SONY

HD COLOR CORRECTOR BOARD

HKSP-313

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お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

設置や保守，点検，修理などを行う前に，本体（PFV-SPシリーズ）に付属のインストレーションマニュアルおよびオペレーションマニュアルの「安全のために」を必ずお読みください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

INSTALLATION MANUAL
2nd Edition (Revised 1)
Serial No. 10111 and Higher

Purpose of this manual

This manual is an installation manual of HD Color Corrector Board HKSP-313.
This manual is intended for use by trained system and service engineers, and describes information regarding installation.

Related manuals

Besides this installation manual, the following manuals are available for the HKSP-313.

- Maintenance Manual (Available on request)
  This manual describes the information that premises the parts level service (adjustment, parts list, diagrams, etc.). If this manual is required, please contact your local Sony Sales Office/Service Center.
- "Semiconductor Pin Assignments" CD-ROM (Available on request)
  This "Semiconductor Pin Assignments" CD-ROM allows you to search for semiconductors used in B&P Company equipment.
  Part number: 9-968-546-XX

1. Installation

The HKSP-313 is composed of the following items.

- Main board (DPR-215B board)
- Connector board (DIF-137B board)
- Unit label (2pcs)
- Operation guide
- Installation manual

Attaching HKSP-313

The HKSP-313 is designed to be installed and operated in the signal processing unit PFV-SP series.
In accordance with the installation manual of the PFV-SP series, be sure to attach the main board and connector board of the HKSP-313.

Note

This unit uses two slots of PFV-SP series. Remove the two-slot blank panels when installing the connector panel.

Matching connector/cable

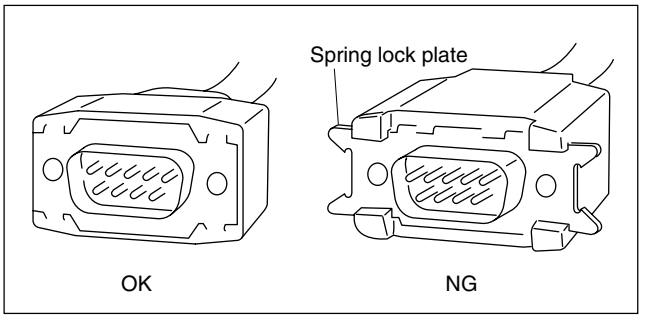
When external cables are connected to the connectors on the connector board, the hardware listed below (or equivalents) must be used.

HD IN, HD OUT, THROUGH OUT
Connector: BNC (75 Ω)/1-569-370-12
Cable: Fujikura 5C-FB cable

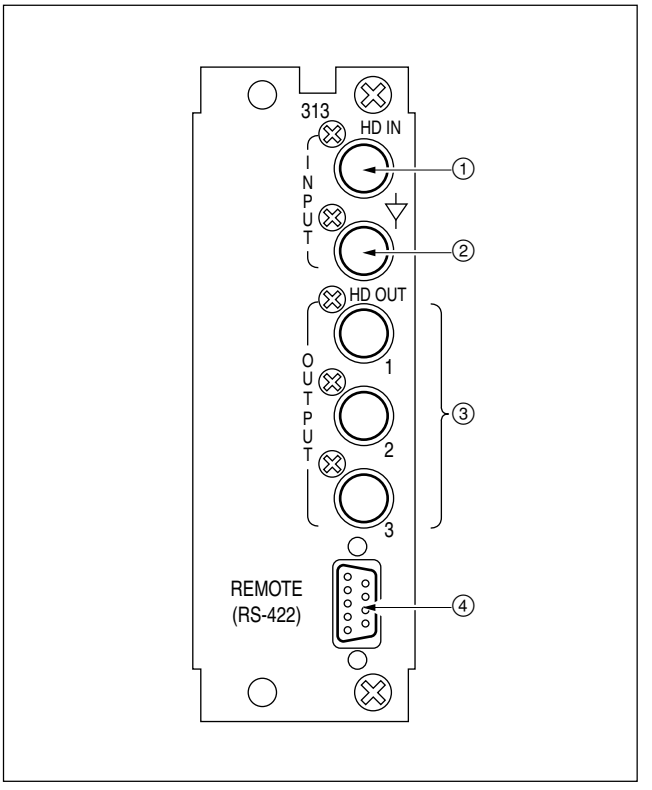
REMOTE
Connector: 9P, Male/1-566-354-XX
Cable: 9P-9P remote control cable
RCC-5G (5 m)
RCC-10G (10 m)
SHELL: Hood for 9 pin/9-885-028-89
DDK Ltd. 17JE-09H-1A or equivalent

Note

Be sure to use the remote control cable RCC-5G/10G without attaching the spring lock plate.



2. Name and Function of Connector



① HD IN (HDTV serial digital video signal input) connector (BNC-type)
This connector inputs a HDTV serial digital video signal.

② HD ACTIVE THROUGH OUT (HDTV serial digital video signal active through output) connector (BNC-type)
This connector outputs an active through signal of the HDTV video signal input to HD IN connector.

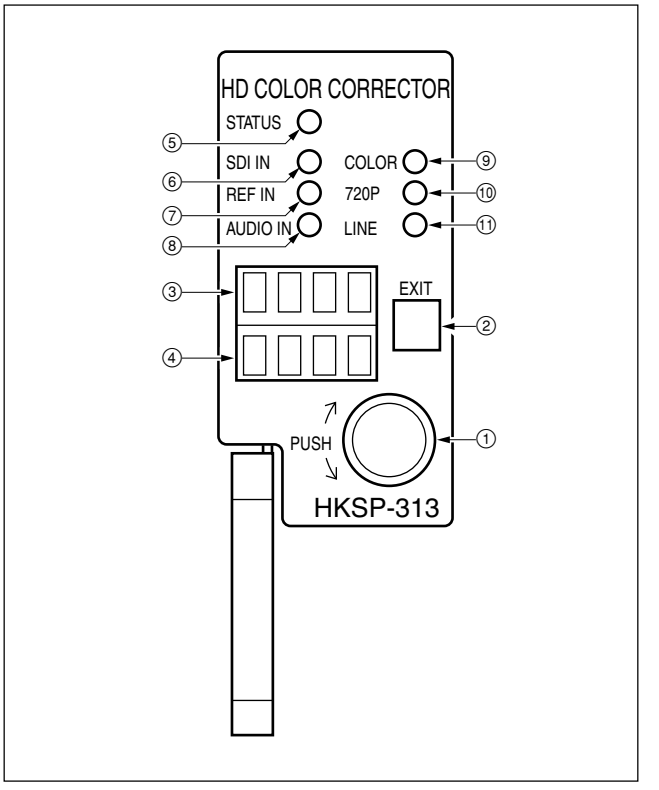
③ HD OUT (HDTV serial digital video signal output) connectors (BNC-type)
The video signal input to the HD IN connector is processed according to the operating mode and then output. The input signal can also be directly output. The same signal is output from connectors 1 and 3.

④ 9PIN/GPI connector (D-sub 9 Pin)
This connector is the input/output connector of an external controls which connecting the HD digital video controller HKDV-900.
Moreover, this connector can also be used as GPI. The selection is performed by the menu of this unit.

3. Name and Function of Switch and Indicator

The switches and indicators on the operation panel and main board (DPR-215B board) are described below.

3-1. Operation Panel



Dial and switch (Refer to Section 5-1-1 for operation.)

No.	Ref. No.	Name	Function
①	EN1 (LED-395B board)	Dial	Selects the setting item and data. Select: Turn the dial. Determine: Press the dial.
②	S1 (LED-395B board)	EXIT key	Returns to the display mode when this switch is pressed in the input mode.

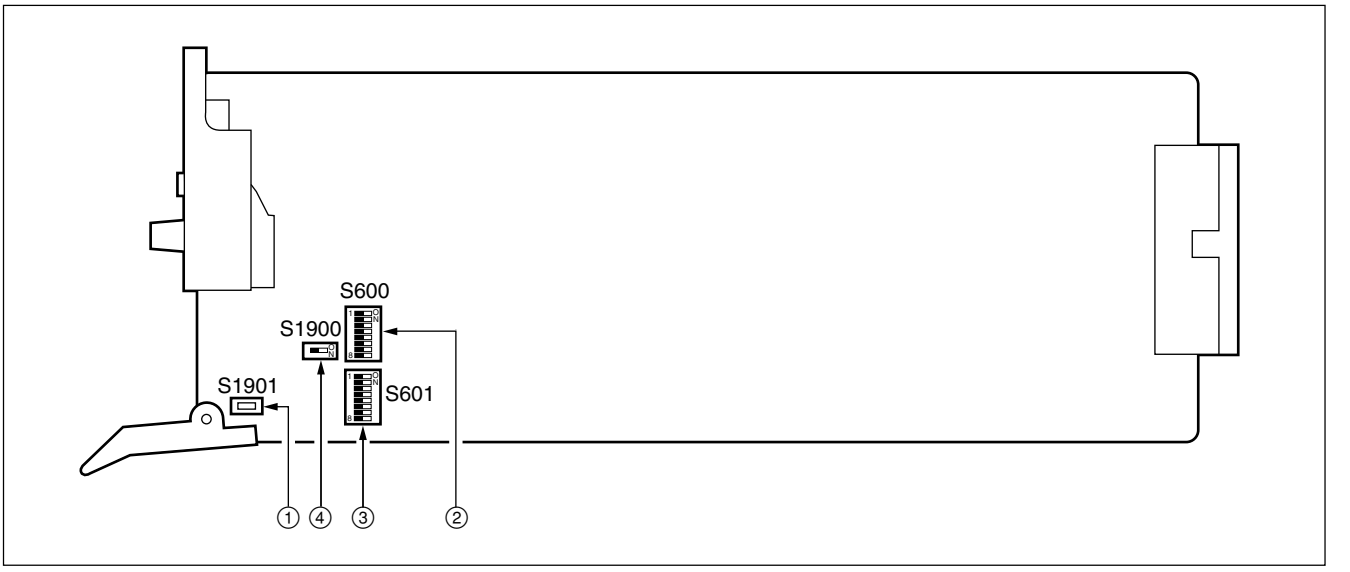
Displays

No.	Ref. No.	Name	Function
③	ND1 (LED-394B board)	Upper Display	Displays the setup and operation data items.
④	ND2 (LED-394B board)	Lower Display	Displays the values of setup and operation data.

Indicators

No.	Ref. No.	Name	Function
⑤	D1 (LED-393B board)	STATUS	Lights in green: Under normal operation Blinks in green: A warning occurs. (Refer to Section 6-1-2.) Blinks in red: An error occurs. (Refer to Section 6-1-1.) Off: The power supply of the main board is abnormal or CPU is not activated. **Note** When an error and warning are occurred simultaneously, error overrides the warning. For details, refer to Sections 5-2 and 6.
⑥	D2 (LED-393B board)	SDI IN	Lights in green: A HDTV SDI video input signal is normal. Lights in red: A HDTV SDI video input signal is abnormal or dose not match with the setting of a format. Off: A HDTV SDI video input signal does not exist.
⑦	D3 (LED-393B board)	REF IN	Lights in green: A selected reference signal is normal. Lights in red: A selected reference signal is abnormal or dose not match with the setting of a format. Off: A selected reference signal does not exist.
⑧	D4 (LED-393B board)	AUDIO IN	Lights in green: An audio input signal is normal. Lights in red: An audio input signal is abnormal. Off: An audio input signal does not exist.
⑨	D6 (LED-393B board)	COLOR	Lights in green: A color corrector mode is selected. Off: Other mode is selected.
⑩	D7 (LED-393B board)	720P	Lights in green: A 720P conversion mode is selected. Off: Other mode is selected.
⑪	D8 (LED-393B board)	LINE	Lights in green: A LINE conversion mode is selected. Off: Other mode is selected.

3-2. Main Board (DPR-215B Board)



Switches (Factory default settings are indicated by a ■ mark.)

No.	Ref. No.	Name	Function
①	S1901	RESET	The DPR-215B board performs the same operation as during the power-on sequence when this switch is pressed. **Note** Do not use during normal operation.
②	S600	STATUS	Status out select switch 1-8 (■ ON) For details about this switch, refer to Section 5-2.
③	S601	TEST	Test switch 1-8 (■ OFF) **Note** Factory use only.
④	S1900	NORM/DOWN	CPU program rewrite switch (■ NORM) **Note** Do not use during normal operation.

4. Operating Function

The HD color corrector board HKSP-313 has a HDTV signal color corrector function as the fundamental function, and in addition, it has an additional function required to handling the HDTV signal.
The HKSP-313 has three modes. These modes can be switched by the front panel etc.

Color corrector mode

The color corrector mode operates in the following formats of HDTV.

1080i/59.94	1080i/50	1080i/60
1035i/59.94	1035i/60	1080p/23.98sF
1080p/24sF	1080p/25sF	1080p/29.97sF
1080p/30sF	720p/59.94	720p/60

In the color corrector function, the color adjustment can be performed in YPbPr, HUE, and RGB.
Moreover, the black clip and white clip can also be adjusted in this mode.
For more details of adjustment, refer to Section 5.

720P conversion mode

The 720P conversion mode has following four modes, and the color corrector mode can also be used at the same time.

1080i/59.94	→	720p/59.94
1080i/60	→	720p/60
720p/59.94	→	1080i/59.94
720p/60	→	1080i/60

LINE conversion mode

The LINE conversion mode has following four modes, and the color corrector mode cannot be used at the same time.

1080i/59.94, 1080i/60	→	1035i/59.94, 1035i/60 Convert
1080i/59.94, 1080i/60	→	1035i/59.94, 1035i/60 Panel
1035i/59.94, 1035i/60	→	1080i/59.94, 1080i/60 Convert
1035i/59.94, 1035i/60	→	1080i/59.94, 1080i/60 Crop

Other functions

- Equipped with active through output.
- Multiplexes the auxilliary data such as VITC and digital super imposed data to HD SDI.
- External sync function
- Sync phase function
- Audio signal can be delayed up to 2 frames.

5. Setting

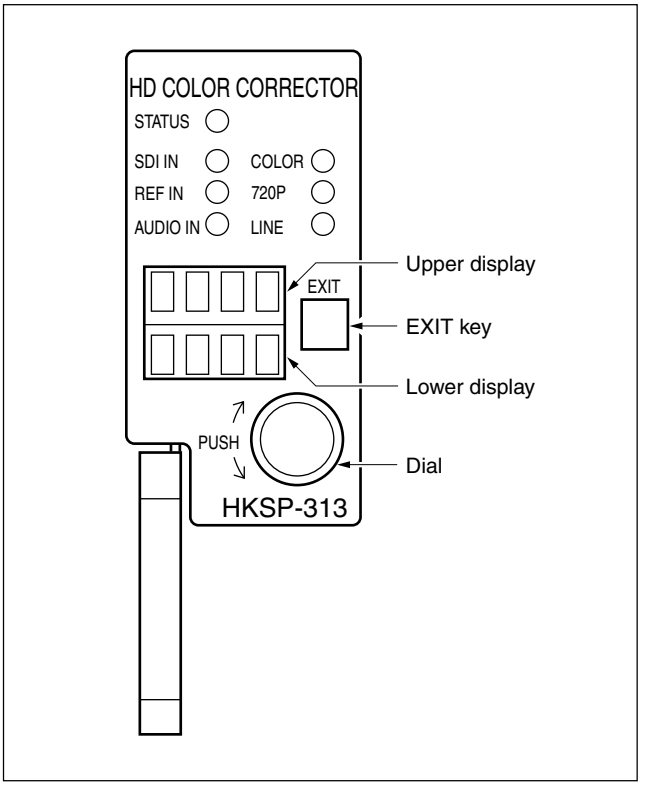
Each item can be set using the operation panel.

The operation of the operation panel and the setting of setup switches on the main board are described below.

The several setting items and operation modes are always stored, so it is not necessary to reset the settings by the POWER ON/OFF etc.

5-1. Setting Using Operation Panel

5-1-1. Operation



Upper Display: Displays the item (menu).
Lower Display: Displays the set value.
Turn the dial clockwise: The item advances.
Turn the dial counterclockwise:
The item returns.
Press the dial: The hierarchy of a menu turns into lower by one.
The set value is determined.
EXIT key: The hierarchy of a menu returns by one.

Note

For the configuration and hierarchy of a menu, refer to Sections “5-1-2. Menu Configuration” and “5-1-3. Menu List”.

Basic operation

1. Turn the dial and select the menu to be set.
2. Press the dial to turns into the lower hierarchy of a menu by one.
3. When it is determined at the bottom of the hierarchy, the display returns to the system menu.

Note

The system automatically returns to the HOME menu mode when, in the input mode, the state of no operation continues over a fixed period of time (about 5 minutes).

Setting example 1 (Without the hierarchy of a menu)

When setting the reference to REF IN A of signal processing unit PFV-SP series

1. Turn the dial to display “REF” on the upper display. The current setting is displayed on the lower display.
2. Press the dial. The lower display turns into the input mode and blinks.
3. Turn the dial to display “REFA” (REF IN A as the reference) and press the dial.
   “REFA” is lit up and returns the display mode, then the reference is set to REF IN A.

Setting example 2 (With the hierarchy of a menu)

When setting the video gain to 90 % in the color corrector mode

1. Turn the dial to display “C/C” on the upper display. The current setting (YPbPr) is displayed on the lower display.
2. Press the dial to turns into the input mode.
3. Turn the dial to display the “HUE”, and press the dial. The menu “VI-G” of the composite video signal is displayed on the upper display. The current setting value (“100 %”) is displayed on the lower display, and its picture is fed out.
4. Press the dial to turns into the input mode.
5. Turn the dial to counterclockwise to display “90 %”. The video gain is set to 90 %.
6. Press the dial once to turn the system into the higher hierarchy by one.
7. Press the EXIT key twice to return the HOME menu.

5-1-2. Menu Configuration

The setting items are classified into three groups.
The current “FMT” of the HOME is displayed when the power is turned on.

- HOME menu
  Group of items that displays the current statuses of MODE and format are contained.
- System menu
  Group of functions (e.g., signal format, default recall) that changes the system setting extensively during the operation are contained.

  Note

  To enter the system menu, press the dial 2 seconds or more in the HOME menu.
- Operation menu
  Group of items (e.g., color corrector function, enhancer function) that changes the setting frequently during the operation are contained.

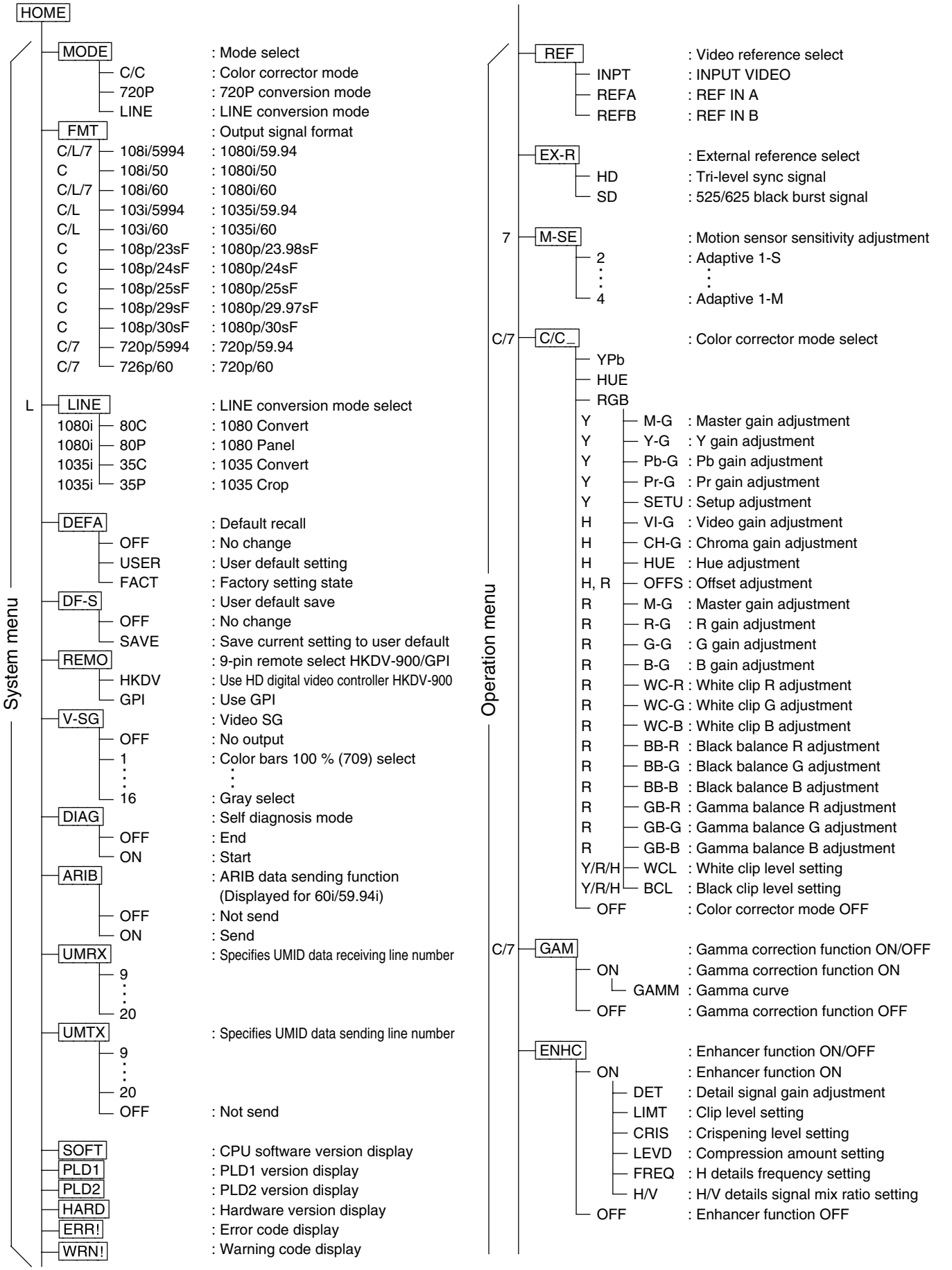
5-1-3. Menu List

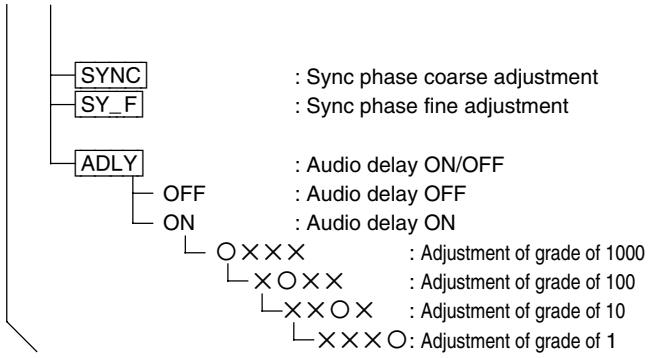
Note

There are some menus that are not displayed according to the operation mode or the setting of the HDTV SDI video signal format.

Note

- Menus for mode
  Menu only for color corrector mode: Displays as “C”.
  Menu only for 720P conversion mode: Displays as “7”.
  Menu only for LINE conversion mode: Displays as “L”.
- Menus for color corrector mode
  Menu for RGB of color corrector mode: Displays as “R”.
  Menu for YPbPr of color corrector mode: Displays as “Y”.
  Menu for HUE of color corrector mode: Displays as “H”.


HOME
System menu
MODE : Mode select
C/C : Color corrector mode
720P : 720P conversion mode
LINE : LINE conversion mode
FMT : Output signal format
C/L/7 108i/5994 : 1080i/59.94
C 108i/50 : 1080i/50
C/L/7 108i/60 : 1080i/60
C/L 103i/5994 : 1035i/59.94
C/L 103i/60 : 1035i/60
C 108p/23sF : 1080p/23.98sF
C 108p/24sF : 1080p/24sF
C 108p/25sF : 1080p/25sF
C 108p/29sF : 1080p/29.97sF
C 108p/30sF : 1080p/30sF
C/7 720p/5994 : 720p/59.94
C/7 726p/60 : 720p/60
L LINE : LINE conversion mode select
1080i 80C : 1080 Convert
1080i 80P : 1080 Panel
1035i 35C : 1035 Convert
1035i 35P : 1035 Crop
DEFA : Default recall
OFF : No change
USER : User default setting
FACT : Factory setting state
DF-S : User default save
OFF : No change
SAVE : Save current setting to user default
REMO : 9-pin remote select HKDV-900/GPI
HKDV : Use HD digital video controller HKDV-900
GPI : Use GPI
V-SG : Video SG
OFF : No output
1 : Color bars 100 % (709) select
16 : Gray select
DIAG : Self diagnosis mode
OFF : End
ON : Start
ARIB : ARIB data sending function
(Displayed for 60i/59.94i)
OFF : Not send
ON : Send
UMRX : Specifies UMID data receiving line number
9
20
UMTX : Specifies UMID data sending line number
9
20
OFF : Not send
SOFT : CPU software version display
PLD1 : PLD1 version display
PLD2 : PLD2 version display
HARD : Hardware version display
ERR! : Error code display
WRN! : Warning code display
Operation menu
REF : Video reference select
INPT : INPUT VIDEO
REFA : REF IN A
REFB : REF IN B
EX-R : External reference select
HD : Tri-level sync signal
SD : 525/625 black burst signal
7 M-SE : Motion sensor sensitivity adjustment
2 : Adaptive 1-S
4 : Adaptive 1-M
C/7 C/C_ : Color corrector mode select
YPb
HUE
RGB
Y M-G : Master gain adjustment
Y Y-G : Y gain adjustment
Y Pb-G : Pb gain adjustment
Y Pr-G : Pr gain adjustment
Y SETU : Setup adjustment
H VI-G : Video gain adjustment
H CH-G : Chroma gain adjustment
H HUE : Hue adjustment
H, R OFFS : Offset adjustment
R M-G : Master gain adjustment
R R-G : R gain adjustment
R G-G : G gain adjustment
R B-G : B gain adjustment
R WC-R : White clip R adjustment
R WC-G : White clip G adjustment
R WC-B : White clip B adjustment
R BB-R : Black balance R adjustment
R BB-G : Black balance G adjustment
R BB-B : Black balance B adjustment
R GB-R : Gamma balance R adjustment
R GB-G : Gamma balance G adjustment
R GB-B : Gamma balance B adjustment
Y/R/H WCL : White clip level setting
Y/R/H BCL : Black clip level setting
OFF : Color corrector mode OFF
C/7 GAM : Gamma correction function ON/OFF
ON : Gamma correction function ON
GAMM : Gamma curve
OFF : Gamma correction function OFF
ENHC : Enhancer function ON/OFF
ON : Enhancer function ON
DET : Detail signal gain adjustment
LIMT : Clip level setting
CRIS : Crispening level setting
LEVD : Compression amount setting
FREQ : H details frequency setting
H/V : H/V details signal mix ratio setting
OFF : Enhancer function OFF


SYNC
: Sync phase coarse adjustment
SY_F
: Sync phase fine adjustment
ADLY
: Audio delay ON/OFF
OFF
: Audio delay OFF
ON
: Audio delay ON
○××× : Adjustment of grade of 1000
×○×× : Adjustment of grade of 100
××○× : Adjustment of grade of 10
×××○ : Adjustment of grade of 1

5-1-4. HOME Menu

Item	Description
HOME	Displays the operation mode (Color corrector mode, 720P conversion mode, or LINE conversion mode) on the upper display. (Displays the contents of the MODE (C/C, 720p, or LINE) in the actual display.) Displays the format on the lower display. (Displays the number of scanning lines and frequency alternately at intervals of 1 second.)

5-1-5. System Menu

Note

To enter the system menu, press the dial in the HOME menu 2 seconds or more.

(Factory default settings are indicated by a ■ mark.)

Item	Description
MODE	Sets the one mode from the three modes, Color corrector mode, 720P conversion mode, and LINE conversion mode. ■ C/C: Color corrector mode 720P: 720P conversion mode LINE: LINE conversion mode

Note

The system delays for each mode are as follows.

	Color corrector		LINE conversion	720P conversion
	Enhancer ON	Enhancer OFF		
Input	1Frame	4 µsec or less	1Frame	1Frame
Ext Ref	1Frame	1Frame	1Frame	1Frame

Notes

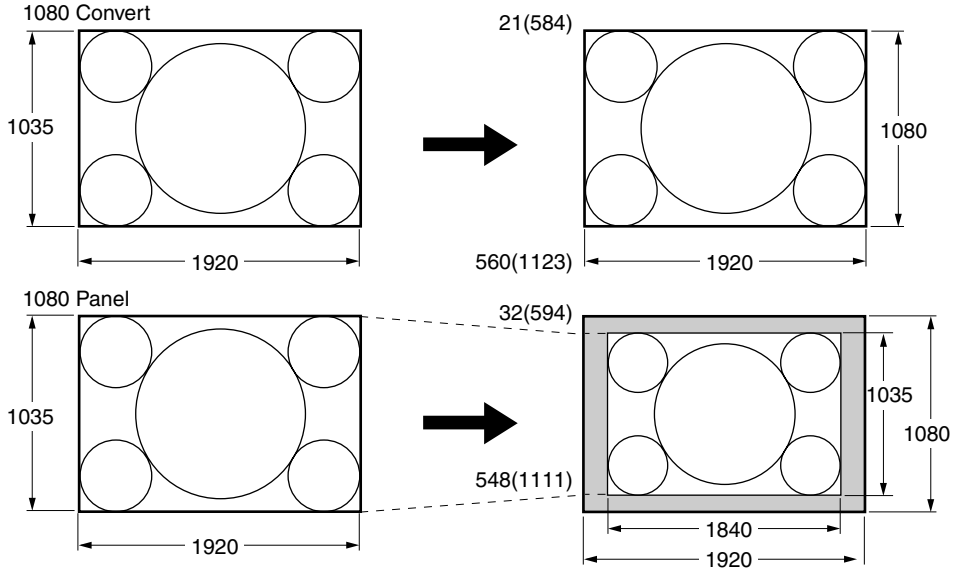
- When changing the mode from/to color corrector mode, 720P conversion mode, and LINE conversion mode, the system will be reset.
  The system will be reset too when changing the internal mode of the LINE conversion mode or 720P conversion mode.
- This unit has not the frame synchronizing function.
  It is necessary to lock the Input signal and External Reference signal, and the phase difference between these signals should be within ±3 msec.

Item	Description
FMT	Selects the output format. The number of scanning lines and frequency is displayed alternately at intervals of 1 second on the lower display. When the dial is pressed, the number of scanning lines is displayed on the upper display, and the frequency is displayed on the lower display, and the format can be selected. **Note** When changing the FMT setting, the system will be reset. Color corrector mode Selects the color corrector mode by MODE, and selects the output format described below by FMT. Display — Output format ■ 108i/5994: — 1080i/59.94 108i/50: — 1080i/50 108i/60: — 1080i/60 103i/5994: — 1035i/59.94 103i/60: — 1035i/60 108p/23sF: — 1080p/23.98sF 108p/24sF: — 1080p/24sF 108p/25sF: — 1080p/25sF 108p/29sF: — 1080p/29.97sF 108p/30sF: — 1080p/30sF 720p/5994: — 720p/59.94 720p/60: — 720p/60 720P conversion mode Selects the 720P conversion mode by MODE, and selects the output format described below by FMT. Display — Input → Output format ■ 108i/5994: — 720p/59.94 → 1080i/59.94 108i/60: — 720p/60 → 1080i/60 720p/5994: — 1080i/59.94 → 720p/59.94 720p/60: — 1080i/60 → 720p/60 LINE conversion mode Selects the LINE conversion mode by MODE, and selects the output format described below by FMT. Display — Output format ■ 108i/5994: — 1080i/59.94 108i/60: — 1080i/60 103i/5994: — 1035i/59.94 103i/60: — 1035i/60

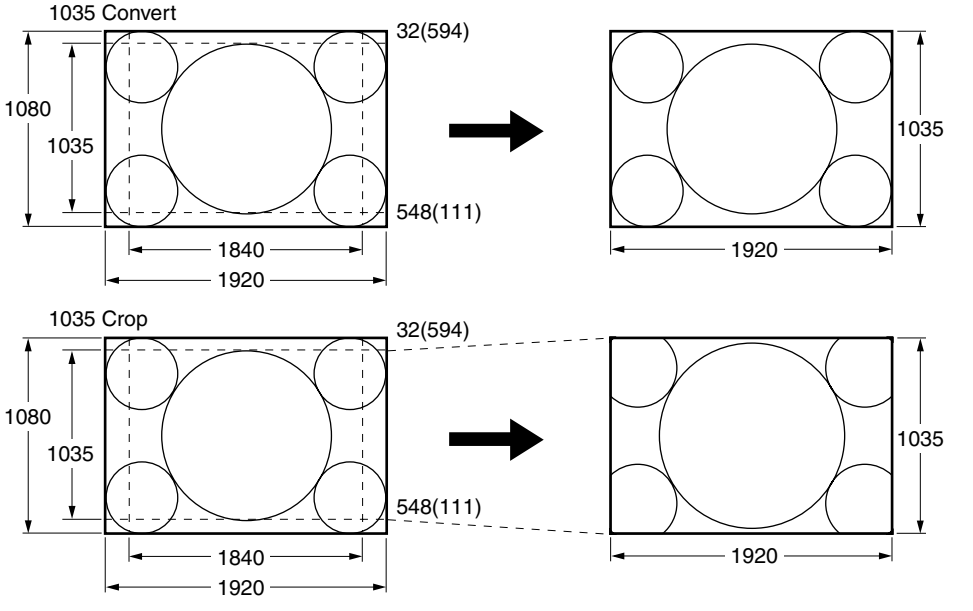
Item	Description
LINE	When selecting the LINE conversion mode by MODE, two kinds of conversion mode can be selected according to the output format selected by FMT. FMT In case the 1080i/59.94 or 1080i/60 is selected: ■ 80C: 1080 convert 80P: 1080 panel FMT In case the 1035i/59.94 or 1035i/60 is selected: ■ 35C: 1035 convert 35P: 1035 crop **Notes** • When changing the setting of LINE, the system will be reset. • When the numbers of LINE are the same between conversion mode and input signal, the LINE conversion is not performed. At this time, the system delay amount does not changed. It is one frame. • When the effective line number of the input signal is changed on the way, the transient noise may be appeared on the picture or audio signal. The color corrector function cannot use during the LINE conversion mode.

(Diagrams of LINE Conversion Mode)

1. 1035 → 1080



2. 1080 → 1035



Item	Description
DEFA	Changes the setting into default setting. ■ _OFF: Not change the setting. USER: Changes the setting into the contents that is saved in DF-S. FACT: Changes the setting into the default settings of the factory shipping state. **Note** If the setting is not saved in DF-S, the default setting of the USER is the same as the factory shipping state.
DF-S	Saves the current setting as the user default. ■ _OFF: Not save the setting SAVE: Saves the setting.
REMO	Selects the 9 pin remote. ■ HKDV: Selects this mode when controlling the unit using a HD digital video controller HKDV-900. GPI: Selects this mode when controlling the unit using GPI. **Notes** • Even if the HKDV-900 is used, the unit can also be controlled by the front panel. • The HD digital video controller HKDV-503 cannot be used. Be sure to use the HKDV-900. • The GPI specification is prepared for the future expansion of the specification, so this function is not mounted now. **Note** The following table shows the functions of the video controller and control function of this unit. The ○ mark means the controllable function. For the items displayed as Enhancer etc. after the ○ mark, these items become controllable by pressing the Enhancer button of the HKDV-900. The × mark means the uncontrollable function.
V-SG	Starts up the VIDEO SG and selects the output signal. ■ OFF: Not output the video signal. (The input video signal is processed and output directly. If no video signal is input, the gray picture is output.) 1: Color Bars 100% (709) 2: Color Bars 75% (709) 3: Vertical Color Bars 100% (709) 4: Vertical Color Bars 75% (709) 5: Ramp 6: Ramp with Chroma 7: 10 steps 8: 5 steps 9: Cross Hatch 10: Dot 11: Box1 12: Box2 13: Vertical Ramp 14: Vertical Ramp with Chroma 15: 100% White 16: Gray

Function	Item	Menu of the unit	HKDV-900
Video/REF select	All	○	×
Motion Detect Select	All	○	×
Color Corrector	YPbPr	○	○ HD (Selectable to RGB)
	HUE	○	○ D2
	RGB	○	○ HD (Selectable to YPbPr)*
	White clip	○	×
	Black clip	○	×
Gamma Correction	All	○	○ Enhancer
Ehnancer	All	○	○ Enhancer
Sync Phase	All	○	○ HD
Audio Delay	All	○	×

*: White clip, black balance, and gamma balance cannot be adjusted for R, G or B respectively.

Item	Description
DIAG	Self diagnosis mode ■ OFF: Ends the self diagnosis mode. ON: Starts the self diagnosis mode. **Note** The DIAG display blinks during self diagnosis mode, and when 60 seconds are left to the end of the self diagnosis, the counts down starts. When the diagnosis is ended, lights up the DIAG display. If the error is not existed, E-OK is displayed on the lower display. If the error is existed, error number is displayed on the lower display. **Note** For details of the diagnosis results, refer to Section “6-2. Self Diagnosis Mode Error Code List”. **Notes** • When the EXIT key is pressed during DIAG, the diagnosis operation is interrupted and ended. • The display during DIAG is controlled normally. • The DIAG operation takes about one minute from a start to an end.
ARIB	Controls the ARIB data sending function. ■ OFF_: Does not send ARIB data. ON__: Sends ARIB data. **Note** This menu is displayed for 60i/59.94i only. Also this menu is not displayed when the ARIB line is specified for the UMID. (The ARIB data sending function is stopped.)
UMRX	Specifies a UMID data receiving line number. Factory setting: 17 Setting range: 9 to 20 **Notes** • UMID line numbers are individually recorded by video format. • Line Nos. 19 and 20 are not displayed when 1035/1080[Tx] ARIB is ON.
UMTX	Specifies a UMID data sending line number. Factory setting: 17 Setting range: 9 to 20 OFF: Does not send UMID data. **Notes** • UMID line numbers are individually recorded by video format. • Line Nos. 19 and 20 are not displayed when 1035/1080[Tx] ARIB is ON.
SOFT	Displays the version of CPU software on the lower display. **Note** There is no hierarchy in this menu. Therefore, even if the dial is pressed, an item does not change.
PLD1	Displays the version of PLD mounted on the main board on the lower display. **Note** There is no hierarchy in this menu. Therefore, even if the dial is pressed, an item does not change.
PLD2	Displays the version of PLD mounted on the connector board on the lower display. **Note** There is no hierarchy in this menu. Therefore, even if the dial is pressed, an item does not change.
HARD	Displays the version of hardware on the lower display. **Note** There is no hierarchy in this menu. Therefore, even if the dial is pressed, an item does not change.
ERR!	Displays the error code generated in this unit. When an error occurs in the error item being selected by STATUS_OUT SW, the error is displayed. When two or more errors occur, an error code is switched at intervals of 1 second, and is displayed. **Note** For details of the error code, refer to Section “6-1-1. Error”.
WRN!	Displays the warning code generated in this unit. When a warning occurs in the warning item being selected by STATUS_OUT SW, the warning is displayed. When two or more warnings occur, a warning code is switched at intervals of 1 second, and is displayed. **Note** For details of the warning code, refer to Section “6-1-2. Warning”.

5-1-6. Operation Menu

(Factory default settings are indicated by a ■ mark.)

Item	Description
REF	Selects the reference of the HD-SDI output signal. ■ INPT: Sets the INPUT VIDEO as the reference. REFA: Sets the REF IN A of the connector board on the PFV-SP series as the reference. REFB: Sets the REF IN B of the connector board on the PFV-SP series as the reference. **Note** This unit has not the frame synchronizing function. Be sure to use the external sync signal synchronized to the input video signal. The phase difference of the external sync signal against the input video signal should be within ±3 msec.
EX-R	Selects the format of the reference input signal. ■ _HD: Tri-level sync signal _SD: 525/625 black burst signal
M-SE	Adjusts the motion sensor sensitivity under 720P conversion mode. (720P conversion mode only) By this sensitivity, the conversion ratio from Frame or Field at the time of conversion can be changed. If a numerical value is enlarged, the sensitivity of motion sensor becomes high. As the result, the portion processed as the animation increases. 2: adaptive1-S ■ 3: adaptive1 4: adaptive1-M
C/C	Selects the system when performing the color correction. The menu displaying by each selection differs. ■ YPb: The color adjustment by YPbPr is possible. M-G: Adjusts the master gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %) Y-G: Adjusts the Y-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %) Pb-G: Adjusts the Pb-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %) Pr-G: Adjusts the Pr-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %) SETU: Adjusts the setup. Factory setting: 0 % Adjusting range: −10 % to +10 % (in units of 0.5 %) WCL: Sets the white clip level. Factory setting: OFF Setting range: 93 % to 108 % (in units of 1 %) BCL: Sets the black clip level. Factory setting: OFF Setting range: −6 % to +7 % (in units of 1 %)

Item	Description
	HUE: The color adjustment by the color specification system of composite is possible. VI-G: Adjusts the video gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	CH-G: Adjusts the chroma gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	HUE: Adjusts the hue. Factory setting: 0.0 ° Adjusting range: −30.0 ° to +30.0 ° (in units of 0.1 °)
	OFFS: Adjusts the offset. Factory setting: 0 % Adjusting range: 10 % to −10 % (in units of 0.5 %)
	WCL: Sets the white clip level. Factory setting: OFF Setting range: 93 % to 108 % (in units of 1 %)
	BCL: Sets the black clip level. Factory setting: OFF Setting range: −6 % to +7 % (in units of 1 %)
	RGB: The color adjustment by RGB is possible. M-G: Adjusts the master gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	R-G: Adjusts the R-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	G-G: Adjusts the G-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	B-G: Adjusts the B-ch gain. Factory setting: 100.0 % Adjusting range: 0.0 to 141.0 % (in units of 0.1 %)
	OFFS: Adjusts the offset. Factory setting: 0 % Adjusting range: 10 % to −10 % (in units of 0.5 %)
	WCL: Sets the white clip level. Factory setting: OFF Setting range: 93 % to 108 % (in units of 1 %) **Note** WC-R/G/B adjustments are effective only when WCL is set to OFF.
	BCL: Sets the black clip level. Factory setting: OFF Setting range: −6 % to +7 % (in units of 1 %) **Note** BB-R/G/B adjustments are effective only when BCL is set to OFF.
	WC-R: Adjusts the R-ch white clip. Factory setting: OFF Setting range: 93 % to 107 % (in units of 3.5 %) **Note** This is adjustable only when GAM (gamma correction) is set to ON and WCL (white clip) is set to OFF.
	WC-G: Adjusts the G-ch white clip. Factory setting: OFF Setting range: 93 % to 107 % (in units of 3.5 %) **Note** This is adjustable only when GAM (gamma correction) is set to ON and WCL (white clip) is set to OFF.

Item	Description
	WC-B: Adjusts the B-ch white clip. Factory setting: OFF Setting range: 93 % to 107 % (in units of 3.5 %) **Note** This is adjustable only when GAM (gamma correction) is set to ON and WCL (white clip) is set to OFF.
	BB-R: Adjusts the R-ch black balance (by adjusting black level with 100 % level unchanged). Factory setting: 0 % Setting range: −10 % to +10 % (in units of 0.5 %) **Note** BB-R is adjustable only when the offset (OFFS) is set to 0 % and BCL (black clip) is set to OFF.
	BB-G: Adjusts the G-ch black balance (by adjusting black level with 100 % level unchanged). Factory setting: 0 % Setting range: −10 % to +10 % (in units of 0.5 %) **Note** BB-R is adjustable only when the offset (OFFS) is set to 0 % and BCL (black clip) is set to OFF.
	BB-B: Adjusts the B-ch black balance (by adjusting black level with 100 % level unchanged). Factory setting: 0 % Setting range: −10 % to +10 % (in units of 0.5 %) **Note** BB-R is adjustable only when the offset (OFFS) is set to 0 % and BCL (black clip) is set to OFF.
	GB-R: Adjusts the R-ch gamma balance. Factory setting: 0.45 Setting range: 0.38 to 0.52 (in units of 0.01) **Note** GB-R is adjustable only when the gamma correction function (GAM) is set to ON.
	GB-G: Adjusts the G-ch gamma balance. Factory setting: 0.45 Setting range: 0.38 to 0.52 (in units of 0.01) **Note** GB-G is adjustable only when the gamma correction function (GAM) is set to ON.
	GB-B: Adjusts the B-ch gamma balance. Factory setting: 0.45 Setting range: 0.38 to 0.52 (in units of 0.01) **Note** GB-B is adjustable only when the gamma correction function (GAM) is set to ON.
	OFF: Sets the color corrector function to OFF.
GAM	Controls the gamma correction function. ON: Sets the gamma correction function to ON. Factory default setting: 0.45 Setting range: 0.38 to 0.52 (in units of 0.01) ■ OFF: Sets the gamma correction function to OFF. **Notes** • This function is effective for the color corrector mode and 720P conversion mode. In the LINE conversion mode, this function cannot be used. • In the gamma correct function, the specifications of both Inv-γ and γ conform to ITU-RBT.709 standard, and the default setting of the γ is ITU-RBT.709.

Item	Description
ENHC	Controls the enhancer function. ON: Sets the enhancer function to ON. **Note** The system delay in the color corrector mode is 4 µsec, but when the enhancer function is turned ON, the system delay is switched to 1 frame forcibly. DET: Increases or decreases the level of the detail signal. The detail is not added on a level “40”, and the detail signal level is maximized on a level “7F”. When decreasing a level from a level “40”, the level decreases, and the detail signal level is minimized on a level “0”. (Detail Gain) Factory setting: 40 Setting range: 0 to 7F (in units of 1) LIMT: Sets the clipped level against the excessive level of the detail signal. (Limitter) Factory setting: 20 Setting range: 0 to 3F (in units of 1) CRIS: Sets the level that adds the crispening to the detail signal. (Crisp) Factory setting: 8 Setting range: 0 to F (in units of 1) LEVD: Sets the compression amount of the detail at the dark level. (Level depend) Factory setting: 8 Setting range: 0 to F (in units of 1) FREQ: Sets the frequency of H detail in the four steps. (Enhancer Frequency) Factory setting: 2 Setting range: 0 to 3 (in units of 1) H/V: Sets the frequency of the mix ratio of the H/V detail signal in the seven steps. (Enhancer Frequency) Factory setting: 3 Setting range: 0 to 7 (in units of 1) ■ OFF: Sets the enhancer function to OFF.
SYNC	Adjusts the sync phase (Coarse). The − means the direction that advances the sync phase, + of no polarity means the direction that delays the sync phase. Variable range: about ±0.5 H Step: 8.6 CK (74 MHz CK), about 116 nsec Factory setting: 0 Setting range: −128 to + 127 (in units of 1) **Note** When the enhancer is set to OFF under the color corrector mode, the system delay is output with minimum value (4 µsec). Then, the adjustment of sync phase (SYNC and SY-F) cannot be performed.
SY-F	Adjusts the sync phase (Fine). Step: about 13.5 nsec. When the setting value exceeds 0 (zero), the sync phase (coarse) is taken up or down one place. Factory setting: 0 Setting range: −0 to 1024 (in units of 8) **Note** When the enhancer is set to OFF under the color corrector mode, the system delay is output with minimum value (4 µsec). Then, the adjustment of sync phase (SYNC and SY-F) cannot be performed.

Item	Description
ADLY	Audio delay adjustment ■ OFF: Delays the audio signal according to the system delay of the video. In the color corrector mode and enhancer is set to OFF: Delays 21 samples (minimum value). Other mode: Delays 1 frame. ON: Delays the audio signal irrespective of the system delay of the video. The audio delay can set up to 21 to 4095 samples (FS). ○××× : The grade of 1000 blinks, and sets the value in the range of 0 to 4. Press the dial to determine the value, and shifts into the grade of 100. ×○×× : The grade of 100 blinks, and sets the value in the range of 0 to 9. Press the dial to determine the value, and shifts into the grade of 10. Shifts the grade of 1000 by pressing the EXIT key. ××○× : The grade of 10 blinks, and sets the value in the range of 0 to 9. Press the dial to determine the value, and shifts into the grade of 1. Shifts the grade of 100 by pressing the EXIT key. ×××○ : The grade of 1 blinks, and sets the value in the range of 0 to 9. Press the dial to determine the value. Shifts the grade of 10 by pressing the EXIT key. **Note** The sample number per 1 Frame differs according to the format. 60 Hz: 1600 samples 59.94 Hz: 1602 samples 24 Hz: 2000 samples 23.97 Hz: 2002 samples

5-2. Setting Using STATUS OUT Switches

The setting using STATUS OUT switches on the main board is described below.

S600 STATUS OUT switch (Factory default settings are indicated by a ■ mark.)

Select whether or not to output a corresponding error/warning by this switch setting.

Switch	Setting item	Function
S600-1 ■ ON	Spare	
S600-2 ■ ON	Mismatch of version	Outputs an error when the hard, or PLD and software are not combined properly.
S600-3 ■ ON	No connector board or different model	Outputs an error when the connector board is not installed, or the different model's is installed.
S600-4 ■ ON	Hardware failure by diagnosis	Outputs an error when a failure is detected by the internal self-diagnosis at the time of starting.
S600-5 ■ ON	Input signal abnormal (Reference)	Outputs a warning when a reference input signal is abnormal.
S600-6 ■ ON	Input signal abnormal (Audio)	Outputs a warning when an audio input signal is abnormal.
S600-7 ■ ON	Input signal abnormal (Video)	Outputs a warning when a video input signal is abnormal.
S600-8 ■ ON	No signal input	Outputs a warning when no video or audio signal input.

Note

All switches are set to ON at the factory shipping state. Therefore, if you want to disable the error/warning output, turn OFF the corresponding switch.

6. Error/Warning

In this unit, the operations below are performed when an error or warning occurs.

- The output signal at pin 4 (BOARD ERROR OUT) or pin 5 (BOARD WARNING OUT) of the STATUS OUT connector on the connector panel of signal processing unit PFV-SP series becomes active.
- The STATUS indicator on the operation panel blinks in red (error) or blinks in green (warning).
- A code appears on the lower display of the operation panel.

6-1. Error/Warning Code List

6-1-1. Error

Error code	Contents of error
- - -	No error exists.
1-01	Internal hardware failure (SYS I/F bus connection check at the time of starting)
1-02	Spare
2-01	A connector board (DIF board) is not installed.
2-02	A connector board of the different model is installed.
2-10	Hardware and software are not combined properly.

6-1-2. Warning

Warning code	Contents of warning
- - -	No warning exists.
1-01	No reference signal input exists.
1-02	Not locks to the reference signal.
2-01	No HDTV SDI video input signal exists.
2-02	The format of a HDTV SDI video input signal does not match with the setting of format.
2-03	A HDTV SDI video input signal is abnormal.
2-04	An audio signal input is abnormal.

6-2. Self-diagnosis Mode Error Code List

Error code	Contents of error
E-OK	No error exists.
E-01	PLD1 (IC2009) system control malfunction defect
E-02	PLD2 (IC701) system control malfunction defect
E-03	NVRAM (IC2016) system control malfunction defect
E-04	COPRO1 (IC108) system control malfunction defect
E-05	VSP (IC905) system control malfunction defect
E-06	VFS (IC1103) system control malfunction defect
E-07	COPRO2 (IC1403) system control malfunction defect
E-08	TG (IC1600) system control malfunction defect
E-09	SDI input presence or absence check
E-10	COPRO1 (IC108) input data is abnormal.
E-11	VSP (IC905) input data is abnormal.
E-12	VFS (IC1103) input data is abnormal.
E-13	COPRO2 (IC1403) input data is abnormal.
E-14	TG (IC1600) malfunction defect

7. Bypass Output

When the main board (DPR-215B board) is not installed, an HDTV SDI video input signal is output to the HD OUT connectors directly.

Note

In bypass mode, signal processing becomes disabled, then the SDI input signal is bypassed and is output directly.

8. Specifications

General

Function guaranteed temperature	+5 ˚C to +40 ˚C
Storage temperature	−20 ˚C to +60 ˚C
Operating humidity	10 % to 90 % (Non-condensing)
Maximum outer dimensions (Width (W)/height (H)/depth (D))	Main board: 398 × 119 × 18 mm Connector board: 153 × 130 × 39 mm
Mass	Main board: Approx. 550 g Connector board: Approx. 210 g
Power requirements	+12 V dc: 1.9 A or less
Power consumption	23 W

Input/Output

HD IN (BNC type) (1)	HDTV SDI signal (Conforms to SMPTE 291M/292M/299M)
Level	0.8 V p-p ±10 %
Input impedance	75 Ω, unbalanced
Input return loss	15 dB or more (5 MHz to 1.485 GHz)
Signal transmission distance	100 m (when using a 5C-FB coaxial cable)
HD OUT (BNC type) (3)	HDTV SDI signal (Conforms to SMPTE 291M/292M/299M)
Output amplitude	0.8 V p-p ±10 %
Output impedance	75 Ω, unbalanced
Output return loss	15 dB or more (5 MHz to 1.485 GHz)
SYSTEM DELAY	4 µs (at enhancer is set to OFF in color corrector mode) 1 Frame (at other mode)
ACTIVE THROUGH OUT (BNC type) (1)	HDTV SDI signal (Conforms to SMPTE 291M/292M/299M)
Output amplitude	0.8 V p-p ±10 %
Output impedance	75 Ω, unbalanced
Output return loss	15 dB or more (5 MHz to 1.485 GHz)
REMOTE IN (D-sub 9 Pin, Female) (1)	Remote controller signal Connectable remote controller HD digital video controller HKDV-900

HKSP-313 (SY) J, E
3-690-410-12

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