SONY

MULTI PORT AV STORAGE UNIT

PWS-4500

OPERATION MANUAL English

1st Edition (Revised 8)

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Chapter 1 Overview

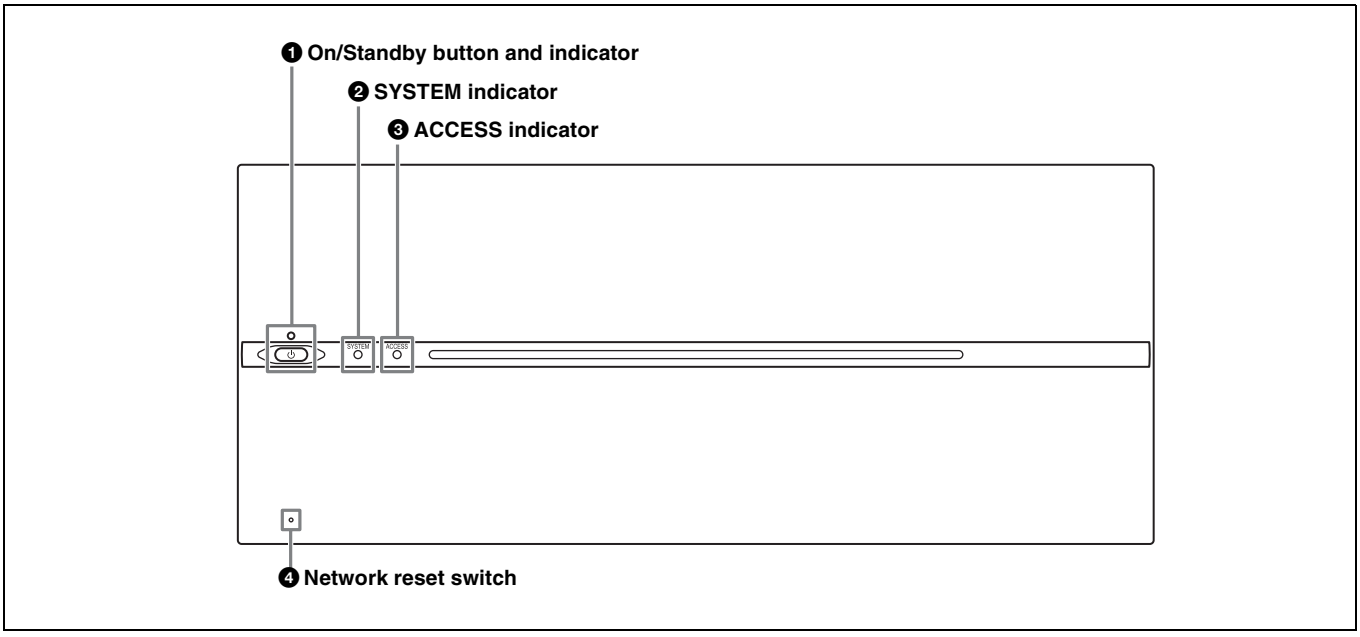
Features

The PWS-4500 is a multi-channel recorder that supports 4K to HD resolutions.
The unit features high-speed, high-capacity memory storage and supports transfers over IP, giving it a high degree of affinity in a network infrastructure.

Names and Functions of Parts

Chapter 2

Front Panel



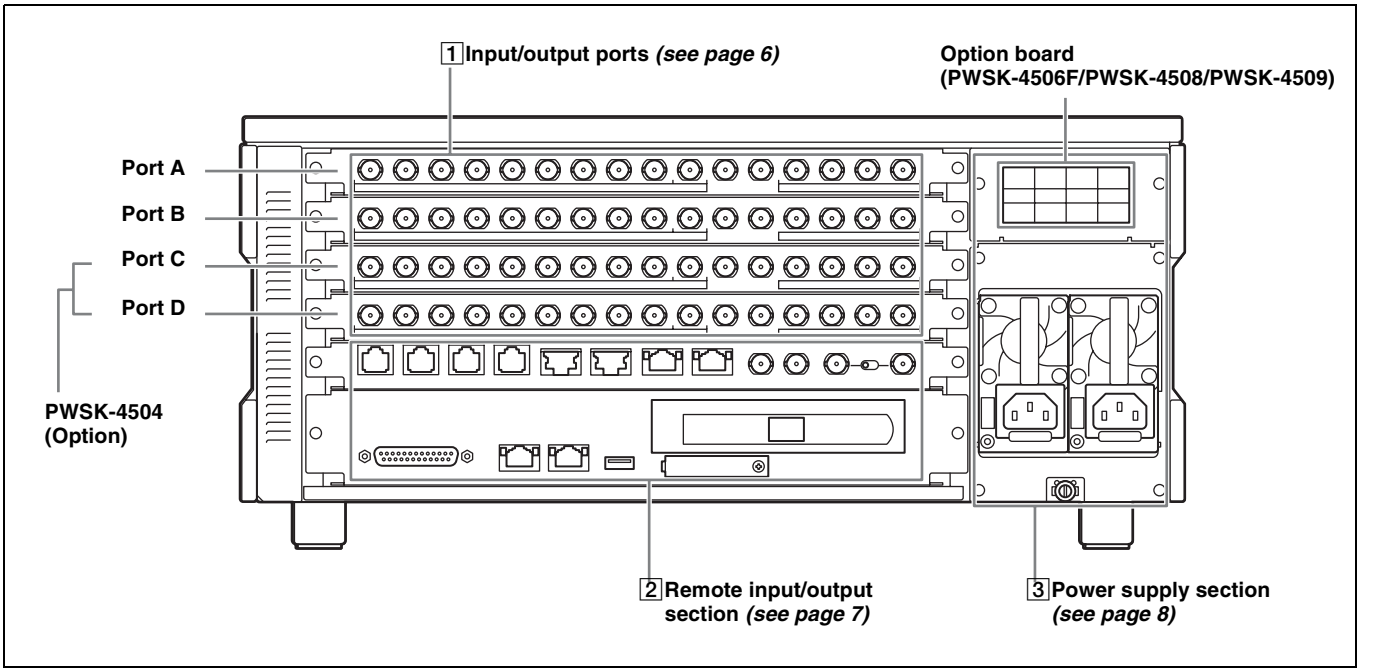
❶ On/Standby button and indicator
Switches the unit on/off (standby state). Connecting the power cord places the unit in standby state, and the indicator turns on red. Pressing the On/Standby button while in standby state turns on the unit and the indicator turns on green. Pressing and holding the On/Standby button for two seconds switches the unit to standby state, and the indicator changes to red. To turn the unit on again after switching from On state to standby state, when the indicator is red, press and hold the On/Standby switch for three seconds or longer. The indicator goes out when the power cord is disconnected.

❷ SYSTEM indicator
Displays the status of the unit.
Green: Operating normally
Green (flashing once per second): Starting up
Orange (flashing once per second): Warning message was issued.
Red (high-speed flashing four times per second): Serious error has occurred.
Purple (flashing once per second): Network reset is in progress.

❸ ACCESS indicator
Displays the access status of storage.
Off: Not being accessed
Blue: Accessing
Blue (flashing): Formatting or deleting files

❹ Network reset switch
Resets the IP address and network settings to their default values. Insert and hold the end of a paper clip or other thin object into the hole to operate the internal switch and then start the unit. The SYSTEM indicator will begin flashing purple.

Connector Panel

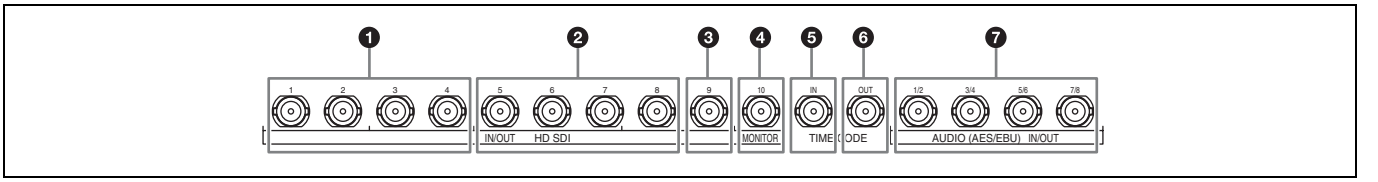


1 Input/output ports

The unit is equipped with two ports (A, B) as standard, and up to four ports are supported. Each port has the following 16 connectors. The ports can be configured as inputs or outputs using the web menu.

Note

The input/output signal on the SDI IN/OUT connectors varies with the port setting (input or output) and the SDI signal format. For details, see *"SDI Connector Input/ Output Specifications" (page 49)*.



For input ports

❶ SDI IN/OUT 1 to 4 connectors
Inputs HD SDI signals (up to four cables).

❷ SDI IN/OUT 5 to 8 connectors
Outputs the same signals input as connectors SDI IN/OUT 1 to 4 for monitors (up to four cables).

❸ SDI IN/OUT 9 connector
Outputs an HD SDI signal with superimposed text information and audio meter for a monitor. To superimpose text information, set [Character On/Off] and [Character & Audio Meter on SDI-9 Monitor] to "On" on the [Port] screen of the web menu. The output signal format can be set to Interlace, Progressive, or PsF in [Port Configuration] on the [Port] screen of the web menu.

When the playback file format is 4K/QFHD, the output is down-converted to HD.
Also, you can use this connector as an HD standard-speed signal input connector during HD high frame rate recording.

❹ SDI IN/OUT 10 connector
Outputs the same signal output as the SDI IN/OUT 9 connector. To superimpose text information, set [Character On/Off] to "On" on the [Port] screen of the web menu. When "HD Multi-Input" (dual-system input) is configured in the port settings, the x-1 (main port) monitor signal is output from the SDI IN/OUT 9 connector and the x-2 (sub port) monitor signal is output from the SDI IN/ OUT 10 connector.

❺ TIME CODE IN connector
Inputs a time code generated by an external device.

❻ TIME CODE OUT connector
When the time code generator is synchronized to the external time code signal input on the TIME CODE IN connector, the external time code is output according to the [TC OUT] setting on the [Port] screen of the web menu.

❼ AUDIO (AES/EBU) connector
Inputs the audio signals in AES/EBU format for channels 1 to 8.

For output ports

❶ SDI IN/OUT 1 to 4 connectors
Outputs HD SDI signals (up to four cables).
When [Output Port SDI-1,2,3,4] is set to [Off] on the [Setup] tab of the [System] screen in the web menu, no signal is output.

❷ SDI IN/OUT 5 to 8 connectors
Outputs the same signals as connectors SDI IN/OUT 1 to 4 (up to four cables).

❸ SDI IN/OUT 9 connector

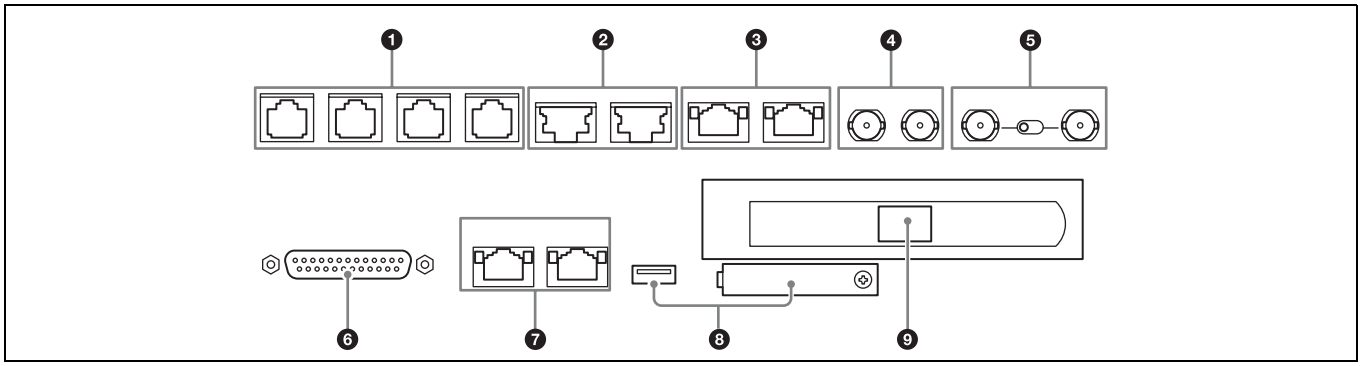
❹ SDI IN/OUT 10 connector
Outputs an HD SDI signal with superimposed text information and audio meter for a monitor. To superimpose text information, set [Character On/Off] to "On" on the [Port] screen of the web menu. You can also choose not to output superimposed text information on the SDI-9 connector by setting [Character & Audio Meter on SDI-9 Monitor] to "Off" on the [Port] screen. The output signal format can be set to Interlace, Progressive, or PsF in [Port Configuration] on the [Port] screen of the web menu. When the playback file format is 4K, the output is down-converted to HD.
When "HD Multi-Output" (dual-system output) is selected in the port settings, the x-1 (main port) monitor signal is output from the SDI IN/OUT 9 connector and the x-2 (sub port) monitor signal is output from the SDI IN/OUT 10 connector.

❺ TIME CODE IN connector
Not used.

❻ TIME CODE OUT connector
Outputs the playback time code.

❼ AUDIO (AES/EBU) connector
Outputs the audio signals in AES/EBU format for channels 1 to 8.

2 Remote input/output section



❶ REMOTE 1/2 to 7/8 connectors
Connects to an external device used to control the unit. Connect devices using a 9-pin remote control cable and a dedicated RJ45 to D-Sub adaptor cable.
SONY VTR/Disk protocol, VDCP, and Odetics control protocols are supported.

❷ SHARE PLAY 1 to 2 connectors
Connects to another PWS-4500 via a network switch to share material between multiple PWS-4500 units.

❸ NMI MONITOR 1 to 2 connectors
Outputs four port A to D, HD monitor signals using a network media interface.

❹ MONITOR 1 to 2 connectors
Port A to H signals output in multi-monitor HD SDI signal format via SDI cable connection.

❺ REF. INPUT connector and 75 Ω termination switch
Inputs the reference video signal of the selected field frequency. Input an HD tri-level SYNC signal or SD black burst signal.
A bridge connection is also supported. Set the 75 Ω termination switch to OFF if using a bridge connection, or set it to ON if not using a bridge connection. Use a 5C-FB cable for the connection.

❻ GPIO (25-pin) connector
Parallel I/O connector.
For details, refer to the Service Manual or Interface Manual.

❼ NETWORK 1 to 2 connectors
Connects to a network cable for monitoring the unit by SNMP, configuring or checking the unit via HTTP, transferring files via FTP, etc.

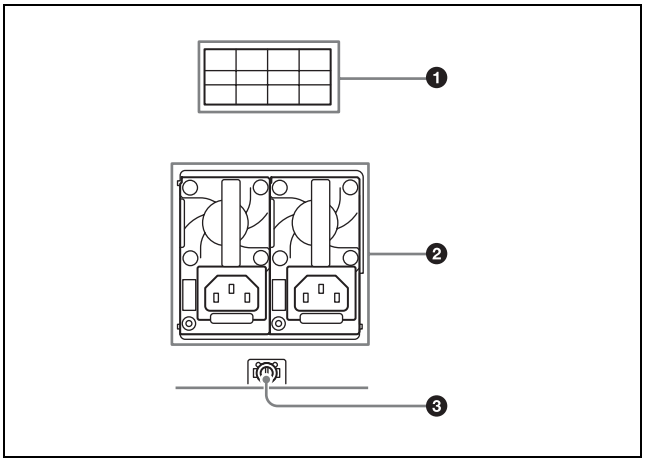
Notes

- For safety, do not connect the connector for peripheral device wiring that might have excessive voltage to this port.
  Follow the instructions for this port.
- When connecting a network cable, use a shielded-type cable to prevent malfunction due to radiation noise.

❽ MAINTENANCE connector
For use by service personnel. Not used for normal operation.

❾ NETWORK 3 connector
The unit is equipped with a 10G Ethernet interface board. Install an SFP+ module and connect to this port using a network cable.

3 Power supply section



❶ Option slot
Use as one of the following connectors by installing an option board.

- NMI LAN connector (when PWSK-4506F is installed)
  Transfers audio/video stream over an NMI.
- 6G/12G-SDI connector (when PWSK-4508 is installed)
  Transfers audio/video stream over 6G-SDI or 12G-SDI.
- LAN connector (when PWSK-4509 is installed)
  Transfers audio/video stream over a LAN.

❷ AC power supply unit
Connects to an AC power outlet using the power cord. The unit can be equipped with two power supply units to provide power supply redundancy. When used in systems where reliability is required, a second power supply unit allows the unit to continue operation if one of the supplies fails.

❸ ⏚ Ground terminal
Connect to ground as required.

Setup

Chapter 3

Connecting External Devices

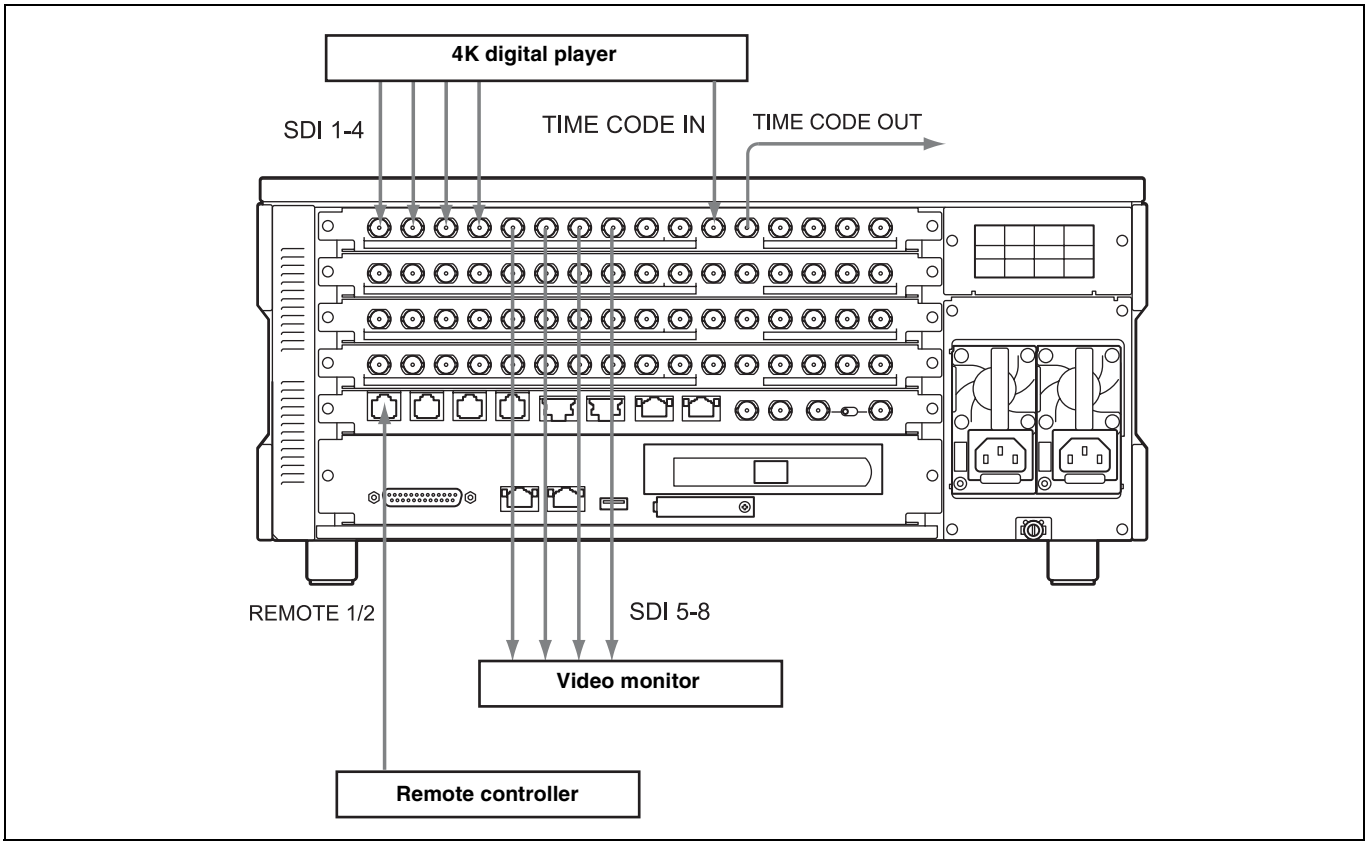
This section describes how to connect the unit to external devices to record or play back data. This section describes the configuration with ports A and C used for inputs and ports B and D used for outputs.

Using the unit as a recorder

The following shows an example of connecting a 4K digital player or other devices to the input ports and using the unit as a recorder.

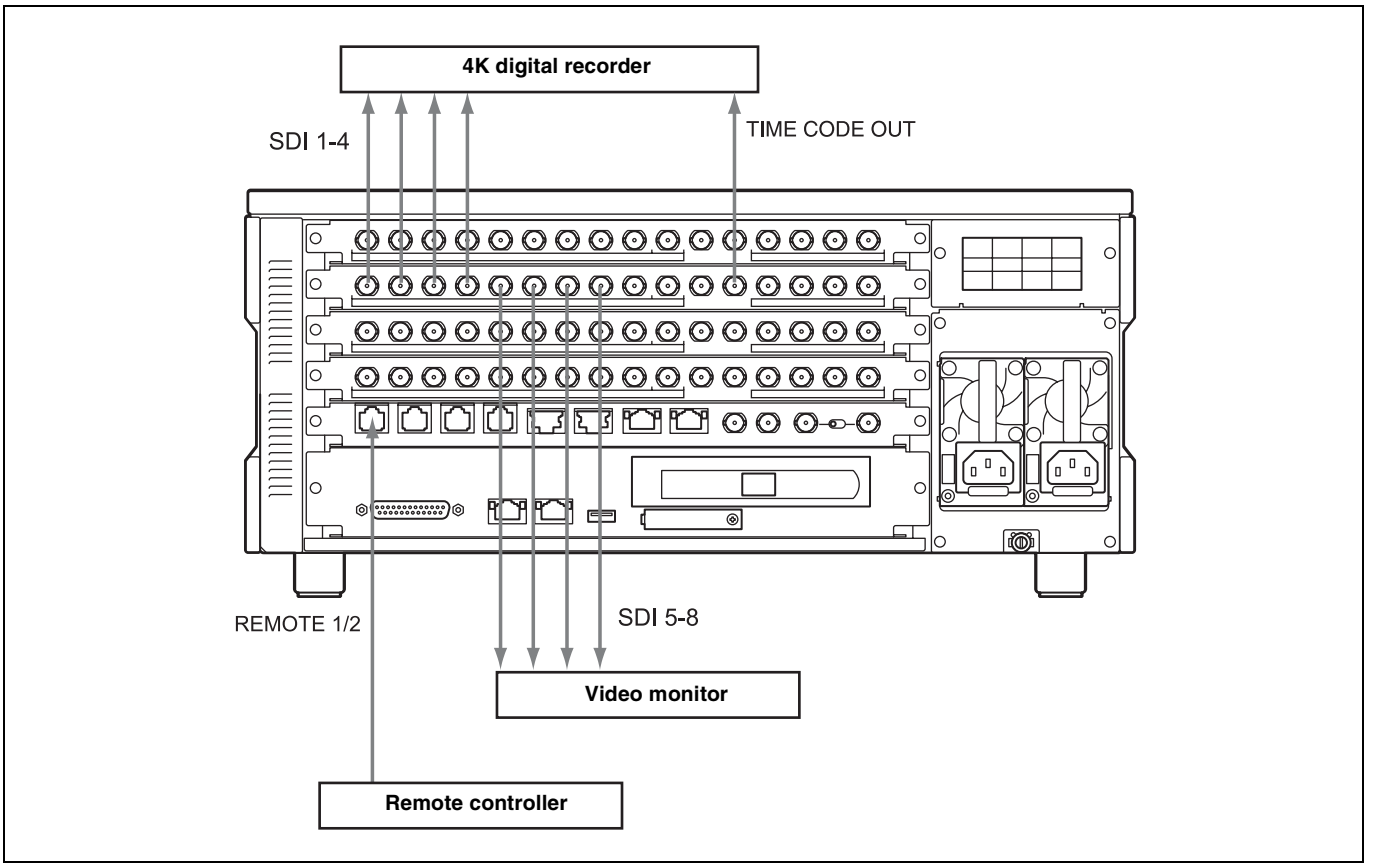
Using a common time code

On this unit, a common time code can be used for multiple input ports.
To use a common time code, set the master time code in Master TC *(page 22)* on the Setup tab of the web menu, then set “Master TC” in TCG Source *(page 36)* for each input port on the Port screen.



Using the unit as a player

The following shows an example of connecting a 4K digital recorder or other devices to the output ports and using the unit as a player.



Displaying the Web Menu

You set up and control the unit by connecting to a computer via the network and displaying the web menu in a web browser on the computer.

Validated operating environments

Web browser:
- Windows: Microsoft Edge, Internet Explorer 11, Google Chrome 84, Firefox 79, Opera 70
- Mac: Safari 6

Display: Screen width of 1024 pixels or greater

Connect a computer that satisfies the above requirements to NETWORK connector 1 or 2 on the rear panel of the unit. Enter "http://(device_IP_address)/" in the address bar of a web browser on the computer to display the web menu. When prompted to provide a user name and password, enter the following information and click the [Log on] button.
- User Name: usr1
- Password: (User-configured password)

The following IP addresses are configured at the factory for the NETWORK connectors of the unit.
- NETWORK 1 connector: 192.168.0.1
- NETWORK 2 connector: 192.168.0.2

If the IP addresses are changed, specify the new addresses. The IP address to connect to can be specified on the [System] screen > [Network] tab of the web menu.

Notes

- For details about network settings, contact your network administrator.
- You may be unable to connect to the network, depending on your proxy server settings.
- It may not be possible to set the appropriate setting due to conflicts if the computer is using a multi-session connection. If this occurs, reconfigure the settings.
- The web menu cannot be displayed on a computer connected to the NETWORK 3 connector. To display the web menu, always connect the computer to NETWORK connector 1 or 2.

Do not browse any other website in the Web browser while making settings or after making settings. Since the login status remains in the Web browser, close the Web browser when you complete the settings to prevent unauthorized third parties from using the unit or harmful programs from running.

Configuring the Network

Access the [System] screen > [Network] tab of the web menu to configure settings related to the IP address and network. For details about settings, see *"Network tab" (page 27)*.

Configure each setting on the [Network] tab, and then click the [Submit] button. A confirmation message appears. Click [OK] to restart the unit. The settings are enabled after the unit restarts.
To display the web menu subsequently, enter the IP address you specified.

Accessing over a network

When accessing files using a network cable, you can also transfer files while recording or playback is in progress. However, since SDI input/output has priority, the transfer rate over the network may decrease depending on input/output port usage.

Setting the System and Boards

You set the system frequency and board settings for the unit using the web menu. The settings are specified using a setup wizard.

1 Display the [System] screen of the web menu, and click the [Board] tab.

2 Click the [Setting] button.

The [Step 1] screen appears.

3 Select the system frequency, input/output mode, and the number of input/output boards installed, then click the [Next] button.

System frequency
- 23.98 Hz
- 24 Hz
- 25 Hz
- 29.97 Hz

Input/output mode
- SDI Mode
- NMI Mode
- IP (ST 2110) Mode

Number of input/output boards
- 2 Boards
- 4 Boards

Notes

- The input/output mode sets whether the SDI, NMI, or IP (ST 2110) signal input/output is used as a reference for the whole unit.
  The input/output mode cannot be set independently for each port.
- Input signals can use SDI, NMI, or IP (ST 2110) only.
- The output signals are always output as both SDI and option board (NMI, IP (ST 2110)), regardless of whether SDI, NMI, or IP (ST 2110) is configured for the input/output mode.
- Signals output from NMI or IP (ST 2110) are delayed by one frame on the receiver side after transmission. Note that there is a phase difference between audio signals and TC signals in systems that use a mix with SDI.
- When the input/output mode is set to "NMI" and the video signal format is QFHD (3840:2160), 1x or 2x speed recording can be selected. When the video signal format is HD (1920:1080), only 1x speed recording can be selected. HD (1280:720) video signal format cannot be selected.
- When the input/output mode is set to "IP (ST 2110)," the video signal format can be set to QFHD (3840:2160) or HD (1920:1080). HD (1280:720) cannot be selected.

Click the [Next] button to display the [Step 2] screen.

4 Select the input/output type of each port, and click the [Next] button.

- Input (single-system input)
- HD Multi-Input (dual-system input)
- Input with 2 Boards (using two boards)
- Output (single-system output)
- HD Multi-Output (dual-system output)
- HD Cut Out (for 4K/QFHD video HD cutout)

For high frame rate recording (HD 300i/359i/400i/479i/300p/359p/400p/479p, 4K 100p/119p), two boards are used.
No audio signal is recorded if high frame rate recording is selected.

Click the [Next] button to display the [Step 3] screen.

5 Select the video codec of each port, and click the [Next] button.

The [Step 4] screen appears.

6 Select the video signal format of each port, and click the [Next] button.

For each port, select the video signal format group from the matrix.
The [Step 5] screen appears.

7 Select the port grouping to operate in sync, and click the [Next] button.

The [Step 6] screen appears, displaying the selections made on the [Step 1] to [Step 5] screens.

8 Check the selected items, and click the [Submit] button. A confirmation message appears. Click [OK].

The unit restarts automatically and the settings are enabled.

To set each port individually, see *"Port Screen" (page 35)* of the web menu.

Note

Changing the system frequency or other board settings will disable the loop recording area settings. Reconfigure the settings on the [Loop] tab on the [Storage] screen of the web menu, as required.

Maximum Recording Time of Memory

The following is a guide to the maximum recording time when recording to internal memory.

Format		2 TB	4 TB	6 TB	8 TB
XAVC Class480	4K 23.98p	9.7	19.5	29.3	39
	4K 29.97p	7.8	15.6	23.4	31.2
	4K 50p	4.8	9.6	14.4	19.2
	4K 59.94p	4	8	12	16
XAVC Class300	4K 23.98p	14.8	29.7	44.6	59.4
	4K 29.97p	11.8	23.7	35.6	47.5
	4K 50p	7.3	14.7	22.1	29.5
	4K 59.94p	6.1	12.3	18.4	24.6
XAVC Class100	HD 50i	27.5	55.1	82.7	110.3
	HD 59.94i	27.6	55.2	82.9	110.5
	HD 50p	14.9	29.9	44.9	59.9
	HD 59.94p	15.2	30.5	45.8	61.1
Avid DNxHD 45	HD 25p	55.6	111.3	166.9	222.5
	HD 29.97p	46.3	92.7	139.1	185.5
Avid DNxHD 145	HD 50i	27.5	55.1	82.7	110.3
	HD 59.94i	22.9	45.9	68.9	91.9
	HD 50p	14.9	29.9	44.9	59.9
	HD 59.94p	12.4	24.9	37.4	49.9
Avid DNxHD 220x	HD 50i	19.4	38.8	58.2	77.7
	HD 59.94i	16.1	32.3	48.5	64.7
	HD 50p	10.2	20.5	30.8	41.1
	HD 59.94p	8.5	17.1	25.7	34.3
Apple ProRes 422 LT	HD 50i	33.1	66.3	99.5	132.6
	HD 59i	27.6	55.2	82.9	110.5
	HD 50p	18.3	36.6	55.0	73.3
	HD 59p	15.2	30.5	45.8	61.1
Apple ProRes 422	HD 50i	23.6	47.2	70.8	94.5
	HD 59.94i	19.6	39.3	59	78.7
	HD 50p	12.6	25.3	38	50.7
	HD 59.94p	10.5	21.1	31.6	42.2
Apple ProRes 422 HQ	HD 50i	17.3	34.7	52.1	69.5
	HD 59.94i	14.4	28.9	43.4	57.9
	HD 50p	9.1	18.2	27.4	36.5
	HD 59.94p	7.6	15.2	22.8	30.4

Unit: Hours (approx.)

The maximum recording time varies depending on the recording format.
The maximum recording time for a single file is 24 hours.

Web Menu

Chapter 4

The web menu comprises the following screens.

Home screen: Displays the operating status of unit's boards and the network.

Status screen: Displays a list of errors and warnings that have occurred on the unit.

System screen: Makes basic settings for the unit.

Port screen: Makes settings for each port of the unit.

File screen: Displays a file list.

Storage screen: Displays information about memory and configures the memory of the unit.

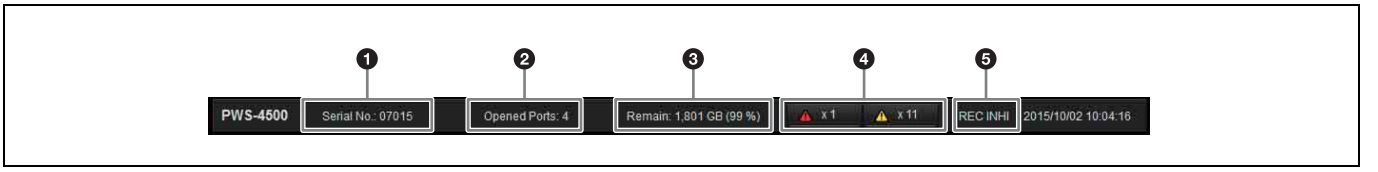
Maintenance screen: Used for maintenance of the unit. For details about this screen, refer to the Service Manual.

SNMP screen: Makes SNMP settings. For details about this screen, refer to the Service Manual.

In the descriptions of each screen, the underlined option is the default value for each item.

Title Bar

The title bar is common to each screen of the web menu.



❶ Serial number
Displays the serial number of the unit.

❷ Number of open ports

❸ Storage capacity

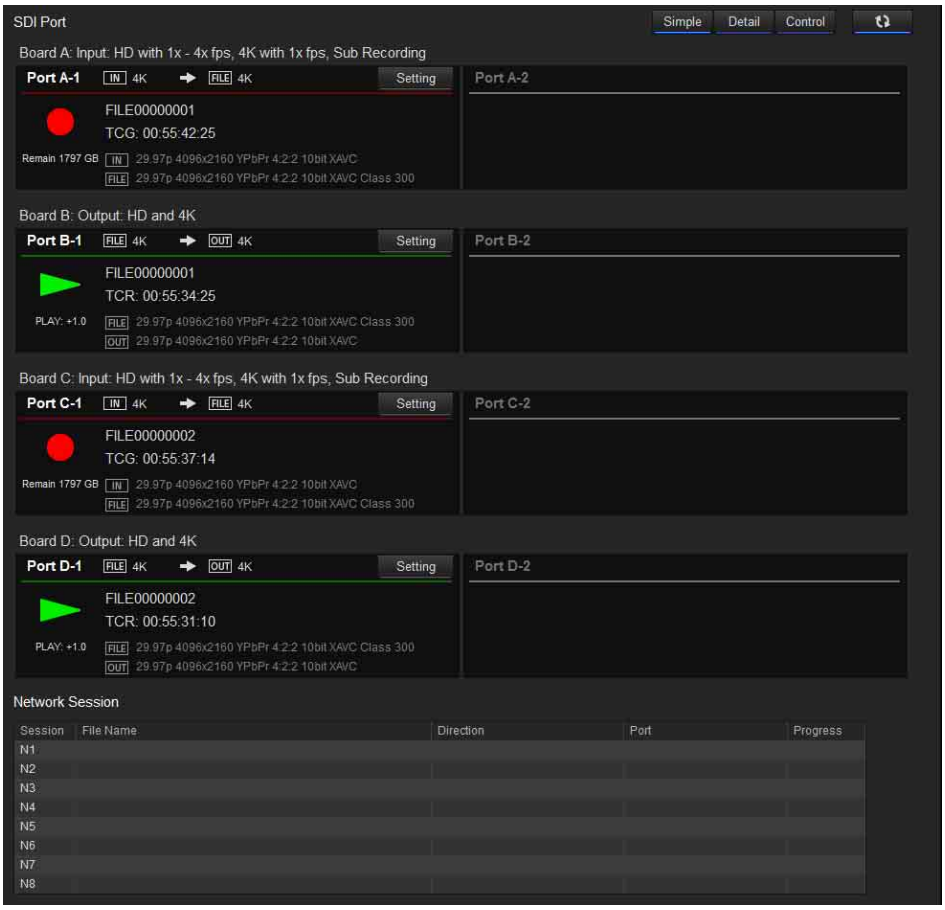
❹ Error/warning indicators
Displays the number of errors and warnings that have occurred.
Clicking the indicator displays detailed information about the error/warning.

❺ REC INHI indicator
Indicates when recording is inhibited (red).
The indicator is white when recording is supported.

Home Screen

Displays the operating status of units boards and the network.
The Home screen supports simple display mode and detail display mode. You can switch mode using the [Simple]/[Detail] buttons.
Clicking the button, turning it on, updates the screen display automatically.

The [Control] button function is provided for service administrators. A password is required to use it.



HD-SDI Port

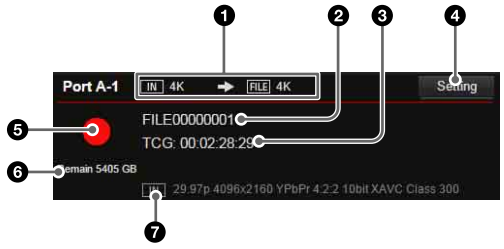
Displays the status of each port.

The port settings vary depending on whether the port is used for input or for output.

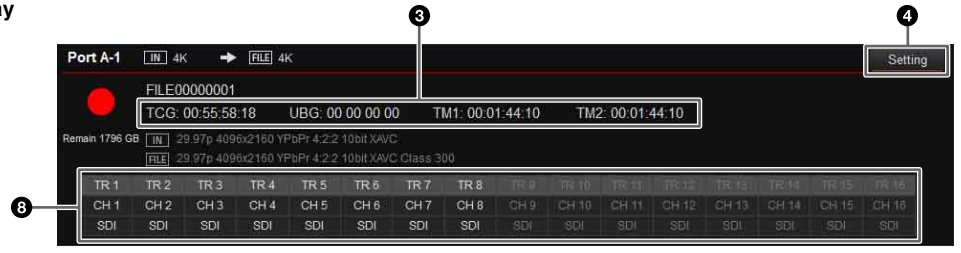
For inputs

The following information is displayed.

Simple display



Detailed display



❶ Input/recording format
[IN] displays the video format (HD/QFHD/4K) of the input signal, and [FILE] displays the video format of the recording.

❷ File name
Displays the name of the file being recorded. “File: NEXT” is displayed before recording.

❸ Time code display
Displays time code data (TCG).
In detail display mode, UBG, TM1, and TM2 are also displayed simultaneously.

❹ [Setting] button
Displays the [Port] screen *(page 35)* for the corresponding port to configure port settings.

❺ Recording indicator
Displays ● mark when recording.
Displays icon when a loop recording area is specified.

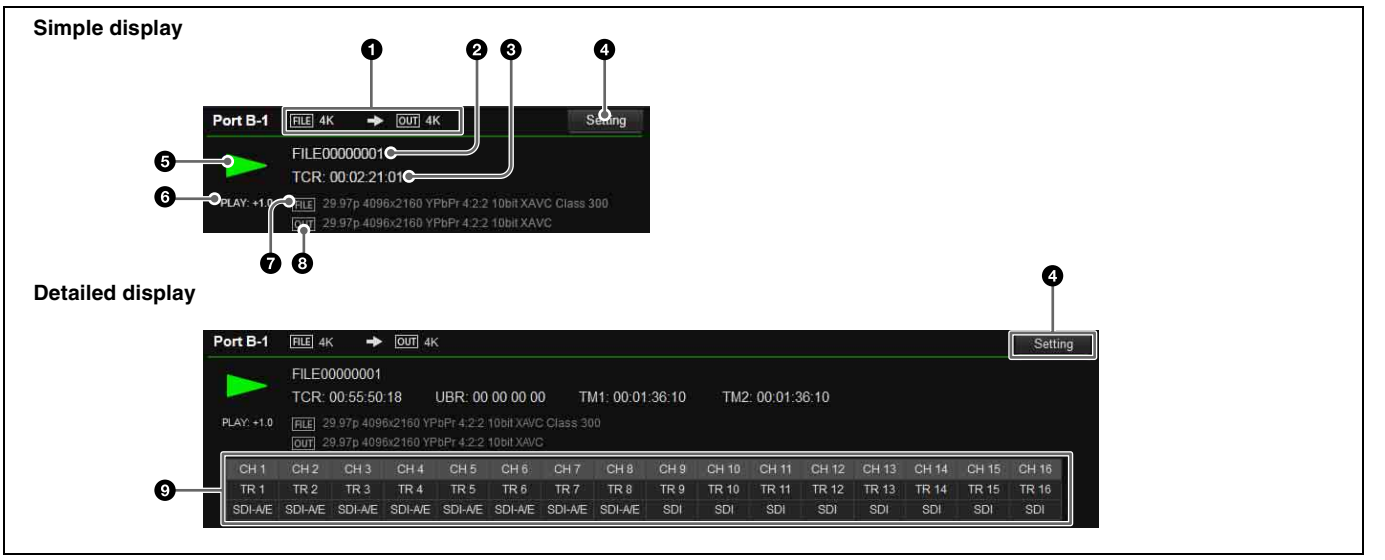
❻ Remaining capacity
Displays the remaining memory capacity.
When a loop recording area is specified, this displays the capacity of the writable area of the capacity assigned to the loop recording area. In loop recording, the recording loops back to the start of the loop recording area when it reaches the end of the area, overwriting the previous recording. However, if a subclip is created in a loop recording area file, the subclip area cannot be overwritten. Accordingly, the capacity of the loop recording area decreases by the size of the subclip.
If the remaining capacity that can be used for loop recording is reduced to less than five minutes after creating a subclip in the loop recording area, further subclips cannot be created.

❼ [IN]
Displays the video format of the input signal.

❽ Audio track (detail display mode only)
Displays the signal (SDI, NMI, or AES/EBU) used for each audio track.

For outputs

The following information is displayed.



❶ File/output format
[FILE] displays the video format (HD/QFHD/4K) of the file, and [OUT] displays the video format of the output signal.

❷ File name
Displays the name of the file being played back. “Sub” is displayed beside the file name when playing back a subclip.

❸ Time code display
Displays time code data (TCR).
In detail display mode, UBR, TM1, and TM2 are also displayed simultaneously.

❹ [Setting] button
Displays the [Port] screen *(page 35)* for the corresponding port to configure port settings.

❺ Playback indicator
Displays "▶" during playback. The following are displayed as the playback mode.
- No indication: Normal file playback
- (File Repeat): File repeat playback
- (List): Normal playlist playback
- (List Repeat): Playlist repeat playback

❻ Playback status indicator
The following are displayed as the playback status.
- CLOSE
- STOP
- PLAY (playback speed)
- SHUTTLE (playback speed)
- JOG (FWD/REV)
- VAR (playback speed)
- STILL

❼ [FILE]
Displays the video format of the file being played back.

❽ [OUT]
Displays the video format of the video signal being output.

❾ Audio track (detail display mode only)
Displays which external channel is used for each audio track, and the signal (SDI, NMI, IP (ST 2110), or AES/EBU) used.

Network Session

Displays the operating status of the network connection. The following information is displayed.

Session
Displays the session name (N1 to N8).

File Name
Displays the name of the file being transferred.

Direction
Displays the transfer direction as an icon (unit t computer, unit T computer).

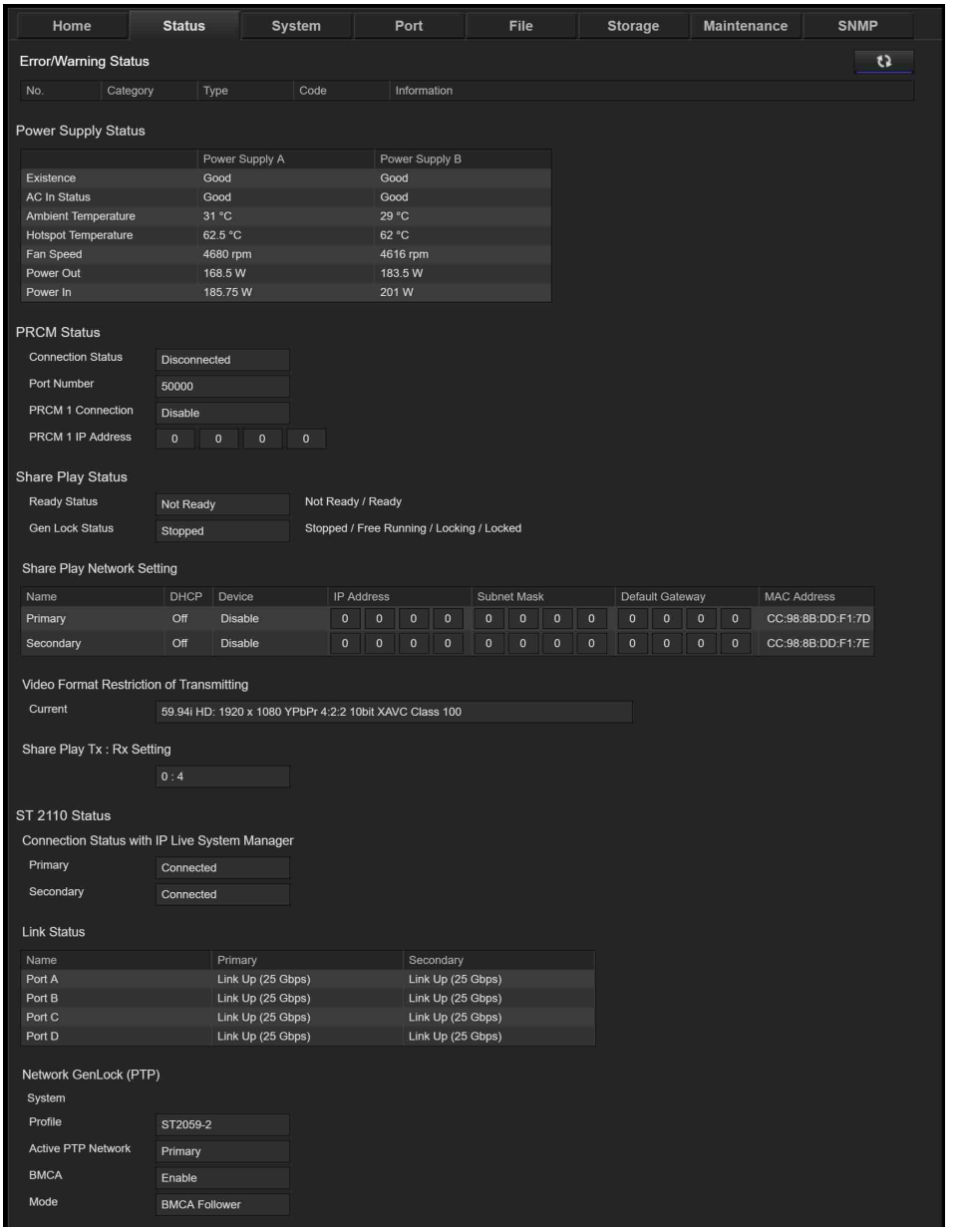
Port
Displays the transfer speed (1G/10G) of the network.

Progress
Displays the transfer progress.

Abort
Clicking the button displayed for each session forcibly terminates network transfer.

Status Screen

Displays a list of errors and warnings that have occurred on the unit, and the power supply status. Click the button, turning it on, to update the display automatically.



Error/Warning Status

Displays a list of errors and warnings.

Power Supply Status

Displays the status of the AC power supply unit(s).

Existence

Indicates whether the AC power supply unit(s) have been recognized.

AC In Status

Indicates the presence or otherwise of AC input.

Ambient Temperature
Displays the ambient temperature of the unit.

Hotspot Temperature
Displays the hotspot temperature.

Fan Speed
Displays the speed of the fan.

Power Out
Displays the output power.

Power In
Displays the input power.

PRCM Status

Displays the connection status with the PRC manager.

Connection Status
Displays the connection status between the PWS-4500 and the PRC manager.

Port Number
Displays the port number on the network.

PRCM 1 Connection
Displays whether the connection with the PRC manager has been set to “Enable.”

PRCM 1 IP Address
Displays the IP address of the PRC manager.

Share Play Status

Displays the connection status of Share Play.

Ready Status
Displays whether the interface is available for connection.

Gen Lock Status
Displays the genlock operation status.

Share Play Network Setting
Displays the network setting.

Video Format Restriction of Transmitting
Displays the video formats that can be transmitted using Share Play.

Share Play Tx : Rx Setting
Displays the Tx and Rx number configured in Share Play.

ST 2110 Status

Displays information relating to the ST 2110 interface.

System Parameters

Controller Protocol
Displays the control program.

Hitless Failover
Displays the redundancy setting status.

Stream Startup Mode
Displays whether the stream is configured to connect automatically or not when the unit is turned on.

Node Label
Displays the name set for the unit.

Connection Status with IP Live System Manager
Displays the connection status with IP Live System Manager.

Link Status
Displays the link status of each port.

Network GenLock (PTP)
Displays the operating status of PTP (Precision Time Protocol).

System
Displays the system status of PTP.

Profile
Displays the supported profiles.
In the current version, only ST2059-2 profile is supported.

Active PTP Network
Displays whether Primary or Secondary is being used.

BMCA
Displays the enable/disable state of BMCA (Best Master Clock Algorithm).

Mode
Displays the operating mode of PTP.

Primary/Secondary
Displays the PTP operating status of Primary and Secondary.

Stream Status

Displays the connection status of the Video, Audio, and Meta streams for the Primary and Secondary in list view.
Click the [+ Expand All] to view all status in list view.
Click the [+ Collapse All] to display only the titles in list view.

NMOS Settings

Displays the operating status of RDS (Registration & Discovery System).

NMOS IS-04 Node Port
Displays the IS-04 Node port number.

NMOS IS-05 Connection Port
Displays the IS-05 Connection port number.

Network Interface
Displays the interface used by the NMOS function.

Connection Status
Displays the connection status of RDS.

RDS Discovery
Displays the enable/disable state of RDS auto discovery.

RDS Port
Displays the manually configured RDS port number.

RDS IP Address
Displays the manually configured RDS IP address.

DNS IP Address
Displays the IP address of the DNS server obtained from the DHCP server.

DNS Domain Name
Displays the domain name.

Note

ST 2110 related status is displayed only when PWSK-4509 is installed.

System Screen

Makes basic settings for the unit.

Board tab

Makes input/output board settings using a setup wizard. Click the [Setting] button at the bottom of the screen to start configuration.
For details about settings, see *"Setting the System and Boards" (page 12)*.

Step 1
Sets the system frequency, input/output mode, and the number of input/output boards for the unit.

Step 2
Sets the input/output type of ports A to D.

Step 3
Sets the video codec of each port.
Select the codec using the radio buttons.

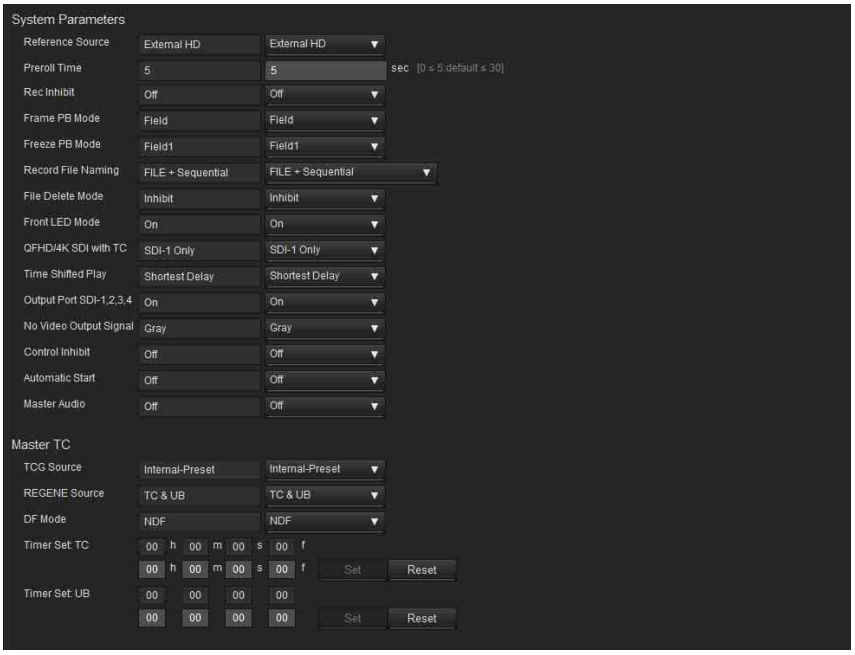
Step 4
Sets the video signal format of each port.
Select the format to use from the matrix.

Step 5
Select the port grouping to operate in sync.
You can set up multiple combinations of input ports or output ports.

Step 6
Check the settings made in steps 1 to 5, and submit the settings.

Setup tab

Makes basic operating mode settings of the unit.



System Parameters

Reference Source

Selects the reference signal for operation of the unit. In NMI mode, only “External HD” and “External SD” can be selected.

- External HD: Tri-level SYNC signal input on the REF. INPUT connector
- External SD: SD signal input on the REF. INPUT connector
- Input Board A-1, Input Board A-2 to Input Board D-1, Input Board D-2: Signal input to the HD SDI INPUT signal on the corresponding board

Preroll Time

Sets the preroll time in units of seconds.

- 0 to 5 to 30 seconds

Rec Inhibit

Sets record inhibit mode.

- Off: Enables recording
- On: Disables recording

Frame PB Mode

Selects the playback mode during variable speed playback.

- Field: Field playback
- Frame: Frame playback

Freeze PB Mode

Specifies the freeze mode and freeze timing for manual freeze (freeze control using the front panel, REMOTE 1 to 8 connectors, and GPIO (25-pin) connector) and auto freeze.

- Field 1: Freezes the 1st (odd) field.
- Field 2: Freezes the 2nd (even) field.
- Frame: Freezes in frame mode.

Record File Naming

Selects the file naming convention for automatically generated files.

- FILE + Sequential: Assigns a sequential number.
- Serial + Time: Uses the recorded time as the file name.
- User Specified Name: Allows the user to specify a 4-character prefix for the file name.

File Delete Mode

Selects whether to delete a file if the Delete command is received for a file for which playback or file transfer (export) is in progress.

- Inhibit: Prevents deletion of files during playback or file transfer.
- Permit: For a file during playback, it deletes the file when the port closes. For a file during file transfer, it stops the transfer and then deletes the file.

Front LED Mode
Selects whether the front panel indicators are enabled/ disabled.
- Off: Indicators are always off.
- On: Indicators are enabled to indicate the status of the unit.

QFHD/4K SDI with TC
Selects whether to superimpose the time code on the output from the SDI 1 connector only or on all SDI signals, if QFHD or 4K is specified as the video format.
- SDI-1 Only
- All SDI

Time Shifted Play
Selects, when using chasing playback, whether to play back video stored in a buffer for playback with the shortest delay, or to play back video that is recorded in storage.
- Shortest Delay
- From Storage Only

Output Port SDI-1, 2, 3, 4
When using each port as an output port, this selects whether to output the signal from the SDI 1 to 4 connectors. When set to Off, signals are output from the SDI 5 to 8 connectors only.
- Off
- On

No Video Output Signal
Selects the display color or the main output and monitor output if there is no input signal on the input port or nothing is playing on the output port.
- Gray
- Dark Gray
- White
- Black

Control Inhibit
When enabled, this prevents all changes to the configuration using the web menu.

Automatic Start
When enabled, the unit turns on automatically when power is connected using the power cord.

Master Audio
When the input port of a master audio signal is specified, the audio signal input on that port can be recorded on all input ports.
Set whether to record the master audio or the audio signal that is input on each port for each port using [Audio Source] on the Port screen.

Master TC
Makes master time code settings.
The master time code can be used as common time code generator for each input port.

TCG Source
Selects the source signal for synchronizing the internal time code generator. You can select a signal input on ports A to D.
- Internal-Preset
- External-LTC: A
- External-LTC: B
- External-LTC: C
- External-LTC: D

REGENE Source
Selects the signal to regenerate when the time code generator is in regenerate mode.
- TC&UB: Regenerates both the time code signal and user bit signal.
- TC Only: Regenerates the time code signal only.
- UB Only: Regenerates the user bit signal only.

DF Mode
Sets the drop frame mode of the time code generator or timer counter.
- NDF
- DF

Note

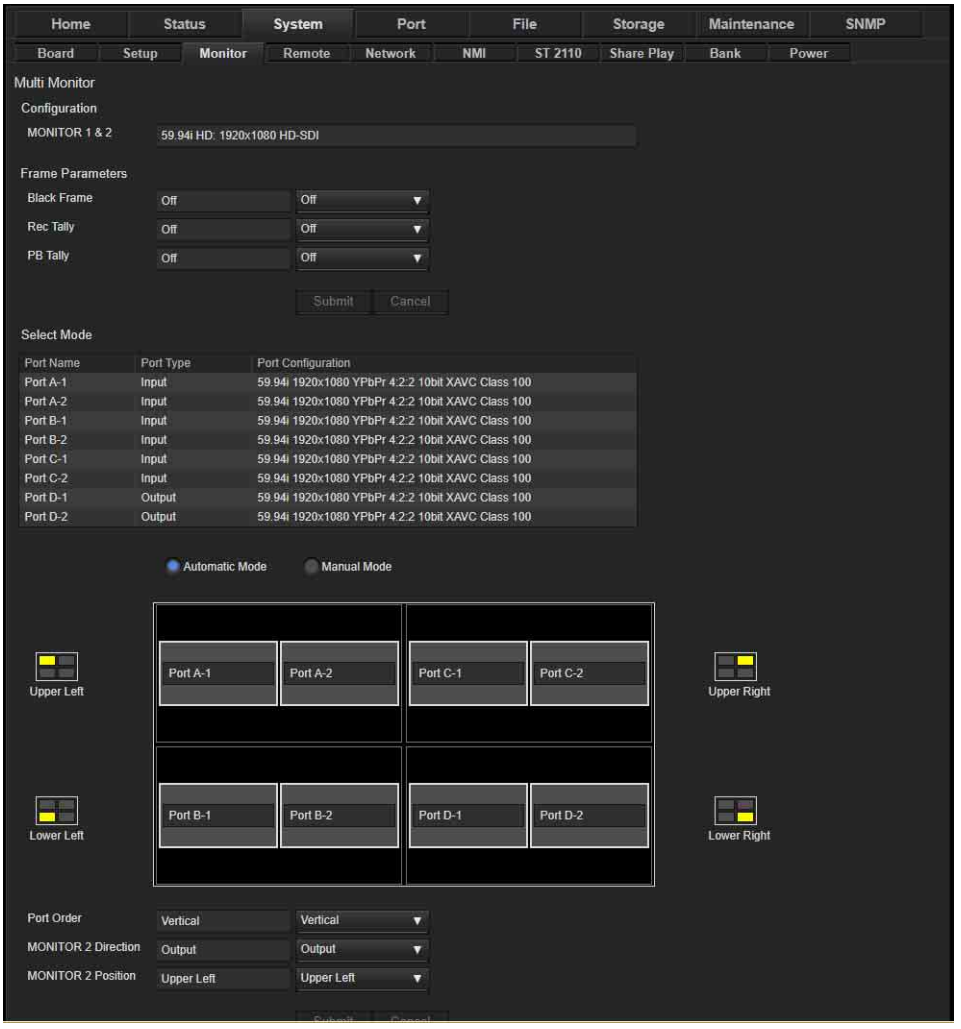
This setting is valid only when [TCG Source] is set to “Internal-Preset” and the frame frequency is 29.97 Hz.

Timer Set: TC
This sets the time code when [TCG Source] is set to “Internal-Preset” or [REGENE Source] is set to “UB Only.” Enter a numeric value and click the [Set] button to change the time code. Clicking the [Reset] button resets the counter.

Timer Set: UB
This sets the user bits when [TCG Source] is set to “Internal-Preset” or [REGENE Source] is set to “TC Only.” Enter a numeric value and click the [Set] button to change the user bits. Clicking the [Reset] button resets the counter.

Monitor tab

Makes settings related to monitor signals.



Multi Monitor

Makes settings for the multi-monitor signal output from the MONITOR connector.

MONITOR 1 & 2

Displays the signal format configured for the MONITOR connector.

Black Frame

Selects whether to display a black frame around the screen for each port.

- Off
- On

Rec Tally

Sets whether to add a tally indicator for the monitor signal from the input port.

- Off
- Auto

PB Tally

Sets whether to add a tally indicator for the monitor signal from the output port.

- Off
- Auto

Select Mode

Displays the settings of each port configured on the Board tab.

Automatic Mode

Automatically configures the multi monitor output layout settings.

Manual Mode

Enables you to configure the multi monitor output 1/2 layout settings individually.

The multi monitor screen is divided into four quadrants. Select the layout of each quadrant. Also, specify the port to output to each quadrant.

- Layout A: Output the specified port signal to the quadrant.
- Layout B: Subdivide the quadrant by 2, and output the specified port signals to the corresponding regions.
- Layout C: Subdivide the quadrant by 4, and output the specified port signals to the corresponding regions.

"Black" can be selected, in addition to ports, when specifying the port to output to each region. The region is displayed solid black when "Black" is selected.
You can click the [Output 1→2] button on the settings screen of multi monitor output 2 to copy the settings of output 1 to output 2.

Port Order

When [Automatic Mode] is selected, this specifies the ordering of ports.

- Vertical
- Horizontal

MONITOR 2 Direction

When [Automatic Mode] is selected, this sets the input/output direction of the MONITOR 2 connector of the multi monitor.

- Output
- Input

MONITOR 2 Position

When [Automatic Mode] is selected and the MONITOR 2 connector of the multi monitor is used as an input, this sets the position on the MONITOR 1 connector output to place the input video signal.

- Upper Left
- Lower Left
- Upper Right
- Lower Right

When changing the [Multi Monitor] settings, click the [Submit] button to apply the settings. Click the [Cancel] button to return to the current settings.

Embedded Audio

Sets the audio signal to embed in the multi monitor output 1/2 individually.
The audio signal of the selected port is output.
This is set to "Muting" (no audio output) by factory default.

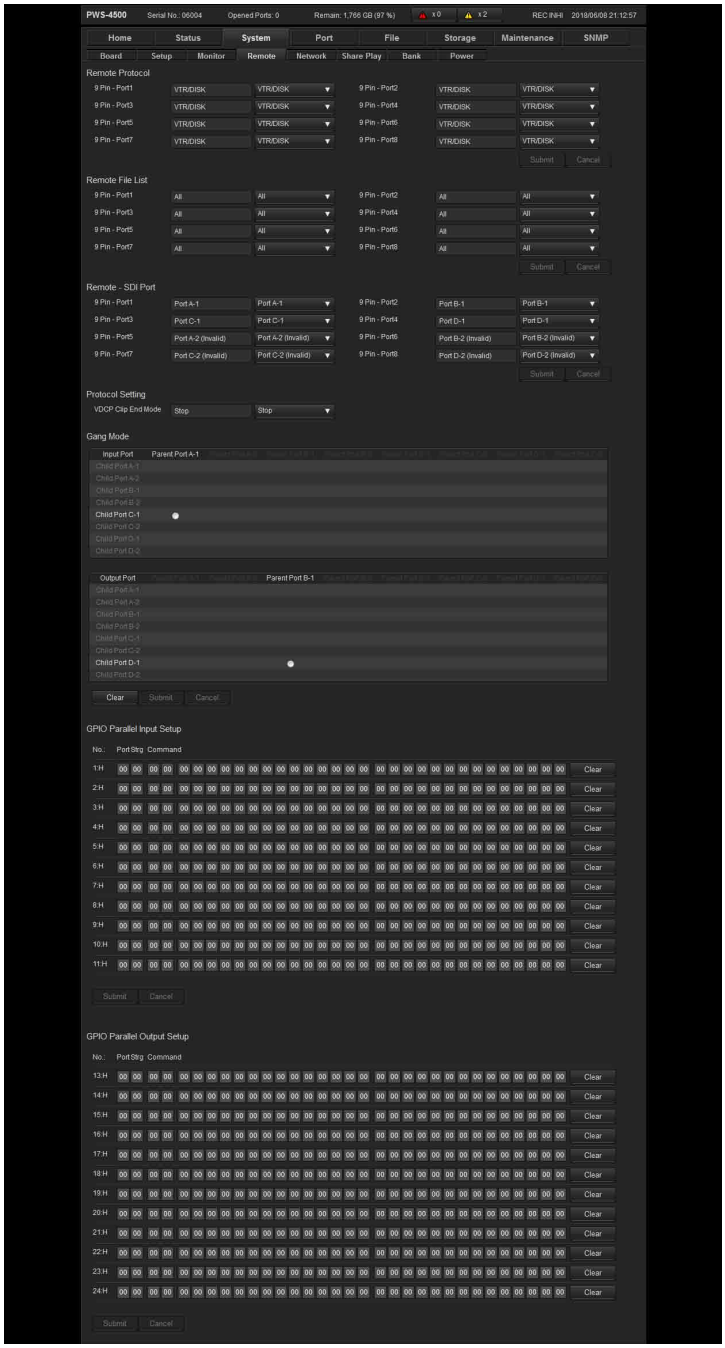
Notes

- Use multi monitor output for simple monitor applications.
- The audio signal can be embedded in the multi monitor output only when operating in the following formats.

  3840:2160 50p/59p
  1920:1080 50i/59i/50p/59p
- The audio signal embedded in the multi monitor output leads the displayed video signal by about two frames.

Remote tab

Makes settings related to remote control.



Remote Protocol

Selects the protocol used on the REMOTE 1 to 8 connectors.
If not using either the VDCP protocol or Odetics protocol, select "VTR/DISK."
- VTR/DISK: SONY VTR/Disk protocol
- VDCP: VDCP protocol
- Odetics: Odetics protocol

Remote File List

Selects the information returned in response to a file information sense command on the REMOTE 1 to 8 connectors.
- All: Information about all files
- Port A Playable: Information about playable files on port A
- Port A Editable: Information about files that can be switched seamlessly during playback on port A
- Port B Playable: Information about playable files on port B
- Port B Editable: Information about files that can be switched seamlessly during playback on port B
- Port C Playable: Information about playable files on port C
- Port C Editable: Information about files that can be switched seamlessly during playback on port C
- Port D Playable: Information about playable files on port D
- Port D Editable: Information about files that can be switched seamlessly during playback on port D

Remote - SDI Port

Selects the port to operate remotely on the REMOTE 1 to 8 connectors.

Protocol Setting

VDCP Clip End Mode

Sets whether the to automatically play the next clip or whether to stop playback upon reaching the end of a clip during continuous playback using VDCP.
- Auto Play: Play the next clip automatically upon reaching the end of a clip.
- Stop: Stop playback upon reaching the end of a clip if a Play command is not received from a remote control device.

Gang Mode

Input Port

Selects the port grouping to control using input port syncing.

Output Port

Selects the port grouping to control using output port syncing.

GPIO Parallel Input Setup

Assigns the commands for the input side of the GPIO (25-pin) connector.
A 32-byte setting can be specified for pin 1 to pin 11.

GPIO Parallel Output Setup

Assigns the commands for the output side of the GPIO (25-pin) connector.
A 32-byte setting can be specified for pin 13 to pin 24.
For details about commands, refer to the Interface Manual.

Network tab

Makes network settings.
You can use this tab to check the MAC addresses on each network.

Network 1 (1GbE)

Sets the IP address, subnet mask, and default gateway of the NETWORK 1 connector.
The following values are the factory default values.
IP Address: 192.168.0.1
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0

Network 2 (1GbE)

Sets the IP address and subnet mask of the NETWORK 2 connector. The default gateway setting for Network 1 is displayed.
The following values are the factory default values.
IP Address: 192.168.0.2
Subnet Mask: 255.255.255.0

Network 3 (10GbE)

When an optional 10 Gigabit network is used, this sets the IP address, subnet mask, default gateway, and MTU.
The following values are the factory default values.
IP Address: 192.168.0.10
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
MTU: 1500

FTP Server

Activation

Enables/disables the FTP port used for import/export.

Importing File Naming
Selects whether to add a “Tmp_” prefix to the file name during importing.
- Off
- Adding [Tmp_]

Import Clips with Odd Frames (50p & 59.94p)
Selects the processing to perform when the last frame is odd when importing 50p or 59.94p files.
- Not Acceptable: Do not import.
- Acceptable (Omit Last Frame): Import, omitting the last frame.

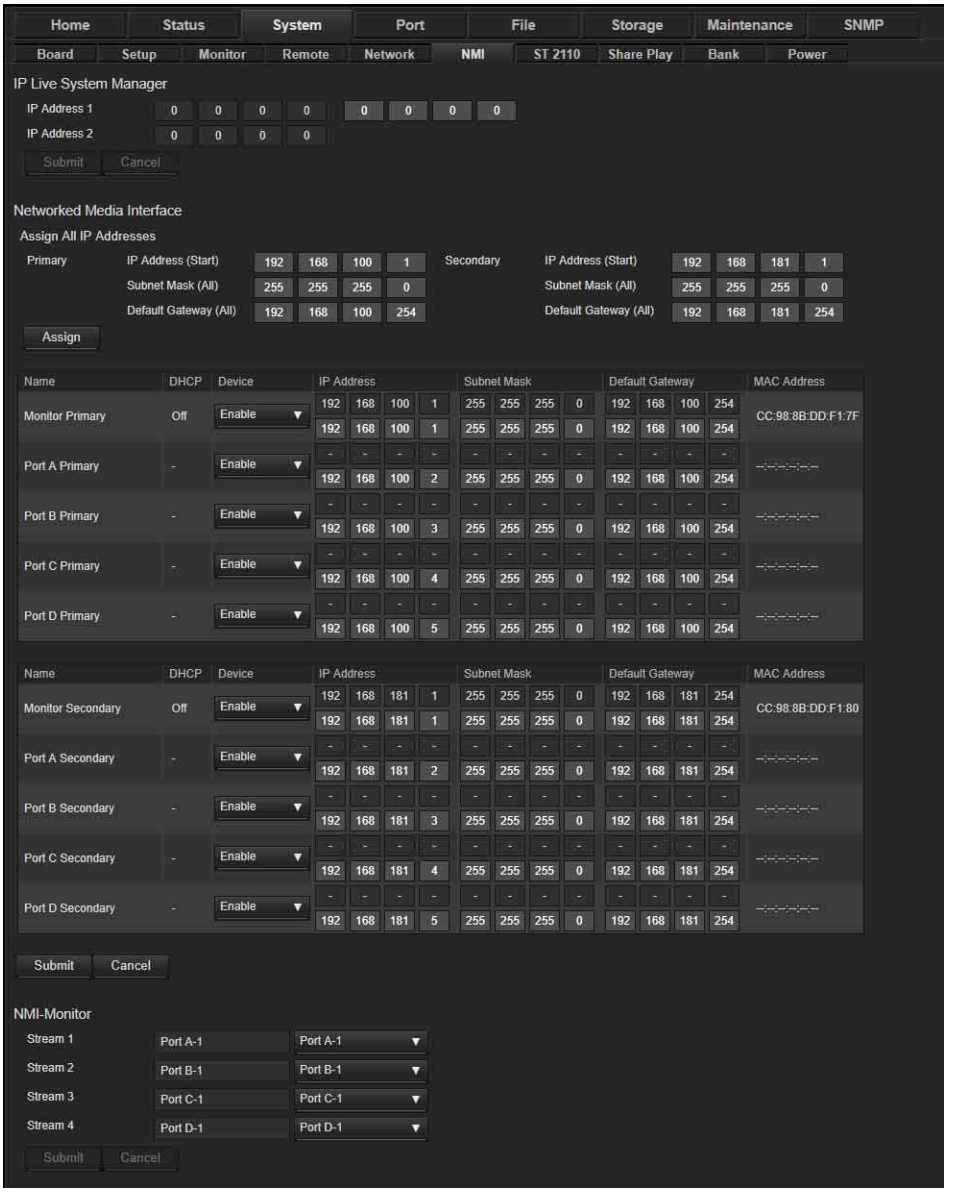
PRCM Setting
Configures network settings when using a PRC manager.

Port Number
Sets the port number of the PRC manager.

PRCM 1 Connection
Selects whether to connect the PRC manager 1.

PRCM 1 IP Address
Sets the IP address of PRC manager 1.

NMI tab



IP Live System Manager

Sets the IP address of the connected IP Live System Manager using [IP Address 1]. [IP Address 2] is set automatically depending on the IP Live System Manager.

Networked Media Interface

Assign All IP Addresses

Enter values for the IP address, subnet mask, and default gateway for both the Primary and Secondary in the input fields at the top area of the list table, and click the [Assign] button.
When you click the [Assign] button, consecutive IP addresses are displayed, and common subnet mask and default gateway values are displayed for each NMI interface in the list table.
Change the values displayed in the list table, as required, and click the [Submit] button to configure all the NMI parameters at the same time.

NMI-Monitor

Stream 1

Sets the output port for NMI Monitor stream 1.

- Port A-1
- Port A-2

Stream 2

Sets the output port for NMI Monitor stream 2.

- Port B-1
- Port B-2

Stream 3

Sets the output port for NMI Monitor stream 3.

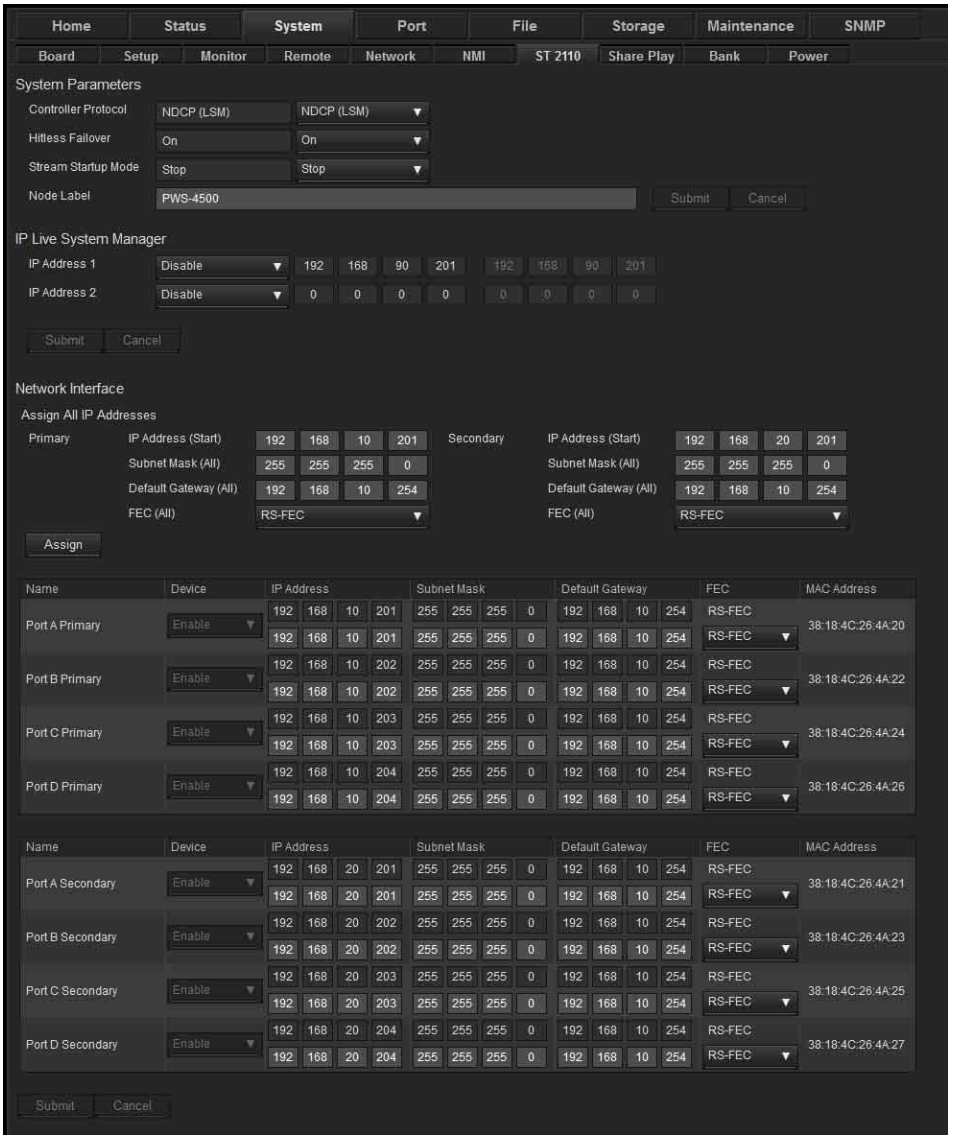
- Port C-1
- Port C-2

Stream 4

Sets the output port for NMI Monitor stream 4.

- Port D-1
- Port D-2

ST 2110 tab



System Parameters

Controller Protocol

Sets the control protocol.

- NDCP (LSM)
- NMOS

Hitless Failover

Enables/disables IP stream redundancy.

- Off
- On

Stream Startup Mode

Sets whether the stream is connected or not using the same settings used previously when the unit is turned on.

- Stop
- Resume

Node Label

Sets the name of the unit.

IP Live System Manager

Displayed when “NDCP (LSM)” is selected in [System Parameters]. Not displayed when “NMOS” is selected.

IP Address

Sets the IP address and the enable/disable state of the two connected IP Live System Manager instances.

Network Interface

DHCP
Enables/disables DHCP.
Displayed when “NMOS” is selected in [System Parameters]. Not displayed when “NDCP (LSM)” is selected.

Assign All IP Addresses
Enter values for the IP address, subnet mask, default gateway, and FEC for both the Primary and Secondary in the input fields at the top area of the list table, and click the [Assign] button.
When you click the [Assign] button, consecutive IP addresses are displayed, and common subnet mask and default gateway values are displayed for each ST 2110 interface in the list table.
Change the values displayed in the list table, as required, and click the [Submit] button to configure all the ST 2110 parameters at the same time.

Network GenLock (PTP)

Configures settings related to the PTP master.

Enable
Sets whether to use the PTP master for the Primary and Secondary.
- Disable
- Enable

Domain Number
Sets the PTP domain number.
- 0 to 127

Communication Mode
Sets the PTP communication mode.
- Mixed Mode: Responds to PTP master in unicast transmission.
- Multicast Mode: Responds to PTP master in multicast transmission.

IP Audio Format

Selects the audio transfer format of each port.
- 48kHz 0.125ms 2ch
- 48kHz 0.125ms 4ch
- 48kHz 0.125ms 8ch
- 48kHz 0.125ms 16ch
- 48kHz 1ms 2ch
- 48kHz 1ms 4ch
- 48kHz 1ms 8ch

NMOS Settings

Configure RDS (Registration & Discovery System).
Displayed when “NMOS” is selected in [System Parameters]. Not displayed when “NDCP (LSM)” is selected.

NMOS IS-04 Node Port
Sets the IS-04 Node port number.

NMOS IS-05 Connection Port
Sets the IS-05 Connection port number.

RDS Discovery
Enables/disables RDS auto discovery.
When enabled, RDS discovery occurs within the same subnet.

Note

If RDS is configured on a different subnet, disable this parameter, and set the IP address and port number manually.

RDS Port
Sets the RDS port number when RDS auto discovery is disabled.

RDS IP Address
Sets the RDS IP address when RDS auto discovery is disabled.

Multicast Address Settings

Sets the multicast address of each stream.
Displayed when “NMOS” is selected in [System Parameters]. Not displayed when “NDCP (LSM)” is selected.

For example, if you click the part that displays [+ Video Stream], a list table of settings relating to each video stream is displayed.
If you click the part that displays [– Video Stream], the list table is collapsed.

Assign All Multicast Addresses
Enter values for the multicast address and port number for both the Primary and Secondary in the input fields at the top area of the list table, and select [Assign Mode]. In Assign mode, select whether to set the same value for all multicast addresses or consecutive addresses for each stream.
When finished, click the [Assign] button to display the multicast addresses and port numbers for each ST 2110 stream in the list table.
Change the values displayed in the list table, as required, and click the [Submit] button to configure all the multicast addresses for each stream at the same time.

PING

You can execute a ping on an ST 2110 interface.
Enable this when you want to check a network connection.

Network Interface
Sets from which ST 2110 interface to execute a ping.

Destination IP Address
Sets the ping destination IP address.

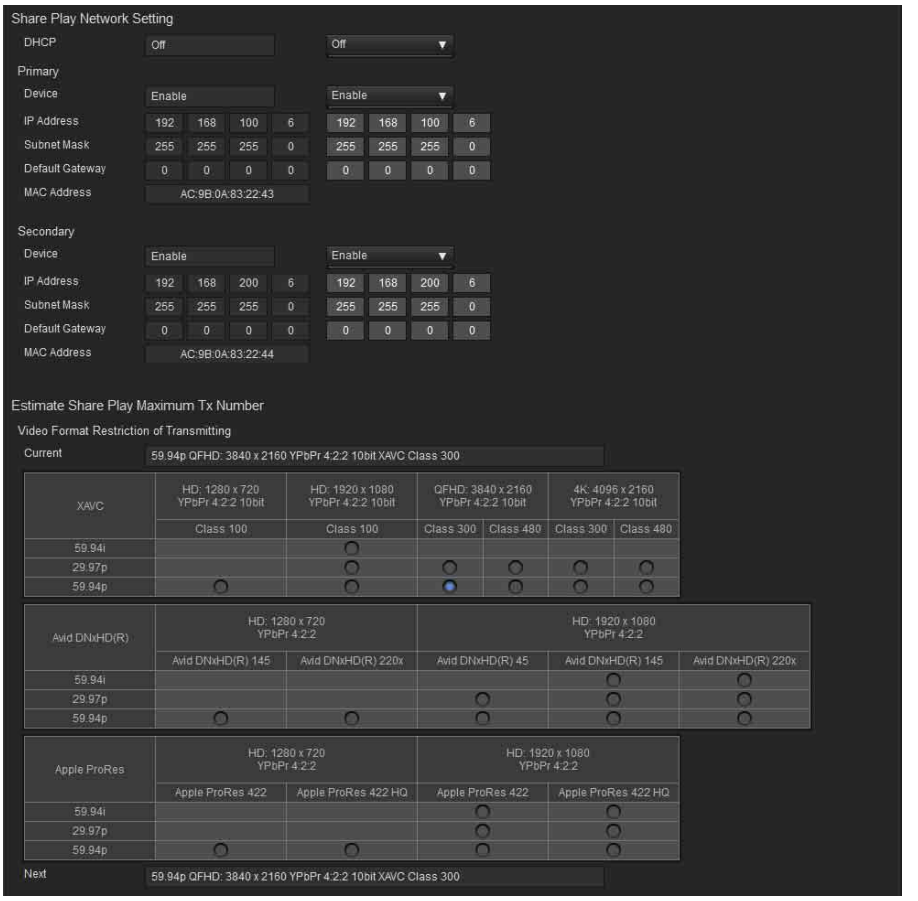
[Start] button
Executes a ping with the specified parameter.

[Reset] button
Resets the execution parameter to the default value.

Result
Displays the ping execution result for the ST 2110 interface.

Share Play tab

Makes Share Play settings.



Share Play Network Setting
Configures network settings when using Share Play.

DHCP
In this version, DHCP can only be set to Off.

Device
Enables/disables the Primary and Secondary of the Share Play network. Set the IP address, subnet mask, and default gateway parameters.

Estimate Share Play Maximum Tx Number
Selects the target video format for Share Play from the matrix, and specifies the maximum number of audio tracks.

Share Play Tx:Rx Setting
Selects the Tx and Rx number used by Share Play.

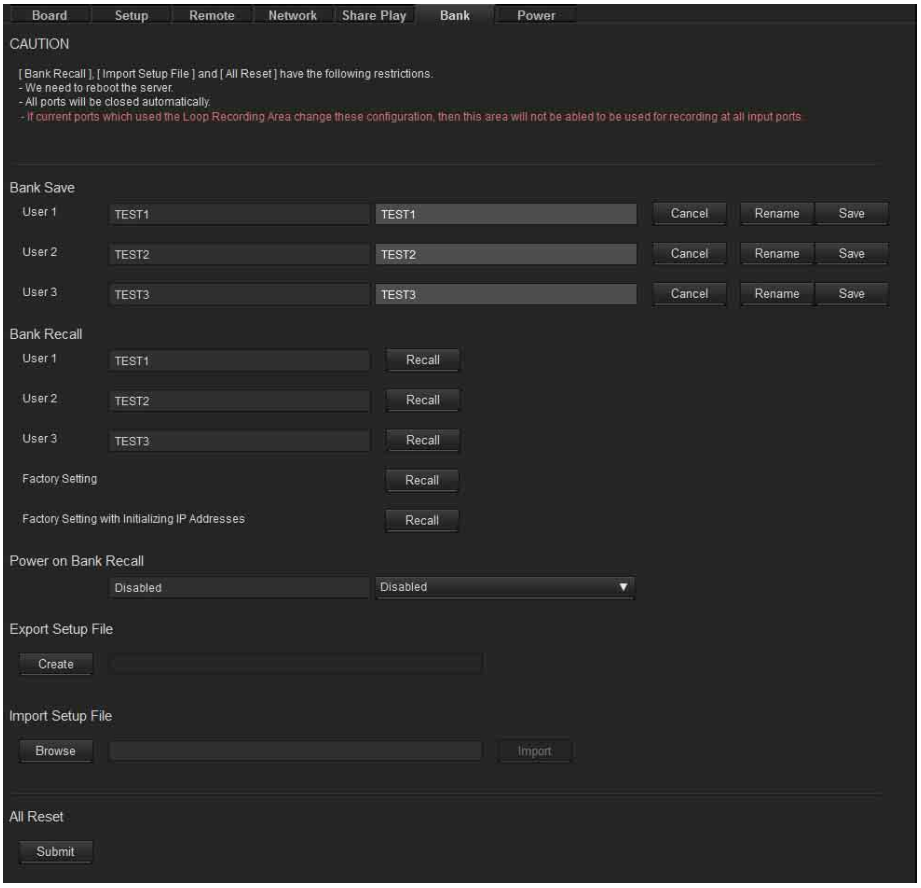
Note

Consider the following when using Share Play redundancy.

- Separate the network segments for Primary and Secondary.
  Example: Primary:192.168.11.xx, Secondary: 192.168.12.xx
- If both Primary and Secondary are connected to a single network switch, configure the switch so that the network segments are separated using VLANs.

Bank tab

Makes settings for user banks of saving settings.



Bank Save

Saves the settings on the System screen to user banks.
Click the [Save] button for the bank (Bank 1 to 3) you want to save. To save named settings, enter a name in the text box on the right and then click the [Save] button.
To rename saved settings, enter a new name in the text box on the right and then click the [Rename] button.

Bank Recall

Recalls saved settings. Click the [Recall] button for the bank (Bank 1 to 3) you want to recall or to recall default values (Factory Setting).
To recall default values, use the [Factory Setting] button or the [Factory Setting with Initializing IP Addresses] button. Clicking the [Factory Setting with Initializing IP Addresses] button clears the network IP address settings and recalls the default values.

Power On Bank Recall

Specifies the user bank to recall when the power to the unit is turned on.

- Disabled
- BANK1
- BANK2
- BANK3

Export Setup File

Click the [Create] button to create a setup file that stores all settings of the PWS-4500.
The file name is displayed after the setup file is successfully created. You can right-click the file name to save the data file on the computer.

Import Setup File

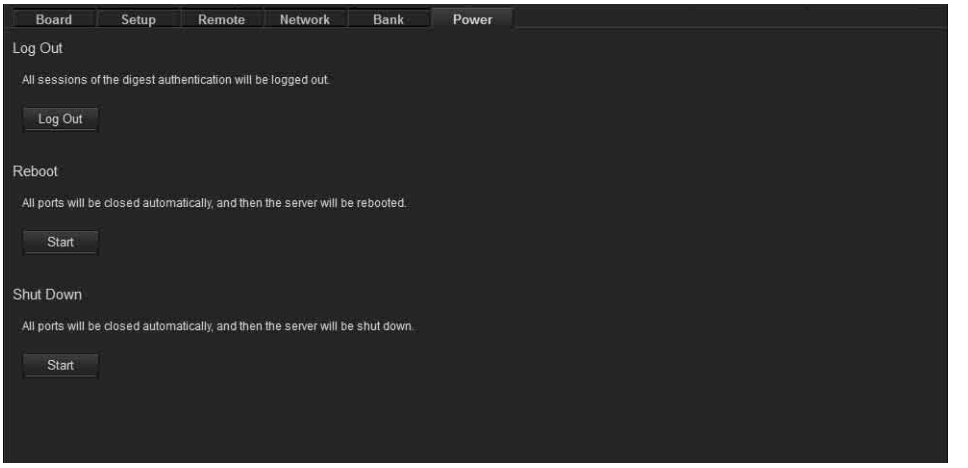
Loads the settings from a setup file (.dat) stored on the computer, and configures the PWS-4500.

All Reset

Click the [Submit] button to reset all settings. The IP addresses and other network settings and the menu settings saved in all banks are also reset.

Power tab

Used to reboot and shut down the unit.



Log Out

Click the [Log Out] button to log out from the web menu.

Reboot

Click the [Start] button to close all ports and reboot the unit.

Shut Down

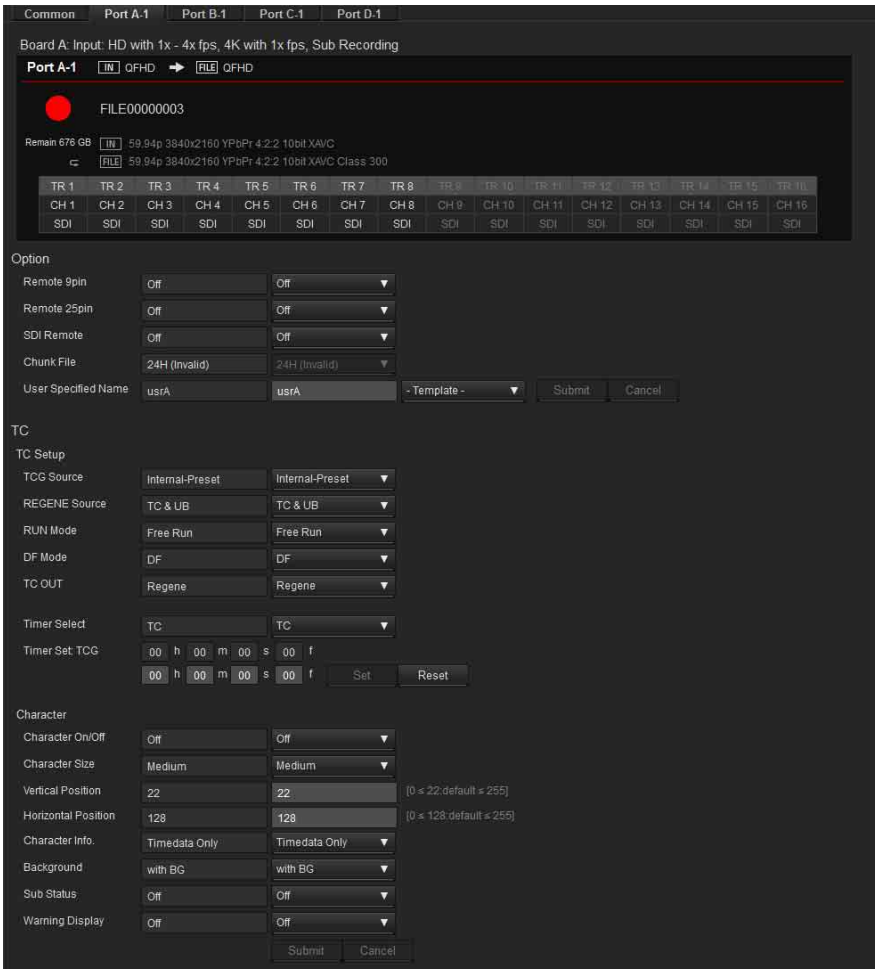
Click the [Start] button to close all ports and shut down the unit.

Port Screen

Makes settings for each port of the unit.

The settings vary depending on whether the port is for input or for output.

For input ports



Port information

Displays the operating status of the selected port. The display is the same as on the Home screen.

Option

Remote 9pin

Selects whether to enable remote control from the device connected to the REMOTE 1 to 8 connectors.

- Off
- On

Remote 25pin

Selects whether to enable remote control from the device connected to the GPIO (25-pin) connector.

- Off
- On

SDI Remote

Selects whether to enable remote control from the device connected to the SDI input connector.

- Off
- On

Chunk File
When recording continuously, this sets the number of hours before splitting the recording into separate files. When split into separate files, each file is appended with an incrementing suffix (_01, _02, and so on).
- 6H
- 24H

Note

The maximum recording time for a single file is 24 hours.

User Specified Name
Sets the 4-character prefix for the names of recorded files. Enter an arbitrary string in the text box or select a prefix from the drop-down list.

TC
Makes time code settings.

TCG Source
Selects the source signal for synchronizing the internal time code generator.
- Internal-Preset
- External-LTC
- SDI-LTC, NMI-LTC, or IP-LTC (selection options vary depending on the input signal)
- SDI-VITC, NMI-VITC, or IP-VITC (selection options vary depending on the input signal)
- Master TC

REGENE Source
Selects the signal to regenerate when the time code generator is in regenerate mode or in automatic editing mode.
- TC&UB: Regenerates both the time code signal and user bit signal.
- TC Only: Regenerates the time code signal only.
- UB Only: Regenerates the user bit signal only.

RUN Mode
Sets the running mode of the time code generator.
- Free Run: The time code advances when the power is on regardless of the unit's operating mode.
- Rec Run: The time code advances during recording only.

DF Mode
Sets the drop frame mode of the time code generator or timer counter.
- NDF
- DF

Note

This setting is valid only when [TCG Source] is set to "Internal-Preset" and the frame frequency is 29.97 Hz. When the frame frequency is not set to 29.97 Hz, the mode is set to NDF, and DF cannot be selected.

TC OUT
Sets the output time code from the TIME CODE OUT connector when recording.
- Through
- Regene

Timer Select
Selects the time data to display.
- TC
- UB
- TM1
- TM2

Timer Set
Displays the time counter.
To change the counter, enter a value and click the [Set] button. Clicking the [Reset] button resets the counter.

Note

Displayed only when [Timer Select] is set to TC, UB, or TM1.

Character

Character On/Off
Selects whether to display superimposed character information, such as the time code, on the monitor signal.

Character Size
Sets the display size of character information.
- Small
- Medium

Vertical Position
Sets the vertical display position of character information.
- 0 (top) to 22 to 255

Horizontal Position
Sets the horizontal display position of character information.
- 0 (left) to 128 to 255

Character Info.
Sets the character information content if [Character On/Off] is set to "On."
- Timedata Only: Timer counter only
- Timedata & TM1: Timer counter and TM1
- Timedata & TM2: Timer counter and TM2
- Timedata & UB: Timer counter and user bits
- Timedata & Status: Timer counter and operating status
- Timedata & Audio: Timer counter and audio level

Background
Sets the character information background.
- Outline: White characters with black outlines
- Translucent: White characters on a gray transparent background
- without BG: White characters with no background
- with BG: White characters on a black background

Sub Status
Sets additional information displayed with the character information.
- Off: Displays no additional information.
- File Name: Displays the file name.

Warning Display
Sets whether to display a flashing warning message on the second line of character information when [Character Info.] is set to an item other than "Timedata Only."
- Off
- On

Audio Meter

Audio Meter On/Off
Selects whether to display the audio meter in the monitor signal.
- Off
- On

Position
Sets the display position of the audio meter.
- Upper Left
- Upper Right
- Left
- Right
- Lower Left
- Lower Right

Translucency
Sets the translucency of the audio meter display.
- Off: Non-translucent display.
- Half-translucent: Displays the audio meter at 50% translucency so that the video signal behind the audio meter is visible.

Channel Setting
Sets the audio channels to display in the audio meter.
- L - R: Maximum value of L (odd-numbered channels) and R (even-numbered channels).
- CH01 - CH02
- CH03 - CH04
- CH05 - CH06
- CH07 - CH08
- CH09 - CH10
- CH11 - CH12
- CH13 - CH14
- CH15 - CH16
- CH01 - CH04
- CH05 - CH08
- CH09 - CH12
- CH13 - CH16
- CH01 - CH06
- CH01 - CH08
- CH09 - CH16
- CH01 - CH16

Character & Audio Meter on SDI-9 Monitor
Selects whether to display superimposed character information, such as the time code, and audio meter on the output from the SDI-9 connector.
When set to "Off," text information display can be enabled only on the SDI-10 connector, and no text information is displayed on the SDI-9 connector.
- Off
- On

META Data Input
Sets from which lines to acquire uncompressed metadata.

META Line 1
- 9H to 16H
- 18H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

META Line 2
- 9H to 16H
- 18H to 19H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

META Line 3
- 9H to 16H
- 18H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

Video

Port Configuration
Selects the video format of each port from the matrix.

Internal SG
Selects the type of signal output from the internal signal generator.
- Off
- CB100
- CB75
- SMPTE
- ARIB
- MB1
- MB2
- 10STEP
- PBAR
- RAMP
- Black
- White

Color Space
Sets the color space of the input signal.
- VPID
- ITU-R BT.709
- ITU-R BT.2020

OETF
Selects the input signal OETF.
- SDR
- VPID
- S-Log3
- HLG
- PQ (ST2084)

Audio

Audio Input Select
Selects the external channel to record for each audio file track. Also selects the type of each signal (SDI, IP (ST 2110), or AES/EBU) to record.
Not displayed in NMI mode.

Track Number
Selects the number of audio tracks for recording.
- 8 track
- 16 track

AES/EBU Input Mode
Selects whether to pass the input AES/EBU signal through a sampling rate converter when recording.
- Auto: Use converter. In this case, there are no limitations on input signals.
- Vlock: Do not use converter. In this case, the input signals need to be locked to the video signal at 48 kHz. Noise will occur if this condition is not met.

SDI Source Port
For dual-system input per board, this selects whether the audio signal is input on the main port or the sub-port.
- x-1: Selects the main port audio signal.
- x-2: Selects the sub-port audio signal.

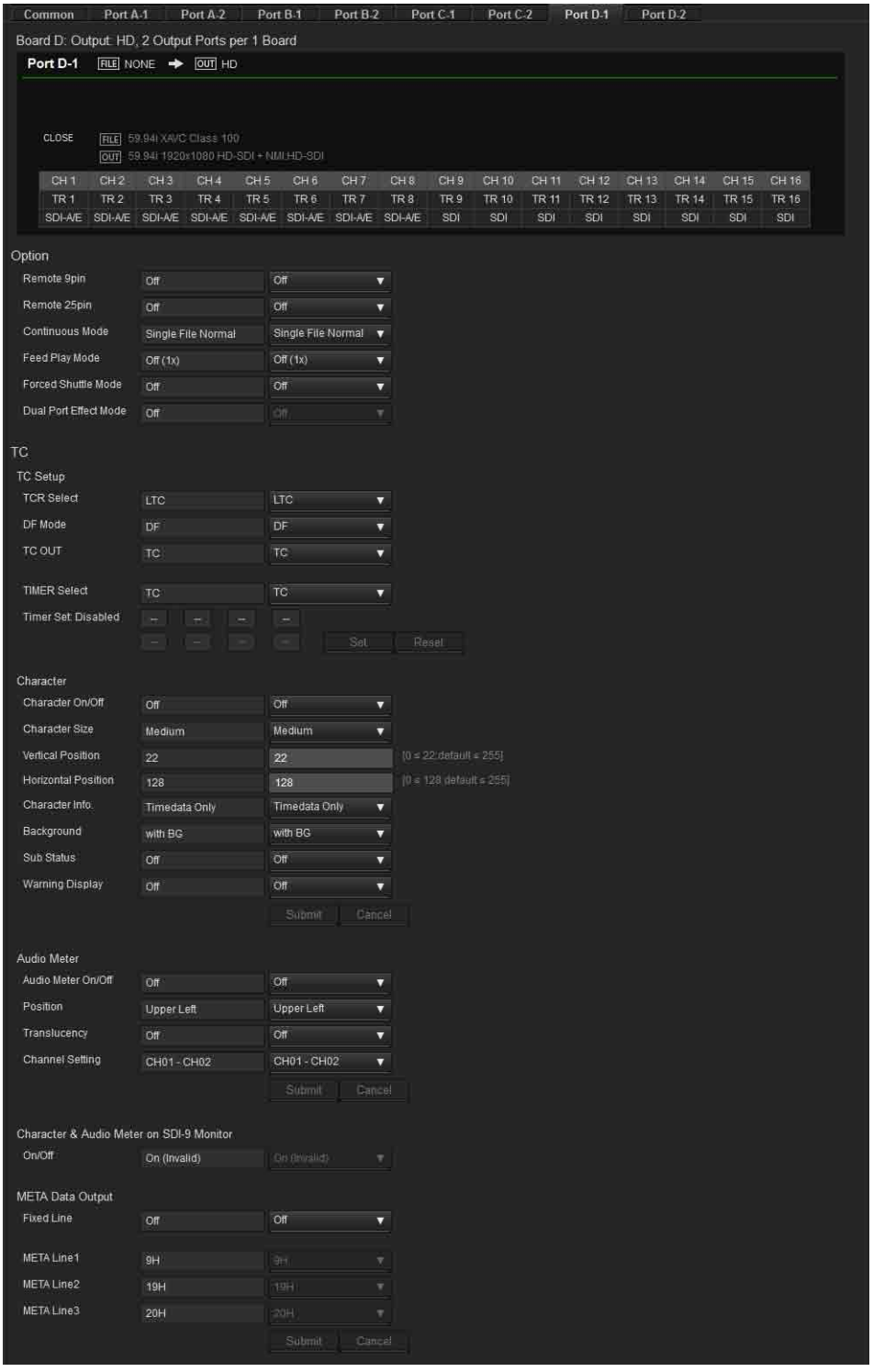
"x" represents the port (A to D).

Audio Source
Selects whether to record the master audio or the audio signal that is input on each port.

Non-Audio Input Select
Selects whether to input non-audio data.
- Invalid
- SDI-Data
- NMI-Data
- IP-Data
- A/E-Data

Internal SG
Selects the type of signal output from the internal signal generator.
- Off: No output
- Silence: Silence signal
- 1kHz: 1 kHz sine wave

For output ports



Port information

Displays the operating status of the selected port. The display is the same as on the Home screen.

Option

Remote 9pin

Selects whether to enable remote control from the device connected to the REMOTE 1 to 8 connectors.

- Off
- On

Remote 25pin

Selects whether to enable remote control from the device connected to the GPIO (25-pin) connector.

- Off
- On

Continuous Mode

Sets the preview file or list selection, and the repeat operation.

- Single File Normal
- Single File Repeat
- File List Normal
- File List Repeat

Feed Play Mode

Sets the playback speed of feed play.
If the playback speed is controlled using the PWA-PRC1 application, this setting is ignored.

- Off (1x)
- On (2x)
- On (4x)
- On (6x)
- On (8x)
- On (16x)

Forced Shuttle Mode

Selects whether to forcibly switch to shuttle control when using the Jog/Var command.

- Off
- On

Dual Port Effect Mode

Sets whether to execute effect using two playback ports, when the video codec is set to Avid DNxHD or Apple ProRes and "HD Multi Output" is selected.
The option is grayed out and is not available for selection under all other conditions.

- Off
- Resource: Port x

TC Setup

TCR Select

Sets the readout value of the time code reader.

- LTC
- VITC

DF Mode

Sets the drop frame mode of the timer counter.

- NDF
- DF

Note

When the frame frequency is not set to 29.97 Hz, the mode is set to NDF, and DF cannot be selected.

TC OUT

Selects the signal to output from the TIME CODE OUT connector of the connector panel.

- TC
- Through
- TM1
- TM2

Timer Select

Selects the time data to display.

- TC
- UB
- TM1
- TM2

Timer Set

Displays the time counter.
To change the counter, enter a value and click the [Set] button. Clicking the [Reset] button resets the counter.

Note

Displayed only when [Timer Select] is set to TM1.

Character

Character On/Off

Selects whether to display superimposed character information, such as the time code, on the monitor signal.

Character Size

Sets the display size of character information.

- Small
- Medium

Vertical Position

Sets the vertical display position of character information.

- 0 (top) to 22 to 255

Horizontal Position

Sets the horizontal display position of character information.

- 0 (left) to 128 to 255

Character Info.

Sets the character information content if [Character On/Off] is set to "On."

- Timedata Only: Timer counter only
- Timedata & VITC: Timer counter and VITC
- Timedata & TM1: Timer counter and TM1

- Timedata & TM2: Timer counter and TM2
- Timedata & UB: Timer counter and user bits
- Timedata & Status: Timer counter and operating status
- Timedata & Audio: Timer counter and audio level

Background
Sets the character information background.
- Outline: White characters with black outlines
- Translucent: White characters on a gray transparent background
- without BG: White characters with no background
- with BG: White characters on a black background

Sub Status
Sets additional information displayed with the character information.
- Off: Displays no additional information.
- File Name: Displays the file name.

Warning Display
Sets whether to display a flashing warning message on the second line of character information when [Character Info.] is set to an item other than "Timedata Only."
- Off
- On

Audio Meter

Audio Meter On/Off
Selects whether to display the audio meter in the monitor signal.
- Off
- On

Position
Sets the display position of the audio meter.
- Upper Left
- Upper Right
- Left
- Right
- Lower Left
- Lower Right

Translucency
Sets the translucency of the audio meter display.
- Off: Non-translucent display.
- Half-translucent: Displays the audio meter at 50% translucency so that the video signal behind the audio meter is visible.

Channel Setting
Sets the audio channels to display in the audio meter.
- L - R: Displays the maximum value of L (odd-numbered channels) and R (even-numbered channels).
- CH01 - CH02
- CH03 - CH04
- CH05 - CH06
- CH07 - CH08
- CH09 - CH10
- CH11 - CH12
- CH13 - CH14
- CH15 - CH16
- CH01 - CH04
- CH05 - CH08
- CH09 - CH12
- CH13 - CH16
- CH01 - CH06
- CH01 - CH08
- CH09 - CH16
- CH01 - CH16

Character & Audio Meter on SDI-9 Monitor
Selects whether to display superimposed character information, such as the time code, and audio meter on the output from the SDI-9 connector.
When set to "Off," text information display can be enabled only on the SDI-10 connector, and no text information is displayed on the SDI-9 connector.
- Off
- On

META Data Output
Sets the lines on which to output uncompressed metadata.

Fixed Line
When enabled, uncompressed metadata is output on the lines set by the following options. When disabled, metadata is output according to the line number information recorded in clip data.

META Line 1
- 9H to 16H
- 18H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

META Line 2
- 9H to 16H
- 18H to 19H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

META Line 3
- 9H to 16H
- 18H to 20H (up to 25H for 720p, up to 41H for 3G-SDI Level A)

Video

Port Configuration
Selects the video format of each port from the matrix.

SDI Sync Phase
Sets the sync phase of the video signal output on the SDI connector.

Sync
Coarse adjustment of the sync phase.
–64 to 0 to 127

Fine
Fine adjustment of the sync phase.
0 to 1024

Note

When using preview control on the PWA-PRC1, set the Sync and Fine values to 0 (factory default values).

Color Space
Sets the color space of the output signal.
- Clip Data
- ITU-R BT.709
- ITU-R BT.2020

OETF
Selects the output signal OETF.
- SDR
- Clip Data
- S-Log3
- HLG
- PQ (ST2084)

Others

VIDEO OUT BLANK
Turns on/off vertical interval blanking processing of the video signal output.
- Through: Does not perform blanking processing.
- Blank: Performs blanking processing.

Y ADD
Selects whether to forcibly turn off “Y add.”
- Auto
- Off

Audio

Audio Output Select
Selects the file track to output for each audio output channel.

AES/EBU
Selects the audio signal track that is output from the x-1 (main port) or x-2 (sub-port) on the AES/EBU 1/2 to 7/8 connectors when the port is set to “HD Output Multi.”

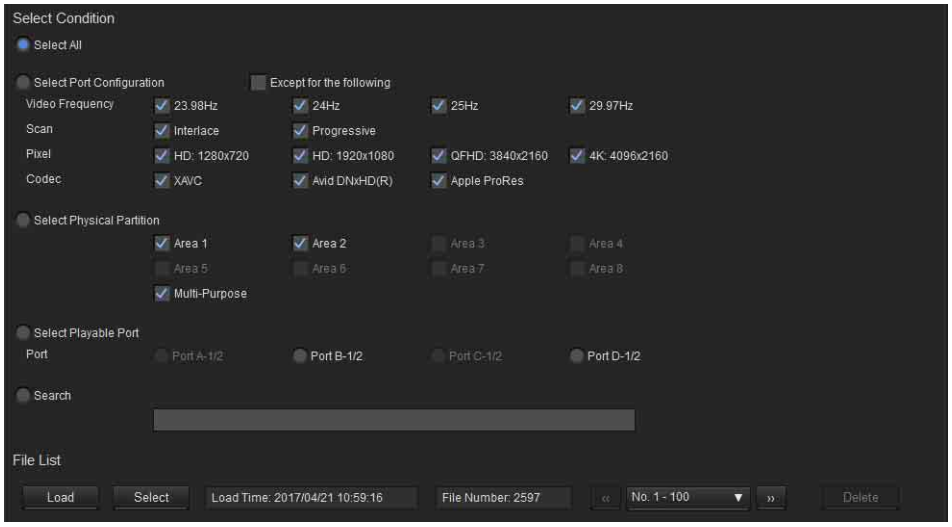
Shuttle Muting
Sets whether to output the audio signal during shuttle playback.
- Off: Audio is output.
- On: No output

VAR Muting
Sets whether to output the audio signal during variable-speed playback (not using PLAY).
- Off: Audio is output.
- On: Do not output

Audio Output Phase
Adjusts the audio output phase.
- 0 to 128 to 255 samples

File Screen

Displays a list of the files stored in the unit. You can filter the files to display only the required files.



Select Condition

Select All
Displays all files in the list.

Select Port Configuration
Displays files filtered by system frequency, scanning method, resolution, and codec.
Placing a check mark in [Except for the following] allows you to exclude files that match the selected criteria.

Select Physical Partition
Specifies the recording areas in internal memory for display.

Select Playable Port
Displays files for the specified playable port.

Search
Displays files with file names that contain the specified character string.

File List

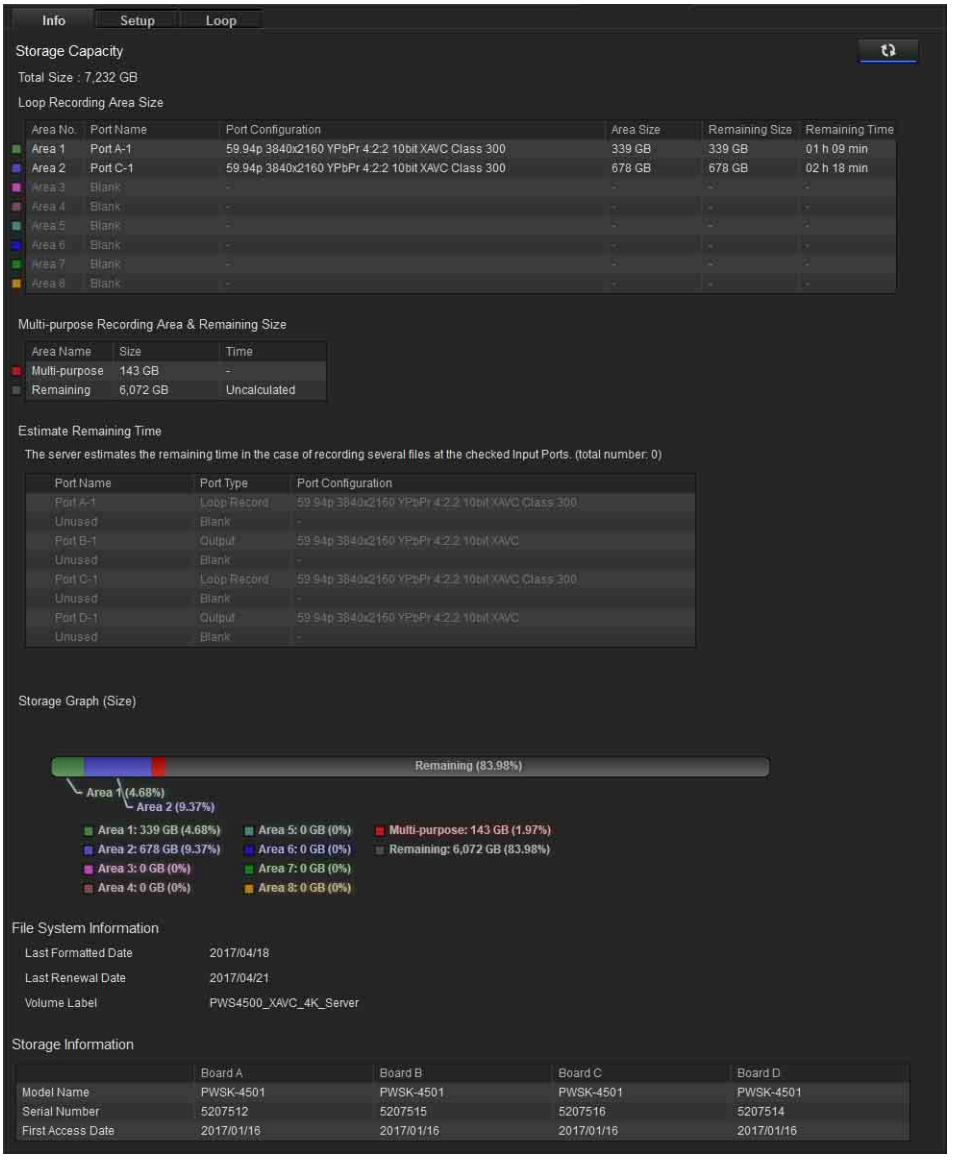
Displays the file list.
To filter the files using options, specify the search criteria in [Select Condition] and click the [Load] button.
To filter the currently displayed files using different search criteria, change the setting in [Select Condition] and click the [Select] button.

Storage Screen

Displays information about memory and configures the memory of the unit.

Info tab

Displays the status of internal memory and boards A to D.



Storage Capacity

Total Size

Displays the total capacity of internal memory.

Loop Recording Area Size

Displays the size and usage status of each area for loop recording.

Multi-purpose Recording Area & Remaining Size
Displays the memory used, remaining memory, and estimated recording time for the recording area used for normal recording and recording files received from the network (excludes loop recording).

Estimate Remaining Time
Selects the recording port parameters to use when calculating the remaining recording time.

Storage Graph
Displays the usage state of each recording area in internal memory as a graph.

File System Information

Last Formatted Date
Displays the date the file system was last formatted.

Last Renewal Date
Displays the date the file system was last renewed.

Volume Label
Displays the volume label.

Storage Information

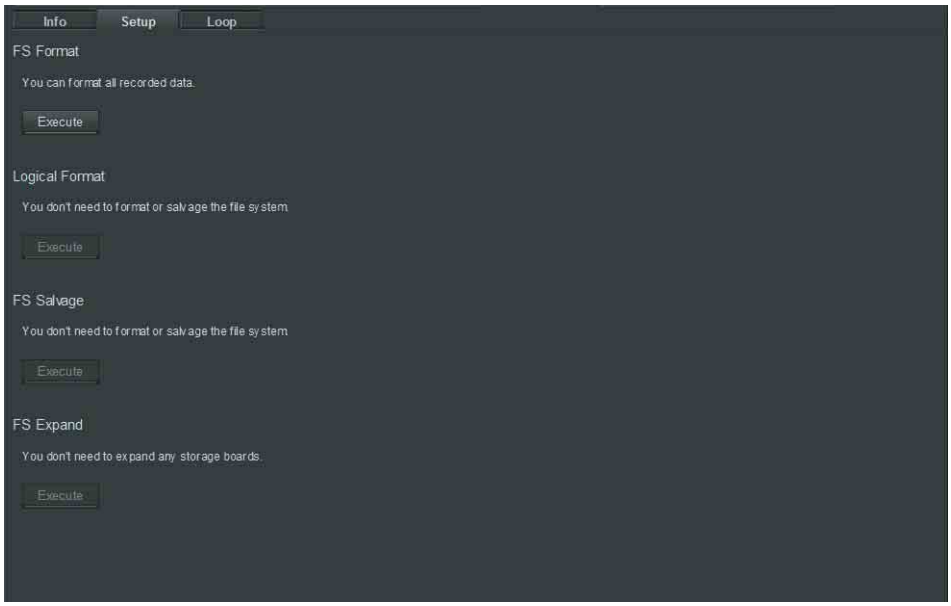
Displays information about memory boards A to D.

Model Name
Displays the model name of the memory board.

Serial Number
Displays the serial number of the memory board.

First Access Date
Displays the date that files were first accessed.

Setup tab



FS Format
Formats the file system.

Logical Format
Formats the logical file system.
Use to recover memory, when required, due to power outage while writing data to memory storage or other cause. All recorded data will be erased.

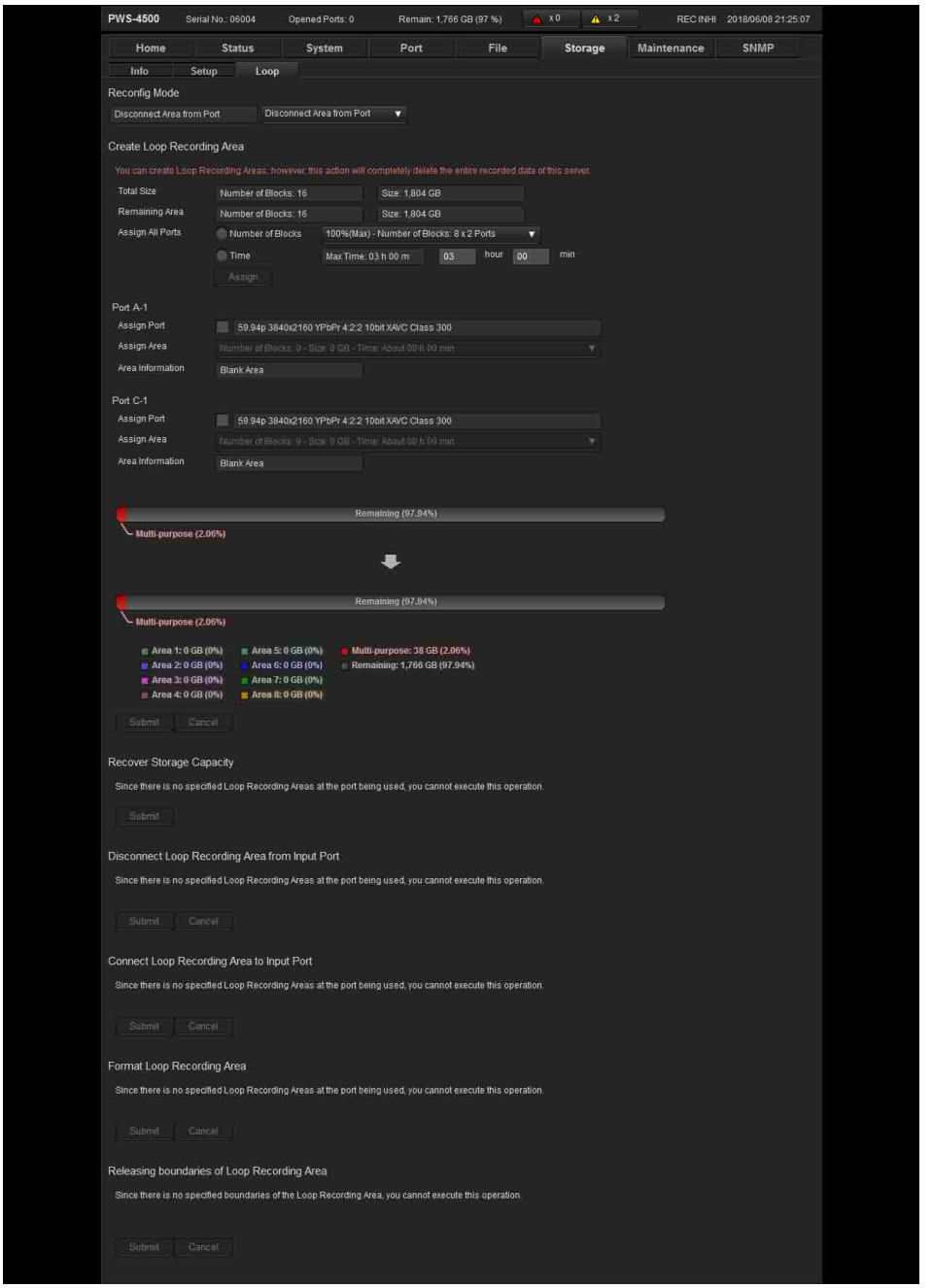
FS Salvage
Salvages the file system.
Use to recover memory, when required, due to power outage while writing data to memory storage or other cause. Recorded data is recovered where possible.

FS Expand
Expands the file system when an additional memory board is installed.

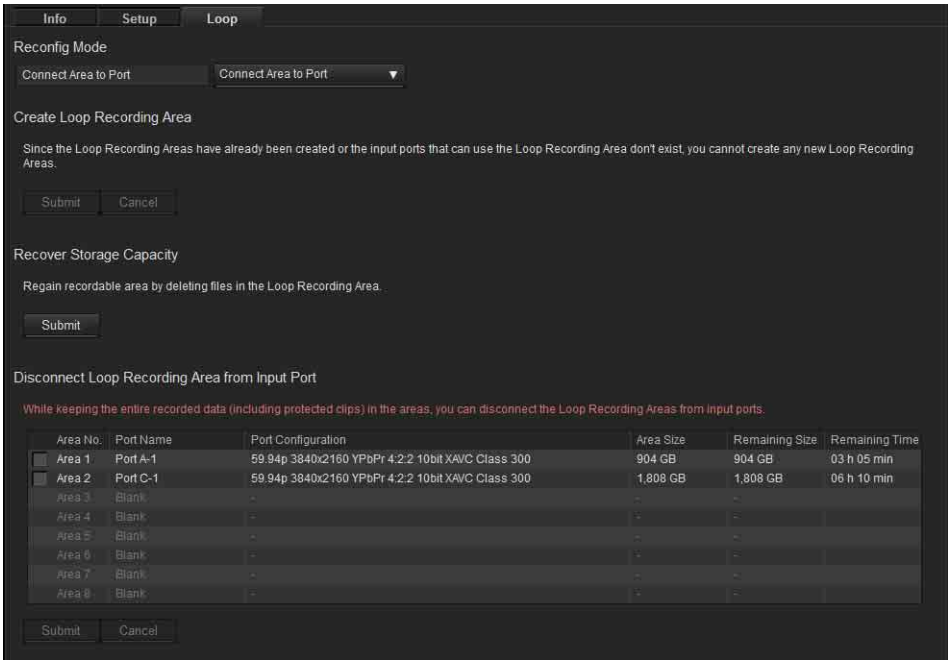
Loop tab

Assigns the recording area for each input/output when using loop recording. The recording loops back to the start of the loop recording area when it reaches the end of the area, overwriting the file. If there is more than one file in the loop recording area, files are overwritten starting with the oldest file.

Before defining loop recording area



After defining loop recording area



Reconfig Mode

When the signal setting of the recording port is changed, this selects whether to disconnect the loop recording area from the recording port, or to reconnect the loop recording area to the recording port.

- Disconnect Area from Port: Disconnects the loop recording area from the recording port.
- Connect Area to Port: Reconnects the loop recording area to the recording port.

Create Loop Recording Area

Total Size

Displays the total number of blocks and total capacity of internal memory.

Remaining Area

Displays the number of blocks and capacity of the area that can be assigned for loop recording.

Assign All Ports

Use to assign the loop recording area equally to all recording ports.
You can select whether to assign the number of blocks (capacity) evenly or assign the recording time evenly to each port as the assignment criterion.
To assign a number of blocks as the criterion, select the number of blocks (capacity) closest to the desired number from the selection options.
To assign the recording time as the criterion, enter the recording time. Specifying a recording time automatically calculates the number of blocks (capacity) to satisfy the recording time.
After the loop recording equally is equally assigned to each port, you can adjust the assignment using the Assign Area menu.

Assign Port

Selects the input port to assign to the loop recording area.

Assign Area

Sets the number of blocks (capacity) to assign for loop recording for the corresponding port.
It also displays an estimate of the loop recording time calculated from the specified capacity.

Area Information

Displays the loop recording area number used.

When finished making settings, click the [Submit] button. The storage is formatted, and the specified capacity and the loop recording areas are assigned. Click the [Cancel] button to return to the current settings.

Notes

- When a loop recording area is specified, all files in memory are deleted.
- To reconfigure this item, format the file system using [FS Format], or open the loop recording area as described in *"Releasing boundaries of Loop Recording Area" (page 48)* and then configure it.

Recover Storage Capacity

If a subclip is created in the loop recording area using PWA-PRC1 and overwriting the loop recording area has been prohibited (write-protected), the loop recording area remains write-protected, even if the subclip is deleted. In these cases, click the [Submit] button for this item to disable write protection and restore the loop recording area to recordable state.
This function can be executed when a loop recording area has been defined. However, it cannot be executed during recording/playback operation, during access from the network, or similar operations.

Disconnect Loop Recording Area from Input Port

Disconnects the link between the loop recording area and the recording port.
Select the corresponding loop recording area and click the [Submit] button to disconnect the link.

Connect Loop Recording Area to Input Port

Reconnects the link between the loop recording area and the recording port.
Select the corresponding loop recording area and click the [Submit] button to reconnect the loop recording area and recording port.
This function can be executed when a loop recording area has been defined which is not linked with a recording port.

Format Loop Recording Area

Erases the data in the loop recording area.
Select the corresponding loop recording area and click the [Submit] button to erase the data in the loop recording area. Any link between the loop recording area and the recording port is maintained.
This function can be executed when a loop recording area has been defined.

Releasing boundaries of Loop Recording Area

Opens the loop recording area.
Select the corresponding loop recording area and click the [Submit] button to open the loop recording area. Any link between the loop recording area and the recording port is simultaneously disconnected.
This function can be executed when a loop recording area has been defined.

Appendix

SDI Connector Input/ Output Specifications

The input/output signals and connectors used on each SDI port vary depending on the input port setting, output port, setting, and signal format.

For input ports

Format			SDI	SDI IN/OUT connector									
				1	2	3	4	5	6	7	8	9 a)	10 a)
4K	422	23p/PsF to 29p/PsF	1.5G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	DC/Char	DC/Char
			3G	In1-1	In1-2	–	–	IM1-1	IM1-2	–	–	DC/Char	DC/Char
		50p/59p	3G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	DC/Char	DC/Char
		100p/ 119p b)	3G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	DC/Char	DC/Char
				In1-5	In1-6	In1-7	In1-8	IM1-5	IM1-6	IM1-7	IM1-8	–	–
HD	422	50i/59i	1.5G	In1	In2	–	–	IM1	IM2	–	–	Char1	Char2
		23p/PsF to 29p/PsF	1.5G	In1	In2	–	–	IM1	IM2	–	–	Char1	Char2
		50p/59p	1.5G	In1-1	In1-2	In2-1	In2-2	IM1-1	IM1-2	IM2-1	IM2-2	Char1	Char2
			3G/ 1.5G c)	In1	In2	–	–	IM1	IM2	–	–	Char1	Char2
		100i/119i	1.5G	In1-1	In1-2	–	–	IM1	IM2	–	–	Char	Char
			3G	In1	–	–	–	IM1	–	–	–	Char	Char
		100p/119p	3G/ 1.5G c)	In1-1	In1-2	–	–	IM1-1	IM1-2	–	–	Char	Char
		150i/179i	1.5G	In1-1	In1-2	In1-3	–	IM1-1	IM1-2	IM1-3	–	Char	Char
		150p/179p	3G/ 1.5G c)	In1-1	In1-2	In1-3	–	IM1-1	IM1-2	IM1-3	–	Char	Char
		200i/239i	1.5G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	Char	Char
			3G	In1-1	In1-2	–	–	IM1-1	IM1-2	–	–	Char	Char
		200p/239p	3G/ 1.5G c)	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	Char	Char
		300i/359i b)	1.5G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	In2/Char d)	Char
				In1-5	In1-6	In1-7	In1-8	IM1-5	IM1-6	IM1-7	IM1-8	–	–
			3G	In1-1	In1-2	–	–	IM1-1	IM1-2	–	–	In2/Char d)	Char
				In1-3	In1-4	–	–	IM1-3	IM1-4	–	–	–	–
		300p/ 359p b)	3G/ 1.5G c)	In1-1	In1-2	In1-3	–	IM1-1	IM1-2	IM1-3	–	In2/Char d)	Char
				In1-5	In1-6	In1-7	–	IM1-5	IM1-6	IM1-7	–	–	–

Format			SDI	SDI IN/OUT connector									
				1	2	3	4	5	6	7	8	9 [a]	10 [a]
HD	422	400i/479i [b]	1.5G	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	In2/Char [d]	Char
				In1-5	In1-6	In1-7	In1-8	IM1-5	IM1-6	IM1-7	IM1-8	–	–
			3G	In1-1	In1-2	–	–	IM1-1	IM1-2	–	–	In2/Char [d]	Char
				In1-3	In1-4	–	–	IM1-3	IM1-4	–	–	–	–
		400p/ 479p [b]	3G/ 1.5G [c]	In1-1	In1-2	In1-3	In1-4	IM1-1	IM1-2	IM1-3	IM1-4	In2/Char [c]	Char
				In1-5	In1-6	In1-7	In1-8	IM1-5	IM1-6	IM1-7	IM1-8	–	–

In: SDI signal input. In1 and In2 represent inputs 1 and 2, respectively, of the dual-system input of each port. Input 1 is the main port, and input 2 is the sub-port. For single system signal formats transferred using more than one SDI cable, it is represented by In1-1, In1-2, and so on.

IM (Input Monitor): Input SDI signal output for monitor. IM1 and IM2 represent inputs 1 and 2, respectively, when using dual-system input.

DC: Down-converted 4K to HD signal output for monitor.

Char: Superimposed character information output for monitor. For dual-system input, Char1 and Char2 represent monitor outputs 1 and 2, respectively.

–: Not used.

a) The format of the signals output from the SDI IN/OUT 9 and 10 connectors is set when the video format is specified on the [Board] tab of the [System] screen of the web menu. The supported formats for the SDI IN/OUT 9 and 10 connectors vary depending on the signal format specified for the SDI IN/OUT 1 to 8 connectors.

b) Two input ports are used to input a single system signal.

c) 1280:720p is connected using 1.5G SDI.

d) To simultaneously record a normal-speed HD signal, connect a normal-speed HD signal to the SDI IN/OUT 9 connector.

Notes

- To connect a BPU4000/BPU4800 for HD 4x speed recording, connect the SDI-1 to SDI-4 connectors of the BPU4000/BPU4800 to the SDI-1 to SDI-4 connectors of the unit.
- To connect a BPU4000/BPU4800 for HD 6x or 8x speed recording, connect the SDI-1 to SDI-4 connectors of the BPU4000/BPU4800 to the SDI-1 to SDI-4 connectors of port A of the unit, and connect the SDI-5 to SDI-8 connectors of the BPU4000/BPU4800 to the SDI-1 to SDI-4 connectors of port B of the unit.

For output ports

Format			SDI	SDI IN/OUT connector									
				1 [a]	2 [a]	3 [a]	4 [a]	5	6	7	8	9 [b]	10 [b]
4K	422	23p/Psf to 29p/Psf	1.5G	Out1-1	Out1-2	Out1-3	Out1-4	Out1-1	Out1-2	Out1-3	Out1-4	DC/Char	DC/Char
			3G	Out1-1	Out1-2	Out1-1	Out1-2	Out1-1	Out1-2	Out1-1	Out1-2	DC/Char	DC/Char
		50p/59p	3G	Out1-1	Out1-2	Out1-3	Out1-4	Out1-1	Out1-2	Out1-3	Out1-4	DC/Char	DC/Char
HD	422	50i/59i	1.5G	Out	Out	Out	Out	Out	Out	Out	Out	Char	Char
		23p/Psf to 29p/Psf	1.5G	Out	Out	Out	Out	Out	Out	Out	Out	Char	Char
		50p/59p	1.5G	Out1-1	Out1-2	Out1-1	Out1-2	Out1-1	Out1-2	Out1-1	Out1-2	Char	Char
			3G/1.5G	Out	Out	Out	Out	Out	Out	Out	Out	Char	Char

Out: Represents all SDI IN/OUT 1 to 8 connector outputs. For single system signal formats transferred using more than one SDI cable, it is represented by Out1-1, Out1-2, and so on. 8-system output is supported for formats that are transferred using one SDI cable (Single Link), 4-system output for formats using two cables (Dual Link), and 2-system output for formats using four cables (Quad Link).

DC: Down-converted 4K to HD signal output for monitor.

Char: Superimposed character information output for monitor.

–: Not used.

a) When [Output Port SDI-1,2,3,4] is set to [Off] on the [Setup] tab of the [System] screen in the web menu, no signal is output.

b) The format of the signals output from the SDI IN/OUT 9 and 10 connectors is set when the video format is specified on the [Board] tab of the [System] screen of the web menu. The supported formats for the SDI IN/OUT 9 and 10 connectors vary depending on the signal format specified for the SDI IN/OUT 1 to 8 connectors.

c) 1280:720p is connected using 1.5G SDI.

NMI/IP (ST 2110) Connector Input/Output Specifications

Main signal input/output format

4K	3840×2160	50p, 59p, 100p, 119p
HD	1920×1080	50i, 59i, 50p, 59p
		• IP (ST 2110) only 100i, 119i, 100p, 119p, 150i, 179i, 150p, 179p, 200i, 239i, 200p, 239p, 300i, 359i, 300p, 359p, 400i, 479i, 400p, 479p

Monitor output format

HD	1920×1080	50i, 59i

Note

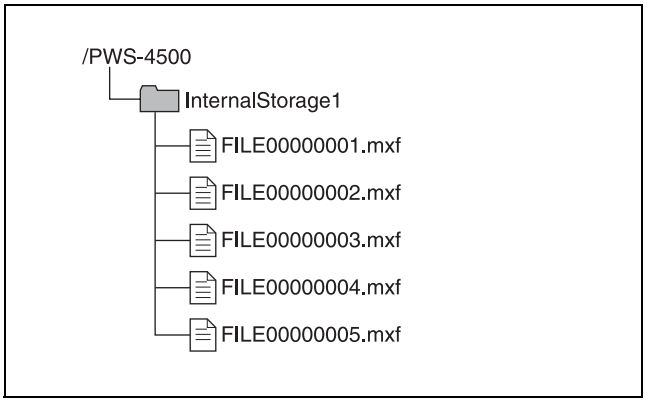
HFR (2x, 3x, 4x, 6x, 8x) signals are input only; they are not output.

File Operations via FTP

File operations between the unit and the computer are performed using the File Transfer Protocol (FTP).

Directory structure

The following diagram shows the PWS-4500 internal directory structure that is visible on the computer.



Setting Up

1 Connect the unit and the computer network terminals using a network cable. Alternatively, connect the unit to the same network as the computer.

2 Set the IP address and other settings of the unit.

See "Network tab" (page 27).

Connecting a computer running Windows 8/ Windows 10

Disable internet protocol version 6 (TCP/IPv6).

On Windows 8: (1) Open [View network status and tasks] > [Change adapter settings] > [Local Area Connection] in Control Panel.
(2) Display [Local Area Connection Properties], uncheck the [Internet Protocol Version 6 (TCP/IPv6)] checkbox, and click the [OK] button.

On Windows 10: (1) Open [Network & Internet] > [Network and Sharing Center] > [Change adapter settings].
(2) Display [Local Area Connection Properties], uncheck the [Internet Protocol Version 6 (TCP/IPv6)] checkbox, and click the [OK] button.

Connecting via FTP

You can connect the unit and computer via FTP using the following methods.
- Using the command prompt.
- Using FTP client software.

This section describes using the command prompt method. If using FTP client software, set up the software as required.

Logging in

1 Launch the command prompt.

2 Enter "ftp <SP> <IP_address>" and press the Enter key (where <SP> is a space character).

For example, if the IP address of the unit is set to "192.168.0.1", enter "ftp 192.168.0.1".

For information about the FTP command, refer to the Help in Windows.

If the connection is successful, you will be prompted to enter a user name.

3 Enter a user name of "usr1" and press the Enter key.

If the user name is authenticated, you will be prompted for a password.

The user name cannot be changed.

4 Enter the user-configured password and press the Enter key.

If the password is verified, login is complete.

For details about setting the password, refer to the Service Manual.

If a connection timeout occurs

The unit disconnects the FTP connection if no command is received within 90 seconds of the last command being received. In this case, first log out (see next section) and then repeat steps **1** to **3**.

Note

If the power to the unit is turned off during an FTP connection, any data being transferred will be discarded.

Logging out

To log out after completing file operations, enter "QUIT" at the command prompt and press the Enter key.

Command list

The FTP protocol commands supported on the unit comprise standard commands (below) and extended commands *(page 55)*.

Notes

- To execute an FTP command, application software must be installed on the computer.
- The supported commands may vary depending on the application software.
- Only ASCII characters can be used in file names.
- When using simultaneous 8-system remote control from devices connected to the REMOTE 1 to 8 connectors and there are 2,000 or more files and subclips on the server, the response to FTP file operations (LIST, NLST, RNFR/RNTO, DELE) may become slow.

Standard commands

In the command syntax, <SP> represents a space character, and <CRLF> represents a carriage-return/line-feed entered using the Enter key.

USER

Authenticates a user name.

Syntax: USER <SP> <user_name> <CRLF>
Example: USER usr1

PASS

Authenticates a password.

Syntax: PASS <SP> <password> <CRLF>
Example: PASS pws-4500

QUIT

Terminates the FTP connection. If executed during a file transfer, the connection closes after the file transfer ends.

Syntax: QUIT <CRLF>

PORT

Notifies the unit of the IP address and port number of the computer to use for data connection (for initiating data connection from the unit).

Syntax: PORT <SP> <h1,h2,h3,h4,p1,p2> <CRLF>
- h1 (byte 1) to h4 (byte 4): IP address
- p1 (byte 1) and p2 (byte 2): Port number

Example: PORT 10,0,0,1,242,48
(IP address: 10.0.0.1, Port number: 62000)

PASV

Requests that the unit listen to a port other than the default data connection port (sets the unit to Passive mode for initiating a data connection from the computer).

Syntax: PASV <CRLF>

TYPE

Specifies the data type.

Syntax: TYPE <SP> <type_code (<SP>-delimited options)> <CRLF>

The following type codes exist. However, this unit transmits code “I” regardless of the specified code.

- A: ASCII
  - N: Non-print
  - T: Telnet format
  - C: ASA carriage control
- E: EBCDIC
  - N: Non-print
  - T: Telnet format
  - C: ASA carriage control
- I: IMAGE (Binary) (default)
- L: LOCAL BYTE
  - SIZE: Byte size

Example: TYPE I

STRU

Specifies the data structure.

Syntax: STRU <SP> <structure_code> <CRLF>

The following structure codes exist. However, this unit transmits code “F” regardless of the specified code.

- F: File structure (default)
- R: Record structure
- P: Page structure

Example: STRU F

MODE

Specifies the transfer mode.

Syntax: MODE <SP> <mode_code> <CRLF>

The following mode codes exist. However, this unit transmits code “S” regardless of the specified code.

- S: Stream mode (default)
- B: Block mode
- C: Compressed mode

Example: MODE S

LIST

Transfers a list of files from the unit to the computer.

Syntax: LIST <SP> <path_name> <CRLF>

The following data is transferred, depending on the presence or otherwise of the directory or file specified in <path_name>.

- When a directory is specified: A list of files in the specified directory
- When a file is specified: Information about the specified file
- Nothing specified: A list of files in the current directory

Example 1: LIST InternalStorage1
Example 2: LIST FILE00000010.mxf

NLST

Transfers a list of file names only from the unit to the computer.

Syntax: NLST <SP> <path_name> <CRLF>

The following data is transferred, depending on the presence or otherwise of the directory specified in <path_name>.

- When a directory is specified: A list of the names of files in the specified directory
- Nothing specified: A list of names of files in the current directory

Example: NLST InternalStorage1

RETR

Copies files from the specified path on the unit to the current directory on the computer.

Syntax: RETR <SP> <path_name> <CRLF>

Example: RETR FILE00000010.mxf

STOR

Copies MXF files on the computer to the current directory.

Syntax: STOR <SP> <path_name> <CRLF>

Example: STOR FILE00000010.mxf

RNFR
RNTO

Renames a file.
Specify the current file name using the RNFR command and specify the new file name using the RNTO command (always execute the RNFR command before executing the RNTO command).

Note

Files cannot be renamed during recording or playback.

Syntax: RNFR <SP> <path_name (current file name)> <CRLF>
RNTO <SP> <path_name (new file name)> <CRLF>

Example: RNFR FILE00000010.mxf
RNTO SCENE100.mxf

DELE

Deletes the file at the specified path on the unit.

Notes

- Files cannot be deleted during recording or playback.
- Files may not be deleted, depending on the type of directory or file.

Syntax: DELE <SP> <path_name> <CRLF>

Example: DELE FILE00000099.mxf

STAT

Transmits attribute information about the file at the specified path or transmits data transfer status from the unit to the computer. If a file is specified, the following attribute information is displayed.

- MXF file
  - File name (excluding .mxf extension)
  - File protection information
  - File type
  - File length (number of frames)
  - File size (number of bytes)
  - File recording date
  - File recording time
  - File update date
  - File update time
  - DF flag (NDF/DF)
  - First LTC value
  - Flag (OK/NG/KEEP)
  - System frequency (23/24/25/29)
  - Video system frequency (23/24/25/29/50/59/100/119/150/179/200/239/300/359/400/479)
  - Video scan type (Interlaced/Progressive)
  - Number of video pixels (e.g. 1920 × 1080)
  - Video signal type (YPbPr/RGB/XYZ)
  - Video bit depth (8/10/12 bits)
  - Video codec information
  - Video compression mode
  - Audio codec and sample frequency information
  - Number of audio channels
  - Non-audio information (1-bit × 16 channels)
  - Emphasis information (2-bit × 16 channels)
  - Recording model information (11: PWS-4500)
  - Playback permission information and editing permission information
- Subclip In-point information
- Subclip Out-point information
- Color space information

If a storage folder is specified, detailed storage information is displayed.

- Model name
- Serial number
- Protection information
- Volume label
- Access start date
- Final formatting date
- Final update date
- Remaining capacity (GB)
- General file area remaining capacity (%)

Syntax: STAT <SP> <path_name> <CRLF>

The following data is transferred, depending on the presence or otherwise of the file specified in <path_name>.

- When a file is specified: Attribute information about the specified file
- When storage is specified: Detailed information about the specified storage
- Nothing specified: RETR transfer progress rate (%) (over 8 sessions)
  Typical output: 211 45 75 10 25 50 30 15 80

Example 1: STAT FILE0000001.mxf
Example 2: STAT InternalStorage1

ABOR

Aborts the currently executing data transfer and other tasks on the unit.

Syntax: ABOR <CRLF>

SYST

Displays the system name of the unit.

Syntax: SYST <CRLF>

NOOP

No operation (command used to check operation of the unit).

Syntax: NOOP <CRLF>

PWD

Displays the current directory ("/" is displayed for the root directory).

Syntax: PWD <CRLF>

CWD

Changes the current directory (switches from the current directory to another directory).

Syntax: CWD <SP> <path_name> <CRLF>

Switches to the following directory, depending on the presence or otherwise of the directory specified in <path_name>.

- When a directory is specified: The specified directory
- Nothing specified: The root directory

Example: CWD InternalStorage1

CDUP

Changes the current directory to the directory one level up (parent directory).

Syntax: CDUP <CRLF>

SIZE

Transmits the size of the specified file.

Syntax: SIZE <SP> <path_name> <CRLF>

Extension commands

In the command syntax, <SP> represents a space character, and <CRLF> represents a carriage-return/line-feed entered using the Enter key.

SITE REPF

Transfers the MXF file from the specified path on the unit to the current directory on the computer.
You can use this command to specify a portion of the body of the MXF file to transfer required portions only.

Syntax: SITE REPF <SP> <path_name> <SP>
<start_frame> <SP> <transfer_size> <SP>
<number_of_audio_channels> <SP>
<metadata_packets> <CRLF>

<start_frame> specifies the offset of the start video frame to transfer from the first frame in the file (first frame is 0).
<transfer_size> specifies the number of video frames to transfer (specify 0 to transfer all frames to the end of the file).
<number_of_audio_channels> specifies the number of audio data channels to transfer with the video.
<metadata_packets> specifies whether to add metadata packets. Specify “1” to add packets, or “0” to not add packets.

Example: SITE REPF FILE00000010.mxf 50 200 4 0
This command transfers FILE00000010.mxf. It transfers a body portion of 200 frames from frame 50, audio channels 1 to 4, and does not add metadata packets.

SITE DF

Displays the free storage space.

Syntax: SITE DF <CRLF>

Usage Precautions

Network

SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND RESULTING FROM A FAILURE TO IMPLEMENT PROPER SECURITY MEASURES ON TRANSMISSION DEVICES, UNAVOIDABLE DATA LEAKS RESULTING FROM TRANSMISSION SPECIFICATIONS, OR SECURITY PROBLEMS OF ANY KIND.

Depending on the operating environment, unauthorized third parties on the network may be able to access the unit. When connecting the unit to the network, be sure to confirm that the network is protected securely.

Condensation

If the unit is suddenly taken from a cold to a warm location, or if ambient temperature suddenly rises, moisture may form on the outer surface of the unit and/or inside of the unit. This is known as condensation. If condensation occurs, turn off the unit and wait until the condensation clears before operating the unit. Operating the unit while condensation is present may damage the unit.

WARNING

Operation of this equipment in a residential environment could cause radio interference.

Troubleshooting

Salvaging memory when recording ends abnormally

When recording ends, press the On/Standby switch on the front panel to finish operation of the unit. Recording will not end normally if the main power switch of the connector panel is turned off or the power cord is disconnected during recording. If this happens, the file system will not be updated and the video/audio data that was recorded in real time will not be recognized as a file, resulting in the content of the file that was recorded being lost.
The unit is equipped with a function (salvage function) for restoring the data in memory with minimal loss. The salvage function allows the file to be restored based on marker and other information recorded to memory.
The salvage process can take a few seconds or up to 10 minutes, depending on the state of the memory when the recording was interrupted.

Notes

- Before turning off the main power switch on the connector panel, switch the unit to standby mode using the On/Standby button on the front panel.
- The salvage function is designed to salvage as much recorded material as possible in the event that an unforeseen accident occurs but there is no guarantee that 100% of the data will be restored.
- Data immediately before recording was interrupted cannot be restored even if you execute this function. Approximately one second of data prior to the interruption is lost.
- A dialog prompting you to salvage or format is displayed each time you turn the power on if there are files that have not been restored.
- Recording and playback cannot be performed if files have not been restored.
- Formatting memory will immediately enable you to use it again as storage, but all recorded data will be lost.
- Even if data is successfully restored after a salvage, it is recommended that you transfer files you want to keep to external network storage or run playback to copy the files to other media, and then reformat the memory.

Restoring files using salvage

1 If memory for which recording did not end normally is detected, a warning message appears on the web menu screen and a confirmation message appears prompting you to salvage or format memory.

Note

The salvage process cannot be stopped once it is started. Allow plenty of time for the salvage process to complete.

2 Select [FS Salvage] on the Storage screen of the web menu.

The salvage process begins and a “Please wait.” message appears.
The message window closes automatically when the process ends.

When files cannot be restored using salvage

If files cannot be restored even by performing a salvage, the internal memory cannot be used in this condition. Formatting memory will enable you to use it again.

1 If memory for which recording did not end normally is detected, a warning message appears on the web menu screen and a confirmation message appears prompting you to salvage or format memory.

2 Select [FS Format] on the Storage screen of the web menu.

The format process begins and a “Please wait.” message appears.
The message window closes automatically when the process ends.

Note

If [Rec Inhi] is set to “On” on the [Setup] tab of the System screen of the web menu, change the setting to “Off.”

Error Messages

If the unit ceases to operate correctly due to malfunction or an internal system error, the SYSTEM indicator on the front panel starts flashing yellow or red, and an error message appears on the web menu screen.

After an error message appears, resolve the cause of the error based on the error message and then turn the unit back on. If the error message appears again when the unit is turned on, contact your Sony representative.

Code [1)]	Indication	Description
14xx00 14xxpp	PS FAN1 TROUBLE, etc.	A malfunction of cooling fan motor was detected. For details, refer to the Service Manual.
260100	POWER SUPPLY A UNIT TROUBLE	A failure was detected in power supply unit A.
260200	POWER SUPPLY B UNIT TROUBLE	A failure was detected in power supply unit B.
260300	POWER SUPPLY A/B UNIT INCONSISTENT	Model name mismatch between power supply units A and B.
960100	CALENDAR CLOCK ERROR	An internal calendar clock error was detected.
B3xx00 B3xxpp	SY CPLD2 INITIAL ERROR, etc.	An error was detected at the device initialization stage. For details, refer to the Service Manual.
B80300	SYS1-NW NO COMMUNICATION ERROR	An error occurred in communications with the CPU (SYS1) on the SY-422 board and the CPU (NW) on the CPU-453 board.
B9zz00	SYS1 SOFTWARE TASK ERROR	A software task error in SYS1 CPU was detected. For details, refer to the Service Manual.
D101pp	PORT x DIO DMA1 ERROR, etc.	An error occurred in the input/output board data processing. Recording or playback may not have been performed successfully.
D103pp	PORT x ENC PROC ERROR	An error occurred during encoding. For details, refer to the Service Manual.
D203pp	PORT x DEC PROC ERROR	An error occurred during decoding. For details, refer to the Service Manual.
D3xx01	AV WRITE ERROR1, etc.	An error occurred while writing to memory. For details, refer to the Service Manual.
D4xx01	AV READ ERROR1, etc.	An error occurred while reading from memory. For details, refer to the Service Manual.
D5xx01	SLOT Mx INTERFACE ERROR1, etc.	Cannot use memory because cannot communicate with the memory inserted in the unit. If this error persists after turning the unit on again, the unit or memory may be faulty.
D6xx01	SLOT Mx UNMOUNT ERROR1, etc.	An error occurred when attempting to unmount memory. The memory may not be usable. If error D7xx01 occurs every time the power is turned on, the data must be salvaged.
D7xx01	SLOT Mx MOUNT ERROR1, etc.	An error occurred when detecting the memory. If error D7xx01 occurs every time the power is turned on, the data must be salvaged.
D80101	SLOT Mx FILE SYSTEM ERROR	An error was detected with the file system in memory. If the same error occurs every time the power is turned on, the memory must be formatted. Follow the on-screen instructions to format memory.
E101pp	PORT x COND3 BAD, STOP REC	Recording was aborted because all the swap space to replace bad memory cells has been consumed in the memory in use.
E106pp	PORT x FS STUFFED, STOP REC	Recording was aborted because file system control limits have been reached in the memory in use. Format the memory to use it for recording.
E108pp	PORT x WRITE FAIL, STOP REC	Recording was aborted to protect existing data because an attempt was made to overwrite data in the memory in use. Format the memory to use it for recording.

Code [1)]	Indication	Description
E10901	SLOT Mx CANNOT REC	An abnormality was detected in an unrecorded area in memory. This memory cannot be used for recording. Format the memory to use it for recording.
E43100	INTERNAL MEMORY LACK	Some or all of the internal memory boards are not installed.
E43200	INTERNAL MEMORY WRONG POSITION	An internal memory board was inserted in the wrong position.

1) The portion in lower case letters in the above codes is one of the following numbers.

pp: Number identifying the corresponding port.
- 81: Port A-1
- 82: Port B-1
- 83: Port C-1
- 84: Port D-1
- 85: Port A-2
- 86: Port B-2
- 87: Port C-2
- 88: Port D-2

xx: Number identifying the error location. For details, refer to the Service Manual.

zz: Number identifying the error type. For details, refer to the Service Manual.

Warning Messages

When one of the problems described below is detected by the unit, a warning mark appears on the status bar of the web menu. Operation can continue even when the warning mark appears. When multiple errors occur simultaneously, the number of errors is indicated to the right of the warning mark.

After a warning message appears, resolve the cause of the warning based on the message.

For details on resolving the causes of warning messages, refer to the Service Manual.

Code [1)]	Indication [2)]	Description
010100	NO EXTERNAL REFERENCE (NO EXT REF)	No reference signal is input to the selected REF. INPUT port. The unit is using the internal reference signal.
020100	LOST LOCK	Synchronization was lost during playback, recording, or editing.
0601pp	PORT x SDI INPUT PHASE NG (P-x PHASE)	The input signals to the SDI 1 to 4 connectors on the indicated port are out of phase.
0801pp	PORT x NO SDI-1 INPUT (P-x NO SDI-1)	The input signal to the SDI 1 connector on the indicated port cannot be detected.
0802pp	PORT x NO SDI-2 INPUT (P-x NO SDI-2)	The input signal to the SDI 2 connector on the indicated port cannot be detected. This message appears only for signal formats that use the SDI 2 connector.
0803pp	PORT x NO SDI-3 INPUT (P-x NO SDI-3)	The input signal to the SDI 3 connector on the indicated port cannot be detected. This message appears only for signal formats that use the SDI 3 connector.
0804pp	PORT x NO SDI-4 INPUT (P-x NO SDI-4)	The input signal to the SDI 4 connector on the indicated port cannot be detected. This message appears only for signal formats that use the SDI 4 connector.
0B01pp	PORT x VIDEO DATA ERROR	Part of the playback video signal on the indicated port was accompanied by noise.
0B02pp	PORT x VIDEO DATA ERROR IN SHARE PLAY	Could not play correctly due to an NMI data transfer system fault.
1901pp	PORT x NO A1/A2 INPUT (P-x NO A1/A2)	No carrier was detected on digital audio channel 1/channel 2 input for the indicated port.
1A01pp	PORT x NO A3/A4 INPUT (P-x NO A3/A4)	No carrier was detected on digital audio channel 3/channel 4 input for the indicated port.
1B01pp	PORT x NO A5/A6 INPUT (P-x NO A5/A6)	No carrier was detected on digital audio channel 5/channel 6 input for the indicated port.
1C01pp	PORT x NO A7/A8 INPUT (P-x NO A7/A8)	No carrier was detected on digital audio channel 7/channel 8 input for the indicated port.

Code [1)]	Indication [2)]	Description
1D01pp	PORT x NO A9/A10 INPUT (P-x NO A9/10)	No carrier was detected on digital audio channel 9/channel 10 input for the indicated port.
1E01pp	PORT x NO A11/A12 INPUT (P-x NO A11/12)	No carrier was detected on digital audio channel 11/ channel 12 input for the indicated port.
1F01pp	PORT x NO A13/A14 INPUT (P-x NO A13/A14)	No carrier was detected on digital audio channel 13/ channel 14 input for the indicated port.
2001pp	PORT x NO A15/A16 INPUT (P-x NO A15/A16)	No carrier was detected on digital audio channel 15/ channel 16 input for the indicated port.
210101	REC INHIBIT (REC INHBIT)	Cannot record to memory due to a menu setting.
220201	FS LOCKED (FS LOCKED)	The memory in the indicated slot is locked and cannot be recorded.
220400	UNFORMATTED MEMORY BOARD DETECTION	An unformatted memory board was detected.
2901pp	PORT x VPID MISMATCH BITDEPTH (P-x VPID B-DP)	The bit length specified in the VPID of the input signal from the indicated port does not match the system bit length.
2A01pp	PORT x VPID MISMATCH COLORSPACE (P-x VPID C-SP)	The color space specified in the VPID of the input signal from the indicated port does not match the system color space.
2A02pp	PORT x VPID MISMATCH OETF	The OETF in the VPID of the input signal from the specified port does not match the system OETF.
2B01pp	PORT x VPID MISMATCH LINK INFORMATION (P-x VPID LINK)	The link data specified in the VPID of the input signal from the specified port does not match the data of the connected port.
2D01pp	PORT x INVALID SDI DATA (P-x INVLD SDI)	The data of the SDI input signal for the indicated port is not valid.
2E01pp	PORT x SDI INPUT ORDER MISMATCH	There was a mismatch in the input order of SDI 1 to 4 connectors.
300100	POWER SUPPLY A INVALID INPUT VOLTAGE	The input voltage applied to power supply unit A is incorrect. Check the applied power supply voltage.
300200	POWER SUPPLY B INVALID INPUT VOLTAGE	The input voltage applied to power supply unit B is incorrect. Check the applied power supply voltage.
310100	POWER SUPPLY A MISCELLANEOUS DEFECT	A failure occurred in power supply unit A.
310200	POWER SUPPLY B MISCELLANEOUS DEFECT	A failure occurred in power supply unit B.
470100	RTC BATTERY LOW LEVEL (RTC BATT LOW)	The lithium battery on the SY-422 board is low on power.
6002pp	ST 2110 PRIMARY DHCP TIMEOUT	Communication with the DHCP server configured for the IP (ST 2110) Primary side timed out.
6003pp	ST 2110 SECONDARY DHCP TIMEOUT	Communication with the DHCP server configured for the IP (ST 2110) Secondary side timed out.
6004pp	ST 2110 PACKET LOSS	Packet loss was detected on the IP (ST 2110) interface.
7301pp	PORT x NO REF INFORMATION	Lock cannot be achieved because the frames/second reference information is not available for the SDI signal input on port x.
7401pp	PORT x ASYNCHRONOUS VIDEO INPUT (P-x ASYNC VIN)	The HD SDI input signal for the indicated port is out of phase by ±4H or more from the reference signal.
740200	ASYNCHRONOUS SHARE PLAY INTERFACE	The SHARE PLAY input signal phase is out of phase by ±2H or more from the reference signal.
74.03.ii	xx ASYNCHRONOUS INTERFACE	NMI Leader is out of phase by ±0.5H or more from the reference signal.

Code [1]	Indication [2]	Description
75.01.ii	SHARE PLAY x INTERFACE DEFECTIVE	Link is down, regardless of whether SHARE PLAY IF is enabled.
AA0100	SYS1 FTP IF TASK ERROR	An error occurred in a network FTP interface task. The connected network session may have been terminated abnormally.
B902pp	PORT x SYS2 PROCESS DELAYED	A SYS2 software processing delay occurred.
BB01pp	PORT x NMI COMMUNICATION ERROR	There was not response to the NMI command.
BB03pp	ST 2110 COMMUNICATION ERROR	An IP (ST 2110) communication error occurred.
D104pp	PORT x DIO-DM DMA ERROR	DMA transfer between the DIO board and DM board was not completed successfully. The may be noise in the recorded data.
D204pp	PORT x DATA READ ERROR IN SHARE PLAY	An access error to target storage occurred during SHARE PLAY execution.
D205pp	PORT x DATA READ ERROR IN REMOTE PLAY	An access error to target storage occurred during SHARE PLAY execution.
D402ss	SLOT Mx AV READ ERROR2	A video or audio signal playback error caused by memory occurred.
D802cc	FILE MISSING x IN REMOTE PLAY	The requested file could not be found during Share Play execution.
E10101	MEMORY FULL, NOT RECORDABLE (M1 FULL)	The recording operation/command was terminated because there was insufficient remaining recording capacity in memory. Deletes files from memory.
E10201	MEMORY COND3 BAD, NOT RECORDABLE (M1 COND3 BAD)	Cannot record because the swap space to replace bad memory cells has been consumed in memory. The recording operation/command was terminated.
E10301	MEMORY FUNCTION LIMIT (M1 FUNC LIMIT)	The recording/playback operation was terminated due to memory function limits related to recording and playback.
E10501	MEMORY MAXIMUM FILES, NOT RECORDABLE (M1 MAX FILES)	The recording operation/command was terminated because the number of files in memory has reached the upper limit. Deletes files from memory.
E10601	MEMORY FILE SYSTEM STUFFED, NOT RECORDABLE (M1 FS STUFFED)	The recording operation/command was terminated because the memory file system control limits have been reached. Format the memory to use it for recording.
E202pp	PORT x FULL, STOP RECORDING (P-x FULL STOP)	Recording was terminated for the indicated port because the memory is full.
E401pp	PORT x NMI LINK RESOURCE LACK	An error was detected relating to the control from PRCM.

1) The portion in lower case letters in the above codes is one of the following numbers.

ss: Number indicating the corresponding internal memory slot.
- 01: Slot A
- 02: Slot B
- 03: Slot C
- 04: Slot D

pp: Number identifying the corresponding port.
- 81: Port A-1
- 82: Port B-1
- 83: Port C-1
- 84: Port D-1
- 85: Port A-2
- 86: Port B-2
- 87: Port C-2
- 88: Port D-2

ii: The following characters indicate the input/output interface.
- 91: SHARE PLAY1
- 92: SHARE PLAY2
- 93: NMI MONITOR1
- 94: NMI MONITOR2
- A1: NMI LAN A1
- A2: NMI LAN A2
- A3: NMI LAN B1
- A4: NMI LAN B2
- A5: NMI LAN C1
- A6: NMI LAN C2
- A7: NMI LAN D1
- A8: NMI LAN D2

2) Information in parentheses () indicates short messages for superimposed display.

Memory status messages

The following warning messages appear depending on the wear or usage of the memory. Using memory repeatedly gradually increases the possibility that errors will occur during recording and playback. When any of the following messages appear, it is time to replace with new memory. Specifically, if the "CONDITION x BAD" message appears, it is best to replace with new memory as soon as possible.

Code	Indication	Description
C10101	SLOT Mx CONDITION1 DOUBTFUL (M1 COND1 DBT)	The number of errors when writing/reading is becoming larger. Although all errors can be corrected, it is recommended that you replace with new memory.
C10201	SLOT Mx CONDITION1 BAD (M1 COND1 BAD)	The number of errors when writing/reading has become extremely large. Although all errors can be corrected, it is strongly recommended that you replace with new memory.
C10301	SLOT Mx CONDITION2 DOUBTFUL (M1 COND2 DBT)	The number of memory repetitive operations has become large. Although there is currently no problem, it is recommended that you replace with new memory.
C10401	SLOT Mx CONDITION2 BAD (M1 COND2 BAD)	The number of memory repetitive operations has become extremely large. Although there is currently no problem, it is strongly recommended that you replace with new memory.
C10501	SLOT Mx CONDITION3 DOUBTFUL (M1 COND3 DBT)	The swap space used to replace bad memory cells is becoming smaller. Although there is currently no problem, it is recommended that you replace with new memory.
C10601	SLOT Mx CONDITION3 BAD (M1 COND3 BAD)	The swap space used to replace bad memory cells has been exhausted. Although playback is still available, recording is no longer possible. It is strongly recommended that you replace with new memory.

To clear a warning message

1 Display the Warning tab of the Maintenance screen of the web menu.

2 Select [Warning Cancel].

3 Place a check mark in the messages whose settings you want to change.

4 When finished, click the [OK] button.

For details, refer to the Service Manual.

Displaying the error log

You can check up to 99 detected error messages and warning messages on the [Log] tab of the [Maintenance] screen. You can also export the log to a file.
The error and warning messages are displayed in [Error/Warning Table] on the [Maintenance] screen > [Log] tab.

To export the error log to a file

1 Click the [Log] tab on the [Maintenance] screen.

2 Click the [Create Error Log] button.

3 Right-click [Download Log File] and save the file.

Note

The [Create Command Log 1/2] button and [Create Storage Log 1/2] button are for maintenance use.

Accessing Error Messages from the ST 2110 Interface

Error messages relating to the ST 2110 interface are sent to IP Live System Manager (LSM). The error messages can also be accessed using the web menu of the PWSK-4509.

For details about accessing messages using the web menu, refer to the Service Manual.

Error code [1)]	Notation on LSM	Error level	Description	Solution
4051010x	[Network] Link down (Port A/B/C/D Primary/Secondary)	Warning	Port A/B/C/D Primary/ Secondary is not connected to the network switch. The network switch is turned off.	Connect the LAN cable correctly. If the network switch is turned off, turn the network switch on.
4051020x	[Network] Unable to connect to LSM (Port A/B/C/D Primary/ Secondary)	Warning	Port A/B/C/D Primary/ Secondary does not connect to LSM.	Check that the IP address of LSM is set correctly on the device. Check the network connection status.
403201yy	[Stream] Packet loss was detected (I/O Name)	Error	Packet loss was detected.	(1) A fault may have occurred with the SDI signal on the transmitting side. Check the status of the input SDI signal, sync signal, and Network GenLock. (2) If there is no problem after checking the above, check whether the packet loss is still occurring. Packet loss may have occurred due to bandwidth overflow or fiber/transceiver corruption.
405202yy	[Stream] Invalid sequence number (LAN Primary)	Warning	Non-consecutive packet sequence numbers were detected.	(1) A fault may have occurred with the SDI signal on the transmitting side. Check the status of the input SDI signal, sync signal, and Network GenLock. (2) If there is no problem after checking the above, check whether the packet loss is still occurring. Packet loss may have occurred due to bandwidth overflow or fiber/transceiver corruption.
405203yy	[Stream] Invalid sequence number (LAN Secondary)	Warning	Non-consecutive packet sequence numbers were detected.	(1) A fault may have occurred with the SDI signal on the transmitting side. Check the status of the input SDI signal, sync signal, and Network GenLock. (2) If there is no problem after checking the above, check whether the packet loss is still occurring. Packet loss may have occurred due to bandwidth overflow or fiber/transceiver corruption.
40330201	[Genlock] Unable to lock to PTP leader	Error	A PTP leader could not be found on the network.	If any of the following Warning error levels occur, take the corresponding action.
40530301	[Genlock] PTP leader is NOT detected (LAN Primary)	Warning	A PTP leader could not be found on the network.	Check the PTP leader settings.
40530302	[Genlock] PTP leader is NOT detected (LAN Secondary)	Warning	A PTP leader could not be found on the network.	Check the PTP leader settings.
40530401	[Genlock] PTP status remains “Locking” state (LAN Primary)	Warning	Continuous “Locking” state for Port A Primary.	• Check that the communication mode settings for the PTP leader and device are matching. • Check the network environment.
40530402	[Genlock] PTP status remains “Locking” state (LAN Secondary)	Warning	Continuous “Locking” state for Port A Secondary.	• Check that the communication mode settings for the PTP leader and device are matching. • Check the network environment.

Error code 1)	Notation on LSM	Error level	Description	Solution
40530501	[Genlock] Primary leader and Secondary leader are NOT synchronized	Warning	A time difference between Primary Leader and Secondary Leader was detected in PTP redundancy configuration.	Check that the clocks of the Primary Leader and Secondary Leader are synchronized.

1) The portion in lower case letters in the above codes is one of the following numbers.

x: Number identifying the corresponding port.
- 1: Port A Primary
- 2: Port A Secondary
- 3: Port B Primary
- 4: Port B Secondary
- 5: Port C Primary
- 6: Port C Secondary
- 7: Port D Primary
- 8: Port D Secondary

yy: Number identifying the port and stream.

For HD (1x)
- 01: Port A1/V
- 02: Port A1/A
- 03: Port A1/M
- 04: Port A2/V
- 05: Port A2/A
- 06: Port A2/M
- 13: Port B1/V
- 14: Port B1/A
- 15: Port B1/M
- 16: Port B2/V
- 17: Port B2/A
- 18: Port B2/M
- 25: Port C1/V
- 26: Port C1/A
- 27: Port C1/M
- 28: Port C2/V
- 29: Port C2/A
- 30: Port C2/M
- 37: Port D1/V
- 38: Port D1/A
- 39: Port D1/M
- 40: Port D2/V
- 41: Port D2/A
- 42: Port D2/M

For 4K/QFHD (1x)
- 01: Port A1/V
- 02: Port A1/A
- 03: Port A1/M
- 13: Port B1/V
- 14: Port B1/A
- 15: Port B1/M
- 25: Port C1/V
- 26: Port C1/A
- 27: Port C1/M
- 37: Port D1/V
- 38: Port D1/A
- 39: Port D1/M

For HD (2x)
- 01: Port A-HFR1/V
- 02: Port A-HFR1/A
- 03: Port A-HFR1/M
- 04: Port A-HFR2/V
- 05: Port A-HFR2/A
- 06: Port A-HFR2/M
- 07: Port A-HFR3/V
- 08: Port A-HFR3/A
- 09: Port A-HFR3/M
- 10: Port A-HFR4/V
- 11: Port A-HFR4/A
- 12: Port A-HFR4/M
- 13: Port B-HFR1/V
- 14: Port B-HFR1/A
- 15: Port B-HFR1/M
- 16: Port B-HFR2/V
- 17: Port B-HFR2/A
- 18: Port B-HFR2/M
- 19: Port B-HFR3/V
- 20: Port B-HFR3/A
- 21: Port B-HFR3/M
- 22: Port B-HFR4/V
- 23: Port B-HFR4/A
- 24: Port B-HFR4/M
- 25: Port C-HFR1/V
- 26: Port C-HFR1/A
- 27: Port C-HFR1/M
- 28: Port C-HFR2/V
- 29: Port C-HFR2/A
- 30: Port C-HFR2/M
- 31: Port C-HFR3/V
- 32: Port C-HFR3/A
- 33: Port C-HFR3/M
- 34: Port C-HFR4/V
- 35: Port C-HFR4/A
- 36: Port C-HFR4/M

For QFHD (2x)
- 01: Port A-HFR1/V
- 02: Port A-HFR1/A
- 03: Port A-HFR1/M
- 13: Port A-HFR2/V
- 14: Port A-HFR2/A
- 15: Port A-HFR2/M

Recording Format

COMPRS	SIGNAL/SIZE	DEPTH	SCAN	FRAME	SDI	Rec Rate	MULTIPLE
XAVC Class100	YPbPr (4:2:2) 1280:720	10	Progressive	50	1.5G	100	1x
				59.94	1.5G	100	
				100	1.5G/12G	200	2x
				119	1.5G/12G	200	
				150	1.5G/12G	300	3x
				179	1.5G/12G	300	
				200	1.5G/12G	400	4x
				239	1.5G/12G	400	
				300	1.5G/12G	600	6x
				359	1.5G/12G	600	
				400	1.5G/12G	800	8x
				479	1.5G/12G	800	
	YPbPr (4:2:2) 1920:1080	10	Interlace	25	1.5G	100	1x
				29.97	1.5G	100	
				50	1.5G/3G/12G	200	2x
				59.94	1.5G/3G/12G	200	
				75	1.5G/3G/12G	300	3x
				89	1.5G/3G/12G	300	
				100	1.5G/12G	400	4x
				119	1.5G/12G	400	
				150	1.5G/12G	600	6x
				179	1.5G/12G	600	
				200	1.5G/12G	800	8x
				239	1.5G/12G	800	
			Progressive	23.98	1.5G	80	1x
				25	1.5G	100	
				29.97	1.5G	100	
				50	1.5G/3G	200	
				59.94	1.5G/3G	200	
				100	3G/12G	400	2x
				119	3G/12G	400	
				150	3G/12G	600	3x
				179	3G/12G	600	
				200	3G/12G	800	4x
				239	3G/12G	800	
				300	3G/12G	1200	6x
				359	3G/12G	1200	
				400	3G/12G	1600	8x
				479	3G/12G	1600	

COMPRS	SIGNAL/SIZE	DEPTH	SCAN	FRAME	SDI	Rec Rate	MULTIPLE
XAVC Class300	YPbPr (4:2:2) 3840:2160	10	Progressive	23.98	3G	240	1x
				25	3G	250	
				29.97	3G	300	
				50	3G/12G	500	
				59.94	3G/12G	600	
				100	3G/12G	1000	2x
				119	3G/12G	1200	
	YPbPr (4:2:2) 4096:2160	10	Progressive	23.98	3G	240	1x
				24	3G	240	
				25	3G	250	
				29.97	3G	300	
				50	3G	500	
				59.94	3G	600	
XAVC Class480	YPbPr (4:2:2) 3840:2160	10	Progressive	23.98	3G	384	1x
				25	3G	400	
				29.97	3G	480	
				50	3G/12G	800	
				59.94	3G/12G	960	
				100	3G/12G	1600	2x
				119	3G/12G	1920	
	YPbPr (4:2:2) 4096:2160	10	Progressive	23.98	3G	384	1x
				24	3G	384	
				25	3G	400	
				29.97	3G	480	
				50	3G	800	
				59.94	3G	960	
Avid DNxHD 45	YPbPr (4:2:2) 1920:1080	8	Progressive	23.98	1.5G	36	1x
				25	1.5G	36	
				29.97	1.5G	45	
				50	1.5G/3G	70	
				59.94	1.5G/3G	90	
Avid DNxHD 145	YPbPr (4:2:2) 1280:720	8	Progressive	50	1.5G	115	1x
				59.94	1.5G	145	
	YPbPr (4:2:2) 1920:1080	8	Interlace	25	1.5G	121	1x
				29.97	1.5G	145	
			Progressive	50	1.5G/3G	242	
				59.94	1.5G/3G	290	

COMPRS	SIGNAL/SIZE	DEPTH	SCAN	FRAME	SDI	Rec Rate	MULTIPLE
Avid DNxHD 220x	YPbPr (4:2:2) 1280:720	10	Progressive	23.98	1.5G	116	1x
				25	1.5G	121	
				29.97	1.5G	145	
				50	1.5G	175	
				59.94	1.5G	220	
	YPbPr (4:2:2) 1920:1080	10	Interlace	25	1.5G	184	1x
				29.97	1.5G	220	
			Progressive	23.98	1.5G	176	
				25	1.5G	184	
				29.97	1.5G	220	
				50	1.5G/3G	367	
				59.94	1.5G/3G	440	
Apple ProRes 422 LT	YPbPr (4:2:2) 1920:1080	10	Interlace	25	1.5G	85	1x
				29.97	1.5G	102	
			Progressive	23.98	1.5G	82	
				25	1.5G	85	
				29.97	1.5G	102	
				50	1.5G/3G	170	
				59.94	1.5G/3G	204	
Apple ProRes 422	YPbPr (4:2:2) 1280:720	10	Progressive	50	1.5G	122	1x
				59.94	1.5G	147	
	YPbPr (4:2:2) 1920:1080	10	Interlace	25	1.5G	122	1x
				29.97	1.5G	147	
			Progressive	23.98	1.5G	117	
				25	1.5G	122	
				29.97	1.5G	147	
				50	1.5G/3G	245	
				59.94	1.5G/3G	293	
Apple ProRes 422 HQ	YPbPr (4:2:2) 1280:720	10	Progressive	50	1.5G	184	1x
				59.94	1.5G	220	
	YPbPr (4:2:2) 1920:1080	10	Interlace	25	1.5G	184	1x
				29.97	1.5G	220	
			Progressive	23.98	1.5G	176	
				25	1.5G	184	
				29.97	1.5G	220	
				50	1.5G/3G	367	
				59.94	1.5G/3G	440	

Note

For the input/output specifications for the NMI/IP (ST 2110) connectors, see *"NMI/IP (ST 2110) Connector Input/Output Specifications" (page 51)*.

Difference between loop recording and normal recording

When loop recording is executed, a file is created in the loop recording area specified on the Loop tab of the Storage Screen, and AV data is saved to the file. After the whole loop recording area is consumed, the file with the oldest creation date is deleted and the recording continues in the vacated space.
Conversely, when files are received over the network or during normal recording (as opposed to loop recording), AV data is stored in the general recording area not assigned as the loop recording area.
The general recording area and loop recording area are managed separately. Accordingly, files received over the network are saved in the general recording area and are not deleted automatically by loop recording mode.
If the entire storage capacity is assigned to the loop recording area, there is no general recording area remaining, which means that files cannot be received over the network and normal recording (as opposed to loop recording) cannot be performed.

Specifications

General

Recording format
XAVC, Avid DNxHD(R),
Apple ProRes 422

Power requirements
100 V to 127 V AC / 200 V to 240 V AC

Power consumption
Maximum 480 W

Inrush current

(1) Maximum possible inrush current at initial switch-on (Voltage changes caused by manual switching):
22 A peak, 2.8 A r.m.s. (240 V AC)

(2) Inrush current after a mains interruption of five seconds (Voltage changes caused at zero-crossing):
22 A peak, 2.8 A r.m.s. (240 V AC)

Operating temperature
5 °C to 40 °C (41 °F to 104 °F)

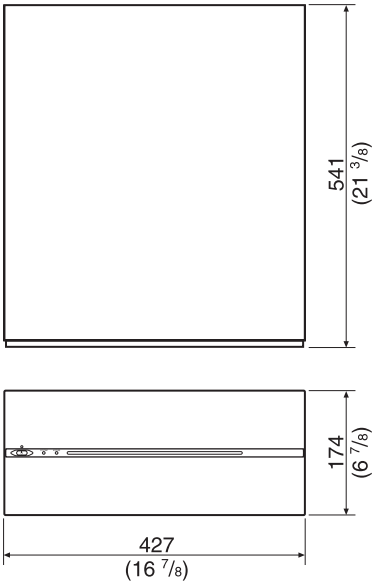
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)

Operating humidity
25% to 90% (no condensation)

Storage humidity
5% to 80% (no condensation)

Mass 22 kg (48 lb. 8 oz.) (with all options installed)

Dimensions 427 × 174 × 541 mm
(16 $^{7}/_{8}$ × 6 $^{7}/_{8}$ × 21 $^{3}/_{8}$ in.) (W×H×D)



Video

422 format

Sampling frequency
Y: 74.25 MHz
Pb/Pr: 37.125 MHz

Quantization 8/10 bits

Compression XAVC, Avid DNxHD(R),
Apple ProRes 422

Audio

Digital audio signal format

Sampling frequency
48 kHz (video sync)

Quantization 24 bits

Headroom 20 dB / 18 dB / 16 dB / 15 dB / 12 dB / 9 dB (selectable)

I/O connectors

When ENCODER mode is selected (per board)

SDI INPUT

1 to 4 BNC (4),
HD SDI (1.485 Gbps) SMPTE ST 292-1/ BTA-S004B compliant
3G SDI (2.97 GHz) SMPTE ST 424 Level A, B

SDI OUTPUT

INPUT MONITOR 5 to 8
BNC (4),
HD SDI (1.485 Gbps)
3G SDI (2.97 GHz)
Does not satisfy the SDI signal standard, and should be used for input signal monitor applications only.

MONITOR BNC (2),
HD SDI (1.485 Gbps) SMPTE ST 292-1/ BTA-S004B compliant

TIMECODE INPUT
BNC (1), 0.5 to 5 Vpp, 10 kΩ

TIMECODE OUTPUT
BNC (1), 1.5 Vpp, low impedance

DIGITAL AUDIO (AES/EBU) INPUT
BNC (4),
CH 1/2 to CH 7/8, AES/EBU format, unbalanced

Note

When connecting devices for AES/EBU signal input/output, use a cable whose length is less than 300 meters (984 feet).

When DECODER mode is selected (per board)

SDI OUTPUT
1 to 8 BNC (8),
HD SDI (1.485 Gbps) SMPTE ST 292-1/ BTA-S004B compliant
3G SDI (2.97 GHz) SMPTE ST 424 Level A, B

SDI OUTPUT
MONITOR BNC (2),
HD SDI (1.485 Gbps) SMPTE ST 292-1/ BTA-S004B compliant

TIMECODE OUTPUT
BNC (1), 1.5 Vpp, low impedance

DIGITAL AUDIO (AES/EBU) OUTPUT
BNC (4),
CH 1/2 to CH 7/8, AES/EBU format, unbalanced

File sharing

SHARE PLAY 1 to 2
RJ-45 (2), Network Interface 10G Copper

Monitoring

NMI MONITOR 1 to 2
RJ-45 (2), Network Interface 1G Copper

MONITOR HD SDI (1.485 Gbps) SMPTE ST 292-1/ BTA-S004B compliant

Reference

REF INPUT BNC (2, including 1 loop through),
75 Ω with terminal switch
HD (tri-level sync)
SD (Black Burst)
NTSC: 0.286 Vpp, 75 Ω
PAL: 0.3 Vpp, 75 Ω

Remote

REMOTE1/2 to REMOTE7/8
RJ-45 (4)

GPIO (25P) 25-pin D-Sub, female (1)

NETWORK1 to 2
RJ-45 (2), 1000BASE-T

MAINTENANCE
USB (1)

NETWORK SFP+ (1)
10GBASE-SR/LR (Add-in Card) [1) 2)]

1) Network card connected to the unit
- Intel Ethernet Converged Network Adapter X520-DA1

For information about network cards, visit the following site.
http://www.intel.com/support/go/network/adapter/userguide.htm

2) Available only when an SFP+ module is installed.

Supplied accessories

Operation Guide (1)
Installation Manual (1)
Operation Manual (CD-ROM) (1)
Cable, RJ45-DSUB
Part No. 1-848-424-12 (SONY) (4)

Optional accessories

Expansion memory board
PWSK-4401 (2 TB)
PWSK-4501 (2 TB)
SDI input/output board
PWSK-4504
BPU Share Play board
PWSK-4505
Media interface board
PWSK-4506F
12G-SDI interface board
PWSK-4508
ST 2110 interface board
PWSK-4509
SFP+ transceiver module
OTM-10GSR1
SFP28 transceiver module
OTM-25GSR1
OTM-25GLR1
4K/HD CUT OUT software
PWSL-HR45
HFR software
PWSL-HF45
ST 2110 SNMP AGENT software
PWSL-SN45
Option codec (Avid DNxHD(R))
PWSL-DH45
Option codec (Apple ProRes)
PWSL-PH45
Power cord

Design and specifications are subject to change without notice.

Notes

- Always make a test recording, and verify that it was recorded successfully.
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2. File obtained by accessing https://<NMI LAN IP address>/osl or https://<ST 2110 IP address>/osl

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