP

Set value

LAST MEMORY: I/O channels status at the last time the FDX is turned off will be applied [Default]
DEFAULT MEMORY: All I/O channels are set to OFF.
PRESET MEMORY 01 to 32: I/O status set for preset memory 1 to 32 will be applied.

7.9 Setting other functions [OTHERS]

7.9.1 Grouping keys for key lock [KEY LOCK]

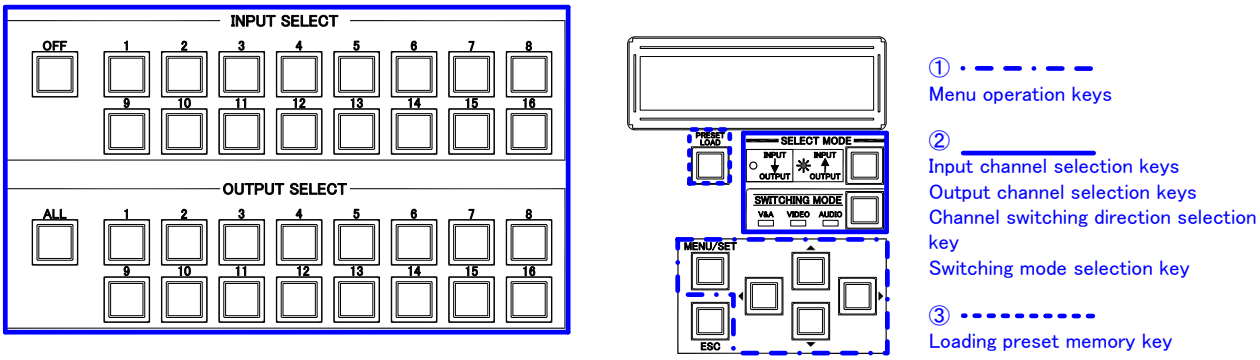
Using menu

OTHERS → KEY LOCK

Set value

MENU KEY LOCK: Keys of ① are locked. [Default]
MENU KEY UNLOCK: Keys of ① are not locked.
CH KEY LOCK: Keys of ② are locked. [Default]
CH KEY UNLOCK: Keys of ② are not locked.
PRESET LOCK: Keys of ③ are locked. [Default]
PRESET UNLOCK: ③ are not locked.

【Reference:6.6 Setting/Releasing key lock】



[Fig. 7.10] Grouping for key lock

Note: When all keys of ①, ②, and ③ are locked, the "**ESC**" key is also locked.

7.9.2 Beep sound [BUZZER]

Using menu

OTHERS → BUZZER

Set value

ON: Beep sound ON [Default]
OFF: Beep sound OFF

7.9.3 Power saving [POWER SAVE]

Using menu

OTHERS → POWER SAVE

Set value

ON: The backlight and key LEDs are turned off. [Default]
If no key operation is performed for 60 seconds, the backlight will be turned off.
OFF: The backlight and key LEDs are turned on at all times.

7.9.4 Compatible-mode communication command [COMMAND FORMAT]

Set this item when the FDX is controlled by compatible-mode communication commands. See the Command guide for details.

Using menu

OTHERS → COMMAND FORMAT

Set value

STANDARD: Normal command [Default]
OPTION: Compatible-mode communication command

7.9.5 [ALARM]

The alarm is output in case a problem occurs in a cooling fans, power supply voltage, and I/O slot board.

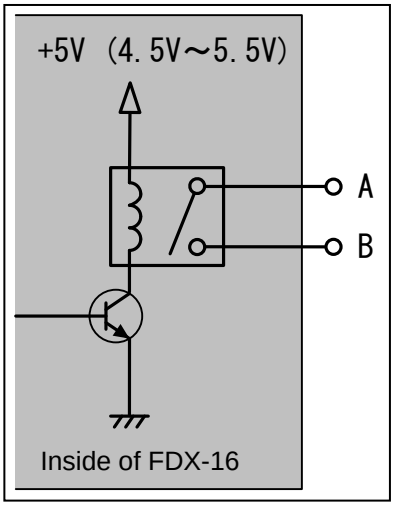
Using menu

OTHERS → ALARM

Set value

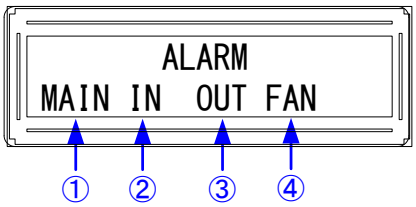
ON [Default]
OFF

Rated voltage: 24 V
Rated current: 300 mA



[Fig. 7.11] Circuit for alarm output

In case a problem occurs in a cooling fan, power supply voltage, or I/O slot board, the relay will be closed and the contact between A and B will be set to ON.
When an alarm occurs, the following ALARM page will be displayed and the backlight will blink, but only if the Top page has been set to ON (default is OFF). See section 7.9.6 for setting the Top page to ON.



[Fig. 7.12] Alarm page

#	Description
①	Displayed if a problem occurs in the supply voltage.
②	Displayed if a problem occurs in the supply voltage of an input slot board.
③	Displayed if a problem occurs in the supply voltage of an output slot board.
④	Displayed if a problem occurs in the number of rotations of cooling fans.

[Table 7.3] Description of alarm page

Note: In case the alarm page is displayed, the FDX may have problems. Please contact us.

【Reference:7.9.9 Displaying slot board status [BOARD STATUS]】
【Reference:7.9.10 Displaying cooling fan status [FAN STATUS]】
【Reference:7.9.11 Displaying supply voltage status [POWER STATUS]】

7.9.6 Top page [TOP DISPLAY]

Using menu

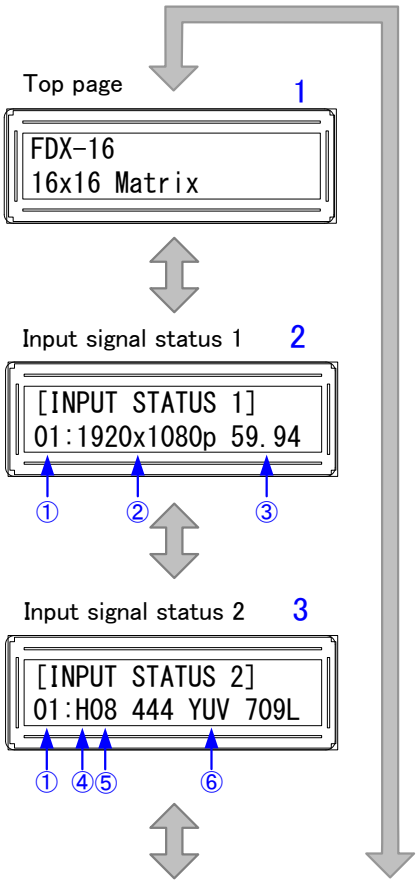
OTHERS → TOP DISPLAY

Set value

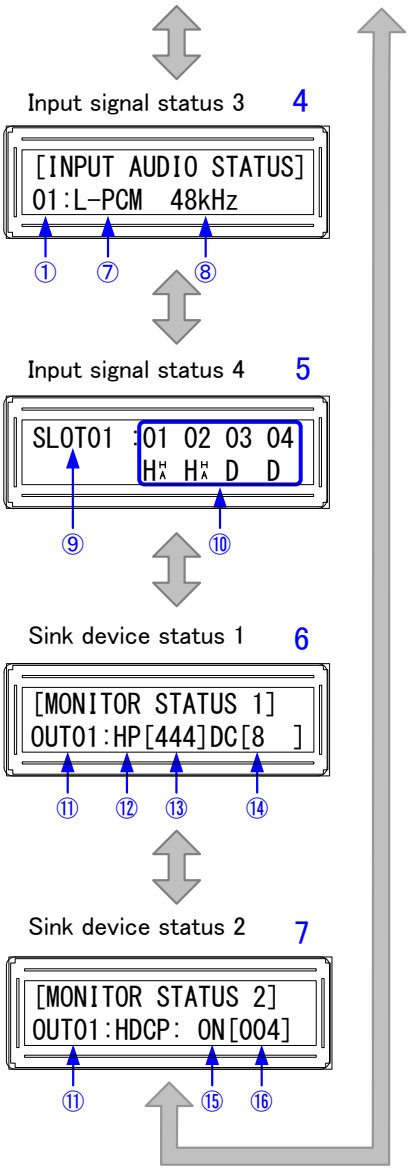
OFF: Normal [Default]

ON: Statuses of input signals and sink device are displayed.

If you select "ON" and press "▲" and "▼" keys while the top page is being displayed, pages displaying statuses of input signals (four pages) and sink device (two pages) can be displayed.
The desired I/O cannel can be selected by "◀" and "▶" keys in each page.



1	Top page
2	①Input channel number ②Input resolution ③Input vertical synchronous frequency When there are no input signals: "No Signal" is displayed. When input slot board is not mounted: "----------" is displayed.
3	④Input signals D: DVI signals, without HDCP D: DVI signals, with HDCP H: HDMI signals, without HDCP H: HDMI signals, with HDCP ⑤Color depth 08: 24 bit/pixel (8 bit/component) 10: 30 bit/pixel (10 bit/component) 12: 36 bit/pixel (12 bit/component) ⑥YUV When there are no input signals: "No Signal" is displayed. When input slot board is not mounted: "----------" is displayed.



[Fig. 7.13] Displaying statuses

4	⑦Input audio signals L-PCM: Linear PCM COMPRESSED AUDIO: Compressed audio ⑧Input sampling frequency When there are no input signals: "No Signal" is displayed. When input slot board is not mounted: "----------" is displayed.
5	⑨Input slot board number ⑩For each slot board H: HDMI signals D: DVI signals H: With HDCP A: With audio input
6	⑪Output channel number ⑫Audio status HC : Compressed audio is supported HP: Compressed audio is not supported (only Linear PCM) D: DVI monitor ⑬Color space status RGB: RGB is supported 422: YCbCr 4:2:2 is supported 444: YCbCr 4:4:4 is supported ⑭Color depth status 8:24 bit/pixel (8 bit/component) 10:30 bit/pixel (10 bit/component) 12:36 bit/pixel (12 bit/component) When sink devices are not connected : "UNCONNECTED" is displayed. When output slot board is not mounted: "----------" is displayed.
7	⑮HDCP status ON: Supported OFF: Not supported ---: Not checked ⑯HDCP authentication status 000: No HDCP 001: Being authorized (just started) 002: Being authorized (middle of the processing) 003: Being authorized (almost completed) 004: Authentication completed successfully. 005: Authentication fails. When sink devices are not connected: "UNCONNECTED" is displayed. When output slot board is not mounted: "----------" is displayed.

7.9.7 Displaying input signal status [INPUT STATUS]

Using menu

OTHERS → INPUT STATUS

【Reference:7.9.6 Top page [TOP DISPLAY]】

7.9.8 Displaying sink device status [MONITOR STATUS]

Using menu

OTHERS → MONITOR STATUS

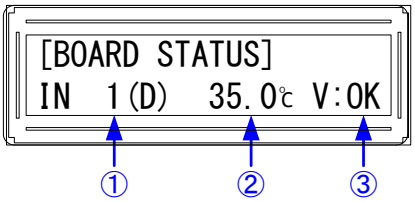
【Reference:7.9.6 Top page [TOP DISPLAY]】

7.9.9 Displaying slot board status [BOARD STATUS]

Temperature and supply voltage statuses of each slot board can be displayed.

Using menu

OTHERS → BOARD STATUS



[Fig. 7.14] Page for displaying slot board status

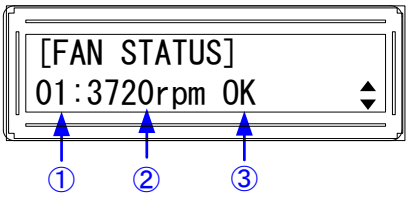
#	Description
①	Slot board position IN 1 to 4, OUT 1 to 4 Press "▲" and "▼" keys to display another slot board status. (D): digital I/O slot board, (T): HDBaseT I/O slot board, (O): optical I/O slot board
②	Temperature of slot board When the slot board is not mounted, "**------**" is displayed.
③	Supply voltage of slot board OK: normal, NG: abnormal, "**--**": slot board is not mounted

Note: In case "NG" (problems in slot board) is displayed, the FDX may have problems. Please contact us.

7.9.10 Displaying cooling fan status [FAN STATUS]

Using menu

OTHERS → FAN STATUS



[Fig. 7.15] Page for displaying cooling fan status

#	Description
①	The cooling fan position 01 to 05 Press "▲" and "▼" keys to display another fan status.
②	The number of rotations of cooling fans
③	Cooling fan status OK: normal, NG: abnormal

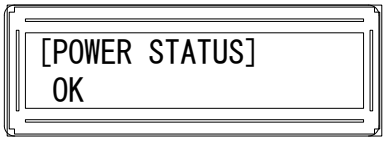
Note: In case "NG" (problems in cooling fans) is displayed, the FDX may have problems. Please contact us.

7.9.11 Displaying supply voltage status [POWER STATUS]

Using menu

OTHERS → POWER STATUS

OK: normal, NG: abnormal



[Fig. 7.16] Pages for displaying power supply voltage

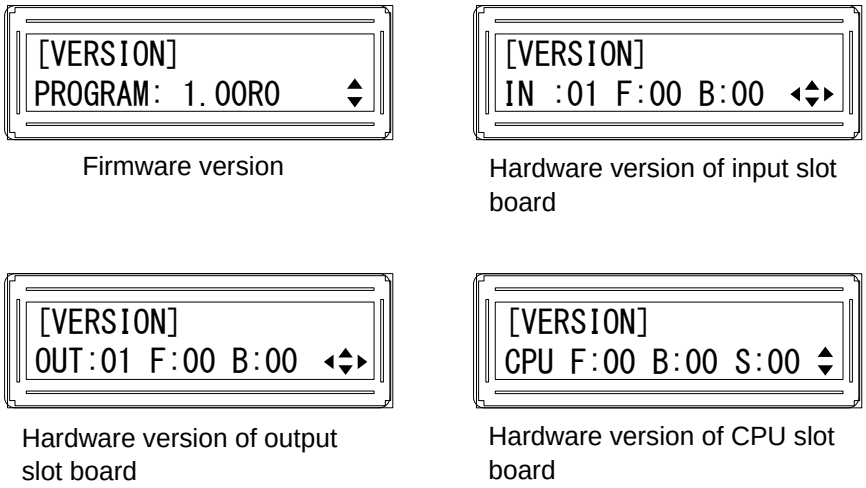
Note: In case "NG" (problems in supply voltage) is displayed, the FDX may have problems. Please contact us.

7.9.12 Displaying firmware and hardware versions [VERSION]

Using menu

OTHERS → VERSION

Version information is displayed on four pages, and you can switch each page by pressing "▲" and "▼" keys. Hardware versions of input and output slot boards is available, and you can switch the page of each slot by pressing "◄" and "►" keys.

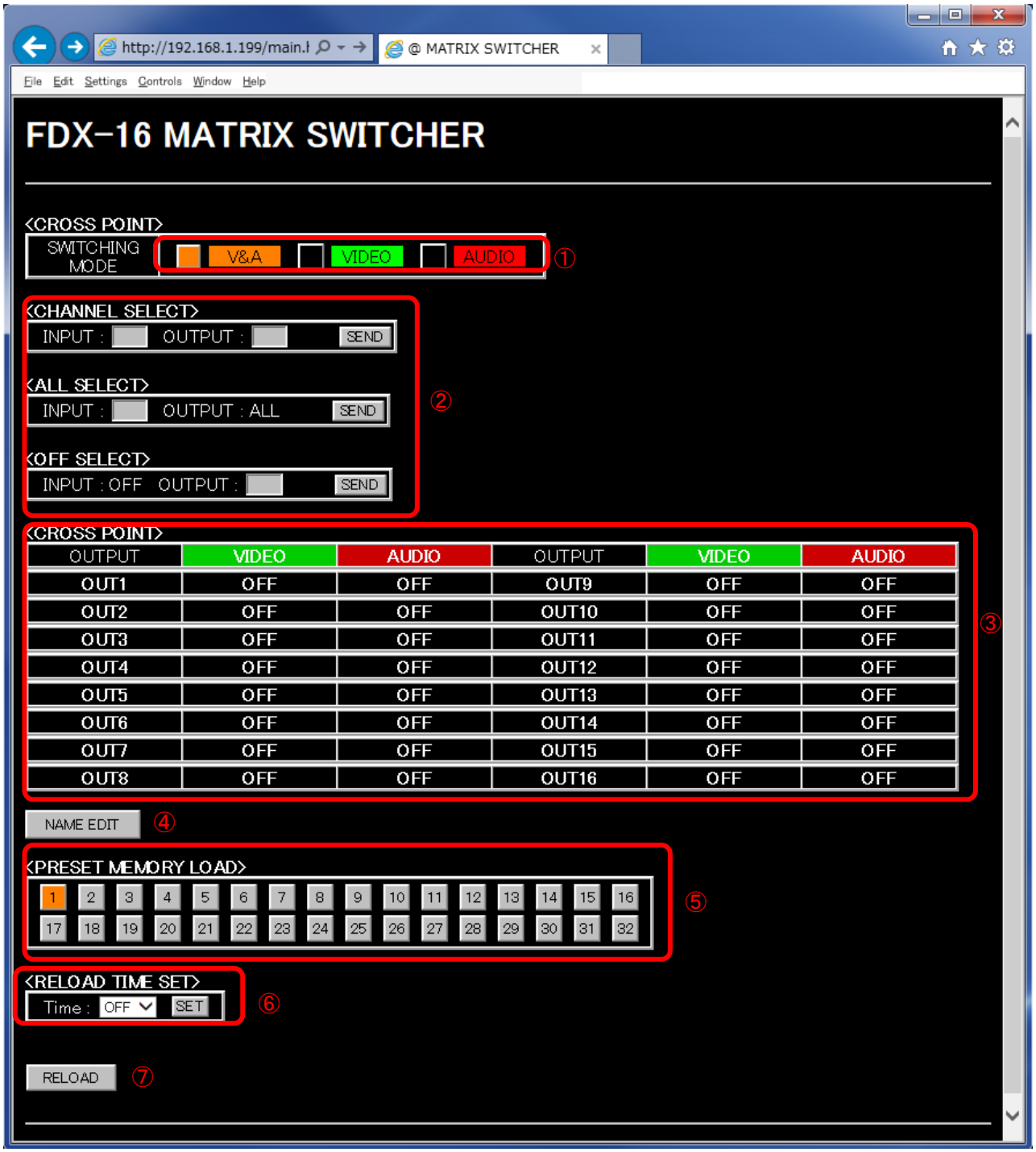


[Fig. 7.17] Pages for displaying version information

8 WEB browser

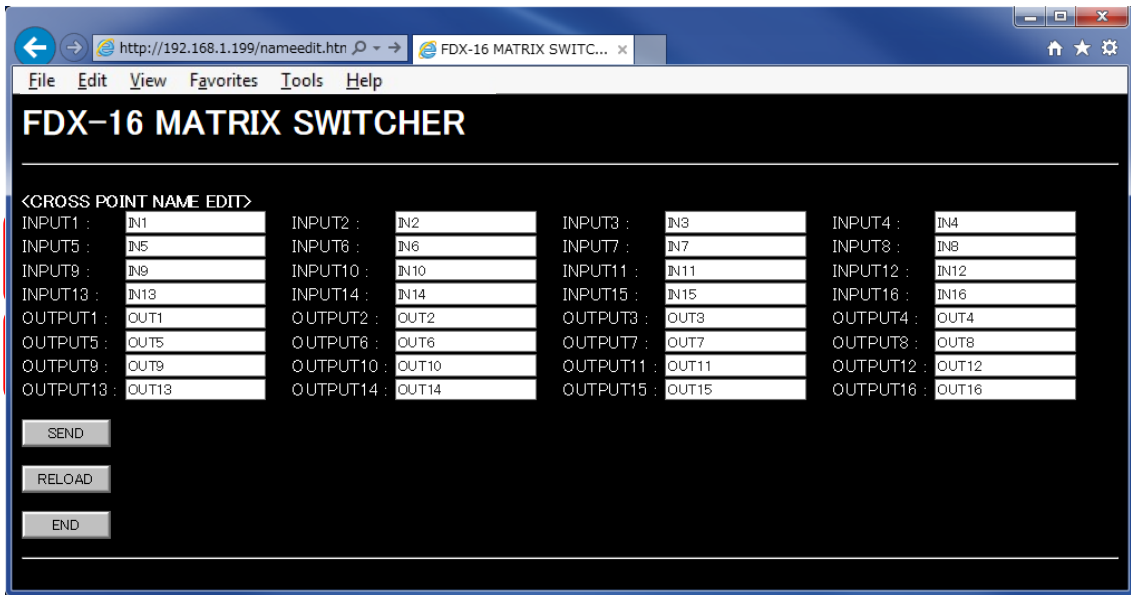
The FDX can be controlled by a web browser.
Open a web browser on the PC using the same LAN and type the IP address of the FDX in the address bar to open the operation window.

Note: IDK has tested the operation on the Microsoft Internet Explorer 8.0 for Windows or greater.



[Fig. 8.1] Page for controlling on a web browser

#	Button name	Description
①	SWITCHING MODE	Sets and displays a switching mode V&A: Switching I/O channels of both the FDX and (optional) MAU-1616 VIDEO: Switching I/O channels of only the FDX AUDIO: Switching I/O channels of only the MAU-1616
②	CHANNEL SELECT ALL SELECT OFF SELECT	Sets an input channel to an output channel CHANNEL SELECT: Sets I/O channels individually ALL SELECT : Sets a specified input channel to ALL (all outputs) OFF SELECT : Sets a specified output channel to OFF (no signal) Enter the I/O channel numbers in the text box and click the "SEND" button. 
③	CROSS POINT	Displays I/O channel status Orange: FDX and MAU-1616 Green: FDX Red: MAU-1616 Black: Not set
④	NAME EDIT	Edits I/O channel name displayed in "CROSS POINT".
⑤	PRESET MEMORY LOAD	Loads the desired registered preset memory and sets the I/O channel status. The memory name that is being loaded is displayed in orange. If the preset memory is named, the name is displayed on the button.
⑥	RELOAD TIME SET	Sets the automatic reload time of the web browser
⑦	RELOAD	Displays the latest information of the FDX



[Fig. 8.2] Screen for editing I/O channel name

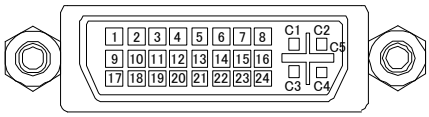
#	Button name	Description
①	CROSS POINT NAME EDIT (for inputs)	Edits input channel name displayed in "CROSS POINT". "IN1" to "IN16" names are set as default. Up to 10 characters in ASCII code (Even if you enter 11 characters or more, only the first 10 characters are valid)
②	CROSS POINT NAME EDIT (for outputs)	Edits output channel name displayed in "CROSS POINT". "OUT1" to "OUT16" names are set as default. Up to 10 characters in ASCII code (Even if you enter 11 characters or more, only the first 10 characters are valid)
③	SEND	Sets the I/O channel name and saves it in the FDX.
④	RELOAD	Reloads the display and displays the current settings
⑤	END	Terminates the name editing

9 Specification

9.1 Pin assignments

9.1.1 DVI-I connector

DVI-I 29 pin female



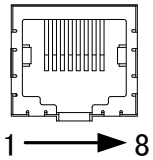
Pin #	Signal name	Pin #	Signal name
1	TMDS data2-	16	Hot plug detect
2	TMDS data2+	17	TMDS data0-
3	TMDS data2 shield	18	TMDS data0+
4	N.C.	19	TMDS data0 shield
5	N.C.	20	N.C.
6	DDC CLOCK-	21	N.C.
7	DDC DATA	22	TMDS clock shield
8	N.C.	23	TMDS clock+
9	TMDS data1-	24	TMDS clock
10	TMDS data1+	C1	N.C.
11	TMDS data1 shield	C2	N.C.
12	N.C.	C3	N.C.
13	N.C.	C4	N.C.
14	+5 V power supply	C5	GND
15	GND		

N.C.: No Connection

[Fig. 9.1] DVI-I pin assignments

9.1.2 RJ-45 connector

8 pin RJ-45
Modular connector



TIA/EIA-568A pin assignments

Pin #	Signal name
1	WHITE/GREEN、Stripe
2	GREEN
3	WHITE/ORANGE、Stripe
4	BLUE
5	WHITE/BLUE、Stripe
6	ORANGE
7	WHITE/BROWN、Stripe
8	BROWN

TIA/EIA-568B pin assignments

Pin #	Signal name
1	WHITE/ORANGE、Stripe
2	ORANGE
3	WHITE/GREEN、Stripe
4	BLUE
5	WHITE/BLUE、Stripe
6	GREEN
7	WHITE/BROWN、Stripe
8	BROWN

[Fig. 9.2] RJ-45 pin assignments

9.2 Specification

Item			Description
Input			16
Output			16
The number of slot boards (1 slot board has 4 inputs or 4 outputs)			
	Input	HDBaseT	Up to 4 slots (16 inputs)
		Optic	
		Digital	
	Output	HDBaseT	Up to 4 slots (16 inputs)
		Optic	
		Digital	
HDBaseT input slot board			
	Input		4 inputs
	Video	HDBaseT	TMDS clock: 25 MHz to 225 MHz HDMI Deep Color supported (*1) / DVI 1.0, HDCP 1.4 supported (*2), EDID emulation
		Format	VGA to QWXGA (dot clock: 25 MHz to 165 MHz) WUXGA / QWXGA: only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	HDBaseT	Multi channel linear PCM: up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate:1 6 bit to 24 bit
	Connector		RJ-45 (*3)
	Cable		Cat6 UTP / STP straight, Cat5e UTP / STP straight (*4)
	Max. extension distance		330 ft. / 100 m (*5)
Optical input slot board (*6)			
	Input		4 inputs
	Video	Digital optical signals for extension	TMDS clock: 25 MHz to 165 MHz HDMI (*7) / DVI 1.0, HDCP 1.4 supported, EDID emulation HDCP 1.4
		Format	VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / WUXGA WUXGA: only DVI signals (Reduced Blanking) is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital optical signals for extension	Multi channel linear PCM: up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate: 16 bit to 24 bit
	Cable		Duplex fiber cable, SFP module (LC connector x 2) (*8)
	Recommended polishing method (*9)		SFP module for multimode: PC polishing (recommended) SFP module for singlemode: UPC polishing (recommended), SPC polishing (APC polishing is not supported)
	Max. extension distance (*10)		Multimode fiber (OM3): 985 ft. / 300 m Multimode fiber (OM4): 0.62 miles / 1 km Singlemode fiber (OS1): 2.9 miles / 4.7 km
Digital input slot board			
	Input		4 inputs
	Video	HDMI/DVI	TMDS single link, TMDS clock: 25 MHz to 225 MHz HDMI Deep Color supported (*1) / DVI 1.0、HDCP 1.4 supported, built-in cable equalizer, EDID emulation
		Format	VGA to QWXGA (dot clock: 25 MHz to 165 MHz) WUXGA / QWXGA: only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital audio	Multi channel linear PCM; up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate: 16 bit to 24 bit
	Connector		DVI-I (29 pin), female (Analog signals cannot be used.)
	Max. extension distance		33 ft. to 99ft. / 10 m to 30 m (*11)
HDBaseT output slot board			
	Output		4 outputs
	Video	HDBaseT	TMDS clock: 25 MHz to 225 MHz HDMI Deep Color supported (*1) / DVI 1.0, HDCP 1.4 supported (*12)
		Format	VGA to QWXGA (dot clock: 25 MHz to 165 MHz) WUXGA / QWXGA: only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	HDBaseT	Multi channel linear PCM: up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate: 16 bit to 24 bit
	Connector		RJ-45 (*3)
	Cable		Cat6 UTP / STP straight, Cat5e UTP / STP straight (*4)
	Max. extension distance		100 m (*5)

Item			Description
Optical output slot board (*6)			
	Output		4 outputs
	Video	Digital optical signals for extension	TMDS clock: 25 MHz to 165 MHz HDMI (*7) / DVI 1.0, HDCP 1.4 supported
		Format	VGA / SVGA / XGA / WXGA (1280x768) / WXGA (1280x800) / Quad-VGA / SXGA / WXGA (1360x768) / WXGA (1366x768) / SXGA+ / WXGA+ / WXGA++ / UXGA / WSXGA+ / WUXGA WUXGA: only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital optical signals for extension	Multi channel linear PCM: up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate: 16 bit to 24 bit
	Cable		Duplex fiver cable, SFP module (2 LC connectors) (*8)
	Recommended polishing method (*9)		SFP module for multimode: PC polishing (recommended) SFP module for singlemode: UPC polishing (recommended), SPC polishing (APC polishing is not supported)
	Max. extension distance (*10)		Multimode fiber (OM3): 985 ft. / 300 m Multimode fiber (OM4): 0.62 miles / 1 km Singlemode fiber (OS1): 2.9 miles / 4.7 km
Digital output slot board			
	Output		4 outputs
	Video	HDMI/DVI	TMDS single link, TMDS clock: 25 MHz to 225 MHz HDMI Deep Color supported (*1) / DVI 1.0, HDCP 1.4 supported, built-in cable equalizer
		Format	VGA to QWXGA (dot clock: 25 MHz to 165 MHz) WUXGA / QWXGA: only Reduced Blanking is supported. 480i / 480p / 576i / 576p / 720p / 1080i / 1080p
	Audio	Digital audio	Multi channel linear PCM: up to 8 channels Sampling frequency: 32 kHz to 192 kHz, quantization bit rate: 16 bit to 24 bit
	Connector		DVI-I (29 pin), female (Analog signals cannot be used.)
	Max. extension distance		33 ft. to 131 ft. / 10 m to 40 m (*11)
Function			Video and audio are switched separately (when audio unit MAU-1616 (optional) is connected); I/O slot board and CPU slot board can be replaced without removing from the rack; startup memory; preset memory (32 memories＋startup memory); last memory; key lock; anti-snow (*13); connection reset (*14); the number of inputs and outputs can be customized by 4 inputs or 4 outputs
Alarm output			1output terminal block (2 pin), power monitor, fan monitor
External control	RS-232C		1 port D-sub9 pin connector, male
	LAN		1port RJ-45 connector 10Base-T / 100Base-TX (Auto Negotiation), Auto MDI / MDI-X
	Optional (MAU-1616)		1port D-sub25 pin connector, female
General	Power supply voltage		AC ～ 100 V - 240 V ± 10%, 50 Hz / 60 Hz ± 3 Hz
	Power consumption (*15)		At maximum HDBaseT extension input / output configuration : about 212 W At maximum optical input / output slot board Multimode fiber : about 244 W Singlemode fiber : about 255 W At maximum digital input / output slot board configuration : about 123 W
	Dimensions		About 16.93 (W) x 5.2 (H) x 13.88 (D)" / 430 (W) x 132 (H) x 350 (D) mm (EIA rack 3U, not including projections)
	Weight (*15)		At maximum HDBaseT extension input / output configuration : 23.8 lbs. / 10.8 kg At maximum optical input / output slot board Multimode fiber : 27.34 lbs. / 12.4 kg Singlemode fiber : 27.34 lbs. / 12.4 kg At maximum digital input / output slot board configuration : 21.6 lbs. / 9.8 kg
	Temperature		Operating temperature: 32 °F to 104 °F / 0 °C to +40 °C Storage temperature: -4 °F to +176 °F / -20 °C to +80 °C
	Humidity		Operating/ Storage humidity: 20 % to 90 % (Non Condensing)
	Included items		RS-232C cable (5.9 ft./1.8 m). power supply cable (5.9 ft./1.8 m), rack mounting brackets, terminal block (2 pin)

*1 36 bit / pixel (12 bit / component) Deep Color is supported. xvYCC, Lip Sync, 3D, ARC, HEC and CEC are not supported.
*2 DVI signals protected by HDCP are not supported. For those signals, use HDC-TD100 as the transmitter.
*3 RJ-45 (HDBaseT connector) is the special connector to extent video and audio signals using a Cat5e / Cat6 twisted pair cable. Use this connector only for IDK's twisted pair cable transmitter and receiver; do not use it for LAN devices.
*4 T568A or T568B straight. For longer than 164.04 ft. / 50 m, Cat6 is recommended.
*5 If the FDX is connected to a device which is in significantly bad condition, video may be interrupted. Since some LC monitors operates unsteadily, check the operation beforehand or contact us.
*6 Use OPF-H1000-A as the extender connected to an optical I/O slot board.
*7 Deep Color, xvYCC, Lip Sync, 3D, ARC, HEC and CEC are not supported.
*8 The standard SFP specification is as follows.
*9 Polishing methods other than the recommended method can be used, but the extension distance will change due to an increase in return loss.
*10 The mentioned maximum extension distance is acquired when the recommended polishing method fiber is used, there is no connection through the path, and the allowable bending radius is not exceeded.
*11 The transmission distance depends on connected devices. The distance above is the maximum transmission distance when a cable made by IDK (AWG24) is used and signals, 1080p 60 Hz 24 bit/pixel (8 bit/component), are input or output. If the connected device is not matched to the FDX or if other makers' cables are used, video signals can be unstable or video signals cannot be output, even though the transmission distance is within the information above.
*12 DVI signals protected by HDCP are not supported. For those signals, use HDC-RD100 as the receiver.
*13 Anti-snow feature fixes snowy noise automatically that is a specific symptom of the signal having HDCP. The problem occurs mainly during start-up. This feature is invalid when snow noise has already occurred before start-up or when snow noise occurs due to a bad status of transmission line.
*14 This feature automatically resolves problems which can be resolved by unplugging and plugging in connectors. This feature works only for this device's outputs, and this may be disabled if another device is connected between this device output and display device.
*15 For power consumption and weight at each I/O slot board combination, please contact us.

■ **Standard SFP specification**

Item	Multimode fiber	Singlemode fiber
Wave length	850 nm (Oxide VCSEL laser (*16))	1310 nm (Fabry-Perot laser (*16))
Max. extension distance	OM3: 985 ft. / 300 m, OM4: 0.62 miles / 1 km	OS1: 2.92 miles / 4.7 km
Input level	-13 dBm or more	-18 dBm or more
Output level	-9 dBm to -2.5 dBm	-8.4 dBm to -3 dBm
Connector	LC (Duplex)	

*16 The lasers in this product meet Class 1 Laser Safety per FDA/CDRH and EN (IEC) 60825 laser safety standards which specifies design safety.

If you need an SFP for singlemode fiber that can extent up to 18.7 miles / 30 km (OS1), please contact us.

10 Troubleshooting

This chapter recommends what to do if you have problems operating the FDX.

In case the FDX does not work correctly, please check the following items first.

- ・Are the FDX and all devices plugged in and powered on normally?
- ・Are cables connected correctly?
- ・Are there no loose connections?
- ・Are correct cables supported by devices being used?
- ・Are signal specifications of connected devices matched to each other?
- ・Are settings of the sink device correct?
- ・Are there any close objects that may cause noise?

If the problem still cannot be solved, perform the following actions. Refer to manuals of connected devices as well, since they may possibly be the cause of the problem.

Problem	Cause/Check item/Solution	Page
Video output		
Video is not output.	If there are no problems with cable connections, first check [1] and [2] below.	ー
	[1] Is the EDID resolution setting of this device set to the input resolution supported by the sink device? If the EDID resolution is set to 480i, 576i or 1080i, the video may not be output to the sink device that does not support the interlaced signals. Vertical synchronous frequency: For TV output resolutions (480i to 1080p), video of 59.94 Hz or 60Hz may not be output. PC output resolutions (VGA to WUXGA/QWXGA) may not be output to LCD TVs and plasma TVs.	38
	[2] Are signals output from the source device? If the input resolution is displayed in "INPUT STATUS", check [3] to [6]; if "No Signal" is displayed, check [7] and [8].	61
	[3] If signals protected by HDCP are input, does the sink device support the HDCP? If the sink device does not support HDCP, those signals cannot be output. Some source devices check the HDCP of the sink device to output appropriate signals, but the FDX may not output video if connected to a sink device that does not support HDCP since the FDX supports HDCP. In such a case, disable the HDCP input from the source device.	33 61

Problem	Cause/Check item/Solution	Page
Video output		
Video is not output.	[4] If a long cable is connected for input or output when digital I/O slot board is mounted, replace it with a 5 m/16.4 ft. or shorter Cable. Even though a 5 m/16.4 ft. or longer cable can be connected for digital I/O of the FDX, HDCP authentication or EDID acquisition may fail depending on the cable quality and the connected device.	—
	[5] Are signals that are not supported being input?	38
	[6] Change the time for ignoring video output request signals.	35
	[7] Is the set monitoring time for no signal input too short?	32
	[8] Check the video output setting of the source device.	—
Video is dissappeared, interrupted, or has noise.	If a long cable is connected for input or output when a digital I/O slot board is mounted, set the input or output equalizer.	31 34
	If a long cable is connected for input or output when digital I/O slot board is mounted, replace it with a 5 m/16.4 ft. or shorter Cable. Even though a 5 m/16.4 ft. or longer cable can be connected for digital I/O of the FDX, the FDX may not provide its full performance depending on the cable quality and the connected device. If the problem is solved by replacing the cable, signals might have been degraded due to long haul transmission. We have high-quality cables, cable boosters and extenders. Please contact us as needed.	—
	When high-speed signals (e.g.: high-resolution signals such as UXGA, WUXGA, and 1080p, and Deep Color signals) are input or output, video may not be displayed or noise may appear depending on the cable quality and connected devices. If this problem occurs in all output connectors, check the input side. If it occurs in a specific output connector(s), check the output side as follows: Change the resolution lower and/or turn off DEEP COLOR. You can check the resolution and color depth of input signals in the LCD screen, and you can set the EDID in order to control the resolution and color depth of the input signals.	38 41
	Is a cable that is appropriated for the transmission distance when an HDBaseT I/O slot board is mounted? If the transmission distance is 50 m/164 ft. or longer, we recommend using a Cat6 cable whose noise characteristic and frequency characteristic and using STP cable instead of UTP cable to reduce the influence of interference and external noise. If the transmission distance is 50 m/164 ft. or shorter, you can use a Cat5e cable.	18
	When a twisted pair I/O slot board is mounted, connect cables correctly (place them straight) to reduce the influence of noise. Keep the distance among cables and not to place cables closely in parallel.	18

Problem	Cause/Check item/Solution	Page
Video output		
Video is dissappeared, interrupted, or has noise.	When an optical I/O slot board is mounted, are optical fiber cable type, standard, polishing method, and laying method correct? Make sure that the both ends have LC connecter, the cable meets the SFP module standard, and the polishing method is correct. The optical loss occurs depending on scratches and dirt of connector ends, bend radius, lateral pressure, and connection method of optical fiber cables. Check the power budget.	18
Snowy noise appears.	Since optical I/O slot board does not support QWXGA, snow noise appears. Input another resolution. You can check the resolution input signals in the LCD screen, and you can set the EDID in order to control the resolution.	38
Deep Color signals are not output.	Does the sink device support Deep Color? If not, 24 bit/pixel (8 bit/component) is used even if signals are input in Deep Color. Since the optical output slot board does not support Deep Color, signals are transmitted in 24 bit/pixel (8 bit/component).	41
Video flickers.	If interlace signals are input to a sink device that does not support interlace signals, the video may blink. Check the output resolution of the sink device.	ー
Video edges (up/down/right/left) are cut out.	Some sink devices display input video in overscan, and the video may be cut out. Check the display setting of the sink device.	ー
Video is distorted horizontally or vertically.	Some sink devices display input video on full screen mode, and the aspect ratio cannot be kept. Check the display setting of the sink device. With some resolutions, full-screen display cannot be avoided. In that case, change the output resolution of the source device.	ー
Black appears at top, bottom, right and left on PC video or only part of the PC video is displayed, and the rest is displayed by scrolling with the mouse.	If the PC has the Panel Fit function, select "Scale Full Screen". If the resolution that is set for the PC and the resolution that is actually output from the PC are not matched, those problems may occur. Check the resolution of the PC and the EDID resolution setting.	38
The dual monitor function cannot be set or it is canceled automatically.	When the No-signal input monitoring function works, the dual monitor function may not be enabled correctly. In this case, turn off this monitoring function.	32

Problem	Cause/Check item/Solution	Page
Video output		
Video is displayed in purple or green.	Some sink devices do not find the color space of the input video correctly, and the video may be displayed in purple or green. Set the correct color space in the output mode to solve this problem.	34
Audio output		
Audio is not output.	Verify that audio output is turned on.	36
	If there are multiple output connectors in the source device, check the audio output setting of the source device.	ー
	Verify that audio whose format is supported by the connected sink device is input. Especially, LCD monitors may not output 88.2 kHz or higher linear PCM and compressed audio (such as Dolby Digital and DTS). In order to play a Blu-ray disc having compressed audio, check the audio output setting of the source device. You can also control audio signals that will be output from the source device by setting EDID.	43 to 48
	Verify that DVI signals are not being output from the source device.	61
	Is the output mode setting DVI output?	34
	If the EDID of the connected sink device cannot be acquired for some reason, the FDX cannot find the sink type. As a result, audio may not be output. In that case, set OUTPUT HDMI MODE to "Always".	35
Even though multi-channel audio is played, only audio signals of 2 channels are output.	For multiple channel play, change the EDID setting which is set to 2 channels by default.	42
Compressed audio (such as Dolby Digital, DTS, and the like) is not output from the source device.	Inputting compressed audio is controlled in the EDID setting by default. Change the EDID setting in order to use the compressed audio.	43 to 48
	Check the audio output setting of the source device.	ー
Key operation		
Keys do not operate.	Is key operation locked?	27
	It takes about 7 seconds after turning on the FDX to complete the start process. All key operations are invalid during this start process.	ー
Communication command control		
The FDX cannot be controlled by the PC using communication command control	The following items are set correctly? for RS-232C communication, baud rate, data bit length, and the like for LAN communication, IP address, subnet mask, and the like	49 to 51
	It takes about 7 seconds from turning on the FDX to completing the start process. The communication command control is invalid during the start process.	ー
Web browser control		
The FDX cannot be controlled by the PC using web browser control	Is the connection setting of the TCP port valid for the web browser?	51

If additional assistance is required, please perform the following tests and then contact us.

1. The problem occurs in all connectors?
2. Connect the devices using genuine cables without connecting the FDX-16.

The problem still cannot be solved? Please contact us for assistance.

User's guide of FDX-16

Ver.1.0.0

Issued on: 11 November 2015

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