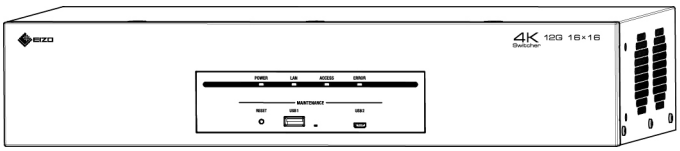
12G-SDI Switcher

CuratOR®
CXS-1616-12G

Operator's Manual (v.2.0)



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Product Overview

This is a switcher with 16 inputs and 16 outputs compatible with 12G-SDI signals.

It supports EIA 19-inch 2U rack mounting, horizontal placement, and vertical placement.
For installation methods, please refer to the “Installation” section of the hardware manual.

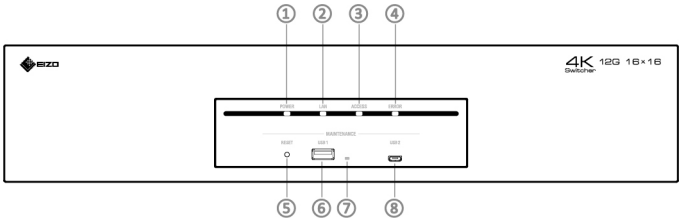
Product Features

The main features of this product are as follows:

- Supports switching and distribution of 12G/6G/3G/HD/SD-SDI signals.
- Equipped with downscaling capability for 6 channels, enabling downscaling from 4K (3840 x 2160) to Full HD (1920 x 1080), allowing operation of systems that use a mix of 4K and Full HD signals.
- Also supports 4096 x 2160 downscaling. (Downscales to 1920 x 1080 after side-cutting to 3840 x 2160)
- Equipped with mixer functions (PinP, PbyP, 4Mix).
- Switching, distribution control, various settings, and firmware updates can be managed from a web console via a networked PC.
- Thumbnail images of input videos can be generated.
- Manual switching control is possible using a USB keyboard.
- Status can be displayed on the LED on the front panel.

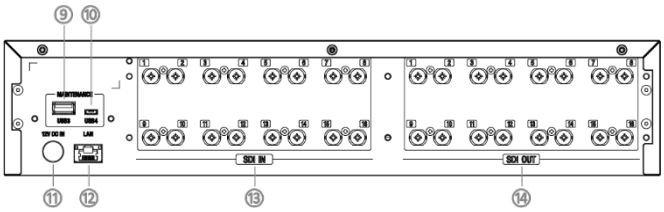
Names of Each Part

< front >



① POWER LED
② LAN LED
③ ACCESS LED
④ ERROR LED
⑤ Reset switch (for maintenance)
⑥ USB port (for maintenance)
⑦ USB LED
⑧ Micro-USB port (for maintenance)

< back >



⑨ USB port (for maintenance)
⑩ Micro-USB port (for maintenance)
⑪ DC power input port
⑫ LAN port
⑬ SDI Input port （1-16）
⑭ SDI Output port （1-16）

Functions

How to use

Connect the included AC adapter to the DC power input terminal and then connect it to an electrical outlet. When the AC power is supplied, the POWER LED will light up, and the device will start operating. To turn off the device, disconnect the AC power.

IP Address Settings

The factory default IP address for the LAN port of this unit is "192.168.1.180," and the subnet mask is "255.255.255.0."

About the LEDs

POWER LED

Changes according to the power state of the main unit.

Off	When the power is off
On (blue)	When the power is on

LAN LED

Change according to the LAN connection status.

Off	When LAN is not connected
On (yellow)	When LAN is connected

ACCESS LED

Changes according to the communication status from an external application.

Off	No communication with external applications
On (yellow)	Communicating with an external application

ERROR LED

When an error occurs, it flashes multiple times or lights up constantly (orange). The main unit is suspected to be faulty, so record the number of flashes and request repair service.

* The ERROR LED lights up during startup or restart, but this is not an indication of a malfunction.

USB LED

Changes according to the operation with the USB keyboard (described later).

Off	When a USB keyboard is not connected
On (yellow)	When a USB keyboard is connected
Flashing (yellow)	When operating a USB keyboard

Reset switch

The unit will restart when the reset switch is pressed.

Built-in scaler

This device is equipped with a 6-channel downscaler that converts 4K signals to Full HD signals.

Basic Specifications

- Input format: 4K (4096x2160, 3840x2160) 59.94/50/60Hz
  * 4096x2160 is downscaled after sidecutting to 3840x2160.
  * If an unsupported signal is input, it will be output without conversion (bypass).
- Output format: 1920x1080 3G-SDI LEVEL-A
  * The frame rate will be the same as the input.
  * Embedded audio is not supported.
- Number of channels: 6CH (scaler mode), 2CH (mixer mode)
- Supports color space conversion from BT.2020 to BT.709

About Frame Rate

You need to set the scaler's frequency according to the input signal. If a signal with a different frequency than the set one is input, the signal will be output without downscaling.

The following channels are paired and share the same frequency settings.

CH 1 ・ CH 2
CH 3 ・ CH 4
CH 5 ・ CH 6

The modes that can be set for each CH pair are as follows:

59.94	Used when the input is 59.94 Hz
50/60	Used when the input is 50/60 Hz

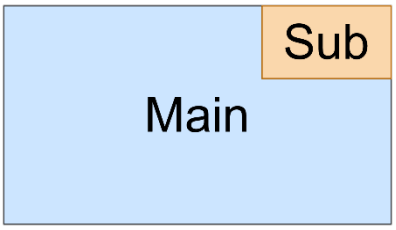
AUTO	The frequency is automatically set according to the input. If signals are input to both paired channels, the frequency of the signal connected first will be selected. For example, if a 60Hz signal is input to CH2 and then a 59.94Hz signal is input to CH1, the scaler frequency will be set to 60Hz. * If CH5 and CH6 are set to AUTO, the mixer function and color bar function cannot be used.

Built-in mixer

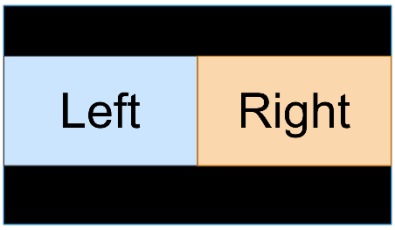
You can use the built-in mixer function to perform screen composition (PinP/PbyP/4Mix).
You can select 2-input PinP/PbyP or 4-input 4Mix.
4Mix mode also supports 4K (3G SDI Quad-Link 2SI/SQD) input.

Layout

You can choose from the following three layouts.



PinP



PbyP

4Mix

PinP/PbyP Specifications

Input Signal	4096x2160/59.94p/60p/50p 3840x2160/59.94p/60p/50p 3840x2160/29.97p/30p/25p 1920x1080/59.94p/60p/50p 1920x1080/59.94i/60i/50i 1920x1080/29.97p/30p/25p 1280x720/59.94p/50p 720x480/59.94i 720x576/50i
Output Signal	3840x2160/59.94p/60p/50p 1920x1080/59.94p/60p/50p
Number of Channels	1 ch
PinP sub-screen size	・At 4K output Large: 1280x720 (when SD input: 960x720) Small: 960x540 (when SD input: 720x540) ・At 2K output Large: 640x360 (when SD input: 480x360) Small: 480x270 (when SD input: 360x270)
PinP Sub-Screen Position	Upper right / Lower right / Lower Left / Upper left
PbyP Screen Size	・At 4K output 1920x1080 (when SD input: 1440x1080) ・At 2K output 960x540 (when SD input: 720x540)
Delay	Approx.1-2 frames

* When the input is 4096x2160, it will be side-cut to 3840x2160.
* When using the PinP/PbyP function, Scaler channels 1 to 4 cannot be used.
* Cannot be used simultaneously with the 4MIX function.
* The frame rate for PinP/PbyP output is the same as the scaler 5/6ch and Colorbar settings.

4Mix 2x2 Specifications

Input Signal	3840x2160/59.94p/60p/50p (3G-SDI Quad-Link 2SI/SQD) 1920x1080/59.94p/60p/50p
Output Signal	3840x2160/59.94p/60p/50p (12G-SDI)
Number of Channels	1 ch
Delay	Approx. 1-2 frames

* When using the 4MIX function, scaler channels 1-4 cannot be used.

* Cannot be used simultaneously with the PinP/PbyP function.

* The frame rate of 4MIX output is shared with the settings of scaler channels 5/6 and the color bar.

Mode Switching

When using the mixer (PinP/PbyP/4Mix) function, set the operating mode to "PinP, PbyP" or "4Mix" respectively.

A restart is required for switching.

Web Functions

Web Console

If the settings such as the IP address of the device are correct, you can use the Web Console to configure the device's functions and update the firmware from a web browser on the same network. For example, if the device's IP address is "192.168.1.180", you can access the Web Console (settings screen) by entering "http://192.168.1.180" in the browser's address bar. Additionally, if you connect a PC to the micro USB port on the front panel, the device will be recognized as a Remote NDIS device, and you can access it by entering "http://192.168.11.1".

The factory default user ID for the Web Console is "admin" and the password is "admin".

Be sure to change the factory default password. If you do not change it, a warning message will be displayed on the Web Console.

< Supported Browsers>

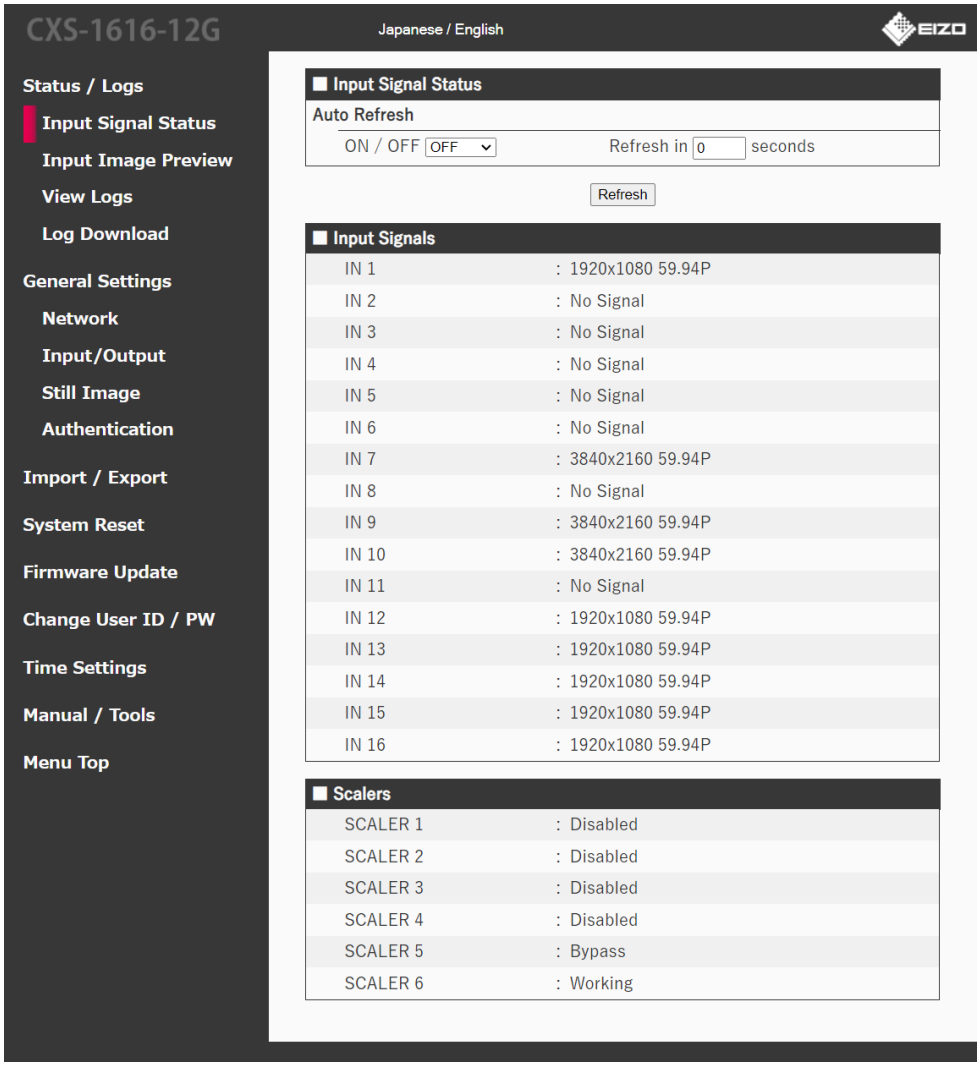
Google™ Chrome™

Microsoft Edge

* Internet Explorer is not supported.

Status/Logs

Input Signal Status



You can check the input signal format and the operating status of the scaler.

- Auto Refresh

  When changed to ON, the information is automatically updated. The number in parentheses indicates the update interval (seconds).

- Refresh button

  This button updates the information.

- Input Signals

  The signal status of each input terminal is displayed.

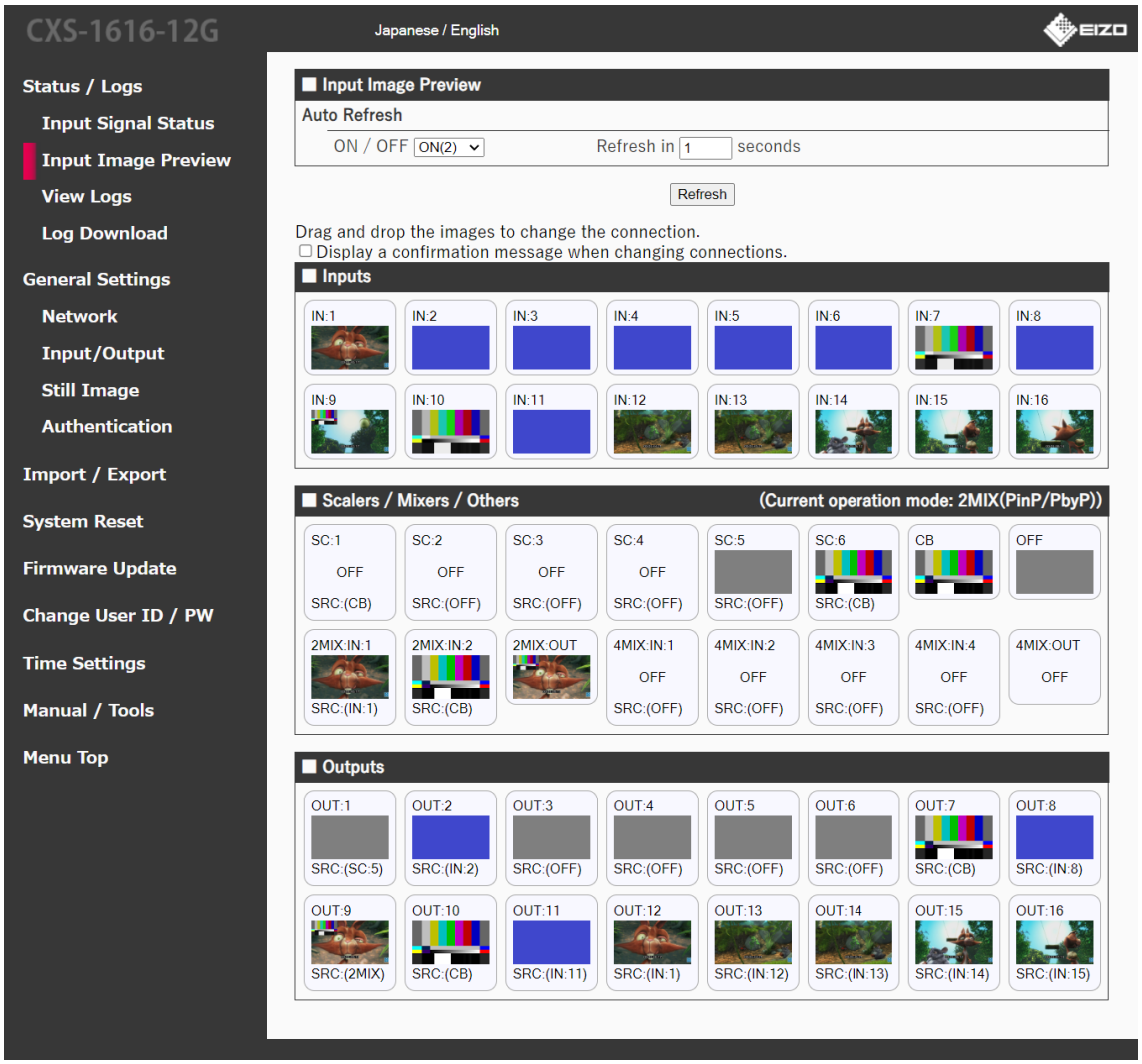
Resolution display	A signal with the displayed resolution is being input
No Signal	No signal is being input
Carrier detected	A signal is detected, but the resolution is undetected or the signal is unsupported

- Scalers

  The operating status of the scaler is displayed.

Working	The downscaler is running
Bypass	A non-4K signal is being input, or no signal is being input
Disabled	The downscaler is disabled. Scaler channels 1 to 4 cannot be used when in mixer mode.

Input Image Preview



You can check the preview of the input video and the routing settings.

- Auto Refresh

  When changed to ON, the information is automatically updated. The number in parentheses indicates the update interval (seconds).

  Depending on the environment, if the update interval is too short, the image may not update. In that case, set a longer update interval.

- Refresh button

  This button updates the information.

- Preview Screen

You can change the connections by dragging and dropping the video.

- Input (IN)

  This is the input video. If there is no input, a blue image is displayed. It can be connected to the scaler (SC), mixer (2MIX, 4MIX), and Output (OUT).

- Scaler (SC)

  This is the scaler that downscales 4K video. The scaler can take input from Input (IN), Mixer (2MIX, 4MIX), Color Bar (CB), or no input (OFF). The output of the scaler can be connected to the Mixer (2MIX, 4MIX) and Output (OUT). Channels displayed as OFF in the thumbnail are currently disabled.

- Mixer (2MIX, 4MIX)

  This is the mixer that combines multiple inputs. 2MIX represents PinP/PbyP. The mixer can take input from Input (IN), Color Bar (CB), Scaler (SC), or no input (OFF). The output of the mixer can be connected to the scaler (SC) or output (OUT).

  IN:1 and IN:2 indicate the input signals. To switch the input signal, drop the desired signal into this part.

  OUT indicates the output signal of the mixer. Drop it onto the desired output terminal to connect the mixer's output.

- Color Bar (CB)

  Outputs a color bar signal. It can be connected to the Scaler (SC), Mixer (2MIX, 4MIX), and Output (OUT).

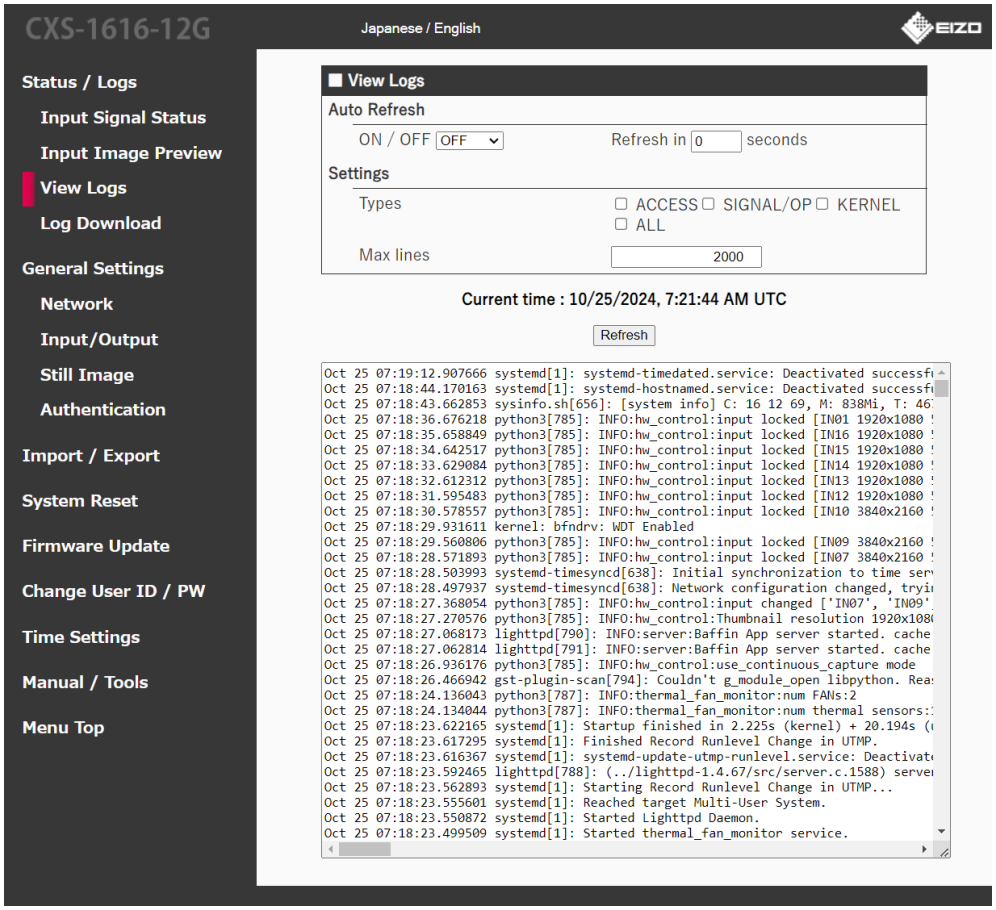
- No Input (OFF)

  Used when you want to stop the signal output. It can be connected to the Scaler (SC), Mixer (2MIX, 4MIX), and Output (OUT).

- Output (OUT)

  This is the video output from the output terminal.

View Logs



You can check the operation logs.

- Auto Refresh

  When changed to ON, the information is automatically updated. The number in parentheses indicates the update interval (seconds).

- Types

  Specifies the type of log to display. If not specified, all logs are displayed.

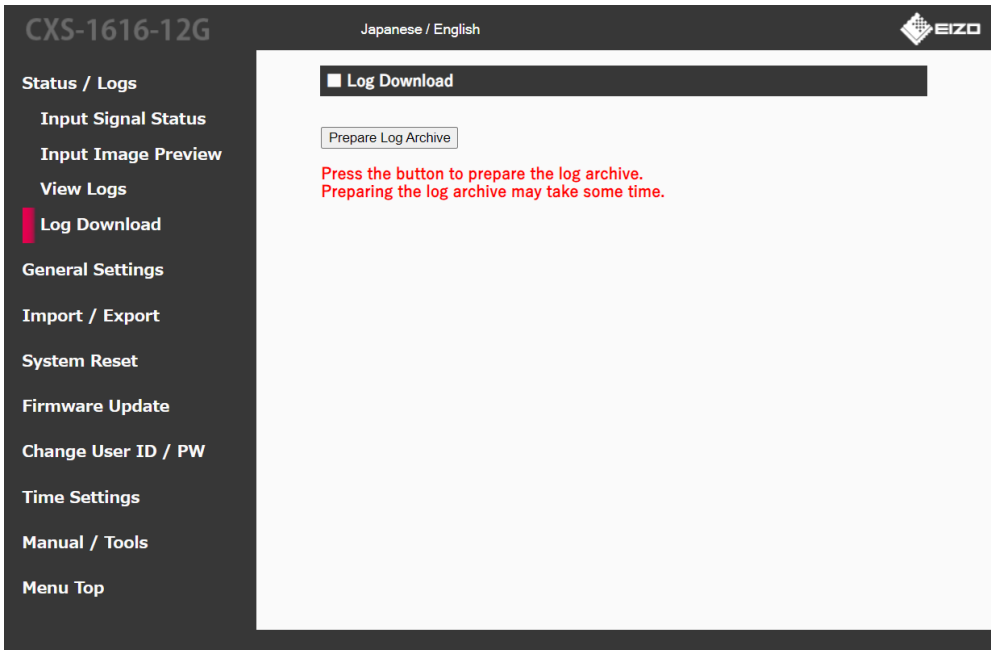
- Max lines

  Specifies the number of rows to retrieve.

- Refresh button

  A button to update the information.

Log Download



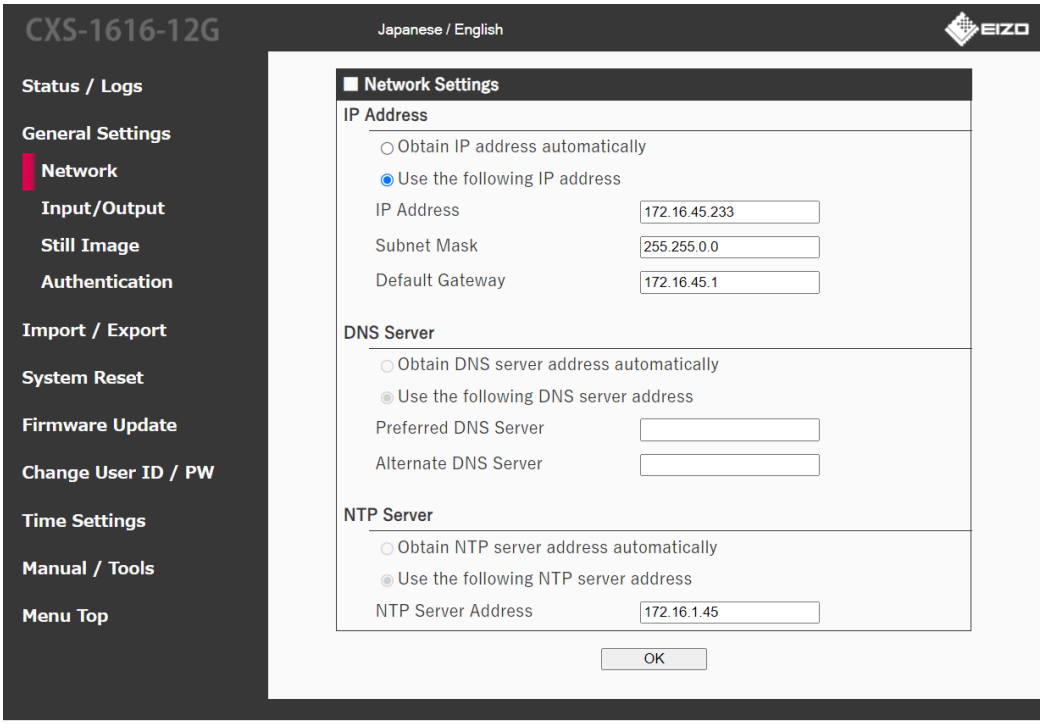
You can download the log files.

If there are a large number of logs, it may take about 1–2 minutes to generate the archive.

It is recommended to regularly download the logs to external storage to prevent loss of logs or in case of device failure.

General Settings

Network Settings



You can change the IP address and other settings.

- IP address

  You can set the IP address information used by this device.

  If you want to automatically obtain the IP address via DHCP, select the radio button "Obtain IP address automatically".

- DNS Server

  You can set the DNS server information used by this device.

  If you want to automatically obtain the DNS server address via DHCP, select the radio button "Obtain DNS server address automatically".

  If "Obtain IP address automatically" is not selected, you cannot select the radio button "Obtain DNS server address automatically".

- NTP Server

  You can set the NTP server information used by this device.

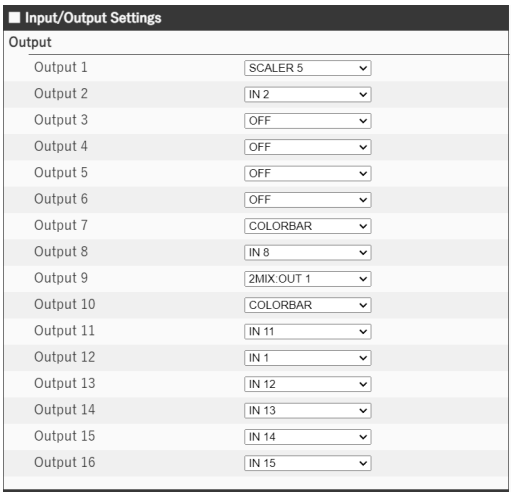
  If you want to automatically obtain the NTP server address via DHCP, select the radio

button “Obtain NTP server address automatically”.

If “Obtain IP address automatically” is not selected, you cannot select the radio button “Obtain NTP server address automatically”.

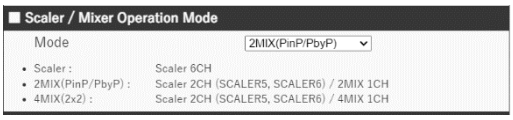
Input/Output Settings

- Output Settings



Sets the signal to be output to the output terminal.

- Scaler/Mixer Operation Mode

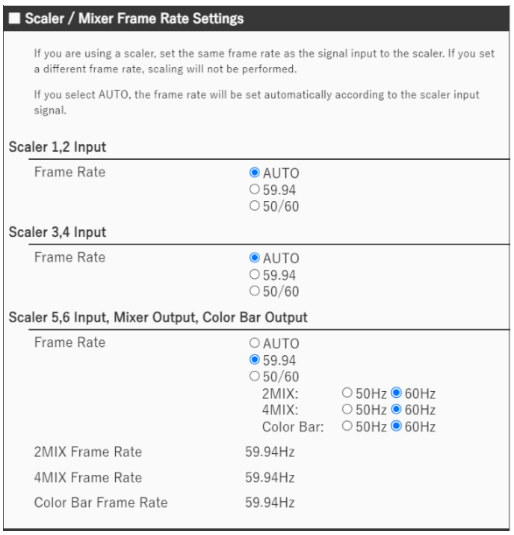


Set the operation mode of the device.

You can choose from the following three modes:

- Scaler : Scaler 6CH
- 2MIX(PinP,PbyP) : Scaler 2CH (SCALER5, SCALER6) /2MIX 1CH
- 4MIX(2x2) : Scaler 2CH (SCALER5, SCALER6) /4MIX 1CH

- Scaler/Mixer Frame Rate Settings



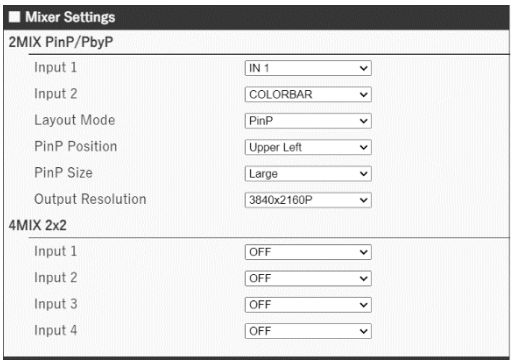
Set the frame rate of the scaler/mixer.

When using the scaler, set the same frame rate as the signal input to the scaler. If a different frame rate is set, scaling will not be performed.

If AUTO is selected, the frame rate will be automatically set according to the scaler input signal.
If AUTO is selected for SCALER5,6, the mixer and color bar cannot be used.

When using 50Hz or 60Hz output for the mixer and color bar, select the 50/60 setting and then choose 50Hz or 60Hz.

- Mixer Settings



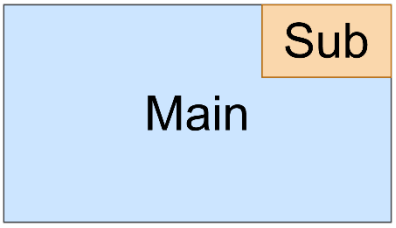
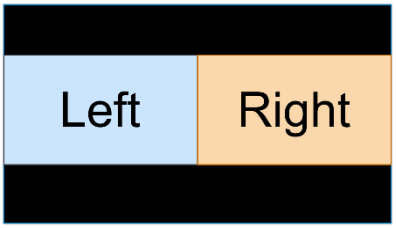
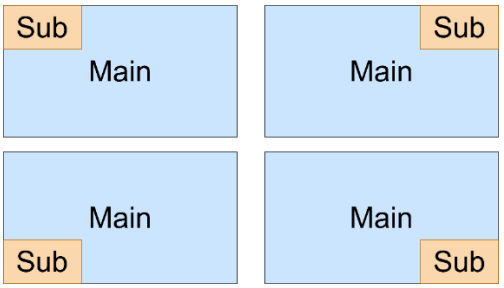
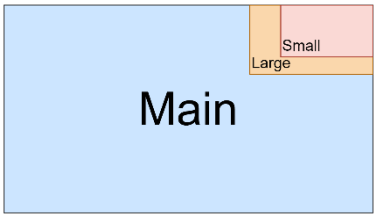
Configure the settings for PinP/PbyP and 4Mix mixers.

- Input

  Set the terminal to be input to the mixer.

- Layout Mode, PinP Position, PinP Size

  Configure the layout settings of the mixer.

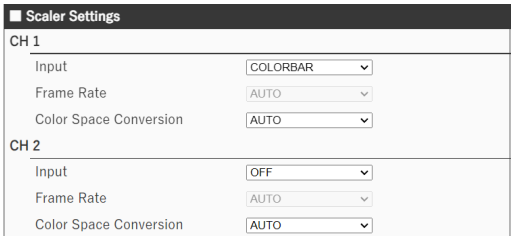
<table>
<tr><td rowspan="2">Layout Mode</td><td>PinP</td><td> 
</td></tr>
<tr><td>PbyP</td><td> 
</td></tr>
<tr><td>PinP Position</td><td>Upper Left,
Upper Right,
Lower Left,
Lower Right</td><td> 
</td></tr>
<tr><td>PinP Size</td><td>Large, Small</td><td> 
</td></tr>
</table>

- Output Resolution

  Set the output resolution for PinP/PbyP. You can choose 3840x2160 or 1920x1080.

  For 4Mix, it is fixed at 3840x2160.

- Scaler settings



  - Input

    Set the terminal to be input to the scaler.

  - Frame Rate

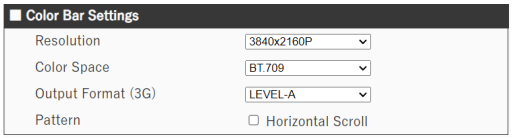
    The frame rate set in the Scaler/Mixer Frame Rate Settings will be displayed.

  - Color Space Conversion

    Convert BT.2020 signals to BT.709 signals.

AUTO	Converts if the input signal is BT.2020 based on VPID information
Always OFF	Never converts
Always ON	Always treats the signal as BT.2020 and converts regardless of the signal format

- Color Bar Settings



  - Resolution

    Set the resolution of the color bar.

  - Color Space

    Set the color space of the color bar.

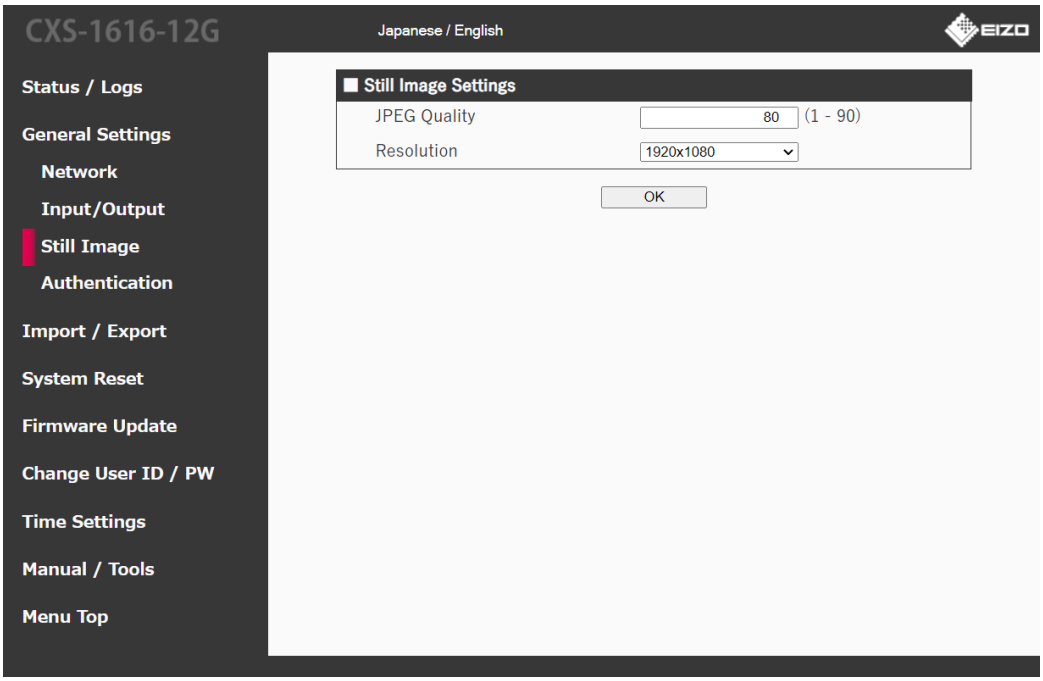
  - Output Format (3G)

    Set the format for 3G SDI.

  - Pattern

    Set the horizontal scrolling to ON or OFF.

Still Image Settings



Configure the still image settings for input preview.

- JPEG Quality

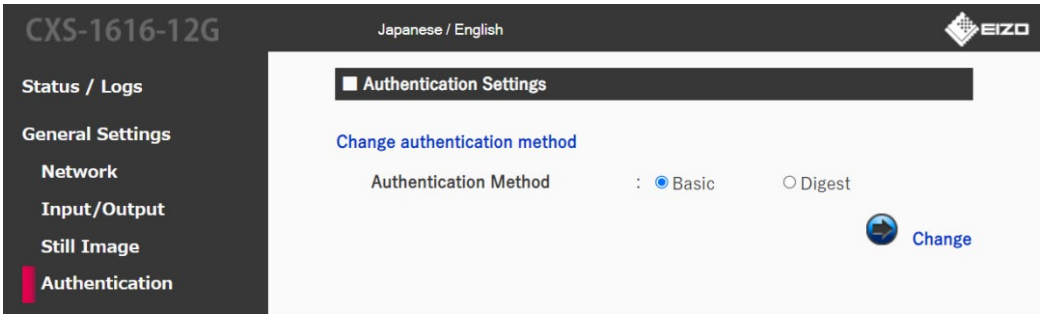
  Set the JPEG quality (1: low quality to 90: high quality).

- Resolution

  Set the resolution of the still image.

  If the input is SD resolution (720x480, 720x576), it will be fixed at half size (360x240, 360x288) regardless of the setting.

Authentication settings



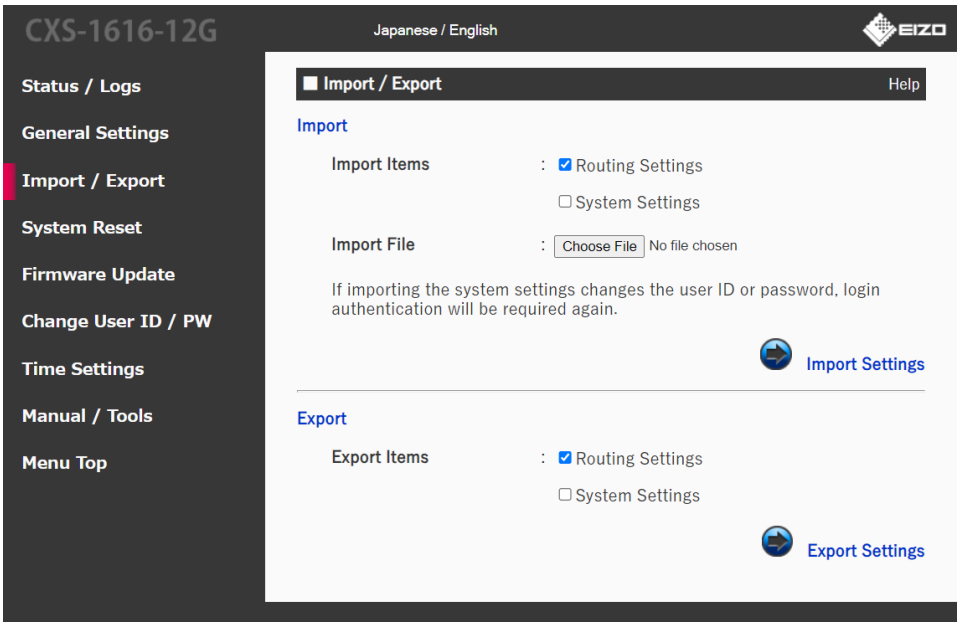
Set the authentication protocol for accessing the web console.

- Authentication method

  Select the authentication method for the web console.

  If using Digest authentication, cookies must be enabled.

Import/Export



Perform import and export of settings.

To import, select the file and items to import, then press “Import Settings”.

To export, select the items to export, then press “Export Settings”.

System settings include passwords. Protect them with encryption or other means as necessary.

Import/Export Items

- Routing Settings

  Includes the following items:

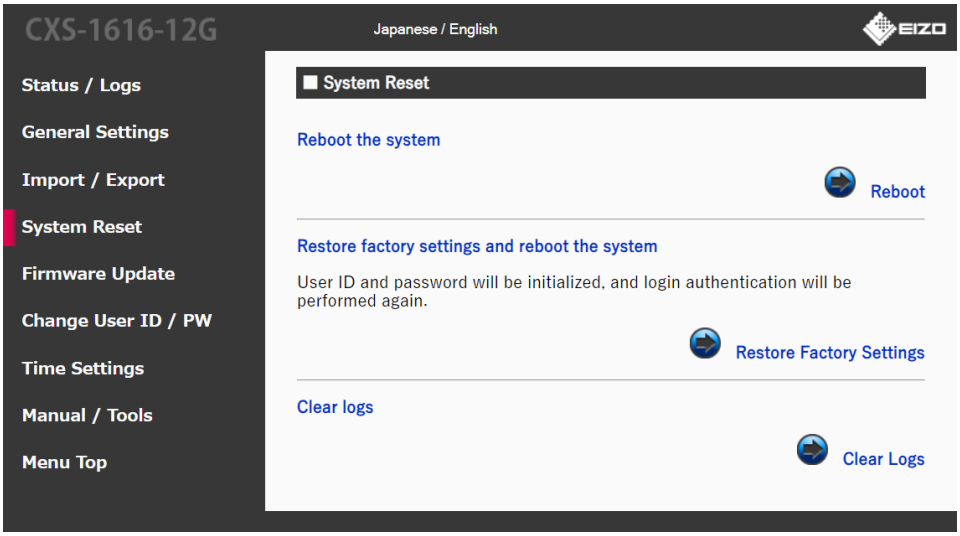
  Input/Output Settings, Still Image Settings

- System Settings

  Includes the following items:

  Network Settings, Authentication Settings, User ID, Password

System Reset



You can restart the system or restore it to factory settings.

- Reboot

  Restart the device.

- Restore factory settings

  Restore the device to its factory state.

  Please note that IP addresses and user settings will also revert to their initial state.

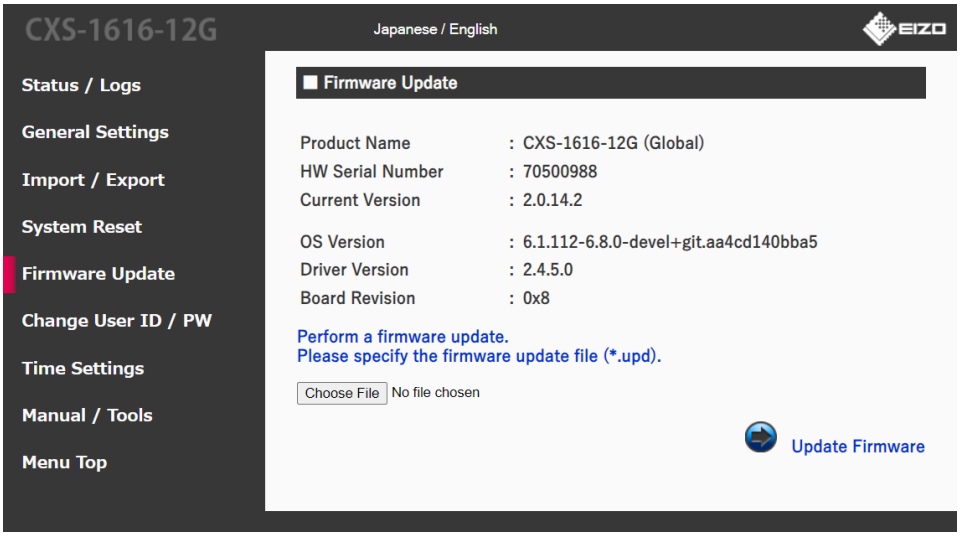
  * Logs will not be cleared.

- Clear Logs

  Delete all logs stored on the device.

  Before using after-sales service or disposing of the product, reset the settings and clear the logs to prevent leakage of input information and operation history.

Firmware Update



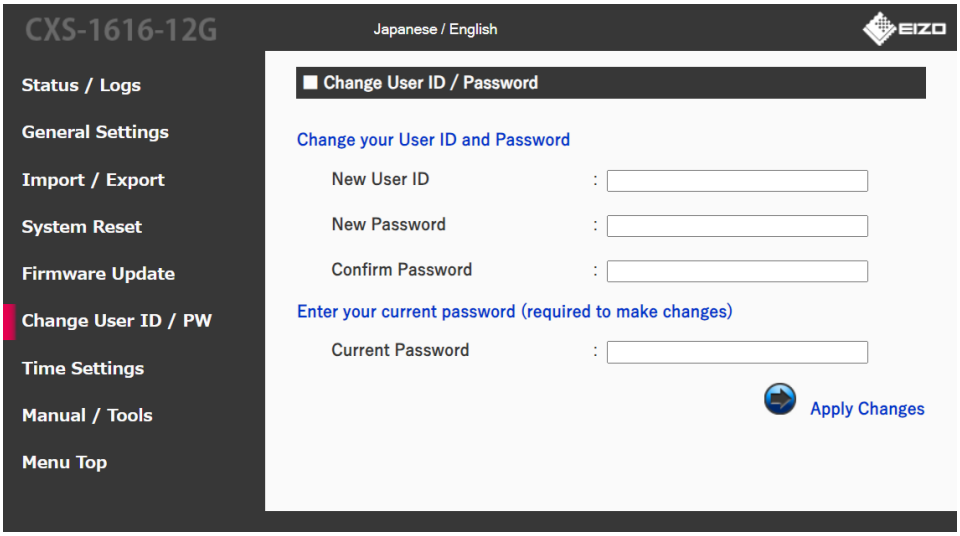
Displays the firmware version and product name, etc.

You can update the firmware.

Obtaining Update Files

Always obtain update files through official channels. Using files obtained from unofficial sources may affect the system's security and operation.

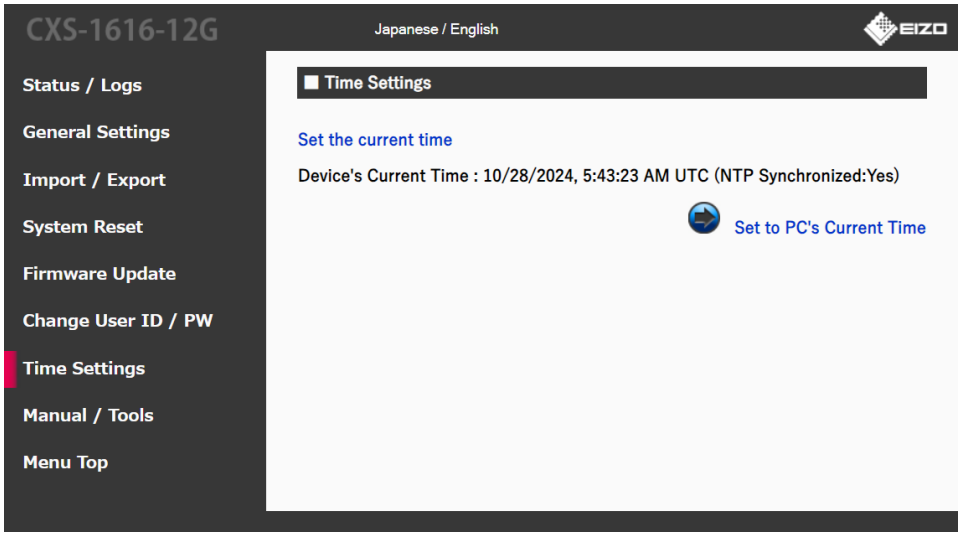
Change User ID/Password



You can set the user ID and password to access the device.

Enter the current password and the new user ID and password to change them.
The characters that can be used for the user ID and password are alphanumeric (uppercase and lowercase) up to 64 characters.

Time Settings

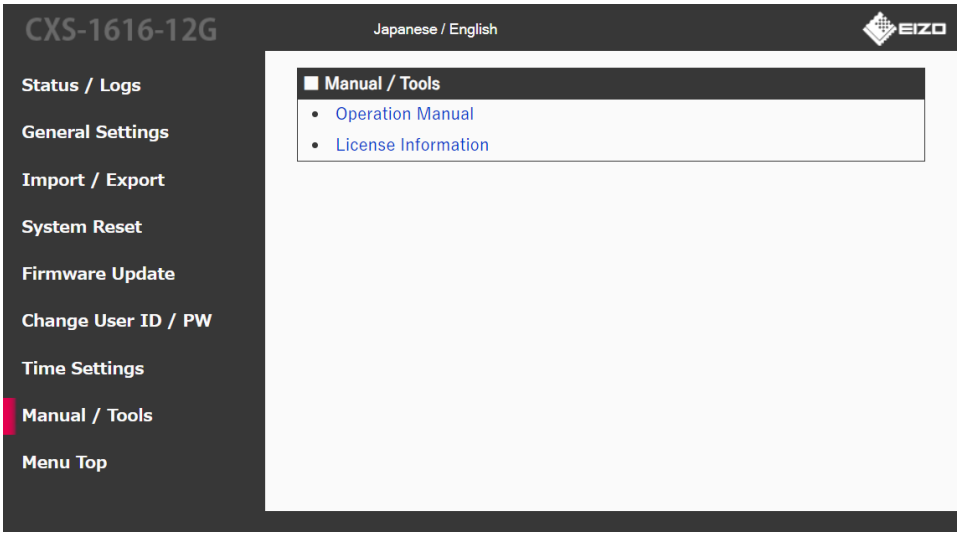


Set the time for the device.
* The time zone is set to JST or UTC at the time of shipment.

- Device's Current Time
  Displays the time of the device's internal clock. If using an NTP server, the synchronization status will also be displayed.

- Set to PC's Current Time
  You can set the time of the accessing PC as the device's time. Due to Web browser limitations, continuous time settings may not be reflected. If not reflected, close the Web browser and try again.

Manual/Tools



You can download the manual.

- Operation Manual

  The operation manual for the device.
- License information

  License information for the OSS (Open Source Software) used in the device.

Web API

Using the Web API, you can configure the device's functions from user applications. For details on the Web API, please contact our sales office.

Switching with USB keyboard

How to use

By connecting a USB keyboard or USB numeric keypad to the USB port (Type A) of this device, switching control can be performed manually.

The USB keyboard should be connected to only one port, either the front or the back.

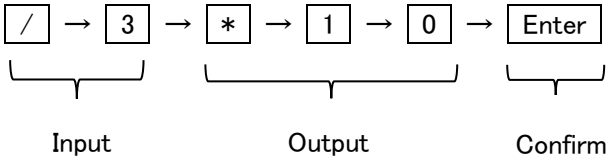
The [/] and [*] keys on the alphanumeric section cannot be used. If using a keyboard without a numeric keypad, use [I ('I'nput)] and [O ('O'utput)] instead.

Function	Specification Method
Input Source Specification	[/] + Channel Number The channel numbers are as follows: Input 1–16: 1–16 Scaler Output 1–6: 81–86 Mixer Output 2MIX: 71 Mixer Output 4MIX: 73 OFF： 90 Color Bar: 91
Output Destination Specification	[*] + Channel number The channel numbers are as follows: Output 1–16: 1–16 Scaler Input 1–6: 81–86 Mixer Input 2MIX: 71, 72 Mixer Input 4MIX: 73, 74, 75, 76
Reset I/O Specifications	[–] or [Backspace]
Confirm	[Enter]

Example of Operation with Keyboard

To connect input port 3 to output port 10, perform the following operation:

* The order of input and output specification does not matter.



How to Restore to Factory Settings from the Keyboard

If you forget the login password for the web console, you can restore the device to its factory state from the keyboard.

Initialization operation:

/ → 8 → 8 → 2 → 2 → * → 4 → 6 → 4 → 6 → 1 → 3 → Enter

When initialization starts, the USB LED will blink for a few seconds, and the device will restart.

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Contact Information:
https://www.eizoglobal.com/contact/index.html

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