

Leader

LV 5490 / LV 5480 MULTI WAVEFORM MONITOR

LV 5490SER01	SDI INPUT
LV 5490SER02	SDI INPUT / EYE
LV 5490SER03	DIGITAL AUDIO Dolby (Option)
LV 5490SER04	FOCUS ASSIST
LV 5490SER05	CIE DIAGRAM
LV 5490SER06	12G-SDI INPUT
LV 5490SER07	HDR
LV 5490SER08	IP (NMI)
LV 5490SER09	12G-SDI EYE
LV 5490SER10	VIDEO NOISE METER
LV 5480SER20	4K
LV 5480SER21	TSG

Instruction Manual

Thank you for purchasing.

Please carefully read this instruction manual and the included "GENERAL SAFETY SUMMARY".
Please use the product safely.

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GENERAL SAFETY SUMMARY

■ Read This before Using the Instrument

This instrument should only be used by persons with sufficient knowledge of electronics who thoroughly understand the contents of this manual.

This instrument is not designed or manufactured for households or ordinary consumers.

If unqualified personnel are to use the instrument, be sure the instrument is handled under the supervision of qualified personnel (those who have electrical knowledge). This is to prevent the possibility of personal injury or damage to the instrument.

■ Note about Reading This Manual

The contents of this manual contain specialized terminology and may be difficult to understand. If you have any questions about the contents of this manual, please contact your local LEADER agent.

■ Symbols and Terms

The following symbols and terms are used in this instruction manual and on the instrument to indicate important warnings and notes.

<Symbol> 	This symbol appears in this instruction manual and on the instrument to indicate an area where improper handling could result in personal injury, damage to the instrument, or malfunction of the instrument or devices connected to it. When you encounter this symbol on the instrument, be sure to refer to the information in this instruction manual that corresponds to the area that the symbol marks.
<Term> 	Ignoring the precautions that this term indicates could lead to death or serious injury.
<Term> 	Ignoring the precautions that this term indicates could lead to personal injury or damage to the instrument.

GENERAL SAFETY SUMMARY

Read the warnings and information below thoroughly to avoid death, personal injury, and damage and deterioration of the instrument.



■ Warnings Concerning the Case and Panels

Do not remove the instrument's case or panels for any reason. Touching the internal components of the instrument could lead to fire or electric shock.

Also, do not allow foreign materials, such as liquids, combustible matter, and metal, to enter the instrument. Turning the instrument on when such materials are inside it could lead to fire, electric shock, damage to the instrument, or some other accident.

■ Installation Environment

• Operating Temperature Range

Use this instrument in a 0 to 40 °C environment. Using the instrument with its vents blocked or in a high temperature environment could lead to fire.

Drastic changes in temperature, such as might be caused by moving the instrument between two rooms with different temperatures, can damage the instrument by causing condensation to form within it. If there is a possibility that the instrument has condensation within it, wait for approximately 30 minutes before turning on the power.

• Operating Humidity Range

Use this instrument in an environment whose relative humidity is 85 %RH or less where there is no threat of condensation forming.

Also, do not operate this instrument with wet hands. Doing so could lead to electric shock or fire.

• Do Not Operate in an Explosive Atmosphere

Using this instrument in an environment where flammable gasses, explosive gasses, or steam is emitted or stored could lead to an explosion or fire. Do not use the instrument in such an environment.

• Do Not Insert Foreign Materials

Do not insert foreign materials, such as metal and flammable objects, through the vents or allow liquid to enter the instrument. Such acts can lead to fire, electric shock, damage to the instrument, or some other accident.

■ If You Notice Something Wrong during Operation

If you notice smoke, fire, a strange smell, or something else that is wrong with the instrument while you are operating it, stop operation immediately. Failing to do so could lead to fire. Turn OFF the power switch, and remove the power cord from the outlet. After making sure that fire has not spread anywhere, contact your local LEADER agent.

GENERAL SAFETY SUMMARY



WARNING

■ Warnings Concerning the Power Source

Do not use a power source with a voltage other than the rated power source voltage for the instrument. Doing so could lead to fire.

Confirm the voltage of the power source before you connect the power cord to it.

Only use a power source whose frequency is 50/60 Hz.

Use a power cord that is appropriate for the voltage of the power source. Also, use a power cord that meets the safety standards of the country that you are using it in.

Using a power cord that does not meet the standards could lead to fire. If the power cord is damaged, stop using it, and contact your local LEADER agent. Using a damaged power cord could lead to electrical shock or fire.

When removing the power cord from the power outlet, do not pull on the cord. Pull from the plug.

■ Warnings Concerning Grounding

The instrument has a ground terminal to protect the user and the instrument from electric shock. Ensure that the product is properly grounded for safe operation.

■ Warnings Concerning the Panel

Sections of the panel are made out of glass. If the glass breaks, the broken glass may lead to injury. Do not apply a strong shock to the panel, cut it with sharp metal, or damage it in any similar manner.



CAUTION

■ Cautions Concerning the Input and Output Connectors

To avoid damaging the instrument, only apply signals to the input connectors that conform to the specifications in this instruction manual. Do not short or apply external voltage to the output connectors. Doing so could damage the instrument.

■ Cautions Concerning the Ethernet Port

When you are connecting the instrument to the communication provider's equipment, connect to the Ethernet port through a hub that is authorized for use in the country that you are using the instrument in.

GENERAL SAFETY SUMMARY

■ Calibration and Repairs

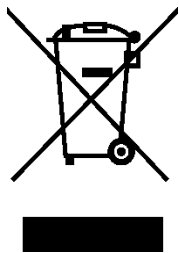
This instrument has been carefully examined at the factory to ensure that its performance is in accordance with the standards. However, because of factors such as parts wearing out over time, the performance of the instrument may degrade. To ensure stable performance, we recommend that you have the instrument calibrated regularly. Also, if the instrument malfunctions, repairs are necessary. For repairs and calibration, contact your local LEADER agent.

■ Routine Maintenance

When you clean the instrument, remove the power plug from the outlet.

Do not use thinner or benzene when you clean the instrument's case, panels, or knobs. Doing so could lead to paint chipping and the corrosion of plastic components. To clean the case, panels, and knobs, use a soft cloth with mild detergent, and wipe gently. While cleaning, make sure that foreign materials, such as water and detergent, do not enter the product. If liquid or a metal object enters into the instrument, fire or electric shock may result.

■ About the European WEEE Directive



This instrument and its accessories are subject to the European WEEE Directive. Follow the applicable regulations of your country or region when discarding this instrument or its accessories. Follow the EU Battery Directive when discarding the batteries that you removed from this instrument.
(WEEE stands for Waste Electrical and Electronic Equipment.)

Follow the warnings and precautions that have been listed in this section to use the instrument correctly and safely. Precautions are also contained in various other sections of this instruction manual. To use the instrument correctly, be sure to follow those precautions as well.

If you have any questions or comments about this instruction manual, please contact your local LEADER agent.

1. INTRODUCTION

Thank you for purchasing this LEADER instrument. To use this instrument safely, read this instruction manual thoroughly, and make sure that you know how to use the instrument properly.

If some point about the operation of this instrument is still unclear after you have read this instruction manual, refer to the contact information on the back cover of the manual to contact LEADER, or contact your local LEADER agent.

After you have finished reading this manual, keep it in a convenient place so that you can refer to it when necessary.

1.1 Scope of Warranty

This LEADER instrument has been manufactured under the strictest quality control guidelines. LEADER shall not be obligated to furnish the following free services during the warranty period.

1. Repair of malfunction or damages resulting from fire, natural calamity, or improper voltage applied by the user.
2. Repair of a product that has been improperly repaired, adjusted, or modified by personnel other than a factory-trained LEADER representative.
3. Repair of malfunctions or damages resulting from improper use.
4. Repair of malfunctions caused by devices other than this instrument.
5. Repair of malfunctions or damages without the presentation of a proof of purchase or receipt bill for the instrument.

1. INTRODUCTION

1.2 Operating Precautions

1.2.1 Maximum Allowable Input Voltage



The maximum signal voltage that can be applied to the input connectors is indicated below. Do not apply excessive voltage to the connectors. Doing so may damage the device or lead to injury.

Table 1-1 Maximum allowable input voltage

	Input Connector	Maximum Allowable Input Voltage
LV 5490	EXT REF	± 5 V (DC + peak AC)
	REMOTE	0 to +5 V
SER01	SDI INPUT	± 2 V (DC + peak AC)
SER02	SDI INPUT (1A to 1D)	0 to +12 V (DC), ± 1 V (AC)
	SDI INPUT (2A to 2D)	± 2 V (DC + peak AC)
SER03	DIGITAL AUDIO INPUT	± 5 V (DC + peak AC)
SER06	12G-SDI INPUT (1A to 1D)	± 2 V (DC + peak AC)
	3G-SDI INPUT (2A to 2D)	
SER08	12G-SDI INPUT (1A to 1D)	± 2 V (DC + peak AC)
	3G-SDI INPUT (2A to 2D)	

1.2.2 Mechanical Shock

This instrument contains sensitive components, so it may be damaged if it is dropped or otherwise exposed to a strong shock.

1.2.3 Electrostatic Damage

Electronic components can be damaged by static discharge. Static electricity can build up in the core wire of a coaxial cable. Before connecting a coaxial cable to the instrument, short the core wire of the cable with the external conductor.

1.2.4 Warming Up

To ensure more accurate measurements, turn ON the instrument approximately 30 minutes before you intend to use it to allow its internal temperature to stabilize.

1.2.5 About Standby Mode

Even if you press the power switch to turn off this instrument, the instrument remains in standby mode as long as the power cord is connected to the outlet. In standby mode, some of the internal circuits operate and may generate heat. Unless necessary, keep the power cord disconnected from the outlet.

1. INTRODUCTION

1.2.6 Backup

This instrument has a last-memory feature. When you turn the power on, the instrument starts with the panel settings that were in use the last time that it was turned off. If the backup battery is out of power, the message “The last memory feature is disabled.” will appear, and this last-memory feature will no longer work.

To continually use the last-memory feature, we recommend that you replace the backup battery with a new one every five years after you purchase the instrument. You cannot replace the backup battery yourself. For details, contact your nearest LEADER agent.

1.2.7 About the LCD Panel

There may be a small number of pixels in the LCD panel that do not light or are always on. Note that this is not a malfunction.

The LCD panel supports a large number of video signals. SDI input signals are displayed asynchronously on the LCD. Therefore, images may appear to flicker on the waveform and picture displays.

In addition, the input SDI signal is temporarily stored in frame memory and is loaded by using the LCD display synchronization signal—which is not synchronized with the input SDI signal. Therefore, because frame skip—which skips over frames in the memory—and frame repeat—which reads the same frames of the memory twice—occur, the image may appear to flicker.

(An external sync signal can be used to synchronize the LCD to the input signal.)

1.3 About Trademarks and Licenses

The company and product names in this document are trademarks or registered trademarks of their respective holders.

1.4 About Terminology Used in this Manual

● SER**

LV 5490SER** is referred to as SER**.

● Single Input Mode

This refers to the mode in which on the INPUT menu, **F•7** DISPLAY is set to SINGLE. It is a mode for measuring a single input signal.

● Simul Mode

This refers to the mode in which on the INPUT menu, **F•7** DISPLAY is set to SIMUL. It is a mode for measuring multiple input signals simultaneously.

● Multi Display

This refers to the mode in which the MULTI key is on.

● About Underlining (_)

Underlined options indicate the default values.

● Input Formats and Link Systems

The following names are used for the input formats and link systems.

Multi link may be used as a collective term to refer to dual link and quad link.

Table 1-2 Input formats and link systems

Name	Description	Link System
SD	SD-SDI	Single link
HD	HD-SDI	Single link
3G-A	3G-SDI level A	Single link
3G-B-DL	3G-SDI level B dual link mapping	Single link
3G-B-DS	3G-SDI level B dual stream mapping	Single link
12G	12G-SDI TYPE 1	Single link
HD (DL)	HD-SDI dual link	Dual Link
HD (QL)	HD-SDI quad link	Quad link
3G (DL)-2K	3G-A, 3G-B-DL dual link Resolution 1920(2048)×1080	Dual Link
3G (DL)-4K	3G-B-DS dual link Resolution 3840(4096)×2160	Dual Link
3G (QL)	3G-A, 3G-B-DL quad link	Quad link
3G	Collective name for 3G links	-
3G-B	Collective name for 3G-B-DL and 3G-B-DS	-
3G (DL)	Collective name for 3G (DL)-2K and 3G (DL)-4K	-
4K	Collective name for HD (QL), 3G (DL)-4K, 3G (QL) and 12G	-

1. INTRODUCTION

1.5 About the LV 5480

This manual explains the LV 5490.

If you are using the LV 5480, refer to the LV 5490 vs. LV 5480 comparison table below, and read LV 5490 as LV 5480 in this manual.

Table 1-3 LV 5490 vs. LV 5480 comparison

Item	LV 5490	LV 5480
Supported units	LV 5490SER01 LV 5490SER02 LV 5490SER03 LV 5490SER06 LV 5490SER08	LV 5490SER01 LV 5490SER02 LV 5490SER03 LV 5490SER06 (*1) LV 5490SER08 (*1)
Supported options	LV 5490SER04 LV 5490SER05 LV 5490SER07 LV 5490SER09 (*2) LV 5490SER10	LV 5490SER04 LV 5490SER05 LV 5490SER07 LV 5490SER09 (*2) LV 5490SER10 LV 5480SER20 LV 5480SER21
4K function	Standard support	Supported with LV 5480SER20 (*3)
Signal generation function	Standard support	Supported with LV 5480SER21 (*4)
USB save destination folder name	LV5490_USER	LV5480_USER
TELNET login and password	LV5490	LV5480
FTP login and password	LV5490	LV5480
SNMP MIB file name	lv5490.my	lv5490.my (*5)

*1 The LV 5480SER20 must be installed to install the LV 5490SER06 or LV 5490SER08.

*2 The LV 5490SER06 must be installed, to install LV 5490SER09.

*3 Installing the LV 5480SER20 enables you to select 4K 3G Quad Link, 4K 3G Dual Link, and 4K HD Quad Link for SDI System on the SDI IN tab.

*4 Installing the LV 5480SER21 enables you to select Test Signal for Mode on the SDI OUT tab.

*5 The MIB file is shared with the LV 5490, but the SNMP manager detects it as "LV5480." The other aspects of the SNMP function are the same as those of the LV 5490.

2. Product Configuration

2.1 Lineup

LV 5490 MULTI WAVEFORM MONITOR Built-in LCD Multi Waveform Monitor

2.2 About Units

This instrument only functions as a measuring instrument after at least one unit is installed. To replace or add a unit, contact your local LEADER agent. You cannot install or uninstall units.

Table 2-1 Unit types

Unit	Name	Main Function
LV 5490SER01	SDI INPUT	SDI signal measurement
LV 5490SER02	SDI INPUT / EYE	SDI signal measurement and eye pattern display
LV 5490SER03	DIGITAL AUDIO	Embedded audio signal measurement External Audio Signal Measurement Dolby signal measurement (option)
LV 5490SER06	12G-SDI INPUT	12G SDI signal measurement
LV 5490SER08	IP(NMI)	IP(NMI), 12G SDI signal measurement

* The LV 5490 requires an LV 5490SER01, LV 5490SER02, LV 5490SER06, or LV 5490SER08 to be installed. These units cannot be installed simultaneously.

2.3 About Options

The following options (sold separately) can be installed in the LV 5490.

If you want to obtain an option, provide your local LEADER agent with the LV 5490's MAC address (see the LICENSE tab) and serial number (see the rear panel). We will issue a license key.

When you receive the license key, install the option by referring to section 7.4, "Installing Options." Each LV 5490 requires a unique license key. You cannot use the same key for multiple instruments.

Table 2-2 Types of options

Option	Name	Main Function
LV 5490SER04	FOCUS ASSIST	Assists focusing
LV 5490SER05	CIE DIAGRAM	Displays CIE chromaticity diagrams
LV 5490SER07	HDR	HDR signal measurement
LV 5490SER09	12G-SDI EYE	Eye pattern display of 12G SDI signal

3. SPECIFICATIONS

3.1 General

The LV 5490 is a multi waveform monitor that supports 4K video formats. It can receive four 12G-SDI signals by switching. It can also receive up to four signals up to 3G-SDI simultaneously, and up to eight signals can be displayed by switching. For 4K video formats, 12G-SDI single link, 3G-SDI dual link, and quad link, HD-SDI quad link, IP(NMI) are supported.

The display is a 9-inch full high definition LCD enabling the LV 5490 to also be used as a high-quality picture monitor. In addition, the LV 5490 is equipped with SDI and DVI-D output connectors. The content shown on the LV 5490 display can be output to an external full high definition monitor.

The display incorporates a new free layout technology that allows the size and position of the display layout to be customized with a mouse to suit your application.

The following units and options are available. You can combine them to suit your application.

LV 5490SER01 (SDI INPUT):	SDI input (*1)
LV 5490SER02 (SDI INPUT / EYE):	SDI input with eye pattern (*1)
LV 5490SER03 (DIGITAL AUDIO):	Digital audio I/O
LV 5490SER06 (12G-SDI INPUT):	12G SDI input (*1)
LV 5490SER08 (IP(NMI)):	IP(NMI) input (*1)
LV 5490SER04 (FOCUS ASSIST):	Focus assist
LV 5490SER05 (CIE DIAGRAM):	CIE diagram
LV 5490SER07 (HDR):	High dynamic range
LV 5490SER09 (12G-SDI EYE):	12G SDI eye pattern (*2)
LV 5490SER10 (VIDEO NOISE METER):	Video noise meter

*1 The LV 5490 requires an LV 5490SER01, LV 5490SER02, LV 5490SER06, or LV 5490SER08 to be installed. These units cannot be installed simultaneously.

*2 The LV 5490SER06 must be installed, to install LV 5490SER09.

3. SPECIFICATIONS

3.2 Features

- 4K Video Format

The LV 5490 supports 4K video formats (4096×2160 and 3840×2160) based on 12G single link, 3G dual link and quad link and HD quad link.

Up to four 12G single link or 3G dual link 4K video signals can be displayed by switching.

Up to two 3G quad link or HD quad link 4K video signals can be displayed by switching.

In addition, IP (NMI) supports video signals in 4K video format (3840×2160). If 4K video is input into IP (NMI), only one input is displayed.

- Full High Definition LCD

The LV 5490 is equipped with a 9-inch LCD with excellent viewing angle and color reproducibility. It can also be used as a high-quality high definition picture monitor.

- Free Layout

The LV 5490 can display not only the video signal waveform, vector waveform, picture, and the like of an input SDI signal simultaneously, but it can also display multiple input signals simultaneously and overlay them for comparison. The measurement screens can be adjusted in size and position as you like.

Different layout configurations can be achieved simply by using the mouse.

- Eight Inputs and Simultaneous Four Input Display

The LV 5490 has four SDI input connectors compatible with 3G, HD, and SD and can display up to four SDI input signals simultaneously. It also has four additional SDI I/O connectors. (*1) If these connectors are used as inputs, the LV 5490 can receive up to eight SDI input signals.

*1 For the I/O connectors, the maximum length of 5C2V cables that SD signals can be received is 100 meters. See section 5.7.1, "SDI Signal I/O."

- Up to Four 12G-SDI Inputs and Reclock Output (SER06/SER08)

The LV 5490 has four SDI input connectors compatible with 12G and can display the SDI signal of one of these inputs by switching. Further, it also provides reclock output of the displayed 12G-SDI signal.

- Equivalent Cable Length Measurement (SER01/SER02)

The four SDI input connectors are equipped with an equivalent cable length measurement function. This function displays SDI signal attenuation in terms of a coaxial cable length, which can be used to check the margin that the system has.

- Pattern Generator Function and Reclock Output

By using the four SDI I/O connectors as outputs, you can use them as reclock outputs of the SDI signals received through the SDI input connectors. They can also be used as outputs for generating patterns such as color bars with embedded audio. In pattern output, the phase of each SDI output can be varied up to ± 0.5 lines or $\pm 1/2$ frames. This feature can be used to check the system's phase margin.

3. SPECIFICATIONS

- External Monitor Output and SDI Routing

The measurement screen can be output in SDI or DVI-D from the monitor output connector. The output signal can be displayed on an external LCD in full high definition resolution. In addition, an SDI signal received through one of the SDI input or SDI I/O connectors can be reclocked and output, serving as a routing function. (excluding 12G-SDI)

- USB Mouse Operation

A USB mouse can be used to operate the panel. If the measurement screen is displayed on an external monitor in SDI or DVI-D, you can control the LV 5490 by using a USB mouse while viewing the external monitor.

- SDI Signal Analysis

On the status display, SDI signal transmission errors and various errors related to the embedded audio signal, ancillary data, and video data can be detected.

It also has event log, data dump, phase difference measurement features, and lip sync measurement (SER03) enabling you to perform detailed SDI signal analysis.

- Screen Capture

The LV 5490 is equipped with a screen capture feature, which captures the entire display as still-image data. Not only can captured data be displayed by the LV 5490, but it can also be compared with an input signal or saved to a USB memory device as bitmap data for viewing on a PC.

- Frame Capture

The LV 5490 is equipped with a frame capture feature, which captures single frames in an SDI signal. Frames can be captured manually or automatically when errors occur.

- Time Code Display

The LV 5490 can display the LTC or VITC that is embedded in an SDI signal and the D-VITC of an SD signal. The timecode can also be used for time stamps in the event log.

- External Remote Connector

The remote control connector can be used to load presets, switch the input signal, and transmit alarms.

- Ethernet Port

By connecting the Ethernet interface to a PC, you can control the LV 5490 remotely over TELNET, transfer files over FTP, control the LV 5490 remotely and detect errors over SNMP, and control the LV 5490 over HTTP (to be supported in the future). You can also connect to the separately-sold LV 5490-01 (REMOTECONTROLLER).

- Eye Pattern Display (SER02/SER09)

This feature can display eye pattern waveforms and jitter waveforms of SDI signals as well as measurement results of various parameters. The feature displays the information of the SDI signals received through the four SDI input connectors, one input at a time.

3. SPECIFICATIONS

- Embedded Audio Display (SER03)

Embedded audio can be separated from the SDI signal and shown in Lissajous, surround, and meter displays. Other types of analysis displays are also available. 16 channels of one SDI signal or 4 channels of four SDI signals can be displayed simultaneously.

- Digital Audio I/O (SER03)

The digital Audio I/O option has eight digital I/O connectors. Switching between input and output is possible in groups of four connectors (eight channels).

When used as inputs, digital audio can be shown in Lissajous, surround, and meter displays. Other types of analysis displays are also available.

When used as outputs, embedded audio is separated from SDI signals and output as digital audio signals.

- Dolby Option (SER03)

When the Dolby option is added, the Dolby audio signal in the embedded audio or digital audio signal can be decoded and displayed.

Dolby E, Dolby Digital, and Dolby Digital Plus are supported.

- Focus Assist (SER04)

A new focusing algorithm based on nonlinear super-resolution technology has been developed, allowing highly sensitive focusing even on low-contrast images that were difficult to be focused in on in the past. You can select the sensitivity from the five available levels according to the image scene.

- CIE Diagram (SER05)

Chromaticity diagrams based on ITU-R BT.601, ITU-R BT.709, and ITU-R BT.2020 colorimetries can be displayed. Display mode supports CIE 1931 (xy display) and CIE 1976 (u'v' display).

- HDR (SER07)

On CINEZONE display, the SDR area is displayed in monochrome, while the HDR area is displayed using colors corresponding to the brightness. This makes it easy to view the brightness distribution in the HDR area. In addition, displaying the peak and average values of brightness reduces the grading time.

On video signal waveform display and histogram display, displaying a scale corresponding to the HDR standard makes it possible to manage video in Scene linear.

- IP(NMI) Input (SER08)

As the IP input supports Networked Media Interface (NMI), 4K (compressed) and HD (compressed or uncompressed) video signals can be displayed with little delay.

If the input signal is HD, the video signals of up to four inputs can be displayed simultaneously. In addition, IP and SDI can be displayed simultaneously.

- Video Noise Meter (SER10)

Noise included in the Y, G, B, or R signal of the SDI signal applied to the LV 5490 can be measured.

3. SPECIFICATIONS

- RS-422/485 Connector (custom order feature)

The camera ID can be displayed using serial communication.

- Remote Controller (LV 5490-01; sold separately)

Equipped with keys that correspond to the front panel keys of the LV 5490. They can be used to remotely control the LV 5490 via Ethernet.

(You cannot use TELNET while you are using the LV 5490-01.)

3. SPECIFICATIONS

3.3 Specifications

3.3.1 SDI Formats and Standards

Table 3-1 SD video signal formats and standards

Color System	Quantization	Image	Field Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	720×487	59.94/I	SMPTE ST 259
		720×576	50/I	

Table 3-2 HD video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 292-1 SMPTE ST 296
		1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 292-1
			30/29.97/25/24/23.98/PsF	

Table 3-3 3G-A video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-1
			48/47.95/P	-
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 425-1 SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2
YCbCr 4:4:4	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 296 SMPTE ST 425-1
		1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2

3. SPECIFICATIONS

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
RGB 4:4:4	10 bits	1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 296 SMPTE ST 425-1
		1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2
XYZ 4:4:4	12 bits	2048×1080	30/25/24/P	SMPTE ST 425-1
			30/25/24/PsF	SMPTE ST 428

Table 3-4 3G-B-DL and HD (DL) video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 372 SMPTE ST 425-1
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 372 SMPTE ST 425-1 SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
YCbCr 4:4:4	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1 SMPTE ST 2048-2

3. SPECIFICATIONS

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
RGB 4:4:4	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
	12 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 372
			30/29.97/25/24/23.98/PsF	SMPTE ST 425-1
				SMPTE ST 2048-2
XYZ 4:4:4	12 bits	2048×1080	30/25/24/P	SMPTE ST 372
			30/25/24/PsF	SMPTE ST 425-1
				SMPTE ST 428

* When these signals are displayed, phase differences of up to 100 clocks (approx. 1.34 us) between HD (DL) links are automatically corrected.

Table 3-5 3G-B-DS video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		1280×720	60/59.94/50/30/29.97/25/24/23.98/P	SMPTE ST 296
				SMPTE ST 425-1

Table 3-6 3G(DL)-2K video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	12 bits	1920×1080	60/59.94/50/P	SMPTE ST 274
				SMPTE ST 425-3
			48/47.95/P	-
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2
YCbCr 4:4:4	10 bits	1920×1080		SMPTE ST 425-3
			60/59.94/50/P	SMPTE ST 274
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2
	12 bits	1920×1080		SMPTE ST 425-3
			60/59.94/50/P	SMPTE ST 274
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2
				SMPTE ST 425-3

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Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
RGB 4:4:4	10 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3
	12 bits	1920×1080	60/59.94/50/P	SMPTE ST 274 SMPTE ST 425-3
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 2048-2 SMPTE ST 425-3

* When these signals are displayed, phase differences of up to 100 clocks (approx. 0.67 us) between links are automatically corrected.

* 3G-A and 3G-B-DL links are supported.

Table 3-7 3G (DL)-4K video signal formats and standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
Square	YCbCr 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
2 sample interleave	YCbCr 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2048-1

* When these signals are displayed, phase differences of up to 100 clocks (approx. 0.67 us) between links are automatically corrected.

* 3G-B-DS links are supported.

Table 3-8 HD (QL) video signal formats and standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
Square	YCbCr 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	-
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	-
				30/29.97/25/24/23.98/PsF	-

* When these signals are displayed, phase differences of up to 100 clocks (approx. 0.67 us) between links are automatically corrected.

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Table 3-9 3G (QL) video signal formats and standards

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
Square	YCbCr 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 425-5 SMPTE ST 2036-1
				48/47.95/P	-
			4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
	YCbCr 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
				30/29.97/25/24/23.98/PsF	-
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
				30/29.97/25/24/23.98/PsF	-
	XYZ 4:4:4	12 bits	4096×2160	30/25/24/P	SMPTE ST 425-5 SMPTE ST 428
				30/25/24/PsF	-

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Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
2 sample interleave	YCbCr 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 425-5 SMPTE ST 2036-1
				48/47.95/P	-
		12 bits	4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2048-1
			3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
			3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
	YCbCr 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
	XYZ 4:4:4	12 bits	4096×2160	30/25/24/P	SMPTE ST 425-5 SMPTE ST 428

- * When these signals are displayed, phase differences of up to 100 clocks (approx. 0.67 us) between links are automatically corrected.
- * 3G-A and 3G-B-DL links are supported.

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Table 3-10 12G video signal formats and standards (SER06/SER08)

Division Transmission System	Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
2 sample interleave	YCbCr 4:2:2	10 bits	3840×2160	60/59.94/50/P	SMPTE ST 2036-1 SMPTE ST 2082-10
				48/47.95/P (SER08 only)	-
		12 bits	4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
	YCbCr 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
	RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
		12 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10
			4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 2036-1 SMPTE ST 2082-10

* 12G-SDI TYPE 1 links are supported.

3.3.2 Supported IP (NMI) Input Signal Formats (SER08)

Table 3-11 IP (NMI) input signal format

Color System	Quantization	Image	Frame (Field) Frequency/Scanning
YCBCR 4:2:2	10 bits	1920×1080	59.94/50/I
YCBCR 4:2:2	10 bits	3840×2160	59.94/50/P

* The IP transmission input system supports NMI.

* The supported IP control system is IP Live System Manager.

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3.3.3 Embedded Audio Playback Format (SER03)

Compliant Standards

3G, HD, HD (DL) SMPTE ST 299

SD SMPTE ST 272

Format L-PCM, Dolby-E (option), Dolby Digital (option), Dolby Digital Plus (option)

Sampling Frequency 48 kHz

Quantization 24 bits

Clock Generation Generated from the video clock

Synchronization Must be synchronized to the video clock.

All SDI signals must be synchronized.

Channel Separation Separates up to four groups (16 channels) from an SDI input.

3.3.4 SDI I/O Connectors

SDI Input Connectors

Connector Type BNC

Number of Input Connectors

4 (1A, 1B, 1C, 1D)

Input Impedance 75 Ω

Input Return Loss

5 MHz to 1.485 GHz 15 dB or more

1.485 to 2.97 GHz 10 dB or more

Maximum Input Voltage

SER01/SER06/SER08 ± 2 V (DC + peak AC)

SER02 0 to +12 V (DC), ± 1 V (AC)

SDI I/O Connectors

Connector Type BNC

Number of I/O Connectors 4 (2A, 2B, 2C, 2D)

I/O Impedance 75 Ω

I/O Return Loss

5 MHz to 1.485 GHz 15 dB or more

1.485 to 2.97 GHz 10 dB or more

Maximum Input Voltage ± 2 V (DC + peak AC)

Output Voltage 800 mVp-p ± 10 % (into 75 Ω)

Output Signals Reclocked signal of SDI input, pattern generator

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12G-SDI Output Connector (SER06/SER08)

Connector Type	BNC
Number of Output Connectors	1
Output Impedance	75 Ω
Output Return Loss	
5 MHz to 1.485 GHz	15 dB or more
1.485 to 2.97 GHz	10 dB or more
Output Voltage	800 mVp-p $\pm$ 10 % (into 75 Ω)
Output Signals	Reclocked signal of the SDI signal received through 1A to 1D

Input Signal Selection (*1)

When the I/O Connector Is Set to Input

SD/HD/3G-A/3G-B-DL	Four input signals consisting of 1A, 1B, 1C, and 1D or four input signals consisting of 2A, 2B, 2C, and 2D
3G-B-DS	One input signal selected from 1A, 1B, 1C, and 1D or one input signal selected from 2A, 2B, 2C, and 2D
HD (DL), 3G (DL)-2K	Two input signals consisting of (1A, 1B) and (1C, 1D) or two input signals consisting of (2A, 2B) and (2C, 2D)
3G (DL)-4K	One input signal selected from (1A, 1B) and (1C, 1D) or one input signal selected from (2A, 2B) and (2C, 2D)
3G (QL), HD (QL)	One input signal selected from (1A, 1B, 1C, 1D) and (2A, 2B, 2C, 2D)
12G (SER06/SER08)	One input signal selected from 1A, 1B, 1C, and 1D

When the I/O Connector Is Set to Output

SD/HD/3G-A/3G-B-DL	Input signals 1A, 1B, 1C, 1D
3G-B-DS, 12G (SER06/SER08)	One input signal selected from 1A, 1B, 1C, and 1D
HD (DL), 3G (DL)-2K	Two input signals consisting of (1A, 1B) and (1C, 1D)
3G (DL)-4K	One input signal selected from (1A, 1B) and (1C, 1D)
3G (QL), HD (QL)	One input signal consisting of (1A, 1B, 1C, 1D)

*1 Parentheses indicate multi link combinations.

3.3.5 IP(NMI) Input Connectors (SER08)

Input terminal (SFP+)	DLC/DLC connector
Number of Ports	2
Compliant Standard	10GBASE-SR
Fiber Type	Multi mode
Optical fiber diameter	50 μ m
Wavelength	850 nm

* The SFP+ transceivers are accessories.

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3.3.6 External Reference Input

Connector Type	BNC
Number of Input Connectors	1 pair
Input Impedance	15 k Ω passive loop-through
Input Return Loss	≥ 30 dB for 50 kHz to 30 MHz into 75 Ω
Maximum Input Voltage	± 5 V (DC + peak AC)
Input Signal	Tri-level sync or NTSC/PAL black burst signal

- * The waveform display position and the measured phase of the phase difference display based on the external sync signal may vary by ± 1 clock depending on the timing when the external sync signal or SDI signal is connected or disconnected or when the device is restarted.
- * Waveform display using an external sync signal is not possible for the following formats.
 - 3G 720/30P, 720/29.97P, 720/25P, 720/24P, 720/23.98P
 - HD (DL) 1080/60P, 1080/59.94P, 1080/50P
 - 3G (DL), 3G (QL), HD (QL), 12G (SER06/SER08)
 - Frame frequency 48P, 47.95P
- * Phase difference display using an external sync signal is not possible for the following formats.
 - 3G 720/30P, 720/29.97P, 720/25P, 720/24P, 720/23.98P
 - Frame frequency 48P, 47.95P

3.3.7 Audio Input/Output Connectors (SER03)

Digital Audio I/O Connectors

Connector Type	BNC
Number of I/O Connectors	
Group A	4 pairs (8 channels)
Group B	4 pairs (8 channels)
I/O Impedance	75 Ω
Maximum Input Voltage	± 5 V (DC + peak AC)
Output Voltage	1.0 Vp-p ± 10 % (into 75 Ω)
Input/Output Switching	By group (4 pairs (8 channels))
Compliant Standard	AES-3id
Supported Format	L-PCM, Dolby-E (option), Dolby Digital (option), Dolby Digital Plus (option)
Sampling Frequency	48 kHz
Output Signal	Audio signal displayed on the screen (Dolby signals are decoded and generated.)

Headphone Output

Connector Type	One mini jack (stereo)
Output Signals	Two channels from the audio signals that are being displayed on the screen (downmixed Lt and Rt are also possible)
Sampling Frequency	48 kHz
Volume Adjustment	Using the menu
Power Output	100 mW maximum (into 8 Ω load)

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3.3.8 Monitor Output Connector

SDI Output Connector

Connector Type	BNC
Number of Output Connectors	1
Output Impedance	75 Ω
Output Return Loss	
5 MHz to 1.485 GHz	15 dB or more
1.485 to 2.97 GHz	10 dB or more
Output Voltage	800 mVp-p $\pm$ 10 % (into 75 Ω)
Output Signal	Outputs the LCD screen in HD, 3G-A, or 3G-B-DL.
Output Format	

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			60/59.94/50/P	

Synchronization	Synchronized with the LCD refresh rate (free run or frequency synchronization with the external reference signal(*1))
Routing	Outputs the SDI signal received through I/O connectors 1A to 1D or 2A to 2D (excluding 12G-SDI)

DVI-D Output Connector

Connector Type	DVI-D
Number of Output Connectors	1
Signal Format	Single Link T.M.D.S
DDC	Not supported
HOT PLUG Detection	Not supported
Output Signal	Outputs the LCD screen
Image	1920×1080
Frame Frequency	60P, 59.94P, 50P
Synchronization	Synchronized with the LCD refresh rate (free run or frequency synchronization with the external reference signal(*1))

*1 Frame (field) frequencies 24 Hz and 23.98 Hz are not supported.

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3.3.9 Control Connectors

USB Port

Port Type	Standard A
Number of Ports	2 (one on front, one on rear)
Specifications	USB 2.0
Compatible Devices	USB memory, USB mouse
USB Memory Feature	Saves captured data, preset data, and data dumps
USB Mouse Feature	Used to control on the screen

Ethernet Port (*1)

Compliant Standard	IEEE802.3
Supported Protocol	TELNET, FTP, SNMP, HTTP, SNTP
I/O Connectors	RJ-45
Function	Remote control from an external PC or the LV 5490-01
Type	10Base-T, 100Base-TX

Remote Connector

Port Type	15-pin D-sub (female)
Locking screws	Inch screws (No.4-40UNC)
Number of Ports	1
Control Signal	LV-TTL level (low active)
Input Voltage Range	0 to 5 VDC All inputs are pulled up to +3.3 V (control is also possible using +5 V)
Function	Used to load preset settings, switch input signals, and transmit the alarm signal
Alarm Output	Outputs alarms signals when format alarms occur, when various errors occur, when the fan malfunctions, or when the internal temperature is abnormal

RS-422/485 Connector	Custom order feature

*1 You cannot use TELNET and the LV 5490-01 at the same time.

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3.3.10 Front Panel

Display

LCD Type	9-inch color TFT
Resolution	1920×1080P
Refresh Rate	60 Hz, 59.94 Hz, 50 Hz (free run or frequency synchronization with the external reference signal (*1))

Backlight Brightness 32 levels

Key LEDs All the keys are dimly back-lit.
The selected key is lit more brightly.

Power Switch Electronic switch (which remembers whether the instrument is on or off)

Last Memory Backs up the panel settings to memory

Key Lock Prevents erroneous operation

*1 The LCD refresh rate changes automatically depending on the frame rate of the external reference signal.

Frame Rate of the External Reference Signal	LCD Refresh Rate
23.98 Hz	Free run
24 Hz	Free run
25 Hz	50 Hz
29.97 Hz	59.94 Hz
30 Hz	60 Hz

3.3.11 Screen Capture

Function	Captures the screen
Indication	Displays only the captured image or overlays the captured image over the input signal
Media	Internal memory (RAM) and USB memory You can only record one screen capture to the internal memory.
Data Output	Screen captures can be saved as bitmap files to USB memory, or they can be saved in a file format that the LV 5490 can load.
Data Input	Data saved to USB memory can be loaded and displayed on the LV 5490.

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3.3.12 Frame Capture

Function	Captures frame data
Indication	Displays the captured frame data or superimposes the captured frame data over the input signal
Media	Internal memory (RAM) and USB memory You can only record one frame of data to the internal memory
Data Output	Frame captures can be saved to USB memory as .dpx files, .tif files, or in a file format that the instrument can load
Data Input	Data saved to USB memory can be loaded and displayed on the instrument (*1)
Capture Timing	Manual and automatic (error capture)
Error Capturing	Automatically captures frame data when an error occurs

*1 An input signal in the same format as the frame data is required.

3.3.13 Pattern Generator

Table 3-12 HD video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 292-1
			30/29.97/25/24/23.98/PsF	

Table 3-13 3G-A, 3G-B-DL video signal formats and standards

Color System	Quantization	Image	Frame (Field) Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	1920×1080	60/59.94/50/48/47.95/P	SMPTE ST 274 SMPTE ST 425-1
			48/47.95/P	-
		2048×1080	60/59.94/50/48/47.95/P	SMPTE ST 425-1 SMPTE ST 2048-2
YCbCr 4:4:4 RGB 4:4:4	10 bits	1920×1080	60/59.94/50/I	SMPTE ST 274
			30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	
		2048×1080	30/29.97/25/24/23.98/P	SMPTE ST 425-1
			30/29.97/25/24/23.98/PsF	SMPTE ST 2048-2

Table 3-14 3G (DL)-4K video signal formats and standards

Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2036-1
			30/29.97/25/24/23.98/PsF	-
		4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-3 SMPTE ST 2048-1
			30/29.97/25/24/23.98/PsF	-

* The supported division transmission systems are square and 2 sample interleave.

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Table 3-15 3G (QL) video signal formats and standards

Color System	Quantization	Image	Frame Frequency/Scanning	Compliant Standard
YCbCr 4:2:2	10 bits	3840×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2036-1
			48/47.95/P	-
		4096×2160	60/59.94/50/48/47.95/P	SMPTE ST 425-5 SMPTE ST 2048-1
YCbCr 4:4:4 RGB 4:4:4	10 bits	3840×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2036-1
			30/29.97/25/24/23.98/PsF	-
		4096×2160	30/29.97/25/24/23.98/P	SMPTE ST 425-5 SMPTE ST 2048-1
			30/29.97/25/24/23.98/PsF	-

* The supported division transmission systems are square and 2 sample interleave.

* 3G-A and 3G-B-DL links are supported.

Output Pattern Color bar 100%, color bar 75%, multiformat color bar, color raster, cross hatch, 10 step, limit ramp

Scroll

Direction Eight directions (up, down, left, right, and their combinations)

Speed Range and Unit 4 to 124 dots, in 4 dot steps

Moving Box ON, OFF

Frequency Phase Adjustment (*1)

Quad Link Adjust the phase of Bch, Cch, and Dch separately relative to Ach

Dual Link Adjust the phase of Bch relative to Ach and the phase of Dch relative to Cch

Adjustment Range ± 0.5 line (in units of video clocks)
± 1/2 frame (in unit of lines)

Embedded Audio

Number of Embedded Channels

16 or 8 channels depending on the video format

Embedding On/Off On/off at the audio group level

Audio Level -20dBFS, -18dBFS, 0dBFS, Mute

*1 The output phase may be off by ±1 clock from the specified value as a result of switching the format or turning on and off the power.

3.3.14 Preset

Preset Saves panel settings (with a few exceptions)

Number of Presets 60

Preset Loading Method Front panel or remote control connector (*1)

Copying All preset data can be copied from the LV 5490 to a USB memory device or from a USB memory device to the LV 5490.

*1 The number of presets loaded from the remote control connector can be 8 or 60.

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3.3.15 Display

Free Layout	
Function	Freely arrange the windows shown with WFM, VECT, PIC, AUDIO (SER03), STATUS, EYE (SER02/SER09) (one of each), and a window consisting of five displays shown with MULTI
Display Format	Displays up to four input signals in tiled, mixed, V aligned, or H aligned mode.
Tiled Display	The screen is divided into windows.
Mixed Display	The windows are cascaded.
V Aligned Display	The windows are arranged top to bottom.
H Aligned Display	The windows are arranged side by side.
3G-B-DS Display Format	
Aligned Display	The screen is divided into windows.
Mixed Display	The windows are cascaded.
Time Display	
Displayed Contents	Current time, time code
Current Time Display	The time based on the internal clock
Time Code Display	LTC, VITC, D-VITC (SD only)
Compliant Standards	
LTC, VITC	SMPTE ST 12-2
D-VITC	SMPTE ST 266
Alarm Indications	Displayed on the screen when various alarms occur, when various errors occur, when the fan malfunctions, or when the internal temperature is abnormal
Format Alarm	Displays an alarm when a signal in a format other than the specified format is received
Colorimetry Alarm	Displays an alarm when a signal with a colorimetry other than the specified colorimetry is received

3.3.16 SDI Video Signal Waveform Display

Waveform Operations	
Display Mode	
Overlay	Overlays component signals
Parade	Displays component signals side by side
Blanking Interval	H and V blanking periods can be masked.
RGB Conversion	Converts a Y,CB,CR signal into an RGB signal and displays the result
Channel Assignment	GBR or RGB order
Pseudo-Composite Display	Artificially converts component signals into composite signals and displays the result
Line Select	Displays the selected line
Sweep Modes	H, V
Color	7 colors to choose from

3. SPECIFICATIONS

Vertical Axis

Gain	×1 / ×5
Scale Jump	Sets the scale display position at ×5 gain (*1) 0, +10, +20, +30, +40, +50, +60, +70, +80, +90, CURSOR (sets the display position near the selected cursor)
Variable Gain	×0.2 to ×2.0
Amplitude Accuracy	
×1	±0.5 %
×5	±0.2 %
3G, HD (DL) (1080/60P, 1080/59.94P, 1080/50P)	
Y Signal	±0.5 % (1 to 60 MHz)
CBCR Signal	±0.5 % (0.5 to 30 MHz)
Low-Pass Attenuation	20 dB or greater (at 40 MHz)
3G, HD, HD (DL) (excluding 1080/60P, 1080/59.94P, 1080/50P)	
Y Signal	±0.5 % (1 to 30 MHz)
CBCR Signal	±0.5 % (0.5 to 15 MHz)
Low-Pass Attenuation	≥ 20 dB (at 20 MHz)
SD	
Y Signal	±0.5 % (1 to 5.75 MHz)
CBCR Signal	±0.5 % (0.5 to 2.75 MHz)
Low-Pass Attenuation	≥ 20 dB (at 3.8 MHz)

Horizontal Axis

Line Display	
Display Format	Overlay (1H, 2H) (*2) Parade (1H, 2H, 3H) 4Y parade (4H)
Magnification	×1, ×10, ×20, ACTIVE, or BLANK
Field Display	
Display Format	Overlay (1V, 2V) (*3) Parade (1V, 2V, 3V)
Magnification	×1 / ×20 / ×40
Time Accuracy	±0.5 %

Cursor Measurement

Composition	
Horizontal Cursors	2 (REF and DELTA)
Vertical Cursors	2 (REF and DELTA)
Simultaneous Display	Displays both the horizontal cursors and vertical cursors
Amplitude Measurement	mV, %, R%, DEC, HEX, HDR (SER07)
Time Measurement	Second display
Frequency Display	Computes and displays the frequency with the length of one period set to the time between two cursors
Cursor Value Display	Displays measured values on the cursors

3. SPECIFICATIONS

Scale	
Type	%, V, decimal, hexadecimal
Color	7 colors to choose from

*1 The jump range varies depending on COLOR MATRIX, SCALE UNIT, and the like.

*2 2H display is not possible when the input signal is 4K.

*3 2V display is not possible when the input signal is progressive.

3.3.17 SDI Vector Waveform Display

Color	7 colors to choose from
Blanking Interval	H and V blanking periods can be masked (according to the video signal waveform display settings).
Pseudo-Composite Display	Artificially converts component signals into composite signals and displays the result
Line Select	Displays the selected line
Gain	×1, ×5, IQ-MAG
Variable Gain	×0.2 to ×2.0
Amplitude Accuracy	±0.5 %
Scale	
Type	ITU-R BT.601, ITU-R BT.709, AUTO
Setting the Color Bar Saturation	75 %, 100 %
IQ Axis	Show or hide
Color	7 colors to choose from
Vector Marker Display	Displays a marker and numeric value at the specified location on the vector display
Number of Markers	1
Numeric Display	Displays the marker position numerically
Cb	Displays the CB position as a percentage
Cr	Displays the CR position as a percentage
deg	Displays the hue in degrees.
d	Displays the distance from the center as a percentage
Histogram Display	Displays the luminance distribution

3.3.18 SDI Signal 5-Bar Display

Function	Converts an SDI signal into Y, R, G, B, and composite values and then displays the five peak levels
Channel Assignment	RGB / GBR
Scale	mV / %
Error Level	Based on the gamut error, composite gamut error, and luminance error thresholds
Line Select	Selected line display
Low-Pass Filter	The same as gamut errors Removes transient errors

* This function is not supported in some of the LV 5490 products. To check, see section 7.3, "Displaying System Information."

3. SPECIFICATIONS

3.3.19 SDI Picture Display

Quantization	8 bits
Display Sizes	Reduced, actual size, ×2, full frame
Quality Adjustment and Color Selection	Brightness, contrast, gain, bias, chroma gain, monochrome display
Frame Rate	Converts the frame rate based on the LCD frame rate (60P, 59.94P, 50P)
Aspect Marker	
3G (17:9 aspect ratio)	16:9, 14:9, 13:9, 4:3, 2.39:1
3G (16:9 aspect ratio), HD, HD (DL)	17:9, 14:9, 13:9, 4:3, 2.39:1, AFD (*1)
SD	16:9, 14:9, 13:9, AFD (*1)
Aspect Marker Format	Line, shadow (99 levels), black
Safety Marker Size	ARIB TR-B4, SMPTE RP-218, or user-defined
AFD Display (*1)	Displays abbreviations for SMPTE 2016-1-2007 standard AFD codes
Line Select	Marks the selected line
Gamut Error Display (*2)	The positions of gamut errors are displayed on the picture (this is the logical sum of gamut, composite gamut, and luminance errors)

*1 Supports SD or HD.

*2 This function is not supported in some of the LV 5490 products. To check, see section 7.3, "Displaying System Information."

3. SPECIFICATIONS

3.3.20 SDI CINELITE Display

CINELITE Display

Function	f Stop display, percentage display, and 256 level gradation display
f Stop Display	Displays f Stop values relative to a reference point Set in reference to an object with an 18% reflectance
f Stop Gamma Correction	
Fundamental Gamma	0.45 (ITU-R BT.709)
User Correction Table	3 types
% Display	Displays the luminance level or RGB level as a percentage
Gradation Display	RGB components are displayed with 8-bit, 256-level gradation.
Code Value Display	Displays the video data values of SDI signals
Measured Points	3
Measurement Sizes	1 x 1 pixel, 3 x 3 pixels, and 9 x 9 pixels

CINELITE Advanced Display

Function	Synchronizes the markers on the waveform display or vectorscope display to the points selected with CINELITE
Waveform Display Link Markers	Synchronizes the markers on the waveform display to the points selected with CINELITE
Number of Link Markers	Up to 16 (for YRGB, YGBR display)
Vector Link Markers	Synchronizes the markers on the vectorscope display to the points selected with CINELITE
Number of Link Markers	Up to 4
Vector Numeric Display	Displays numerically the active marker position
Cb	Displays the C_B position as a percentage
Cr	Displays the C_R position as a percentage
deg	Displays the hue in degrees.
d	Displays the distance from the center as a percentage

CIE Chromaticity Diagram Display (SER05) Link Markers

	Synchronizes the markers on the CIE chromaticity diagram display to the points selected with CINELITE
Number of Link Markers	Up to 4

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3.3.21 SDI CINEZONE Display

CINEZONE Display

Function	Adds colors to the display in accordance with luminance levels
Color	Linear (1024 colors), step (12 colors)
Upper Limit	-6.3 to 109.4% (values equal to or greater than the upper limit are displayed in white)
Lower Limit	-7.3 to 108.4% (values less than the lower limit are displayed in black)

Level Search Display

Function	Displays a specified luminance level $\pm 0.5\%$ using green on an otherwise monochrome picture display
Luminance Level	-7.3 to 109.4%
Upper Limit	-6.3 to 109.4% (values equal to or greater than the upper limit are displayed in red)
Lower Limit	-7.3 to 108.4% (values less than the lower limit are displayed in blue)

3.3.22 Digital Audio Display (SER03)

Input Signal	SDI embedded audio signal, external audio signal
Displayed Channels	Up to 16 channels
Select the embedded audio channel	Select up to four groups (16 channels) from the available SDI inputs
Display Types	Level meter, Lissajous, correlation meter, surround, status
Level Meter Display	
Displayed Channels	8 or 16 channels
Dynamic Range	-60 dBFS, -90 dBFS, reference level ± 3 dB
Meter Response Model	TRUE PEAK, PPM type I, PPM type II, VU
Peak Hold Response Model	TRUE PEAK, PPM type I, PPM type II
Peak Hold Time	0.0 to 5.0 s (in 0.5 s steps), HOLD
Level Setting	-40.0 to 0.0 dBFS (standard level, warning level, over level)
Lissajous Display	
Displayed Channels	2, 8, or 16 channels
Display Modes	X-Y, MATRIX
Correlation Meter	Displays the correlation between two channels as a value from -1 to 1
Indicator Display (option)	Displays Dolby E frame locations with indicators

3. SPECIFICATIONS

Surround Display	
Function	Displays a graphical representation of a sound field
Surround Format	5.1
Channel Mapping	L, R, C, LFE, Ls, Rs, Lt, Rt
Center Channel Format	Normal, phantom center
Gain	×1, AUTO
Status Display	
Level	Audio levels are displayed using numbers (dBFS).
Error Detection	Counts the number of errors that occur for each channel
Level Over	Counts the number of times that the level of the input signal exceeds the set value
Detection Setting	-40.0 to 0.0 dBFS
Clipping	Counts the number of times that a received signal exceeds the maximum signal value for the specified number of consecutive samples
Detection Setting	1 to 100 samples
Mute	Counts the number of times that the length of a received mute signal exceeds the specified period
Detection Setting	1 to 5000 ms
Parity Error	Counts the number of times that the input signal's parity bit and the parity bit recalculated by the LV 5490 differ
Validity Error	Counts the number of times that the input signal's validity bit is 1
CRC Error	Counts the number of times that the CRC of the channel status bits and the calculated CRC are different
Code Violation	Counts the number of times that the state of the input signal's biphase modulation is abnormal
Elapsed Time	Displays the amount of time that has elapsed since the instrument was reset
Channel Status Bits	Dump display, text display
User Data Bits	Dump display
Dolby-E Metadata	Text display (option)
Dolby Digital Metadata	Text display (option)

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3.3.23 SDI Signal Status Display

Signal Detection	Detects the presence of an SDI signal
Format Display	Displays the video signal format
Frequency Deviation Display	
Function	Displays the sampling frequency deviation Displays an error if ± 10 ppm is exceeded
Measurement Range	± 100 ppm
Precision	± 2 ppm
Equivalent Cable Length Display (1A to 1D on the SER01/SER02 only)	
Function	Displays SDI signal attenuation in terms of cable length Displays an error if the specified cable length is exceeded
Supported Cables	
3G, HD	LS-5CFB, 1694A
SD	L-5C2V, 8281
Display Range	
3G	< 10 m, 10 to 105 m, > 105 m
HD	< 5 m, 5 to 130 m, > 130 m
SD	< 50 m, 50 to 300 m, > 300 m
Precision	± 20 m
Resolution	5 m
Error Count Display	Up to 999,999 errors for each error type
Count Period	1 second, 1 field (frame)
Embedded Audio Channel Display (*1)	Displays the embedded audio channel numbers
SDI Signal Error Detection	
CRC Error	Detects 12G (SER06/SER08), 3G and HD signal transmission errors
EDH Error	Detects SD signal transmission errors
TRS Position Error	Detects TRS embedding position errors
TRS Code Error	Detects TRS protection bit errors
Line Number Error	Detects errors with the line numbers embedded in 12G (SER06/SER08), 3G and HD signals
Illegal Code Error	Detects data within the range of 000 to 003h and 3FC to 3FFh in locations other than TRS and ADF
Ancillary Data Packet Error Detection	
Checksum Error	Detects ancillary data transmission errors
Parity Error	Detects ancillary data header parity errors

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Embedded Audio Packet Error Detection (*1)

BCH Error	Detects audio packet transmission errors
DBN Error	Detects audio packet continuity errors
Parity Error	Detects audio packet parity errors
Embedded Position Error	Detects the presence of audio in lines where it should not be embedded
Sample Counter Error	Detects asynchronous audio by measuring the number of audio samples

Video Error Detection

Gamut Error (*2) Detects gamut errors

Detection Range

Upper Limit 90.8 to 109.4 %

Lower Limit -7.2 to 6.1 %

Low-Pass Filter

Format	Low-Pass Filter	
	HD/SD:1MHz	HD:2.8MHz SD:1MHz
SD 720×487	Approx.1MHz (EBU R103-2000)	Approx.1MHz
SD 720×576	Approx.1MHz (EBU R103-2000)	Approx.1MHz
HD 1280×720	Approx.1MHz	Approx.2.8MHz
HD 1920×1080 (Frame rate≤30Hz)	Approx.1MHz (IEEE STD 205)	Approx.2.8MHz
HD 1920×1080 (Frame rate> 30Hz)	Approx.2MHz	Approx.5.5MHz
HD 2048×1080 (Frame rate≤30Hz)	Approx.1MHz (IEEE STD 205)	Approx.2.8MHz
HD 2048×1080 (Frame rate> 30Hz)	Approx.2MHz	Approx.5.5MHz
4K 3840×2160 (Frame rate≤30Hz)	Approx.4MHz	Approx.11MHz
4K 3840×2160 (Frame rate> 30Hz)	Approx.8MHz	Approx.22MHz
4K 4096×2160 (Frame rate≤30Hz)	Approx.4MHz	Approx.11MHz
4K 4096×2160 (Frame rate> 30Hz)	Approx.8MHz	Approx.22MHz

Area Specification 0.0 to 5.0 %

Time Specification 1 to 60 frames

Composite Gamut Error (*2) Detects level errors that occur when component signals are converted to composite signals

Detection Range

Upper Limit 90.0 to 135.0 %

Lower Limit -40.0 to 20.0 %

Low-Pass Filter The same as the gamut error

Area Specification 0.0 to 5.0 %

Time Specification 1 to 60 frames

Freeze Error Detects freezing of video within the specified time range

Detection Method Video interval checksum

Time Specification 2 to 300 frames

Black Error Detects video blackouts

Black Level Specification 0 to 100 %

Area Specification 1 to 100 %

Time Specification 1 to 300 frames

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Level Error	Detects $YC_B C_R$ level errors
Upper Y Limit	-51 to 766 mV
Lower Y Limit	-51 to 766 mV
Upper $C_B C_R$ Limit	-400 to 399 mV
Lower $C_B C_R$ Limit	-400 to 399 mV
Low-Pass Filter	The same as the gamut error

- *1 If the input signal is 3G-B-DL, only stream 1 is supported.
- *2 This function is not supported in some of the LV 5490 products. To check, see section 7.3, "Displaying System Information."

3.3.24 SDI Analysis Features

Event Log Display	
Function	Records detected errors, events—such as the LV 5490 switching between input signals, and time stamps.
Recording Capacity	Up to 1000 events
Operation	Records all events from start to finish
Data Output	Data can be saved as text files to USB memory
Data Dump Display	
Display Format	
HD, SD, 3G-A, 3G-B-DS	Displays serial data sequence or displays each color component separately
3G-B-DL	PICTURE, stream 1, stream 2
HD (DL)	PICTURE, link A, link B
3G (DL)	PICTURE, link 1, link 2
3G (QL), HD (QL), 12G (SER06/SER08)	PICTURE, link 1, link 2, link 3, link 4
Display Format Details	
PICTURE	Combines links or streams 1 and 2 and shows in a picture structure (displays only the image area for 4K)
Stream 1/2	Displays each stream in a transmission structure
Link A/B/1/2/3/4	Displays the selected link
Line Select	Displays the selected line
Sample Select	Displays from the selected sample
Jump Feature	Moves to EAV or SAV (Moves to 0 or 3839/4095 for 4K in PICTURE format)
Data Output	Text output to USB memory

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Phase Difference Display (*1)

Function	Displays the phase difference between a reference signal and an SDI signal or between two SDI signals numerically and graphically
Reference Signal	
SD, HD, 3G, 3G (QL), HD (QL)	External sync signal, Ach
HD (DL), 3G (DL)	External sync signal, Ach, Cch
12G	External sync signal
Display Range	
Vertical	1 frame
Horizontal	± 1 line

SDI Ancillary Data List Display

List Display Details	Presence or absence of each ancillary data type, embedded line number, and number of packets per frame
Dump Display	The selected ancillary data is displayed in hexadecimal or binary.

EDH Display (Only for SD)

Compliant Standard	SMPTE RP 165
Display Details	Analyzes and displays EDH packets and displays received CRC errors
Display Format	Text, hexadecimal, binary

Payload ID Display

Compliant Standard	SMPTE ST 352
Display Details	Analyzes and displays payload information
Display Format	Text and binary

Audio Control Packet

Compliant Standard	SMPTE ST 299-1, SMPTE ST 272
Display Details	Displays audio control packet analysis
Display Format	Text, hexadecimal, binary
Group Select	1, 2, 3, 4

Closed Caption Display (*2)

Compliant Standard	ARIB STD-B37
Display Details	Analyzes and displays the closed caption signal
Display Format	Text, hexadecimal, binary

Inter-Stationary Control Signal (NET-Q) Display (*2)

Compliant Standard	ARIB STD-B39
Display Details	Analyzes and displays inter-stationary control signals
Display Format	Text, hexadecimal, binary
Logging Feature	Q-signal logging
Format ID Display Feature	Analyzes and displays the format ID
Data Output	Outputs Q signal logs in CSV format through a USB memory device

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Data Broadcast Trigger Signal (*2)

Compliant Standard	ARIB STD-B35
Display Format	Text, hexadecimal, binary

V-ANC User Data Display (*2)

Compliant Standard	ARIB TR-B23
Display Format	Hexadecimal and binary

AFD Packet Display

Compliant Standard	SMPTE ST 2016-3
Display Format	Text, hexadecimal, binary

User-Defined ANC Packet Display

ANC Specification Method	DID, SDID
Display Details	Y, C

- *1 If the reference signal is set to an external sync signal, the measured phase may vary by ± 1 clock depending on the timing when the external sync signal or SDI signal is connected or disconnected or when the power is turned on and off.
If the reference signal is set to an SDI signal, the measured phase may vary by ± 2 clock depending on the timing when the SDI signal is connected or disconnected or when the power is turned on and off.
- *2 This is not supported when the input signal is 3G, 12G (SER06/SER08).

Lip Sync Display (SER03)	Displays the phase difference between the video and audio
Lip Sync Measurement	
Function	Measures the time difference between the SDI signal and digital audio signal and displays the results numerically and graphically
Reference Signal	A Leader TSG that supports lip syncing (*1)
Measurement Method	Measures the time difference when the luminance level of the video signal exceeds the specified value and when the audio level signal exceeds the specified value
Luminance Level Setting	25 to 100%
Audio Signal Level Setting	-30 to 0 dBFS
Supported Audio Signals	Embedded audio signal, digital audio signal
Measurement Range (Bar Display)	± 50 ms / ± 100 ms / ± 500 ms / ± 1.0 s / ± 2.5 s
Measurement Range (Numeric Display)	± 3999 ms
Measurement Resolution	1 ms

- *1 TSG patterns not made by Leader may be supportable by specifying the video signal setting and audio signal setting.

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3.3.25 Eye Pattern Display (SER02/SER09)

Display	Displays the input SDI waveform before equalizing
12G (SER09), 3G, HD, SD	Displays channel A, B, C, or D, whichever is selected
HD (DL)	Displays link A or B, whichever is selected
3G (DL)	Displays link 1 or 2, whichever is selected
3G (QL), HD (QL)	Displays link 1, 2, 3, or 4, whichever is selected
Waveform Display Color	7 colors to choose from
Scale Display Color	7 colors to choose from
Method	Equivalent time sampling
Frequency Response (SER02)	7 GHZ -3dB (converted from the rise time)
Amplitude Accuracy	800 mV $\pm$ 5 % (for 800 mV input)
Time Axis	
2 UI Display	
12G (SER09)	12.5 ps/div
3G	50 ps/div
HD	100 ps/div
SD	550 ps/div
4 UI Display	
12G (SER09)	25 ps/div
3G	100 ps/div
HD	200 ps/div
SD	1100 ps/div
16 UI Display	
12G (SER09)	100 ps/div
3G	400 ps/div
HD	800 ps/div
SD	4400 ps/div
Time Axis Accuracy	$\pm$ 3 %
Jitter Filter	
10 Hz	HPF 10 Hz
100 Hz	HPF 100 Hz
1 kHz	HPF 1 kHz
100 kHz	HPF 100 kHz
Timing	HPF 10 Hz
Alignment	
12G (SER09), 3G, HD	HPF 100 kHz
SD	HPF 1 kHz
Cursor Measurement	Amplitude measurement using Y cursors
	Time measurement using X cursors
	Rise time and fall time measurement using the TrTf cursor

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Automatic Measurement Items

Eye pattern's amplitude
 Rise time (the time for the signal to rise from 20 to 80 % of its amplitude)
 Fall time (the time for the signal to fall from 80 to 20 % of its amplitude)
 Timing jitter
 Current jitter
 Overshoot of the rising edge
 Overshoot of the falling edge

3.3.26 Jitter Display (SER02/SER09)

Display	Displays the jitter component of an SDI signal
12G (SER09), 3G, HD, SD	Displays channel A, B, C, or D, whichever is selected
HD (DL)	Displays link A or B, whichever is selected
3G (DL)	Displays link 1 or 2, whichever is selected
3G (QL), HD (QL)	Displays link 1, 2, 3, or 4, whichever is selected
Waveform Display Color	7 colors to choose from
Scale Display Color	7 colors to choose from
Method	Phase detection method
Gain	×16, ×8, ×4, ×2, ×1
Measurement Range	
3G, HD, SD	
×8	0.00 to 1.20 UI
×2	1.20 to 4.80 UI
×1	4.80 to 9.60 UI
12G (SER09)	
×16	0.00 to 1.20 UI
×4	1.20 to 4.80 UI
×2	4.80 to 9.60 UI
×1	9.60 to 19.20 UI
Time Axis	1 H, 2 H, 1 V, 2 V (*1)
Time Axis Accuracy	±3 %
Jitter Filter	
10 Hz	HPF 10 Hz
100 Hz	HPF 100 Hz
1 kHz	HPF 1 kHz
100 kHz	HPF 100 kHz
Timing	HPF 10 Hz
Alignment	
12G (SER09), 3G, HD	HPF 100 kHz
SD	HPF 1 kHz

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Cursor Measurement	Jitter value measurement through the use of cursors
Automatic Measurement Display Feature	Displays the jitter value in seconds (sec) and unit intervals (UI)
Automatic Measurement Items	Timing jitter, current jitter
Accuracy	Input jitter frequency: 1 kHz. Filter setting: 10 Hz, within measurement range
	0 UI < automatic measurement value ≤ 1 UI
	SER02 ±10 % + 0.05 UI
	SER09 ±10 % + 0.07 UI
	1 UI < automatic measurement value ≤ 7 UI
	±10 %

*1 2V display is not possible when the input signal is progressive except for 60/59.94/50P of HD (DL).

3.3.27 Eye Pattern and Jitter Detection (SER02/SER09)

Error Detection	On or off per item
Error Threshold Settings	Can be set individually for 12G (SER09), 3G, HD, and SD signals
Event Log	Stores eye patterns and jitter errors
Threshold Values	100 % of the values in the SMPTE standard
Eye-Pattern Amplitude	
Upper Limit	80 to 140 % (640 to 1120 mV)
Lower Limit	40 to 100 % (320 to 800 mV)
Rise Time, Fall Time	
12G (SER09)	40 to 140 % (18.0 to 63.0 ps)
3G	40 to 140 % (54.0 to 189.0 ps)
HD	40 to 140 % (108.0 to 378.0 ps)
SD	40 to 140 % (0.60 to 2.10 ns)
Difference between the Rise and Fall Times	
12G (SER09)	40 to 140 % (7.2 to 25.2 ps)
3G	40 to 140 % (20 to 70 ps)
HD	40 to 140 % (40 to 140 ps)
SD	40 to 140 % (0.20 to 0.70 ns)
Timing Jitter	
12G (SER09)	10 to 200 % (0.80 to 16.00 UI, 67.2 to 1344.0 ps)
3G	10 to 200 % (0.20 to 4.00 UI, 67.4 to 1348.0 ps)
HD	10 to 200 % (0.10 to 2.00 UI, 67.4 to 1348.0 ps)
SD	10 to 200 % (0.02 to 0.40 UI, 0.07 to 1.48 ns)
Current Jitter	
12G (SER09)	10 to 200 % (0.03 to 0.60 UI, 2.5 to 50.4 ps)
3G	10 to 200 % (0.03 to 0.60 UI, 10.1 to 202.5 ps)
HD	10 to 200 % (0.02 to 0.40 UI, 13.5 to 270.0 ps)
SD	10 to 200 % (0.02 to 0.40 UI, 0.07 to 1.48 ns)

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Overshoot of the Rising Edge

0 to 200 % (0.0 to 20.0 %)

Overshoot of the Falling Edge

0 to 200 % (0.0 to 20.0 %)

3.3.28 Focus Assist Display (SER04)

Detection Sensitivity LOW, MIDDLE, HIGH, V-HIGH (*1), U-HIGH (*1)

Highlight Display Color WHITE, GREEN, BLUE, RED

Picture Luminance Level OFF, EMBOSS, 25 %, 50 %, 75 %, 100 %

*1 If there is noise in the image, the noise will also be enhanced.

3.3.29 CIE Diagram Display (SER05)

Display Standard CIE1931 (xy display), CIE1976 (u'v' display)

Display Type Chromaticity diagram display, color temperature display

Display Mode

Chromaticity Diagram Display

Luminance display, color display

Color Temperature Display Luminance display

Colorimetry BT.601(525), BT.601(625), BT.709, DCI, BT.2020

Clipping

ON

Clips negative values of the input signal to zero

OFF

Displays negative values of the input signal according to BT.1361

Smoothing

Displays by averaging data every two pixels

Accuracy

± 0.005 (relative to the measurement coordinate value)

Chromaticity Diagram Display Scale

Triangle

Select two from BT.601(525), BT.601(625), BT.709, DCI, and BT.2020

User-defined Triangle

Set a single user-defined triangle

Background

Color sample, white background

Sub Scale

Color temperature curve, grid (0.1 steps), white point (D65), triangle name (each can be turned on or off)

Cursor

Displays the cursor position in coordinates

User-defined gamma

1.5 to 3.0

3.3.30 HDR Display (SER07)

Compliant Standards

ARIB STD-B67 (HLG; Hybrid Log Gamma)

SMPTE ST 2084 (PQ curve, Narrow Range only)

S-Log3

Supported Format

All inputs except SD and XYZ inputs

CINEZONE Display Color

Upper limit or higher

Magenta

HDR area

Coloring according to the brightness

SDR area

Monochrome

Lower limit or less

Black

3. SPECIFICATIONS

3.3.31 IP(NMI) Status Display (SER08)

NMI Display	Displays the IP address, gateway address, subnet mask, and PTP domain number of IP (NMI) A/B

IP Live System Manager Display	Displays the IP address, port number, protocol, and communication status of IP Live System Manager

NMI Status Display (*1)	Displays the set format and the PTP synchronization state

*1 Only Network Media Interface (NMI) signals are supported.

3.3.32 Video Noise Meter (SER10)

Measurement Function

Measured Signal Select Y, G, B, or R.

Measurement Area	Set the size and position of the area to be measured

Noise Level Display mVrms, dB

Alert Function	Displays measured values in red when the values exceed the specified threshold

Low-Pass Filter -12 dB $\pm$ 1 dB at the cutoff frequencies in the following table

Format	Cutoff frequencies						
SD 720×487	5.5MHz	4.4MHz	3.6MHz	2.7MHz	1.4MHz	0.7MHz	Through
SD 720×576	5.5MHz	4.4MHz	3.6MHz	2.7MHz	1.4MHz	0.7MHz	Through
HD 1280×720	30MHz	24MHz	20MHz	15MHz	7.5MHz	3.7MHz	Through
HD 1920×1080 (Frame rate≤30Hz)	30MHz	24MHz	20MHz	15MHz	7.5MHz	3.7MHz	Through
HD 1920×1080 (Frame rate> 30Hz)	60MHz	48MHz	40MHz	30MHz	15MHz	7.5MHz	Through
HD 2048×1080 (Frame rate≤30Hz)	30MHz	24MHz	20MHz	15MHz	7.5MHz	3.7MHz	Through
HD 2048×1080 (Frame rate> 30Hz)	60MHz	48MHz	40MHz	30MHz	15MHz	7.5MHz	Through
4K 3840×2160 (Frame rate≤30Hz)	120MHz	96MHz	80MHz	60MHz	30MHz	15MHz	Through
4K 3840×2160 (Frame rate> 30Hz)	240MHz	192MHz	160MHz	120MHz	60MHz	30MHz	Through
4K 4096×2160 (Frame rate≤30Hz)	120MHz	96MHz	80MHz	60MHz	30MHz	15MHz	Through
4K 4096×2160 (Frame rate> 30Hz)	240MHz	192MHz	160MHz	120MHz	60MHz	30MHz	Through

Passband Ripple	±0.5dB

3. SPECIFICATIONS

High-Pass Filter -12 dB±1 dB at the cutoff frequencies in the following table

Format	Cutoff frequencies	
	ON	OFF
SD 720×487	36kHz	Through
SD 720×576	36kHz	Through
HD 1280×720	200kHz	Through
HD 1920×1080 (Frame rate≤30Hz)	200kHz	Through
HD 1920×1080 (Frame rate> 30Hz)	400kHz	Through
HD 2048×1080 (Frame rate≤30Hz)	200kHz	Through
HD 2048×1080 (Frame rate> 30Hz)	400kHz	Through
4K 3840×2160 (Frame rate≤30Hz)	800kHz	Through
4K 3840×2160 (Frame rate> 30Hz)	1.6MHz	Through
4K 4096×2160 (Frame rate≤30Hz)	800kHz	Through
4K 4096×2160 (Frame rate> 30Hz)	1.6MHz	Through

Passband Ripple ±0.5dB

Measurement Accuracy (when filters are not applied)

0 to -65.00dB ±0.3dB

-65.01 to -70.00dB ±0.7dB

-70.01 to -75.00dB ±2.0dB

* This function is not supported in some of the LV 5490 products. To check, see section 7.3, "Displaying System Information."

3. SPECIFICATIONS

3.3.33 General Specifications

Environmental Conditions

Operating Temperature	0 to 40 °C
Operating Humidity Range	85 %RH or less (no condensation)
Optimal Temperature	10 to 30 °C
Operating Environment	Indoors
Elevation	Up to 2,000 m
Overvoltage Category	II
Pollution Degree	2

Power Requirements

Voltage	90 to 250 VAC
Frequency	50/60 Hz
Power Consumption	150 W max.

Dimensions 223 (W) × 172 (H) × 360 (D) mm (excluding protrusions)

Weight 5.6 kg max. (including options, excluding accessories)

Accessories	Power cord 1
	Cover/Inlet stopper 1
	15-pin D-sub connector..... 1
	15-pin D-sub connector cover 1
	SFP+ Transceiver Module AFBR-709SMZ) (SER08)
	 2
	Instruction manual 1

4. PANEL DESCRIPTION

4.1 Front Panel

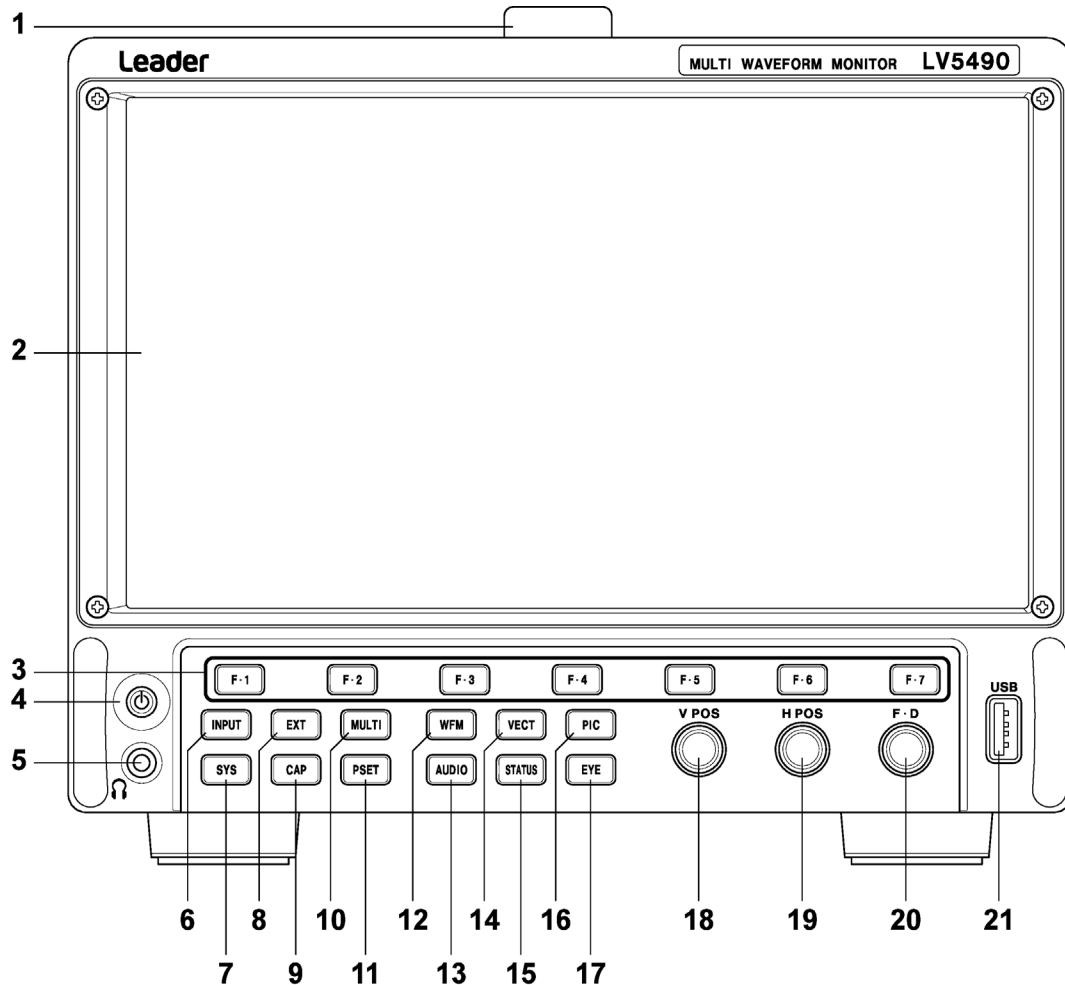


Figure 4-1 Front panel

Table 4-1 Front panel description

No.	Name	Description
1	Handle	Use this when you carry the LV 5980.
2	LCD	Displays measurement and setup screens The protection panel can be removed. See section 5.2, "Removing the Protection Panel."
3	F-1 to F-7	Carries out the corresponding function menu operation. See section 5.8.2, "Function Menu Operations."
4	Power Switch	Press this switch to turn the instrument on. Hold this switch down to turn the instrument off. See section 5.4, "Turning the Instrument On and Off."
5	Headphone jack (SER03)	This is a mini-plug headphone jack. When a pair of headphones are connected to this jack, the LV 5490 transmits the audio signal embedded in the SDI signal or the audio signal received through its rear panel.
6	INPUT	Used to set the measurement channels. See section 6.1, "Setting the Input Signals"
7	SYS	Configures the settings

4. PANEL DESCRIPTION

No.	Name	Description
		See chapter 7, "SYSTEM SETTINGS."
8	EXT	Switches the sync signal. When the internal sync signal is being used, this key's LED turns off. When the external sync signal is being used, this key's LED lights. See section 5.7.2, "External Sync Signal Input."
9	CAP	Captures the screen See chapter 8, "CAPTURE FEATURE."
10	MULTI	Displays a combination of measurement screens. You can change the layout as you like. See section 6.3.7, "Multi Display."
11	PSET	Click to recall a preset; hold down to register, delete, or collectively copy presets. See chapter 9, "PRESET SETTINGS"
12	WFM	Shows the video signal waveform display. You can change the layout as you like. See section 6.3.1, "Video Signal Waveform Display."
13	AUDIO (SER03)	Shows the audio display. You can change the layout as you like. See section 6.3.4, "Audio Display (SER03)."
14	VECT	Shows the vector waveform display. You can change the layout as you like. See section 6.3.2, "Vector Waveform Display."
15	STATUS	Shows the status display. You can change the layout as you like. See section 6.3.5, "Status Display."
16	PIC	Shows the picture display. You can change the layout as you like. See section 6.3.3, "Picture Display."
17	EYE (SER02/SER09)	Switches to the eye pattern display. You can change the layout as you like. See section 6.3.6 "Eye Pattern Display (SER02/SER09)."
18	V POS	Turn to adjust the vertical position of the video signal waveform or other item. Press to return to the reference position.
19	H POS	Turn to adjust the horizontal position of the video signal waveform or other item. Press to return to the reference position.
20	F•D	Turn to specify a numeric value or to move cursors. In most cases, press to reset the value to its default value.
21	USB	Connect a USB memory device or USB mouse. See section 5.5, "Connecting USB Devices."

4. PANEL DESCRIPTION

4.2 Rear Panel

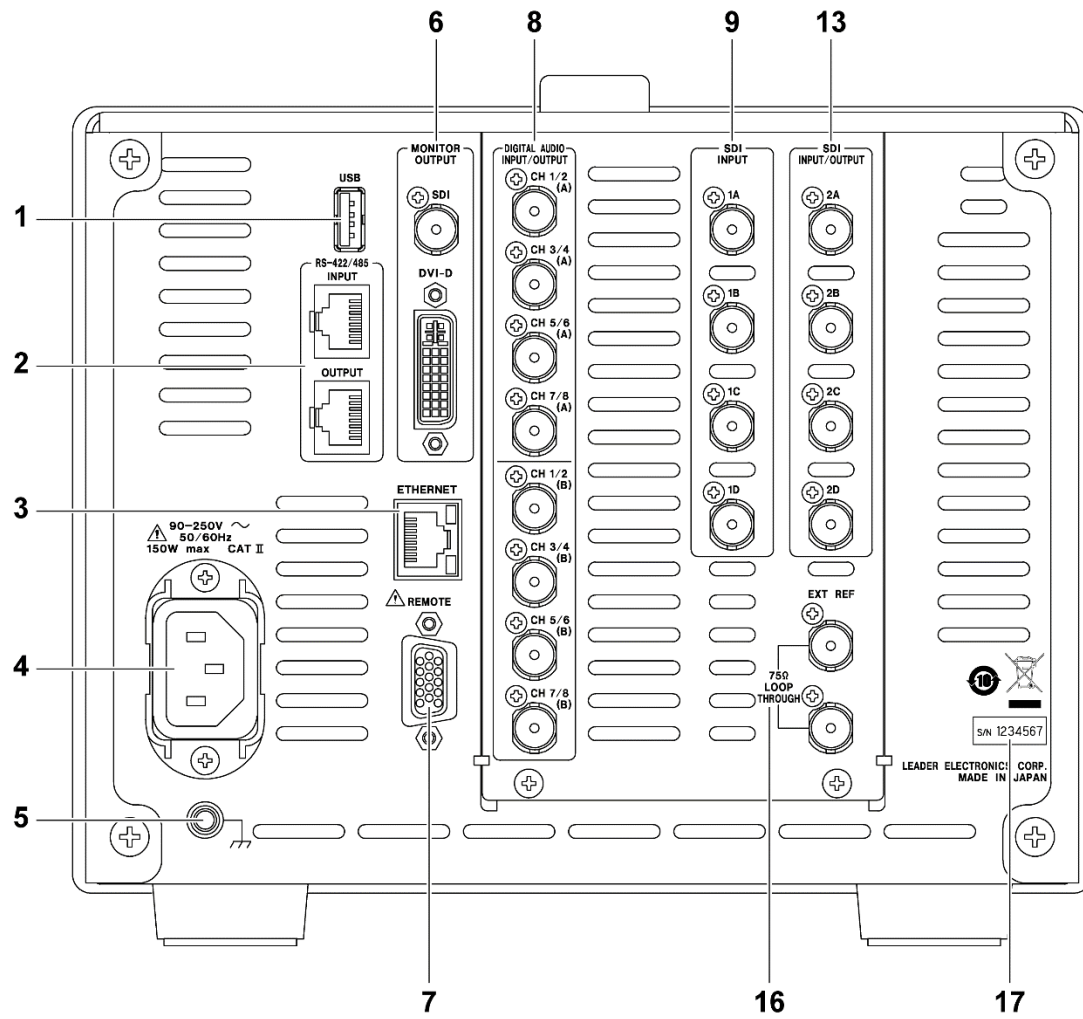


Figure 4-2 Rear panel (SER01/SER02)

4. PANEL DESCRIPTION

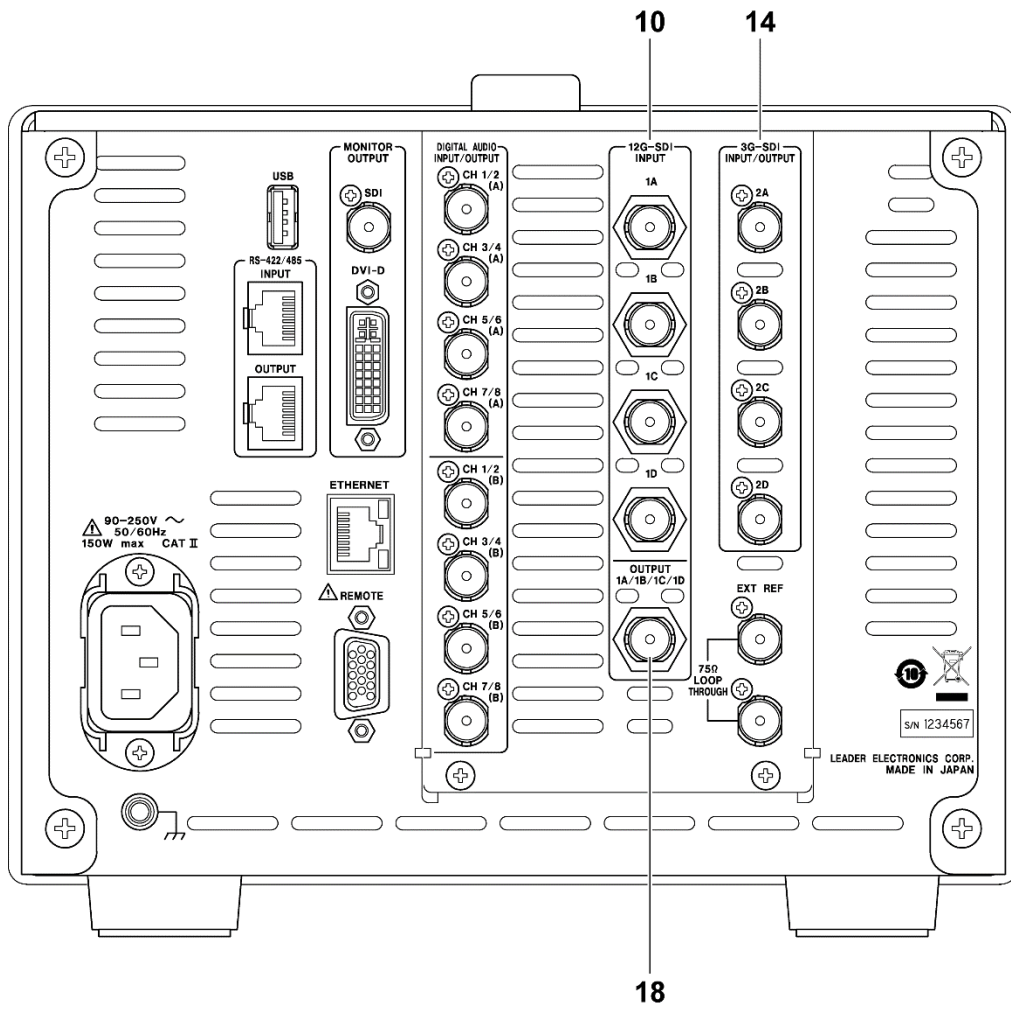


Figure 4-3 Rear panel (SER06)

4. PANEL DESCRIPTION

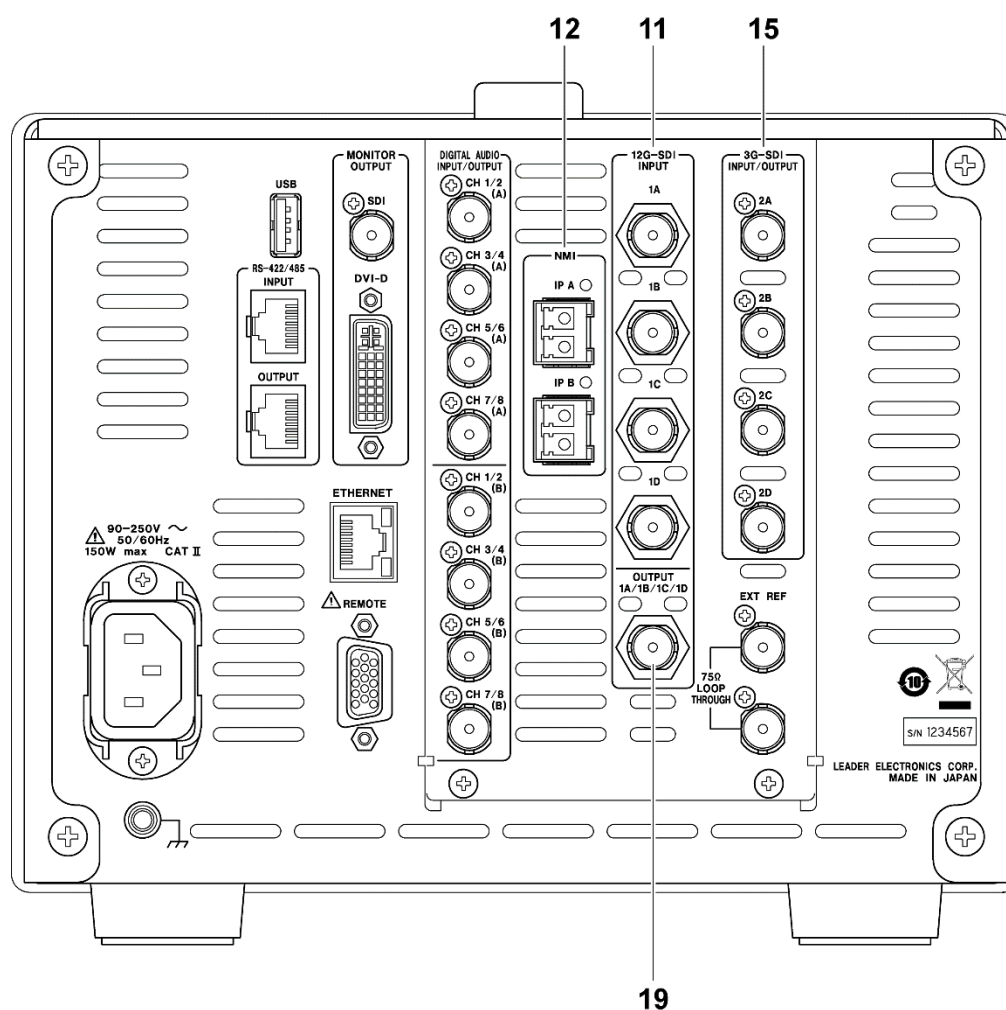


Figure 4-4 Rear panel (SER08)

Table 4-2 Rear panel description

No.	Name	Description
1	USB	Connect a USB memory device or USB mouse. See section 5.5, "Connecting USB Devices."
2	RS-422/485 (custom order feature)	Displays the camera ID using serial communication.
3	ETHERNET	Ethernet port. Supports TELNET, FTP, SNMP, HTTP, and SNTP. See section 20, "ETHERNET REMOTE CONTROL."
4	AC inlet	Attach the included cover/inlet stopper to the AC inlet. See section 5.1, "Attaching the Cover Inlet Stopper."
5	Ground terminal	Connect the instrument to an external ground.
6	MONITOR OUTPUT	Transmits the screen image. The SDI connector can transmit a reclocked SDI signal. See section 5.7.5, "Transmitting Monitor Signals."
7	REMOTE	15-pin D-sub remote control connector. Can be used to execute actions such as recalling preset settings.

4. PANEL DESCRIPTION

No.	Name	Description
8	DIGITAL AUDIO INPUT/OUTPUT (SER03)	Audio signal I/O connectors. Switch between input and output using system settings. See section 5.7.4, "Digital Audio I/O (SER03)."
9	SDI INPUT (SER01/SER02)	SDI signal input connectors. See section 5.7.1, "SDI Signal I/O."
10	12G-SDI INPUT (SER06)	
11	12G-SDI INPUT (SER08)	
12	NMI (SER08)	IP (NMI) signal input connectors. These are used by installing the included SFP+ transceiver modules. See section 5.6, "Installing the SFP+ Transceiver Module (SER08)"
13	SDI INPUT/OUTPUT (SER01/SER02)	SDI signal input/output connectors. Switch between input and output using system settings. Eye patterns and cable lengths cannot be measured. See section 5.7.1, "SDI Signal I/O."
14	3G-SDI INPUT/OUTPUT (SER06)	
15	3G-SDI INPUT/OUTPUT (SER08)	
16	EXT REF	External reference input connector. This is a loop-through connector. See section 5.7.2, "External Sync Signal Input."
17	Serial number label	The serial number is printed on this label.
18	OUTPUT (SER06)	12G SDI output Connector. Reclocked signals 1A to 1D or a test pattern is output. See section 5.7.1, "SDI Signal I/O."
19	OUTPUT (SER08)	

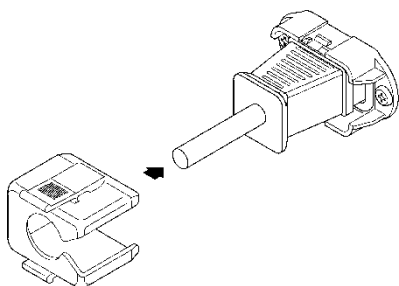
5. BEFORE YOU BEGIN MEASURING

5.1 Attaching the Cover Inlet Stopper

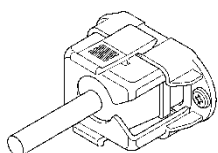
A cover/inlet stopper is included with the LV 5490. Use this device to prevent the power cord from being pulled free of the AC inlet. To attach the cover/inlet stopper, follow the procedure below.

- Attaching the Cover/Inlet Stopper

1. Cover the power cord with the cover/inlet stopper.



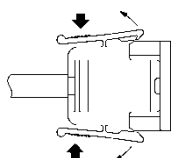
2. Push the cover/inlet stopper, until you hear a click, to attach it to the AC inlet.



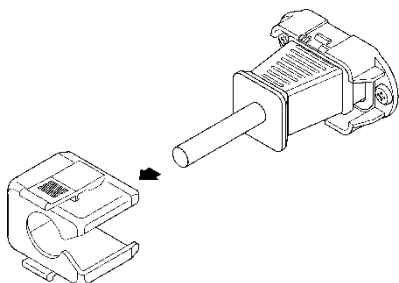
3. Check that the cover/inlet stopper is securely attached to the AC inlet.

- Removing the Cover/Inlet Stopper

1. Release the lock by using two fingers to press the cover/inlet stopper levers.



2. Pull the cover/inlet stopper away from the AC inlet.



5. BEFORE YOU BEGIN MEASURING

5.2 Removing the Protection Panel

A protection panel is attached to the LV 5490 in order to protect the LCD panel from physical shock, scratches, and the like. If necessary, this protection panel can be removed. To do so, remove the four screws.

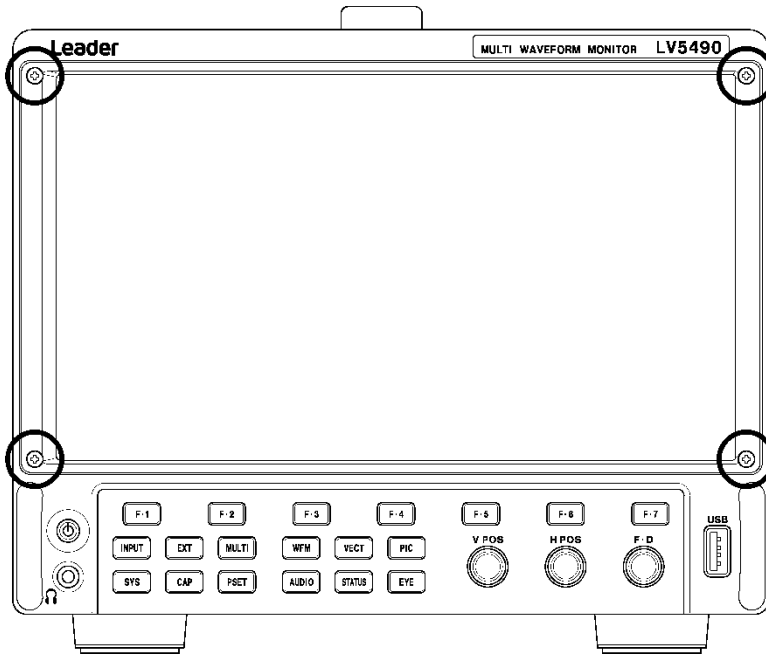


Figure 5-1 Removing the protection panel

5.3 Using the Stand

You can use the stand to tilt the LV 5490. Tilting the LV 5490 may make the screen easier to view or make it easier to operate the front panel. If necessary, pull out the stand.

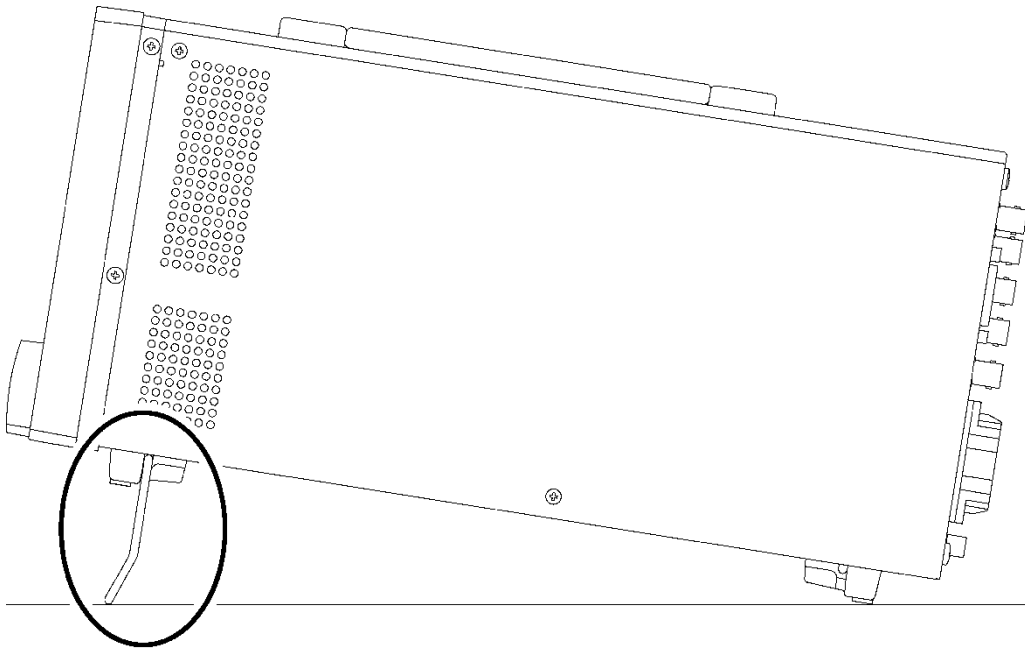


Figure 5-2 Using the stand

5.4 Turning the Instrument On and Off

To turn on the power, press the power switch. The power switch LED lights, and the instrument turns ON. When you turn ON the power, the LV 5490 starts up with the same panel settings that were set when it was last turned OFF.

To turn off the power, hold down the power switch for 2 seconds or more. The power switch LED and the instrument turn OFF.

You can set the time from when the power is turned on until the LV 5490 starts on the GENERAL SETUP tab in the system settings.

Reference GENERAL SETUP tab → 7.2.1, "General Settings."

5.5 Connecting USB Devices

The front and rear panels each has a USB port. You can connect a USB memory device or USB mouse to the ports. You can connect the devices to either USB port, but you cannot connect the same type of devices to the LV 5490 simultaneously.

USB devices can be connected or removed with the power turned on.

● USB Memory Device

When a USB memory device is connected, a USB memory icon  appears in the upper right of the screen.

You can save various types of data in a USB memory device.

This icon is normally green, but it changes to red when the USB memory device is being accessed. Do not turn the power OFF or remove the USB memory device when the icon is red.

● USB Mouse

When a USB mouse is connected, a mouse icon  appears in the upper right of the screen.

Basic operations can be performed without a mouse, but arranging the measurement screen layout requires a mouse.

Reference 6.4, "Arranging the Measurement Screen Layout"

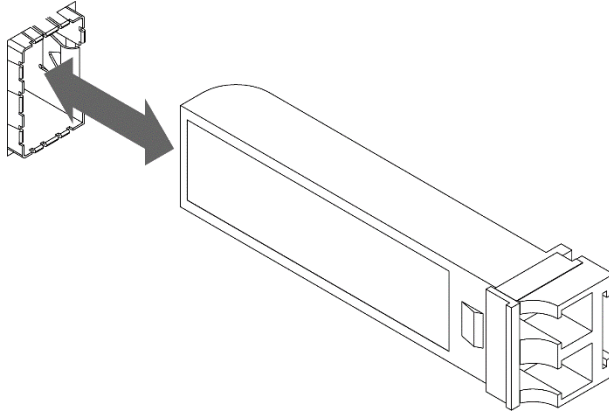
5.6 Installing the SFP+ Transceiver Module (SER08)

If the SER08 is installed, the rear panel has two IP (NMI) input connectors. Use these connectors by installing the included SFP+ transceiver modules.

You can connect and disconnect an SFP+ transceiver module with the power turned on. To install it, follow the procedure below.

- Installation

1. Insert an SFP+ transceiver module into the IP A NMI input connector with the correct orientation.



2. Push it in until a click is heard.
3. Install another module into IP B in a similar manner.

- Uninstallation

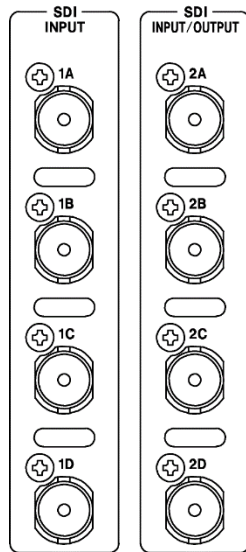
Pinch the SFP+ transceiver module with your fingers, and pull it out. Do not pull the cable.

5. BEFORE YOU BEGIN MEASURING

5.7 Signal I/O

5.7.1 SDI Signal I/O

● SER01/SER02



● SER06/SER08

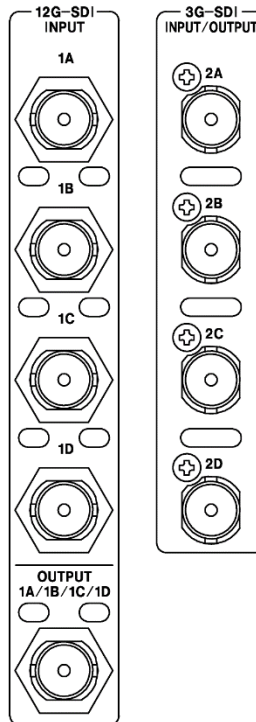


Figure 5-3 SDI I/O connectors

5. BEFORE YOU BEGIN MEASURING

- Input/Output Switching

1A to 1D are fixed to input. 2A to 2D can be switched between input and output.

On the SDI OUT tab in the system settings, select Input or Output.

Reference SDI OUT tab → 7.1.4, "Configuring the SDI I/O Connectors."

- SDI Signal Input : 1A to 1D, 2A to 2D

The input connector assignments to the link system when 2A to 2D are set to input are shown below.

Apply signals that are specified in section 3.3.1, "SDI Formats and Standards."

Table 5-1 SDI signal input

Link System	Input Connector
Single link	Input to 1A, 1B, 1C, 1D, 2A, 2B, 2C, 2D (up to 8 signals)
Dual link	Input to 1A/1B, 1C/1D, 2A/2B, and 2C/2D (up to 4 signals)
Quad link	Input to 1A/1B/1C/1D and 2A/2B/2C/2D (up to 2 signals)

- 12G SDI Signal Input : 1A to 1D (SER06/SER08)

On the SDI IN tab in the system settings, set SDI System to 4K 12G, and then apply signals to 1A to 1D.

When 12G is being measured, even if 2A to 2D are set to input, signals received through 2A to 2D cannot be measured. Further, even if 2A to 2D are set to output (Input Through), the reclocked signals of 1A to 1D are not output.

Reference SDI IN tab → 7.1.1, "Configuring the SDI Input Connectors."

- SDI Signal Output : 2A to 2D

There are two SDI signal output settings: Input Through and Test Signal. You can set it on the SDI OUT tab in the system settings.

- Input Through

2A to 2D output reclocked signals of the signals received through 1A to 1D. Use the signals for monitoring.

For 3G (DL)-4K, the output signals are different as follows:

- When 1A-1B is selected: Both 2A-2B and 2C-2D output reclocked signals of the signals received through 1A-1B.
- When 1C-1D is selected: Both 2A-2B and 2C-2D output reclocked signals of the signals received through 1C-1D.

For single link, you can select whether to set the 2A output to channel A or a channel that you select on the SDI OUT tab. If you select to use a channel that you select, set the output channel using the INPUT menu or **F•6** SELECT CH in the appropriate measurement screen.

For 4K 12G, signals are converted into 3G-SDI×4ch and output through 2A to 2D.

However, because the 12G-SDI payload ID is embedded in the 3G-SDI signal, the format has to be set manually on the receiving device.

For 4K NMI, NMI signals are converted into 3G-SDI×4ch and output through 2A to 2D.

For NMI, signals are converted into HD-SDI and output.

5. BEFORE YOU BEGIN MEASURING

- Test Signal

2A-2D output various patterns. You can superimpose a moving box, vary the phase, and so on. You can use the LV 5490 as a signal generator.

- 12G SDI Signal Output : 1A/1B/1C/1D (SER06)

There are two 12G SDI signal output settings: Input Through and Test Signal. You can set it on the 12G SDI OUT tab in the system settings.

Reference 12G SDI OUT tab → 7.1.8, "Configuring the 12G SDI Output Connector (SER06)."

- Input Through

For 4K 12G, SD/HD/3G-A/3G-B-DL or 3G-B-DS, the channel selected by the INPUT menu or **F•6** SELECT CH on each measurement screen is output. Use the signals for monitoring.

- Test Signal

OUTPUT transmits 12G SDI signals. You can use the LV 5490 as a signal generator.

- 12G SDI Signal Output : 1A/1B/1C/1D (SER08)

12G SDI signal output is fixed to Input Through.

For 4K 12G, SD/HD/3G-A/3G-B-DL or 3G-B-DS, the channel selected by the INPUT menu or **F•6** SELECT CH on each measurement screen is output. Use the signals for monitoring.

- Terminators

The SDI input connectors are terminated internally at 75 Ω , so there is no need to connect terminators to them. Connect cables with a characteristic impedance of 75 Ω .

- Configuring Measurement Channels

Configure the measurement channels using the SDI IN tab in the system settings and the INPUT menu.

Eye patterns and cable lengths for signals applied to 2A to 2D cannot be measured.

Reference 6.1, "Configuring Measurement Channels"

- Cables

It has been confirmed that errors do not occur when the LV 5490 receives an 800 mVp-p stress pattern through the following cables.

Input Signal	Cable Type	Input Connectors (1A to 1D)	I/O Connectors (2A to 2D)	Video Pattern
12G	L5.5CUHD cable	70m	None	COLOR BAR
3G	LS-5CFB cable	70m	70m	CHECK FIELD
HD	LS-5CFB cable	110m	110m	CHECK FIELD
SD	L-5C2V cable	260m	100m	CHECK FIELD

5.7.2 IP(NMI) Signal Input (SER08)

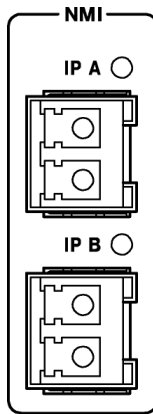


Figure 5-4 IP(NMI) Signal Input connectors

- Signal Input : IP A, IP B (SER08)

On the SDI IN tab in the system settings, set SDI System to 4K NMI or NMI, and then apply signals to IP A and IP B.

Reference 7.1.1, "Configuring the SDI Input Connectors"

5.7.3 External Sync Signal Input

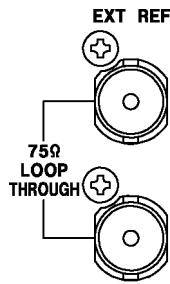


Figure 5-5 External sync signal input connectors

On the video-signal-waveform and vector displays, you can apply an external sync signal to display waveforms. (*1) Apply an external sync signal to an external sync signal input connector, and then press EXT. The LV 5490 determines the sync signal format automatically.

As shown in the figure below, the external sync signal input connectors are loop-through. Apply the input signal to one of the two connectors, and terminate the other connector at 75 Ω , or connect it to another 75 Ω device. If you connect to another device, be sure to terminate the device at the end of the chain at 75 Ω . Connect cables with a characteristic impedance of 75 Ω .

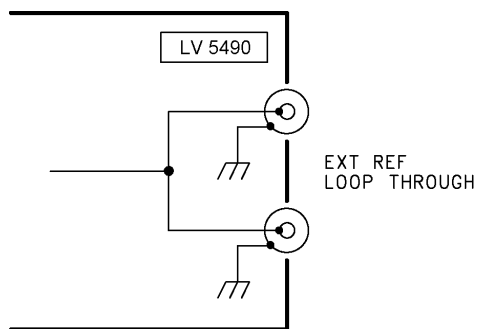


Figure 5-6 Loop-through

*1 Waveform display using an external sync signal is not possible for the following formats.

- 3G 720/30P, 720/29.97P, 720/25P, 720/24P, 720/23.98P
- HD (DL) 1080/60P, 1080/59.94P, 1080/50P
- 3G (DL), 3G (QL), HD (QL), 12G (SER06/SER08)
- Frame frequency 48P, 47.95P

5. BEFORE YOU BEGIN MEASURING

External sync signals that are compatible with each input signal are indicated with a check mark in the following table. Proper measurement is possible only for combinations that are indicated with check marks.

Table 5-2 External sync signal formats (SD, HD)

		SDI (SD, HD) Input Signal Format																							
		525/59.94I	625/50I	1080/60I	1080/59.94I	1080/50I	1080/30PsF	1080/29.97PsF	1080/25PsF	1080/24PsF	1080/23.98PsF	1080/30P	1080/29.97P	1080/25P	1080/24P	1080/23.98P	720/60P	720/59.94P	720/50P	720/30P	720/29.97P	720/25P	720/24P	720/23.98P	
External Sync Signal Format	NTSC with 10 field ID (59.94Hz)(*1)	✓			✓			✓			✓		✓			✓		✓			✓			✓	
	NTSC (59.94Hz)	✓			✓			✓				✓					✓				✓				
	PAL (50Hz)		✓			✓			✓					✓					✓			✓			
	1080/60I			✓			✓																		
	1080/59.94I				✓			✓																	
	1080/50I					✓			✓																
	1080/30PsF						✓																		
	1080/29.97PsF							✓																	
	1080/25PsF								✓																
	1080/24PsF									✓															
	1080/23.98PsF										✓														
	1080/30P											✓													
	1080/29.97P												✓												
	1080/25P													✓											
	1080/24P														✓										
	1080/23.98P															✓									
	720/60P																✓								
	720/59.94P																	✓							
	720/50P																		✓						
	720/30P																			✓					
	720/29.97P																				✓				
	720/25P																					✓			
	720/24P																						✓		
	720/23.98P																							✓	

*1 If the input signal is 1080/23.98PsF or 1080/23.98P, the 10 field ID is automatically detected.

5. BEFORE YOU BEGIN MEASURING

Table 5-3 External sync signal formats (3G)

		1080/60P	1080/59.94P	1080/50P	1080/60I	1080/59.94I	1080/50I	1080/30PsF	1080/29.97PsF	1080/25PsF	1080/24PsF	1080/23.98PsF	1080/30P	1080/29.97P	1080/25P	1080/24P	1080/23.98P	720/60P	720/59.94P	720/50P
External Sync Signal Format	NTSC with 10 field ID (59.94Hz)(*1)		✓			✓			✓			✓		✓			✓		✓	
	NTSC (59.94Hz)		✓			✓			✓					✓					✓	
	PAL (50Hz)			✓			✓			✓					✓					✓
	1080/60I	✓			✓			✓												
	1080/59.94I		✓			✓			✓											
	1080/50I			✓			✓			✓										
	1080/30PsF							✓												
	1080/29.97PsF								✓											
	1080/25PsF									✓										
	1080/24PsF										✓									
	1080/23.98PsF											✓								
	1080/30P												✓							
	1080/29.97P													✓						
	1080/25P														✓					
	1080/24P															✓				
	1080/23.98P																✓			
	720/60P																	✓		
	720/59.94P																		✓	
	720/50P																			✓

*1 If the input signal is 1080/23.98PsF or 1080/23.98P, the 10 field ID is automatically detected.

5. BEFORE YOU BEGIN MEASURING

Table 5-4 External sync signal formats (12G)

		SDI (12G) Sub Image Input Signal Format (*1)							
		1080/60P	1080/59.94P	1080/50P	1080/30P	1080/29.97P	1080/25P	1080/24P	1080/23.98P
External Sync Signal Format	NTSC with 10 field ID (59.94Hz) (*2)		✓			✓			✓
	NTSC (59.94Hz)		✓			✓			
	PAL (50Hz)			✓			✓		
	1080/60I	✓							
	1080/59.94I		✓						
	1080/50I			✓					
	1080/30P				✓				
	1080/29.97P					✓			
	1080/25P						✓		
	1080/24P							✓	
	1080/23.98P								✓

*1 If the input signal is 12G, the phase difference is measured for the 4k sub image format.

*2 If the input signal is 1080/23.98PsF or 1080/23.98P, the 10 field ID is automatically detected.

5.7.4 Digital Audio I/O (SER03)

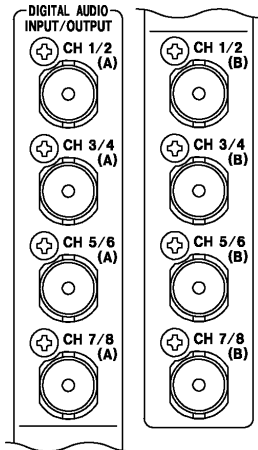


Figure 5-7 Digital audio I/O connectors

- Input/Output Switching

The connectors can be switched between input and output in groups (A and B).

On the AUDIO IN/OUT tab in the system settings, select Input or Output.

Reference AUDIO IN/OUT tab → 7.1.6, “Configuring the Audio I/O Connectors (SER03)”

- Audio Signal Output

If group A or B is set to output, the following signals are output. Use the signals for monitoring.

Table 5-5 Audio signal output

INPUT	CH MODE	Group A Output	Group B Output
SDI	8ch	The 8 channels from 1st GROUP and 2nd GROUP	The 8 channels from 1st GROUP and 2nd GROUP
	16ch	The 8 channels from 1st GROUP and 2nd GROUP	The 8 channels from 3rd GROUP and 4th GROUP
EXT AUDIO	8ch	- (Input)	8 channels applied to group A
		8 channels applied to group B	- (Input)
	16ch	- (Input)	- (Input)

5.7.5 Monitor Signal Output

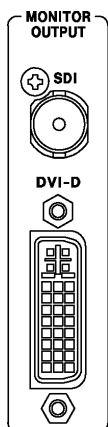


Figure 5-8 Monitor output connectors

The SDI output connector and DVI-D output connector transmit the LV 5490 screen for a monitor device. Connect to a full high definition (1920×1080) display.

- Selecting the Sync Mode

On the MONITOR OUT tab in the system settings, select internal synchronization or external synchronization. If you select internal synchronization, you can also select the output format.

Reference MONITOR OUT tab → 7.1.7, "Configuring the Monitor Output Connectors"

- SDI Routing Output

In single link mode (excluding 12G and 3G-B-DS), in place of transmitting the LV 5490 screen, the SDI output connector can transmit a reclocked signal of a signal received through SDI INPUT. On the MONITOR OUT tab in the system settings, select INPUT ROUTER.

The output channel when INPUT ROUTER is selected is the displayed channel in single input mode or the channel selected with **F•6** SELECT CH on the appropriate measurement screen in simul mode.

5.8 Operation Basics

5.8.1 Displaying the Function Menu

The function menu is used to specify a variety of settings.

Normally the function menu is displayed, but it can be cleared by pressing the measurement key that is currently selected. You can also set it to disappear automatically on the GENERAL SETUP tab in the system settings.

Reference GENERAL SETUP tab → 7.2.1, “General Settings”

If the measurement menu disappears, carry out one of the following operations to display it again.

- Pressing a Measurement Key to Display the Menu

Press the measurement key (WFM, VECT, PIC, AUDIO, STATUS, or EYE) that corresponds to the currently selected display mode to display the menu. When you perform this operation, the top-level menu is displayed.

- Pressing a Function Key to Display a Menu

Press one of the function keys to display the menu. When you perform this operation, the menu is displayed at the level that was displayed before it disappeared.

5.8.2 Function Menu Operations

This section explains how to operate the function menu, using the function menu on the VECT display as an example.

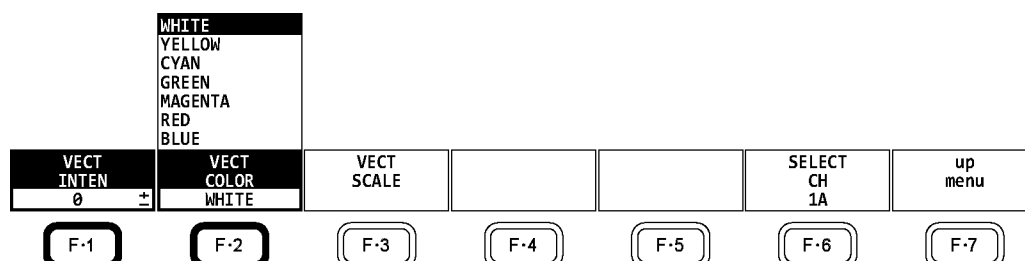


Figure 5-9 Function menu operations

- Specifying Values

To set the value of a setting like **F•1** VECT INTEN, which is shown in the figure above, press **F•1**, and then turn the function dial (F•D). You can reset most settings to their default values by pressing the function dial (F•D).

- Selecting Settings

To select a setting from a list like the one shown in the figure above for **F•2** VECT COLOR, press **F•2** repeatedly to select the setting you want. The setting changes each time you press **F•2**. After you stop pressing **F•2**, the setting is confirmed and the pop-up menu disappears.

5.8.3 Mouse Operations

You can use the mouse to operate the keys on the screen to specify settings in the same manner as using the front panel keys. To display the keys, connect a mouse, and click in the screen.

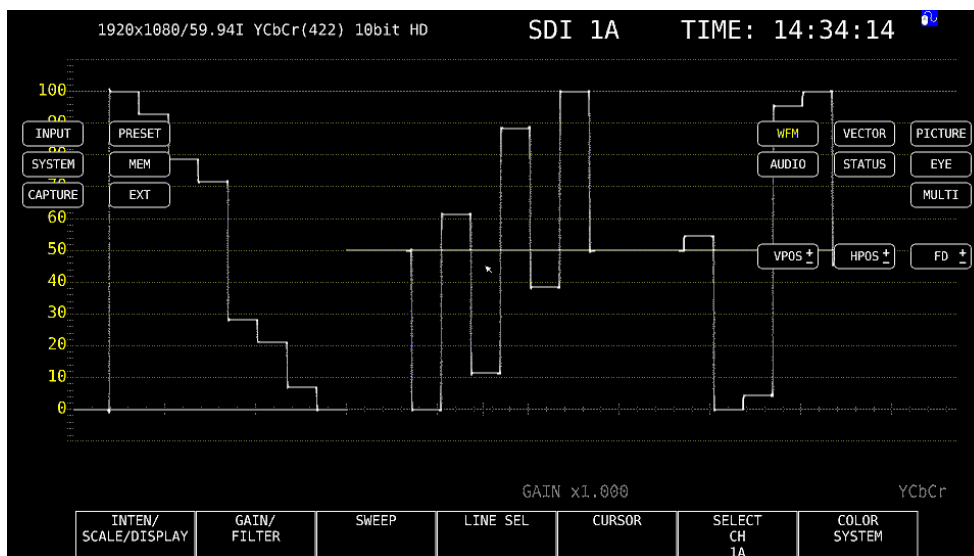


Figure 5-10 Mouse operations

- Measurement Screen Settings

Click the keys on the screen and the function menu.

You can change a value in the function menu by using the +- buttons to the right of FD, the +- buttons to the right of the value, or the wheel on the mouse.

The preset feature is divided into PRESET and MEM keys on the screen. PRESET is used to recall, and MEM is used to store.

- Tab Screen Settings

Click the items on the screen and the function menu.

You can change a value on a tab screen by using the +- buttons to the right of FD or the wheel on the mouse.

- Moving the Cursors

Cursors on video signal waveforms can be moved easily with a mouse.

To do so, click a cursor to select it, and then click a position of your choice. To unselect, right-click.

A portion of the cursors can be moved with a mouse wheel. If you use a mouse wheel, right-click to set the position.

5. BEFORE YOU BEGIN MEASURING

- Right-Click Menu

The menu below appears when you right-click the mouse.
LAYOUT is an item that can only be set using the mouse.

Table 5-6 Right-click menu

Menu	Description
ALL CLEAR	Hides the keys and function menu from the screen. Click in the screen to redisplay them.
KEY CLEAR	Hides the keys from the screen. Click in the screen to redisplay them.
MENU CLEAR	Hides the function menu. Click in the screen to redisplay it.
LAYOUT	Creates a measurement screen layout. Reference 6.4, "Arranging the Measurement Screen Layout"

5.8.4 Tab Menu Operations

Normally, the function menus are used to configure the various settings. However, tab menus—such as that shown below—are displayed in some situations. This section explains how to operate the tab menu, using the GENERAL SETUP tab menu as an example.



Figure 5-11 Tab menu operations

- Moving Cursors

To move the cursor, turn the function dial (F•D). Depending on what you are setting, there are some items in which you cannot move the cursor.

- Switching Tabs

When there are multiple tabs, such as in the figure above, press **F•2** PREV TAB and **F•3** NEXT TAB to change between tabs. If you switch to another tab, the settings are retained, but they are not confirmed until you press **F•1** COMPLETE.

5. BEFORE YOU BEGIN MEASURING

- Selecting a Check Box

Move the cursor to the check box that you want to select, and press the function dial (F•D).

- Entering Values

Move the cursor to the item that you want to enter the value for, and press the function dial (F•D). Turn the function dial (F•D) to set the value. To confirm the value that you have set, press the function dial (F•D) again.

- Confirming Settings

Press **F•1** COMPLETE to apply the settings from all the tabs and return to the screen that is one level up.

- Canceling Settings

Press **F•7** up menu to cancel the settings from all the tabs and return to the screen that is one level up.

5.8.5 Setting the Key Lock

You can prevent unintentional operations on the LV 5490 by enabling the key lock. The key lock disables all LV 5490 keys except for the power switch.

- Enabling the Key Lock

Hold down SYS until the following message is displayed on the screen. While the key lock is enabled, the key lock icon  appears in the upper right of the screen.



Figure 5-12 Enabling the key lock

- Releasing the Key Lock

Hold down SYS until the following message is displayed on the screen.



Figure 5-13 Releasing the key lock

5. BEFORE YOU BEGIN MEASURING

5.9 Measurement Screen Explanation

The measurement screen layout can be arranged as you like. This section explains items that are common to all displays.

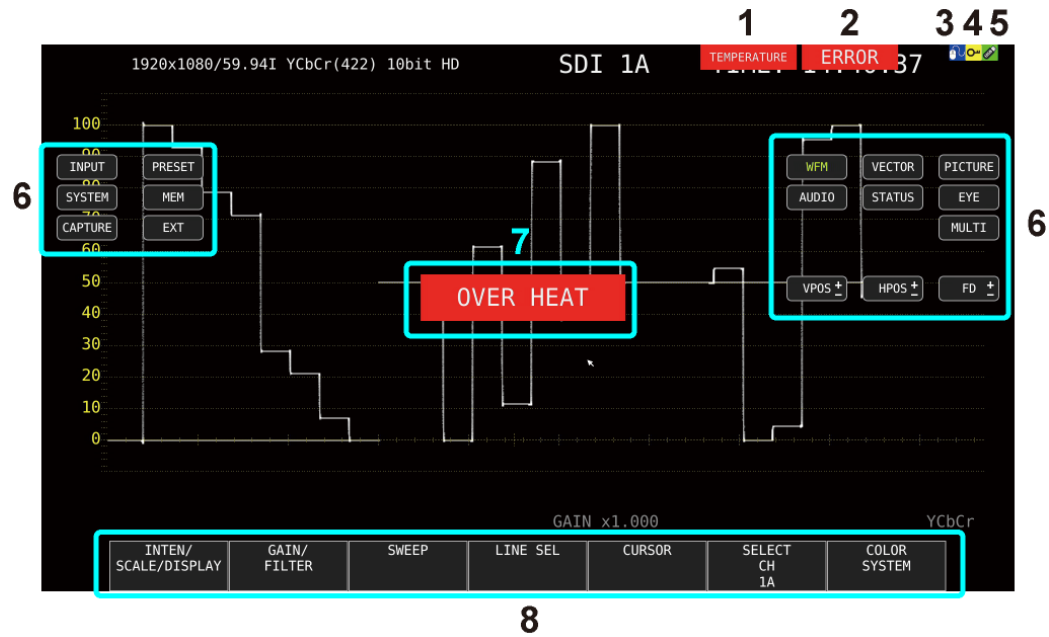


Figure 5-14 Measurement screen explanation

5. BEFORE YOU BEGIN MEASURING

Table 5-7 Measurement screen explanation

No	Name	Description
1	TEMPERATURE	Appears when the internal temperature increases. You can also choose to hide this information. See sections 7.3, "Displaying System Information" and 7.2.1, "General Settings."
2	ERROR	Appears when an input signal error occurs.(*1) To configure error detection settings, use F•5 STATUS SETUP on the STATUS menu or F•4 ERROR SETUP on the EYE menu.
3	Mouse icon	Appears when a USB mouse is connected. You can also choose to hide this information. See section 5.5, "Connecting USB Devices" and 7.2.1, "General Settings."
4	Key lock icon	Appears when key lock is enabled. You can also choose to hide this information. See section 5.8.5, "Enabling the Key Lock" and 7.2.1, "General Settings."
5	USB memory icon	Appears when a USB memory device is connected. You can also choose to hide this information. See section 5.5, "Connecting USB Devices" and 7.2.1, "General Settings."
6	Screen keys	Keys on the screen that you operate with a mouse. See section 5.8.3, "Mouse Operations."
7	OVER HEAT FAN ALARM	"OVER HEAT" appears when the internal temperature increases. "FAN ALARM" appears when a fan error occurs. If either of these alarm appears, immediately turn the power off, and then check for problems with the operating environment. If this alarm appears even though there are no problems with the operating environment, contact your local LEADER agent. See section 7.3, "Displaying System Information."
8	Function menu	A menu for configuring settings. See section 5.8.1, "Displaying the Function Menu."

*1 The applicable channels are all channels in the selected group (1A to 1D or 2A to 2D).
However, when measuring 3G-B-DS or 3G (DL)-4K, only on the currently displayed channels are applicable.

6. BASIC OPERATION

6.1 Setting the Input Signals

This section explains the INPUT menu settings and input format display.

6.1.1 Selecting the Input Mode

When SDI System on the SDI IN tab is set to SD/HD/3G-A/3G-B-DL, HD Dual Link, or NMI to select the input mode, follow the procedure below.

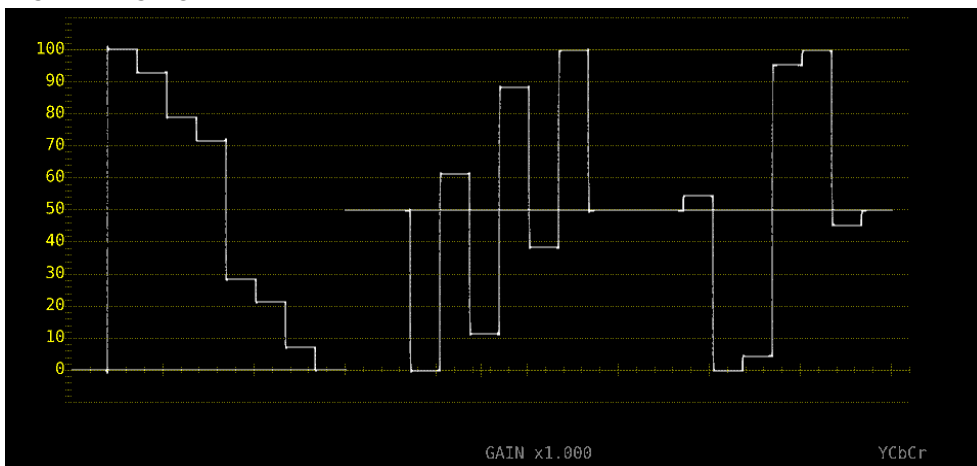
Procedure

INPUT	→	F•7	DISPLAY: <u>SINGLE</u> , SIMUL

Settings

SINGLE:	The LV 5490 operates in single input mode. It is a mode for measuring a single signal that has been turned on using F•1 to F•4 .
SIMUL:	The LV 5490 operates in simul mode. It is a mode for measuring multiple signals that have been turned on using F•1 to F•4 .

DISPLAY = SINGLE



6. BASIC OPERATION

DISPLAY = SIMUL

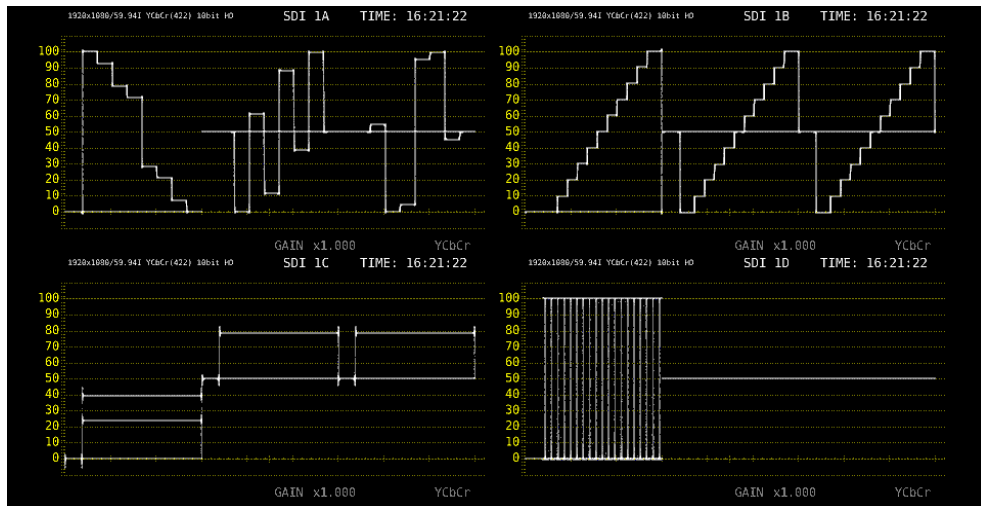


Figure 6-1 Selecting the Input Mode

6.1.2 Selecting Simul Operation

When in simul mode, to select how to set each channel, follow the procedure below. If you change **INDIVIDUAL** to **COM**, all the settings are changed to those of the channel selected with **F•6** SELECT CH on each measurement screen.

Procedure

INPUT → F•6 OPERATE CH MODE: COM / INDIVIDUAL

Settings

COM:	Measurement settings are made for all channels. A portion of the settings, such as the line selection when signals of different formats are applied, are not shared by all channels.
INDIVIDUAL:	Measurement settings are made for each channel. To select the channel you want to set, use F•6 SELECT CH on each measurement screen. A portion of the settings, such as ERROR CLEAR on the STATUS menu are shared by all channels.

6.1.3 Selecting the Measurement Group

When SDI In/Out BNC on the SDI OUT tab is set to Input, to select the measurement group, follow the procedure below. When SDI System on the SDI IN tab is 4K 12G, the group is fixed to 1, and this menu item is not displayed.

Procedure

INPUT → F•5 INPUT GROUP: 1 / 2

Settings

1:	Signals received through 1A to 1D are measured
2:	Signals received through 2A to 2D are measured

6.1.4 Selecting the Channels to Measure

To select the channels to measure in the group selected with **F•5** INPUT GROUP, follow the procedure below.

Procedure (when the link format is set to single)

INPUT	
→ F•1	1A: <u>ON</u> / OFF F•1 2A: <u>ON</u> / OFF
→ F•2	1B: <u>ON</u> / OFF F•2 2B: <u>ON</u> / OFF
→ F•3	1C: <u>ON</u> / OFF F•3 2C: <u>ON</u> / OFF
→ F•4	1D: <u>ON</u> / OFF F•4 2D: <u>ON</u> / OFF

Procedure (when the link format is set to dual)

INPUT	
→ F•1	1A - 1B: <u>ON</u> / OFF F•3 2A - 2B: <u>ON</u> / OFF
→ F•2	1C - 1D: <u>ON</u> / OFF F•4 2C - 2D: <u>ON</u> / OFF

Procedure (when the link format is set to quad)

INPUT	
→ F•1	1A - 1D: <u>ON</u> F•2 2A - 2D: <u>ON</u>

Procedure (when SDI System is set to 4K NMI, SER08)

INPUT	
→ F•1	1 - 4: <u>ON</u>

Procedure (when SDI System is set to NMI, SER08)

INPUT	
→ F•1	1: <u>ON</u> / OFF
→ F•2	1: <u>ON</u> / OFF
→ F•3	1: <u>ON</u> / OFF
→ F•4	1: <u>ON</u> / OFF

You can also use **F•6** SELECT CH on each measurement screen to select the channel you want to measure.

F•6 SELECT CH works as follows:

- In single input mode, select the measurement channel.
- Selects the signal that is output from SDI OUTPUT (2A) when Select Out on the SDI OUT tab is set to A/B/C/D ch.
- Selects the signal that is output from MONITOR OUTPUT (SDI) when Mode on the MONITOR OUT tab is set to INPUT ROUTER.
- Selects that channel to be configured when **F•6** OPERATE CH MODE of the INPUT menu is set to INDIVIDUAL.
- Selects where to recall captured frame data from.

6. BASIC OPERATION

6.1.5 Input Format Error Display

If the format of the received signal is not appropriate for the setting specified on the SDI IN tab in the system settings, the LV 5490 displays the format in red or an INPUT FORMAT window in the center of the screen.

If this occurs, check the settings on the SDI IN tab, the input signal, and payload ID.

The format is displayed in red in the following situations.

- If the format is 2 sample interleave of 3G(DL)-4K or 3G(QL), and the order of the link is not correct
- When the payload ID is not appropriate

An INPUT FORMAT window is displayed in the following situations.

- If the input signal is multi link, and the format specified on the SDI IN tab is not received

Reference SDI IN tab → 7.1.1, "Configuring the SDI Input Connectors."

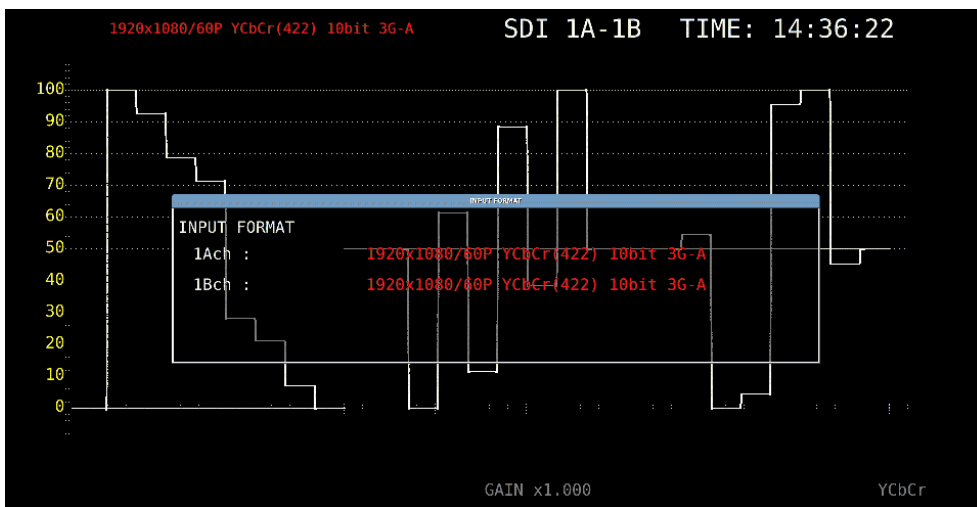


Figure 6-2 Input Format Error Display

6. BASIC OPERATION

6.2 Setting the Signals to Measure

This section explains the procedure from applying an input to displaying the measurement screen for each of the different input signal formats.

6.2.1 Measuring SD, HD, 3G-A, and 3G-B-DL Signals

1. On the SDI IN tab in the system settings, set SDI System to SD/HD/3G-A/3G-B-DL.

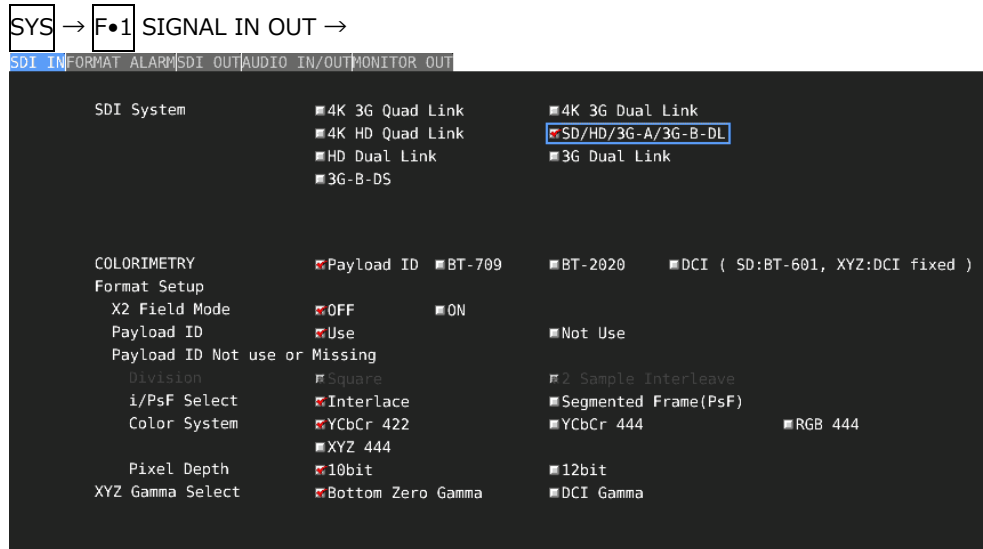


Figure 6-3 SDI IN tab

2. If the input signal is HD or 3G, set the payload ID.
Select Use or Not Use. If you select Not Use, specify the following settings.
 - HD Set i/PsF Select.
 - 3G Set i/PsF Select, Color System, and Pixel Depth.Reference 7.1.1, "Configuring the SDI Input Connectors"

6. BASIC OPERATION

- Press **F•2** PREV TAB or **F•3** NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to eight signals (1A to 1D and 2A to 2D).

Select Output to apply up to four signals (1A to 1D). (2A to 2D are set to output.)

SYS → **F•1** SIGNAL IN OUT → **F•2** PREV TAB or **F•3** NEXT TAB →

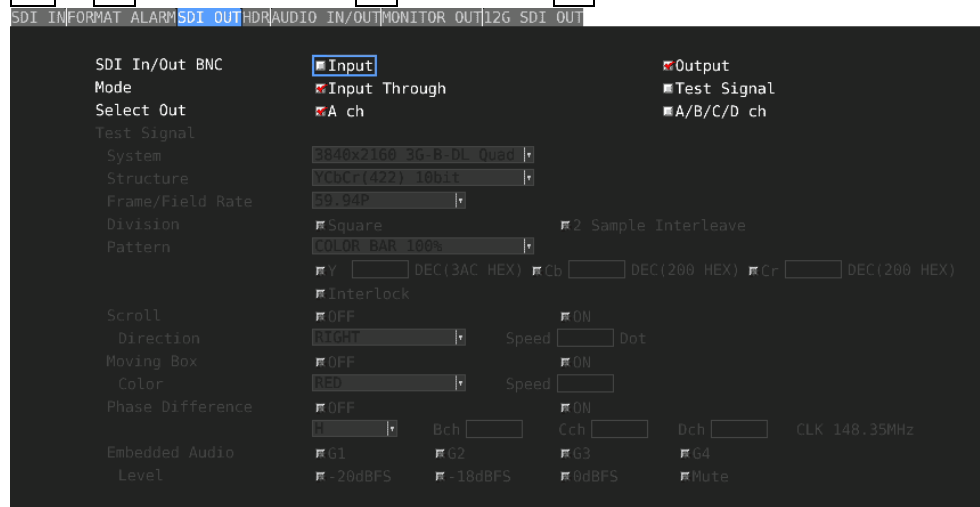


Figure 6-4 SDI OUT tab

- Press COMPLETE.
- Apply SDI signals to the SDI INPUT connectors on the rear panel.
If Output is selected in step 3, do not apply signals to 2A to 2D.

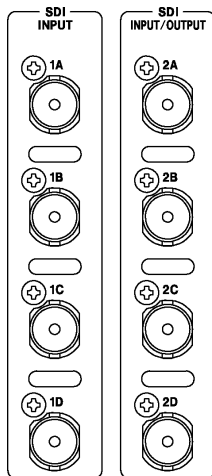


Figure 6-5 SDI input connectors

6. BASIC OPERATION

6. Press INPUT to select the channels you want to measure.

First, press **F•7** DISPLAY to select whether to measure a single channel (SINGLE) or multiple channels (SIMUL).

Next, press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2). This does not appear if Output was selected in step 3.

Finally, press **F•1** to **F•4** to turn on the channels you want to measure.

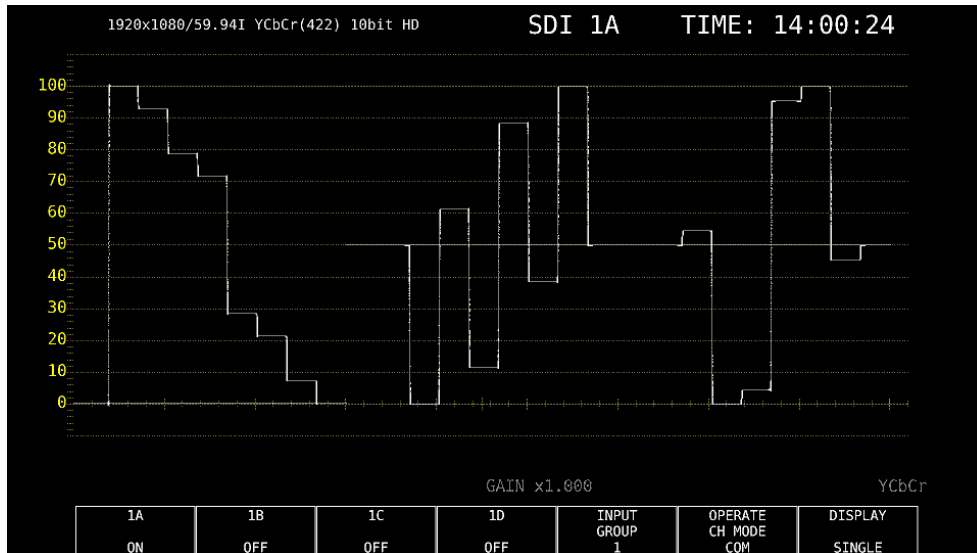


Figure 6-6 Measurement screen

6.2.2 Measuring 3G-B-DS Signals

1. On the SDI IN tab in the system settings, set SDI System to 3G-B-DS.

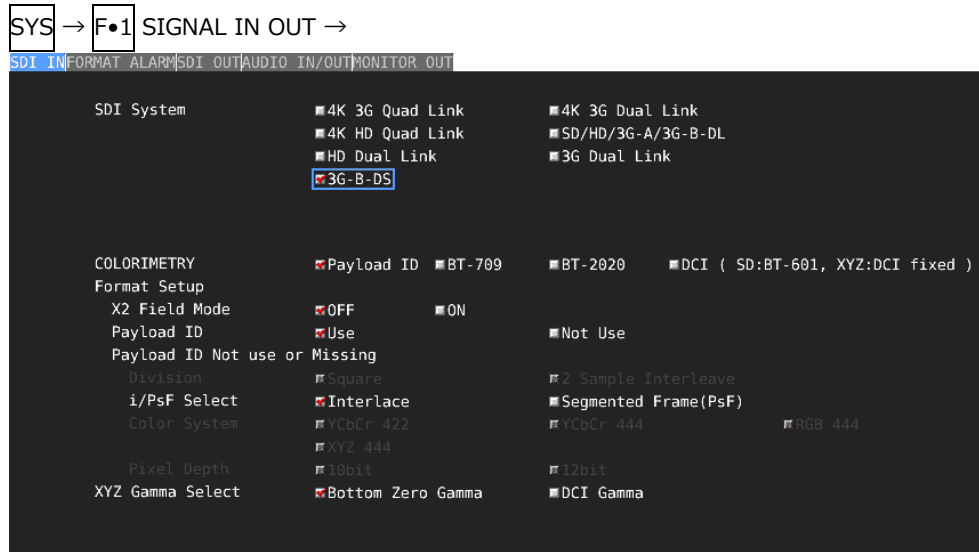


Figure 6-7 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. If you select Not Use, set i/PsF Select.

Even if Use is selected, if a 3G-B-DL signal is applied, the LV 5490 will detect is as a 3G-B-DS signal.

Reference 7.1.1, "Configuring the SDI Input Connectors"

3. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to eight signals (1A to 1D and 2A to 2D).

Select Output to apply up to four signals (1A to 1D). (2A to 2D are set to output.)

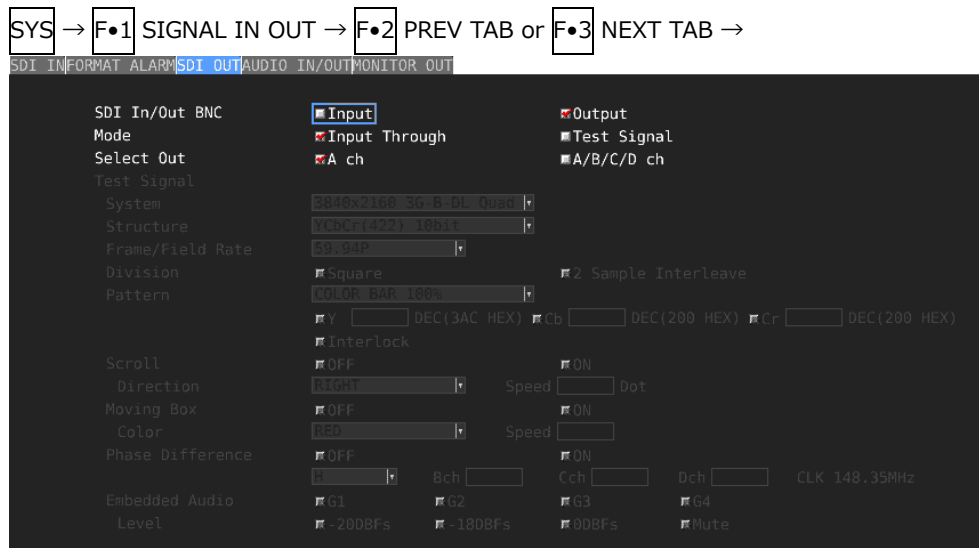


Figure 6-8 SDI OUT tab

6. BASIC OPERATION

- Press COMPLETE.
- Apply 3G-B-DS signals to the SDI INPUT connectors on the rear panel.
If Output is selected in step 3, do not apply signals to 2A to 2D.

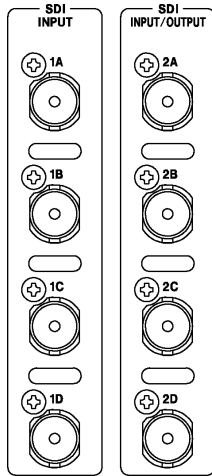


Figure 6-9 SDI input connectors

- Press INPUT to select the channels you want to measure.
First, press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2). This does not appear if Output was selected in step 3.
Next, press **F•1** to **F•4** to turn on the channels you want to measure. Simul mode cannot be used.

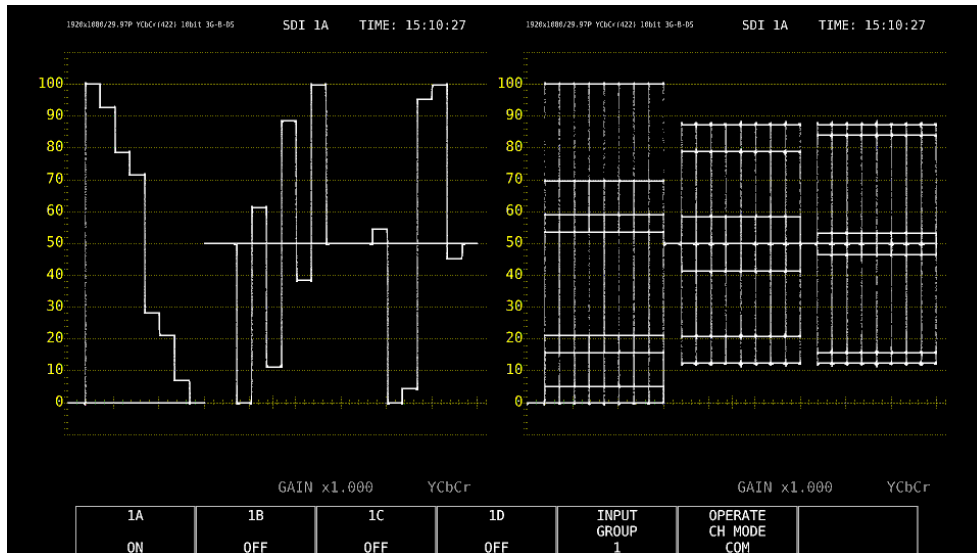


Figure 6-10 Measurement screen

6.2.3 Measuring 12G Signals (SER06/SER08)

1. On the SDI IN tab in the system settings, set SDI System to 4K 12G.

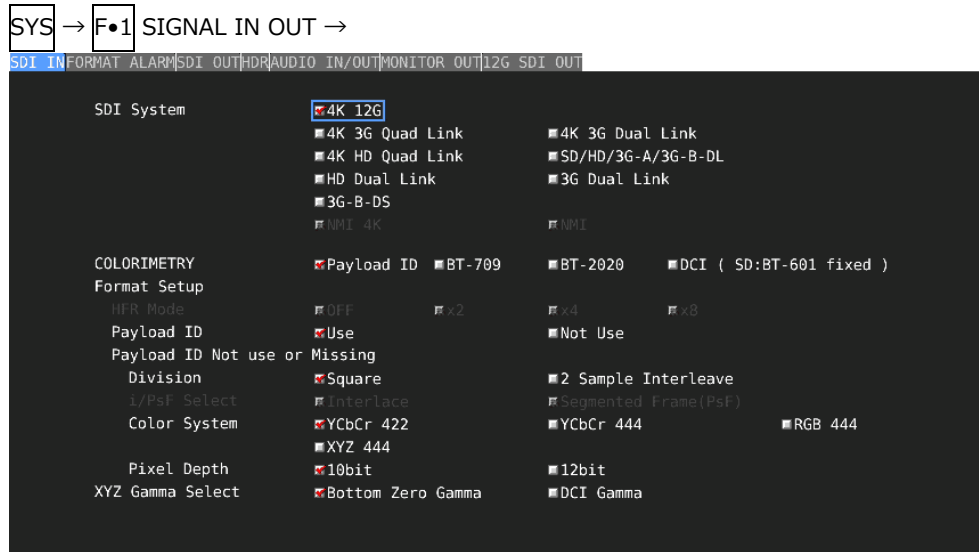


Figure 6-11 SDI IN tab

2. Set the payload ID.
Select Use or Not Use. If you select Not Use, set Division, Color System, and Pixel Depth.
Reference 7.1.1, "Configuring the SDI Input Connectors"
3. Press COMPLETE.
4. Apply 12G signals to the 12G-SDI INPUT (1A to 1D) connectors on the rear panel.
Even if SDI In/Out BNC on the SDI OUT tab is set to Input, signals received through 2A to 2D cannot be measured.

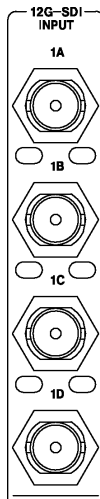


Figure 6-12 12G-SDI input connectors

6. BASIC OPERATION

5. Press INPUT to select the channels you want to measure.

Press **F•1** to **F•4** to turn on the channels you want to measure. Simul mode cannot be used.

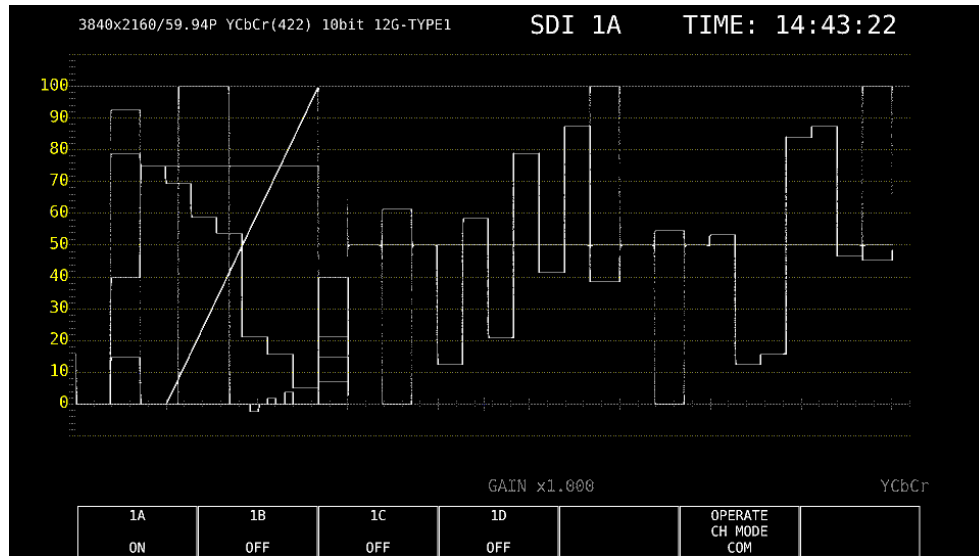


Figure 6-13 Measurement screen

- * To measure 12G-SDI signals, use cables and connectors that are appropriate for transmitting 12G-SDI signals. Using incompatible or degraded cables or connectors may cause the transmission characteristics to degrade drastically.

6. BASIC OPERATION

6.2.4 Measuring HD (DL) Signals

1. On the SDI IN tab in the system settings, set SDI System to HD Dual Link.

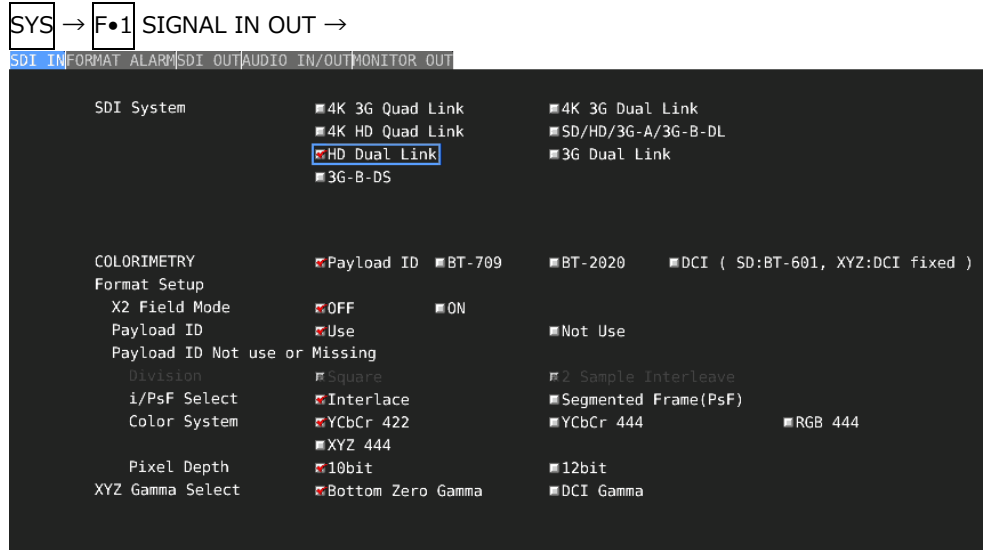


Figure 6-14 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. If you select Not Use, set i/PsF Select, Color System, and Pixel Depth.

Even if Use is selected, if a HD signal is applied, the LV 5490 will detect is as a HD (DL) signal.

Reference 7.1.1.1, "Configuring the SDI Input Connectors"

3. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to four signals (1A/1B, 1C/1D, 2A/2B, and 2C/2D).

Select Output to apply up to two signals (1A/1B and 1C/1D). (2A to 2D are set to output.)

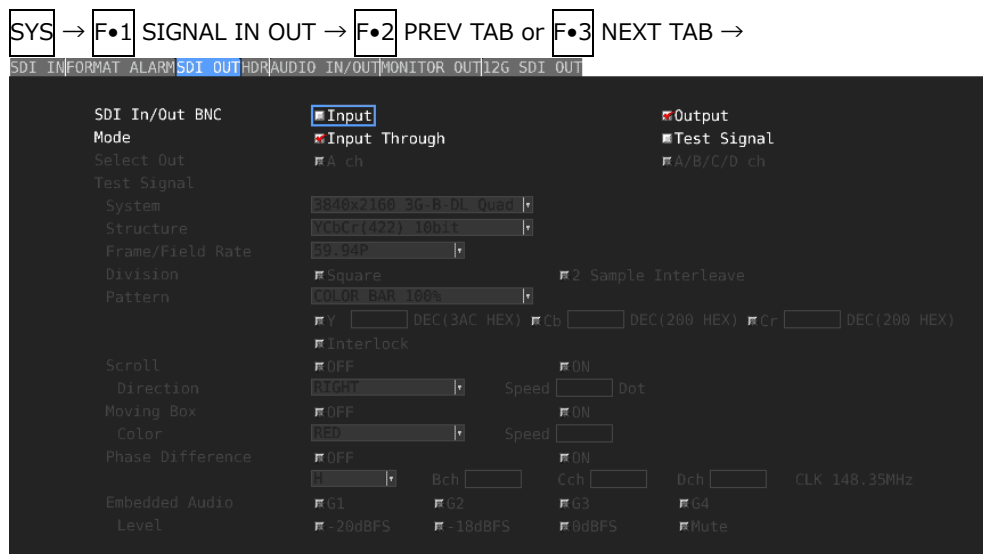


Figure 6-15 SDI OUT tab

6. BASIC OPERATION

4. Press COMPLETE.
5. Apply HD signals to the SDI INPUT connectors on the rear panel.
1A/1B, 1C/1D, 2A/2B, and 2C/2D are pairs.
If Output is selected in step 3, do not apply signals to 2A to 2D.

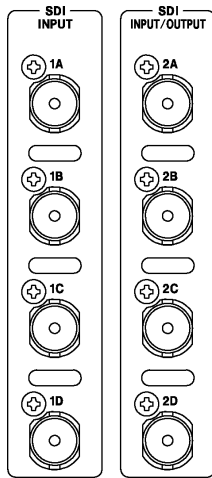


Figure 6-16 SDI input connectors

6. Press INPUT to select the channels you want to measure.
First, press **F•7** DISPLAY to select whether to measure a single channel (SINGLE) or multiple channels (SIMUL).
Next, press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2). This does not appear if Output was selected in step 3.
Finally, press **F•1** to **F•4** to turn on the channels you want to measure.

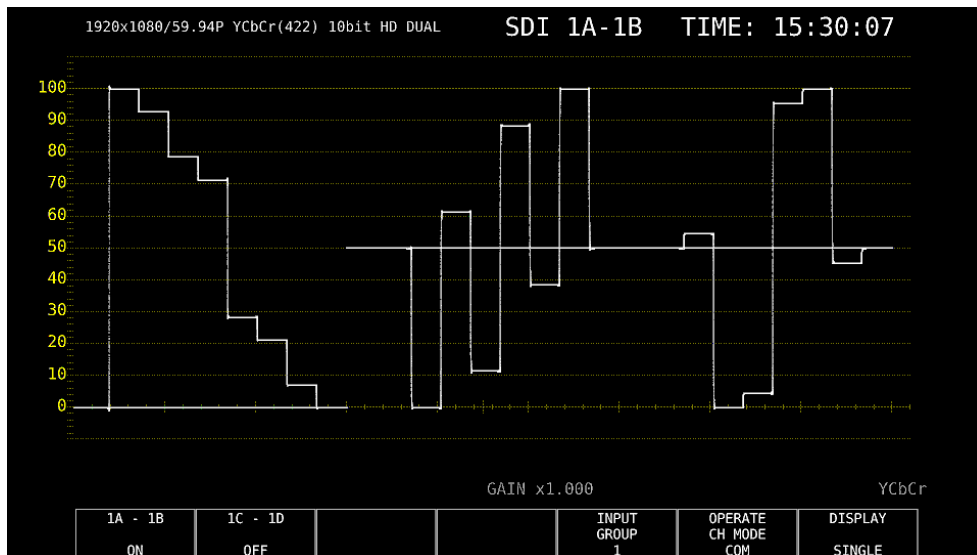


Figure 6-17 Measurement screen

6. BASIC OPERATION

6.2.5 Measuring 3G (DL)-2K Signals

1. On the SDI IN tab in the system settings, set SDI System to 3G Dual Link.

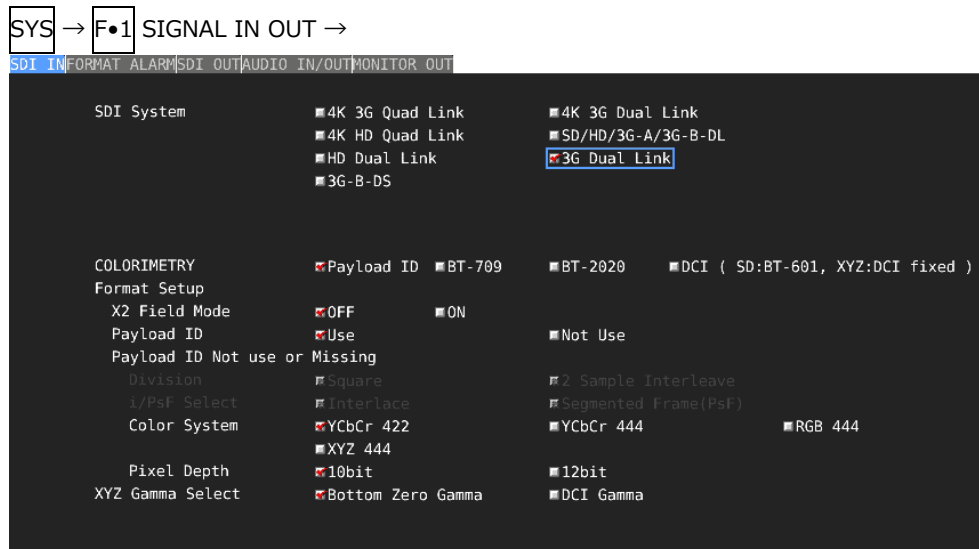


Figure 6-18 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. If you select Not Use, set Color System and Pixel Depth. Even if Use is selected, if a 3G-A or 3G-B-DL signal is applied, the LV 5490 will detect is as a 3G(DL)-2K signal.

Reference 7.1.1, "Configuring the SDI Input Connectors"

3. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to four signals (1A/1B, 1C/1D, 2A/2B, and 2C/2D).

Select Output to apply up to two signals (1A/1B and 1C/1D). (2A to 2D are set to output.)

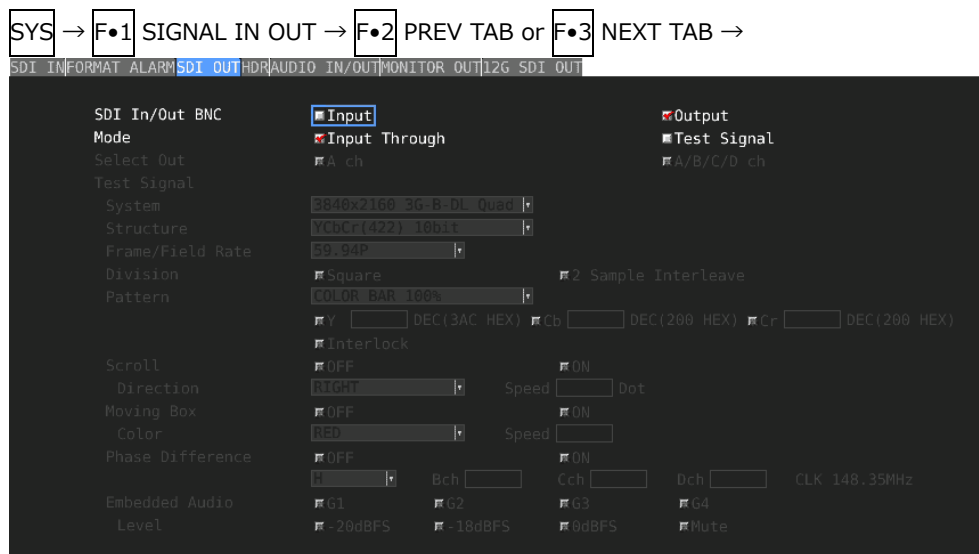


Figure 6-19 SDI OUT tab

6. BASIC OPERATION

4. Press COMPLETE.
5. Apply a 3G-A or 3G-B-DL signal to the SDI INPUT connectors on the rear panel.
1A/1B, 1C/1D, 2A/2B, and 2C/2D are pairs.
If Output is selected in step 3, do not apply signals to 2A to 2D.

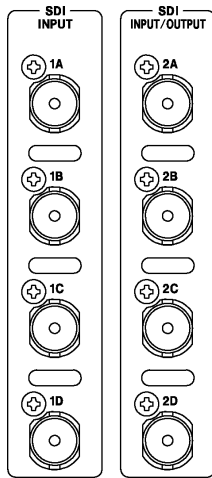


Figure 6-20 SDI input connectors

6. Press INPUT to select the channels you want to measure.
First, press **F•7** DISPLAY to select whether to measure a single channel (SINGLE) or multiple channels (SIMUL).
Next, press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2). This does not appear if Output was selected in step 3.
Finally, press **F•1** to **F•4** to turn on the channels you want to measure.

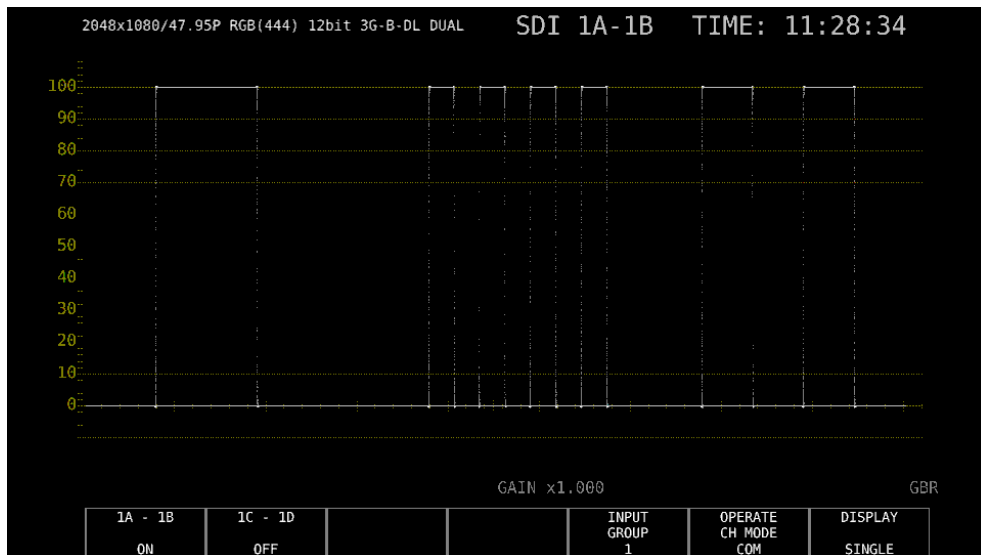


Figure 6-21 Measurement screen

6.2.6 Measuring 3G (DL)-4K Signals

1. On the SDI IN tab in the system settings, set SDI System to 4K 3G Dual Link.

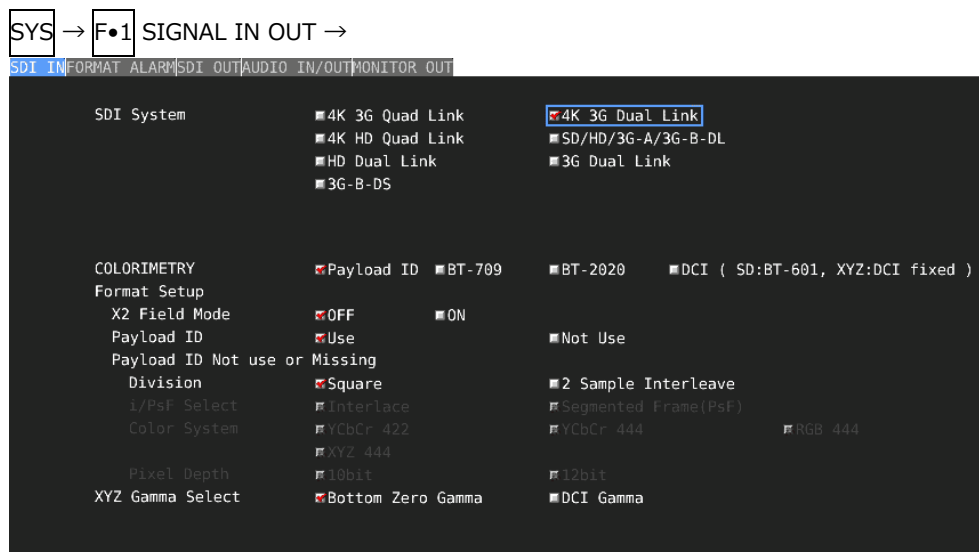


Figure 6-22 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. If you select Not Use, set Division.

Even if Use is selected, if a 3G-B-DL signal is applied, the LV 5490 will detect is as a 3G-B-DS signal.

Reference 7.1.1, “Configuring the SDI Input Connectors”

3. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to four signals (1A/1B, 1C/1D, 2A/2B, and 2C/2D).

Select Output to apply up to two signals (1A/1B and 1C/1D). (2A to 2D are set to output.)

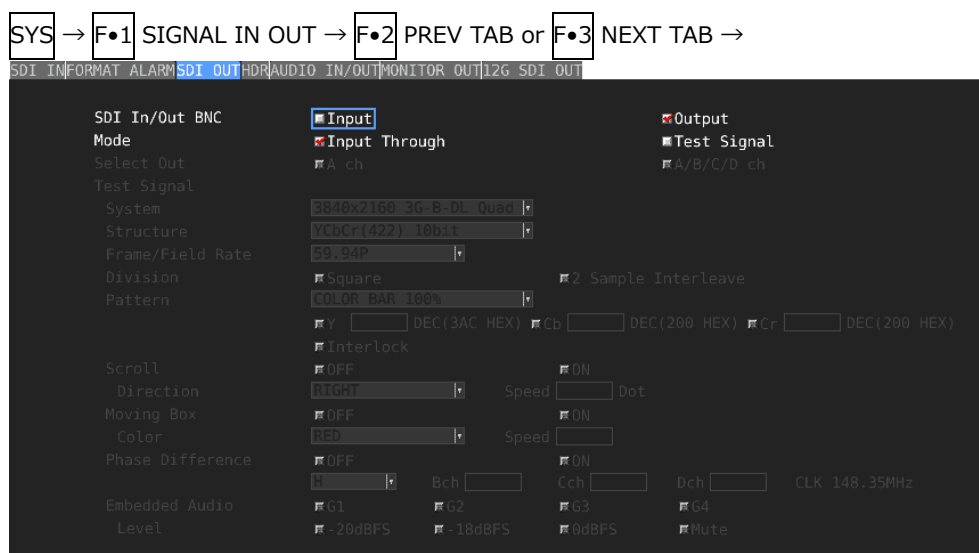


Figure 6-23 SDI OUT tab

6. BASIC OPERATION

4. Press COMPLETE.
5. Apply 3G-B-DS signals to the SDI INPUT connectors on the rear panel.
1A/1B, 1C/1D, 2A/2B, and 2C/2D are pairs.
If Output is selected in step 3, do not apply signals to 2A to 2D.

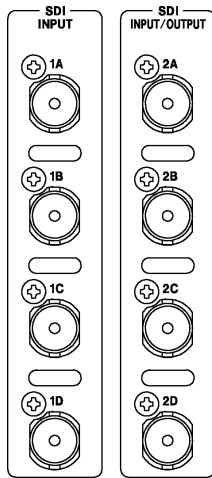


Figure 6-24 SDI input connectors

6. Press INPUT to select the channels you want to measure.
First, press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2). This does not appear if Output was selected in step 3.
Next, press **F•1** to **F•4** to turn on the channels you want to measure. Simul mode cannot be used.

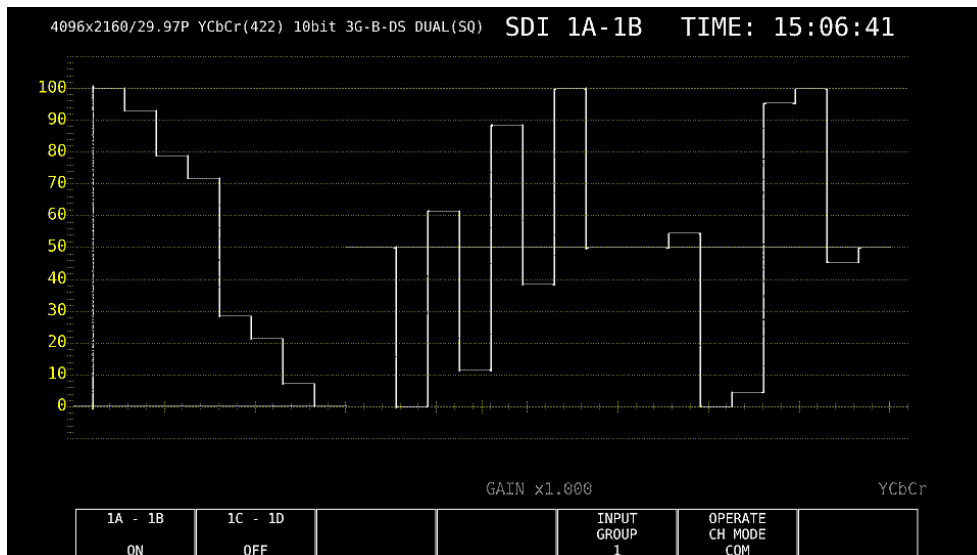


Figure 6-25 Measurement screen

6. BASIC OPERATION

6.2.7 Measuring HD (QL) Signals

1. On the SDI IN tab in the system settings, set SDI System to 4K HD Quad Link.

SYS → F•1 SIGNAL IN OUT →

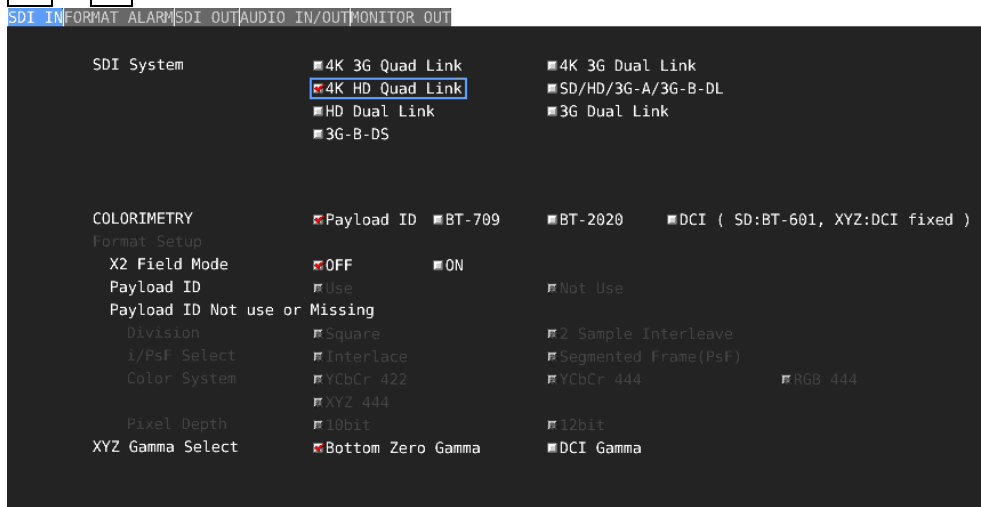


Figure 6-26 SDI IN tab

2. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to two signals (1A to 1D and 2A to 2D).

Select Output to apply up to one signals (1A to 1D). (2A to 2D are set to output.)

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

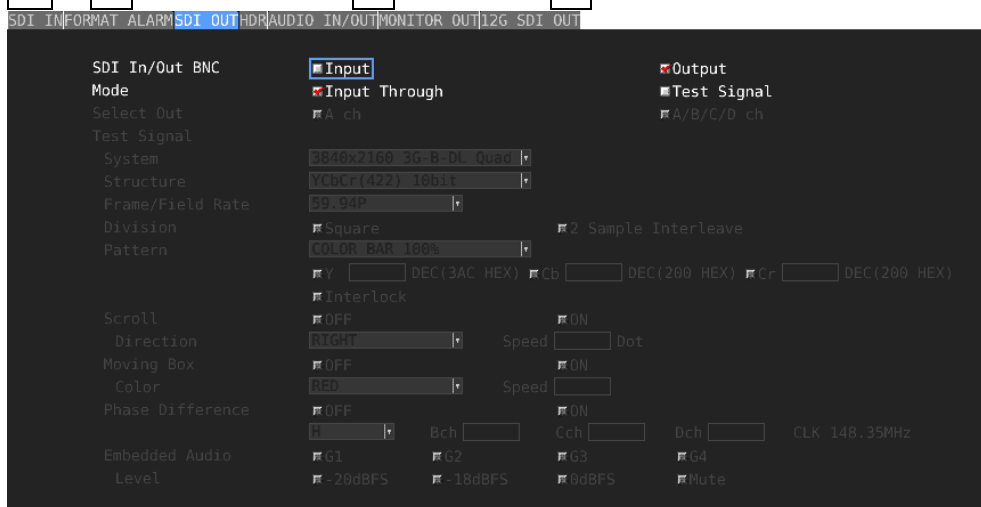


Figure 6-27 SDI OUT tab

6. BASIC OPERATION

3. Press COMPLETE.
4. Apply HD signals to the SDI INPUT connectors on the rear panel.
If Output is selected in step 2, do not apply signals to 2A to 2D.

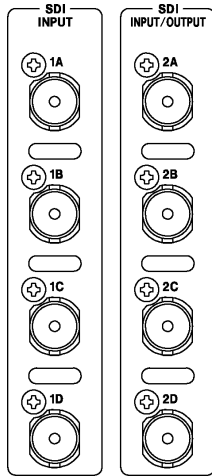


Figure 6-28 SDI input connectors

5. Press INPUT to select the channels you want to measure.
Press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2).
This does not appear if Output was selected in step 2.

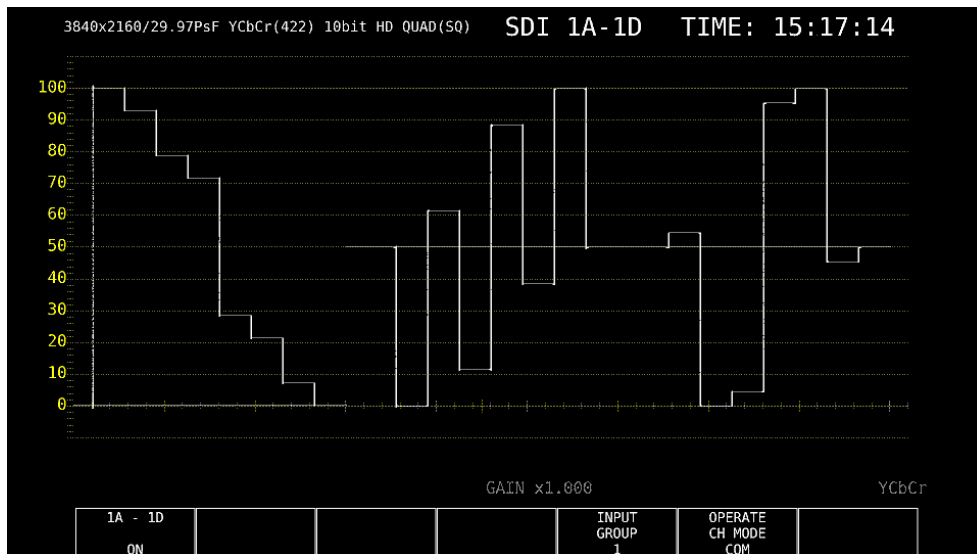


Figure 6-29 Measurement screen

6.2.8 Measuring 3G (QL) Signals

1. On the SDI IN tab in the system settings, set SDI System to 4K 3G Quad Link.

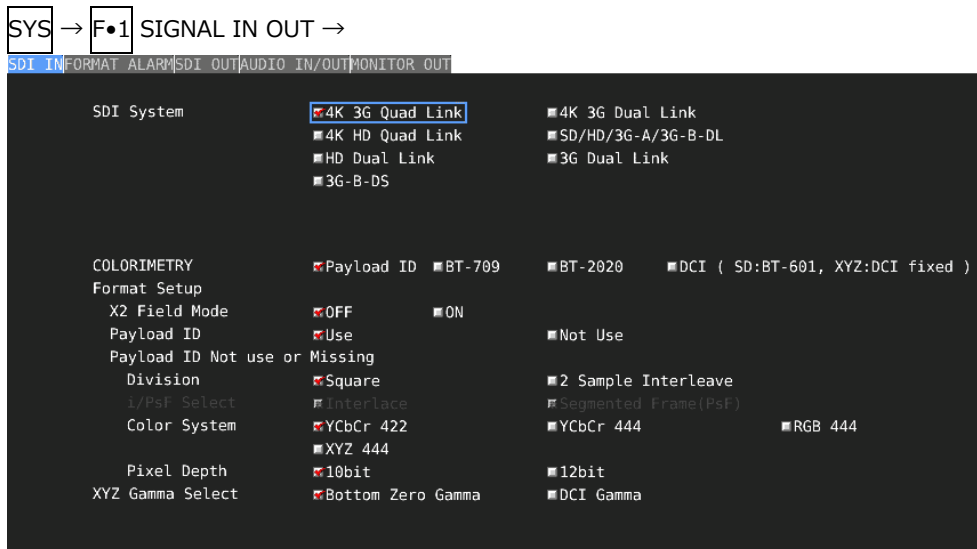


Figure 6-30 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. If you select Not Use, set Division, Color System, and Pixel Depth.

Even if Use is selected, if a 3G-B-DS signal is applied, the LV 5490 will detect is as a 3G-B-DL signal.

Reference 7.1.1, "Configuring the SDI Input Connectors"

3. Press F•2 PREV TAB or F•3 NEXT TAB, and then set SDI In/Out BNC.

Select Input to apply up to two signals (1A to 1D and 2A to 2D).

Select Output to apply up to one signals (1A to 1D). (2A to 2D are set to output.)

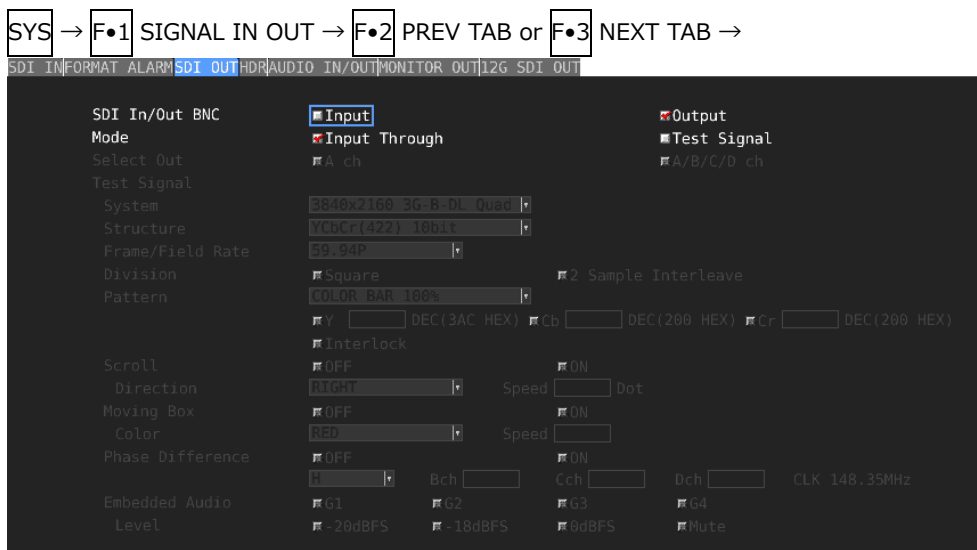


Figure 6-31 SDI OUT tab

6. BASIC OPERATION

- Press COMPLETE.
- Apply a 3G-A or 3G-B-DL signal to the SDI INPUT connectors on the rear panel.
If Output is selected in step 3, do not apply signals to 2A to 2D.

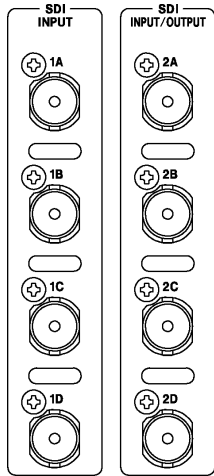


Figure 6-32 SDI input connectors

- Press INPUT to select the channels you want to measure.
Press **F•5** INPUT GROUP to select whether to measure 1A to 1D (1) or 2A to 2D (2).
This does not appear if Output was selected in step 3.

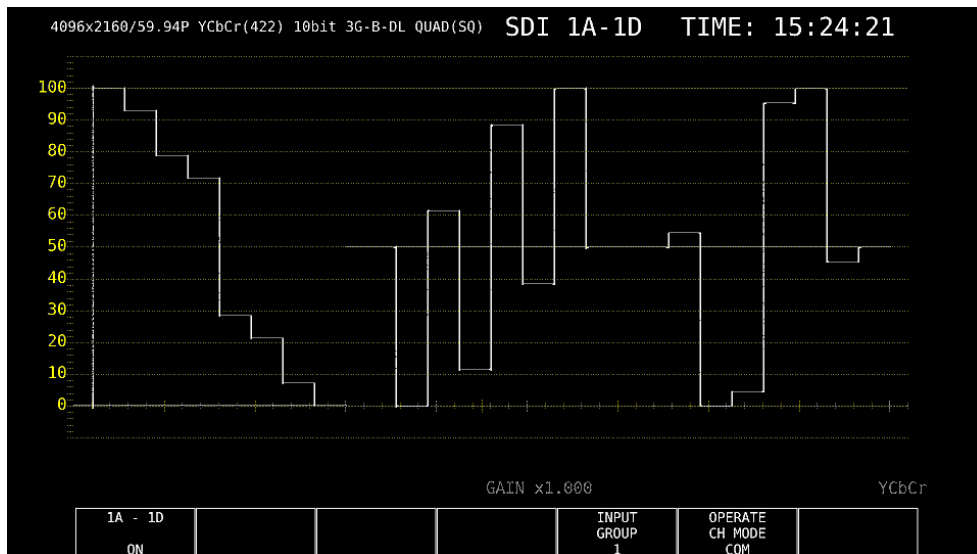


Figure 6-33 Measurement screen

6.2.9 Measuring 4K NMI Signals (SER08)

1. On the SDI IN tab in the system settings, set SDI System to 4K NMI.



Figure 6-34 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. Division is fixed to 2 Sample Interleave. i/PsF Select is fixed to Interlace. Color System is fixed to YCbCr 422. Pixel Depth is fixed to 10 bit.

Even if Use is selected, if a 4K NMI signal is applied, the LV 5490 will detect is as a 4K NMI signal.

Reference 7.1.1, "Configuring the SDI Input Connectors"

3. Press COMPLETE.
4. Apply 4K NMI signals to the NMI connectors on the rear panel.

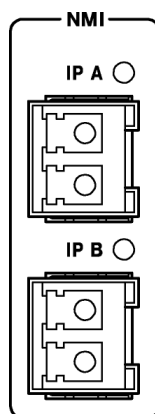


Figure 6-35 NMI input connectors

6. BASIC OPERATION

5. Press INPUT to select the channels you want to measure.

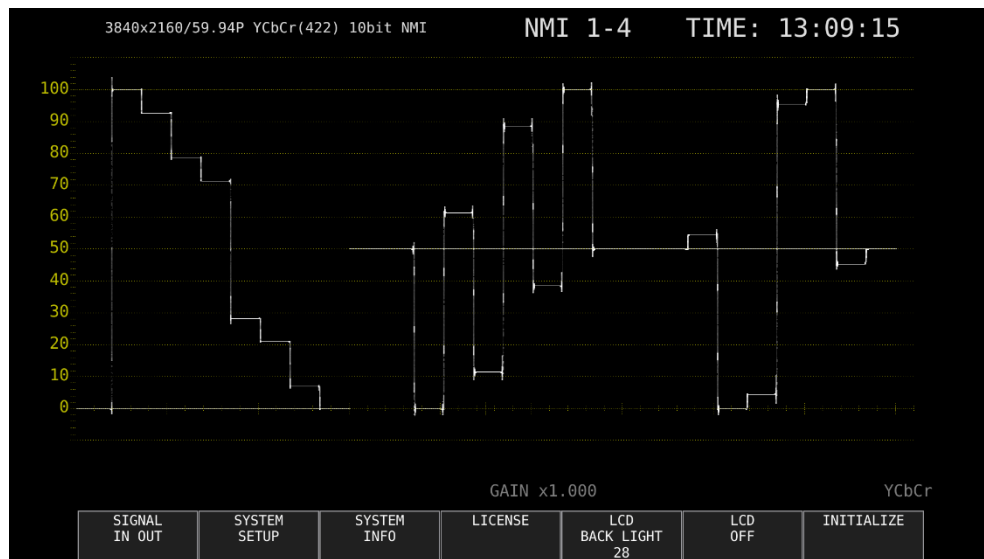


Figure 6-36 Measurement screen

6.2.10 Measuring NMI Signals (SER08)

1. On the SDI IN tab in the system settings, set SDI System to NMI.

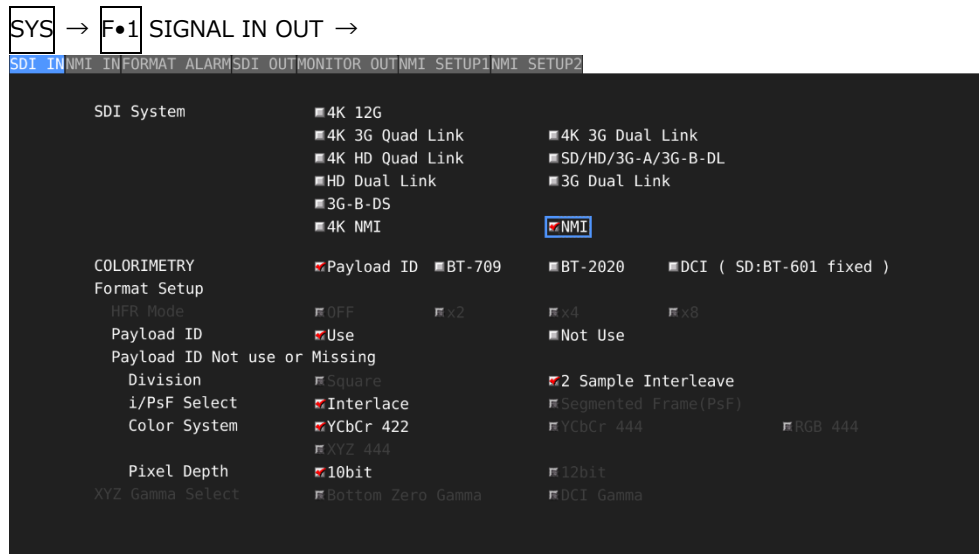


Figure 6-37 SDI IN tab

2. Set the payload ID.

Select Use or Not Use. Division is fixed to 2 Sample Interleave. i/PsF Select is fixed to Interlace. Color System is fixed to YCbCr 422. Pixel Depth is fixed to 10 bit.

Even if Use is selected, if a 4K NMI signal is applied, the LV 5490 will detect is as a 4K NMI signal.

Reference 7.1.1, "Configuring the SDI Input Connectors"

3. Press COMPLETE.
4. Apply NMI signals to the NMI connectors on the rear panel.

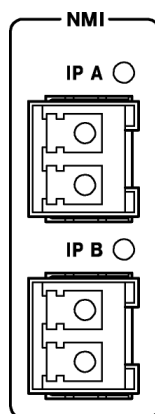


Figure 6-38 NMI input connectors

6. BASIC OPERATION

5. Press INPUT to select the channels you want to measure.

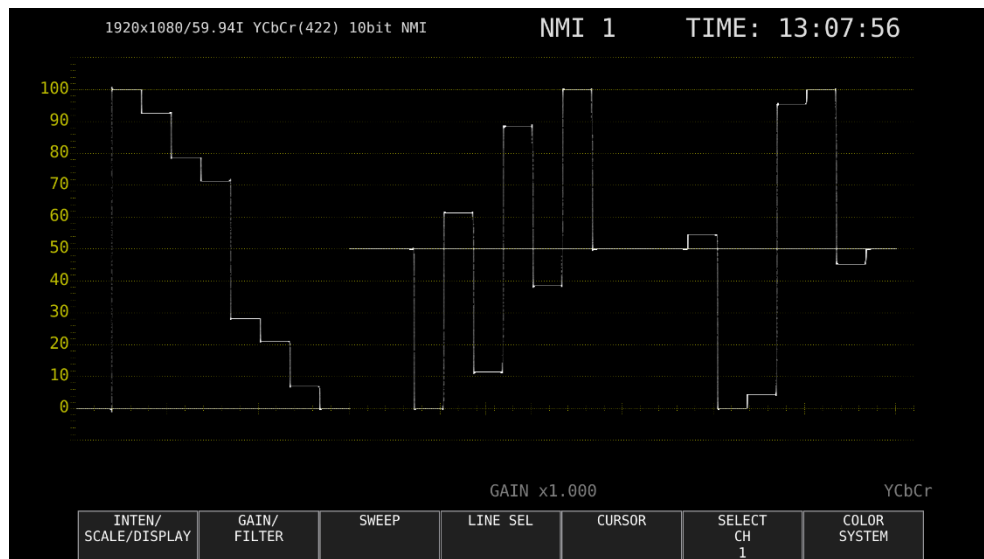


Figure 6-39 Measurement screen

6.3 Selecting the Measurement Mode

The types of measurement screens available are WFM, VECT, PIC, AUDIO, STATUS, and EYE. There is also another type, MULTI, that combines these six types. Press a measurement key on the front panel to select the type.

6.3.1 Video Signal Waveform Display

To display video signal waveforms, press WFM.

The available features include line select display, which displays the waveform of the selected line, RGB display, and pseudo-composite display.

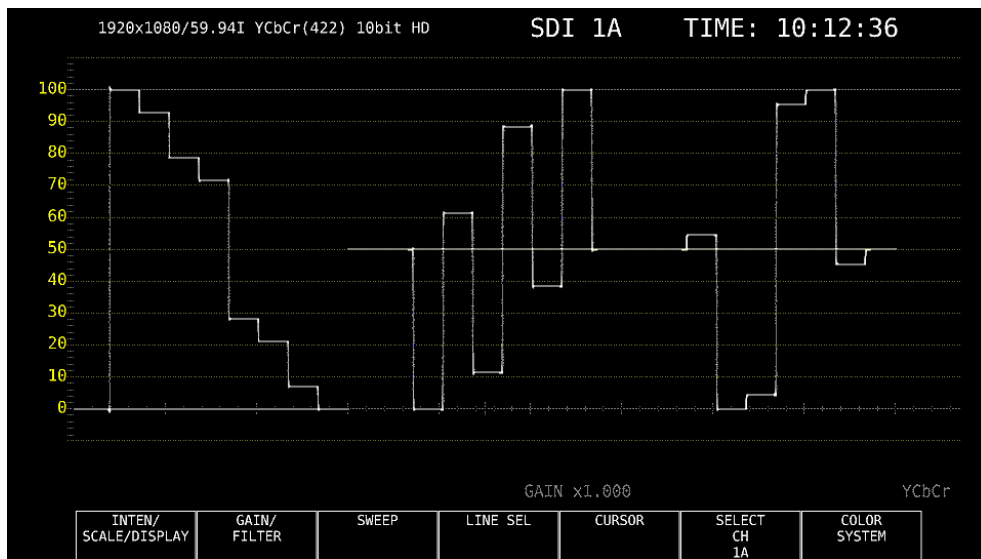


Figure 6-40 Video signal waveform display

6.3.2 Vector Waveform Display

To display vectors, press VECT.

The available features include line select display, marker display, pseudo-composite display, 5 bar display, and CIE diagram display (SER05).

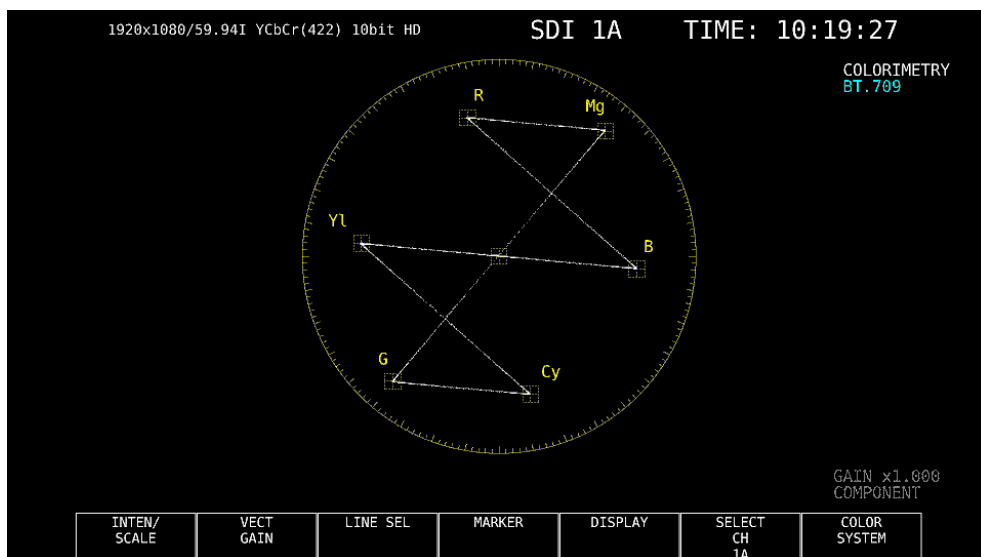


Figure 6-41 Vector waveform display

6. BASIC OPERATION

6.3.3 Picture Display

To show the picture display, press PIC.

The available features include monochrome display, marker display, line select display, and focus assist display (SER04).

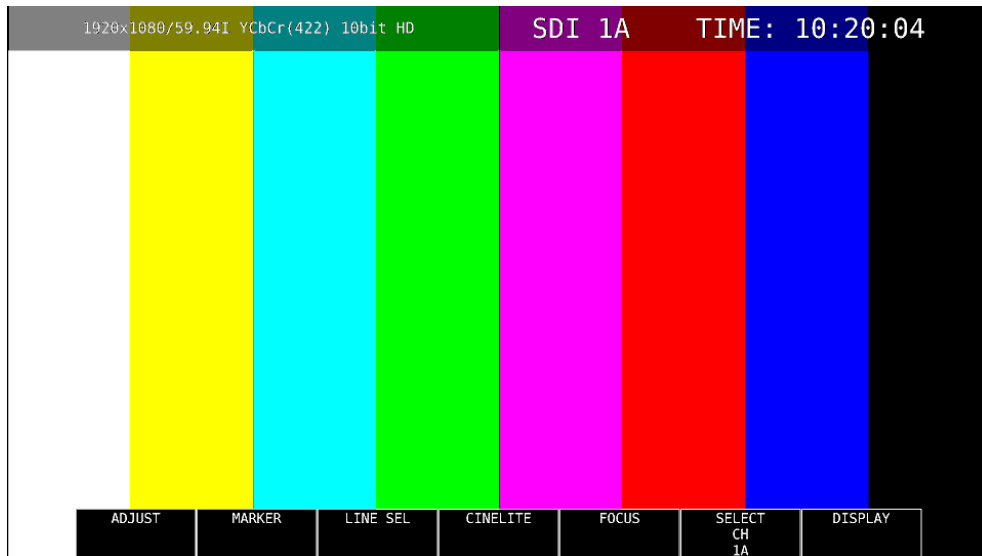


Figure 6-42 Picture display

6.3.4 Audio Display (SER03)

To show the audio display, press AUDIO. (If SER03 is not installed, the AUDIO key is disabled.)

The available features include Lissajous display, surround display, meter display, and status display of the signal selected with **F•1** MAPPING.

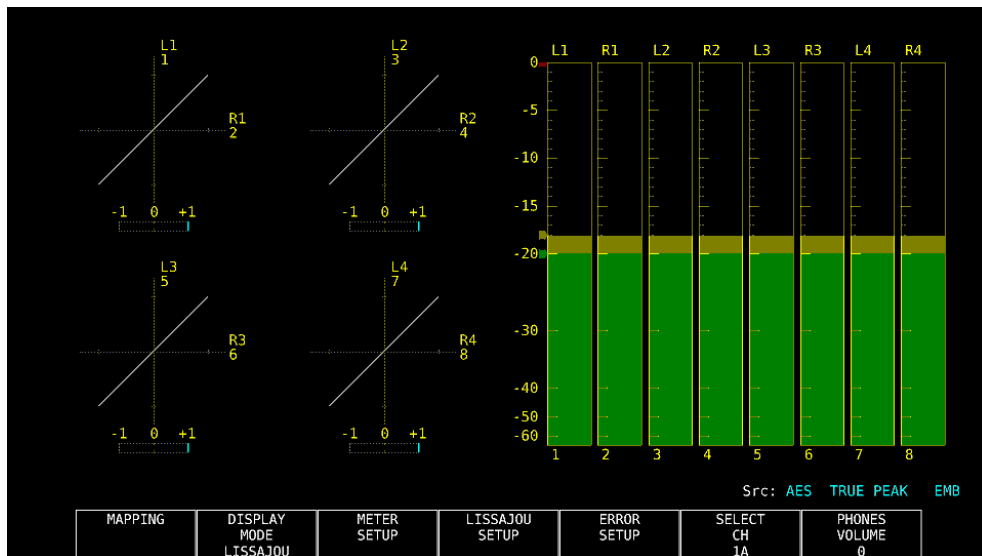


Figure 6-43 Audio display

6. BASIC OPERATION

6.3.5 Status Display

To show the status display, press STATUS.

The available features include event log display and data dump display.

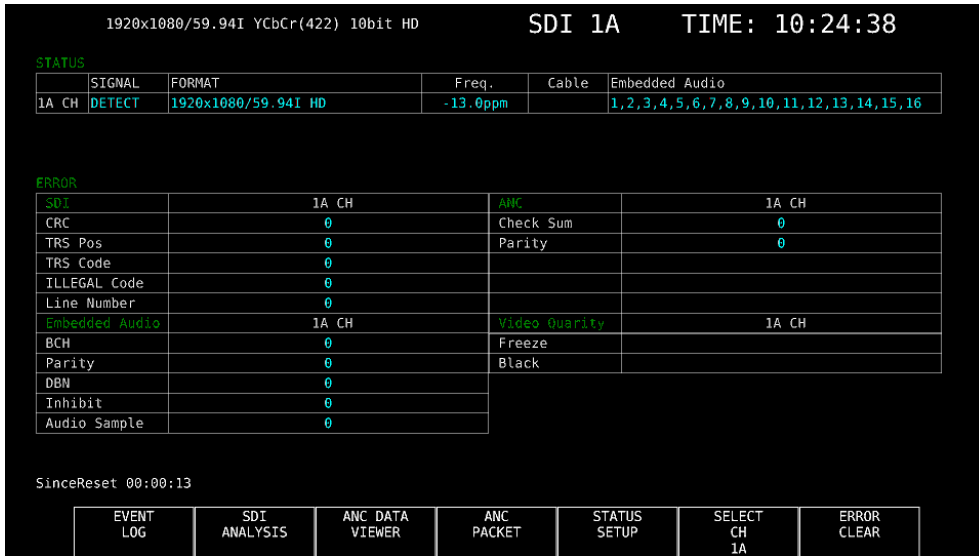


Figure 6-44 Status display

6.3.6 Eye Pattern Display (SER02/SER09)

To show eye patterns, press EYE. (If SER02/SER09 is not installed, the EYE key is disabled.)

You can also show jitter by switching **F•2** MODE.

Simul mode is not supported. In addition signals applied to 2A to 2D cannot be displayed.

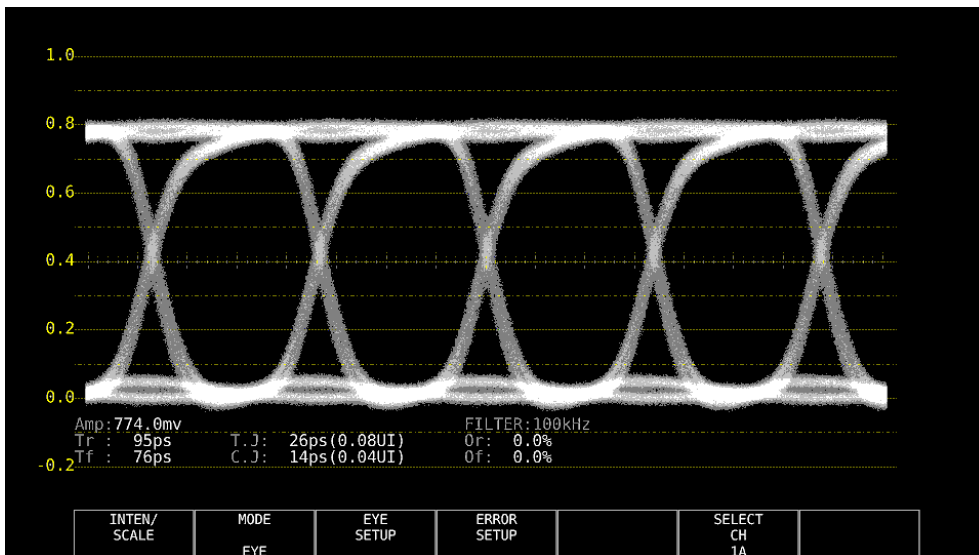


Figure 6-45 Eye pattern display

6. BASIC OPERATION

6.3.7 Multi Display

To show a multi screen, which is a combination of measurement screens, press MULTI. You can select between five types of layouts by using **[F•1]** LAYOUT SELECT. To set each measurement screen, use **[F•2]** MULTI WFM to **[F•7]** MULTI EYE.

● USER 1

The vector, video signal waveform, status, and picture are displayed in four divided screens.

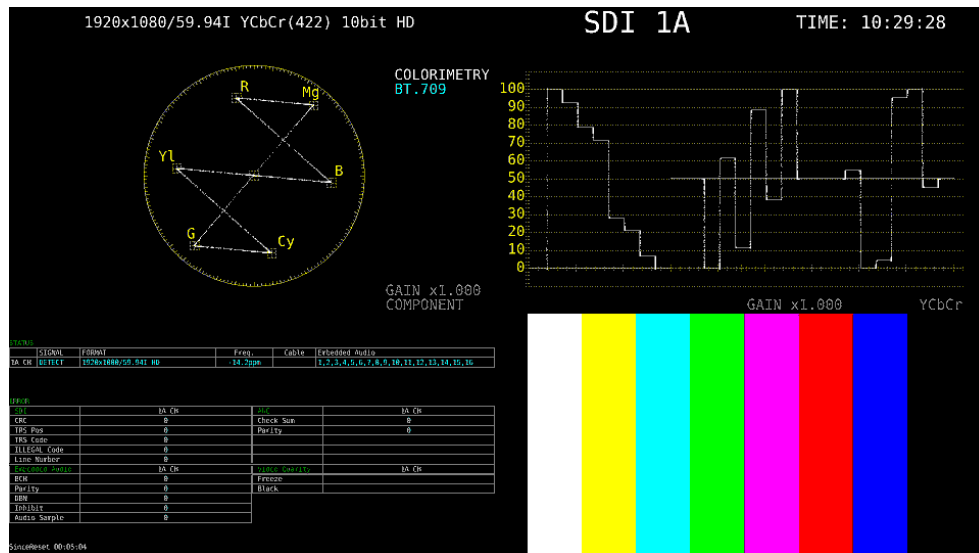


Figure 6-46 Multi display (USER 1)

● USER 2

The picture is displayed in the main screen, and the video signal waveform and vector are displayed as thumbnails.

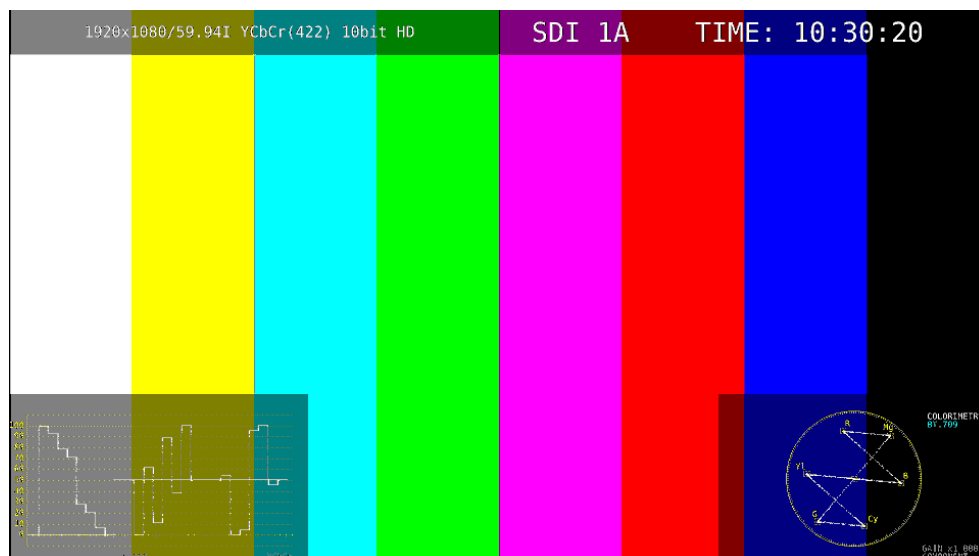


Figure 6-47 Multi display (USER 2)

6. BASIC OPERATION

● USER 3

The vector is displayed in the main screen, and the video signal waveform and picture are displayed as thumbnails.

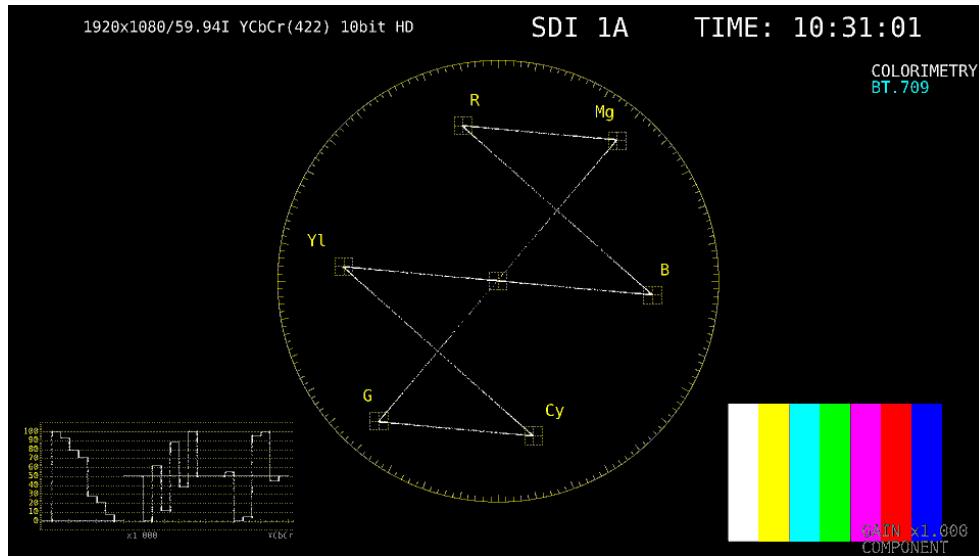


Figure 6-48 Multi display (USER 3)

● USER 4

The picture, video-signal-waveform, and vector are displayed top to bottom. This is suitable for simul mode.

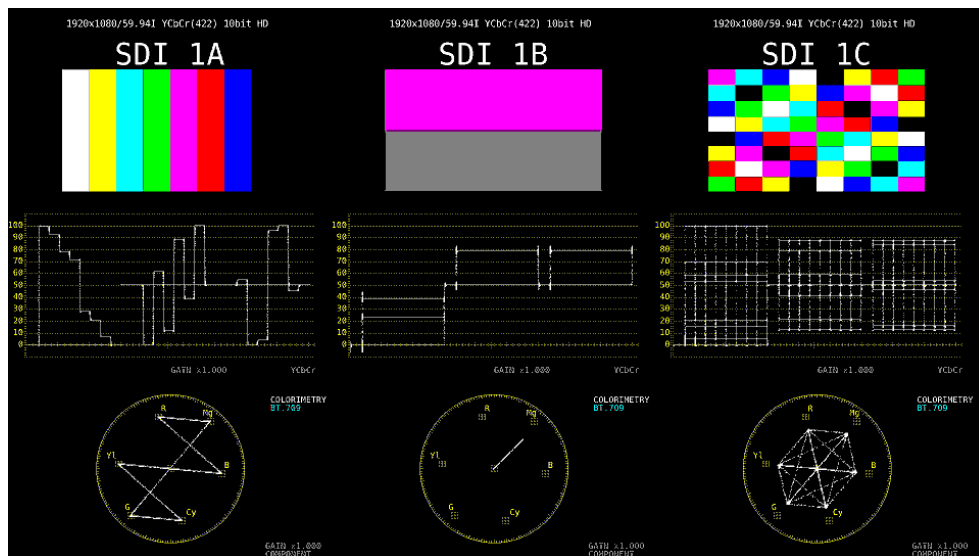


Figure 6-49 Multi display (USER 4)

6. BASIC OPERATION

● USER 5

The picture and video signal waveform are displayed in the top and bottom screens.
This is suitable for simul mode.

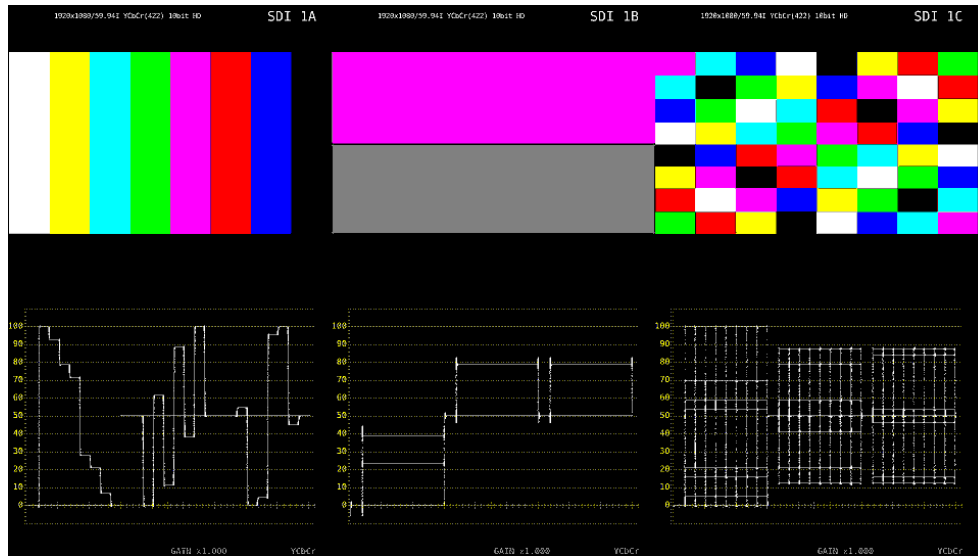


Figure 6-50 Multi display (USER 5)

6.4 Arranging the Measurement Screen Layout

The layout of the measurement screen that appears when the WFM, VECT, PIC, AUDIO, STATUS, or EYE key is pressed (one type each) and the screen that appears when the MULTI key is pressed (five types) can be arranged freely. To do so, connect a mouse to the front or rear panel USB port.

The layout that you specify will not be initialized even if you initialize the LV 5490. To initialize, perform any of the procedures below.

Reference 7.7, "Initialization"

LAYOUT INIT YES on the SYS menu:	The entire layout is initialized.
ALL INIT YES on the SYS menu:	The entire layout is initialized.
Factory default settings:	The entire layout is initialized.
DEFAULT LAYOUT in the layout window:	The layout of the selected measurement display is initialized.

6.4.1 Notes

- The maximum number of items that can be arranged is determined by $64 \div$ the number of measurement channels (1 to 4).
Item, here, includes the items on the Main and Sub tabs as well as Format, Input, and Time on the Option tab.

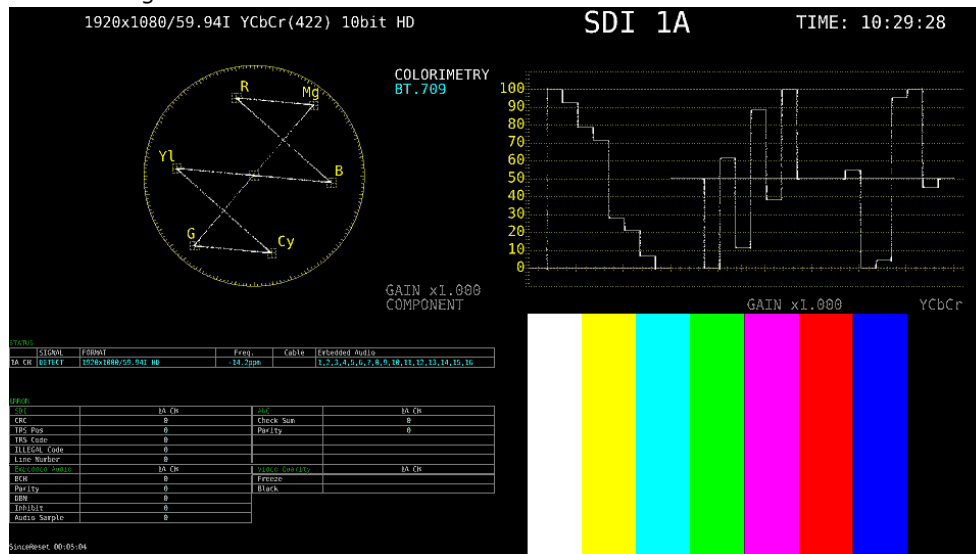
6. BASIC OPERATION

6.4.2 Layout Procedure

As an example, this section explains how to change the layout of a multi display (User 1) in the following manner.

- Display the layout screen
- Change TIME in the upper right of the screen to DATE
- Superimpose the vector on the picture
- Add audio
- Add TIME to the status
- Apply the changes

Before change



After change

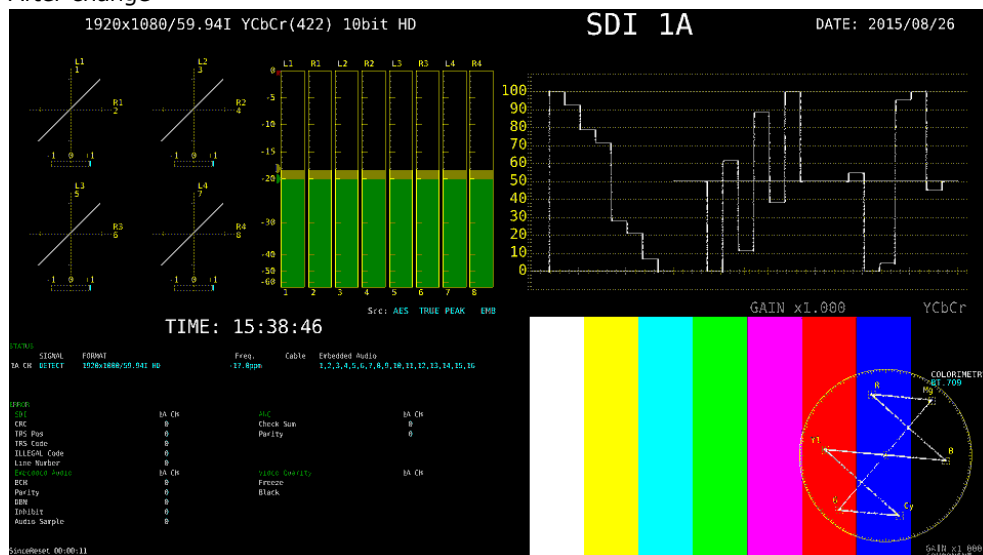


Figure 6-51 Arranging the multi display layout

6. BASIC OPERATION

a) Display the layout screen

1. Press MULTI, and set **F•1** LAYOUT SELECT to USER 1.

There are five layouts for the multi screen. You can use USER 1 to USER 5 to switch between the layouts.

2. Right-click in the measurement screen, and click LAYOUT.

The layout screen appears.

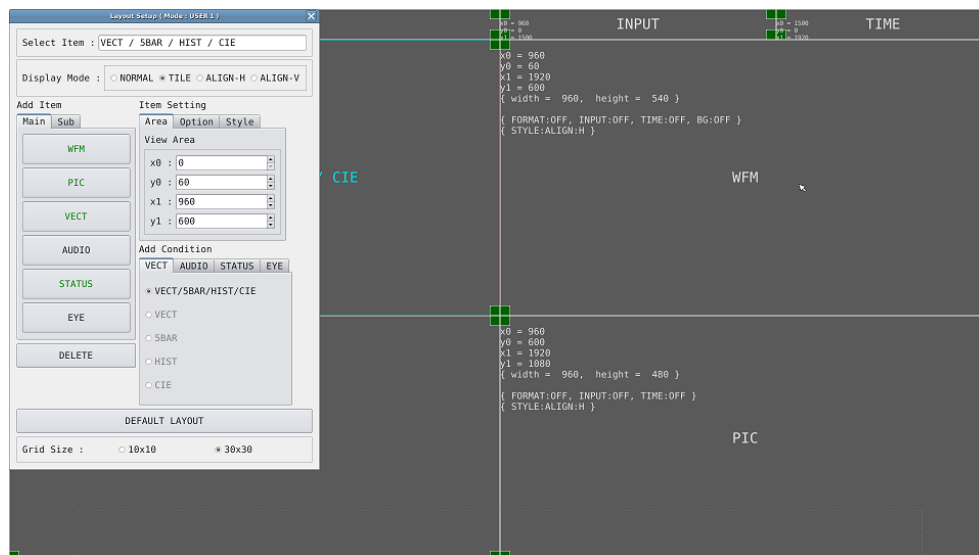


Figure 6-52 Layout screen

b) Change TIME in the upper right of the screen to DATE

3. Click the TIME item in the upper right of the screen.

The color of the frame and text changes to light blue, and Select Item in the layout window displays TIME. This indicates that the TIME item is selected.

4. Click DELETE.

The TIME item is deleted.

5. On the Sub tab, click DATE.

The DATE item appears.

6. Place the DATE item in the area where the TIME item was displayed.

To move an item, drag it.

To resize an item, drag the green handles at the four corners of the item.

The position and size of an item snap to the grid selected by Grid Size in the layout window.

You can also use the Area tab to move and resize an item.

The coordinates at the upper left corner of the screen are (0, 0). Those at the lower right corner are (1920, 1080). Using these references, set the coordinates of the upper left corner of the item (x0, y0) and the lower right corner (x1, y1).

The minimum size is 90×60.

6. BASIC OPERATION

If the layout window gets in the way, move it or close it. If you close it, you can redisplay it by double-clicking in the layout screen.

If multiple items are on top of each other, items in the back may not be selectable. If you need to select such item, click the item on the Main or Sub tab. The selected item will move to the front.

c) Superimpose the vector on the picture

7. Select the VECT item, and click Background Transparent on the Option tab.

Background Transparent is for making the background transparent when an item is superimposed on a picture.

8. Place the VECT item on top of the picture.

Resize as necessary.

d) Add audio

9. Click AUDIO on the Main tab.

The AUDIO item appears.

You can place an AUDIO item even if SER03 is not installed, but the message "Not installed" will appear.

10. Place the AUDIO item in the area where the VECT item was originally displayed.

e) Add TIME to the status

11. Click the STATUS item.

12. Click Time on the Option tab.

The TIME item on the Sub tab can be placed anywhere. Time on the Option tab is displayed at the top of the selected item. You cannot change the display position or size.

f) Apply the changes

13. Right-click in the layout screen, and click COMPLETE.

The measurement screen returns.

If you click CANCEL, all the changes that you made up to that point will be canceled.

6. BASIC OPERATION

6.4.3 Layout Screen Description

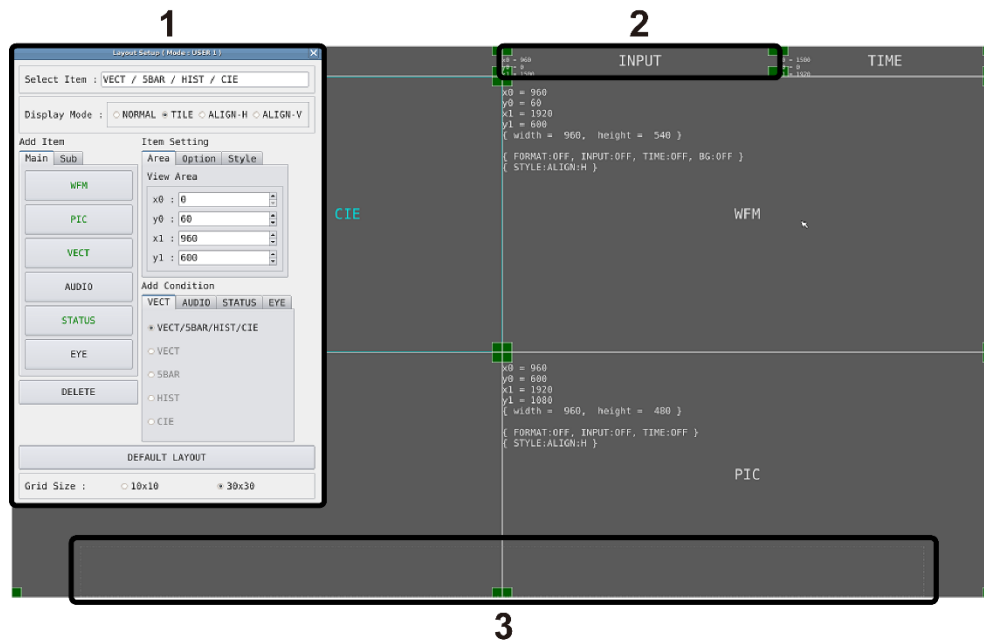


Figure 6-53 Layout screen

1 Layout Window

The Layout window is used to create layouts.

Mode in the title bar displays the current measurement mode (WFM, USER 1 to USER 5, etc.).

You can move the window by dragging and close it by clicking X in the upper right of the window. If you close it, you can redisplay it by double-clicking in the layout screen.

2 Item

Displays the item selected on the Main or Sub tab.

The settings specified with Item Setting are displayed in the frame.

If you select it, the frame color changes from white to light blue.

3 Menu Guide

A function menu appears in this area.

Use this as a guide when placing items.

6. BASIC OPERATION

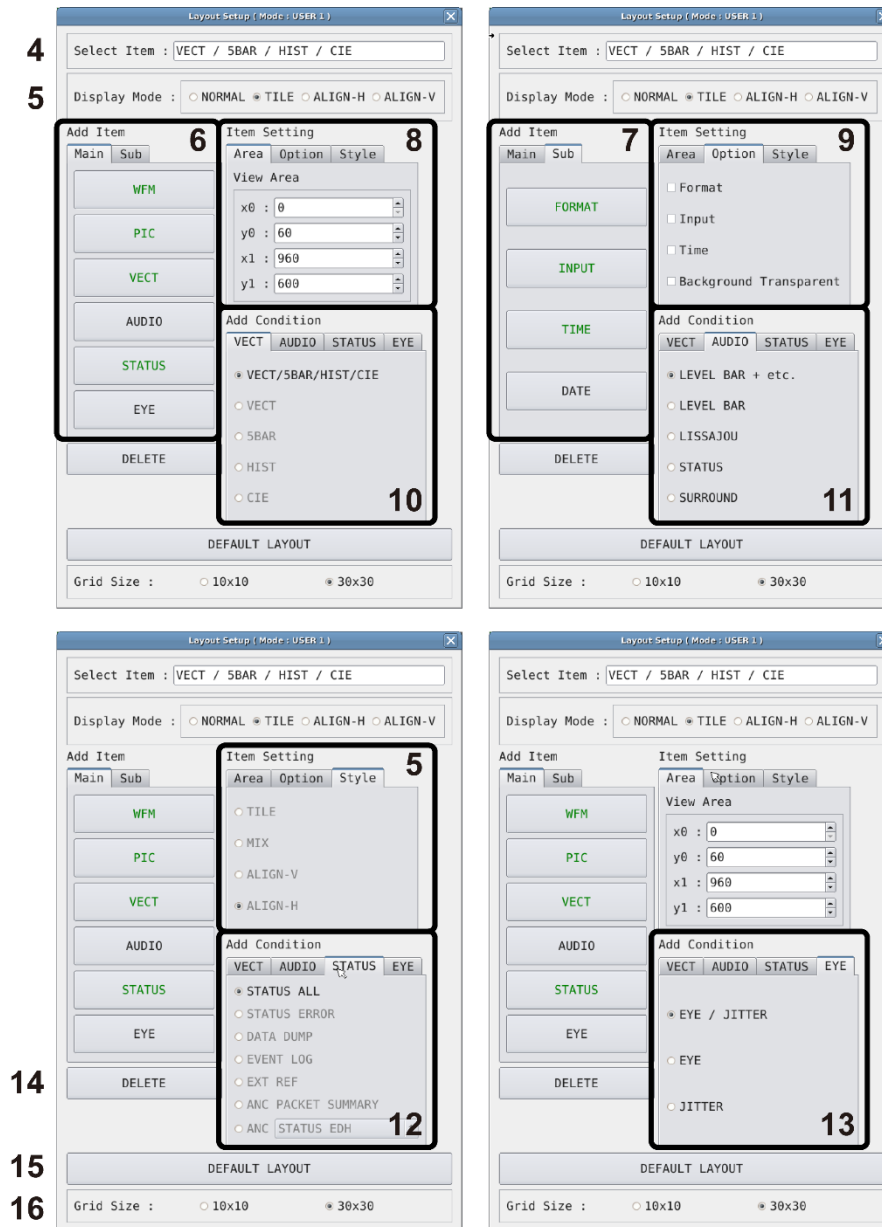


Figure 6-54 Layout window

4 Select Item

Displays the selected item.

5 Display Mode / Style

Select the display format for simul mode.

Display Mode applies to the entire screen, Style applies to the selected item.

If Display Mode is not set to NORMAL or if the selected item is AUDIO or EYE, Style cannot be selected.

If the selected item is VECT(5BAR), VECT(HIST), VECT(CIE), STATUS, or an item on the Sub tab, you cannot set Style to MIX.

6. BASIC OPERATION

If Display Mode is not set to NORMAL and multiple channels are displayed in simul mode, even if you place AUDIO or EYE items in the layout, “Not supported” will appear and will not work.

For example, if the following screens are displayed in single input mode and you change to simul mode, the display changes depending on Display Mode as follows.

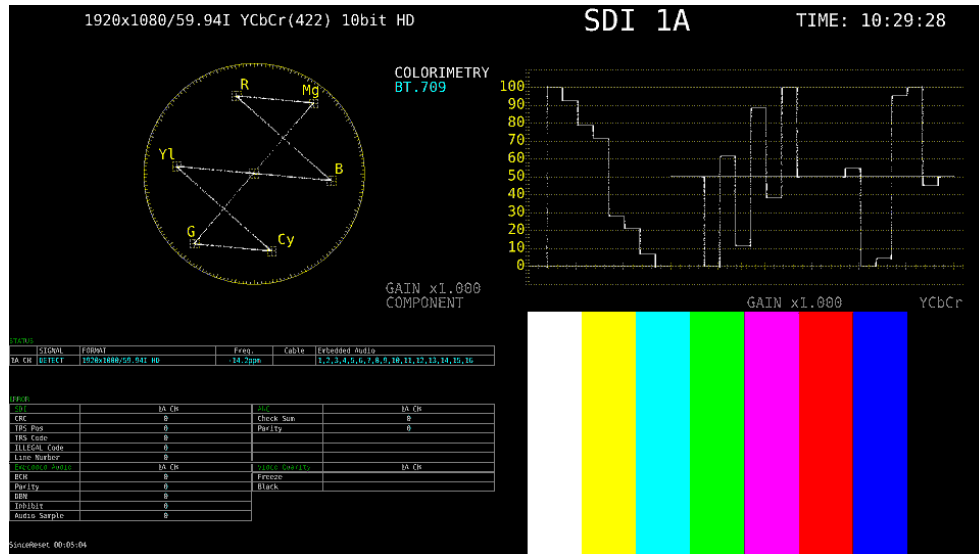


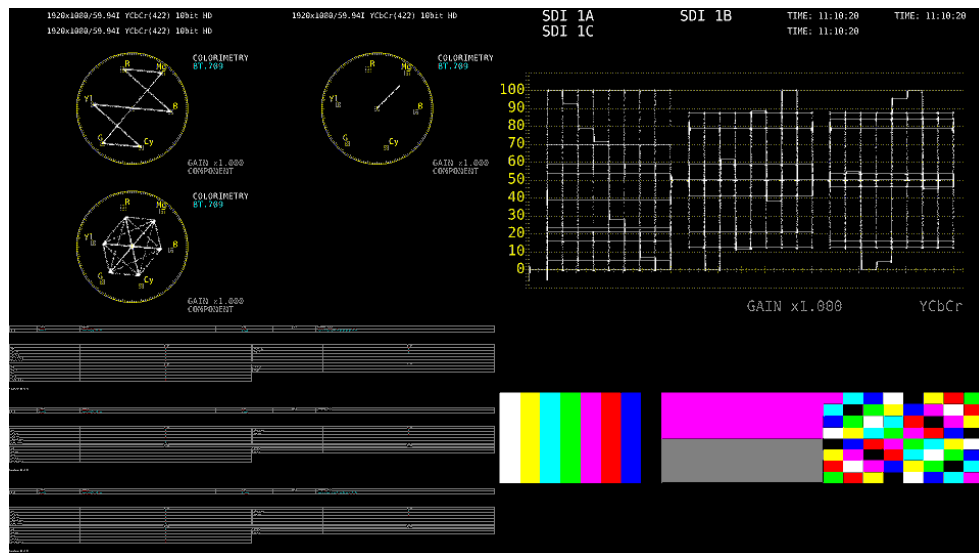
Figure 6-55 Single input mode

● When Display Mode Is NORMAL

The screen is divided by channel within each item. Select the division format with Style.

TILE (tile the screens)

MIX (cascade the screens)



ALIGN-V (arrange vertically)

ALIGN-H (arrange horizontally)

Figure 6-56 Normal display

6. BASIC OPERATION

- When Display Mode Is TILE

The screen is divided by channel.

Ach

Bch



Cch

Figure 6-57 Tiled display

- When Display Mode Is ALIGN-H

The screen is divided by channel and arranged side by side.

Ach

Bch

Cch

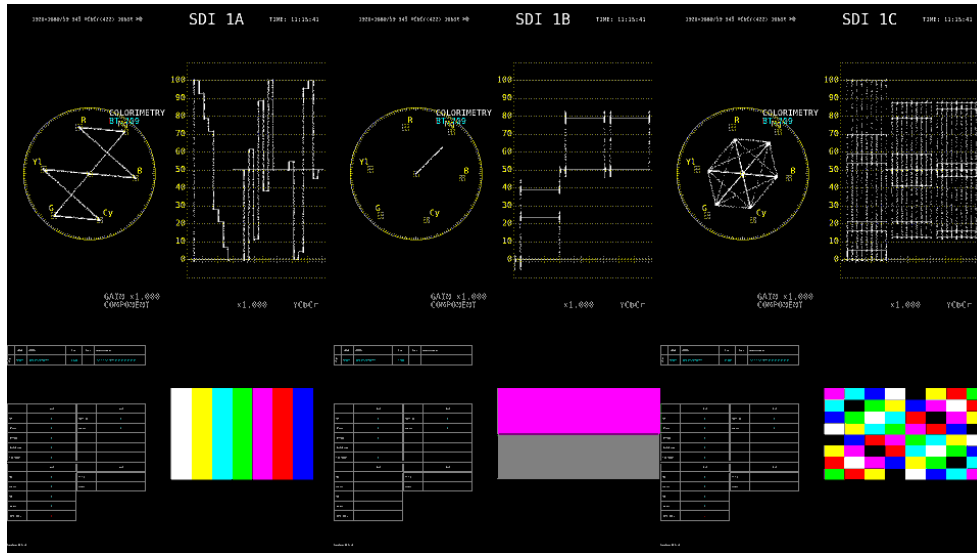


Figure 6-58 ALIGN-H display

6. BASIC OPERATION

- When Display Mode Is ALIGN-V

The screen is divided by channel and arranged top to bottom.

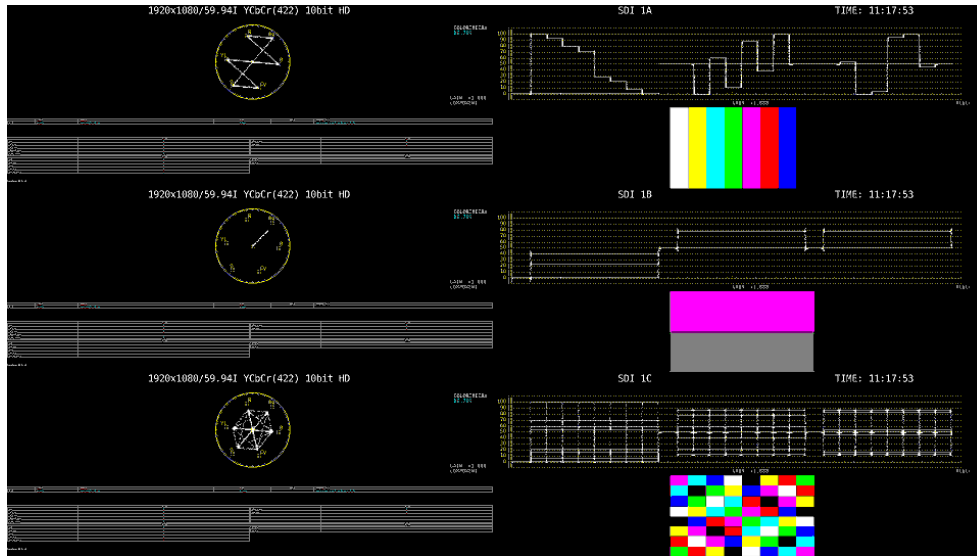


Figure 6-59 ALIGN-V display

6 Main

Measurement item.

- WFM

Shows the video signal waveform display.

- PIC

Shows the picture display.

- VECT

Click this after selecting the display mode on the VECT tab to show the vector waveform display.

A CIE chromaticity diagram (SER05) will not be displayed properly if the VECT item is overlapping other items.

- AUDIO

Click this after selecting the display mode on the AUDIO tab to show the audio display. If SER03 is not installed, the message "Not installed" is displayed.

- STATUS

Click this after selecting the display mode on the STATUS tab to show the status display.

- EYE

Click this after selecting the display mode on the EYE tab to show the eye pattern or jitter.

If SER02/SER09 is not installed, the message "Not installed" is displayed.

6. BASIC OPERATION

7 Sub

Items for displaying information.

- FORMAT

Displays the format (e.g., 1920x1080/59.94I YCbCr(422) 10bit HD).

If you place this item, you can show and hide it using the GENERAL SETUP tab in the system settings.

It is normally displayed in white, but if the input format is not appropriate, it turns red.

- INPUT

Displays the input signal (e.g., SDI 1A).

If you place this item, you can show and hide it using the GENERAL SETUP tab in the system settings.

- TIME

Displays the time (e.g., TIME: 00:00:00).

If you place this item, you can select the display format using the GENERAL SETUP tab in the system settings.

- DATE

Displays the date (e.g., DATE: 2000/01/01).

If you place this item, you can select the display format using the GENERAL SETUP tab in the system settings.

Only one item is displayed even if you switch to simul mode.

8 Area

Set the position and size of the selected item.

The coordinates at the upper left corner of the screen are (0, 0). Those at the lower right corner are (1920, 1080). Based on these references, the coordinates of the upper left corner of the item is (x0, y0), and those of the lower right corner is (x1, y1).

You can change the values using the ▲▼ button or the wheel on the mouse.

9 Option

Set the options for the selected item.

- Format

Turns on and off the format display (e.g., 1920x1080/59.94I YCbCr(422) 10bit HD).

This option cannot be displayed for an AUDIO item, an EYE item, or an item on the Sub tab.

If you enable this option, you can show and hide it using the GENERAL SETUP tab in the system settings.

It is normally displayed in white, but if the input format is not appropriate, it turns red.

- Input

Turns on and off the input signal display (e.g., SDI 1A).

This option cannot be displayed for an AUDIO item, an EYE item, or an item on the Sub tab.

If you enable this option, you can show and hide it using the GENERAL SETUP tab in the system settings.

6. BASIC OPERATION

- Time

Turns on and off the time display (e.g., TIME: 00:00:00).

This option cannot be displayed for an AUDIO item, an EYE item, or an item on the Sub tab.

If you enable this option, you can select the display format using the GENERAL SETUP tab in the system settings.

- Background Transparent

Selects the transmittance of the background when the sub item is superimposed on a picture.

When enabled, the transmittance is set to 100 %; when disabled, the transmittance is set to 50 %.

You cannot set this option for a PIC item.

10 VECT

Selects the display mode of the VECT item. Select the mode before clicking the VECT item.

VECT / HIST / CIE	This is the normal vector waveform display. You can switch the display between vector waveform, histogram, and CIE chromaticity diagram. It cannot be arranged with the items below at the same time. If you want to arrange the items below, delete this item first.
VECT	The vector waveform is displayed.
5BAR	The 5 bar is displayed.
HIST	The histogram is displayed.
CIE	The CIE diagram is displayed. If SER05 is not installed, the message "Not installed" is displayed.

For example, you can arrange VECT and HIST to be displayed at the same time.

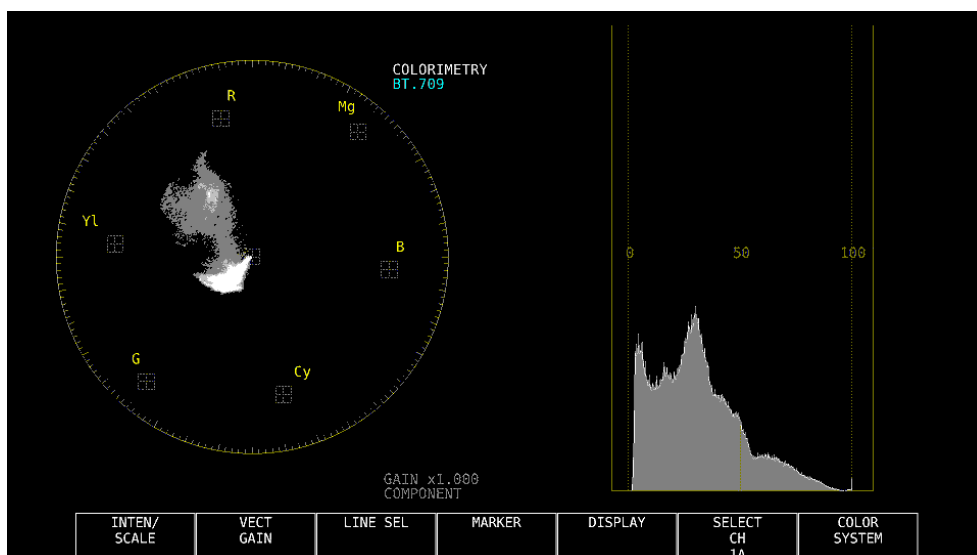


Figure 6-60 Vector waveform display

6. BASIC OPERATION

11 AUDIO

Selects the display mode of the AUDIO item. Select the mode before clicking the AUDIO item.

LEVEL BAR + etc.	This is the normal audio display. The display switches between Lissajous, surround, meter, and status. It cannot be arranged with the items below at the same time. If you want to arrange the items below, delete this item first.
LEVEL BAR	Meters are displayed. When 16 channels are being measured, meters will not be displayed correctly if arranged at the same time with LISSAJOU, STATUS, and SURROUND.
LISSAJOU	Lissajous curves are displayed. It cannot be arranged with STATUS or SURROUND at the same time. When 16 channels are being measured, lissajous curves will not be displayed correctly if arranged at the same time with LEVEL BAR.
STATUS	The status is displayed. It cannot be arranged with LISSAJOU or SURROUND at the same time. When 16 channels are being measured, the status will not be displayed correctly if arranged at the same time with LEVEL BAR.
SURROUND	Surround waveforms are displayed. It cannot be arranged with LISSAJOU or STATUS at the same time. Surround waveforms will not be displayed correctly when 16 channels are being measured or when in embedded audio measurement Simul mode.

6. BASIC OPERATION

12 STATUS

Selects the display mode of the STATUS item. Select the mode before clicking the STATUS item.

STATUS ALL	This is the normal status display. The display switches between error count, data dump, etc. It cannot be arranged with the items below at the same time. If you want to arrange the items below, delete this item first.
STATUS ERROR	Error counts are displayed.
DATA DUMP	Data dump is displayed.
EVENT LOG	The event log is displayed.
EXT REF	Phase differences are displayed. If the input signal is 12G, the message "Not supported" is displayed.
ANC PACKET SUMMARY	A summary of ancillary packets is displayed.
ANC	One of the following is displayed. • STATUS EDH: EDH display • STATUS PAYLOAD: Payload ID display • STATUS CONTROL: Audio control packet display • STATUS ARIB CC: Closed caption display • STATUS ARIB NETQ: NET-Q display • STATUS ARIB TRIG: Data trigger display • STATUS ARIB USER1: User data 1 display • STATUS ARIB USER2: User data 2 display • STATUS SMPTE AFD: AFD display • STATUS SEARCH: Ancillary packet search display

For example, you can arrange DATA DUMP, EXT REF, and ANC STATUS SEARCH to be displayed at the same time.

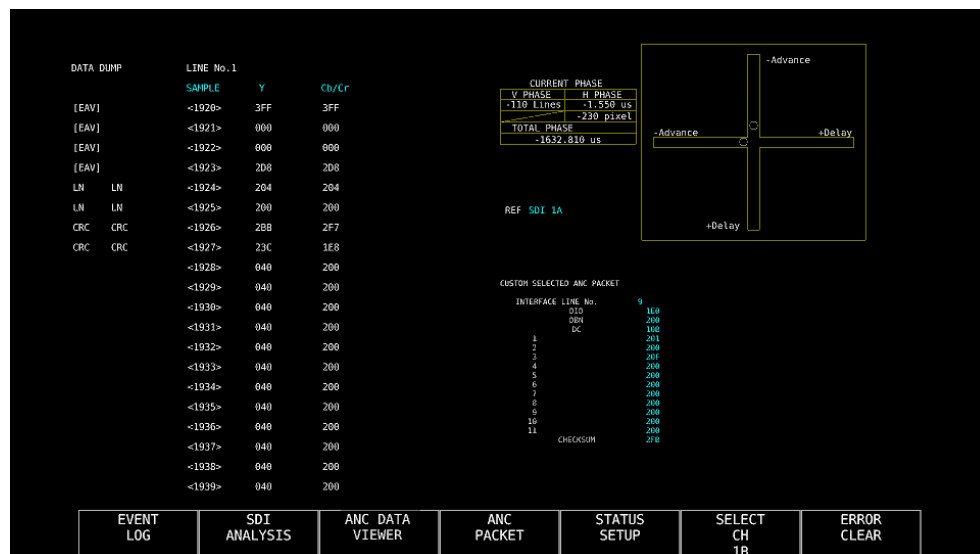


Figure 6-61 Status display

6. BASIC OPERATION

13 EYE

Selects the display mode of the EYE item. Select the mode before clicking the EYE item.

EYE / JITTER	This is the normal eye pattern display. The display switches between eye pattern and jitter. It cannot be arranged with the items below at the same time. If you want to arrange the items below, delete this item first.
EYE	The eye pattern is displayed.
JITTER	The jitter waveform is displayed.

For example, you can arrange EYE and JITTER to be displayed at the same time.

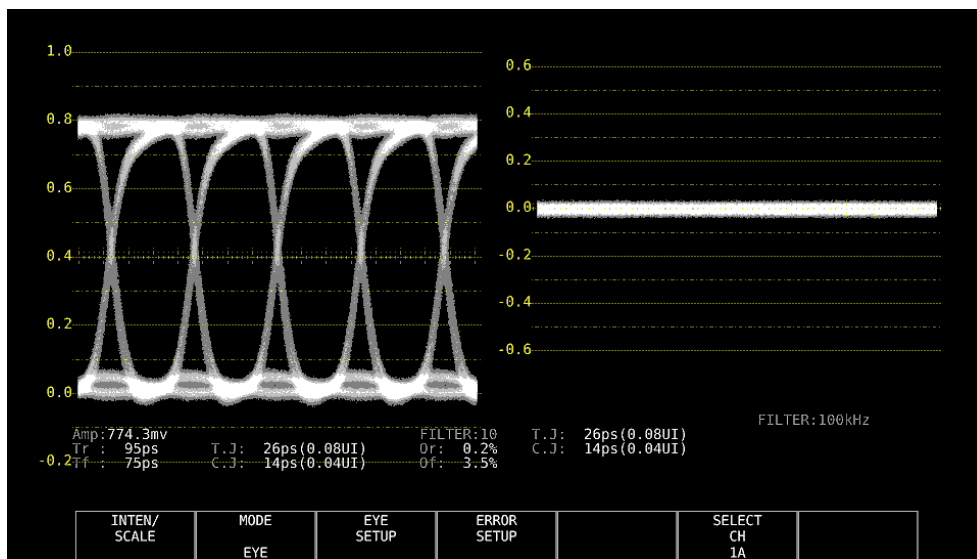


Figure 6-62 Eye pattern display

14 DELETE

Deletes the selected item.

15 DEFAULT LAYOUT

Resets the layout to the initial settings defined for each measurement mode. Grid Size is not reset.

16 Grid Size: 10x10 / 30x30

Select the grid size.

The position and size of items snap to the grid specified here.

7. SYSTEM SETTINGS

The system settings can be used to configure the LV 5490 and unit settings.
Press SYS, and use the SYS menu.

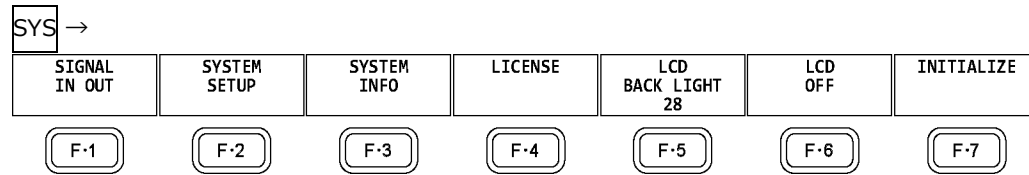


Figure 7-1 SYS menu

7.1 Configuring the I/O Connectors

To configure the I/O connector settings, use **F-1** SIGNAL IN OUT on the SYS menu.

7.1.1 Configuring the SDI Input Connectors

Use the SDI IN tab to configure the format of the SDI signals applied to SDI INPUT or the IP (NMI) signals applied to NMI on the rear panel.

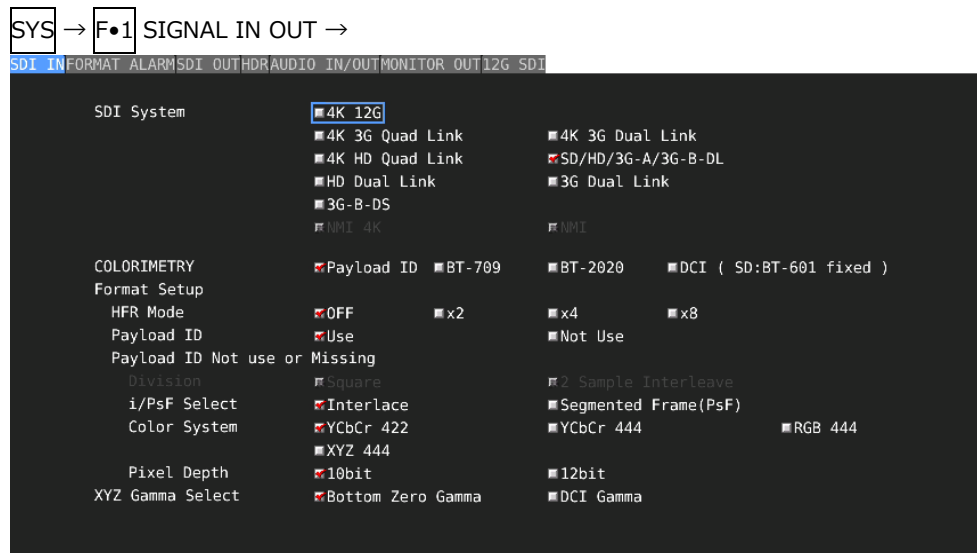


Figure 7-2 SDI IN tab

- SDI System

Select the input format.

4K 12G / 4K 3G Quad Link / 4K 3G Dual Link / 4K HD Quad Link /
SD/HD/3G-A/3G-B-DL / HD Dual Link / 3G Dual Link / 3G-B-DL / 4K NMI / NMI

7. SYSTEM SETTINGS

● COLORIMETRY

Select the colorimetry to use on the video-signal-waveform, vector, picture, and CIE-chromaticity-diagram (SER05) displays.

During XYZ input, if you change the colorimetry between BT-709 or BT2020 and DCI, a message "TONE CURVE SETUP" will be displayed for 10 to 20 seconds when you press **F•1** COMPLETE.

The current applied colorimetry is displayed in cyan in the upper right of the vectorscope display and in the lower right of the CIE chromaticity diagram (SER05) display. For 3G(DL)-4K, 3G(QL), 4K NMI and NMI, if you select a payload ID, the current applied colorimetry is displayed in yellow if the colorimetries of all links are not matched.

For SD input, the colorimetry is fixed to BT.601, regardless of the colorimetry selection.

The picture display on the LV 5490 LCD is not capable of expressing the color space of the applied colorimetry.

<u>Payload ID:</u>	If SDI System is 4K 12G, 4K 3G Quad Link, or 4K 3G Dual Link and the division transmission system is 2 sample interleave of if SDI System is 4K NMI or NMI, the LV 5490 automatically detects BT.2020 from the payload ID and operates. For the square format or for modes other than BT.2020, the LV 5490 runs in BT.709 mode.
BT-709:	Runs in BT.709 mode.
BT-2020:	Runs in BT.2020 mode.
DCI:	Runs in DCI mode.

7. SYSTEM SETTINGS

● HFR Mode

When SDI System is SD/HD/3G-A/3G-B-DL or HD Dual Link, select the display format of the format. The format can be converted into a notation compatible with HFR (High Frame Rate). This cannot be selected when SDI System is 4K NMI or NMI.

OFF / x2 / x4 / x8

The display formats when x2, x4, or x8 is selected are shown below. Items marked with a hyphen or if OFF is selected, the format is displayed as-is.

Table 7-1 Selecting the format display format

SDI System	Input Signal		HFR Mode		
			x2	x4	x8
SD/HD/3G-A/3G-B-DL	3G-B-DL	50P	50I(x2)	50P(x4)	50I(x8)
	3G-B-DL	59.94P	59.94I(x2)	59.94P(x4)	59.94I(x8)
	3G-B-DL	60P	60I(x2)	60P(x4)	60I(x8)
	3G-A	50P	-	50P(x4)	-
	3G-A	59.94P	-	59.94P(x4)	-
	3G-A	60P	-	60P(x4)	-
	HD	50I	-	50I(x4)	-
	HD	59.94I	-	59.94I(x4)	-
	HD	60I	-	60I(x4)	-
HD Dual Link	HD	50P	50I(x2)	-	-
	HD	59.94P	59.94I(x2)	-	-
	HD	60P	60I(x2)	-	-

7. SYSTEM SETTINGS

● Payload ID

Select whether to use the payload ID for input format identification.

This cannot be selected when SDI System is 4K HD Quad Link.

Use / Not Use

If you select Not Use, set the items marked with a ✓ in the table below. The LV 5490 will operate using the specified settings.

If you select Use, the items marked with a ✓ will be detected from the payload ID. There is no need to set these items, but if you set them and a payload ID is not embedded in the input signal, the LV 5490 will operate using the specified settings.

Regardless of whether you select Use or Not Use, items such as scanning and frame frequency will be detected from the TRS.

Table 7-2 Payload ID settings

Input Signal	Division	i/PsF Select	Color System	Pixel Depth
HD	Cannot be set	✓	No need to set (fixed to YCbCr 422)	No need to set (fixed to 10 bits)
SD	Cannot be set	No need to set (fixed to interlace)	No need to set (fixed to YCbCr 422)	No need to set (fixed to 10 bits)
3G-A, 3G-B-DL	Cannot be set	✓	✓	✓
3G-B-DS	Cannot be set	✓	Cannot be set	Cannot be set
12G	✓	Cannot be set	✓	✓
HD (DL)	Cannot be set	✓	✓	✓
3G (DL)-2K	Cannot be set	Cannot be set	✓	✓
3G (DL)-4K	✓	Cannot be set	Cannot be set	Cannot be set
3G (QL)	✓	Cannot be set	✓	✓
4K NMI	Cannot be set (fixed to 2 Sample Interleave)	Cannot be set (fixed to interlace)	Cannot be set (fixed to YCbCr 422)	Cannot be set (fixed to 10 bits)
NMI	Cannot be set (fixed to 2 Sample Interleave)	Cannot be set (fixed to interlace)	Cannot be set (fixed to YCbCr 422)	Cannot be set (fixed to 10 bits)

● Division

Selects the division transmission system when SDI System is 4K. When SDI System is 4K NMI or NMI, this is fixed to 2 Sample Interleave and cannot be changed.

Square / 2 Sample Interleave

7. SYSTEM SETTINGS

● i/PsF Select

The LV 5490 cannot detect the following formats. Therefore, select whether to use interlace or segmented frame for displaying.

This cannot be selected when SDI System is 4K or 3G Dual Link. When SDI System is 4K NMI or NMI, this is fixed to Interlace and cannot be changed.

- 1080/60I and 1080/30PsF
- 1080/59.94I and 1080/29.97PsF
- 1080/50I and 1080/25PsF

Interlace / Segmented Frame(PsF)

● Color System

Select the color system of the input signal.

SDI System is 3G-B-DS, 4K 3G Dual Link, 4K NMI or NMI, this is fixed to YCbCr 422, and you cannot change it.

YCbCr 422 / YCbCr 444 / RGB 444 / XYZ 444

● Pixel Depth

Select the quantization of the input signal.

SDI System is 3G-B-DS, 4K 3G Dual Link, 4K NMI or NMI, this is fixed to 10bit, and you cannot change it.

10bit / 12bit

7. SYSTEM SETTINGS

● XYZ Gamma Select

Select the gamma correction system for XYZ input.

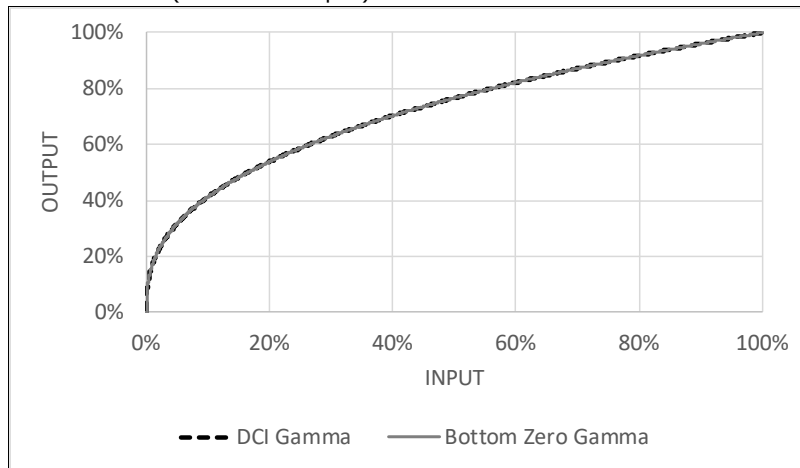
XYZ signals can be converted into RGB signals and shown on the video signal waveform display or vector display, but at the 12-bit quantization defined in the standard (when DCI Gamma is selected), the conversion error near 0% input will be large. As such, showing an RGB display or vector display using the SMPTE RP 431 color bar (color patch) will cause the bright line to deviate greatly from the scale in some areas.

To reduce the error, the LV 5490 uses "Bottom Zero Gamma" in which input up to 0.05% is fixed at 0% as the default setting. Select this setting when adjusting devices and the like.

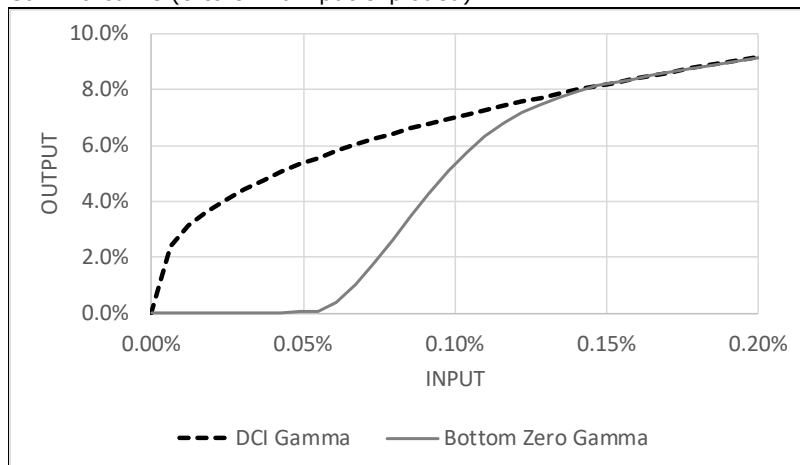
Bottom Zero Gamma: Gamma in which input up to 0.05% is fixed at 0% in comparison to DCI Gamma

DCI Gamma: Input to the $(1/2.6)$ power gamma

Gamma curve (0 to 100% input)

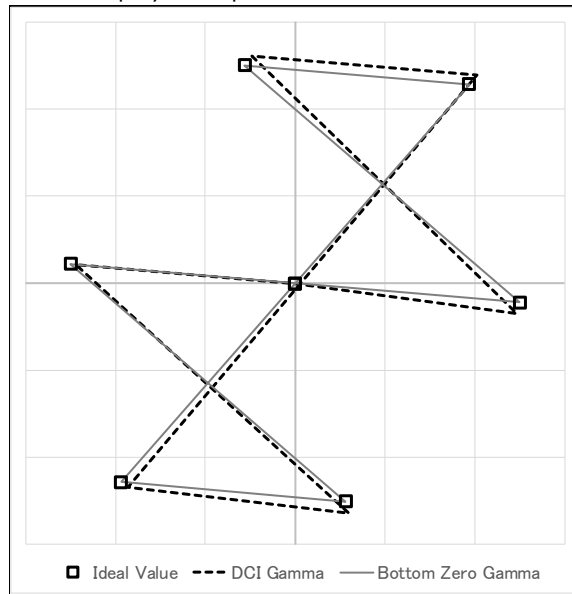


Gamma curve (0 to 0.2% input exploded)



7. SYSTEM SETTINGS

Vector display example



7.1.2 Configuring the IP(NMI) Input (SER08)

On the NMI IN tab, select the input from the IP (NMI) signals received through NMI on the rear panel or the SDI signal received through SDI INPUT when SDI System is set to NMI on the SDI IN tab. When SDI System on the SDI IN tab is 4K NMI, you cannot select the input.

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

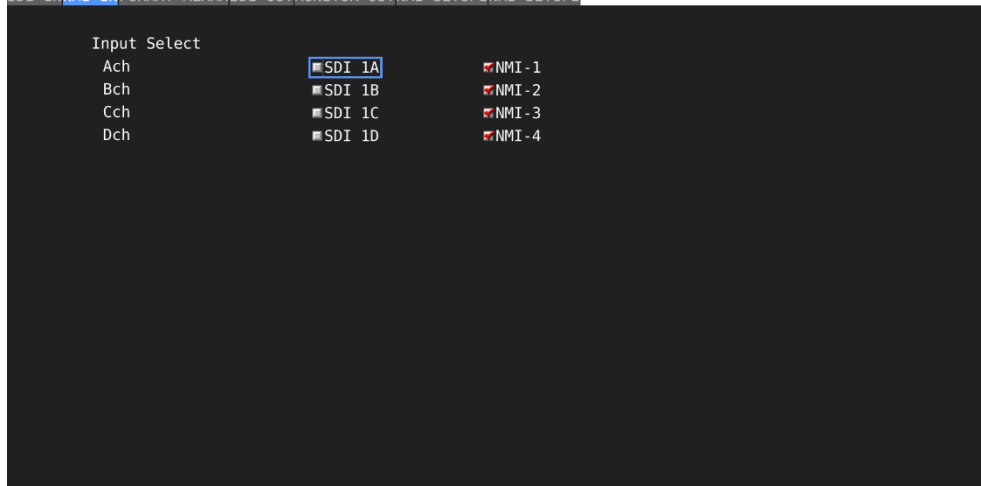


図 7-3 NMI IN tab

- Ach

Selects the input received through Ach.

SDI 1A / NMI-1

- Bch

Selects the input received through Bch.

SDI 1B / NMI-2

- Cch

Selects the input received through Cch.

SDI 1C / NMI-3

- Dch

Selects the input received through Dch.

SDI 1D / NMI-4

7. SYSTEM SETTINGS

7.1.3 Configuring FORMAT ALARM

Use the FORMAT ALARM tab to configure the expected SDI signal format.
When SDI System is 4K NMI or NMI, cannot be changed.

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

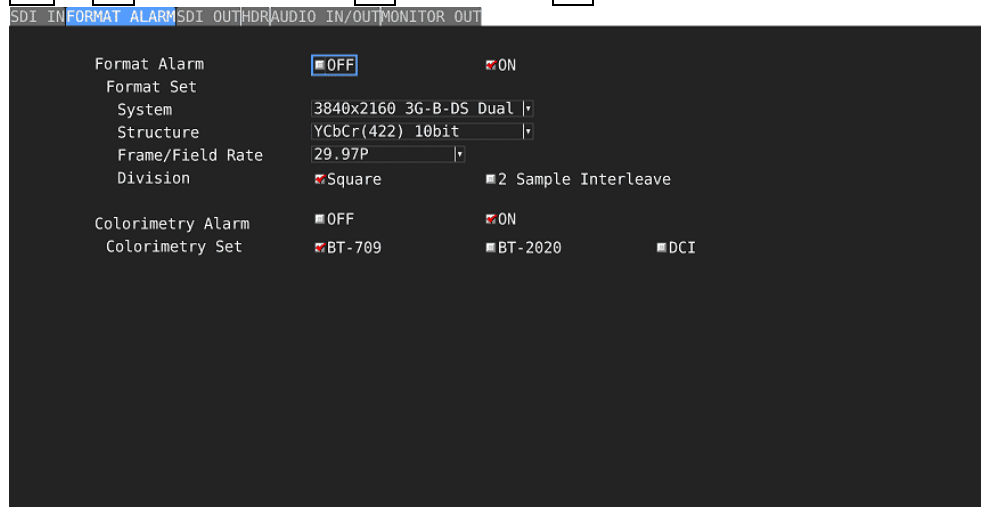


Figure 7-4 FORMAT ALARM tab

- Format Alarm

Turn on and off the format alarm detection.

If alarm detection is set to ON and a format other than the format specified with Format Set is received, the LV 5490 operates in the following manner.

- Displays the format in yellow
- Displays errors in the event log of the status display
- Displays "ERROR" in the upper right of the display
- Alarm output from the remote connector

OFF / ON

7. SYSTEM SETTINGS

● Format Set

When Format Alarm is set to ON, specify the expected format. For information on the format combinations that are available, see section 3.3.1, "SDI Formats and Standards."

Table 7-3 Selecting the format

SDI System	System	Structure	Frame/Field Rate	Division
4K 12G	3840x2160 12G TYPE 1 4096x2160 12G TYPE 1	YCbCr(422) 10bit YCbCr(422) 12bit YCbCr(444) 10bit YCbCr(444) 12bit RGB(444) 10bit RGB(444) 12bit	60/59.94/50/48/47.95/ 30/29.97/25/24/23.98/P	-
4K 3G Quad Link	3840x2160 3G-B-DL Quad 4096x2160 3G-B-DL Quad 3840x2160 3G-A Quad 4096x2160 3G-A Quad	YCbCr(422) 10bit YCbCr(422) 12bit YCbCr(444) 10bit YCbCr(444) 12bit RGB(444) 10bit RGB(444) 12bit XYZ(444) 12bit	60/59.94/50/48/47.95/ 30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	Square/ 2 Sample Interleave
4K 3G Dual Link	3840x2160 3G-B-DS Dual 4096x2160 3G-B-DS Dual	YCbCr(422) 10bit	30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	Square/ 2 Sample Interleave
4K HD Quad Link	3840x2160 HD Quad 4096x2160 HD Quad	YCbCr(422) 10bit	30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	-
SD/HD/3G-A/3G-B-DL	1920x1080 3G-B-DL 2048x1080 3G-B-DL 1280x720 3G-A 1920x1080 3G-A 2048x1080 3G-A 1280x720 HD 1920x1080 HD 720x487 SD 720x576 SD	YCbCr(422) 10bit YCbCr(422) 12bit YCbCr(444) 10bit YCbCr(444) 12bit RGB(444) 10bit RGB(444) 12bit XYZ(444) 12bit	60/59.94/50/I 60/59.94/50/48/47.95/ 30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	-
HD Dual Link	1920x1080 HD Dual 2048x1080 HD Dual	YCbCr(422) 10bit YCbCr(422) 12bit YCbCr(444) 10bit YCbCr(444) 12bit RGB(444) 10bit RGB(444) 12bit XYZ(444) 12bit	60/59.94/50/I 60/59.94/50/48/47.95/ 30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	-
3G Dual Link	1920x1080 3G-B-DL Dual 2048x1080 3G-B-DL Dual 1920x1080 3G-A Dual 2048x1080 3G-A Dual	YCbCr(422) 12bit YCbCr(444) 10bit YCbCr(444) 12bit RGB(444) 10bit RGB(444) 12bit	60/59.94/50/48/47.95/P	-
3G-B-DS	1280x720 3G-B-DS 1920x1080 3G-B-DS	YCbCr(422) 10bit	60/59.94/50/I 60/59.94/50/ 30/29.97/25/24/23.98/P 30/29.97/25/24/23.98/PsF	-

7. SYSTEM SETTINGS

- Colorimetry Alarm

Turn on and off the colorimetry alarm detection.

Normally, colorimetry is displayed in cyan on the vector waveform display and CIE chromaticity diagram display (SER05). But for 3G(QL) and 3G(DL)-4K, if any of the colorimetries does not match, it is displayed in yellow.

If alarm detection is set to ON and a colorimetry other than that specified with Colorimetry Set is received, the colorimetry is displayed in red. It is also displayed in red on the video signal waveform display.

Note that this is invalid when the input signal is SD.

OFF / ON

- Colorimetry Set

If Colorimetry Alarm is set to ON, specify the colorimetry.

BT-709 / BT-2020 / DCI

7.1.4 Configuring the SDI I/O Connectors

Use the SDI OUT tab to configure the SDI INPUT/OUTPUT connectors on the rear panel.

SYS → **F•1** SIGNAL IN OUT → **F•2** PREV TAB or **F•3** NEXT TAB →

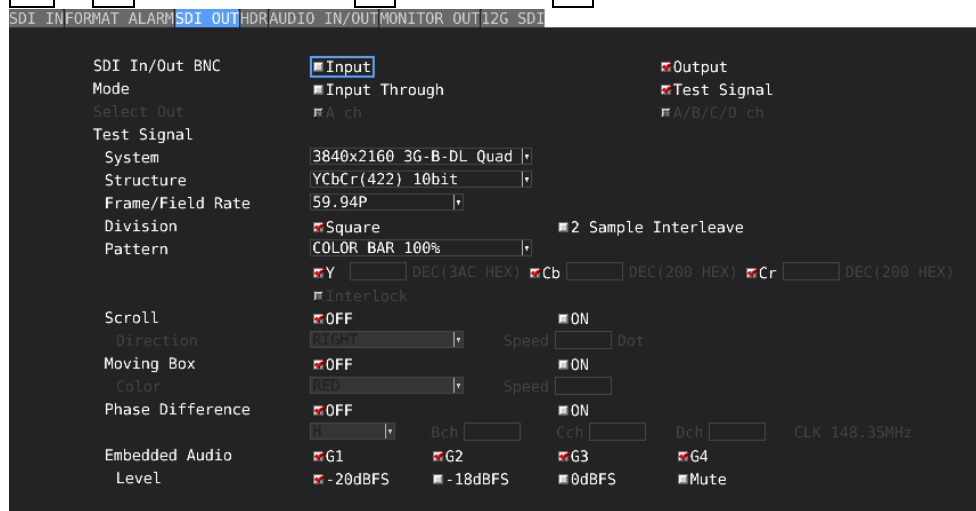


Figure 7-5 SDI OUT tab

- SDI In/Out BNC

Select whether to use SDI INPUT/OUTPUT as input connectors or output connectors. If SDI System on the SDI IN tab is set to 4K 12G, signals received through 3G-SDI INPUT/OUTPUT cannot be measured even if input is specified.

Input / Output

- Mode

Select the signal to output from SDI INPUT/OUTPUT for when SDI In/Out BNC is set to Output.

<u>Input Through:</u>	Transmits the reclocked version of the signals that have been received by the SDI INPUT 1A to 1D connectors. However, if SDI System on the SDI IN tab is set to 4K 12G, reclocked signals are not transmitted.
<u>Test Signal:</u>	Transmits the pattern specified by Test Signal.

- Select Out

Select the signal to output from SDI INPUT/OUTPUT 2A for when Mode is set to Input Through. This is fixed to A ch (except for 3G(DL)-4K) during multi link (cannot be set).

<u>A ch:</u>	Transmits the reclocked version of the signal that has been received by the SDI INPUT 1A connector.
<u>A/B/C/D ch:</u>	Transmits the reclocked version of the signals that have been received by the SDI INPUT 1A to 1D connectors. To select the output channel, use the INPUT menu or F•6 SELECT CH on each measurement screen.

7. SYSTEM SETTINGS

- System
- Structure
- Frame/Field Rate

Set the output format. The possible format combinations are shown below.
The default setting is 3840×2160 3G-B-DL Quad, YCbCr (422) 10 bits, 59.94P.

Table 7-4 Selecting the output format

System	Structure	Frame/Field Rate
3840×2160 3G-B-DL Quad	YCbCr(422) 10bit	60/59.94/50/48/47.95/P
4096×2160 3G-B-DL Quad	YCbCr(444) 10bit	30/29.97/25/24/23.98/P
3840×2160 3G-A Quad	RGB(444) 10bit	30/29.97/25/24/23.98/PsF
4096×2160 3G-A Quad		
2048×1080 3G-B-DL		
2048×1080 3G-A		
3840×2160 3G-B-DS Dual	YCbCr(422) 10bit	30/29.97/25/24/23.98/P
4096×2160 3G-B-DS Dual		30/29.97/25/24/23.98/PsF
1920×1080 3G-B-DL	YCbCr(422) 10bit	60/59.94/50/48/47.95/P
1920×1080 3G-A	YCbCr(444) 10bit	60/59.94/50/I
	RGB(444) 10bit	30/29.97/25/24/23.98/P
		30/29.97/25/24/23.98/PsF
1920×1080 HD	YCbCr(422) 10bit	60/59.94/50/I
		30/29.97/25/24/23.98/P
		30/29.97/25/24/23.98/PsF

- Division

Selects the division transmission system when System is Quad or Dual.

Square / 2 Sample Interleave

7. SYSTEM SETTINGS

● Pattern

Select the output pattern. The selectable patterns are shown below. Depending on the pattern, you can turn on and off YCbCr or RGB separately.

For COLOR RASTER, you can set the YCbCr or RGB levels separately. Moreover, if Structure is set to RGB, you can select the Interlock check box to synchronize the RGB levels.

Bandwidth is not limited for MULTI COLOR BAR, COLOR RASTER, CROSS HATCH, 10 STEP, or LIMIT RAMP.

Table 7-5 Selecting the output pattern

Pattern	YCbCr/RGB on/off	Level adjustment
COLOR BAR 100%	Yes	No
COLOR BAR 75%	Yes	No
MULTI COLOR BAR(*1)	Yes	No
COLOR RASTER	Yes	Yes
CROSS HATCH	Yes	No
10 STEP	Yes	No
LIMIT RAMP	Yes	No

*1 This cannot be selected when the system is 4096x2160 or 2048x1080.

* The signal will be interrupted when the pattern is changed.

● Scroll

Scrolls the pattern.

When set to ON, Moving Box and Phase Difference are turned off. You cannot select this when Pattern is set to CROSS HATCH.

OFF / ON

● Direction

When Scroll is set to ON, set the scroll direction.

<u>RIGHT:</u>	Scrolls from left to right.
LEFT:	Scrolls from right to left.
UP:	Scrolls from down to up.
DOWN:	Scrolls from up to down.
RIGHT & UP:	Scrolls from left_down to right_up.
RIGHT & DOWN:	Scrolls from left_up to right_down.
LEFT & UP:	Scrolls from right_down to left_up.
LEFT & DOWN:	Scrolls from right_up to left_down.

● Speed

When Scroll is set to ON, set the scroll speed.

4 - 124 Dot (in 4 dot steps)

7. SYSTEM SETTINGS

- Moving Box

Superimposes a square that moves randomly.

When set to ON, Scroll and Phase Difference are turned off.

OFF / ON

- Color

When Moving Box is set to ON, set the moving box color.

WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / BLACK

- Speed

When Moving Box is set to ON, set the moving box speed.

Greater the value, higher the speed.

1 - 3

- Phase Difference

When System is set to Quad, you can adjust the Bch, Cch, and Dch phases relative to Ach.

When System is set to Dual, you can adjust the Bch phase relative to Ach and the Dch phase relative to Cch.

When set to ON, Scroll and Moving Box are turned off.

OFF / ON

- Bch, Cch, Dch

When Phase Difference is set to ON, you can adjust the Bch, Cch, and Dch phases.

Switch between H and V to set each value. When System is set to Dual, the Bch and Dch phases are shared.

H: -1374 - 0 - 1374 Dot (depending on frame/field rate)

V: -562 - 0 - 562 Dot

7. SYSTEM SETTINGS

● Embedded Audio

When the pattern is set to COLOR BAR 100%, COLOR BAR 75%, or MULTI COLOR BAR, select the audio channels to embed in the SDI signal.

Channels 1 to 4 are called group 1, channels 5 to 8 group 2, channels 9 to 12 group 3, and channels 13 to 16 group 4.

The channels that can be embedded are 8 channels or 16 channels depending on the system and frame/field rate as shown below.

Table 7-6 Configuring Embedded Audio

System	Frame/Field Rate	G1	G2	G3	G4
3840x2160 3G-B-DL Quad 3840x2160 3G-A Quad 4096x2160 3G-A Quad 3840x2160 3G-B-DS Dual 1920x1080 3G-B-DL 1920x1080 3G-A 2048x1080 3G-A 1920x1080 HD	-	Yes	Yes	Yes	Yes
4096x2160 3G-B-DL Quad 2048x1080 3G-B-DL	60/59.94/30/29.97/P 30/29.97/PsF	Yes	Yes	No	No
	50/48/47.95/25/24/23.98/P 25/24/23.98/PsF	Yes	Yes	Yes	Yes
4096x2160 3G-B-DS Dual	30/29.97/P 30/29.97/PsF	Yes	Yes	No	No
	25/24/23.98/P 25/24/23.98/PsF	Yes	Yes	Yes	Yes

● Level

Select the embedded audio level.

-20dBFS / -18dBFS / 0dBFS / Mute

7.1.5 Configuring HDR (SER07)

On the HDR tab, configure the settings of HDR measurement.

SYS → **F•1** SIGNAL IN OUT → **F•2** PREV TAB or **F•3** NEXT TAB →



Figure 7-6 HDR tab

- HDR MODE

Turn the HDR measurement on or off. If set to ON, HDR signals can be measured on the video-signal-waveform, vector, and picture displays.

If you change the setting, a message “TONE CURVE SETUP” will be displayed for 10 to 20 seconds when you press **F•1** COMPLETE.

When HDR measurement is turned on, the following occurs.

When 5-bar display, gamut error display on the picture, gamut error display on the status, composite gamut error display, luminance level error, or chrominance level error turns on, the SDR conversion format selection is reduced to DISABLE only. If the SDR conversion format is set to a value other than DISABLE, it is changed to DISABLE.

OFF / ON

- STANDARD

Select the HDR signal standard.

If you change the setting, a message “TONE CURVE SETUP” will be displayed for 10 to 20 seconds when you press **F•1** COMPLETE.

HLG denotes ARIB STD-B67 (HLG), PQ denotes SMPTE ST 2084 (PQ curve), and S-Log3 denotes the log curve output from cameras from other manufacturers.

HLG / PQ / S-Log3

- HDR->SDR HIGH UPPER LIMIT

When STANDARD is set to PQ, select the upper limit of the display range.

This setting is valid when SDR conversion is set to HIGH.

10000cd/m2 / 4000cd/m2 / 1000cd/m2

7. SYSTEM SETTINGS

● SYSTEM GAMMA (OOTF)

If SYSTEM GAMMA (OOTF) is set to ON when STANDARD is set to HLG or S-Log3, the scale corresponding to the HDR signal of the video signal waveform display and picture display is shown in cd/m^2 , which is a unit of display intensity for HLG displays.

When STANDARD is set to HLG, gamma 1.2 is used to calculate the intensity with the full scale ranging up to 1000cd/m^2 .

When STANDARD is set to S-Log3, the intensity is displayed with the full scale ranging up to 3000cd/m^2 .

OFF / ON

● REFERENCE LEVEL

When STANDARD is set to HLG or PQ, select the reference level for the program production.

On the video signal waveform display, the selected reference level is shown using broken lines on the scale.

On the picture display, the selected reference level is set to the REF default value on the HDR signal CINEZONE display. The REF default value is applied when you press the function dial (F•D).

When STANDARD is HLG

50% / 75%

When STANDARD is PQ

51% / 58%

7.1.6 Configuring Audio I/O Connectors (SER03)

Use the AUDIO IN/OUT tab to configure the DIGITAL AUDIO INPUT/OUTPUT connectors on the rear panel.

SYS → F•1 SIGNAL IN OUT → F•3 NEXT TAB (×4) →

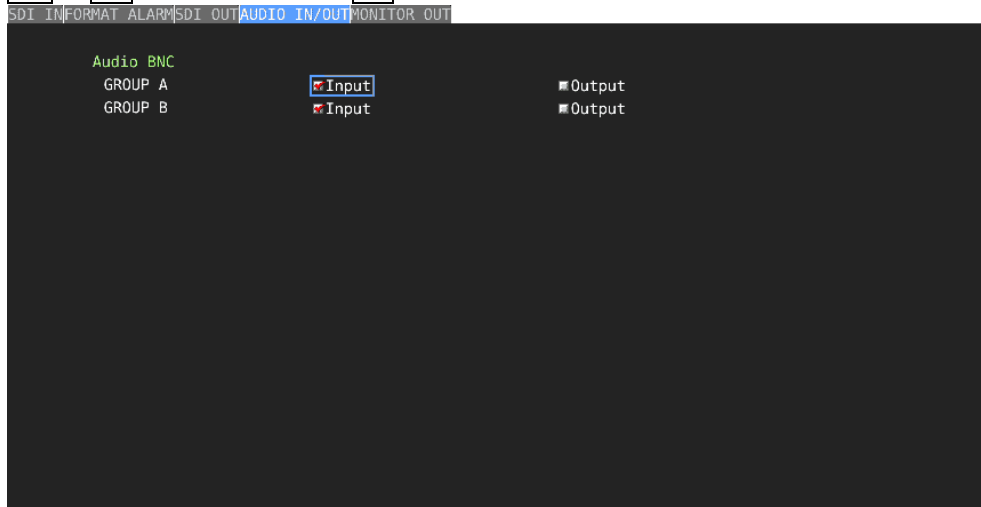


Figure 7-7 AUDIO IN/OUT tab

- Audio BNC

Select whether to use the DIGITAL AUDIO INPUT/OUTPUT connectors of each group as input connectors or output connectors.

Input / Output

7. SYSTEM SETTINGS

7.1.7 Configuring the Monitor Output Connectors

Use the MONITOR OUT tab to configure the MONITOR OUTPUT connectors on the rear panel and the LV 5490 LCD.

SYS → **F•1** SIGNAL IN OUT → **F•2** PREV TAB or **F•3** NEXT TAB →

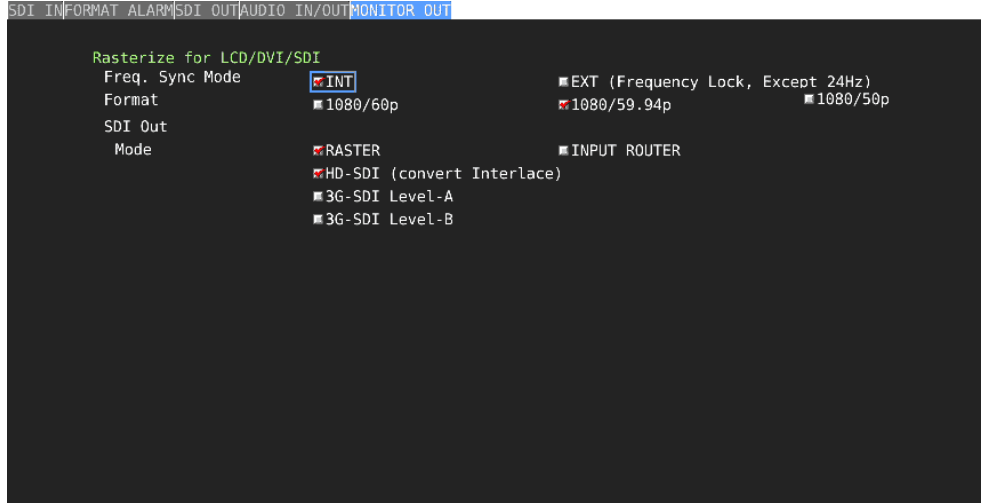


Figure 7-8 MONITOR OUT tab

- Freq. Sync Mode

Select the sync mode.

<u>INT</u> :	Transmits in the selected format by using the internal clock.
<u>EXT</u> :	Transmits by using the external sync signal received through EXT REF. The output signal format varies depending on the frame frequency of the external sync signal as follows.
30 Hz:	1080/60p
29.97 Hz:	1080/59.94p
25 Hz:	1080/50p
24 Hz or 23.98 Hz:	INT
When there is no external sync signal:	INT

- Format

When Freq Sync Mode is set to INT, select the output signal format.

1080/60p / 1080/59.94p / 1080/50p

7. SYSTEM SETTINGS

- SDI Out

Select the signal to transmit from the SDI connector of MONITOR OUTPUT.

<u>RASTER:</u>	Transmits the measurement screen. Set the output format to HD-SDI (converted to interlace), 3G-SDI Level-A or 3G-SDI Level-B.
INPUT ROUTER:	Transmits the reclocked version of the signals that have been received by the SDI INPUT 1A to 1D connectors. The output channel is the displayed channel in single input mode or the channel selected with F•6 SELECT CH on the appropriate measurement screen in simul mode. This option cannot be selected for 3G-B-DS or multi link.

7.1.8 Configuring the 12G SDI I/O Connector (SER06)

Use the 12G SDI tab to configure the 12G-SDI INPUT connector and the 12G-SDI OUTPUT connector on the rear panel.

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

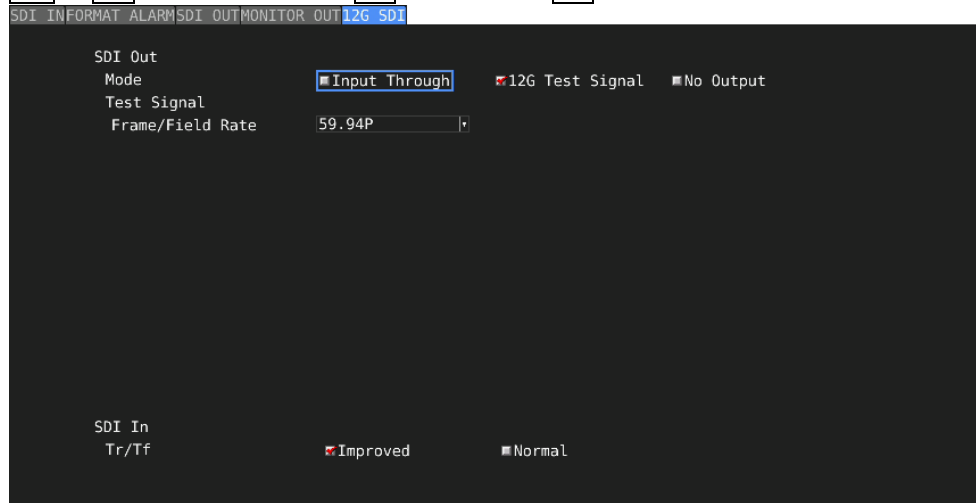


Figure 7-9 12G SDI tab

- Mode

Select the signal to output from 12G-SDI OUTPUT.

<u>Input Through:</u>	Transmits the reclocked version of the signals that have been received by the SDI INPUT 1A to 1D connectors.
12G Test Signal:	Transmits the 12G SDI signal specified by Test Signal
No Output:	12G SDI is not output. The receiving performance of 12G SDI input will improve.

- Frame/Field Rate

If Mode is set to 12G Test Signal, select the frame frequency of the output signal.

60P / 59.94P / 50P

- Tr/Tf

If a 12G-SDI is being received, select the automatic measurement algorithm for Tr/Tf.

<u>Improved:</u>	This mode supports the high data rate of 12G-SDI and is optimized for automatic measurement. Under normal conditions, using the Improved setting is recommended.
Normal:	This mode is compatible with the conventional mode.

7.1.9 Configuring IP (NMI) Pat 1 (SER08)

Use the NMI SETUP1 tab to configure the NMI(IP A, IP B) on the rear panel.

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

The screenshot shows the NMI SETUP1 tab with the following settings:

- NMI Setup**: DHCP is set to **Off** (with **On** as an alternative).
- IP A**: IP Address (192.168.10.21), Subnet Mask (255.255.255.0), Default Gateway (0.0.0.0).
- IP B**: IP Address (192.168.11.21), Subnet Mask (255.255.255.0), Default Gateway (0.0.0.0).
- IP Live System Manager**:
 - IP A**: Set to **Enable** (with **Disable** as an alternative). IP Address: 192.168.10.1, Port: 09004.
 - IP B**: Set to **Enable** (with **Disable** as an alternative). IP Address: 192.168.11.1, Port: 09004.
- NMI System Name**: LV5490SER08
- Serial No.**: 0000000
- MAC Address A**: 00:00:00:00:00:00
- MAC Address B**: 00:00:00:00:00:00

Figure 7-10 NMI SETUP1 tab

- NMI Setup DHCP

Select how to set the IP address.

If set to OFF, manually set the IP address, subnet mask, and default gateway of the IP Live Production System devices connected to IP A and IP B. If set to ON, the IP address, subnet mask, and default gateway of devices connected to IP A and IP B are assigned automatically.

OFF / ON

- NMI Setup IP A, IP B (IP Address / Subnet Mask / Default Gateway)

Set the IP address, subnet mask, and default gateway of the IP Live Production System devices connected to IP A and IP B.

- IP Live System Manager IP A

Configure the communication with IP A and IP Live System Manager. When set to Enable, communication is activated. When set to Enable, set the IP address of the IP Live System Manager.

Disable / Enable

- IP Live System Manager IP A IP Address

Set the IP address of the IP Live System Manager connected to IP A.

- IP Live System Manager IP B

Configure the communication with IP B and IP Live System Manager. When set to Enable, communication is activated. When set to Enable, set the IP address of the IP Live System

Disable / Enable

7. SYSTEM SETTINGS

- IP Live System Manager IP B IP Address

Set the IP address of the IP Live System Manager connected to IP B.

- NMI System Name

Set the NMI system name to read from the IP Live System Manager.

The default name is LV5490SER08, but you can change it with F•5 EDIT SYSTEM NAME.

Enter up to 10 characters.

You can use the following keys on the NMI system name input screen.

F•1	CLEAR ALL	Deletes all characters
F•2	DELETE	Deletes the character at the cursor
F•4	<=	Moves the cursor to the left
F•5	=>	Moves the cursor to the right
F•6	CHAR SET	Enters the character
Function dial (F•D)		Turn to select a character, and press to enter the character.

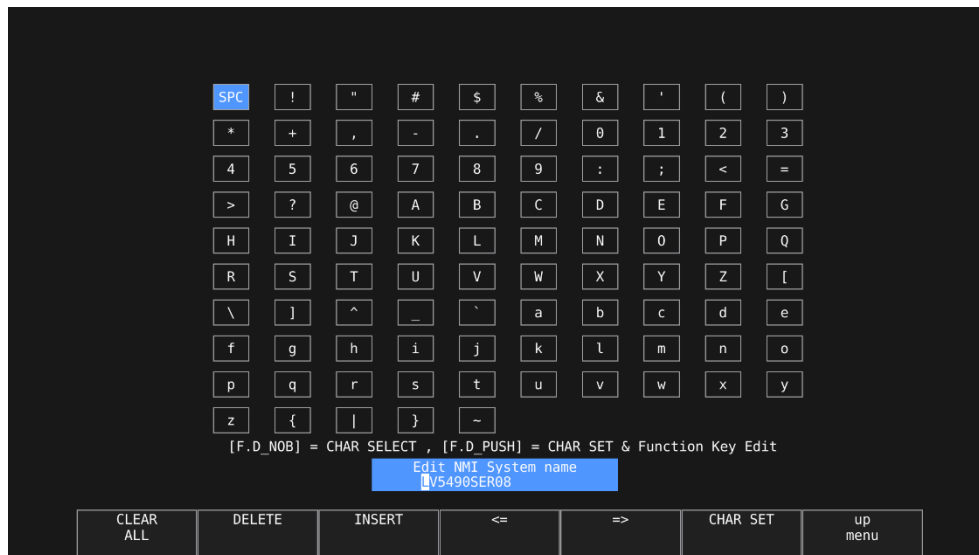


Figure 7-11 NMI SYSTEM NAME input screen

- Serial No.

Displays the SER08 serial number.

- MAC Address A, B

Displays the MAC addresses of IP A and IP B.

7. SYSTEM SETTINGS

7.1.10 Configuring IP (NMI) Pat 2 (SER08)

Use the NMI SETUP1 tab to configure the format of the NMI(IP A, IP B) on the rear panel.

SYS → F•1 SIGNAL IN OUT → F•2 PREV TAB or F•3 NEXT TAB →

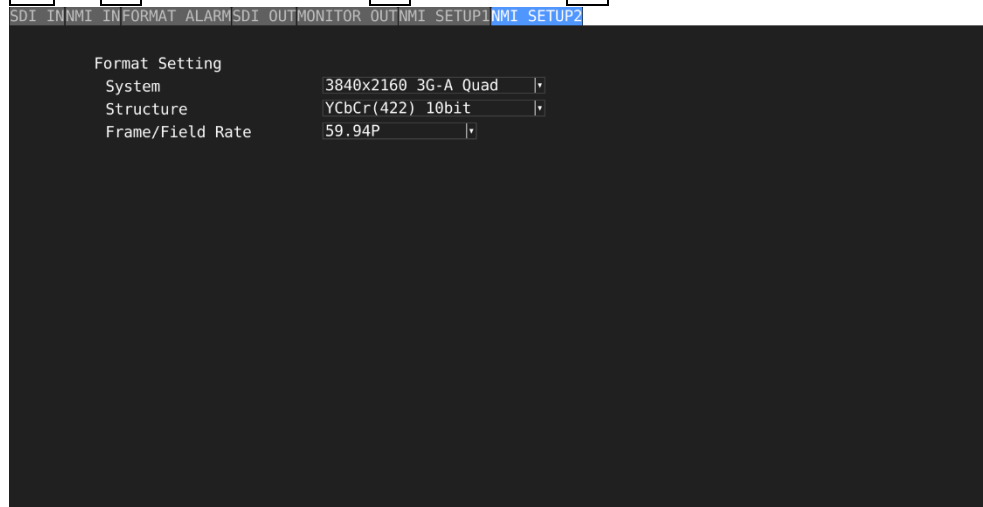


Figure 7-12 NMI SETUP2 tab

- System

When SDI System is 4K NMI on the SDI IN tab, this is fixed to 3840X2160 3G-A Quad.
When SDI System is NMI, this is fixed to 1920x1080 HD.

- Structure

This is fixed to YCbCr (422) 10 bit.

- Frame/Field Rate

When SDI System is 4K NMI on the SDI IN tab, select 59.94P or 50P.

59.94P / 50P

When SDI System is NMI on the SDI IN tab, select 59.94I or 50I.

59.94I / 50I

7. SYSTEM SETTINGS

7.2 LV 5490 Configuration

To configure the LV 5490, press **F•2** SYSTEM SETUP on the SYS menu.

7.2.1 General Settings

Use the GENERAL SETUP tab to configure general LV 5490 settings.



Figure 7-13 GENERAL SETUP tab

- Boot Mode

Select the boot mode.

Normal:	The LV 5490 starts normally.
Fast:	The LV 5490 starts quickly. The mode must be set to Normal when updating the firmware.

- Capture Mode

Select the capture mode for when you press CAP.

Reference 8, "CAPTURE FEATURE"

Screen:	The screen will be captured as still images.
Video Frame:	Single frames of data will be captured.

7. SYSTEM SETTINGS

- Format

Turns on and off the format display (e.g., 1920x1080/59.94I YCbCr(422) 10bit HD).
This setting is valid when a FORMAT item or Format option is placed in the layout.

OFF / ON

- Date

Select the display format of the date. y is the Gregorian year, m is the month, and d is the day.

This setting is valid when a DATE item is placed in the layout.

OFF / y/m/d / m/d/y / d/m/y

- Time

Select the display format of the time.

This setting is valid when a TIME item or Time option is placed in the layout and in the event log of the status display.

OFF / Real Time / LTC / VITC / D-VITC

- Input

Turns on and off the input signal display (e.g., SDI 1A).

This setting is valid when a INPUT item or Input option is placed in the layout.

OFF / ON

- Icon

Turns on and off the mouse icon , key lock icon , and USB memory icon .

OFF / ON

- Error

Turns on and off the error display in the upper right of the measurement screen.

Reference 5.9, "Measurement Screen Explanation"

OFF / ON

- Auto Off

Select whether to make the function menu automatically disappear.

<u>OFF:</u>	The menu does not disappear automatically. For example, the measurement menu can be temporarily hidden by pressing the appropriate measurement key again.

ON:	The menu disappears automatically when the time specified by Time elapses after the last key operation. Some menus, such as the SYS menu, never automatically disappear.

7. SYSTEM SETTINGS

- Time

When Auto Off is set to ON, select the length of time that must elapse without any key operations for the menu to disappear automatically.

1 - 5 - 60 Sec

- Recall

Select the menu to be displayed when recalling presets. Select this first, and then register presets.

Recall Menu: The PSET menu is displayed.

Function Menu: The measurement menu is displayed.

- LCD Auto Off

Select the length of time that must elapse without any key operations for the backlight to turn off automatically.

To turn it on again, press any key excluding the power switch, or double-click.

OFF / 5min / 30min / 60min

- FAN Speed

Select the fan speed.

The larger the value, the higher the speed and the higher the cooling capability. In contrast, the smaller the value, the quieter the fan noise.

1 - 5

- Temperature Warning

Turns on and off the alarm display (TEMPERATURE) that appears when the internal temperature increases.

"OVER HEAT" will still be displayed even if this is set to off.

Reference 7.3, "Displaying System Information"

OFF / ON

7.2.2 Configuring Ethernet Settings

Use the ETHERNET SETUP tab to configure Ethernet settings and view the MAC address. The settings that you specify here will not be initialized even if you initialize the LV 5490. In addition, they are not recorded to presets.

SYS → F•2 SYSTEM SETUP → F•2 PREV TAB or F•3 NEXT TAB →



Figure 7-14 ETHERNET SETUP tab

- Ethernet Select

Select how to set the IP address.

DHCP:	The IP address, subnet mask, and default gateway are set automatically.
IP:	Set the IP address, subnet mask, and default gateway manually.

- SNTP Client Select

Select whether to enable the SNTP client feature.

When set to ON, Server IP Address is set to the IP address of the NTP server, and Time Zone Adjust is set to the appropriate clock adjustment value.

OFF / ON

- TELNET Server

Select whether to enable the TELNET server feature and the LV 5490-01 (REMOTE CONTROLLER). You cannot use TELNET and the LV 5490-01 at the same time.

OFF / ON / LV5490-01

- FTP Server

Select whether to enable the FTP server feature.

OFF / ON

7. SYSTEM SETTINGS

- HTTP Server

Select whether to enable the HTTP server feature.

OFF / ON

- SNMP Read

Select the SNMP access mode.

<u>OFF</u> :	SNMP cannot be used.
ON:	Settings can be read.
Write:	Settings can be read and written.

- SNMP Trap

Select whether to enable SNMP trap output.

OFF / ON

- MAC Address

Displays the MAC address.

7. SYSTEM SETTINGS

7.2.3 Remote Control Settings

Use the REMOTE SETUP tab to configure remote control settings.

The settings that you specify here will not be initialized even if you initialize the LV 5490. In addition, they are not registered to presets.

Reference 10, "REMOTE CONTROL"

SYS → **F•2** SYSTEM SETUP → **F•2** PREV TAB or **F•3** NEXT TAB →
GENERAL SETUP | ETHERNET SETUP | **REMOTE SETUP** | DATE&TIME



Figure 7-15 REMOTE SETUP tab

- Remote Mode

Select the method for loading presets.

<u>Bit</u> :	Use pin 2 (/P1) to pin 9 (/P8) to load presets 1 to 8.
<u>Binary</u> :	Set pin 2 (/P1) as the least significant bit and pin 7 (/P6) as the most significant bit, and use binary code to load presets 1 to 60.

- Alarm Polarity

Select the alarm output polarity.

<u>Positive</u> :	A high signal is transmitted when an error is detected.
<u>Negative</u> :	A low signal is transmitted when an error is detected.

- Alarm Select

Select the channel that errors are detected on for transmitting alarms.
By default, all the check boxes are selected.

A / B / C / D

7. SYSTEM SETTINGS

7.2.4 Setting the Date and Time

Use the DATE&TIME tab to set the date and time.

The settings that you specify here will not be initialized even if you initialize the LV 5490. In addition, they are not recorded to presets.

SYS → F•2 SYSTEM SETUP → F•2 PREV TAB or F•3 NEXT TAB →

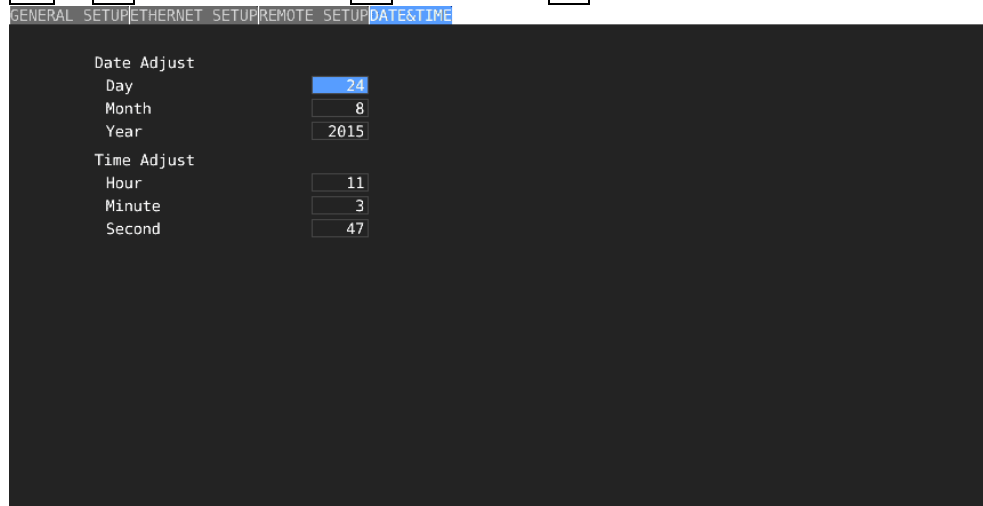


Figure 7-16 DATE&TIME tab

7.3 Displaying System Information

To display the system information, press F•3 SYSTEM INFO on the SYS menu. You can view the LV 5490 version and the internal temperature on this tab.

SYS → F•3 SYSTEM INFO →

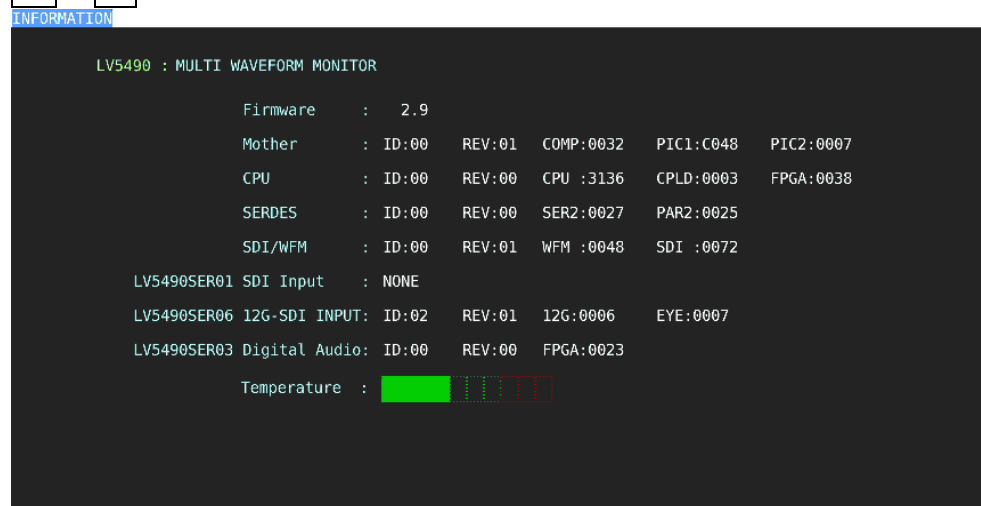


Figure 7-17 INFORMATION tab

7. SYSTEM SETTINGS

- Firmware

Displays the firmware version.

- Mother, CPU, SERDES, SDI/WFM

Displays the hardware versions.

For LV 5490 products that do not support the gamut error detection function, 5-bar display function or Video Noise Meter (SER10), the upper two digits of the four-digit version number displayed next to "PIC1:" under "Mother" will not be "00." In this case, the menu for the gamut error detection function, 5-bar display function and Video Noise Meter (SER10) will not be displayed.

- LV5490SER01, LV5490SER02, LV5490SER03, LV5490SER06, LV5490SER08

Displays the versions of the installed units.

Units displayed as "NONE" are not installed.

- Temperature

The internal temperature is displayed in a bar graph.

The internal temperature is displayed using 10 levels. Green levels indicate normal temperature. If the temperature increases and reaches the red area, a "TEMPERATURE" alarm appears at the top of the screen.

If the internal temperature increases still further, "OVER HEAT" appears. When a specific temperature is reached, the power will be shut down.

If either of these alarm appears, immediately turn the power off, and then check for problems with the operating environment. If this alarm appears even though there are no problems with the operating environment, contact your local LEADER agent.

7.4 Installing Options

To install options, use **F•4** LICENSE on the SYS menu.

You can use this screen to view the MAC address and install options.

Reference 2.3, "About Options"

SYS → **F•4** LICENSE →
LICENSE

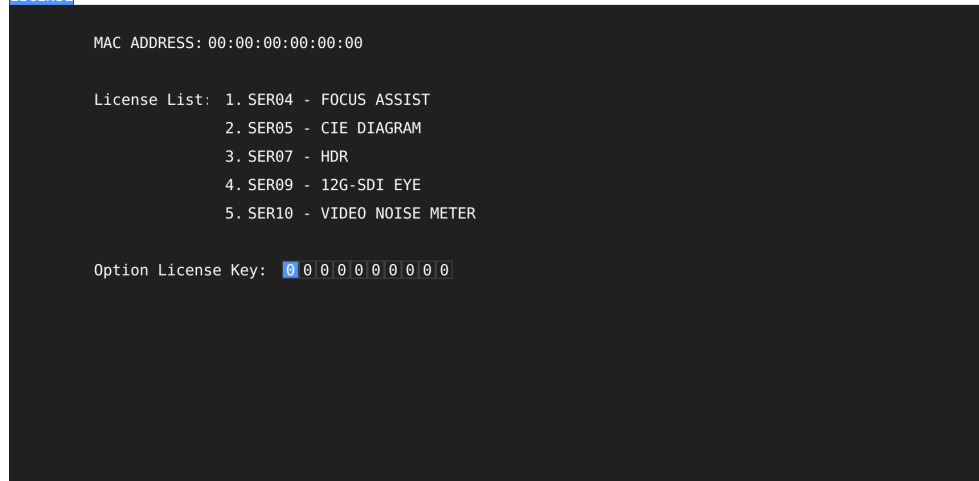


Figure 7-18 LICENSE tab

● Installing an Option

Have your license key ready, and follow the procedure below.

1. Use the function dial (F•D) to enter the license key number.
 Press **F•2** CLEAR to clear the license key to 0000000000.
2. Press **F•3** REGISTER.
 "Accepted" appears if the license key has been entered correctly, and the corresponding option becomes usable. The name of the option that has been installed appears in the License List.
 "Failed" appears if the license key is not correct. Reenter the license key correctly.

● Disabling an Option

Have your license key ready, and follow the procedure below.

1. Use the function dial (F•D) to enter the license key number.
 Press **F•2** CLEAR to clear the license key to 0000000000.
2. Press **F•4** REMOVE.
 "Accepted" appears if the license key has been entered correctly, and the corresponding option is disabled. The name of the option is deleted from the License List.
 "Failed" appears if the license key is not correct. Reenter the license key correctly.
3. Restart the LV 5490.

7.5 Adjusting the Backlight

To adjust the backlight, use **F•5** LCD BACK LIGHT in the SYS menu.

The larger the value, the brighter the backlight. Press the function dial (F•D) to return the setting to its default value (28).

1 - 28 - 32

7.6 Turning Off the LCD Panel

To turn off the LCD, press **F•6** LCD OFF on the SYS menu.

To turn it on again, press any key excluding the power switch, or double-click.

7.7 Initialization

To initialize the LV 5490 settings and layout, use **F•7** INITIALIZE in the SYS menu.

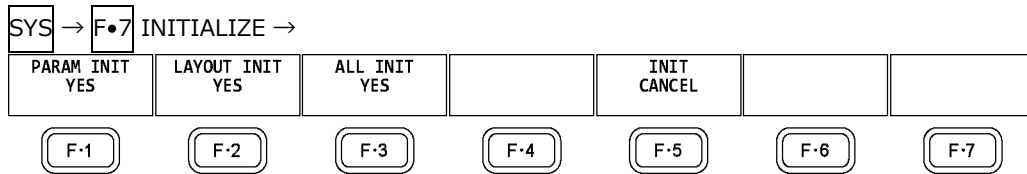


Figure 7-19 INITIALIZE menu

7.7.1 Initializing Settings

To initialize the settings, press **F•1** PARAM INIT YES. To cancel, press **F•5** INIT CANCEL. When you initialize the settings, all the settings—excluding those listed below—are initialized. For information about the default values, see chapter 20, “MENU TREES.”

- Ethernet settings (ETHERNET SETUP tab)
- Remote settings (REMOTE SETUP tab)
- Date and time settings (DATE&TIME tab)
- Preset contents
- Measurement screen layout
- Factory Default Settings

If you also want to initialize the above settings (excluding the date and time settings), turn on the power while holding down the V POS and H POS knobs. Release them when about 3 seconds (after the key LED switch from bright to dim) elapse after the power is turned on, and then press **F•3** SRAM/FLASH INIT YES.

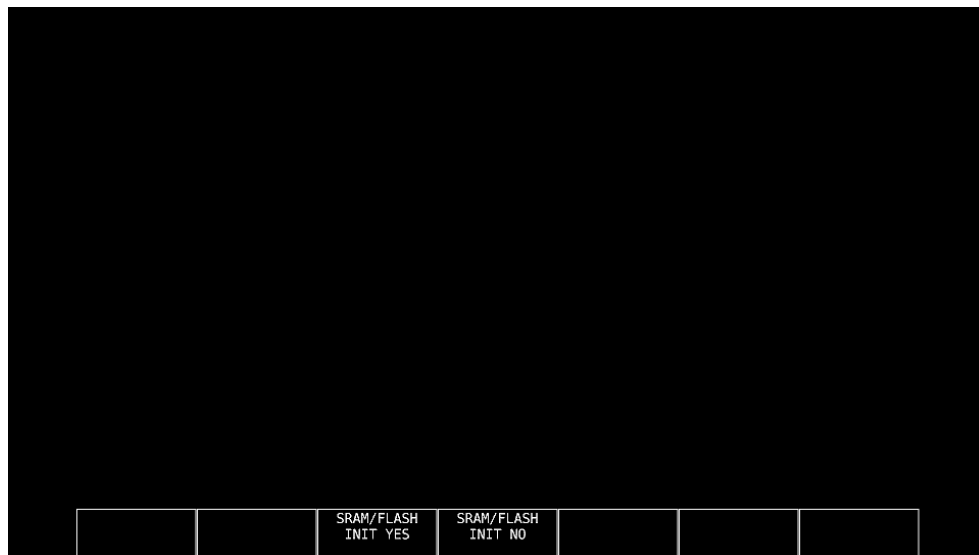


Figure 7-20 Factory default settings

7. SYSTEM SETTINGS

7.7.2 Initializing the Layout

To initialize the layout, press **F•2** LAYOUT INIT YES.

To cancel, press **F•5** INIT CANCEL.

When you initialize the layout, the layouts configured in all measurement displays (11 total) will be initialized. To initialize the layout in each measurement display, click DEFAULT LAYOUT in the appropriate layout window.

Reference DEFAULT LAYOUT → 6.4.3, "Layout Screen Description"

7.7.3 Initializing the Settings and Layout

To initialize the settings and layout, press **F•3** ALL INIT YES.

To cancel, press **F•5** INIT CANCEL.

8. CAPTURE FEATURE

The capture feature consists of screen capture and frame capture.

- Screen Capture

You can use the screen capture feature to capture still-image data of the screen. You can save the captured data to USB memory or overlay it on the input signal on the LV 5490 display.

- Frame Capture

You can use the frame capture feature to capture single frames of data from the SDI signal. You can save the captured data to USB memory or overlay it on the input signal on the LV 5490 display.

Because data is captured as frame data, the data can be displayed on the LV 5490 in different display modes. The supported display modes are the video signal waveform, vector waveform, picture, and status (data dump) displays. For details on the data dump display, see the FUNCTION MENU EXPLANATIONS.

- Switching between Screen Capture and Frame Capture

Change the Capture Mode setting on the GENERAL SETUP tab.

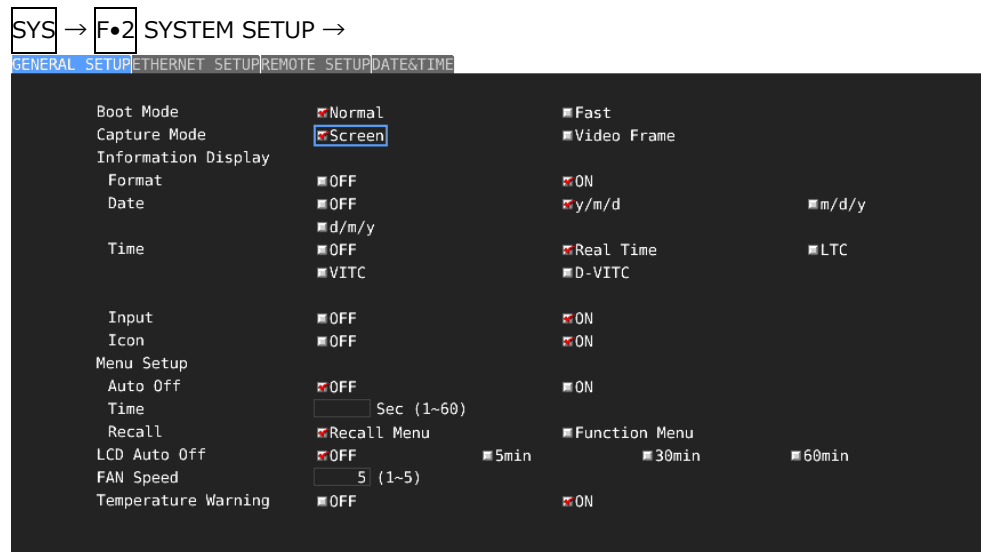


Figure 8-1 GENERAL SETUP tab

8.1 Screen Capture

8.1.1 Capturing the Screen

To take a screen capture of the display, follow the procedure below.

You cannot take screen captures of some screens such as tab menus and file lists.

1. Display the screen you want to capture.
2. Press CAP.

When you press CAP, the LV 5490 stores a screen capture of the display in its internal memory. You can also take screen captures by pressing **F•2** REFRESH while the CAP menu is displayed.

Note that if you perform one of the following operations after capturing a display, the captured data will be deleted.

- Change the measurement screen
- Press INPUT, MULTI, SYS, or PSET
- Turn OFF the power

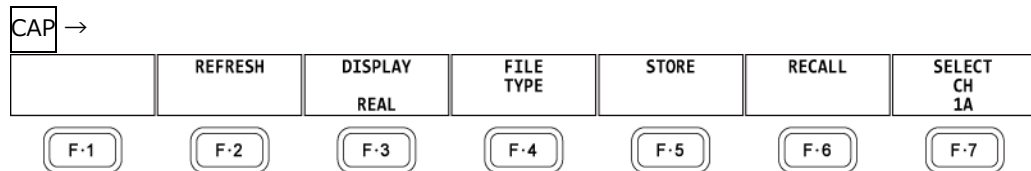


Figure 8-2 CAP menu

8.1.2 Displaying Screen Capture Data

If you press CAP, you can display the acquired screen capture data on the LV 5490 or overlay it on the current input signal.

You can display captured video signal waveform, vector waveform, picture, audio waveform, and eye pattern waveform display data on the LV 5490. Other kinds of data (such as status and scale data) cannot be displayed. However, these other kinds of data can be saved to USB memory as BMP files.

To display screen capture data, press **F•3** DISPLAY on the CAP menu.

REAL	The current input signal is displayed.
HOLD:	The screen capture data is displayed. The video signal waveforms, vectors, and eye pattern waveforms are shown in cyan.
BOTH:	The current input signal and the screen capture data are displayed on top of each other with their intensities halved.

8.1.3 Saving to USB Memory Device

If you press CAP and perform an operation such as changing the measurement screen, the acquired screen capture data is deleted. However, by saving the screen capture data to a USB memory device in BSG format, you can display the screen capture data on the LV 5490 even after you restart the instrument.

Also, if you save the screen capture data in BMP format, you can view the captured data on a PC.

1. Connect a USB memory device to the LV 5490.

2. Press **F•4** FILE TYPE on the CAP menu.

The FILE TYPE menu appears.

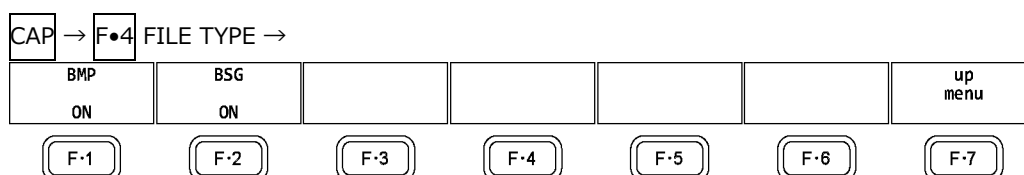


Figure 8-3 FILE TYPE menu

3. Select the file format.

If you set **F•1** BMP to ON, the screen capture data will be saved to the USB memory device as .bmp files. You can view the saved files on a PC.

If you set **F•2** BSG to ON, the screen capture data will be saved to the USB memory device as .bsg files. You can view the saved data on the LV 5490.

The default setting for both **F•1** BMP and **F•2** BSG is ON. You cannot set both of these settings to OFF.

4. Press **F•7** up menu.

The CAP menu appears.

5. Press **F•5** STORE.

The message "Please wait. Saving file" is displayed on the screen, and the screen capture data is saved to USB memory.

It takes approximately 10 seconds to save a file. The file size is approximately 6 MB for a BMP file and 9 MB for a BSG file.

The file is automatically assigned a name that consists of the year, month, day, hour, minute, and second (in that order) that are set in the system settings. (Example: 20090501100859.bmp)

Screen capture data is saved to the following locations.

- USB memory device
 - └ □ LV5490_USER
 - └ □ BMP
 - └ □ YYYYMMDDhhmmss.bmp
 - └ □ YYYYMMDDhhmmss.bsg

8. CAPTURE FEATURE

8.1.4 Displaying Screen Capture Data Saved to a USB Memory Device

To display or overlay on the current input signal the BSG-format screen capture data that has been saved to USB memory, follow the procedure below.

(Screen capture data that has been saved in BMP format and screen capture data that has been saved in BSG format on a different model cannot be displayed on the LV 5490.)

1. Connect a USB memory device to the LV 5490.
2. Press CAP.

The CAP menu appears.

3. Press **F•6** RECALL.

The file list display appears.

No.	Filename	Date&Time	Size(byte)
1	20131002105747.bmp	2013/10/02 10:57:53	6,220,854
2	20131002105747.bsg	2013/10/02 10:57:52	8,847,360
3	20131002105816.bmp	2013/10/02 10:58:22	6,220,854
4	20131002105816.bsg	2013/10/02 10:58:21	8,847,360
5	20131002105900.bmp	2013/10/02 10:59:05	6,220,854
6	20131002105900.bsg	2013/10/02 10:59:04	8,847,360

Disk Size: 8,158,744,576 Byte
Free Size: 8,113,516,544 Byte

RECALL DELETE FILE up menu

Figure 8-4 File list display

4. Turn the function dial (F•D) to select the .bsg file that you want to display.
5. Press **F•1** RECALL.
The file list display closes, and the CAP menu appears.
6. Press **F•3** DISPLAY to select the display format.
After you press **F•1** RECALL, the display format is BOTH.

8. CAPTURE FEATURE

8.1.5 Deleting Screen Capture Data Saved to a USB Memory Device

To delete screen capture data that has been saved to USB memory, follow the procedure below. (You can also delete the data on the PC.)

1. Connect a USB memory device to the LV 5490.
2. Press CAP.

The CAP menu appears.

3. Press **F•6** RECALL.

The file list display appears.

External USB Flash Drive Capture File List			
No.	Filename	Date&Time	Size(byte)
1	20131002105747.bmp	2013/10/02 10:57:53	6,220,854
2	20131002105747.bsg	2013/10/02 10:57:52	8,847,360
3	20131002105816.bmp	2013/10/02 10:58:22	6,220,854
4	20131002105816.bsg	2013/10/02 10:58:21	8,847,360
5	20131002105900.bmp	2013/10/02 10:59:05	6,220,854
6	20131002105900.bsg	2013/10/02 10:59:04	8,847,360

Disk Size: 8,158,744,576 Byte
Free Size: 8,113,516,544 Byte

RECALL DELETE FILE up menu

Figure 8-5 File list display

4. Turn the function dial (F•D) to select the file that you want to delete.
5. Press **F•3** DELETE FILE.

The DELETE FILE menu appears.

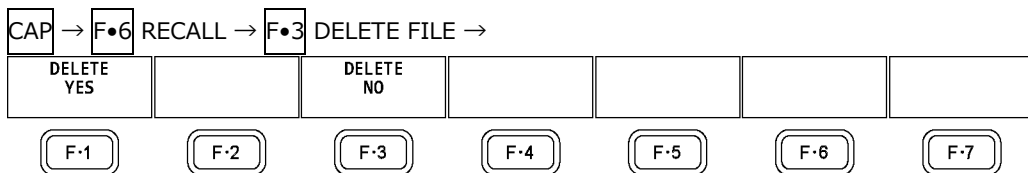


Figure 8-6 DELETE FILE menu

6. Press **F•1** DELETE YES.

To cancel the operation, press **F•3** DELETE NO.

8.2 Frame Capture

8.2.1 Capturing Frame Data

There are two ways to capture frame data. One way is to capture frame data manually, and the other is to capture frame data automatically when errors occur (error capture). When using error capture, use single input mode. It will not work properly in simul mode.

1. Display the screen you want to capture.

The display must be showing video signal waveforms, vector waveforms, or a picture. However, capturing is not possible if an eye pattern (SER02/SER09) or audio (SER03) is shown in the same display.

For vector waveforms, press **F•6** DISPLAY and then **F•1** MODE to select VECTOR. This feature does not support the 5-bar display.

2. Press CAP.

The CAP menu appears.

Unlike screen captures, frame data is not captured when you press CAP.

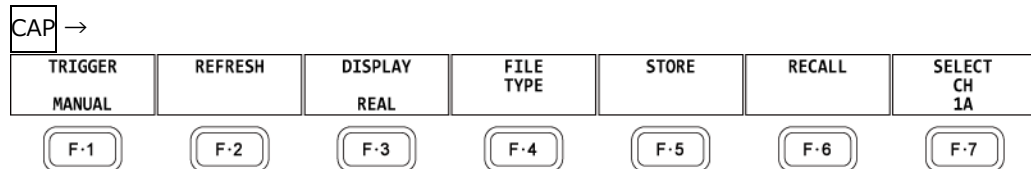


Figure 8-7 CAP menu

- Capturing frame data manually

3. Press **F•1** TRIGGER to select MANUAL.
4. Press **F•2** REFRESH.

One frame of data is captured in the LV 5490.

8. CAPTURE FEATURE

- Capturing frame data automatically (error capture)

3. Press **F•1** TRIGGER to select ERROR.
4. Press **F•7** SELECT CH to select a channel.
5. Press **F•2** REFRESH.

Error capture for the selected channel begins.

To begin error capture on other channels, repeat steps 4 and 5.

The LV 5490 switches to error standby mode and Channels for which capture is in progress appear in the upper right of the screen. Standby mode is cleared by setting **F•1** TRIGGER to MANUAL.

In Simul mode, "Capture is invalid" will appear, and the capture function will not work.



Figure 8-8 Error standby

6. When the message below appears, press any key except for the power key.

If an error occurs during error standby, the LV 5490 captures the frame data at that point and stops the frame capture.

The applicable errors are those listed under "Applicable Errors" below whose detection setting has been set to ON through **F•5** STATUS SETUP on the STATUS menu.

8. CAPTURE FEATURE

Table 8-1 Applicable errors for error capturing

	Applicable Errors	Inapplicable Errors
SDI Error	TRS, Line Number, CRC, EDH, Illegal Code	Frequency, Cable
Ancillary Data Error	Parity, Checksum	-
Embedded Audio Error	BCH, DBN, Parity, Inhibit Line	Sample Count
Video Error	Gamut, Composite Gamut, Level	Freeze, Black

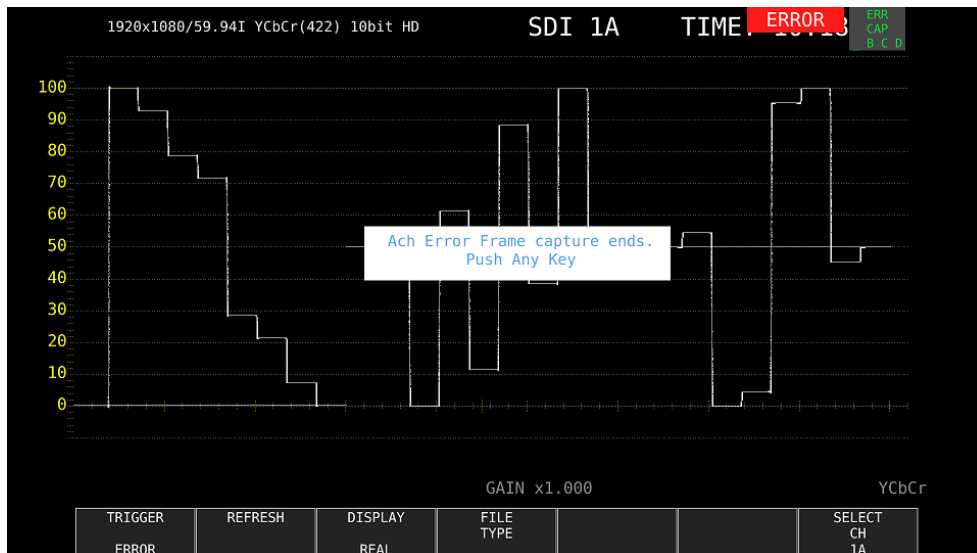


Figure 8-9 Error capture end

8.2.2 Displaying Frame Capture Data

You can display the captured frame data on the LV 5490 or overlay it on the current input signal. You can also display the frame data in different display modes.

To select the display mode, follow the procedure below.

- First, show the video signal waveform display, vector waveform display (except the 5-bar display), or picture display.
- To display frame data, the LV 5490 must be receiving a signal whose format is the same as that of the captured data.
- The display may blink when you operate the V POS knob, H POS knob, or function dial (F•D).
- The scale and measured values are those of the current signal, not those of the captured data.

Procedure

CAP → F•3 DISPLAY: REAL / HOLD / BOTH

Settings

REAL:	The current input signal is displayed.
HOLD:	The frame capture data is displayed. The video signal waveforms and vectors are shown in cyan.
BOTH:	The current input signal and the frame capture data are displayed on top of each other with their intensities halved.

8.2.3 Saving to a USB Memory Device

The frame data captured in the LV 5490 is cleared when the power is turned off. If you want to display it later even after the power is turned off, save the data to USB memory by following the procedure below (save the data in FRM format).

1. Connect a USB memory device to the LV 5490.

2. Press **F•4** FILE TYPE on the CAP menu.

The FILE TYPE menu appears.

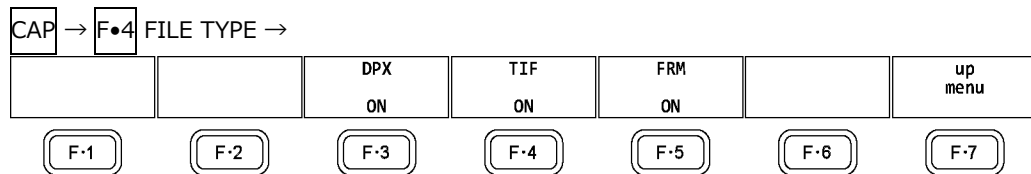


Figure 8-10 FILE TYPE menu

3. Select the file format.

Set the file types for saving the data to ON. By default, all types are set to ON. You cannot turn all the settings off.

F•3 DPX: Only the picture area is saved as 10-bit .dpx files.

Even when the input signal is 12 bits, it is rounded to 10 bits and saved.

F•4 TIF: Only the picture area is saved as .tif files.

This data is DPX converted into TIF.

F•5 FRM: A single frame of data is saved.

4. Press **F•7** up menu.

The CAP menu appears.

5. Press **F•5** STORE.

The message "Please wait. Saving file..." is displayed on the screen, and the frame capture data is saved to the USB memory device. This menu item does not appear when there is no frame data captured in the LV 5490.

When the input signal is 1080i/59.94 and all the file types that you can select with **F•4** FILE TYPE are set to ON, it takes about 50 seconds to save the data. The approximate file sizes for saving the data are 7.9 MB for DPX, 11.8 MB for TIF, and 9.4 MB for FRM.

The file is automatically assigned a name that consists of the year, month, day, hour, minute, second, and CH(in that order) that are set in the system settings.

(Example: 20090501100859A.bmp)

Frame capture data is saved to the following locations.

```

├─ USB memory device
├─ └─ LV5490_USER
├─     └─ BMP
├─         └─ yyyyymmddhhmmss.dpx
├─         └─ yyyyymmddhhmmss.frm
├─         └─ yyyyymmddhhmmss.tif

```

8. CAPTURE FEATURE

8.2.4 Displaying Frame Capture Data Saved to a USB Memory Device

To display or overlay on the current input signal the frame capture data that has been saved to USB memory as .frm files, follow the procedure below.

(Frame capture data that has been saved in FRM format on a different model cannot be displayed on the LV 5490.)

1. Connect a USB memory device to the LV 5490.
2. Press CAP.

The CAP menu appears.

3. Press **F•6** RECALL.

The file list display appears.

No.	Filename	Date&Time	Size(byte)
1	20140221131806.dpx	2014/02/21 13:18:28	8,296,480
2	20140221131806.frm	2014/02/21 13:18:40	9,900,064
3	20140221131806.tif	2014/02/21 13:18:38	12,450,600
4	20140221132935.dpx	2014/02/21 13:30:05	8,296,480
5	20140221132935.frm	2014/02/21 13:30:19	9,900,064
6	20140221132935.tif	2014/02/21 13:30:18	4,151,874

Disk Size: 4,001,431,552 Byte
Free Size: 3,938,385,920 Byte

FORMAT: 1920x1080/59.94I YCbCr(422) 10bit HD

RECALL DELETE FILE up menu

Figure 8-11 File list display

4. Turn the function dial (F•D) to select the .frm file that you want to display.
5. Press **F•1** RECALL.

To display frame data, the LV 5490 must be receiving a signal whose format is the same as that of the saved data. The FORMAT item at the bottom of the display shows the format of the saved data. It is displayed in green if the format is the same as the current format or in red if the format is not the same. If the FORMAT item is in red, **F•1** RECALL does not appear.

6. Press **F•3** DISPLAY to select the display format.

8. CAPTURE FEATURE

8.2.5 Deleting Frame Capture Data Saved to a USB Memory Device

To delete frame capture data that has been saved to a USB memory device, follow the procedure below. (You can also use a PC to delete the data.)

1. Connect a USB memory device to the LV 5490.
2. Press CAP.

The CAP menu appears.

3. Press **F•6** RECALL.

The file list display appears.

External USB Flash Drive Capture File List			
No.	Filename	Date&Time	Size(byte)
1	20140221131806.dpx	2014/02/21 13:18:28	8,296,480
2	20140221131806.frm	2014/02/21 13:18:40	9,900,064
3	20140221131806.tif	2014/02/21 13:18:38	12,450,600
4	20140221132935.dpx	2014/02/21 13:30:05	8,296,480
5	20140221132935.frm	2014/02/21 13:30:18	9,900,064
6	20140221132935.tif	2014/02/21 13:30:18	4,151,874

Disk Size: 4,001,431,552 Byte
Free Size: 3,938,385,920 Byte
FORMAT: 1920x1080/59.94I YCbCr(422) 10bit HD

RECALL DELETE FILE up menu

Figure 8-12 File list display

4. Turn the function dial (F•D) to select the file that you want to delete.
5. Press **F•3** DELETE FILE.

The DELETE FILE menu appears.

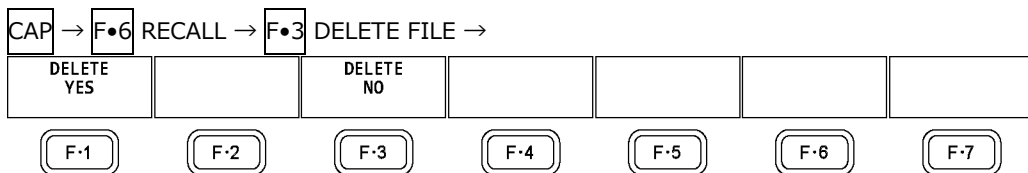


Figure 8-13 DELETE FILE menu

6. Press **F•1** DELETE YES.
To cancel the deletion operation, press **F•3** DELETE NO.

9. PRESET SETTINGS

The preset feature stores up to 60 sets of panel settings. It can be used to easily recall fixed settings. Also, you can use the same settings on multiple LV 5490s by copying presets to USB memory.

All items except the items below are stored in a preset. Stored items are not deleted even if you initialize the settings.

- Ethernet settings (ETHERNET SETUP tab)
- Remote settings (REMOTE SETUP tab)
- Date and time settings (DATE&TIME tab)

9.1 Registering Presets

To register a preset, follow the procedure below.

1. Display the screen you want to register.

You can set the menu that appears when a preset is recalled by setting Recall on the GENERAL SETUP tab in the system settings in advance.

Reference GENERAL SETUP tab → 7.2.1, "General Settings."

2. Hold down PSET.

The preset registration display appears.

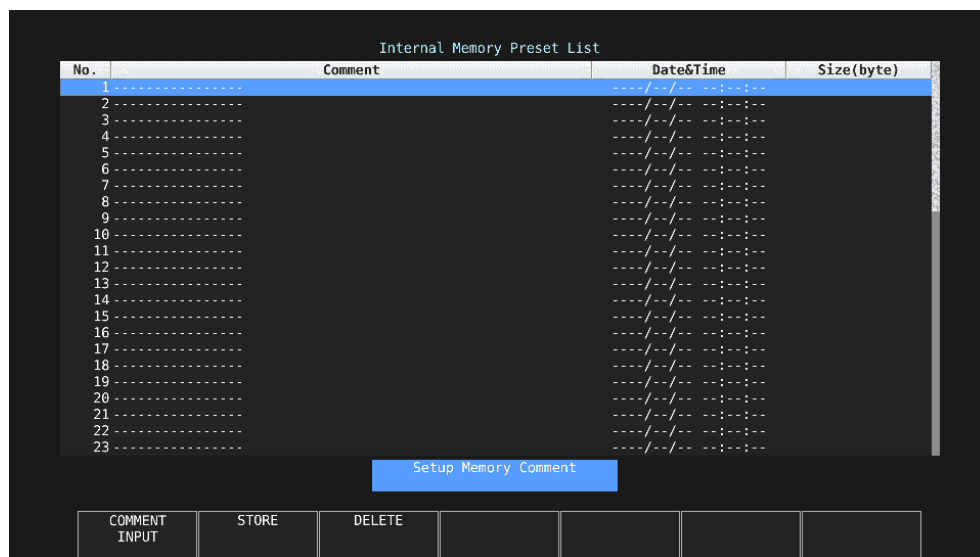


Figure 9-1 Preset registration display

9. PRESET SETTINGS

- Press **F•1** COMMENT INPUT

The comment input display appears.

You can also copy a comment from a preset that already has a comment saved to it. To copy a comment, on the preset registration display, move the cursor to the preset that has the comment that you want to copy, and press the function dial (F•D).

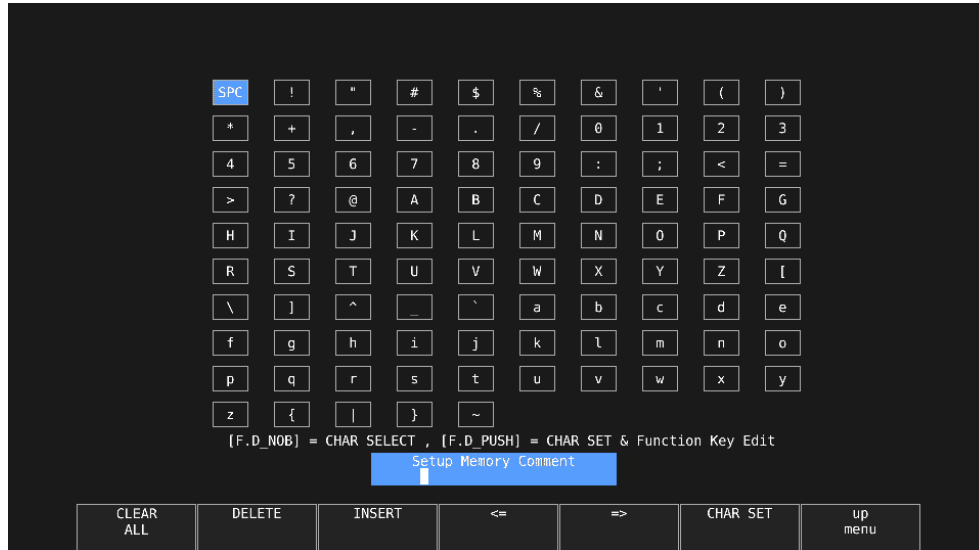


Figure 9-2 Comment input display

- Enter a comment of up to 16 characters.

You can use the following keys on the comment input display.

F•1	CLEAR ALL:	Deletes all characters
F•2	DELETE:	Deletes the character at the cursor
F•3	INSERT:	Inserts the selected character at the cursor position
F•4	<=:	Moves the cursor to the left
F•5	>=:	Moves the cursor to the right
F•6	CHAR SET:	Enters the character

Function dial (F•D): Turn to select a character, and press to enter the character.

- Press **F•7** up menu.
- Turn the function dial (F•D) to select the number of the preset you want to register.
- Press **F•2** STORE.

If a preset has already been stored with the number that you selected, the STORE menu appears. To overwrite the existing preset, press **F•1** OVER WRITE YES. Otherwise, press **F•3** OVER WRITE NO.

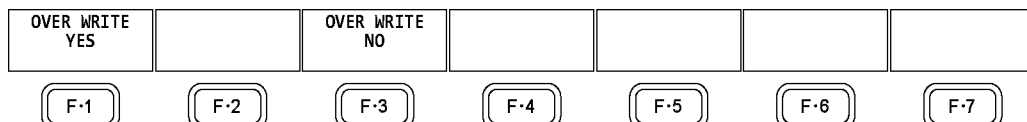


Figure 9-3 STORE menu

9. PRESET SETTINGS

9.2 Recalling Presets

To recall a preset, follow the procedure below.

1. Press PSET.

The PSET menu appears.

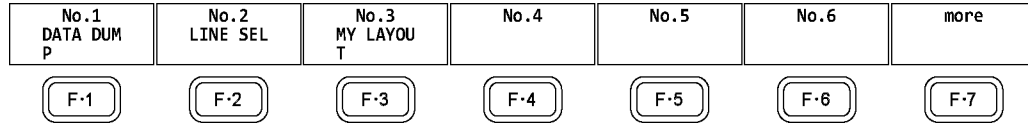


Figure 9-4 PSET menu

2. Press a key from **F.1** No.1 to **F.6** No.6.

If the preset that you want to load is number 7 or greater, press **F.7** more or turn the function dial (F•D).

The menu that appears immediately after loading the preset is either the PSET menu or measurement menu depending on the setting that was specified on the GENERAL SETUP tab when the preset was registered.

Reference GENERAL SETUP tab → 7.2.1, "General Settings."

9. PRESET SETTINGS

9.3 Deleting Presets

To delete a preset, follow the procedure below.

1. Hold down PSET.

The preset registration display appears.

No.	Comment	Date&Time	Size(byte)
1	DATA DUMP	2013/10/02 11:26:59	107,368
2	LINE SEL	2013/10/02 11:28:18	107,368
3	MY LAYOUT	2013/10/02 11:30:05	107,368
4	-----	---/-/-- --:--:--	
5	-----	---/-/-- --:--:--	
6	-----	---/-/-- --:--:--	
7	-----	---/-/-- --:--:--	
8	-----	---/-/-- --:--:--	
9	-----	---/-/-- --:--:--	
10	-----	---/-/-- --:--:--	
11	-----	---/-/-- --:--:--	
12	-----	---/-/-- --:--:--	
13	-----	---/-/-- --:--:--	
14	-----	---/-/-- --:--:--	
15	-----	---/-/-- --:--:--	
16	-----	---/-/-- --:--:--	
17	-----	---/-/-- --:--:--	
18	-----	---/-/-- --:--:--	
19	-----	---/-/-- --:--:--	
20	-----	---/-/-- --:--:--	
21	-----	---/-/-- --:--:--	
22	-----	---/-/-- --:--:--	
23	-----	---/-/-- --:--:--	

Setup Memory Comment

COMMENT INPUT STORE DELETE [] [] [] []

Figure 9-5 Preset registration display

2. Turn the function dial (F•D) to select the file that you want to delete.

3. Press **F•3** DELETE.

The DELETE menu appears.

DELETE YES		DELETE NO				
F•1	F•2	F•3	F•4	F•5	F•6	F•7

Figure 9-6 DELETE menu

4. Press **F•1** DELETE YES.

To cancel the operation, press **F•3** DELETE NO.

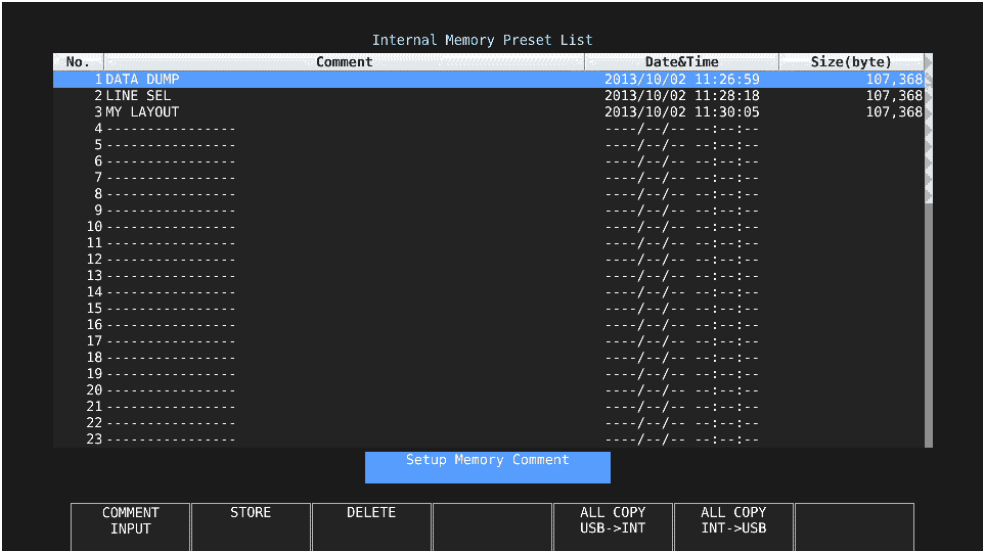
9. PRESET SETTINGS

9.4 Copying All Presets from the LV 5490 to USB Memory

To copy all the presets from the LV 5490 to USB memory, follow the procedure below.

1. Connect a USB memory device to the LV 5490.
2. Hold down PSET.

The preset registration display appears.

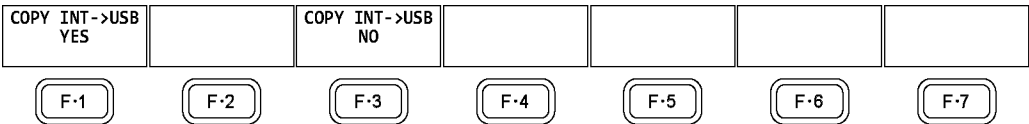


No.	Comment	Date&Time	Size(byte)
1	DATA_DUMP	2013/10/02 11:26:59	107,368
2	LINE_SEL	2013/10/02 11:28:18	107,368
3	MY_LAYOUT	2013/10/02 11:30:05	107,368
4	-----	---/--/--	---
5	-----	---/--/--	---
6	-----	---/--/--	---
7	-----	---/--/--	---
8	-----	---/--/--	---
9	-----	---/--/--	---
10	-----	---/--/--	---
11	-----	---/--/--	---
12	-----	---/--/--	---
13	-----	---/--/--	---
14	-----	---/--/--	---
15	-----	---/--/--	---
16	-----	---/--/--	---
17	-----	---/--/--	---
18	-----	---/--/--	---
19	-----	---/--/--	---
20	-----	---/--/--	---
21	-----	---/--/--	---
22	-----	---/--/--	---
23	-----	---/--/--	---

Figure 9-7 Preset registration display

3. Press **F•6** ALL COPY INT->USB.

The ALL COPY INT->USB menu appears.



COPY INT->USB YES		COPY INT->USB NO				
F-1	F-2	F-3	F-4	F-5	F-6	F-7

Figure 9-8 ALL COPY INT->USB menu

4. Press **F•1** COPY INT->USB YES.

To cancel the copy operation, press **F•3** COPY INT->USB NO. If presets already exist on the USB memory, they will be overwritten.

Presets are saved to the following location.

Note that if you use a PC to change the names of the files stored in the USB memory, you will no longer be able to copy the altered presets from USB memory to an LV 5490.

- 📁 USB memory device
 - └ 📁 LV5490_USER
 - └ 📁 pset
 - └ 📄 PRESET_01.PRE (to PRESET_60.PRE)

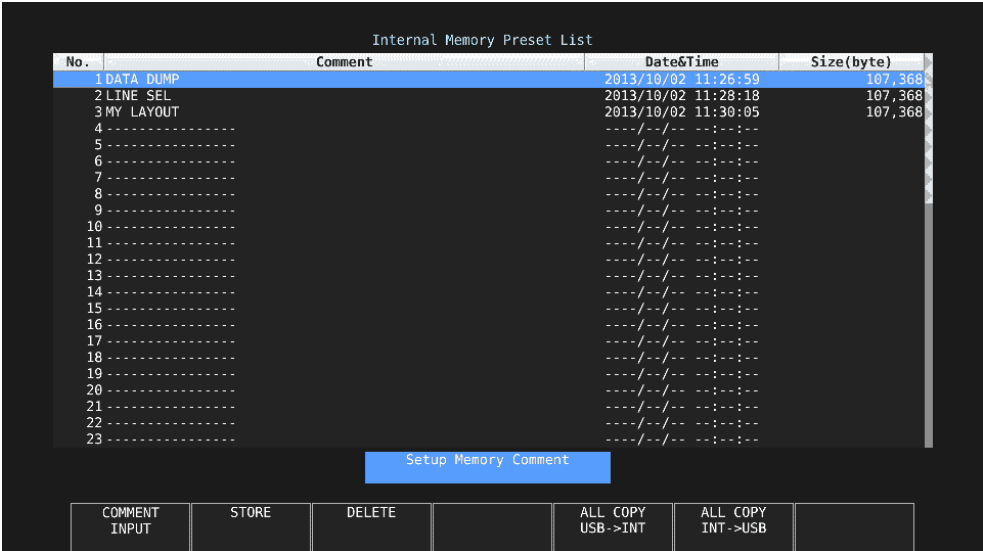
9. PRESET SETTINGS

9.5 Copying All Presets from USB Memory to the LV 5490

To copy all the presets from USB memory to the LV 5490, follow the procedure below.

1. Connect a USB memory device to the LV 5490.
2. Hold down PSET.

The preset registration display appears.

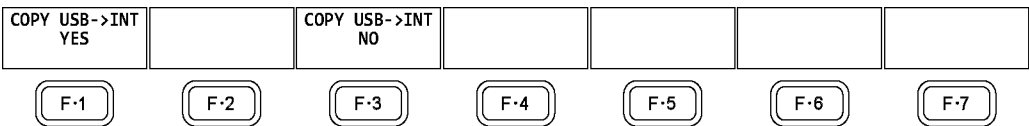


No.	Comment	Date&Time	Size(byte)
1	DATA DUMP	2013/10/02 11:26:59	107,368
2	LINE SEL	2013/10/02 11:28:18	107,368
3	MY LAYOUT	2013/10/02 11:30:05	107,368
4	-----	---/--/--	---
5	-----	---/--/--	---
6	-----	---/--/--	---
7	-----	---/--/--	---
8	-----	---/--/--	---
9	-----	---/--/--	---
10	-----	---/--/--	---
11	-----	---/--/--	---
12	-----	---/--/--	---
13	-----	---/--/--	---
14	-----	---/--/--	---
15	-----	---/--/--	---
16	-----	---/--/--	---
17	-----	---/--/--	---
18	-----	---/--/--	---
19	-----	---/--/--	---
20	-----	---/--/--	---
21	-----	---/--/--	---
22	-----	---/--/--	---
23	-----	---/--/--	---

Figure 9-9 Preset registration display

3. Press **F•5** ALL COPY USB->INT.

The ALL COPY USB->INT menu appears.



COPY USB->INT YES		COPY USB->INT NO				
F-1	F-2	F-3	F-4	F-5	F-6	F-7

Figure 9-10 ALL COPY USB->INT menu

4. Press **F•1** COPY USB->INT YES.

To cancel the copy operation, press **F•3** COPY USB->INT NO. If presets already exist within the LV 5490 internal memory, they will be overwritten.

10. VIDEO SIGNAL WAVEFORM DISPLAY

To display the video signal waveform, press WFM.

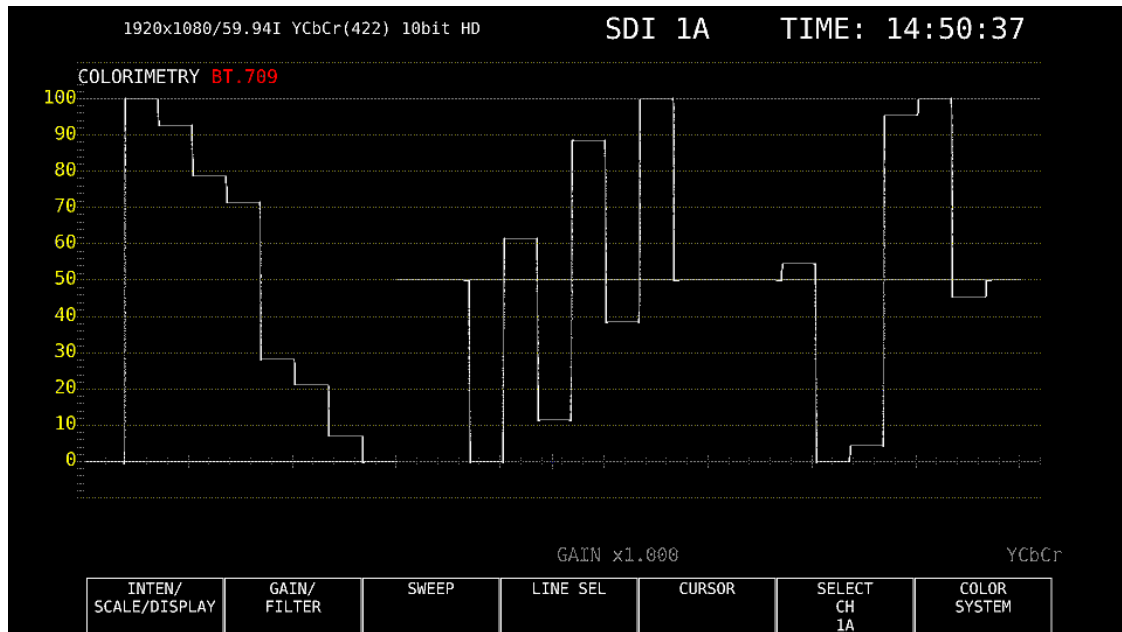


Figure 10-1 Video signal waveform display

- Colorimetry

Normally, colorimetry is not displayed, but when the colorimetry alarm is set to on in the system settings and a colorimetry different from the one specified is received, the alarm is indicated in red in the upper left of the screen.

10.1 Setting the Waveform Display Position

Use the V POS and H POS knobs to adjust the display position of video signal waveforms. On the multi display, these are valid when you press **F•2** MULTI WFM on the MULTI menu.

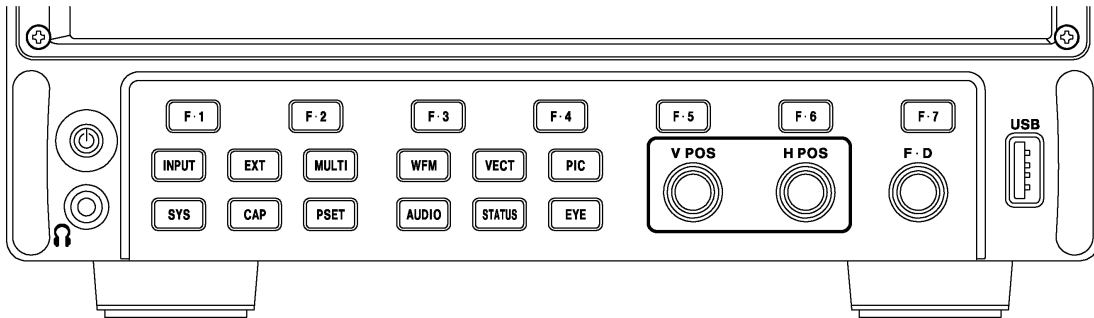


Figure 10-2 V POS and H POS knobs

- V POS Knob

This knob adjusts the vertical position of the video signal waveform. Pressing the knob returns the waveform to its default position.

- H POS Knob

This knob adjusts the horizontal position of the video signal waveform. Pressing the knob returns the waveform to its default position.

10.2 Configuring the Display Settings

To configure the display settings, press **F•1** INTEN/SCALE/DISPLAY on the WFM menu.

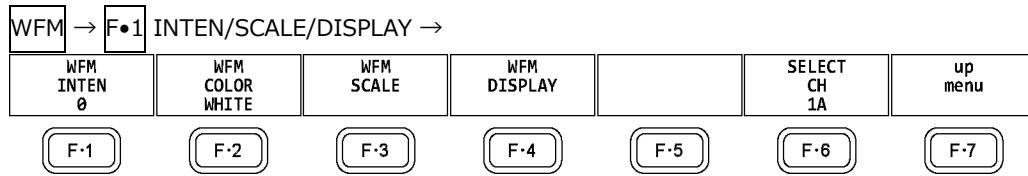


Figure 10-3 INTEN/SCALE/DISPLAY menu

10.2.1 Adjusting the Vector Intensity

To adjust the video signal waveform intensity, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (0).

Procedure

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•1** WFM INTEN: -128 - 0 - 127

10.2.2 Selecting the Vector Color

To select the video signal waveform color, follow the procedure below.

On the multi display, the following colors are assigned to the video signal waveforms.

Y: white, Cb: cyan, Cr: magenta

G: green, B: blue, R: red

X: white, Y: white, Z: white

COMPOSIT: white

Procedure (when not measuring 3G-B-DS)

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•2** WFM COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

Procedure (when measuring 3G-B-DS)

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•2** WFM COLOR

→ **F•1** STREAM1 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

→ **F•2** STREAM2 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI

10.2.3 Adjusting the Scale Intensity

To configure the scale, press **F•3** WFM SCALE on the INTEN/SCALE/DISPLAY menu.

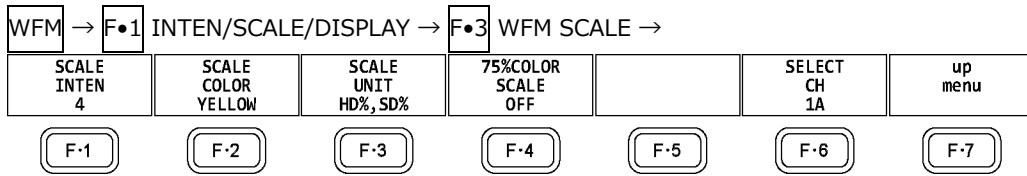


Figure 10-4 WFM SCALE menu

To adjust the scale intensity, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (4).

Procedure

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•3** WFM SCALE → **F•1** SCALE INTEN: -8 - 4 - 7

10.2.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•3** WFM SCALE → **F•2** SCALE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

10.2.5 Selecting the Scale Unit

To select the scale unit, follow the procedure below.

When COLOR MATRIX is set to XYZ, the scale unit is set to "HD%,SD%" or 150%.

When COLOR MATRIX is set to COMPOSIT and the composite display format is NTSC, this is fixed to HD%,SD%. When the composite display format is PAL, this is fixed to HDV,SDV.

Video signal white (100 %) becomes 0.7 V or 100 % on the scale.

Video signal black (0 %) becomes 0 V or 0 % on the scale.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Procedure

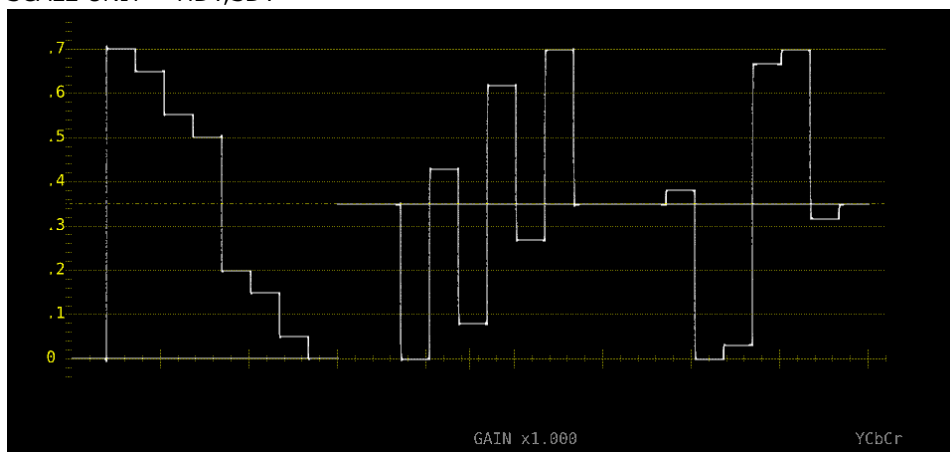
WFM → **F•1** INTEN/SCALE/DISPLAY → **F•3** WFM SCALE → **F•3** SCALE UNIT: HDV,SD% / HDV,SDV / HD%,SD% / 150% / 1023 / 1023,255 / 3FF

Settings

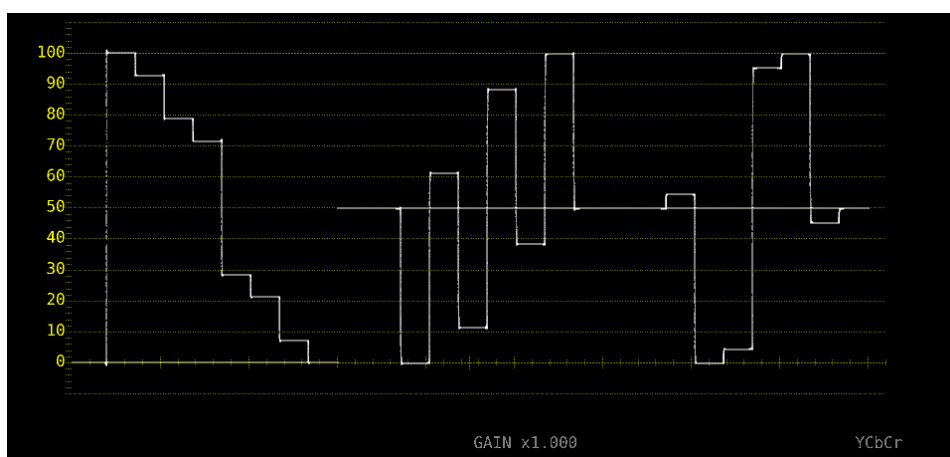
HDV,SD%:	The scale shows voltages when the input signal is not SD and percentages when the input signal is SD.
HDV,SDV:	The scale shows voltages.
HD%,SD%:	The scale shows percentages.
150%:	The scale shows percentages. (The scale starts from -50 %.)
1023:	0 to 100 % is displayed as 64 to 940 (YGBR) or 64 to 960 (CbCr).
1023,255:	0 to 100 % is displayed as 64 to 940 (YGBR) or 16 to 235 (YGBR).
3FF:	0 to 100 % is displayed as 040 to 3AC (YGBR) or 040 to 3C0 (CbCr).

10. VIDEO SIGNAL WAVEFORM DISPLAY

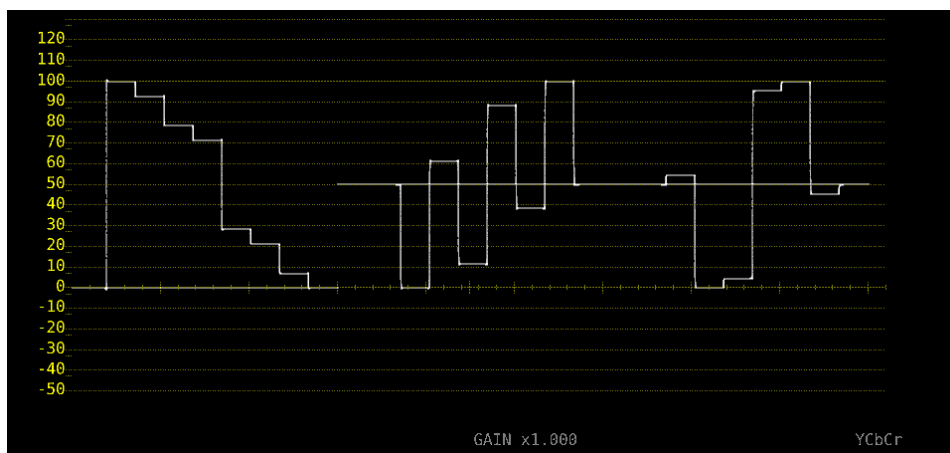
SCALE UNIT = HDV,SDV



SCALE UNIT = HD%,SD%

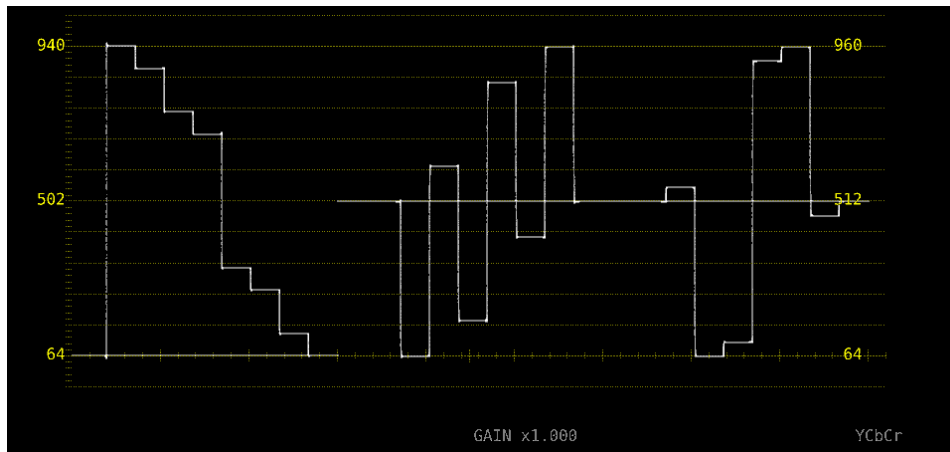


SCALE UNIT = 150%

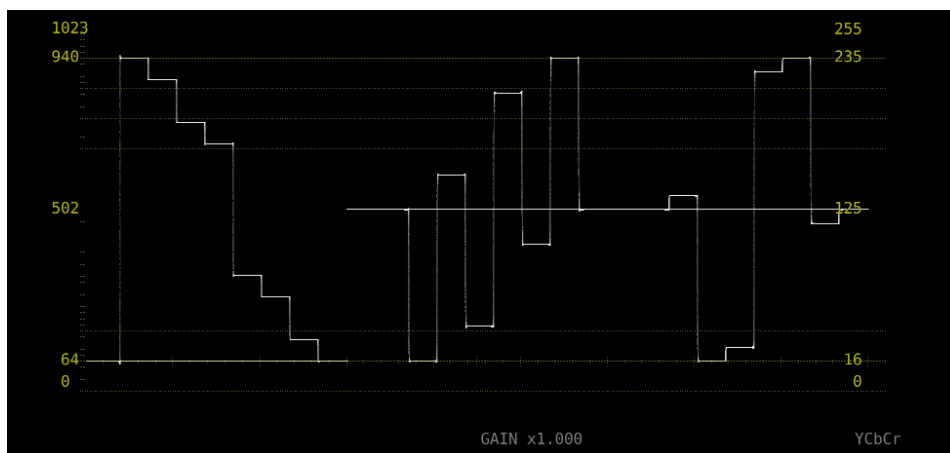


10. VIDEO SIGNAL WAVEFORM DISPLAY

SCALE UNIT = 1023



SCALE UNIT = 1023,255



SCALE UNIT = 3FF

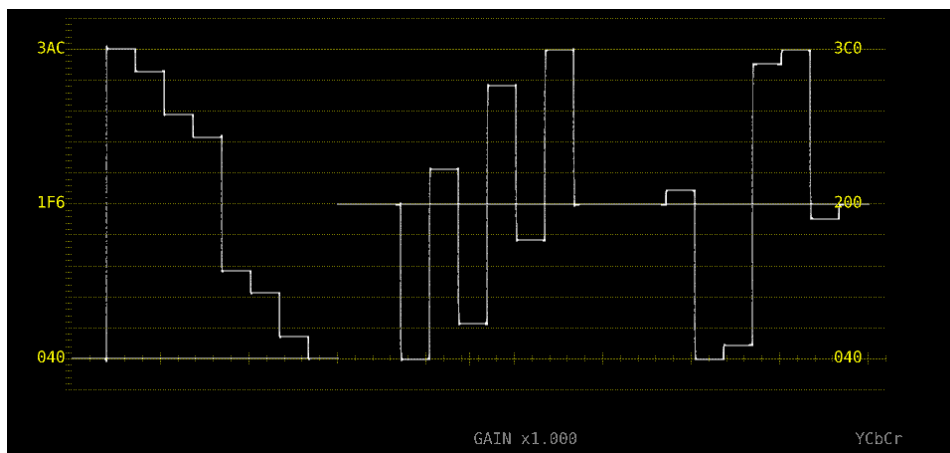


Figure 10-5 Selecting the scale unit

10.2.6 Displaying a Scale for 75 % Intensity Color Bars

When COLOR MATRIX is set to YCbCr, to display a scale that matches the peak levels of the color difference signals for 75 % intensity color bars, follow the procedure below.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Procedure

WFM → F•1 INTEN/SCALE/DISPLAY → F•3 WFM SCALE → F•4 75%COLOR SCALE: ON / OFF

75%COLOR SCALE = ON

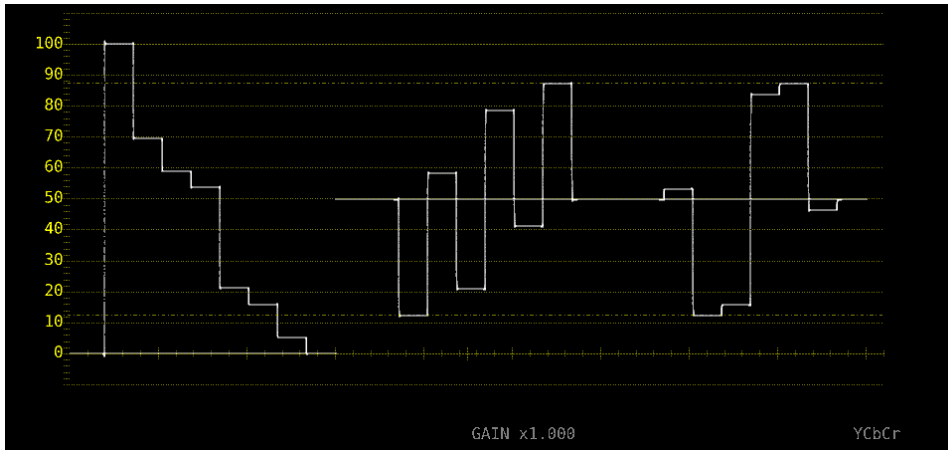


Figure 10-6 Displaying a scale for 75 % intensity color bars

10.2.7 Selecting the Display Mode

To configure the display, press **F•4** WFM DISPLAY on the INTEN/SCALE/DISPLAY menu.

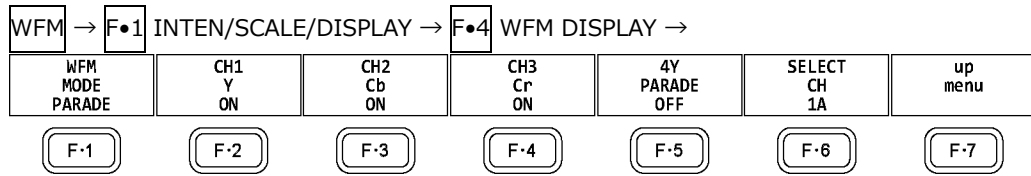


Figure 10-7 WFM DISPLAY menu

To select the video signal waveform display mode, follow the procedure below.

This setting is invalid when COLOR MATRIX is set to COMPOSIT.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Procedure

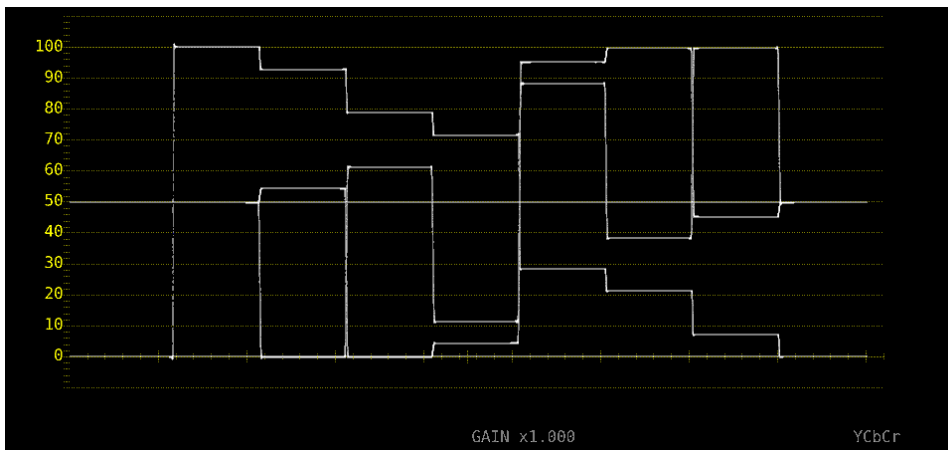
WFM → **F•1** INTEN/SCALE/DISPLAY → **F•4** WFM DISPLAY → **F•1** WFM MODE: OVERLAY / PARADE

Settings

OVERLAY: Input signal is displayed on top of each other.

PARADE: Input signal is displayed side by side.

WFM MODE = OVERLAY



WFM MODE = PARADE

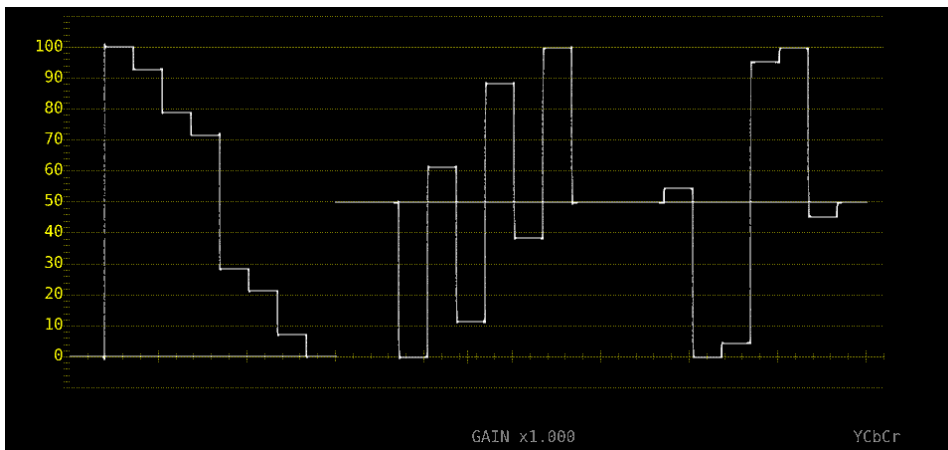


Figure 10-8 Selecting the display mode

10.2.8 Turning the Channels On and Off

To turn individual channels on and off, follow the procedure below.

You cannot turn off all the channels.

This menu item is not available when COLOR MATRIX is set to COMPOSIT or when YGBR or YRGB is set to ON.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

YGBR, YRGB → section 10.7.2, "Turning Luminance Signals On and Off."

Procedure

WFM	→	F•1	INTEN/SCALE/DISPLAY	→	F•4	WFM DISPLAY
→	F•2	CH1 Y / CH1 X / CH1 G / CH1 R: <u>ON</u> / OFF				
→	F•3	CH2 Cb / CH2 Y / CH2 B / CH2 G: <u>ON</u> / OFF				
→	F•4	CH3 Cr / CH3 Z / CH3 R / CH3 B: <u>ON</u> / OFF				

10.2.9 4Y Parade Display

To extract the Y signals from channels A to D and display them side by side, follow the procedure below.

The conditions for displaying the 4Y parade display are listed below.

- Single link
- Simul mode
- **F•7** COLOR SYSTEM → **F•1** COLOR MATRIX on the WFM menu is set to YCbCr or COMPOSIT.
- **F•6** OPERATE CH MODE on the INPUT menu is set to COM.
- The layout display mode is set to NORMAL.

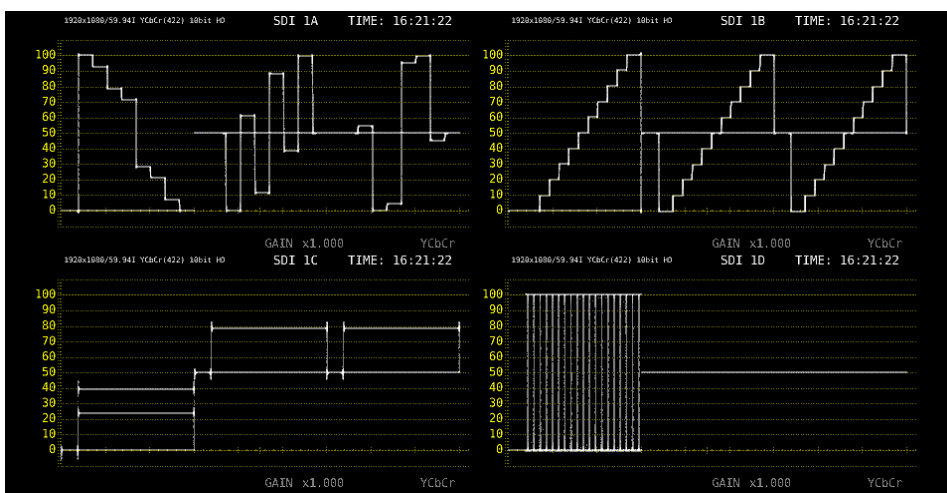
Also, note the following points.

- Only the channels that have been set to ON on the INPUT menu are displayed.
- Option in layout will be hidden.
- Style in layout will be invalid.
- The scale jump function cannot be used.

Procedure

WFM → **F•1** INTEN/SCALE/DISPLAY → **F•4** WFM DISPLAY → **F•5** 4Y PARADE: ON / OFF

4Y PARADE = OFF



4Y PARADE = ON

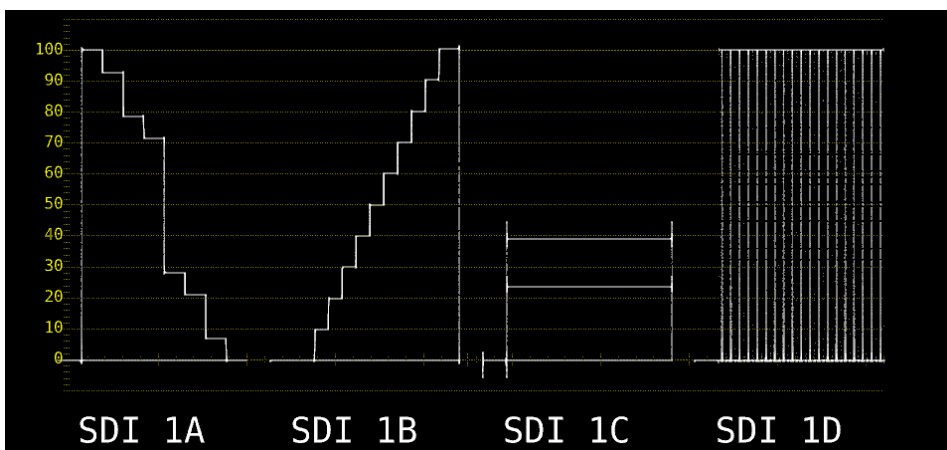


Figure 10-9 4Y parade display

10.2.10 Configuring the 3G-B-DS Display Settings

When measuring 3G-B-DS, to select the display mode, follow the procedure below.

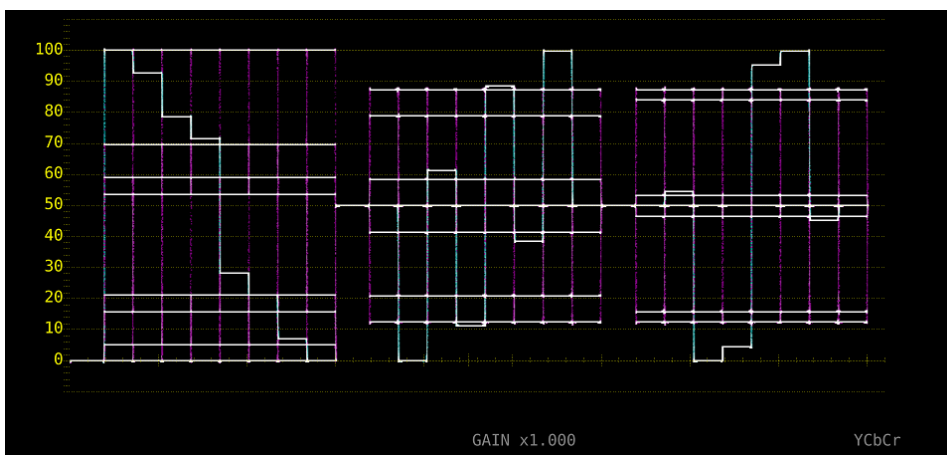
Procedure

WFM → F•1 INTEN/SCALE/DISPLAY → F•4 WFM DISPLAY → F•5 3G-B-DS DISPLAY:
STREAM1 / STREAM2 / MIX / ALIGN

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other.
ALIGN:	Streams 1 and 2 are displayed side by side.

3G-B-DS DISPLAY = MIX



3G-B-DS DISPLAY = ALIGN

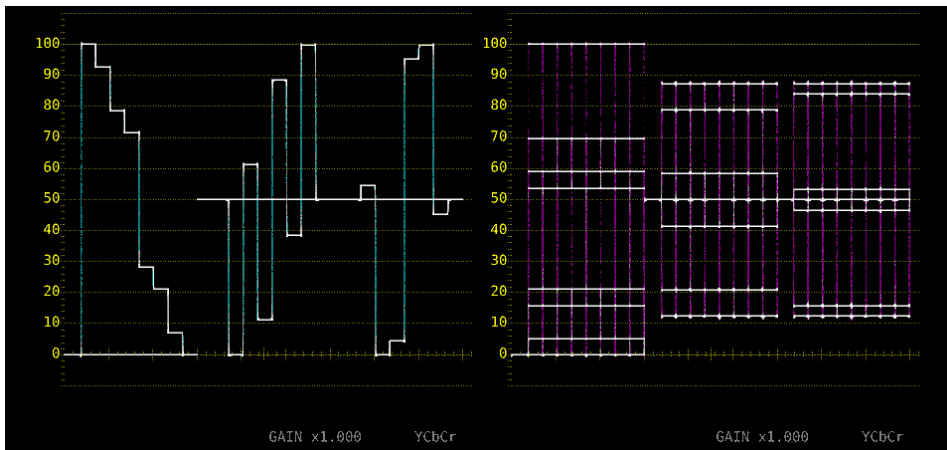


Figure 10-10 Configuring the 3G-B-DS display settings

10.3 Configuring the Gain and Filter Settings

To configure the gain and filter settings, press **F•2** GAIN/FILTER on the WFM menu.

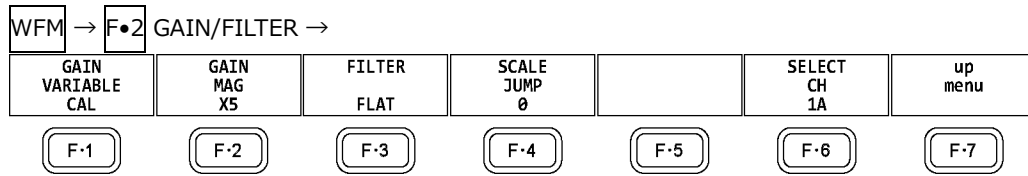


Figure 10-11 GAIN/FILTER menu

10.3.1 Selecting the Fixed Gain

To select the fixed video signal waveform gain, follow the procedure below.

Procedure

WFM → **F•2** GAIN/FILTER → **F•2** GAIN MAG: X1 / X5

10.3.2 Setting the Variable Gain

To set the variable video signal waveform gain, follow the procedure below.

Procedure

WFM → **F•2** GAIN/FILTER → **F•1** GAIN VARIABLE: CAL / VARIABLE

Settings

CAL:	The waveform gain is fixed.
VARIABLE:	You can adjust the waveform gain by turning the function dial (F•D). Press the function dial (F•D) to return the setting to its default value (1.000 or 5.000). The adjusted gain value (the combination of F•1 GAIN VARIABLE and F•2 GAIN MAG) appears at the bottom of the screen. 0.200 - 1.000 - 2.000 (for X1) 1.000 - 5.000 - 10.000 (for X5)

10.3.3 Selecting the Filter

To select the filter to apply to video signal waveforms, follow the procedure below.
The filters that you can select vary depending on the COLOR MATRIX setting.
Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

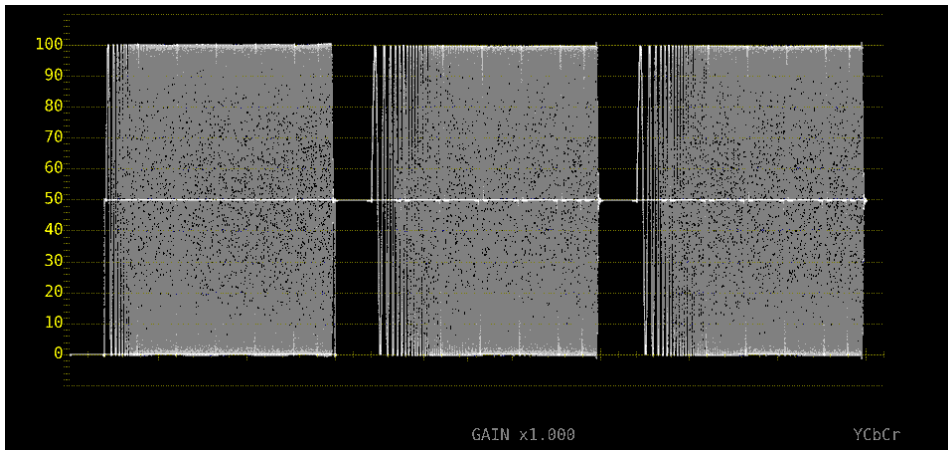
Procedure (When COLOR MATRIX is set to YCbCr, XYZ, GBR, or RGB)

WFM	→	F•2	GAIN/FILTER	→	F•3	FILTER: <u>FLAT</u> / LOWPASS

Settings

- FLAT:** A filter with a flat frequency response over the entire bandwidth of the input signal is applied.
- LOWPASS:** A low-pass filter with the following characteristics is applied.
At 40 MHz, 20 dB attenuation or more (when the input signal is 1080/60P, 59.94P, or 50P)
At 20 MHz, 20 dB attenuation or more (when the input signal is 3G, HD, or HD (DL) excluding 1080/60P, 59.94P, or 50P)
At 3.8 MHz, 20 dB attenuation or more (when the input signal is SD)

FILTER = FLAT



FILTER = LOWPASS

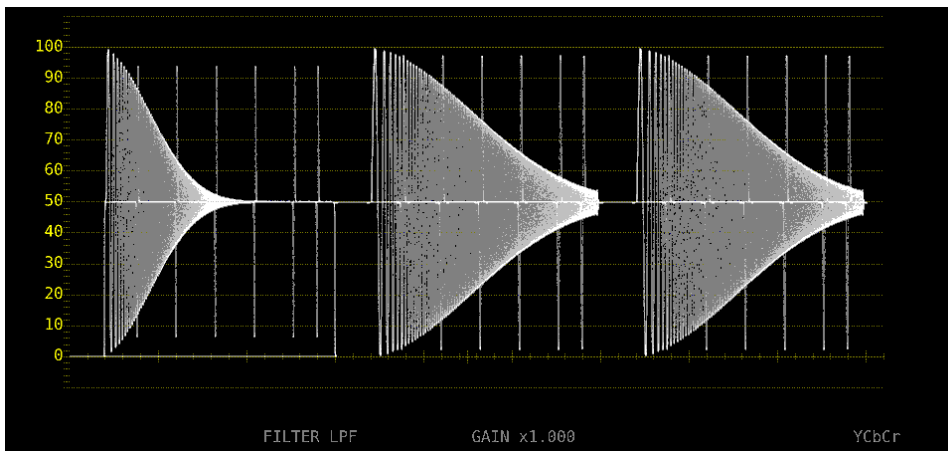


Figure 10-12 Selecting the filter (component)

10. VIDEO SIGNAL WAVEFORM DISPLAY

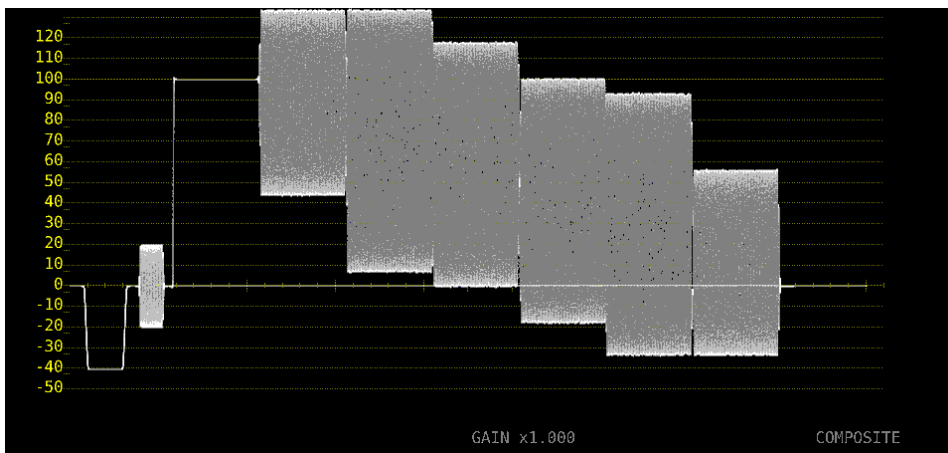
Procedure (When COLOR MATRIX is set to COMPOSIT)

WFM → F•2 GAIN/FILTER → F•3 FILTER: FLAT / LUM / FLAT+LUM / LUM+CRMA

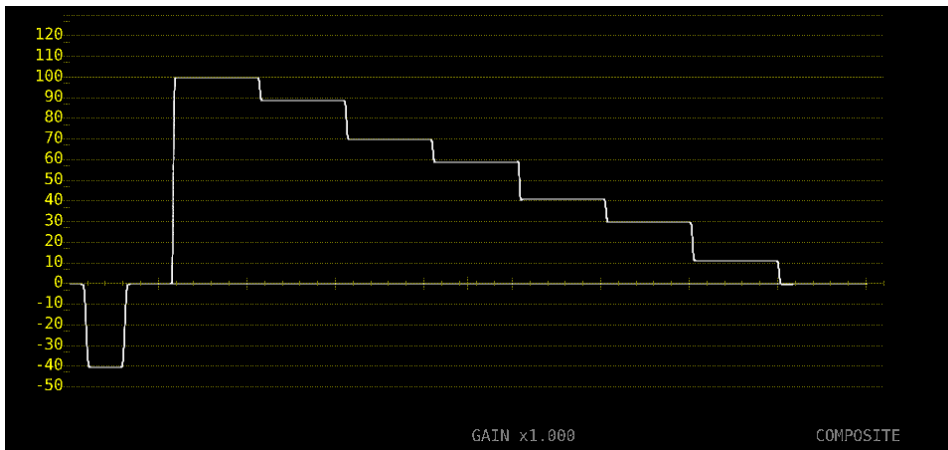
Settings

FLAT:	Only the pseudo-composite signal is displayed.
LUM:	Only the luminance signal is displayed.
FLAT+LUM:	The pseudo-composite and luminance signals are displayed side by side. A filter with an attenuation of 20 dB or more at 40 MHz is applied to the luminance signal.
LUM+CRMA:	The luminance and chrominance signals are displayed side by side. A filter with an attenuation of 20 dB or more at 40 MHz is applied to the luminance signal.

FILTER = FLAT

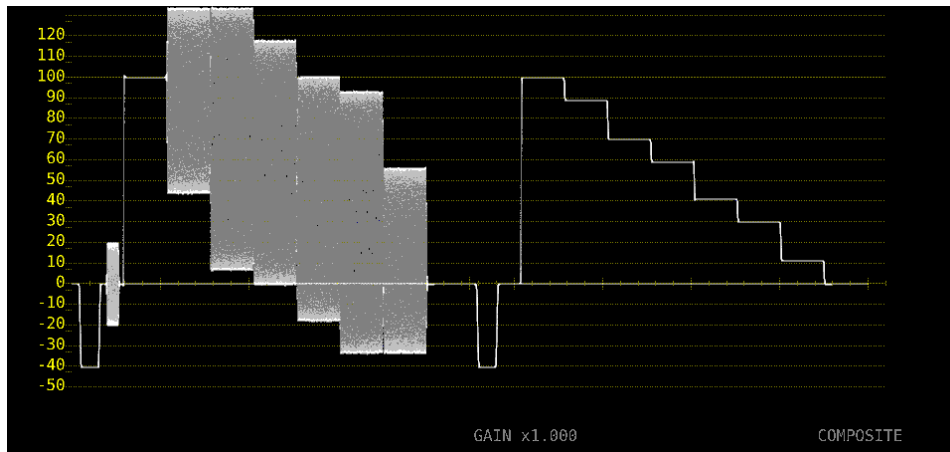


FILTER = LUM



10. VIDEO SIGNAL WAVEFORM DISPLAY

FILTER = FLAT+LUM



FILTER = LUM+CRMA

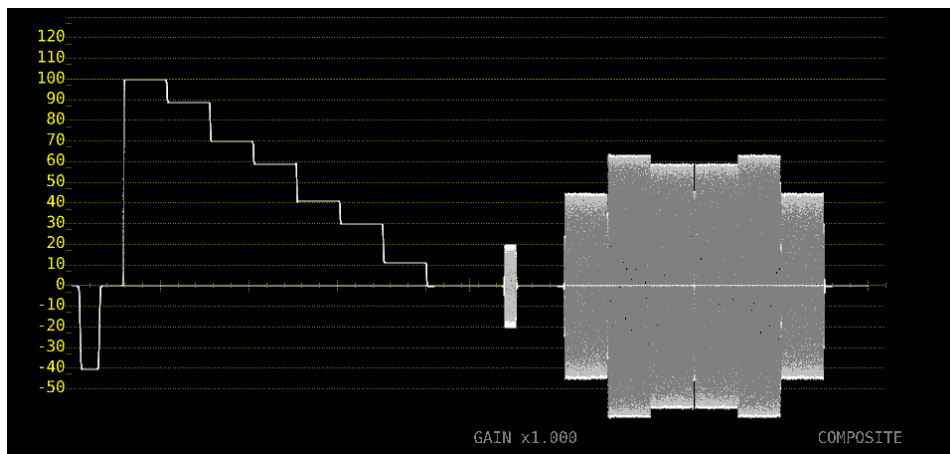


Figure 10-13 Selecting the filter (composite)

10.3.4 Setting the Scale Jump

If **F•2** GAIN MAG is set to X5, the waveform is expanded five times in the Y-axis direction. To select the area you want to see expanded, follow the procedure below. You can view the area that is currently displayed with respect to the entire waveform on the scale shown on the right side of the screen.

This menu appears when **F•1** GAIN VARIABLE is set to CAL. When set to VARIABLE, the value is fixed to 0, and the scale on the right side of the screen does not appear.

Procedure

WFM → **F•2** GAIN/FILTER
 → **F•4** SCALE JUMP: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, CURSOR (when the scale unit is not V)
 → **F•4** SCALE JUMP: .0, .1, .2, .3, .4, .5, .6, .7, CURSOR (when the scale unit is V)

● 0 to 90

The LV 5490 has 10 types of screens in the Y-axis direction, and 0 to 90 is used to switch between these screens.

For example, if the scale unit is % and YCbCr is displayed, selecting 0 displays the 0 to 20% range, selecting 10 displays the 10 to 30% range, and selecting 90 displays the 90 to 110% range.

The same holds true for .0 to .7.

10. VIDEO SIGNAL WAVEFORM DISPLAY

● CURSOR

The scale jump function operates based on the Y-axis cursor, and the area near the currently selected cursor (▼ mark) is expanded.

An example operation is indicated below.

【Preparation】

1. On the CURSOR menu, set F•1 CURSOR to ON and F•2 XY SEL to Y.
2. On the GAIN/FILTER menu, set F•2 GAIN MAG to X5.
3. Set F•4 SCALE JUMP to CURSOR.

【Operation】

4. Set F•2 GAIN MAG to X1.
5. Move the Y-axis cursor to the area you want to display expanded. (You can move the cursor on the GAIN/FILTER menu. You can switch between REF, DELTA, and TRACK by pressing the function dial (F•D).)
6. Set F•2 GAIN MAG to X5 to expand the area near the Y-axis cursor.

SCALE JUMP = CURSOR

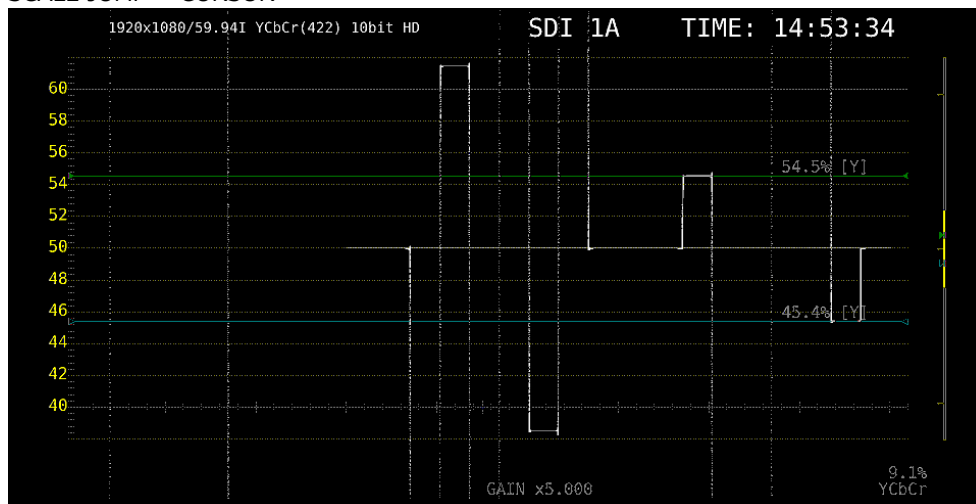


Figure 10-14 Setting the Scale Jump

10.4 Configuring Sweep Settings

To configure the sweep settings, press **F•3** SWEEP on the WFM menu.

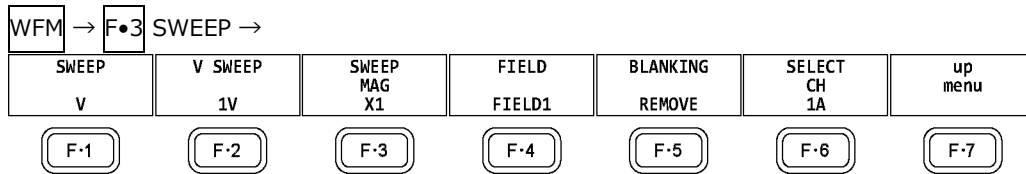


Figure 10-15 SWEEP menu

10.4.1 Selecting the Sweep Method

To select the video signal waveform sweep method, follow the procedure below.

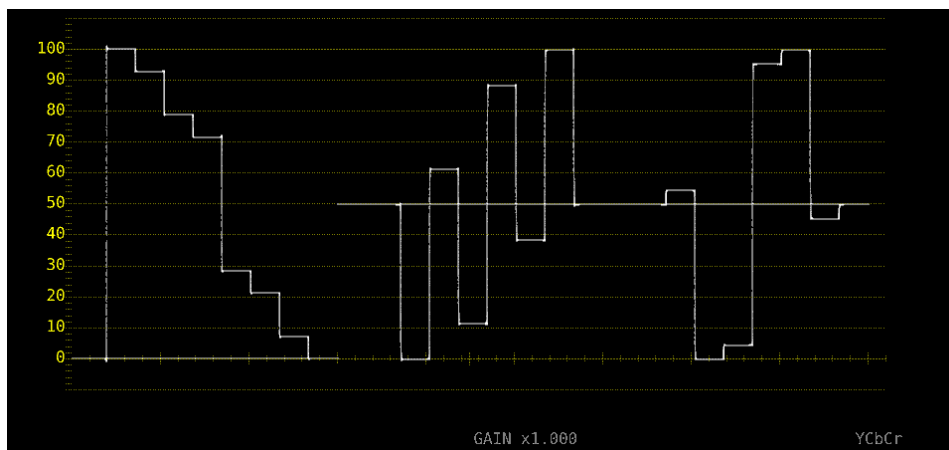
Procedure

WFM → **F•3** SWEEP → **F•1** SWEEP: H / V

Settings

H: Lines are displayed.
V: Fields or frames are displayed. Because the sampled data is downsampled, aliasing distortion occurs.

SWEEP = H



SWEEP = V

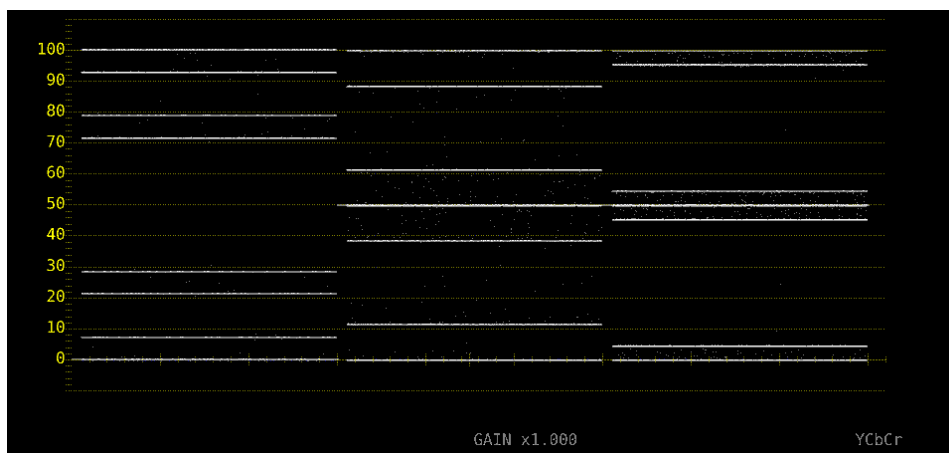


Figure 10-16 Selecting the sweep method

10.4.2 Selecting the Line Display Format

When **F•1** SWEEP is set to H, to select the sweep time, follow the procedure below.

Procedure

WFM → **F•3** SWEEP → **F•2** H SWEEP: 1H / 2H

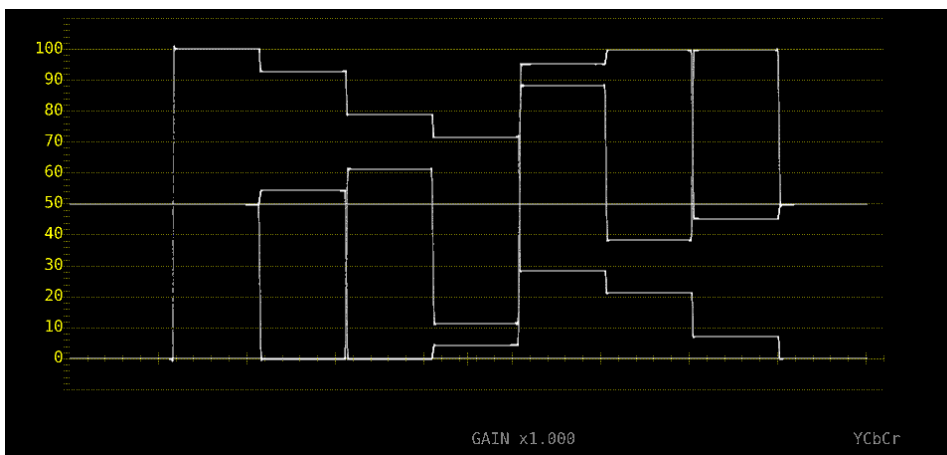
Settings

1H: One line is displayed.

2H: Two lines are displayed. This cannot be selected in the following situations.

- When using 4K
- When **F•1** INTEN/SCALE/DISPLAY → **F•4** WFM DISPLAY → **F•1** WFM MODE is set to PARADE
- When **F•7** COLOR SYSTEM → **F•1** COLOR MATRIX is set to COMPOSIT

H SWEEP = 1H



H SWEEP = 2H

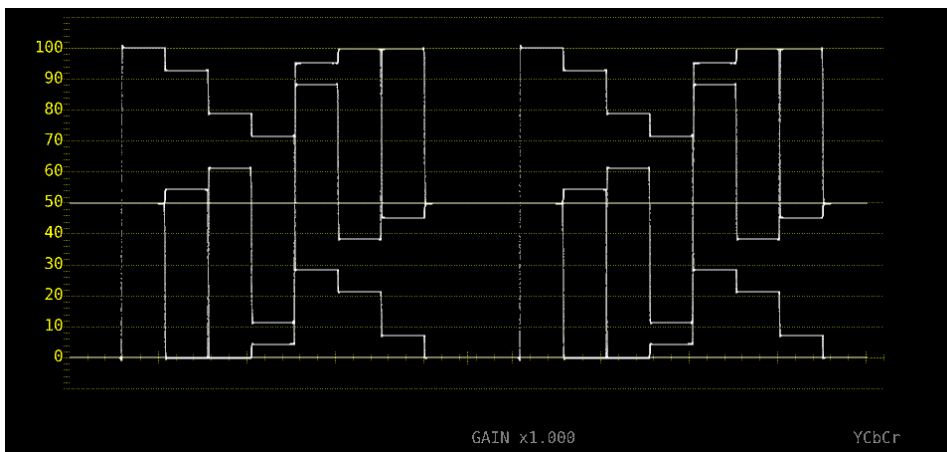


Figure 10-17 Selecting the line display format

10.4.3 Selecting the Field Display Format

When **F•1** SWEEP is set to V, to select the sweep time, follow the procedure below.

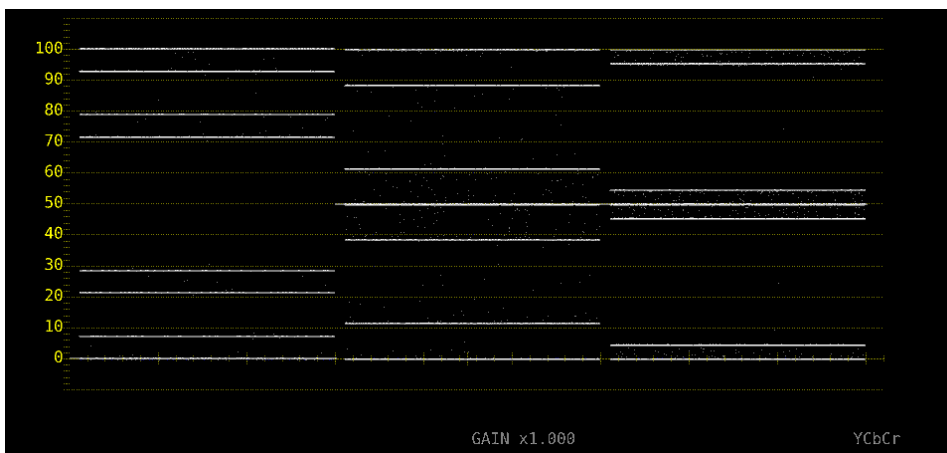
Procedure

WFM	→	F•3	SWEEP	→	F•2	V SWEEP: <u>1V</u> / 2V

Settings

1V:	One field is displayed.
2V:	One frame is displayed. This option cannot be selected when the input signal is progressive.

V SWEEP = 1V



V SWEEP = 2V

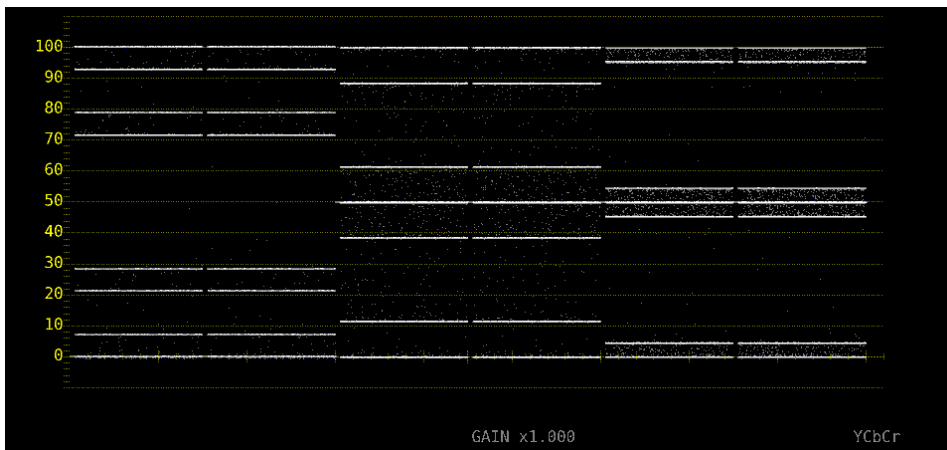


Figure 10-18 Selecting the field display format

Furthermore, when the input signal is interlace or segmented frame and **F•2** V SWEEP is set to 1V, to select which field is displayed, follow the procedure below.

Procedure

WFM	→	F•3	SWEEP	→	F•4	FIELD: <u>FIELD1</u> / FIELD2

10.4.4 Selecting the Horizontal Magnification

To select the horizontal magnification, follow the procedure below. The magnifications that you can select vary as shown below depending on settings such as COLOR MATRIX.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Table 10-1 Horizontal magnifications

F•1	SWEEP	COLOR MATRIX	F•2	H SWEEP	X1	X10	X20	X40	ACTIVE	BLANK
H		YCbCr, XYZ,	1H	1H	Yes	Yes	Yes	No	Yes	Yes
		GBR, RGB		2H	Yes	Yes	Yes	No	No	Yes
		COMPOSIT		-	Yes	Yes	Yes	No	Yes	No
V		-		-	Yes	No	Yes	Yes	No	No

(Yes: Settable. No: Not settable.)

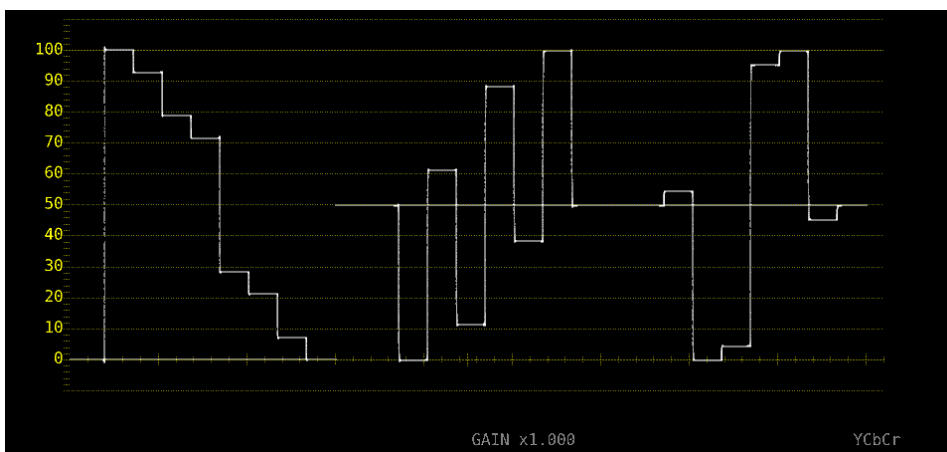
Procedure

WFM → F•3 SWEEP → F•3 SWEEP MAG: X1 / X10 / X20 / X40 / ACTIVE / BLANK

Settings

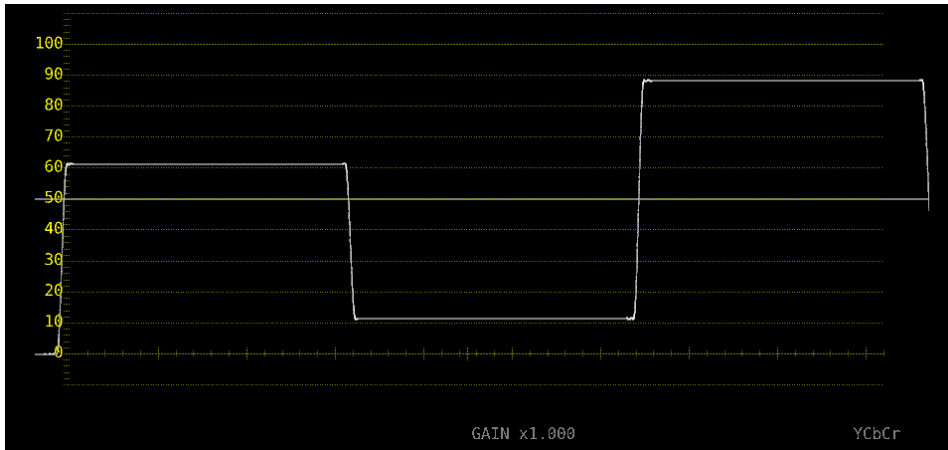
- X1: The video signal waveforms are displayed so that they fit on the screen.
- X10: The video signal waveforms are magnified from the center of the display to 10 times the size of X1.
- X20: The video signal waveforms are magnified from the center of the display to 20 times the size of X1.
- X40: The video signal waveforms are magnified from the center of the display to 40 times the size of X1.
- ACTIVE: Everything but the video signal waveform blanking interval is magnified.
- BLANK: The video signal waveform blanking interval is magnified.
The vertical blanking interval is also displayed on the vector waveform display.

SWEEP MAG = X1

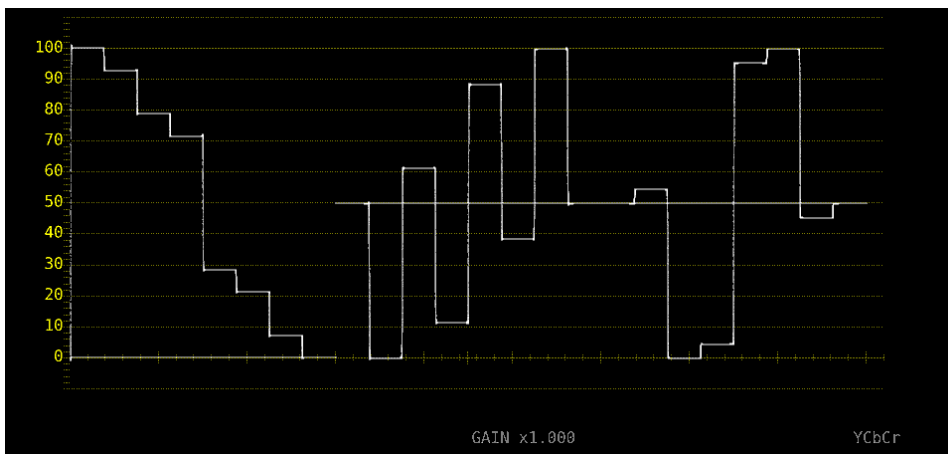


10. VIDEO SIGNAL WAVEFORM DISPLAY

SWEEP MAG = X10



SWEEP MAG = ACTIVE



V

SWEEP MAG = BLANK

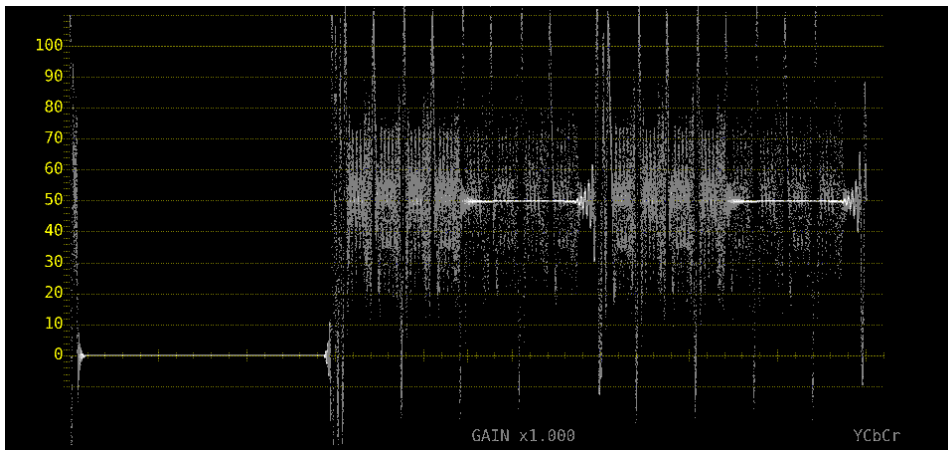


Figure 10-19 Horizontal magnifications

10.4.5 Displaying the Blanking Interval

To set how the waveforms in the blanking interval are displayed, follow the procedure below.

If a setting other than REMOVE is selected, the vertical blanking interval is also displayed on the vector waveform display.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Procedure

WFM	→	F•3	SWEEP	→	F•5	BLANKING: <u>REMOVE</u> / V VIEW / H VIEW / ALL VIEW

Settings

REMOVE:	Only the active interval is displayed.
V VIEW:	The active interval and the vertical blanking interval are displayed.
H VIEW:	The active interval and the horizontal blanking interval are displayed. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.
ALL VIEW:	The entire input signal is displayed. This option cannot be selected when COLOR MATRIX is set to COMPOSIT.

BLANKING = ALL VIEW

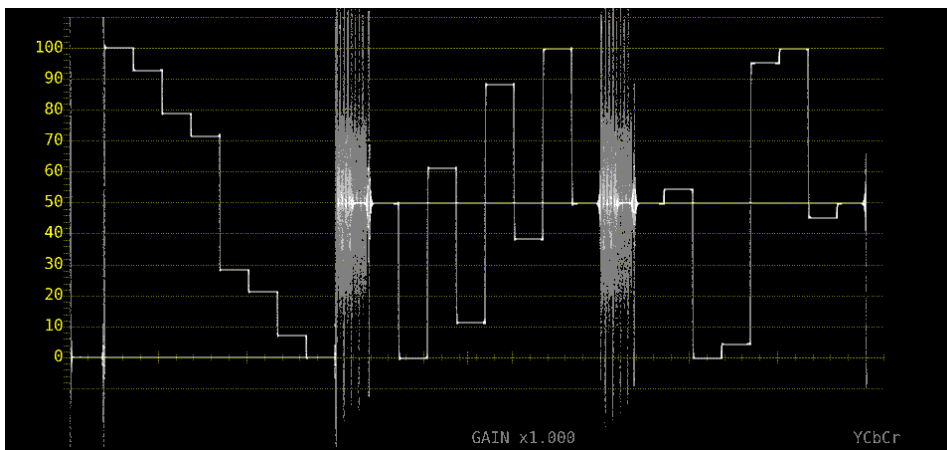


Figure 10-20 Displaying blanking intervals

10.5 Configuring Line Selection Settings

To configure line selection settings, press **F•4** LINE SEL on the WFM menu.

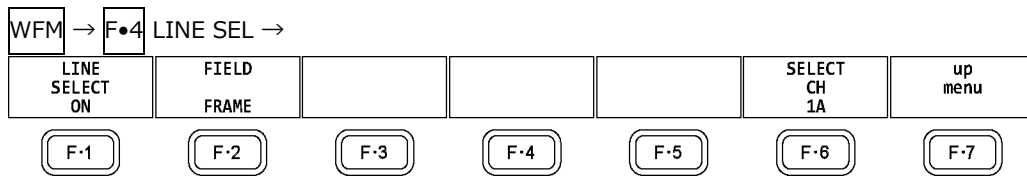


Figure 10-21 LINE SEL menu

10.5.1 Turning Line Selection On and Off

To display the vector of the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the lower left of the display.

Changing this setting will also change the vector-display and picture-display line selection settings.

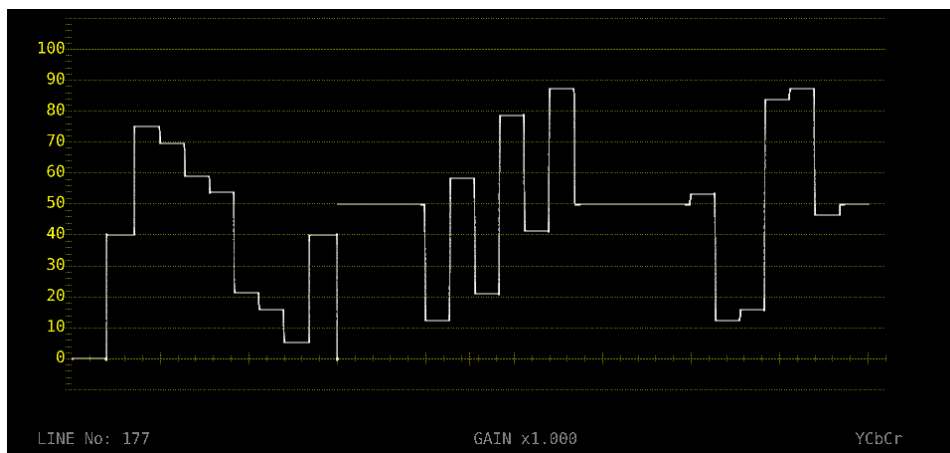
This menu item does not appear when SWEEP is set to V.

Reference SWEEP → Section 10.4.1, "Selecting the Sweep Method"

Procedure

WFM → **F•4** LINE SEL → **F•1** LINE SELECT: ON / OFF

LINE SELECT = ON



10. VIDEO SIGNAL WAVEFORM DISPLAY

LINE SELECT = OFF

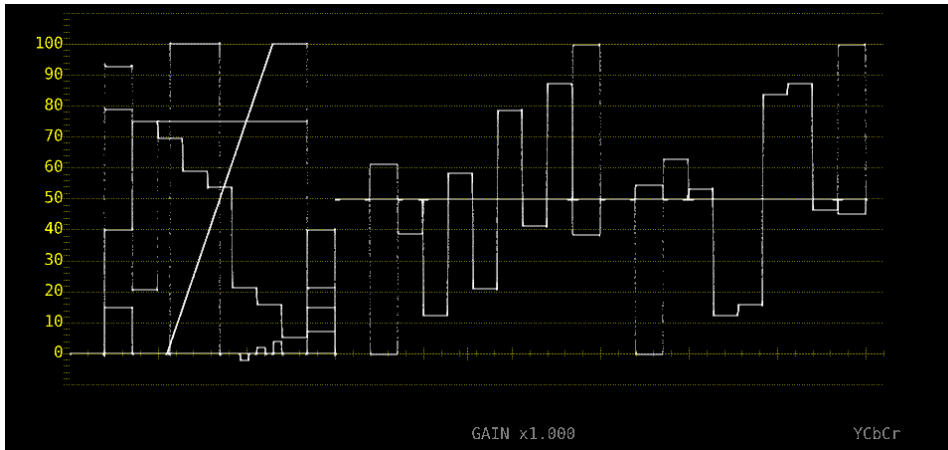


Figure 10-22 Turning line selection on and off

10.5.2 Setting the Line Selection Range

When **F•1** LINE SELECT is set to ON and the input signal format is interlaced or segmented frame, to set the line selection range, follow the procedure below.

Changing this setting will also change the selected line on the vector, picture, and status (data dump) displays.

Procedure

WFM	→	F•4	LINE SEL	→	F•2	FIELD: FIELD1 / FIELD2 / <u>FRAME</u>

Settings

FIELD1:	A line from field 1 can be selected. (Example: 1 to 563)
FIELD2:	A line from field 2 can be selected. (Example: 564 to 1125)
FRAME:	All lines can be selected. (Example: 1 to 1125)

10.6 Configuring Cursor Settings

To configure cursor settings, press **F•5** CURSOR on the WFM menu.

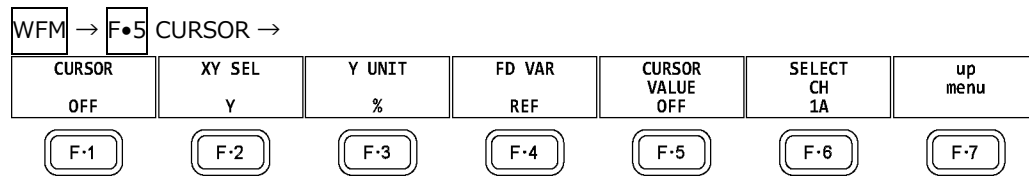


Figure 10-23 CURSOR menu

10.6.1 Turning Cursors On and Off

To turn cursors on and off, follow the procedure shown below.

The REF cursor is displayed in blue, and the DELTA cursor is displayed in green. The value of DELTA - REF appears as a measured value in the lower right of the screen. (When **F•3** Y UNIT is set to DEC or HEX, absolute values are displayed.)

If ON XY is selected, the X-axis cursors and Y-axis cursors are displayed simultaneously.

Procedure

WFM	→	F•5	CURSOR	→	F•1	CURSOR: ON / ON XY / <u>OFF</u>

10.6.2 Selecting the Cursor

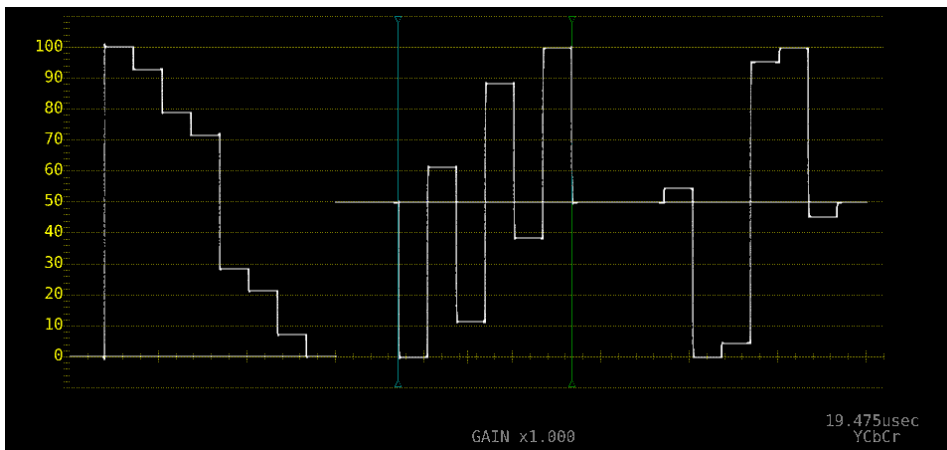
To select the X (time measurement) or Y (amplitude measurement) cursor, follow the procedure below.

If **F•1** CURSOR is set to ON XY, select the cursor to move here.

Procedure

WFM	→	F•5	CURSOR	→	F•2	XY SEL: X / Y

XY SEL = X



XY SEL = Y

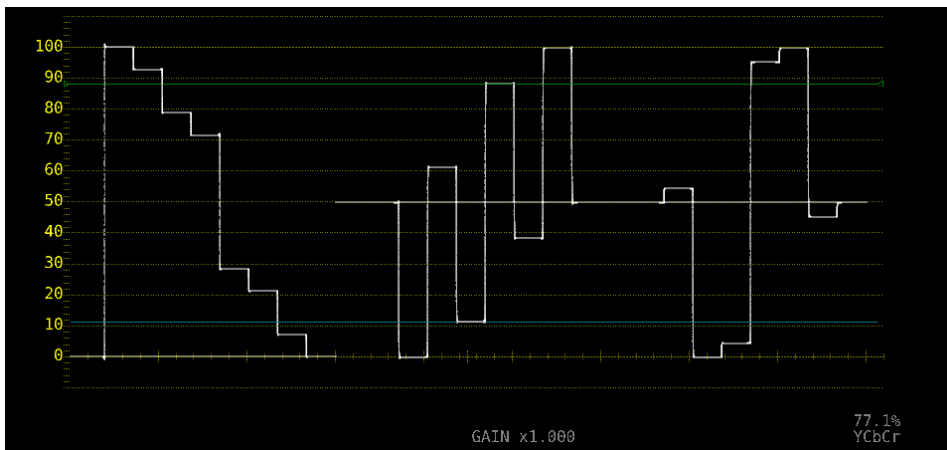


Figure 10-24 Selecting the cursor

10.6.3 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

WFM	→	F•5	CURSOR	→	F•4	FD VAR: <u>REF</u> / DELTA / TRACK

10.6.4 Selecting the Y-Axis Measurement Unit

When **F•2** XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

Reference COLOR MATRIX → section 10.7.1, "Selecting the Color Matrix."

Procedure

WFM	→	F•5	CURSOR	→	F•3	Y UNIT: <u>mV</u> / % / R% / DEC / HEX / HDR

Settings

mV:	The measurement unit is volts.
%:	The measurement unit is percentage. When the composite display format is NTSC, 714 mV is 100 %. When the composite display format is PAL, 700 mV is 100 %.
R%:	The amplitude will be measured as a percentage of the amplitude at the time when you pressed F•5 REFSET.
DEC:	Values are displayed in decimal with 0 to 100 % expressed as 64 to 940. This option cannot be selected when COLOR MATRIX is set to COMPOSIT. C _B C _R signal measurement is not supported.
HEX:	Values are displayed in hexadecimal with 0 to 100 % expressed as 040 to 3AC. This option cannot be selected when COLOR MATRIX is set to COMPOSIT. C _B C _R signal measurement is not supported.
HDR:	Values are displayed as a percentage or cd/m ² . You can select this option when SER07 is installed and when HDR signals are being measured. For details, see section 14.1.2, "Cursor Display."

10.6.5 Selecting the X-Axis Measurement Unit

When **F•2** XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

WFM	→	F•5	CURSOR	→	F•3	X UNIT: <u>sec</u> / Hz

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.

10.6.6 Turning the Cursor Value Display On and Off

To display cursor values, follow the procedure shown below (except when **F•3** Y UNIT is set to R%).

The display unit is the unit specified with **F•3** Y UNIT or **F•3** X UNIT.

If **F•1** CURSOR is set to ON XY, the value is displayed on the cursor selected with **F•2** XY SEL.

Procedure

WFM	→	F•5	CURSOR	→	F•5	CURSOR VALUE: ON / OFF

CURSOR VALUE = ON

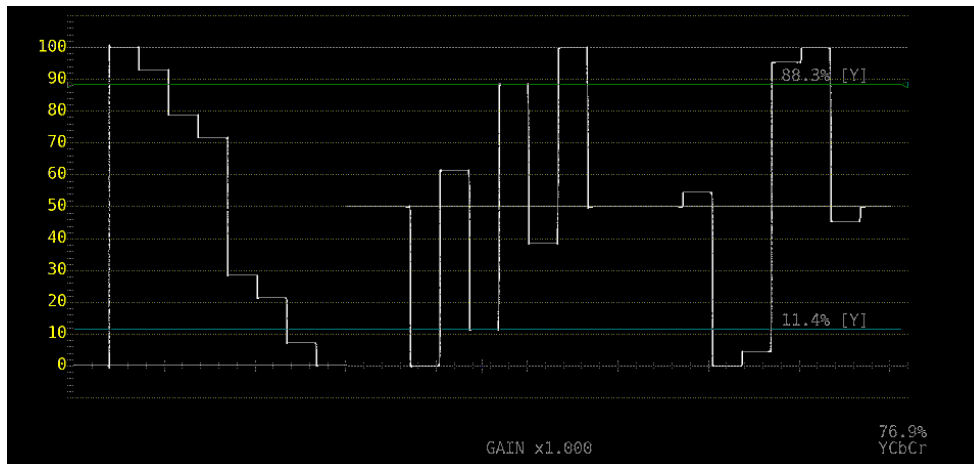


Figure 10-25 Turning the cursor value display on and off

10.7 Configuring the Color System Settings

To configure the color system settings, press **F•7** COLOR SYSTEM on the WFM menu.

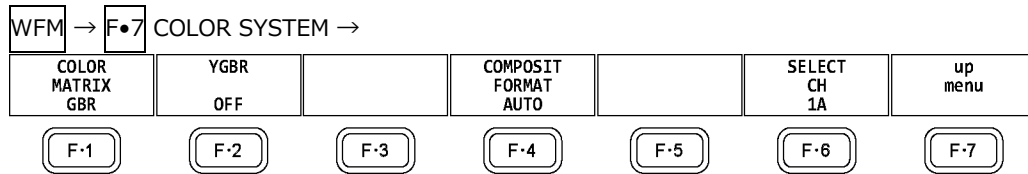


Figure 10-26 COLOR SYSTEM menu

10.7.1 Selecting the Color Matrix

The LV 5490SER01 or LV 5490SER02 performs a matrix conversion on a input signal to convert it into a GBR, RGB or pseudo-composite signal. To select the waveform display format, follow the procedure below. The selected display format is indicated in the lower right of the display.

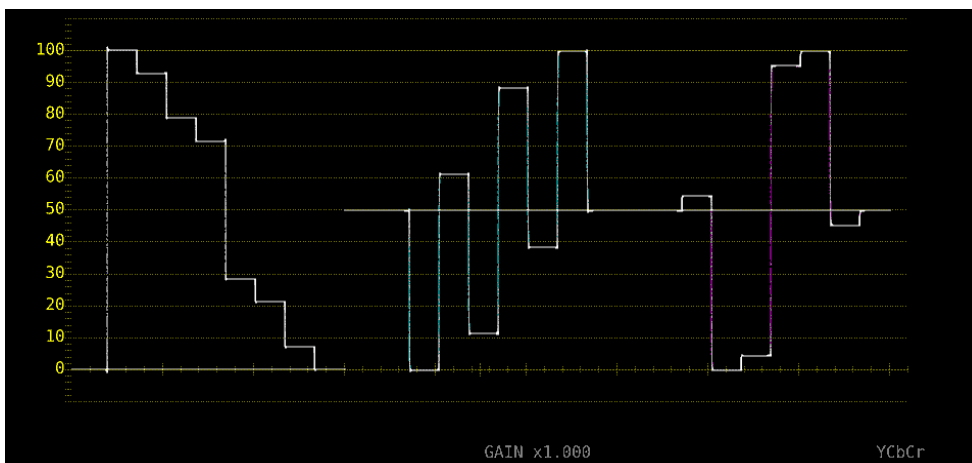
Procedure

WFM → **F•7** COLOR SYSTEM → **F•1** COLOR MATRIX: YCbCr / XYZ / GBR / RGB / COMPOSIT

Settings

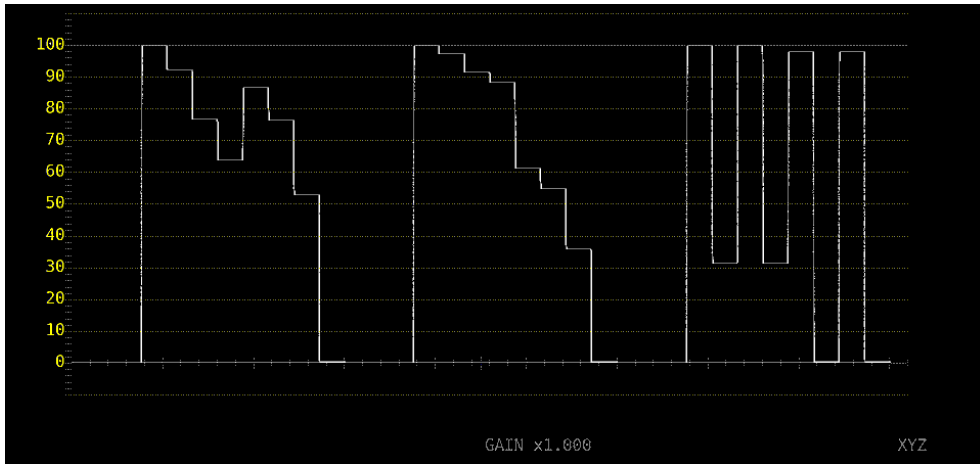
YCbCr:	The $YCbCr$ signal is displayed without changes. This option cannot be selected when the input signal is RGB or XYZ.
XYZ:	The XYZ signal is displayed without changes. This option cannot be selected when the input signal is $YCbCr$ or RGB.
GBR:	The input signal is converted into a GBR signal and displayed.
RGB:	The input signal is converted into a RGB signal and displayed.
COMPOSIT:	The input signal is converted into a pseudo NTSC or PAL composite signal and displayed. - Color burst frequencies do not match those of PAL and NTSC. - Color burst and sync signal widths and locations are different from those of PAL and NTSC. - The signal bandwidth is that of the original signal.

COLOR MATRIX = YCbCr

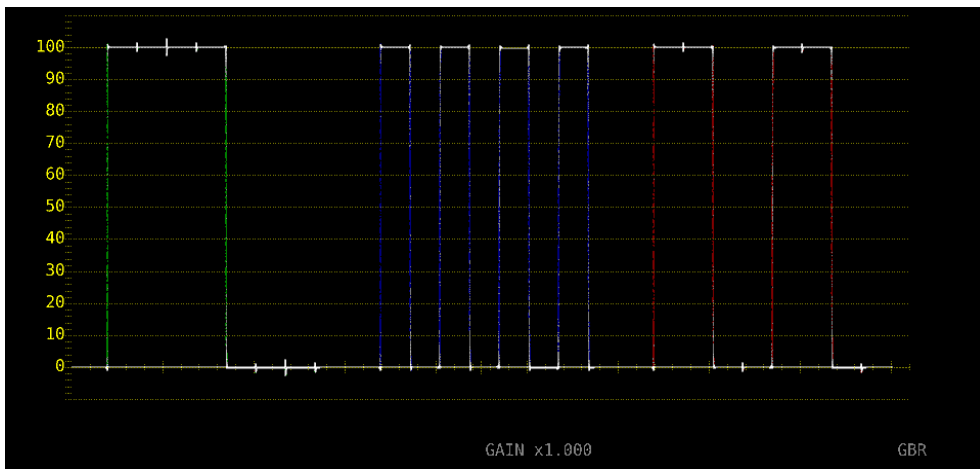


10. VIDEO SIGNAL WAVEFORM DISPLAY

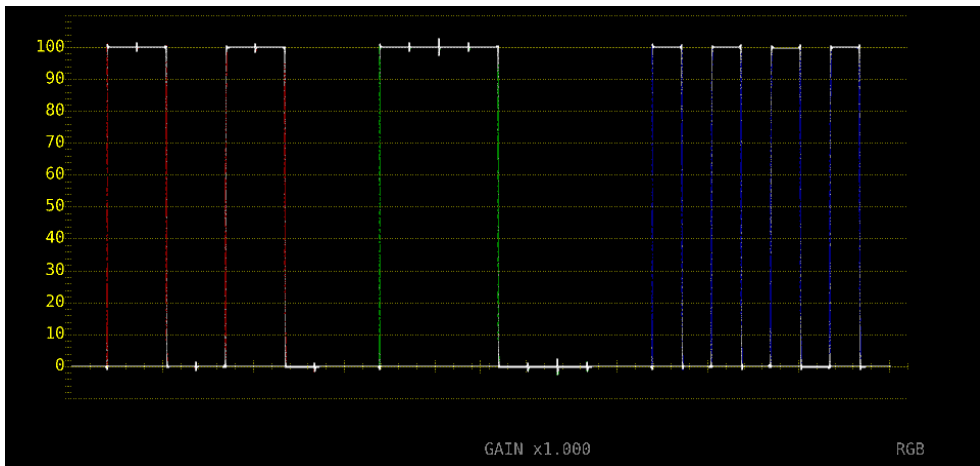
COLOR MATRIX = XYZ



COLOR MATRIX = GBR



COLOR MATRIX = RGB



10. VIDEO SIGNAL WAVEFORM DISPLAY

COLOR MATRIX = COMPOSIT

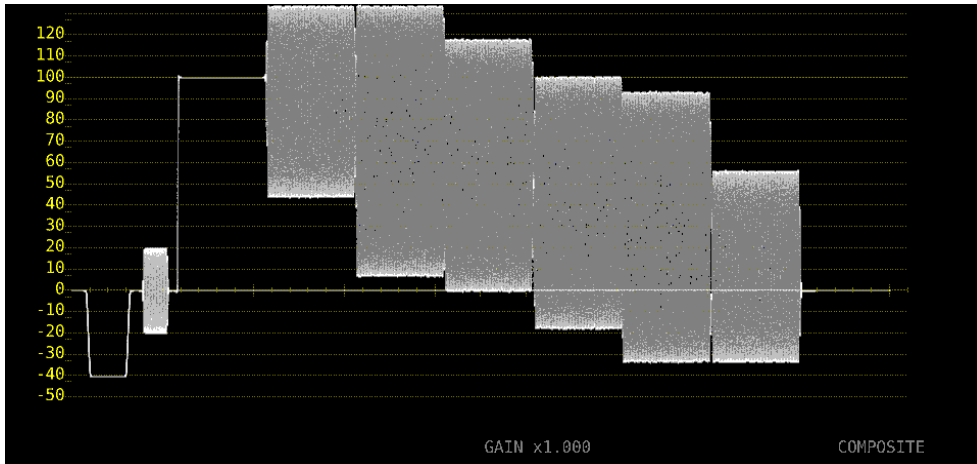


Figure 10-27 Selecting the color matrix

10.7.2 Turning the Luminance Signal On and Off

When **F•1** COLOR MATRIX is set to GBR or RGB, to turn the luminance signal (Y) on and off, follow the procedure below.

Procedure

WFM → **F•7** COLOR SYSTEM

→ **F•2** YGBR: ON / OFF

→ **F•2** YRGB: ON / OFF

YGBR = ON

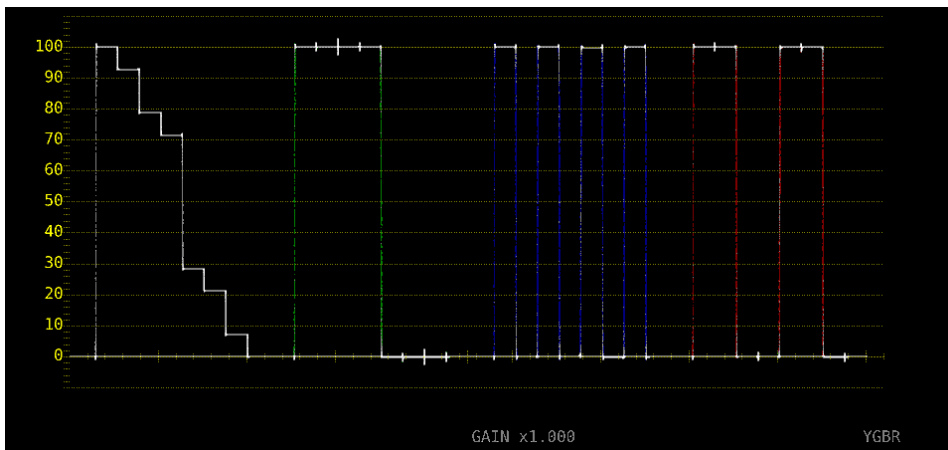


Figure 10-28 Turning the luminance signal on and off

10.7.3 Selecting the Composite Display Format

To select the composite display format, follow the procedure below.

Procedure

WFM	→	F•7	COLOR SYSTEM →	F•4	COMPOSIT FORMAT: <u>AUTO</u> / NTSC / PAL

Settings

AUTO:	When the input signal frame rate is 25 Hz or 50 Hz, the format is PAL. Otherwise, the format is NTSC.
NTSC:	The format is NTSC. The scale is fixed to percentage.
PAL:	The format is PAL. The scale is fixed to V.

10.7.4 Selecting the Setup Level

When **F•1** COLOR MATRIX is set to COMPOSIT, to select the setup level, follow the procedure below.

This menu does not appear if the composite display format is PAL.

Procedure

WFM	→	F•7	COLOR SYSTEM →	F•5	SETUP: <u>0%</u> / 7.5%

SETUP = 7.5%

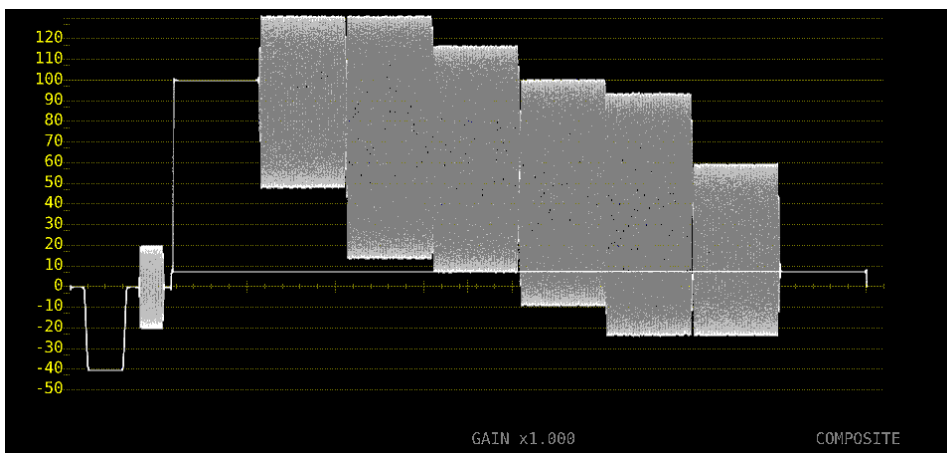


Figure 10-29 Selecting the setup level

11. VECTOR WAVEFORM DISPLAY

To display vectors, press VECT, **F•5** DISPLAY, and then **F•1** MODE to select VECTOR.

For an explanation when MODE is set to 5BAR, see section 11.7, "5-Bar Display."

For an explanation when MODE is set to HISTOGRAM, see section 11.8, "Histogram Display."

For an explanation when MODE is set to CIE DIAGRAM, see chapter 12, "CIE DIAGRAM DISPLAY (SER05)." You can select CIE DIAGRAM when SER05 is installed.

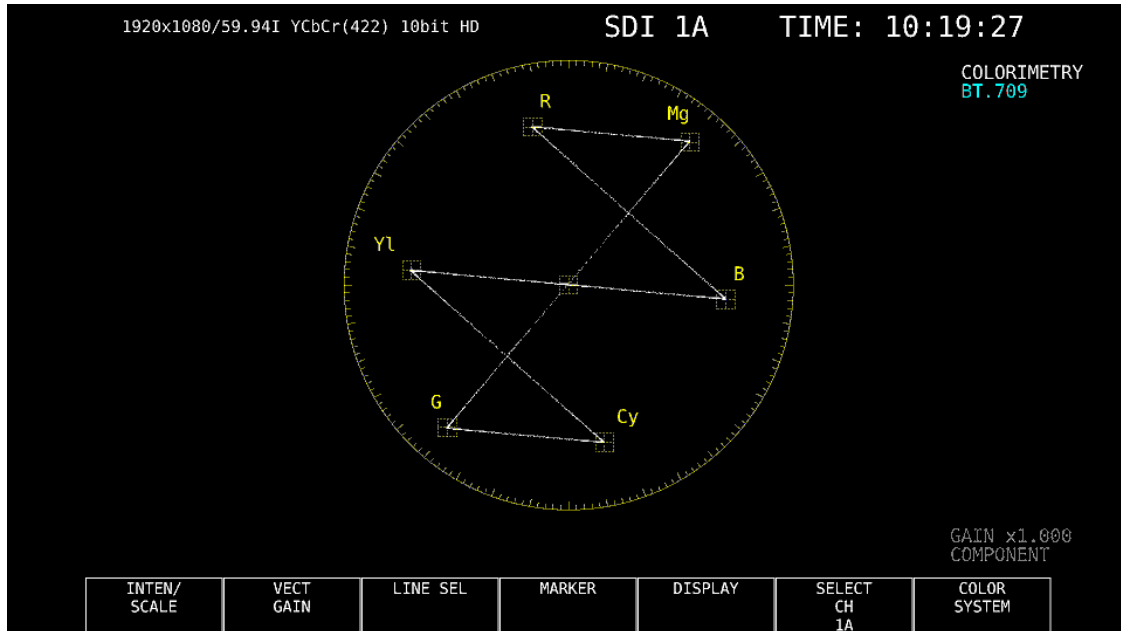


Figure 11-1 Vector waveform display

- Vectors

Component signal vector displays are X-Y displays based on C_B (horizontal) and C_R (vertical). The vector display scale has the following qualities.

- Frame: $\pm 5\%$ of the full scale value of 0.7 V (for component display)
 $\pm 3\%$ of the full scale value of 0.7 V (for pseudo-composite display)
- Circle: $+20\%$ with respect to green

- Blanking interval

Normally, blanking interval is not displayed with vector waveforms, but if SWEEP MAG is set to BLANK on the WFM menu or BLANKING is set to REMOVE, it is displayed.

- Colorimetry

The colorimetry selected in the system settings is displayed in cyan in the upper right of the screen.

However, for 3G(DL)-4K and 3G(QL), the current applied colorimetry is displayed in yellow if the colorimetry information of all links specified by the payload ID are not matched.

When the colorimetry alarm is set to on in the system settings, the alarm is indicated in red.

11.1 Configuring the Intensity and Scale Settings

To configure the intensity and scale settings, press **F•1** INTEN / SCALE on the VECT menu.

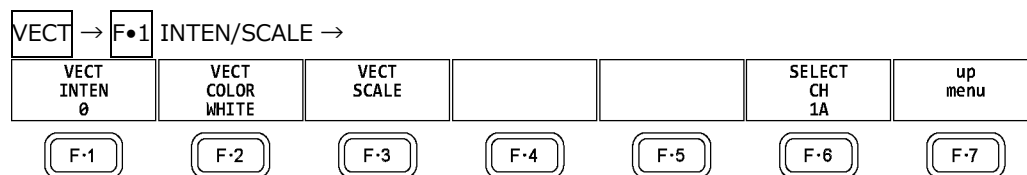


Figure 11-2 INTEN/SCALE menu

11.1.1 Adjusting the Vector Intensity

To adjust the vector intensity, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (0).

Procedure

VECT → **F•1** INTEN/SCALE → **F•1** VECT INTEN: -128 - 0 - 127

11.1.2 Selecting the Vector Color

To select the vector waveform color, follow the procedure below.

Procedure (when not measuring 3G-B-DS)

VECT → **F•1** INTEN/SCALE → **F•2** VECT COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

Procedure (when measuring 3G-B-DS)

VECT → **F•1** INTEN/SCALE → **F•2** VECT COLOR
 → **F•1** STREAM1 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE
 → **F•2** STREAM2 COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

11.1.3 Adjusting the Scale Intensity

To configure the scale, press **F•3** VECT SCALE on the INTEN/SCALE menu.

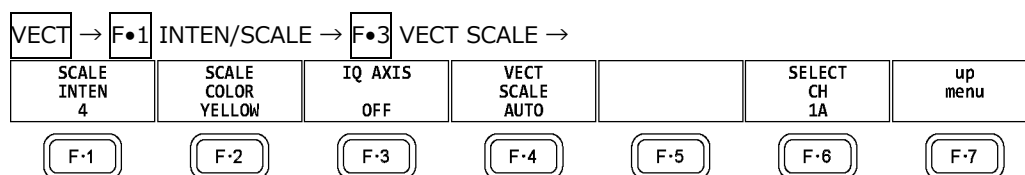


Figure 11-3 VECT SCALE menu

To adjust the scale intensity, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (4).

Procedure

VECT → **F•1** INTEN/SCALE → **F•1** SCALE INTEN: -8 - 4 - 7

11. VECTOR WAVEFORM DISPLAY

11.1.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

VECT → F•1 INTEN/SCALE → F•2 SCALE COLOR: WHITE / YELLOW / CYAN / GREEN /
MAGENTA / RED / BLUE

11.1.5 Turning the Display of the I and Q Axes On and Off

To turn the display of the I and Q axes on and off, follow the procedure below.

This menu item does not appear when VECT SCALE is set to DCI or BT.2020.

When the full scale value of 0.7 V is 100 %, the I and Q axes are displayed at the following values.

Table 11-1 Displaying the I and Q axes

	I Axis	Q Axis
G	44.559%	37.056%
B	27.865%	84.085%
R	69.120%	62.417%

Procedure

VECT → F•1 INTEN/SCALE → F•3 IQ AXIS: ON / OFF

IQ AXIS = ON

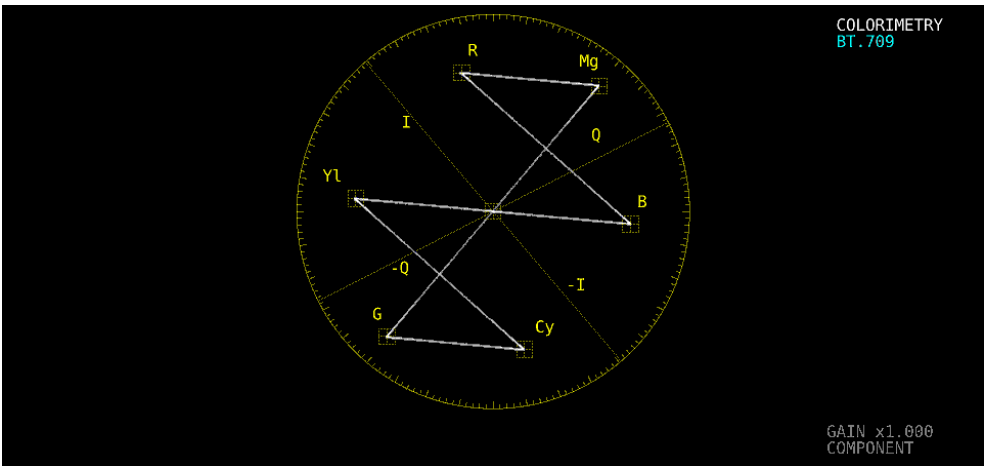


Figure 11-4 Turning the display of the I and Q axes on and off

11.1.6 Selecting the Scale

When COLOR MATRIX is set to COMPONEN, follow the procedure below to select the scale type.

Reference COLOR MATRIX → section 11.6.1, "Selecting the Color Matrix."

Procedure

VECT → F•1 INTEN/SCALE → F•3 VECT SCALE → F•4 VECT SCALE: AUTO / BT.601 / BT.709 / DCI / BT.2020

Settings

AUTO:	A scale for the colorimetry selected in the system settings is displayed.
BT.601:	A scale defined in ITU-R BT.601 is displayed. When the input signal is SD and a 100 % color bar signal is being applied, the peak levels match the ends of the scale.
BT.709:	A scale defined in ITU-R BT.709 is displayed. When the input signal is HD and a 100 % color bar signal is being applied, the peak levels match the ends of the scale.
DCI:	A scale defined in DCI is displayed.
BT.2020:	A scale defined in ITU-R BT.2020 is displayed. When the input signal is 4K, the division transmission system is 2 sample interleave, and a 100% color bar signal is being applied, the peak levels match the ends of the scale.

11.2 Setting the Gain

To configure the gain settings, press **F•2** VECT GAIN on the VECT menu.

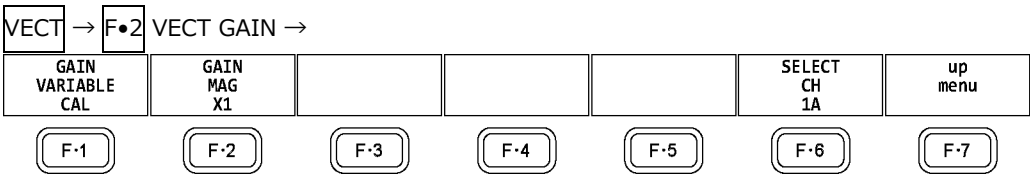


Figure 11-5 VECT GAIN menu

11.2.1 Selecting the Fixed Gain

To select the fixed vector gain, follow the procedure below.

Procedure

VECT → **F•2** VECT GAIN → **F•2** GAIN MAG: X1 / X5 / IQ-MAG

Settings

X1:	Vectors are displayed at x1 magnification.
X5:	Vectors are displayed at x5 magnification.
IQ-MAG:	Vectors are displayed using the following magnifications. x3.12 (for signals other than SD during component display; magnification that causes the I signal of the multiformat colorbar to lie on the circumference of the scale) x2.85 (for signals other than SD during pseudo-composite display; magnification that causes the I signal of the multiformat colorbar, which has gone through pseudo-composite conversion, to lie on the circumference of the scale) x2.92 (for SD signals during component display; magnification that causes the amplitude to lie on the circumference of the scale when the burst signal of the composite vector display is converted into component signals) x2.63 (for SD signals during pseudo-composite display; magnification that causes the -I and Q signals of the SMPTE colorbar, which has gone through pseudo-composite conversion, to lie on the circumference of the scale)

11.2.2 Setting the Variable Gain

To set the variable vector gain, follow the procedure below.

Procedure

VECT	→	F•2	VECT GAIN →	F•1	GAIN VARIABLE: <u>CAL</u> / VARIABLE

Settings

CAL: The waveform gain is fixed.

VARIABLE: You can adjust the waveform gain by turning the function dial (F•D).
 Press the function dial (F•D) to return the setting to its default value.
 The adjusted gain value (the combination of F•1 GAIN VARIABLE and F•2 GAIN MAG) appears in the lower right of the screen.

0.200 - 1.000 - 2.000 (for X1)
 1.000 - 5.000 - 10.000 (for X5)
 0.620 - 3.120 - 6.240 (not IQ-MAG or SD, for component display)
 0.570 - 2.850 - 5.700 (not IQ-MAG or SD, for pseudo-composite display)
 0.580 - 2.920 - 5.840 (IQ-MAG or SD, for component display)
 0.520 - 2.630 - 5.260 (IQ-MAG or SD, for pseudo-composite display)

11.3 Configuring Line Selection Settings

To configure line selection settings, press **F•3** LINE SEL on the VECT menu.

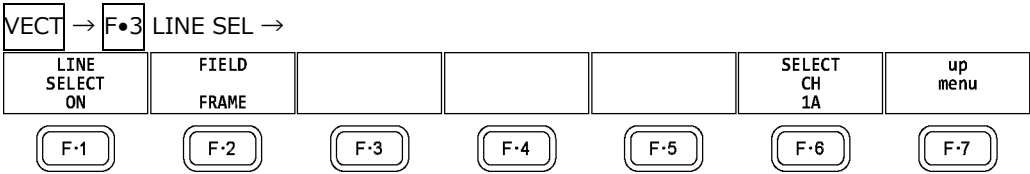


Figure 11-6 LINE SEL menu

11.3.1 Turning Line Selection On and Off

To display the vector of the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the lower left of the display.

Changing this setting will also change the video-signal-waveform-display and picture-display line selection settings.

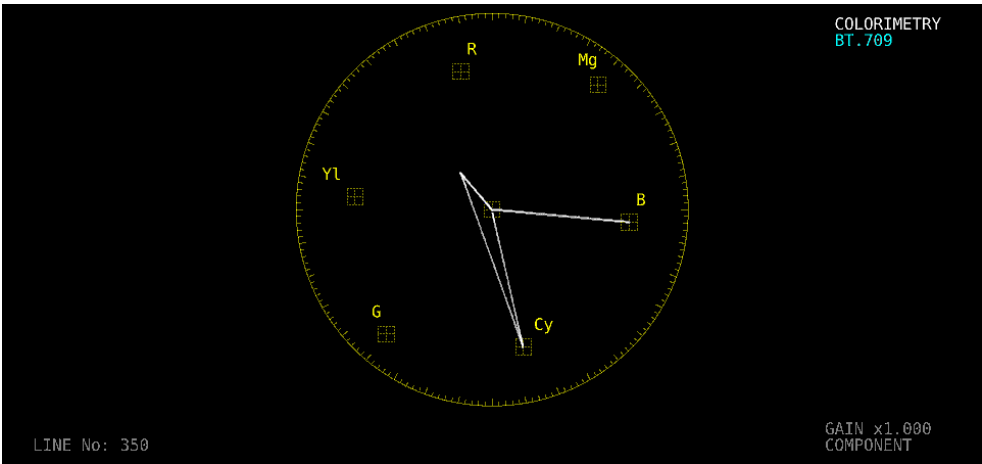
This menu item does not appear when SWEEP on the WFM menu is set to V.

Reference SWEEP → Section 10.4.1, "Selecting the Sweep Method"

Procedure



LINE SEL = ON



11. VECTOR WAVEFORM DISPLAY

LINE SEL = OFF

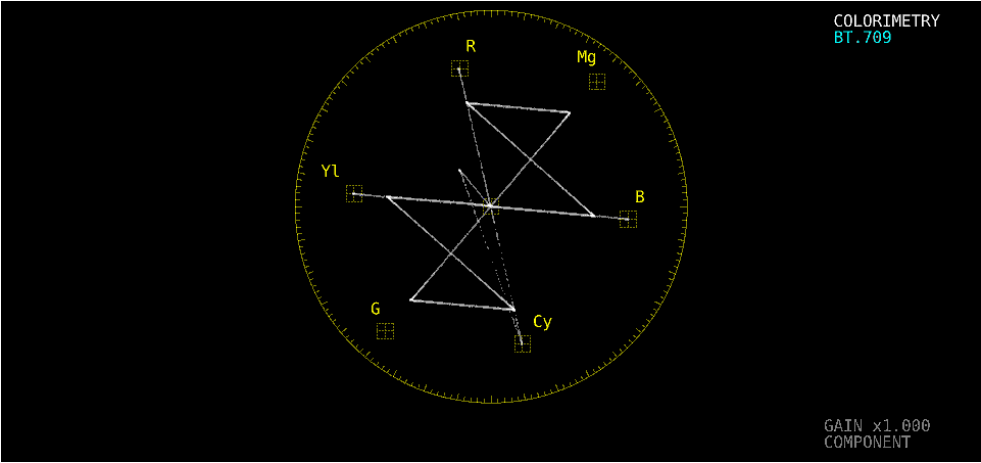


Figure 11-7 Turning line selection on and off

11.3.2 Setting the Line Selection Range

When **F•1** LINE SELECT is set to ON and the input signal format is interlaced or segmented frame, to set the line selection range, follow the procedure below.
Changing this setting will also change the selected line on the video-signal-waveform, picture, and status (data dump) displays.

Procedure

VECT	→	F•3	LINE SEL →	F•2	FIELD: FIELD1 / FIELD2 / <u>FRAME</u>

Settings

FIELD1:	A line from field 1 can be selected. (Example: 1 to 563)
FIELD2:	A line from field 2 can be selected. (Example: 564 to 1125)
FRAME:	All lines can be selected. (Example: 1 to 1125)

11.4 Configuring Marker Settings

To configure marker settings, press **F•4** MARKER in the VECT menu.

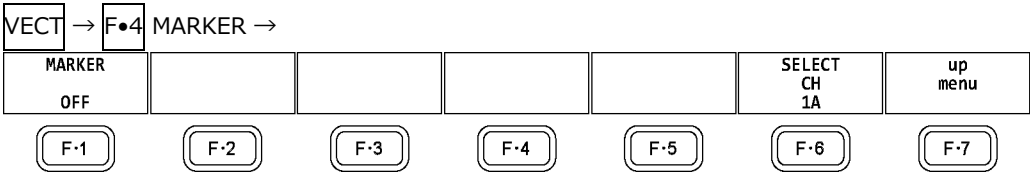


Figure 11-8 MARKER menu

11.4.1 Displaying the Vector Marker

To display a marker on the vector display, follow the procedure below.

You can move the marker horizontally using the H POS knob and vertically using the V POS knob. The measured values are displayed in the lower right of the display. Press the H POS knob to move the marker to the Cb = 0.0% position. Press the V POS knob to move the marker to the Cr = 0.0% position.

Measured values are displayed using the following references: Cb at position B = 100.0% and Cr at position R = 100.0%. The distance from the center is expressed as "d," and hue is expressed as "deg."

Normally, the marker is displayed in green. When it falls outside the display area, it blinks in red. If this occurs, "OVER" appears above the measured values.

Procedure

VECT → **F•4** MARKER → **F•1** MARKER: ON / OFF

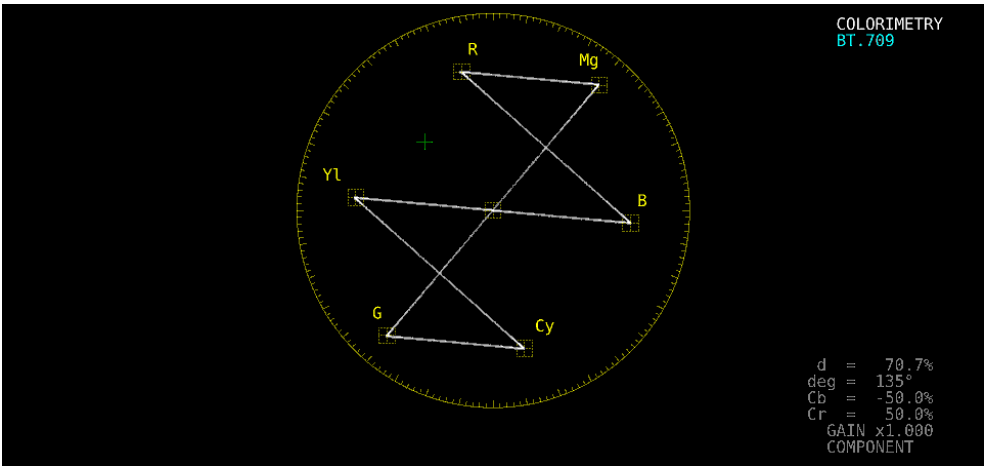


Figure 11-9 Displaying the vector marker

11.5 Configuring the Display Settings

To configure the display settings, press **F•5** DISPLAY on the VECT menu.

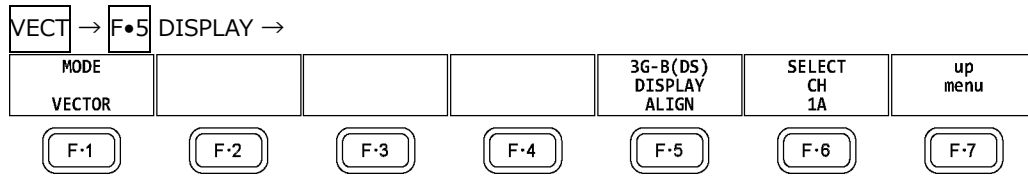


Figure 11-10 DISPLAY menu

11.5.1 Switching the Display Mode

To select the display mode, follow the procedure below.

Procedure

VECT → F•5 DISPLAY → F•1 MODE: VECTOR / 5BAR / HISTOGRAM / CIE DIAGRAM

Settings

VECTOR:	Vector waveforms are displayed.
5BAR:	5-Bar are displayed. For detail on 5 BAR, see section 11.7, "5-Bar Display."
HISTOGRAM:	Histogram is displayed. For detail on histogram, see section 11.8, "Histogram Display."
CIE DIAGRAM:	CIE diagram is displayed. This option can be selected when SER05 is installed. For detail on chromaticity diagram, see chapter 12, "CIE DIAGRAM DISPLAY (SER05)."

11.5.2 Configuring the 3G-B-DS Display Settings

When measuring 3G-B-DS, to select the display mode, follow the procedure below.

Procedure

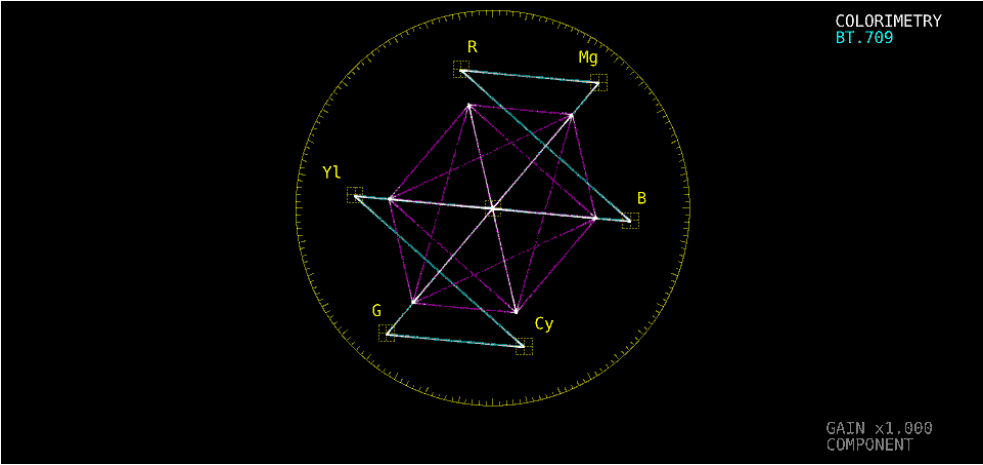
VECT → F•5 DISPLAY → F•5 3G-B-DS DISPLAY: STREAM1 / STREAM2 / MIX / ALIGN

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other.
ALIGN:	Streams 1 and 2 are displayed side by side.

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3G-B-DS DISPLAY = MIX



3G-B-DS DISPLAY = ALIGN

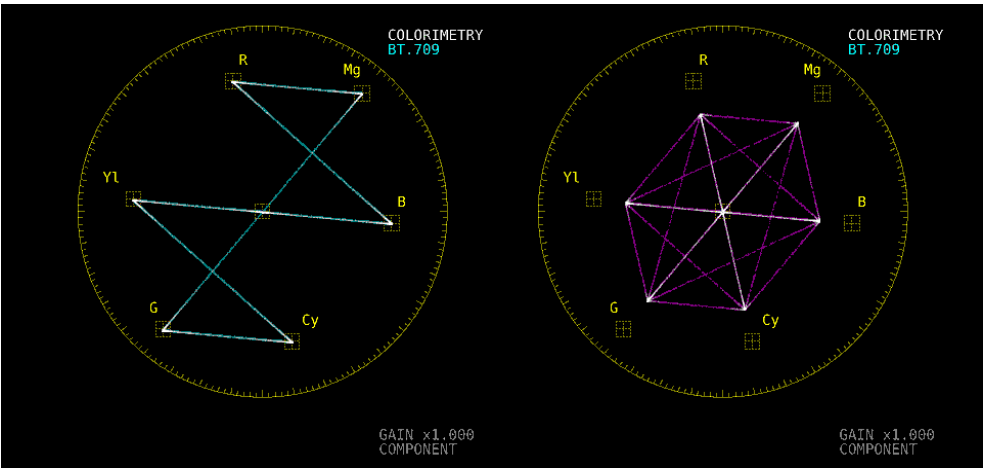


Figure 11-11 Configuring the 3G-B-DS display settings

11.6 Configuring the Color System Settings

To configure the color system settings, press **F•7** COLOR SYSTEM on the VECT menu.

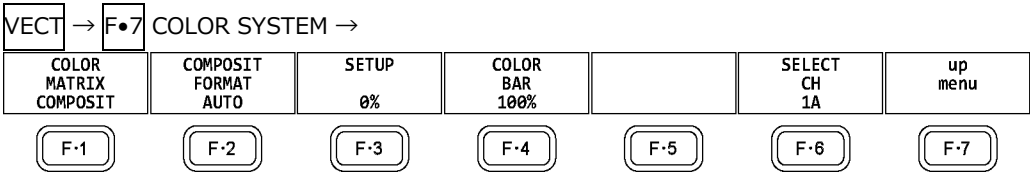


Figure 11-12 COLOR SYSTEM menu

11.6.1 Selecting the Color Matrix

To select the vector display format, follow the procedure below. The selected display format is indicated in the lower right of the display.

Procedure

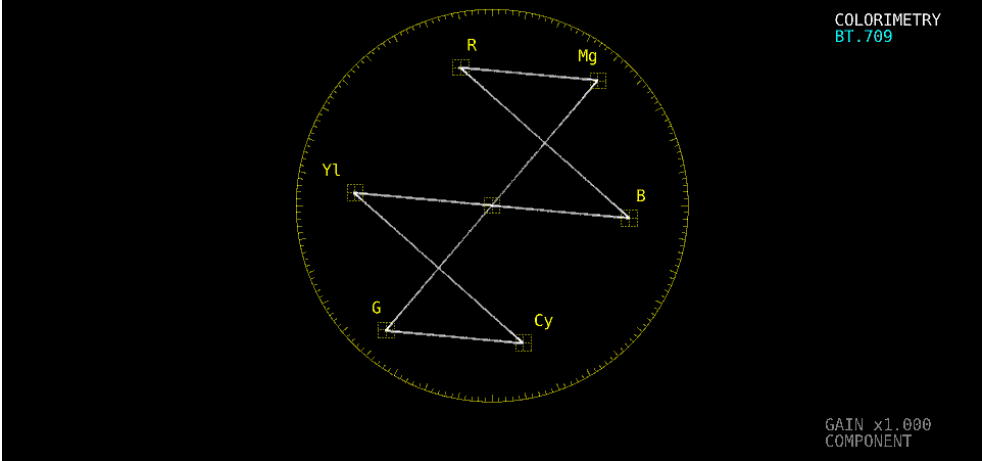


Settings

COMPONEN: The component chrominance signal is displayed on the X and Y axes.

COMPOSIT: The component signal is converted into a pseudo-composite signal, and the pseudo-composite signal's chrominance signal is displayed on the X and Y axes.

COLOR MATRIX = COMPONEN



11. VECTOR WAVEFORM DISPLAY

COLOR MATRIX = COMPOSIT

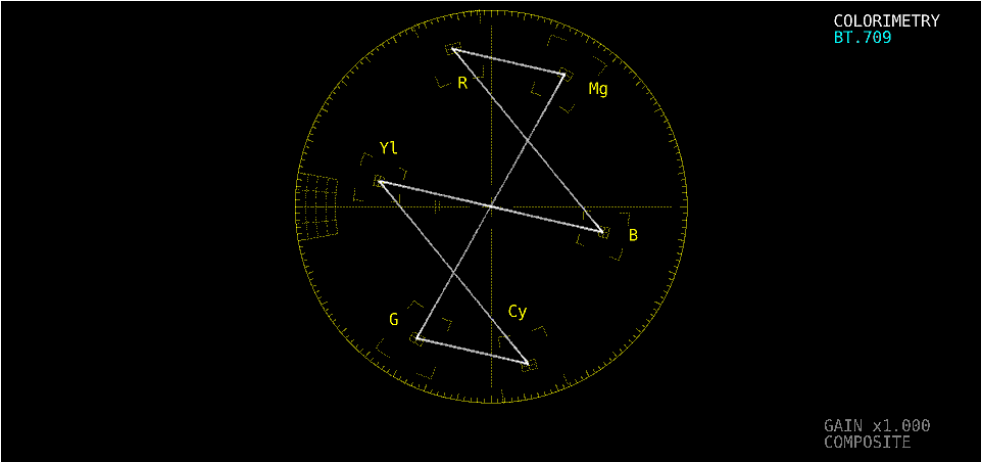


Figure 11-13 Selecting the color matrix

11.6.2 Selecting the Composite Display Format

To select the composite display format, follow the procedure below.

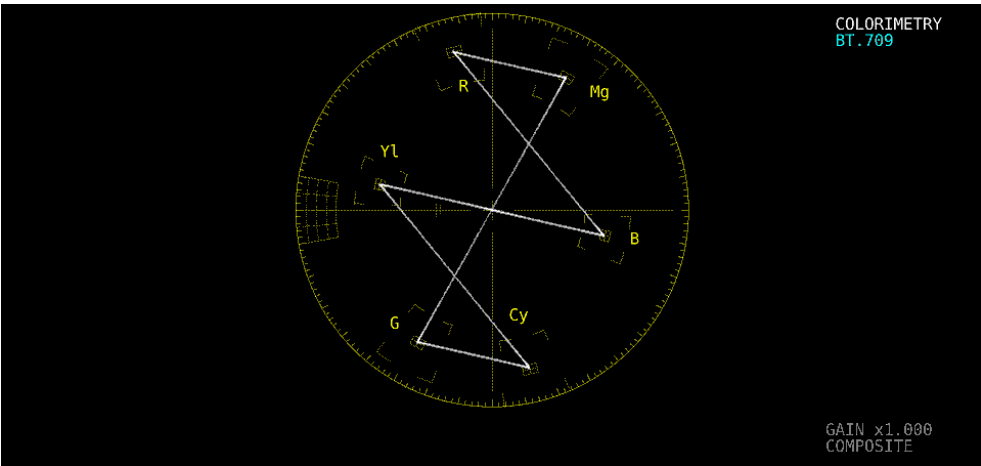
Procedure

VECT	→	F•7	COLOR SYSTEM →	F•2	COMPOSIT FORMAT: <u>AUTO</u> / NTSC / PAL

Settings

AUTO:	When the input signal frame rate is 25 Hz or 50 Hz, the format is PAL. Otherwise, the format is NTSC.
NTSC:	The format is NTSC.
PAL:	The format is PAL.

COMPOSIT FORMAT = NTSC



11. VECTOR WAVEFORM DISPLAY

COMPOSIT FORMAT = PAL

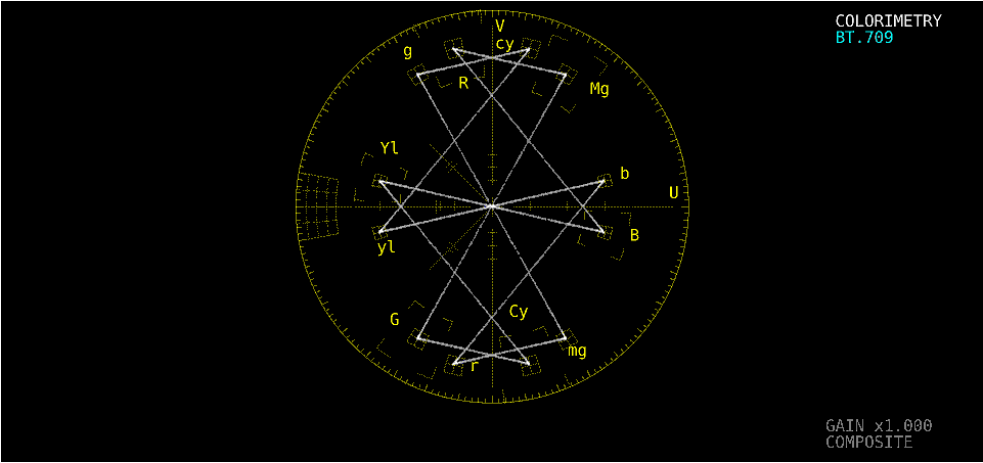


Figure 11-14 Selecting the composite display format

11.6.3 Selecting the Setup Level

When **F•1** COLOR MATRIX is set to COMPOSIT, to select the setup level, follow the procedure below.
This menu does not appear if the composite display format is PAL.

Procedure

VECT	→	F•7	COLOR SYSTEM →	F•3	SETUP: <u>0%</u> / 7.5%

11.6.4 Displaying a Scale for 75 % Intensity Color Bars

To display a scale for 75 % intensity color bars, follow the procedure below.

Procedure

VECT	→	F•7	COLOR SYSTEM →	F•4	COLOR BAR: <u>100%</u> / 75%

Settings

100%:	A scale that matches the peak levels of 100 % intensity color bars is displayed.
75%:	A scale that matches the peak levels of 75 % intensity color bars is displayed.

11. VECTOR WAVEFORM DISPLAY

COLOR BAR = 75%

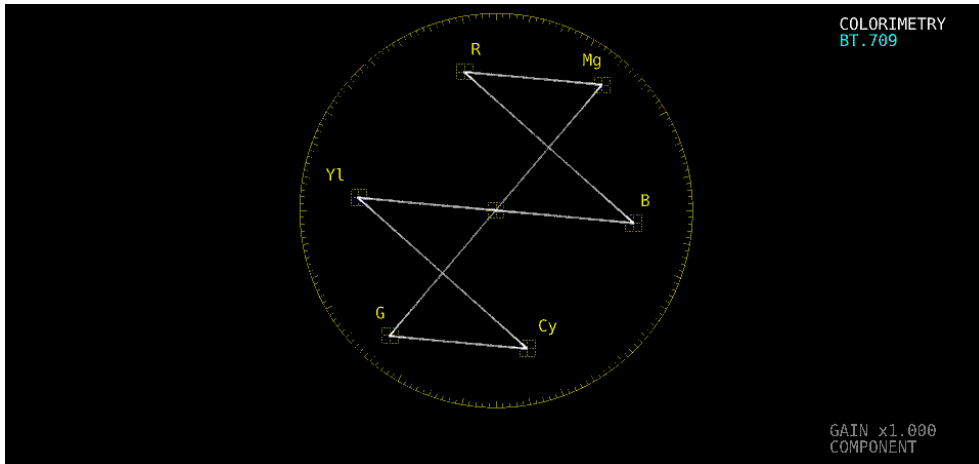


Figure 11-15 Displaying a scale for 75 % intensity color bars (when receiving a 75 % intensity color bar signal)

11.7 5-Bar Display

In the 5-bar display, the $YC_B C_R$ signal is converted into a GBR or pseudo-composite signal, and the peak levels of the converted signal's Y, G, B, R, and CMP (composite) components are displayed simultaneously using five bars.

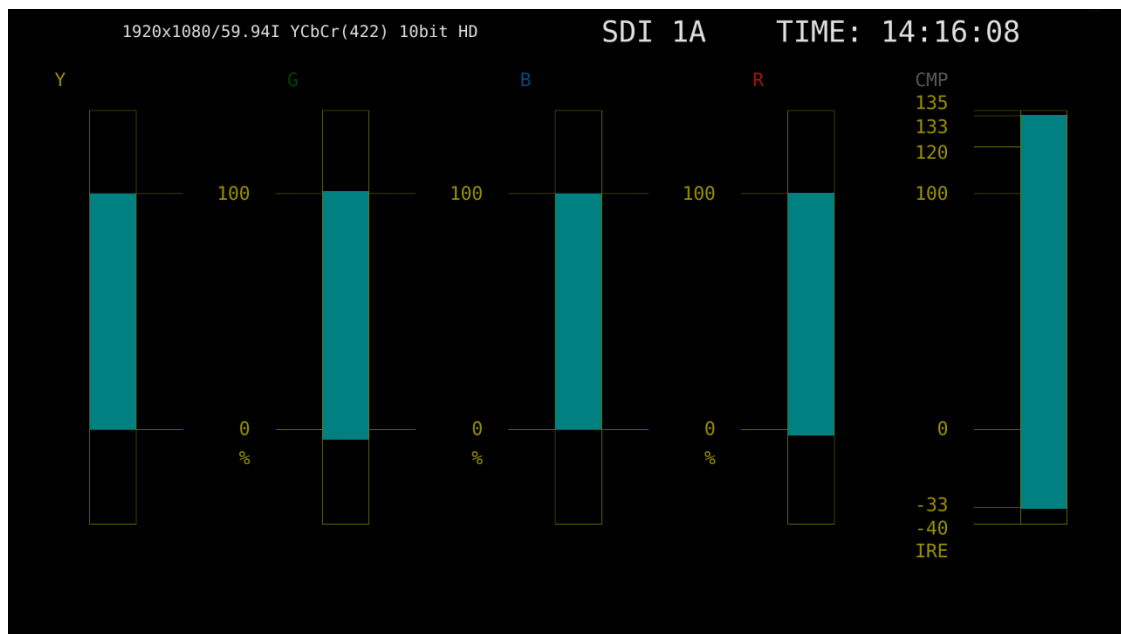


Figure 11-16 5-bar display

● Y

Levels that fall outside of the range that you set using Luminance Upper and Luminance Lower on the status menu are displayed in red.

Reference Luminance Upper/Lower → Section 16.2.4, "Error Setup 4"

11. VECTOR WAVEFORM DISPLAY

● GBR

Levels that fall outside of the range that you set using Gamut Upper and Gamut Lower on the status menu are displayed in red.

Reference Gamut Upper/Lower → Section 16.2.3, "Error Setup 3"

● CMP

Levels that fall outside of the range that you set using Composite Upper and Composite Lower on the status menu are displayed in red.

Reference Composite Upper/Lower → Section 16.2.3, "Error Setup 3"

● Menu

Use the vector menu to configure the 5-bar display settings.

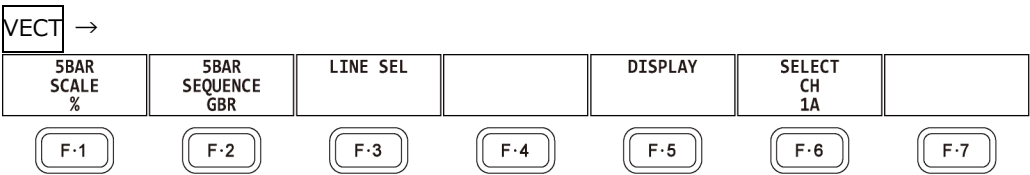


Figure 11-17 Vector menu

11.7.1 Selecting the Scale Unit

When MODE is set to 5BAR, to select the scale unit, follow the procedure below.

Reference MODE → Section 11.5.1, "Switching the Display Mode", Section 11.6.2, "Selecting the Composite Display Format"

Procedure

VECT	→	F.1	5BAR SCALE: % / mV

Settings

%:	The display unit for YGBR is percentage, and the display unit for CMP is IRE.
mV:	The display unit is mV. Depending on the composite display format, the scale differs as follows: NTSC: 100 % = 700 mV (YGBR), 100IRE = 714 mV (CMP) PAL: 100 % (IRE) = 700 mV

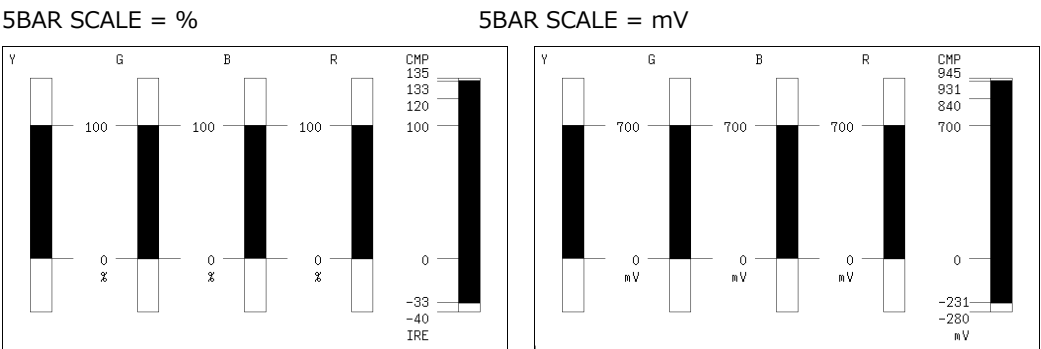


Figure 11-18 Selecting the scale unit

11. VECTOR WAVEFORM DISPLAY

11.7.2 Selecting the Display Order

To select the 5-bar display order, follow the procedure shown below.

Procedure

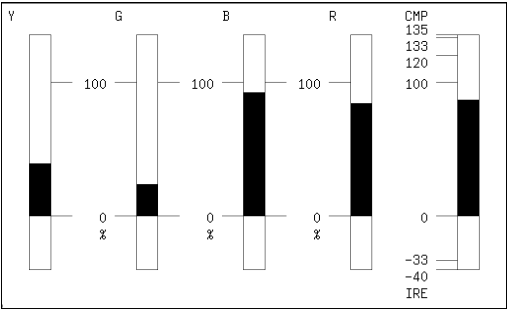
VECT	→	F•2	5BAR SEQUENCE: <u>GBR</u> / RGB

Settings

GBR: From the left, the signals are displayed in this order: Y, G, B, R, CMP.

RGB: From the left, the signals are displayed in this order: Y, R, G, B, CMP.

5BAR SEQUENCE = GBR



5BAR SEQUENCE = RGB

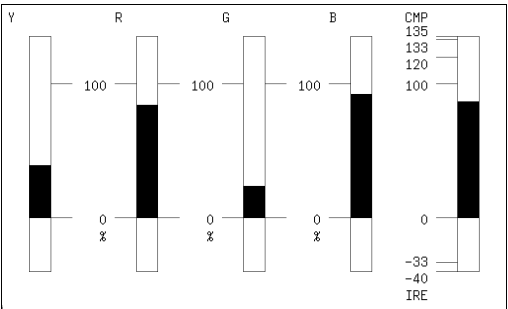


Figure 11-19 Selecting the display order

11.8 Histogram Display

To display histogram, press VECT, **F•5** DISPLAY, and then **F•1** MODE to select HISTOGRAM.

The histogram display shows the image data distribution by plotting the luminance level on the horizontal axis and the number of pixels at each luminance level on the vertical axis.

If SER07 is installed, you can change the horizontal scale. See section 14.2.1, "Histogram Display."

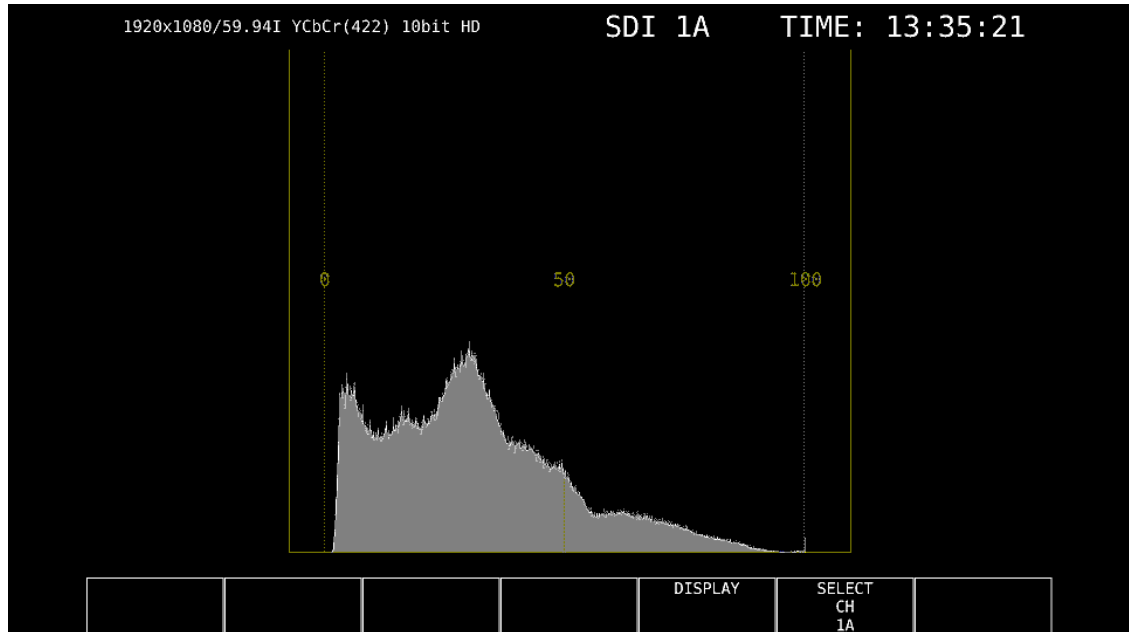


Figure 11-20 Histogram display

12. CIE DIAGRAM DISPLAY (SER05)

To display CIE chromaticity diagram, press VECT, **F•5** DISPLAY, and then **F•1** MODE to select CIE DIAGRAM.

For an explanation when MODE is set to VECTOR or HISTOGRAM, see chapter 11, "VECTOR WAVEFORM DISPLAY."

MODE = CIE DIAGRAM

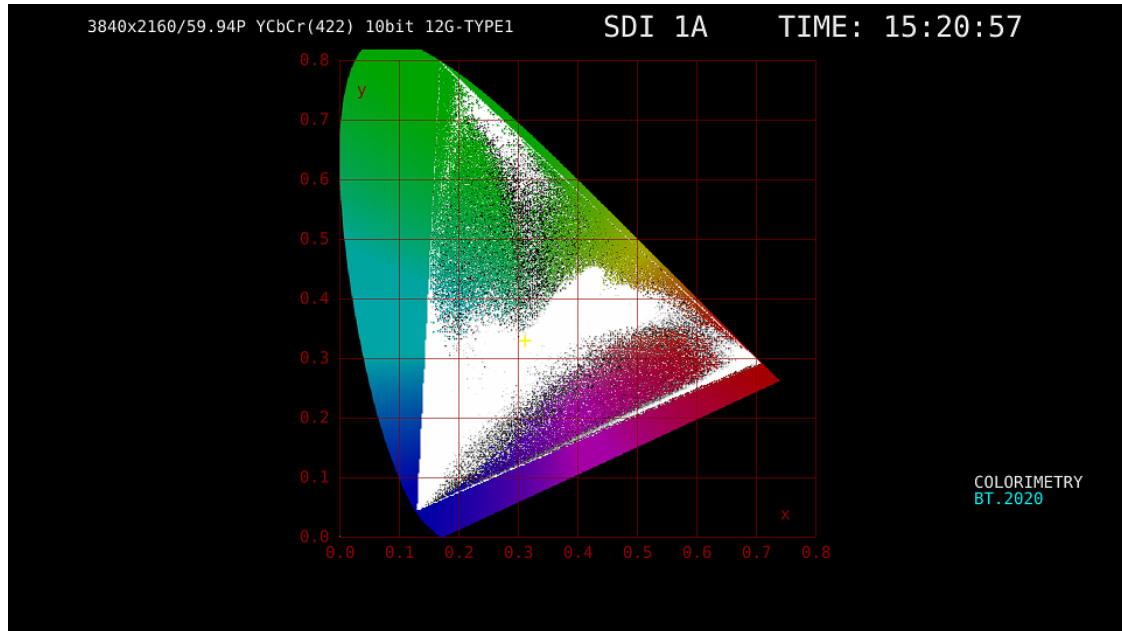


Figure 12-1 CIE diagram display

● Colorimetry

The current colorimetry is displayed in cyan in the lower right of the CIE chromaticity diagram. However, for 3G (DL)-4K and 3G (QL), if you select a payload ID, the current applied colorimetry is displayed in yellow if the colorimetry information of all links are not matched.

12.1 Configuring the Scale Settings

To configure the scale settings, press **F•1** SCALE on the VECT menu.

This menu item does not appear when DISP TYPE is set to TEMP.

Reference DISP TYPE → Section 12.2.1, "Selecting the Display Type"

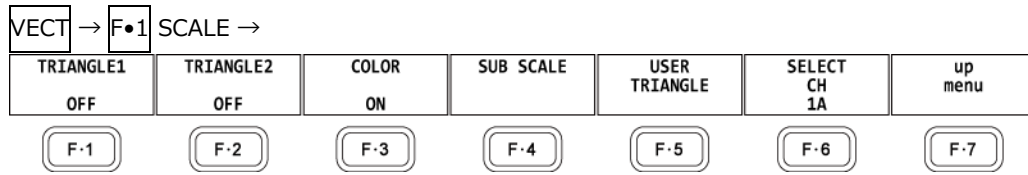


Figure 12-2 SCALE menu

12.1.1 Selecting the Triangle

To display up to three color triangles, follow the procedure below.

Procedure

VECT → **F•1** SCALE
 → **F•1** TRIANGLE1: BT.601(525) / BT.601(625) / BT.709 / DCI / BT.2020 / OFF
 → **F•2** TRIANGLE2: BT.601(525) / BT.601(625) / BT.709 / DCI / BT.2020 / OFF
 → **F•5** USER TRIANGLE → **F•1** TRIANGLE: 1 / 2 / OFF

The color triangle vertex coordinates are shown below.

u'v' coordinates are calculated from the xy coordinates.

Table 12-1 Color triangle vertex coordinates

F•1 F•2	TRIANGLE1 TRIANGLE2		CIE1931		CIE1976	
			x	y	u'	v'
BT.601(525)		R	0.630	0.340	0.433	0.526
		G	0.310	0.595	0.130	0.563
		B	0.155	0.070	0.176	0.178
BT.601(625)		R	0.640	0.330	0.451	0.523
		G	0.290	0.600	0.121	0.561
		B	0.150	0.060	0.175	0.158
BT.709		R	0.640	0.330	0.451	0.523
		G	0.300	0.600	0.125	0.563
		B	0.150	0.060	0.175	0.158
DCI		R	0.680	0.320	0.496	0.526
		G	0.265	0.690	0.099	0.578
		B	0.150	0.060	0.175	0.158
BT.2020		R	0.708	0.292	0.557	0.517
		G	0.170	0.797	0.056	0.587
		B	0.131	0.046	0.159	0.126

12.1.2 Setting the User-defined Triangle

To set the user-defined triangle, press **F•5** USER TRIANGLE on the SCALE menu.

Up to two user-defined triangles can be specified. Press **F•1** TRIANGLE to select 1 or 2.

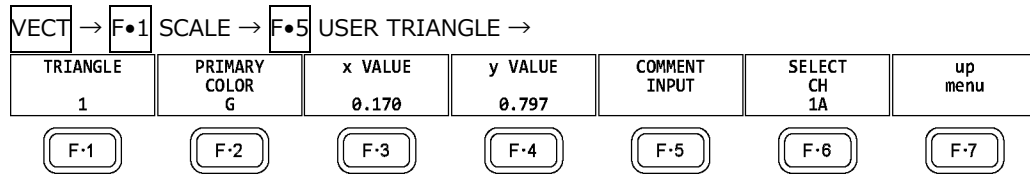


Figure 12-3 USER TRIANGLE menu

To change the vertex coordinates of the color triangle, follow the procedure below. Press **F•2** PRIMARY COLOR to select the vertex you want to change, and then press **F•3** x VALUE and **F•4** y VALUE to set the coordinates. The default setting is equivalent to the BT.2020 coordinates.

Procedure

VECT → **F•1** SCALE → **F•5** USER TRIANGLE

→ **F•2** PRIMARY COLOR: G / B / R

→ **F•3** x VALUE: 0.000 - 1.000

→ **F•4** y VALUE: 0.000 - 1.000

12. CIE DIAGRAM DISPLAY (SER05)

Press **F•5** COMMENT INPUT to assign names of your choice to user-defined triangles.
Enter a file name using up to 8 characters.

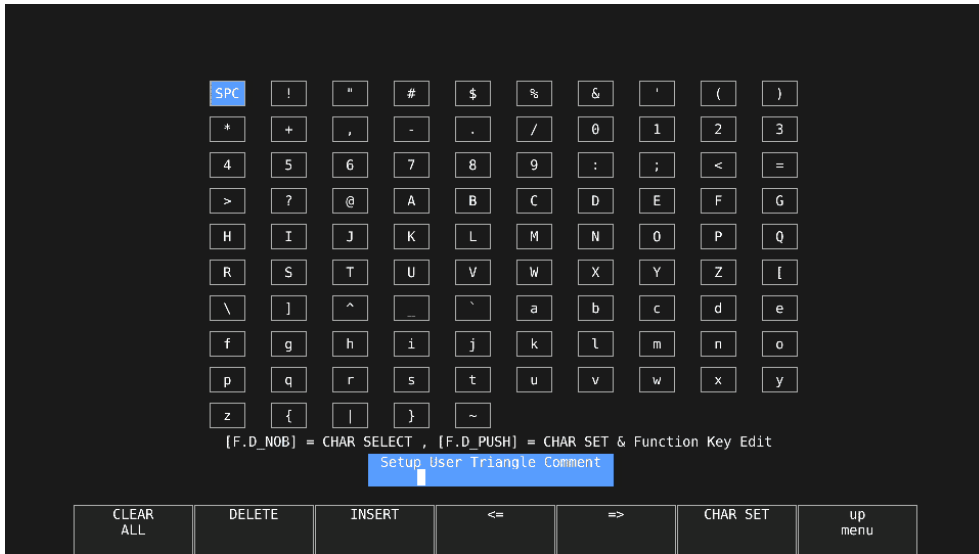


Figure 12-4 Triangle name input screen

The key operations that you can perform in the triangle name input display are as follows:

F•1	CLEAR ALL	: Deletes all characters
F•2	DELETE	: Deletes the character at the cursor
F•3	INSERT	: Inserts a character at the cursor
F•4	<=	: Moves the cursor to the left
F•5	>=	: Moves the cursor to the right
F•6	CHAR SET	: Enters the character
- Function dial (F•D) : Turn to select a character, and press to enter the character.

12. CIE DIAGRAM DISPLAY (SER05)

12.1.3 Selecting the Color Scale

To select the horseshoe-shaped color scale, follow the procedure below.

Procedure

VECT	→	F•1	SCALE →	F•3	COLOR: <u>B.G.COLOR</u> / B.G.WHITE / B.G.BLACK

Settings

B.G.COLOR:	The color scale is displayed. The background is black, and the waveform is displayed according to the luminance level.
B.G.WHITE:	The color scale is not displayed. The background is white, and the waveform is displayed according to the picture color.
B.G.BLACK:	The color scale is not displayed. The background is black, and the waveform is displayed according to the picture color.

COLOR = B.G.WHITE

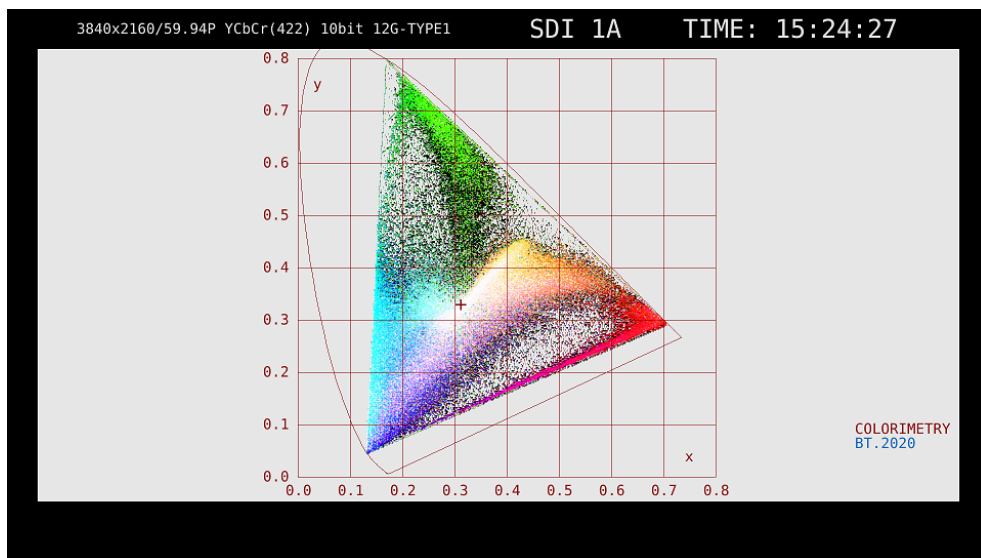


Figure 12-5 Selecting the color scale

12.1.4 Turning the Sub Scale On and Off

To set the sub scale, press **F•4** SUB SCALE on the SCALE menu.

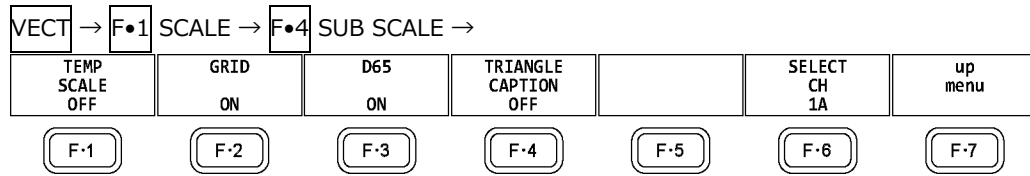


Figure 12-6 SUB SCALE menu

To turn on and off the color temperature curve, grid, white point (D65), or triangle name, follow the procedure below.

Procedure

VECT → **F•1** SCALE → **F•4** SUB SCALE
 → **F•1** TEMP SCALE: ON / OFF
 → **F•2** GRID: ON / OFF
 → **F•3** D65: ON / OFF
 → **F•4** TRIANGLE CAPTION: ON / OFF

TEMP SCALE = ON / GRID = ON / D65 = ON / TRIANGLE CAPTION = ON

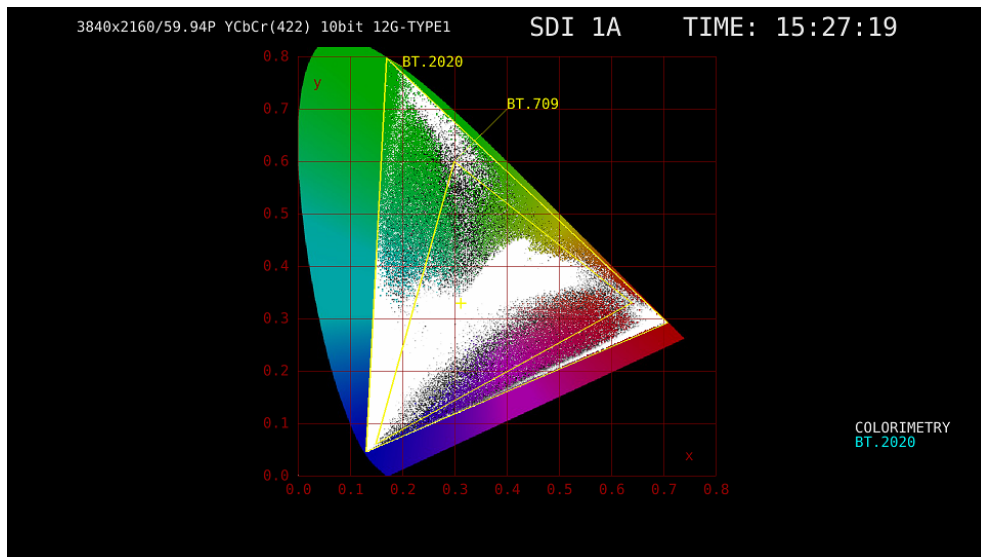


Figure 12-7 Turning the sub scale on and off

12.2 Setting the Chromaticity Diagram Mode

To set the chromaticity diagram mode, press **F•2** CIE DIAGRAM on the VECT menu.

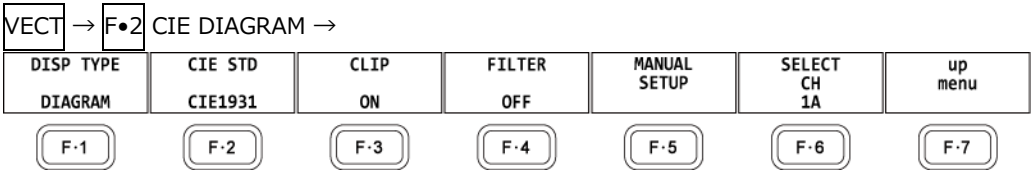


Figure 12-8 CIE DIAGRAM menu

12.2.1 Selecting the Display Type

To select the display type, follow the procedure below.

Procedure



Settings

DIAGRAM: The chromaticity diagram is displayed.
TEMP: The color temperature is displayed.

DISP TYPE = TEMP

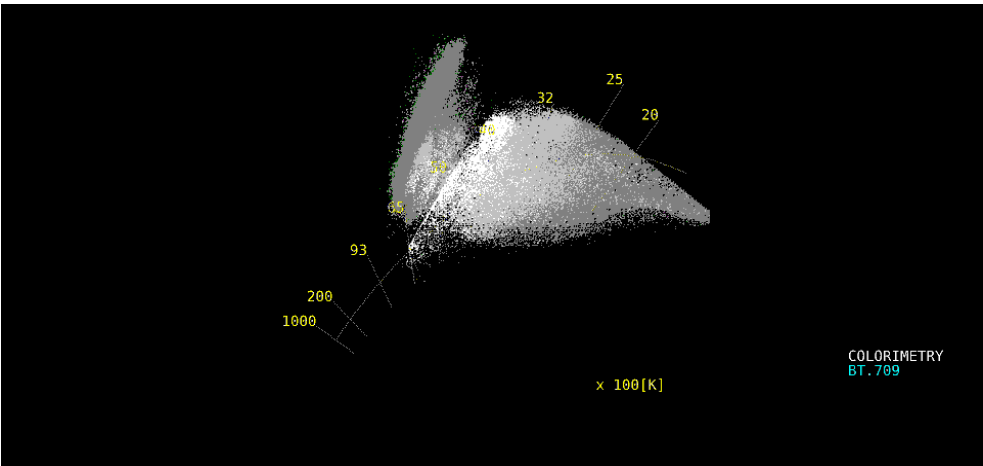


Figure 12-9 Selecting the display type

12.2.2 Selecting the Display Standard

To select the display standard, follow the procedure below.

Procedure

VECT	→	F•2	CIE DIAGRAM	→	F•2	CIE STD: CIE1931 / CIE1976

Settings

CIE1931:	Chromaticity diagram based on CIE 1931 is displayed.
CIE1976:	Chromaticity diagram based on CIE 1976 is displayed.

12.2.3 Turning Clipping On and Off

To turn clipping on and off, follow the procedure below.

Procedure

VECT	→	F•2	CIE DIAGRAM	→	F•3	CLIP: <u>ON</u> / OFF

Settings

ON:	Negative values of the input signal are clipped to zero.
OFF:	Negative values of the input signal are displayed according to BT.1361.

12.2.4 Turning the Filter On and Off

To turn the filter on and off, follow the procedure below.

When set to ON, data is averaged every two pixels and displayed.

Procedure

VECT	→	F•2	CIE DIAGRAM	→	F•4	FILTER: ON / <u>OFF</u>

12.2.5 Setting the Gamma Value

To set the gamma value, follow the procedure below.

Procedure

VECT	→	F•2	CIE DIAGRAM	→	F•5	MANUAL SETUP	→	F•1	MANUAL SETUP: ON / <u>OFF</u>

Settings

ON:	The gamma set with F•5 GAMMA SETUP(1.50 - <u>2.20</u> - 3.00) is used. However, this is not applied to the video-signal-waveform, vector, or picture display. The gamma calculation expression is (input signal level)^(gamma value). In addition, negative input signal values are clipped to zero, regardless of whether F•3 CLIP is set to on or off.
OFF:	The colorimetry standard selected in the system settings is used.

12.3 Configuring Line Selection Settings

To configure line selection settings, press **F•3** LINE SEL on the VECT menu.
See section 11.3, "Configuring Line Selection Settings."

12.4 Configuring Cursor Settings

To configure cursor settings, press **F•4** CURSOR on the VECT menu.

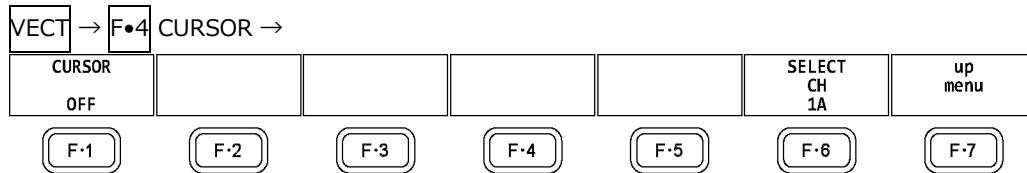


Figure 12-10 CURSOR menu

12.4.1 Displaying the Chromaticity Diagram Cursor

To display a cursor on the chromaticity diagram, follow the procedure shown below.
You can move the cursor horizontally using the H POS knob and vertically using the V POS knob. The measured values are shown in the upper right of the display. Press the H POS and V POS knobs to move the cursor to the following position.

Chromaticity diagram display: $(x, y) = (u', v') = (0, 0)$

Color temperature display: Lower left of the display

Procedure

VECT → **F•4** CURSOR → **F•1** CURSOR: ON / OFF

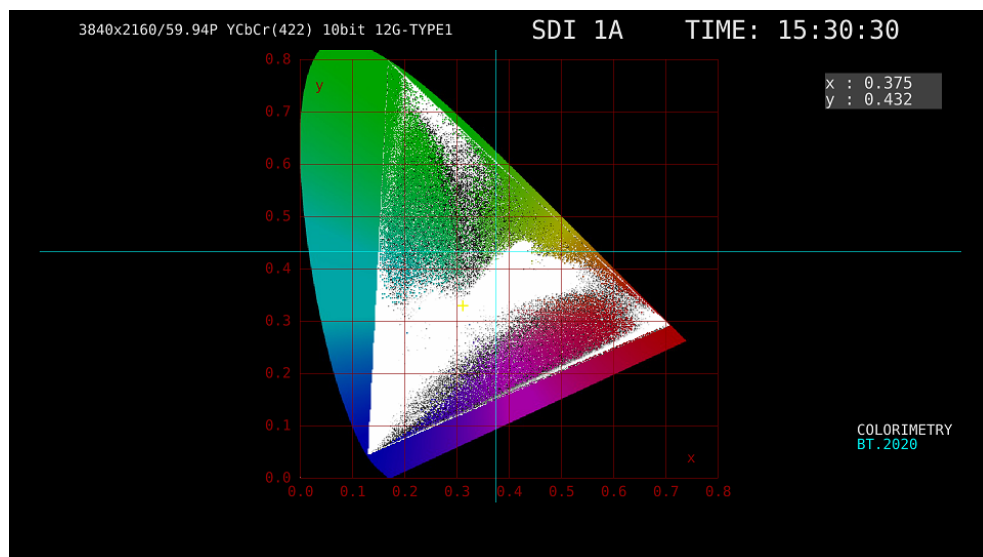


Figure 12-11 Displaying the chromaticity diagram cursor

12.5 Configuring the Display Settings

To configure the display settings, press **F•5** DISPLAY on the VECT menu.
See section 11.5, "Configuring the Display Settings."

13. PICTURE DISPLAY

To display the picture, press PIC.

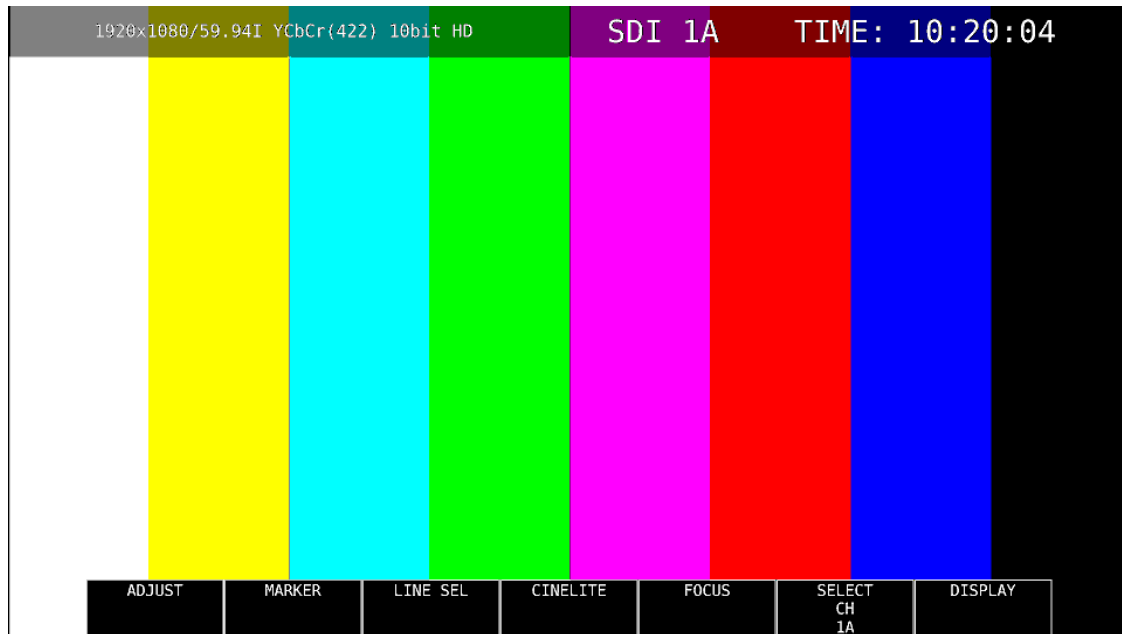


Figure 13-1 Picture display

13.1 Adjusting the Picture

To adjust the picture, press **F•1** ADJUST in the PIC menu.

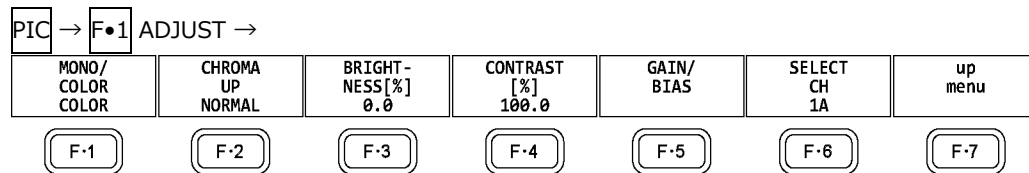


Figure 13-2 ADJUST menu

13.1.1 Switching between the Color and Monochrome Displays

To switch between the color and monochrome displays, follow the procedure below.

Procedure

PIC → **F•1** ADJUST → **F•1** MONO/COLOR: COLOR / MONO

13.1.2 Setting the Chroma Gain

To switch the chroma gain, follow the procedure below.

Procedure

PIC → F•1 ADJUST → F•2 CHROMA UP: NORMAL / UP

Settings

NORMAL: The chroma gain is set to the value that you have set using F•5 GAIN/BIAS → F•1 GAIN.

UP: The chroma gain is set to 2 (200.0 %).

13.1.3 Adjusting the Brightness

To adjust the brightness, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (0.0).

Procedure

PIC → F•1 ADJUST → F•3 BRIGHTNESS[%]: -50.0 - 0.0 - 50.0

13.1.4 Adjusting the Contrast

To adjust the contrast, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (100.0).

Procedure

PIC → F•1 ADJUST → F•4 CONTRAST[%]: 0.0 - 100.0 - 200.0

13.1.5 Adjusting the Gain

To adjust the gain, press F•1 GAIN on the GAIN/BIAS menu.

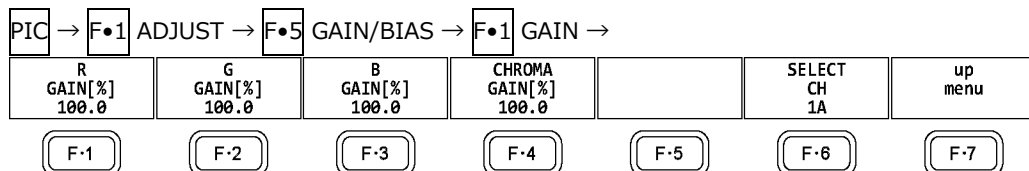


Figure 13-3 GAIN menu

To adjust the gain separately for the R, G, B, and chroma signals, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (100.0).

When F•2 CHROMA UP is set to UP, F•4 CHROMA GAIN does not appear. If is fixed at 200.0.

Procedure

PIC → F•1 ADJUST → F•5 GAIN/BIAS → F•1 GAIN
 → F•1 R GAIN[%]: 0.0 - 100.0 - 200.0
 → F•2 G GAIN[%]: 0.0 - 100.0 - 200.0
 → F•3 B GAIN[%]: 0.0 - 100.0 - 200.0
 → F•4 CHROMA GAIN[%]: 0.0 - 100.0 - 200.0

13.1.6 Adjusting the Bias

To adjust the bias, press **F•2** BIAS on the GAIN/BIAS menu.

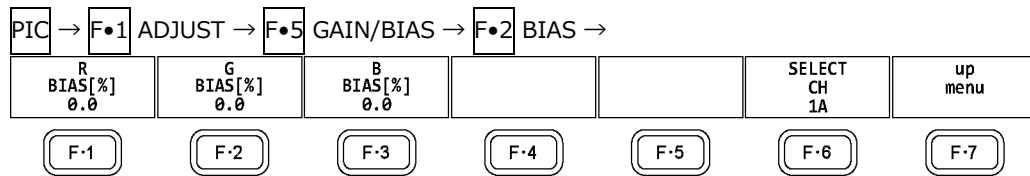
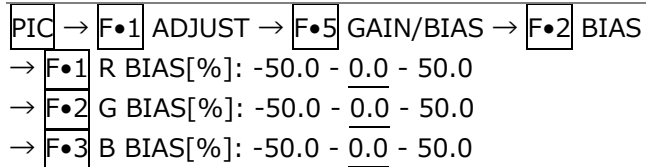


Figure 13-4 BIAS menu

To set the RGB signal bias separately for each color, follow the procedure below.
Press the function dial (F•D) to return the setting to its default value (0.0).

Procedure



13.2 Configuring Marker Settings

To configure marker settings, press **F•2** MARKER in the PIC menu.

This menu item does not appear when SIZE is set to a value other than FIT.

Reference SIZE → Section 13.8.1, "Selecting the Display Size"

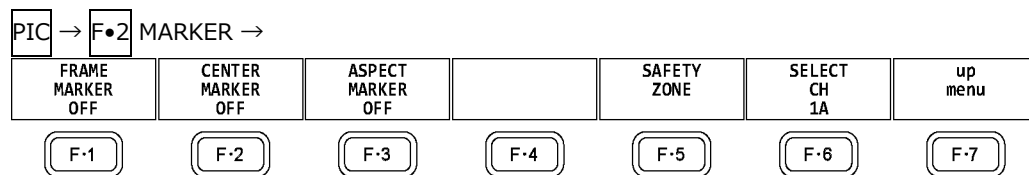


Figure 13-5 MARKER menu

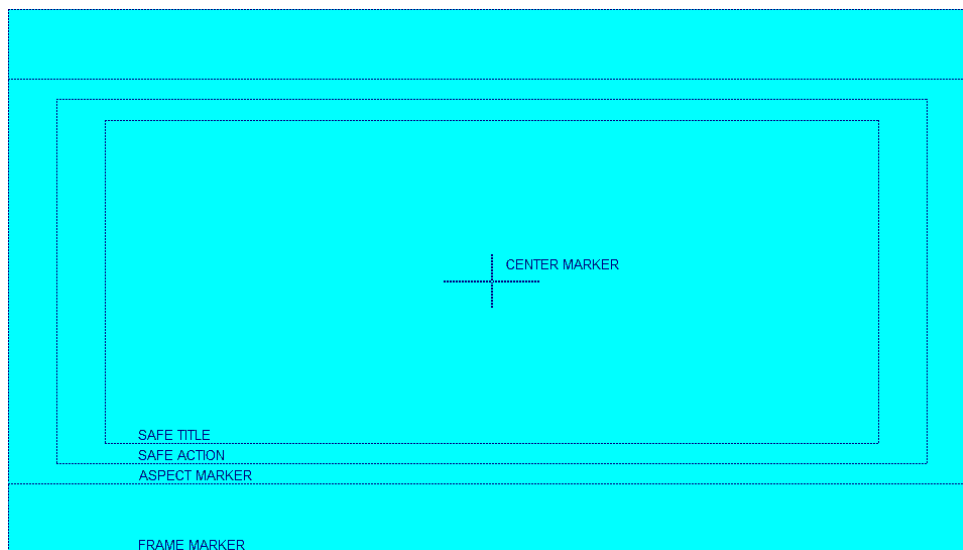


Figure 13-6 Horizontal marker display

13. PICTURE DISPLAY

13.2.1 Turning the Display of the Frame Marker On and Off

To turn the display of the frame marker on and off, follow the procedure below.

Procedure

PIC	→	F•2	MARKER	→	F•1	FRAME MARKER: ON / <u>OFF</u>

13.2.2 Turning the Display of the Center Marker On and Off

To turn the display of the center marker on and off, follow the procedure below.

Procedure

PIC	→	F•2	MARKER	→	F•2	CENTER MARKER: ON / <u>OFF</u>

13.2.3 Setting the Aspect Marker

To display the aspect marker, follow the procedure below.

Procedure

PIC	→	F•2	MARKER	→	F•3	ASPECT MARKER: <u>OFF</u> / 17:9 / 16:9 / 14:9 / 13:9 / 4:3 / 2.39:1 / AFD

Settings

OFF:	An aspect marker is not displayed.
17:9	A 17:9 aspect marker is displayed. This option cannot be selected when the input signal is a 17:9 frame signal or an SD signal.
16:9:	A 16:9 aspect marker is displayed. This option cannot be selected when the input signal is a 16:9 frame signal.
14:9:	A 14:9 aspect marker is displayed.
13:9:	A 13:9 aspect marker is displayed.
4:3:	A 4:3 aspect marker is displayed. This option cannot be selected when the input signal is SD.
2.39:1:	A 2.39:1 aspect marker is displayed. This option cannot be selected when the input signal is SD.
AFD:	The aspect marker included in the AFD (Active Format Description) packets is displayed. Also, abbreviations for SMPTE ST 2016-1-2007 standard AFD codes are displayed in the upper left of the screen. This option can be selected when the input signal is SD or HD.

13. PICTURE DISPLAY

The AFD codes that are displayed in the upper left of the screen are displayed as shown below according to the coded frame and the AFD code. If there are no AFD packets embedded in the input signal, "-----" is displayed.

Table 13-1 Displaying AFD

Displayed AFD	Coded Frame	AFD Code	Explanation
0000- UNDEFINED	0 (4:3)	0000	Undefined
0001- RESERVED	0 (4:3)	0001	Reserved
0010- 16:9LBTOP	0 (4:3)	0010	Letterbox 16:9 image, at top of the coded frame
0011- 14:9LBTOP	0 (4:3)	0011	Letterbox 14:9 image, at top of the coded frame
0100- >16:9LBox	0 (4:3)	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101- RESERVED	0 (4:3)	0101	Reserved
0110- RESERVED	0 (4:3)	0110	Reserved
0111- RESERVED	0 (4:3)	0111	Reserved
1000- FullFrame	0 (4:3)	1000	Full frame 4:3 image, the same as the coded frame
1001- Full Frame	0 (4:3)	1001	Full frame 4:3 image, the same as the coded frame
1010- 16:9LBox	0 (4:3)	1010	Letterbox 16:9 image, vertically centered in the coded frame with all image areas protected
1011- 14:9LBox	0 (4:3)	1011	Letterbox 14:9 image, vertically centered in the coded frame
1100- RESERVED	0 (4:3)	1100	Reserved
1101-4:3Full14:9	0 (4:3)	1101	Full frame 4:3 image, with alternative 14:9 center
1110-16:9LB14:9	0 (4:3)	1110	Letterbox 16:9 image, with alternative 14:9 center
1111-16:9LB4:3	0 (4:3)	1111	Letterbox 16:9 image, with alternative 4:3 center
0000w UNDEFINED	1 (16:9)	0000	Undefined
0001w RESERVED	1 (16:9)	0001	Reserved
0010w Full Frame	1 (16:9)	0010	Full frame 16:9 image, the same as the coded frame
0011w 14:9Pillbox	1 (16:9)	0011	Pillarbox 14:9 image, horizontally centered in the coded frame
0100w >16:9LBox	1 (16:9)	0100	Letterbox image with an aspect ratio greater than 16:9, vertically centered in the coded frame
0101w RESERVED	1 (16:9)	0101	Reserved
0110w RESERVED	1 (16:9)	0110	Reserved
0111w RESERVED	1 (16:9)	0111	Reserved
1000w FullFrame	1 (16:9)	1000	Full frame 16:9 image, the same as the coded frame
1001w 4:3Pillbox	1 (16:9)	1001	Pillarbox 4:3 image, horizontally centered in the coded frame
1010w FullNoCrop	1 (16:9)	1010	Full frame 16:9 image, with all image areas protected
1011w14:9Pillbox	1 (16:9)	1011	Pillarbox 14:9 image, horizontally centered in the coded frame
1100w RESERVED	1 (16:9)	1100	Reserved
1101w4:3PB14:9	1 (16:9)	1101	Pillarbox 4:3 image, with alternative 14:9 center
1110wFul14:9Safe	1 (16:9)	1110	Full frame 16:9 image, with alternative 14:9 center
1111wFull4:3Safe	1 (16:9)	1111	Full frame 16:9 image, with alternative 4:3 center

13.2.4 Setting the Aspect Shadow

When **F•3** ASPECT MARKER is set to a value other than OFF, to adjust the darkness of the aspect marker shadow, follow the procedure below. The larger the number, the darker the shadow. If you specify 0, the aspect marker will be indicated with a line. Press the function dial (**F•D**) to return the setting to its default value (50).

Procedure

PIC	→	F•2	MARKER	→	F•4	ASPECT SHADOW[%]: 0 - <u>50</u> - 100

ASPECT SHADOW[%] = 50

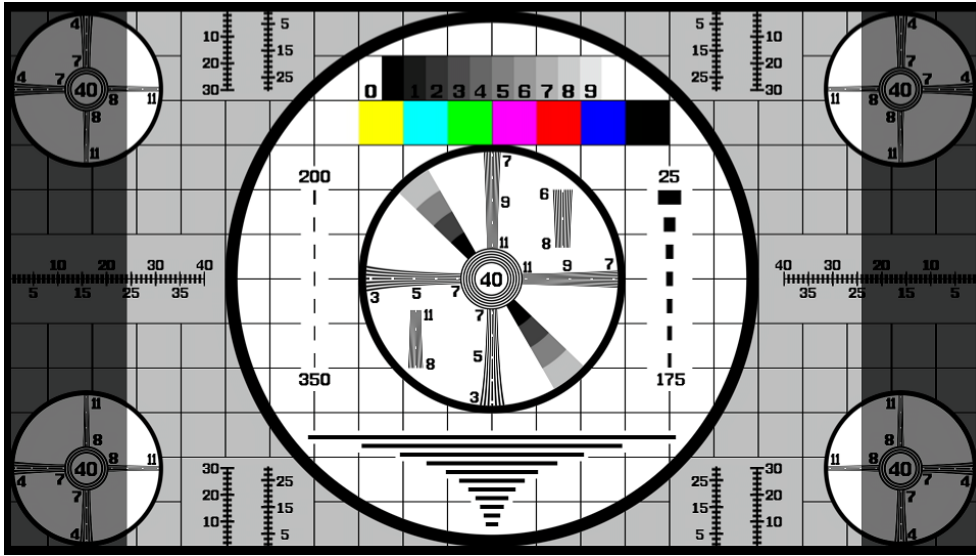


Figure 13-7 Setting the aspect shadow

13.2.5 Setting the Safe Action Marker

To configure safety marker settings, press **F•5** SAFETY ZONE on the MARKER menu. This menu item does not appear when **F•3** ASPECT MARKER is set to AFD.

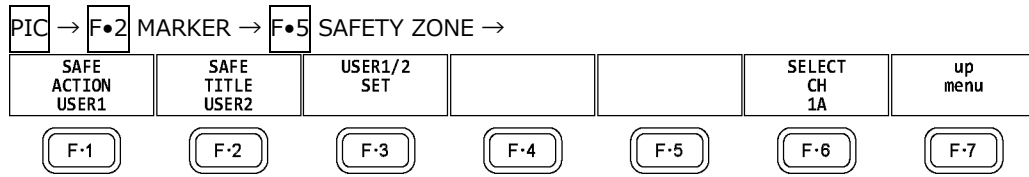


Figure 13-8 SAFETY ZONE menu

To display the safe action marker, follow the procedure below.

When an aspect marker is displayed, the safe action marker is displayed relative to the aspect marker.

Procedure

PIC → **F•2** MARKER → **F•5** SAFETY ZONE → **F•1** SAFE ACTION: ARIB / SMPTE / USER1 / OFF

Settings

ARIB:	An ARIB TR-B4 safe action marker is displayed. This option cannot be selected when the input signal is 4K.
SMPTE:	An SMPTE RP-218 safe action marker is displayed. This option cannot be selected when the input signal is 4K.
USER1:	A marker that has been set with F•1 USER1 WIDTH[%] and F•2 USER1 HEIGHT[%] for F•3 USER1/2 SET is displayed.
OFF:	A safe action marker is not displayed.

13.2.6 Setting the Safe Title Marker

To display the safe title marker, follow the procedure below.

When an aspect marker is displayed, the safe action marker is displayed relative to the aspect marker.

Procedure

PIC → **F•2** MARKER → **F•5** SAFETY ZONE → **F•2** SAFE TITLE: ARIB / SMPTE / USER2 / OFF

Settings

ARIB:	An ARIB TR-B4 safe title marker is displayed. This option cannot be selected when the input signal is 4K.
SMPTE:	An SMPTE RP-218 safe title marker is displayed. This option cannot be selected when the input signal is 4K.
USER2:	A marker that has been set with F•3 USER2 WIDTH[%] and F•2 USER2 HEIGHT[%] for F•3 USER1/4 SET is displayed.
OFF:	A safe title marker is not displayed.

13.2.7 Setting User Markers

By setting **F•1** SAFE ACTION to USER1 and **F•2** SAFE TITLE to USER2, you can display up to two user-defined markers.

To configure user-defined marker settings, press **F•3** USER1/2 SET on the SAFETY ZONE menu.

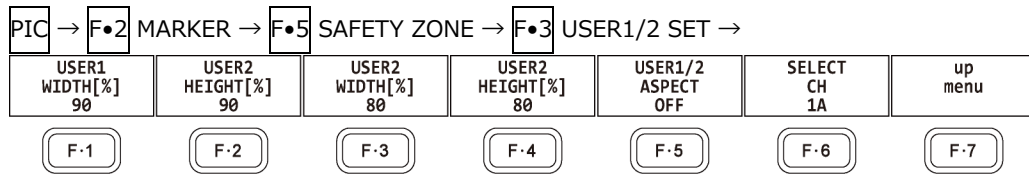


Figure 13-9 USER1/2 SET menu

To set the width and height of a user marker and turn the aspect ratio display on and off, follow one of the procedures below.

Press the function dial (**F•D**) to return the width and height settings to their default value. The aspect ratio display on/off setting applies both to USER1 and USER2.

Procedure

PIC	→	F•2	MARKER	→	F•5	SAFETY ZONE	→	F•3	USER1/2 SET
→	F•1	USER1 WIDTH[%]: 0 - <u>90</u> - 100							
→	F•2	USER1 HEIGHT[%]: 0 - <u>90</u> - 100							
→	F•3	USER2 WIDTH[%]: 0 - <u>80</u> - 100							
→	F•4	USER2 HEIGHT[%]: 0 - <u>80</u> - 100							
→	F•5	USER1/2 ASPECT: ON / <u>OFF</u>							

13.3 Configuring Line Selection Settings

To configure line selection settings, press **F•3** LINE SEL on the PIC menu.

This menu item does not appear when SIZE is set to a value other than FIT.

Reference SIZE → Section 13.8.1, "Selecting the Display Size"

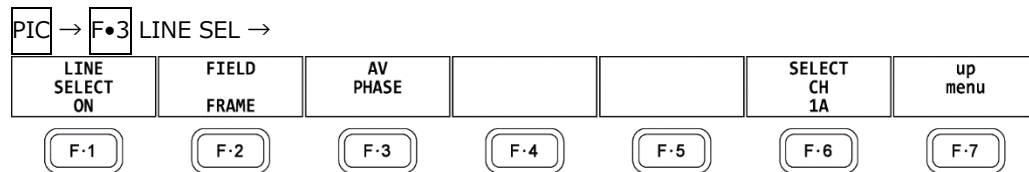


Figure 13-10 LINE SEL menu

13.3.1 Turning Line Selection On and Off

To display a marker on the selected line, follow the procedure below. You can use the function dial (F•D) to select a line. The number of the selected line appears in the upper left of the display.

Changing this setting will also change the video-signal-waveform-display and vector-display line selection settings.

Procedure

PIC → **F•3** LINE SEL → **F•1** LINE SELECT: ON / OFF

LINE SELECT = ON

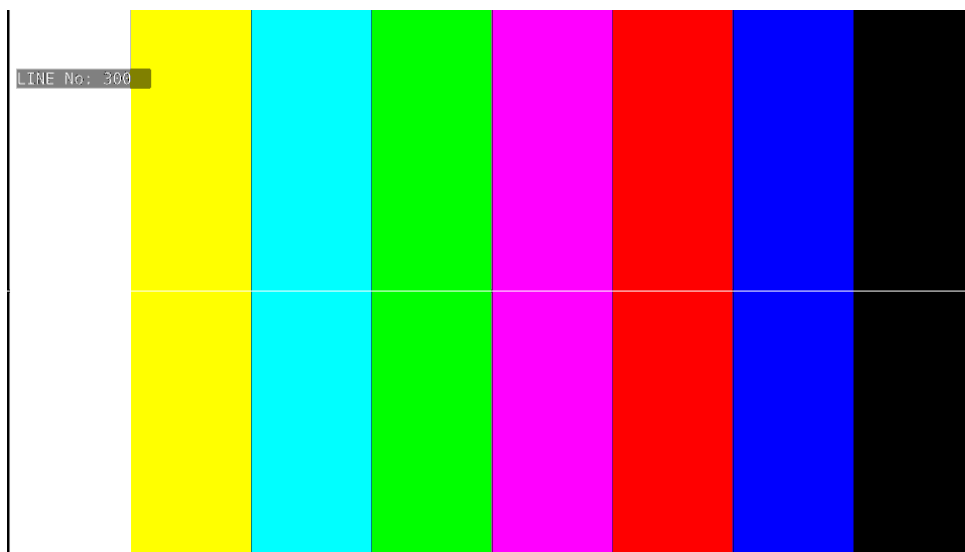


Figure 13-11 Turning line selection on and off

13.3.2 Setting the Line Selection Range

When **F•1** LINE SELECT is set to ON and the input signal format is interlaced or segmented frame, to set the line selection range, follow the procedure below.

Changing this setting will also change the selected line on the video-signal-waveform, vector, and status (data dump) displays.

Procedure

PIC → **F•3** LINE SEL → **F•2** FIELD: FIELD1 / FIELD2 / FRAME

Settings

FIELD1: A line from field 1 can be selected. (Example: 1 to 563)

FIELD2: A line from field 2 can be selected. (Example: 564 to 1125)

FRAME: All lines can be selected. (Example: 1 to 1125)

13.3.3 Setting the Lip Sync Measurement Range (SER03)

To set the lip sync measurement range, press **F•3** AV PHASE on the LINE SELCT menu.

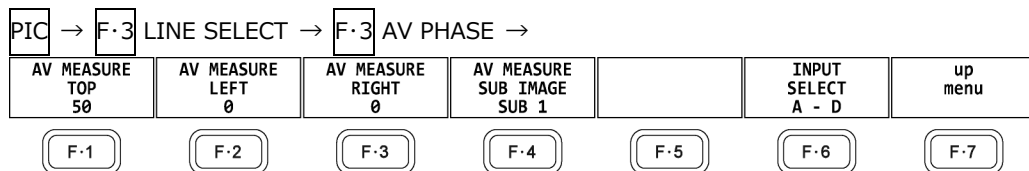


Figure 13-12 AV PHASE menu

To set the lip sync measurement range, follow the procedure below. Markers are displayed at the specified lines.

You can also set these using AV PHASE SETUP of the STATUS menu, but here you can set them while viewing the picture. For details on the settings, section 16.7.3, "Setting the Measurement Range."

Procedure

PIC → **F•3** LINE SEL → **F•3** AV PHASE
 → **F•1** AV MEASURE TOP: 0 - 50 - 100
 → **F•2** AV MEASURE LEFT: 0 - 99
 → **F•3** AV MEASURE RIGHT: 0 - 99
 → **F•4** AV MEASURE SUB IMAGE: SUB 1 / SUB 2 / SUB 3 / SUB 4

13.4 Configuring CINELITE Settings

The CINELITE feature displays the luminance level of a video signal on the picture display. To show the CINELITE display, press **F•4** CINELITE in the PIC menu.

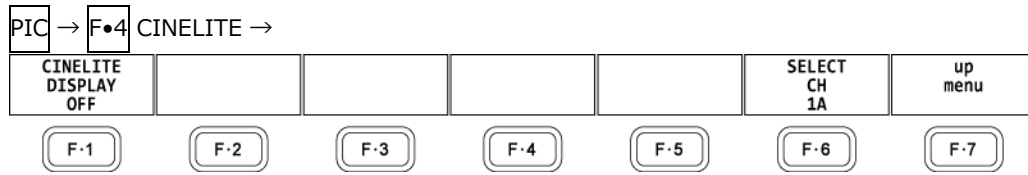


Figure 13-13 CINELITE menu

To switch to the CINELITE display, follow the procedure below.

Procedure

PIC	→	F•4	CINELITE	→	F•1	CINELITE DISPLAY: <u>OFF</u> / f Stop / %DISPLAY / CINEZONE

Settings

OFF:	A cinelite is not displayed.
f Stop:	The f Stop screen is displayed.
	This option cannot be selected in simul mode or 3G-B-DS.
%DISPLAY:	The %DISPLAY screen is displayed.
	This option cannot be selected in simul mode or 3G-B-DS.
CINEZONE:	The CINEZONE screen is displayed.
	This option cannot be selected in simul mode or 3G-B-DS.

13.4.1 f Stop Screen Explanation

To set f Stop, press **F•1** CINELITE DISPLAY to select f Stop and then press **F•2** f Stop SETUP.

On the f Stop screen, luminance levels are displayed using f-stop (exposure) values. The measured f Stop value for a group of measured points is typically displayed using white, but it will be displayed using yellow when it corresponds to a luminance level of 80 % or more. Additionally, f Stop values that correspond to luminance levels equal to or less than 0 % can not be measured. They are displayed in yellow as "****."

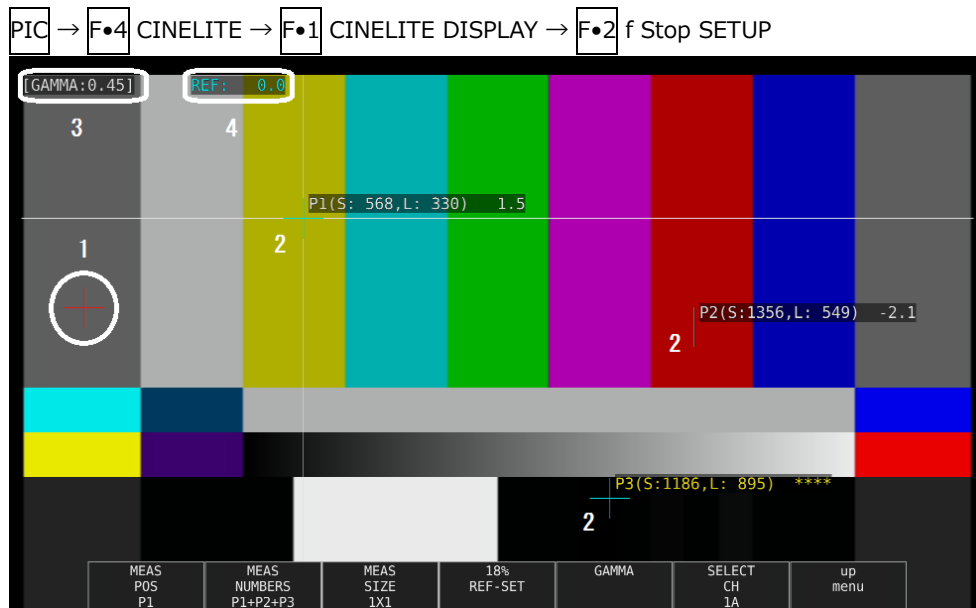


Figure 13-14 f Stop screen

1 Reference Position

The position where the cursors intersected when **F•4** 18% REF-SET was pressed is displayed in red. This is the reference position for f-stop measurement.

2 Cursor

You can set up to three measurement points. The cursor coordinates are indicated using sample numbers and line numbers. Additionally, The f Stop value relative to the reference point is displayed at each point.

3 Gamma Correction Value

The gamma correction value that you selected using **F•5** GAMMA SELECT appears here.

4 Reference Value

The f Stop value at the reference position appears here. The value immediately after you have pressed **F•4** 18% REF-SET is zero, but it will change when the picture changes.

13.4.2 Procedure for Displaying the f Stop Screen

The following example shows how to display luminance levels as f Stop numbers relative to the luminance level of 18 % gray chart. Include an 18 % gray chart with the objects that you are filming.

1. Press PIC.
2. Press F•4 CINELITE.
3. Press F•1 CINELITE DISPLAY to select f Stop.
4. Press F•2 f Stop SETUP.
5. Press F•5 GAMMA and then F•1 GAMMA SELECT to select the gamma correction table type.

The default gamma correction value is 0.45, but you can also use a user-defined gamma correction table that matches the gamma characteristics of the camera that you are using. For details, see section 13.4.7, "Configuring User-Defined Correction Tables."

The selected gamma correction value is indicated in the upper left of the display.

6. Press F•7 up menu.
7. Make sure that the cursors are over the 18 % gray chart, and press F•4 18% REF-SET.

The f Stop value for 18 % gray chart becomes 0.0 and is displayed in the upper part of the screen next to "REF:." The reference position is displayed with a red cursor.

8. Use the cursors to set the measurement points.

The f Stop value relative to 18 % gray chart appears next to each measurement point. You can set up to three measurement points.

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13.4.3 %DISPLAY Screen Explanation

To set %DISPLAY, press **F•1** CINELITE DISPLAY to select %DISPLAY and then press **F•2** %DISPLAY SETUP.

On the %DISPLAY screen, you can display luminance levels as Y percentages, RGB percentages, 255 RGB, using CODE VALUE levels, or using CODE VALUE DEC levels. Use

F•4 UNIT SELECT to select the display format.

The measured values are typically displayed using white, but they are displayed using yellow when the luminance level is 80 % or more or 0 % or less.

● Y% Display

Luminance levels are indicated as percentages.



Figure 13-15 Y% display

● RGB% Display

Each R, G, and B level is indicated using a percentage. The levels are also indicated using bars on the left side of the display (the order is R, G, and then B).

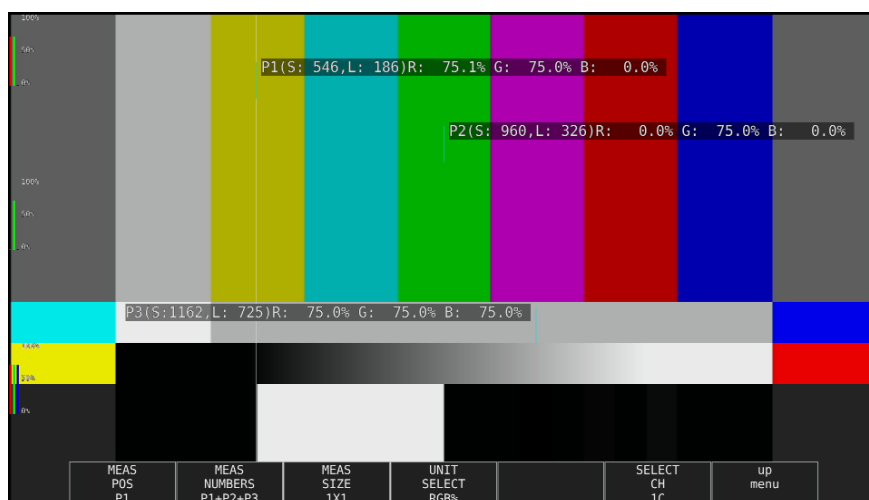


Figure 13-16 RGB% display

13. PICTURE DISPLAY

- RGB255 Display

Each R, G, and B level is indicated using 256 steps from 0 to 255. The levels are also indicated using bars on the left side of the display (the order is R, G, and then B). The value of an RGB level that is 100 % or greater is 255. The value of an RGB level that is 0 % or less is 0.

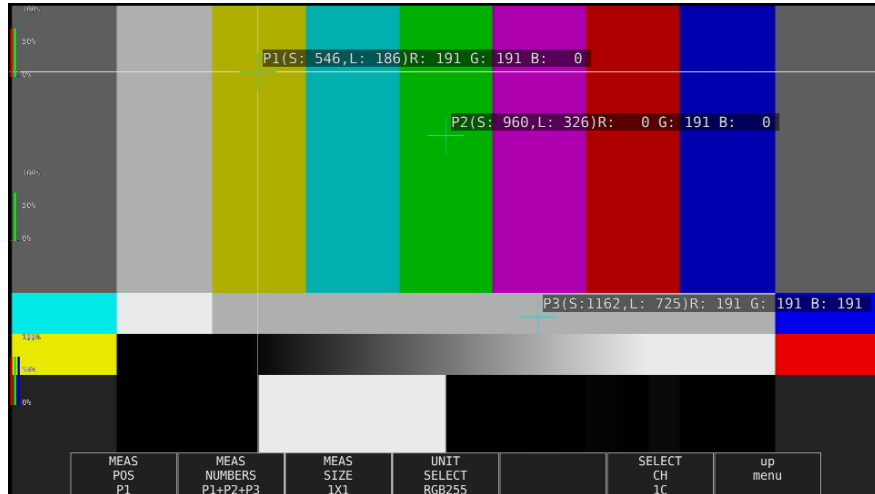


Figure 13-17 RGB255 display

- CODE VALUE Display

The SDI signal video data is displayed in hexadecimal notation. If the input signal is YCbCr, the data is displayed in YCbCr. If the input signal is RGB, the data is displayed in RGB. If the input signal is XYZ, data is displayed using values converted into RGB (with black level offset added). You can select CODE VALUE when **F•3** MEAS SIZE is 1×1.

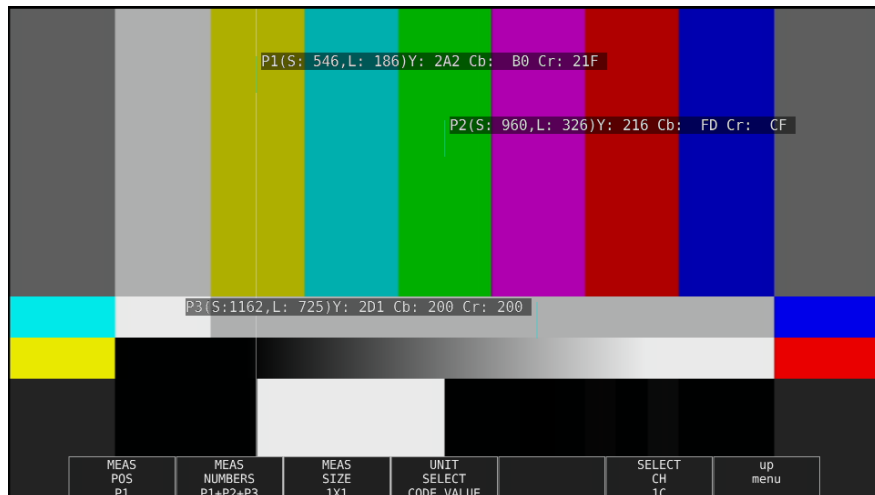


Figure 13-18 CODE VALUE display

13. PICTURE DISPLAY

● CODE VALUE DEC Display

The SDI signal video data is displayed in decimal notation.

If the input signal is YCbCr, the data is displayed in YCbCr. If the input signal is RGB, the data is displayed in RGB. If the input signal is XYZ, data is displayed using values converted into RGB (with black level offset added).

You can select CODE VALUE DEC when **F•3** MEAS SIZE is 1×1.

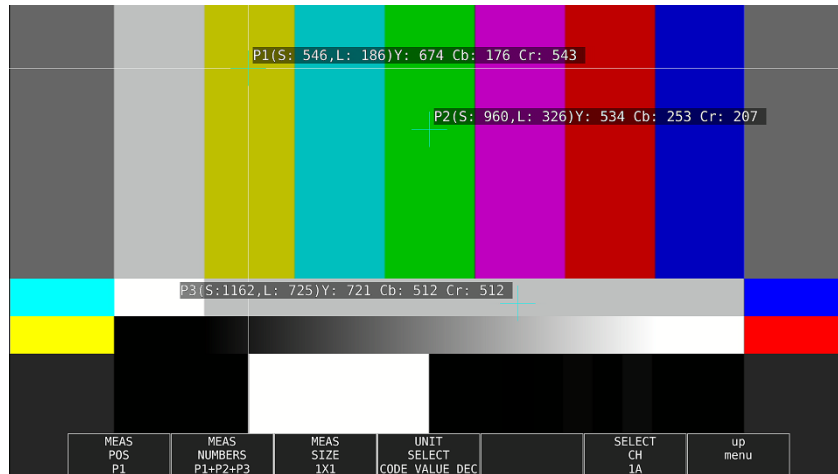


Figure 13-19 CODE VALUE DEC display

13.4.4 Selecting the Points to Display

You can set three points to measure: P1 to P3. To select the measured points that you want to display, follow the procedure below.

Procedure

PIC → **F•4** CINELITE
→ **F•2** f Stop SETUP → **F•2** MEAS NUMBERS: P1 / P1+P2 / P1+P2+P3
→ **F•2** %DISPLAY SETUP → **F•2** MEAS NUMBERS: P1 / P1+P2 / P1+P2+P3

Settings

P1: P1 is displayed.
P1+P2: P1 and P2 are displayed.
P1+P2+P3: P1 to P3 are displayed.

13.4.5 Setting Measurement Points

Follow the procedure below to select which measurement point to set with the cursors, and then move the X cursor by using the H POS knob and the Y cursor by using the V POS knob. Press the H POS and V POS knobs at the same time to move the cursors to the center of the picture.

The cursors are not displayed if they are within the blanking interval. To display cursors that do not appear, move them within the screen.

The measurement point settings made on the menus accessed by pressing fStop and %DISPLAY are the same.

Procedure

PIC	→	F•4	CINELITE
→	F•2	f Stop SETUP	→ F•1 MEAS POS: <u>P1</u> / P2 / P3
→	F•2	%DISPLAY SETUP	→ F•1 MEAS POS: <u>P1</u> / P2 / P3

13.4.6 Setting the Area of Luminance Measurement

To select the area of luminance measurement, follow the procedure below. This setting is applied to P1 to P3 and REF. The luminance measurement area settings made on the menus accessed by pressing fStop and %DISPLAY are the same.

Procedure

PIC	→	F•4	CINELITE
→	F•2	f Stop SETUP	→ F•3 MEAS SIZE: <u>1X1</u> / 3X3 / 9X9
→	F•2	%DISPLAY SETUP	→ F•3 MEAS SIZE: <u>1X1</u> / 3X3 / 9X9

Settings

1X1:	The single pixel at the intersection of the cursors is measured.
3X3:	The 3×3 area of pixels with its center at the intersection of the cursors is averaged and measured.
9X9:	The 9×9 area of pixels with its center at the intersection of the cursors is averaged and measured.

13.4.7 Configuring User-Defined Correction Tables

The default gamma correction value when measuring f Stop levels is 0.45, but you can also use a user-defined gamma correction table that matches the gamma characteristics of the camera that you are using.

There are two types of user-defined correction tables. The first type consists of tables that are created using the LV 5490 and is made up of the USER1 to USER3 tables. The second type consists of tables that have been created externally using a device such as a PC and is made up of the USER_A to USER_E tables. These tables are not deleted even if you initialize the LV 5490.

- Creating User-Defined Correction Tables Using the LV 5490.

You can create and store up to three user-defined correction tables on the LV 5490.

As an example, the following procedure shows how to create a user-defined correction table that matches a camera's gamma characteristics.

Set the camera's f Stop value to F5.6 beforehand, and put an 18 % gray chart in the area that you will film.

1. Adjust the lighting so that the displayed luminance level of the 18 % gray chart is 45.0 % (for example) on a camera whose f Stop value is set to F5.6.

For details, see section 13.4.3, "%DISPLAY Screen Description."

2. Press F•7 up menu.
3. Press F•1 CINELITE DISPLAY to select f Stop.
4. Press F•2 f Stop SETUP.
5. Press F•5 GAMMA and then F•1 GAMMA SELECT to select USER1.

In this example, explanation will be given for USER-1, but USER2 and USER3 can also be created in the same way.

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6. Press **F•2** GAMMA CAL.

When you press **F•2** GAMMA CAL, a user-defined correction table appears in the bottom left of the screen, and the luminance level appears as a 10-bit value (0 % is displayed as 64, and 100 % is displayed as 940) close to the cursor. This setting is available when **F•1** GAMMA SELECT is set to an option from USER1 to USER3.



Figure 13-20 User-defined correction table creation screen

7. Press **F•1** TABLE CLEAR.

All the values in the user-defined correction table that is currently being edited are initialized. Be sure to initialize the values first when you create a new user-defined correction table.

8. Press **F•1** CLEAR YES.

To cancel the initialization of a user-defined correction table, press **F•3** CLEAR NO.

9. Place the cursors over the 18 % gray chart.

10. Press **F•4** CAL F, and select 5.6.

11. Press **F•3** CAL SET

The luminance level when the camera f Stop value is F5.6 is input into Lev in the user-defined correction table. To delete a line of data, press **F•2** 1 DATA CLEAR.

12. Change **F•4** CAL F and the camera f Stop value together in the following order: 4.0, 2.8, 2.0, 8.0, 11.0, 16.0, 22.0. Press **F•3** CAL SET each time you change the value to input the luminance level for each value.

Do not change the lighting or the position of the 18 % gray chart.

Also, make sure that the Lev value for f Stop values 22.0 to 2.0 increases linearly.

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The REF value in the user-defined correction table is entered when you press **F•4** 18% REF-SET on the f Stop display.

For example, if you use the left-hand table shown below and press **F•4** 18% REF-SET when the luminance value at the intersection of the cursors is 416 (10-bit value), the f Stop value at that point (3.0) is displayed as the REF value.

[USER1] REF=0.0				[USER1] REF=3.0		
CAL_F	F	Lev		CAL_F	F	Lev
[22.0]	0.0,	152		[22.0]	0.0,	152
[16.0]	1.0,	240		[16.0]	1.0,	240
[11.0]	2.0,	328		[11.0]	2.0,	328
[8.0]	3.0,	416	→	[8.0]	3.0,	416
[5.6]	4.0,	504		[5.6]	4.0,	504
[4.0]	5.0,	592		[4.0]	5.0,	592
[2.8]	6.0,	680		[2.8]	6.0,	680
[2.0]	7.0,	768		[2.0]	7.0,	768

Figure 13-21 User-defined correction tables

When the above user-defined correction tables are used, f Stop values are indicated as shown below. The values between specified values are interpolated linearly.

When Lv = 152 f Stop = -3.0
 When Lv = 240 f Stop = -2.0
 When Lv = 328 f Stop = -1.0
 When Lv = 416 f Stop = 0.0
 When Lv = 504 f Stop = 1.0
 When Lv = 592 f Stop = 2.0
 When Lv = 680 f Stop = 3.0
 When Lv = 768 f Stop = 4.0

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- Loading a User-Defined Correction Table into the LV 5490

You can load up to five user-defined correction tables into the LV 5490.

To load a user-defined correction table into the LV 5490, follow the procedure below.

1. Create a user-defined correction table.

Example (TEST.CLT)

#####	Comment
NAME:SAMPLE_1	Keyword
TYPE:0	Keyword
#Input -7% 0	Comment
# 109% 4095	Comment
#Output 0% 0	Comment
# 1000% 65535	Comment
#Input Output	Comment
#####	Comment
0 0	Data
1 16	Data
2 32	Data
(Omitted)	
4093 65488	Data
4094 65504	Data
4095 65520	Data
# EOF	Comment

When you create a correction table, make sure that it conforms to the specifications listed below.

Overall File Specifications

File Type:	ASCII text file
Extension:	.CLT
End-of-Line Character:	CR+LF
Number of Lines:	5000 or less
Number of Characters per Line:	255 or less (including CR+LF)
File Name Length:	20 characters or less (excluding the extension)
Permitted File Name Characters:	Letters of the alphabet (A to Z; uppercase and lowercase), numerals (0 to 9), and underscores (_).

Comment Specifications

If you start a line with the number sign (#), the line is treated as a comment and does not affect operations. You can put comments anywhere.

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Keyword Specifications

Be sure to put the keyword lines before the data lines and to enter a keyword without anything preceding it at the beginning of each keyword line.

NAME: The LV 5770A/7770 displays the eight characters that follow the separator (colon) as the name of the correction table. After the separator, enter the correction table name using letters of the alphabet (A to Z; uppercase and lowercase), numbers (0 to 9), and underscores (_). You can enter up to 10 characters.

TYPE: This is a code for identifying the file type. Enter a zero after the separator (colon).

Data Specifications

From the start of a line, enter the input value, a separator, and then the output value, in that order.

Input Value: Enter values from 0 to 4095 (12 bits), increasing the value by one for each line.

A luminance level of 100 % is defined as $940 \text{ (10 bits)} \times 4 = 3760 \text{ (12 bits)}$.

A luminance level of 0 % is defined as $64 \text{ (10 bits)} \times 4 = 256 \text{ (12 bits)}$.

Separator: Enter a single tab code.

Output Value: Enter a value from 0 to 65535 (16 bits).

2. Save the user-defined correction table to USB memory, and connect the USB memory to the LV 5490.

Save the correction table in the following directory.

```
└─ USB memory
   └─ LV5490_USER
      └─ CLT
         └─ TEST.CLT (for example)
```

3. Press PIC.
4. Press F•4 CINELITE.
5. Press F•1 CINELITE DISPLAY to select f Stop.
6. Press F•2 f Stop SETUP.
7. Press F•5 GAMMA and then F•1 GAMMA SELECT to select USER_A.

In this example, a user-defined correction table is copied to USER_A, but user-defined correction tables can be copied to USER_B through USER_E in the same way.

8. Press F•2 GAMMA FILE.

This setting is available when F•1 GAMMA SELECT is set to an option from USER_A to USER_E.

9. Press F•1 FILE LIST.

The file list screen appears. This setting appears when USB memory is connected.

To clear the table that has been copied to USER_A, press F•2 TABLE CLEAR.

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10. Use function dial (F•D) to select the file to copy from the USB memory.

11. Press **F•3** FILE LOAD

The user-defined correction table that you selected is copied from the USB memory to USER_A. The copy operation is complete when the file list screen disappears and the display returns to the measurement screen.

If a file has already been stored to USER_A, an overwrite confirmation prompt appears. If you want to overwrite the current file, press **F•1** OVER WR YES. Otherwise, press **F•3** OVER WR NO.

After you have copied a user-defined correction table, you can select it by pressing **F•1** GAMMA SELECT on the CINELITE menu. A loaded correction table is displayed using the name determined by its NAME keyword.

13.4.8 Displaying Synchronized Markers

To synchronize the markers on the vector display and video signal waveform display to measurement points P1 to P3 and REF that you specify on the CINELITE display, follow the procedure below. Synchronized markers can be displayed only when an f Stop screen or %DISPLAY screen is shown in the same multi-screen display.

Markers cannot be displayed on the video signal waveform display under the following conditions.

- When SWEEP is set to V or H SWEEP is set to 2H in the video signal waveform menu
- When COLOR MATRIX in the video signal waveform menu is COMPOSIT

Marker display will not work properly when waveforms are being displayed using an external sync signal.

Procedure

PIC → **F•4** CINELITE → **F•4** CINELITE ADVANCE: OFF / ON

CINELITE ADVANCE = ON

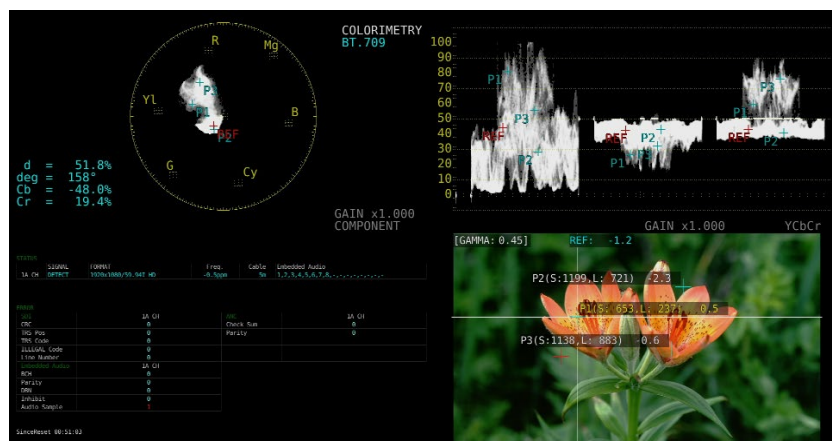


Figure 13-22 Displaying synchronized markers

13.5 Configuring CINEZONE Settings

The CINEZONE display has a gradation (step) display mode, in which the picture luminance levels are converted into RGB colors and displayed and a search display mode, in which the specified luminance level is displayed using green.

To set either of these modes, on the picture menu, press **F•4** CINELITE and then **F•2** CINEZONE SETUP.

Reference CINEZONE SETUP → section 13.3.3, "Configuring CINELITE Settings."

13.5.1 Gradation Display Mode

To display picture luminance levels through color gradation, follow the procedure below. In the gradation display mode, luminance levels are displayed using 1024 colors.

The picture is displayed such that luminance levels above **F•2** UPPER are displayed using white, and levels below **F•3** LOWER are displayed using black.

You can see what colors correspond to what luminance levels by looking at the scale on the right of the display.

If **F•2** UPPER is 1 % greater than **F•3** LOWER and you lower the value of **F•2** UPPER, the value of **F•3** LOWER is automatically lowered to maintain a difference of 1 % between the two values. In the same way, if you raise the value of **F•3** LOWER, the value of **F•2** UPPER is automatically raised to maintain a difference of 1 % between the two values.

F•2 UPPER and **F•3** LOWER appear when you set **F•1** CINEZONE FORM to GRADATE or STEP.

Procedure

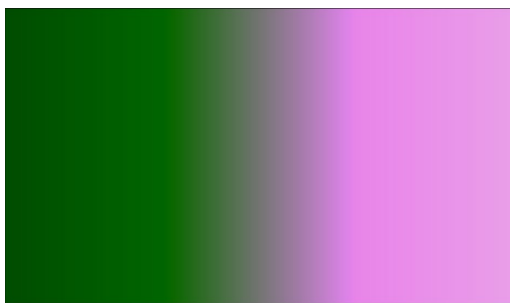
PIC → **F•4** CINELITE → **F•1** CINELITE DISPLAY → **F•2** CINEZONE SETUP → **F•1**

CINEZONE FORM to select GRADATE

→ **F•2** UPPER: -6.3 - 100.0 - 109.4

→ **F•3** LOWER: -7.3 - 0.0 - 108.4

Picture Display



Gradation Display (0% = B, 50% = G, 100% = R)

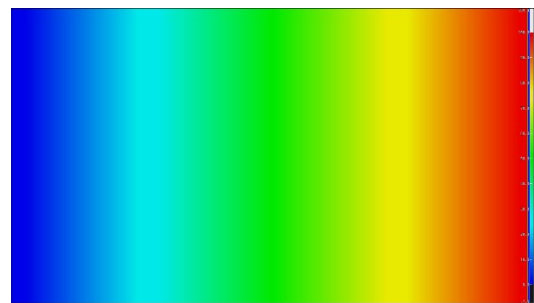


Figure 13-23 Gradation display

13.5.2 Step Display Mode

To display picture luminance levels in steps, follow the procedure below.

In the step display mode, luminance levels are divided into 10 % steps and assigned to 12 different colors. For information about **F•2** UPPER and **F•3** LOWER, see section 13.5.1, "Gradation Display Mode."

Procedure

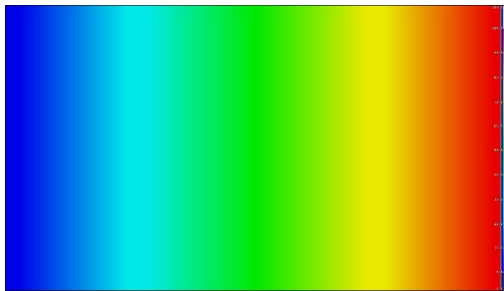
PIC → **F•4** CINELITE → **F•1** CINELITE DISPLAY → **F•2** CINEZONE SETUP → **F•1**

CINEZONE FORM to select STEP

→ **F•2** UPPER

→ **F•3** LOWER

CINEZONE FORM = GRADATE



CINEZONE FORM = STEP

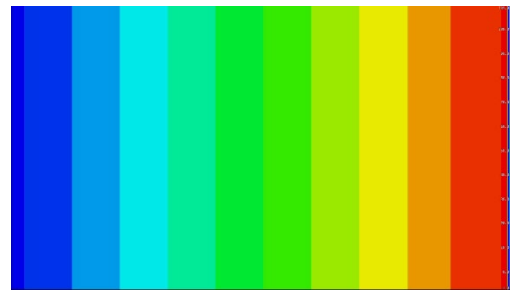


Figure 13-24 Step display

13.5.3 Search Display Mode

In the search display mode, the specified luminance level $\pm 0.5\%$ is displayed using green on an otherwise monochrome picture display.

The picture is displayed such that luminance levels at and above **F•2** UPPER are displayed using red, and levels below **F•3** LOWER are displayed using blue.

To set the level that is displayed using green, follow the procedure below.

F•2 LEVEL appears when **F•1** CINEZONE FORM is set to SEARCH.

F•2 UPPER and **F•3** LOWER appear when **F•1** CINEZONE FORM is set to GRADATE or STEP. For details, see section 13.5.1, "Gradation Display Mode."

Procedure

PIC → **F•4** CINELITE → **F•1** CINELITE DISPLAY → **F•2** CINEZONE SETUP → **F•1**
 CINEZONE FORM to select SEARCH
 → **F•2** LEVEL: -7.3 - 40.0 - 109.4

CINEZONE FORM = SEARCH

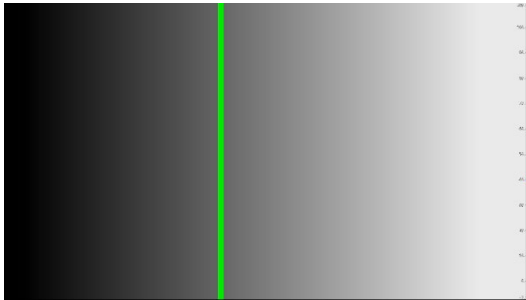


Figure 13-25 Search display

13.6 Focus Assist Display (SER04)

The focus assist display makes it easy to verify the focus by highlighting the image according to the amount of detected edges.

To configure the focus assist settings, press **F•5** FOCUS on the PIC menu.

This menu item does not appear when SIZE is set to FULL FRM.

Reference SIZE → Section 13.8.1, "Selecting the Display Size"

PIC → **F•5** FOCUS →

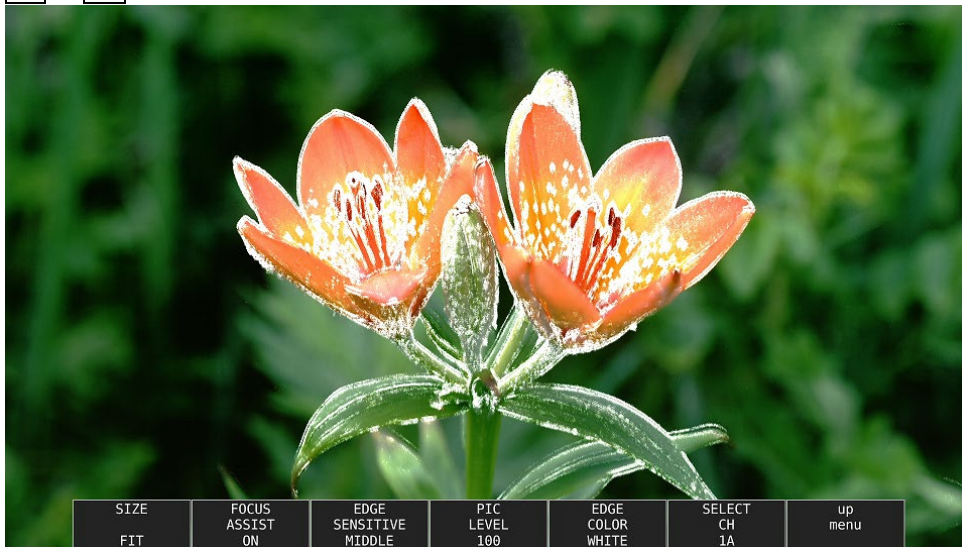


Figure 13-26 Focus assist display

13.6.1 Selecting the Display Size

To select the picture display size, follow the procedure shown below.

See section 13.8.1, "Selecting the Display Size."

Procedure

PIC → **F•5** FOCUS → **F•1** SIZE: FIT / REAL / X2

13.6.2 Turning Focus Assist On and Off

To turn the focus assist display on and off, follow the procedure below.

Procedure

PIC → **F•5** FOCUS → **F•2** FOCUS ASSIST: ON / OFF

13.6.3 Selecting the Detection Sensitivity

When **F•2** FOCUS ASSIST is set to ON, to select the edge detection sensitivity, follow the procedure below.

Procedure

PIC → **F•5** FOCUS → **F•3** EDGE SENSITIVE: LOW / MIDDLE / HIGH / V-HIGH / U-HIGH

13.6.4 Selecting the Luminance Level

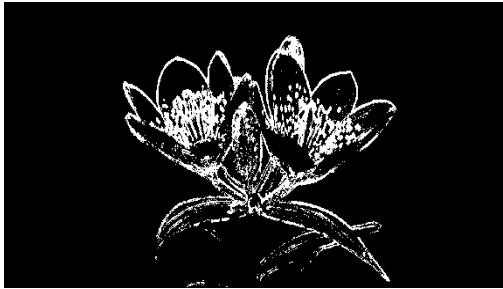
When **F•2** FOCUS ASSIST is set to ON, to select the picture luminance level as a percentage, follow the procedure below.

Select OFF to hide the picture. Select EMBOSS to emboss the edges.

Procedure

PIC	→	F•5	FOCUS	→	F•4	PIC LEVEL: OFF / EMBOSS / 25 / 50 / 75 / <u>100</u>

PIC LEVEL = OFF



PIC LEVEL = EMBOSS



Figure 13-27 Selecting the luminance level

13.6.5 Selecting the Highlight Color

When **F•4** PIC LEVEL is 25, 50, 75, or 100, to select the edge display color, follow the procedure below.

Procedure

PIC	→	F•5	FOCUS	→	F•5	EDGE COLOR: <u>WHITE</u> / RED / GREEN / BLUE

13.7 Video Noise Meter (SER10)

The video noise meter measures the noise included in the Y, G, B, or R signal of the SDI signal applied to the LV 5490 and displays it on the picture.

To configure the video noise meter, press **F•4** NOISE SETUP and **F•5** NOISE STOP/START on the PIC menu.

This menu item does not appear when the SER10 is not installed.

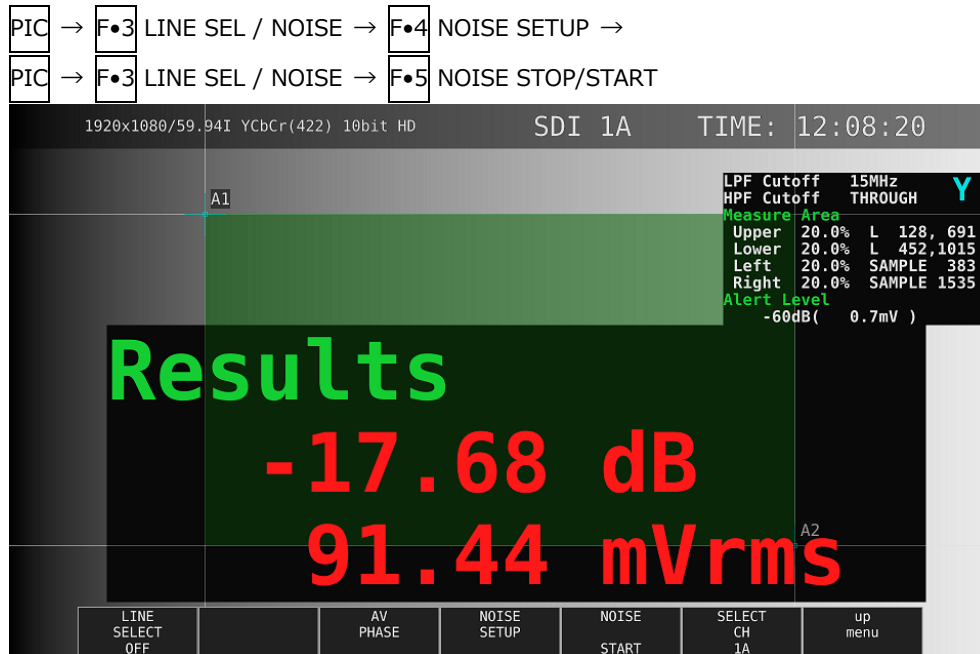


Figure 13-28 Video Noise Meter

13.7.1 Turning Video Noise Meter On and Off

To turn the Video Noise Meter on and off, follow the procedure below.

Procedure

PIC → **F•3** LINE SEL / NOISE → **F•5** NOISE: STOP / START

Settings

STOP: Indicates that the video noise meter is off. Press **F•5** to turn on the video noise meter.

START: Indicates that the video noise meter is on. Press **F•5** to turn off the video noise meter.

13.7.2 Configuring the Measurement Window

To display a window for measuring video noise on the picture display, follow the procedure below. The size and area can be set in units of pixels and lines.

The green area defined by the diagonally opposite cursors A1 and A2 becomes the measurement window.

Set this with the video noise meter turned on.

Procedure

PIC → F•3 LINE SEL / NOISE → F•4 NOISE SETUP
→ F•1 CURSOR CH: A1 / A2 / TRACK / OFF

Settings

A1:	Select cursor A1 for setting the measurement window. Use the V POS and H POS knobs to adjust the position of the cursor.
A2:	Select cursor A2 for setting the measurement window. Use the V POS and H POS knobs to adjust the position of the cursor.
TRACK:	Moves the measurement window. Use the V POS and H POS knobs to adjust the positions of cursors A1 and A2 simultaneously.
OFF:	Turns off the cursor A1 and A2 display.



Figure 13-29 Measurement Window

- * Set the measurement window in an area where the average video level is uniform. If you include dark areas in the video caused by the effect of the lens or areas where the video signal of the object is not flat, accurate video noise measurement may not be possible.
- * There may be cases in which accurate video noise measurement is not possible due to overshooting, undershooting, or ringing occurring in the rising or falling edges of the waveform depending on the input video signal. If this happens, set the measurement window a few percent inside of the rising or falling section.

13. PICTURE DISPLAY

13.7.3 Selecting the Signal to Measure

To select the signal to measure, follow the procedure below.

Procedure

PIC	→	F•3	LINE SEL / NOISE	→	F•4	NOISE SETUP	→	F•2	SIGNAL: <u>Y</u> / G / B / R

13.7.4 Selecting the Filter

To set the cutoff frequencies of the low-pass filter and high-pass filter, follow the procedure below.

Procedure

PIC	→	F•3	LINE SEL / NOISE	→	F•4	NOISE SETUP	→	F•3	FILTER
→	F•1	LPF:	5.5MHz / 4.4MHz / 3.6MHz / 2.7MHz / 1.4MHz / 0.7MHz / THROUGH						
→	F•1	LPF:	30MHz / 24MHz / 20MHz / 15MHz / 7.5MHz / 3.7MHz / THROUGH						
→	F•1	LPF:	60MHz / 48MHz / 40MHz / 30MHz / 15MHz / 7.5MHz / THROUGH						
→	F•1	LPF:	120MHz / 96MHz / 80MHz / 60MHz / 30MHz / 15MHz / THROUGH						
→	F•1	LPF:	240MHz / 192MHz / 160MHz / 120MHz / 60MHz / 30MHz / THROUGH						
→	F•1	LPF:	0.404 / 0.323 / 0.269 / 0.202 / 0.101 / 0.0505 / THROUGH (*1)						
→	F•2	HPF:	OFF / ON						

*1 When the input format cannot be detected, a normalized frequency is displayed.

* The cutoff frequencies of the low-pass filter and high-pass filter vary depending on the input format.
For details, see section 7.1.5, "Configuring HDR (SER07)."

13.7.5 Selecting the Measurement Result Display Size

To select the measurement result display size, follow the procedure below.

Procedure

PIC	→	F•3	LINE SEL / NOISE	→	F•4	NOISE SETUP
→	F•4	RESULTS SIZE:	SMALL / LARGE			

RESULTS SIZE = SMALL



RESULTS SIZE = LARGE

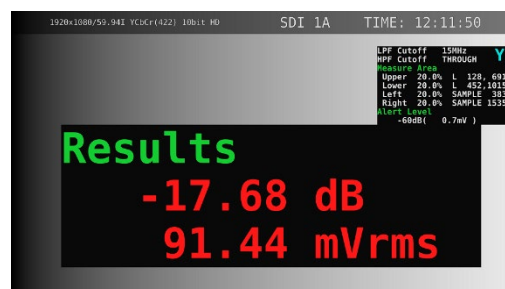


Figure 13-30 Selecting the Measurement Result Display Size

13.7.6 Turning the Alart Function On and Off

To turn the alert function on and off, follow the procedure below.

When set to on, **F•2** ALART LEVEL appears, and you can set the threshold of the alert function.

Procedure

PIC → **F•3** LINE SEL / NOISE → **F•4** NOISE SETUP
 → **F•5** ALART → **F•1** ALART UNIT: OFF / ON

13.7.7 Setting the Threshold of the Alarm Function

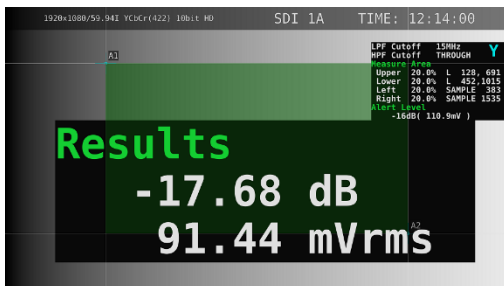
When the alert function is on, to set the threshold of the alert function, follow the procedure below.

When the measurement result is greater than or equal to the specified threshold, the measurement result display turns red.

Procedure

PIC → **F•3** LINE SEL / NOISE → **F•4** NOISE SETUP
 → **F•5** ALART → **F•2** ALART LEVEL: -80dB (0.1mV) – 0dB (700.0mV)

When the measurement result is less than the threshold



When the measurement result is greater than or equal to the threshold

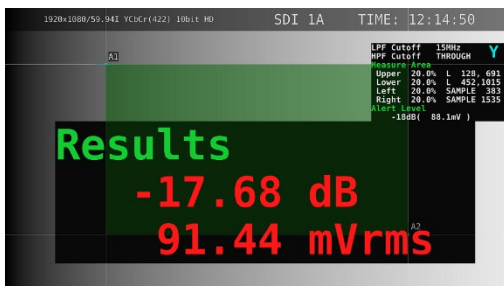


Figure 13-31 Alart display

13.8 Configuring the Display Settings

To configure the display settings, press **F•7** DISPLAY on the PIC menu.

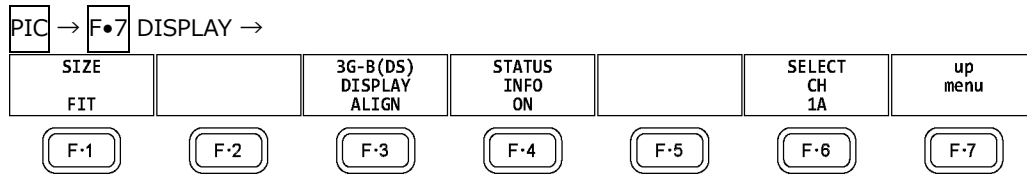


Figure 13-32 DISPLAY menu

13.8.1 Selecting the Display Size

To select the picture display size, follow the procedure shown below.

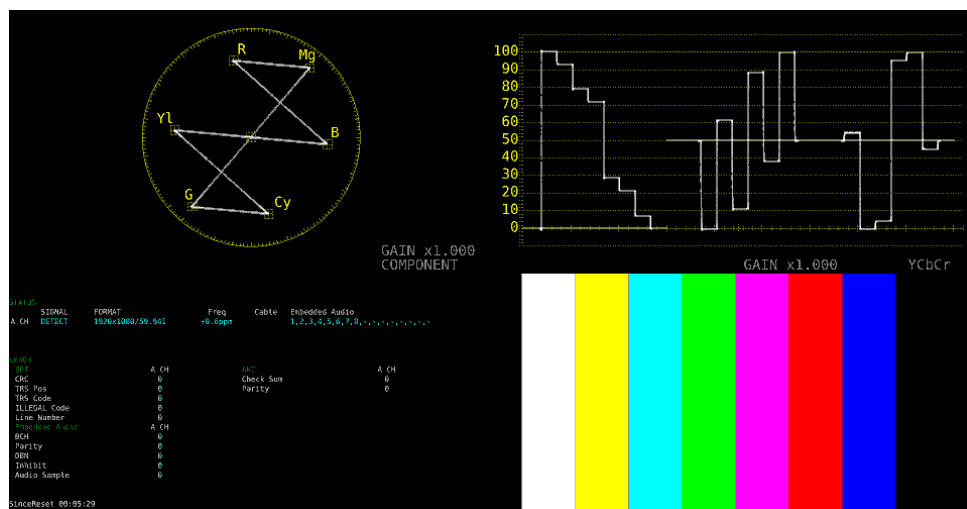
Procedure

PIC → **F•7** DISPLAY → **F•1** SIZE: FIT / REAL / X2 / FULL FRM

Settings

FIT:	The picture is displayed at the optimal size for the display area. Because the picture is enlarged or reduced, the display may become coarse or pixels may drop out. The LV 5490SER01 and LV 5490SER02 use simple filtering to enlarge and reduce the picture.
REAL:	A single sample of the video signal is displayed with a single pixel on the screen. If the picture is larger than the display area, use the V•POS and H•POS knobs to adjust the picture display position. Press a knob to return the picture to the corresponding default location.
X2:	A single sample of the video signal is displayed with 4 pixels (2 horizontal and 2 vertical pixels) on the screen. If the picture is larger than the display area, use the V•POS and H•POS knobs to adjust the picture display position. Press a knob to return the picture to the corresponding default location.
FULL FRM:	A single frame, including the blanking interval, is displayed.

SIZE = FIT



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SIZE = REAL

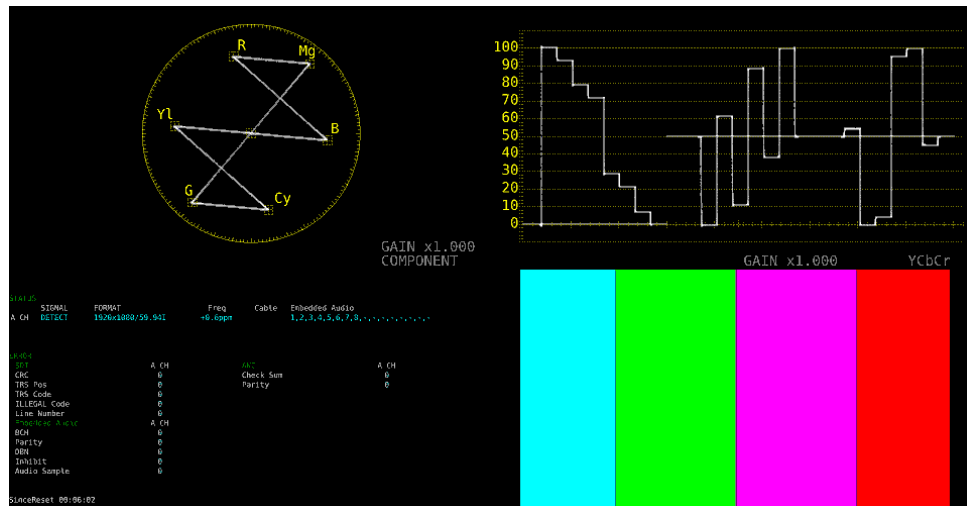


Figure 13-33 Selecting the display size

13.8.2 Gamut Error Display

To display the locations of gamut errors and luminance errors on the picture, follow the procedure below.

These errors are defined by the ranges that you specify by setting Gamut Upper and Gamut Lower, Composite Upper and Composite Lower, and Luminance Upper and Luminance Lower in the status menu. If Gamut Error, Composite Gamut Error, or Level Error is set to OFF, the corresponding errors are not displayed.

Reference Gamut Upper/Lower, Composite Upper/Lower → Section 16.2.3, “Error Setup 3”, Section 16.2.4, “Error Setup 4”

Procedure

PIC	→	F•7	DISPLAY	→	F•2	GAMUT ERR DISP: <u>OFF</u> / WHITE / RED / MESH

Settings

OFF:	Gamut errors are not displayed.
WHITE:	The picture intensity is halved, and gamut error are marked in white.
RED:	The picture intensity is halved, and gamut error are marked in red.
MESH:	Gamut errors are marked with a mesh pattern.

13.8.3 Turning the Information On and Off

To turn on and off the display of the following information that you arranged in the layout, follow the procedure below.

This setting is valid on the display that appears when PIC is pressed. For multi display and other displays, it is fixed to ON.

- Sub tab items (FORMAT, INPUT, TIME, DATE)
- Option tab options (Format, Input, Time)

Procedure

PIC	→	F•7	DISPLAY	→	F•4	STATUS INFO: <u>ON</u> / OFF

STATUS INFO = ON

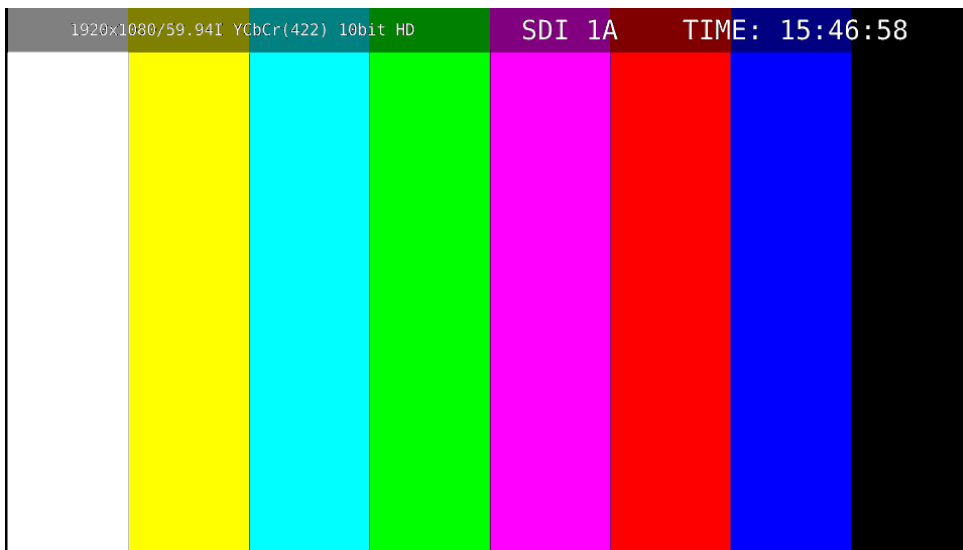


Figure 13-34 Turning the information on and off

13.8.4 Configuring the 3G-B-DS Display Settings

When measuring 3G-B-DS, to select the display mode, follow the procedure below.

Procedure

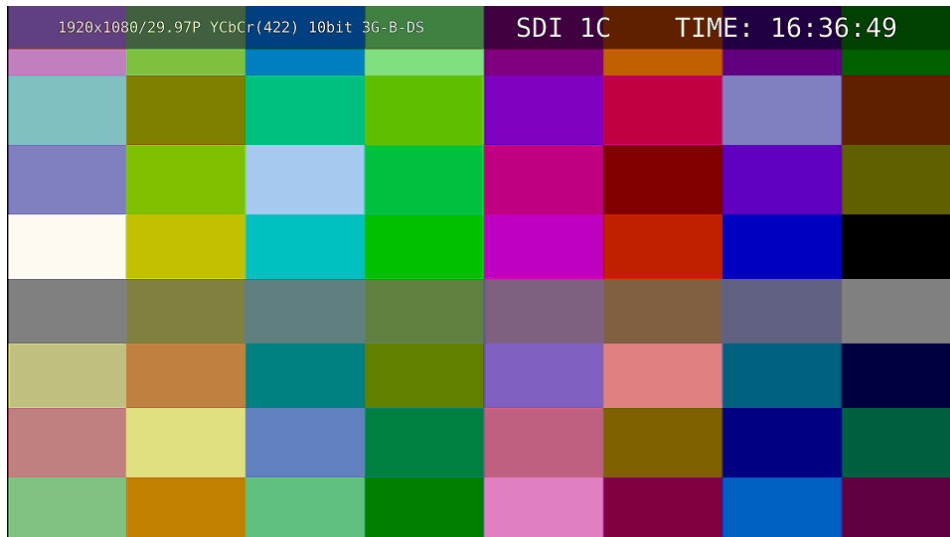
PIC	→	F•7	DISPLAY	→	F•3	3G-B-DS DISPLAY: STREAM1 / STREAM2 / MIX / <u>ALIGN</u>

Settings

STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
MIX:	Streams 1 and 2 are displayed on top of each other.
ALIGN:	Streams 1 and 2 are displayed side by side.

13. PICTURE DISPLAY

3G-B-DS DISPLAY = MIX



3G-B-DS DISPLAY = ALIGN

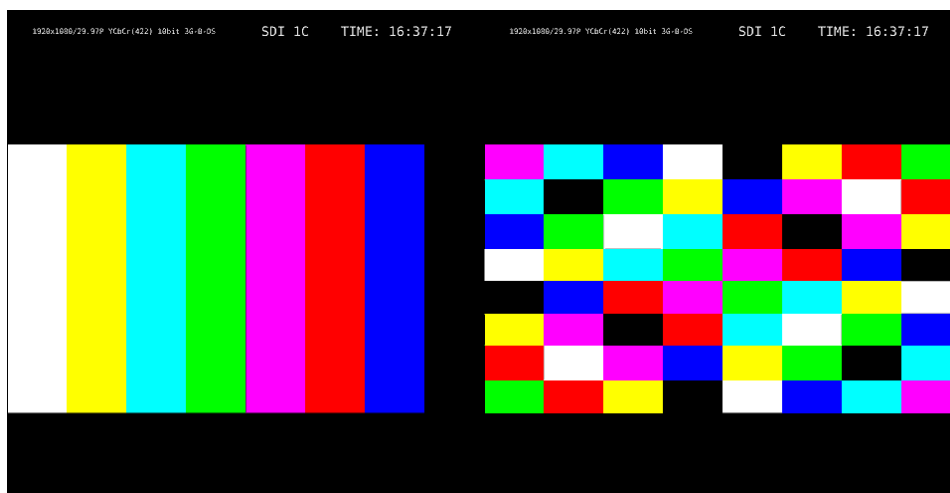


Figure 13-35 Configuring the 3G-B-DS display settings

14. HDR DISPLAY (SER07)

You can measure HDR signals by installing SER07. HDR signal measurement supports all formats except for SD and XYZ.

To measure HDR signals, on the **SYS** → **F.1** SIGNAL IN OUT → HDR tab, set HDR MODE to ON. If necessary, set the STANDARD, HDR->SDR HIGH UPPER LIMIT, SYSTEM GAMMA (OOTF) and REFERENCE LEVEL parameters. For details, see section 7.1.5, "Configuring HDR (SER07)."

When HDR measurement is turned on, the following occurs.

When 5-bar display, gamut error display on the picture, gamut error display on the status, composite gamut error display, luminance level error, or chrominance level error turns on, the SDR conversion format selection is reduced to DISABLE only. If the SDR conversion format is set to a value other than DISABLE, it is changed to DISABLE.



Figure 14-1 HDR tab

14.1 Video Signal Waveform Display

On the video signal waveform display, scales and cursors for HDR signals can be displayed.

14.1.1 Scale Display

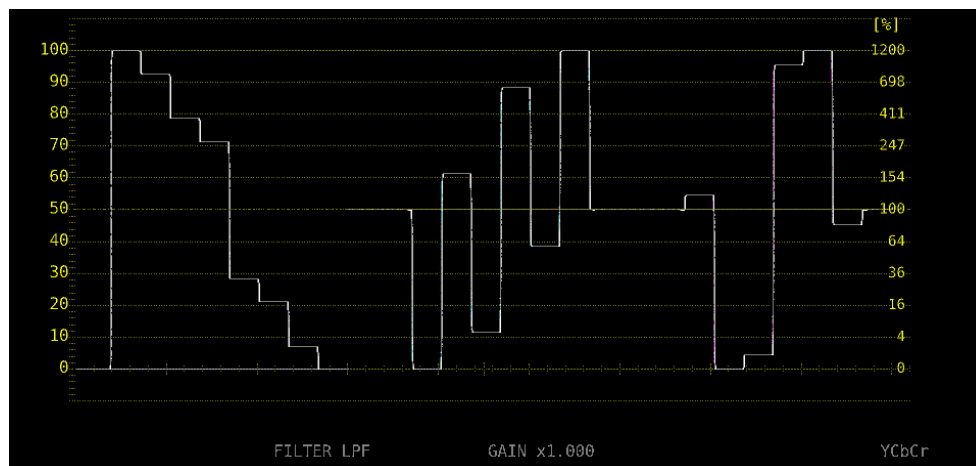
During HDR measurement, a scale corresponding to the HDR signal is displayed on the right side of the video signal waveform.

The scale on the right side varies as follows depending on the STANDARD and SYSTEM GAMMA (OOTF) parameters of the HDR tab.

- When STANDARD is HLG and
 - SYSTEM GAMMA (OOTF) is OFF: 0 to 100 [%] is displayed as 0 to 1200 [%].
 - SYSTEM GAMMA (OOTF) is ON: 0 to 100 [%] is displayed as 0 to 1000 [cd/m²].
- When STANDARD is PQ:
 - 0 to 100 [%] is displayed as 0 to 10000 [cd/m²].
(If the scale unit is 1023,255 and 0 to 100 [%] is set to 64 to 940, 4 to 1019 is displayed as 0 to 10000 [cd/m²])
- When STANDARD is S-Log3 and
 - SYSTEM GAMMA is OFF: If 0 to 100 [%] is set to 64 to 940, 95 to 940 is displayed as 0 to 2055 [%].
 - SYSTEM GAMMA is ON: 0 to 100 [%] is displayed as 0 to 3000 [cd/m²].

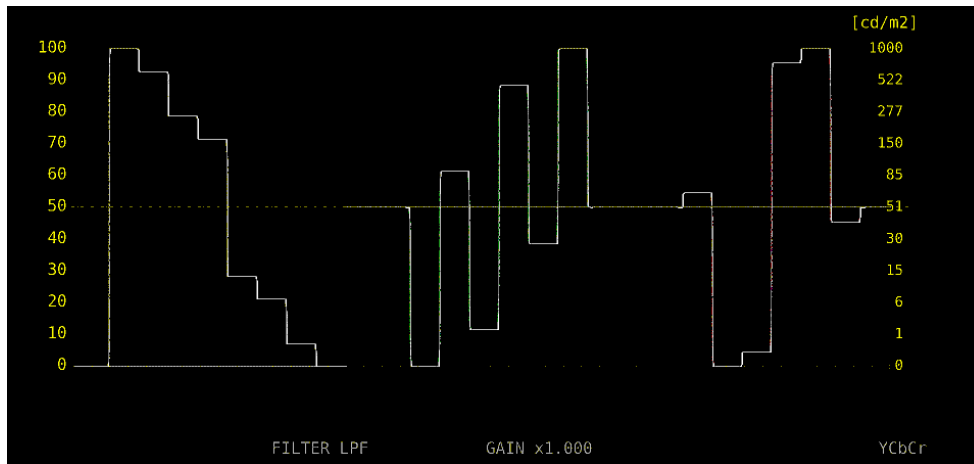
If GAIN VARIABLE is set to VARIABLE or if COLOR MATRIX is set to COMPOSITE, the scale on the right side will not appear.

STANDARD = HLG, SYSTEM GAMMA (OOTF) = OFF

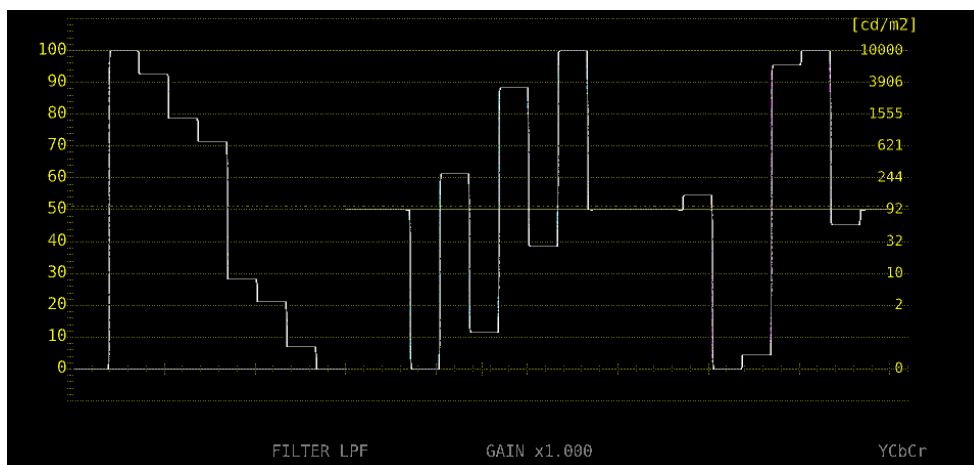


14. HDR DISPLAY (SER07)

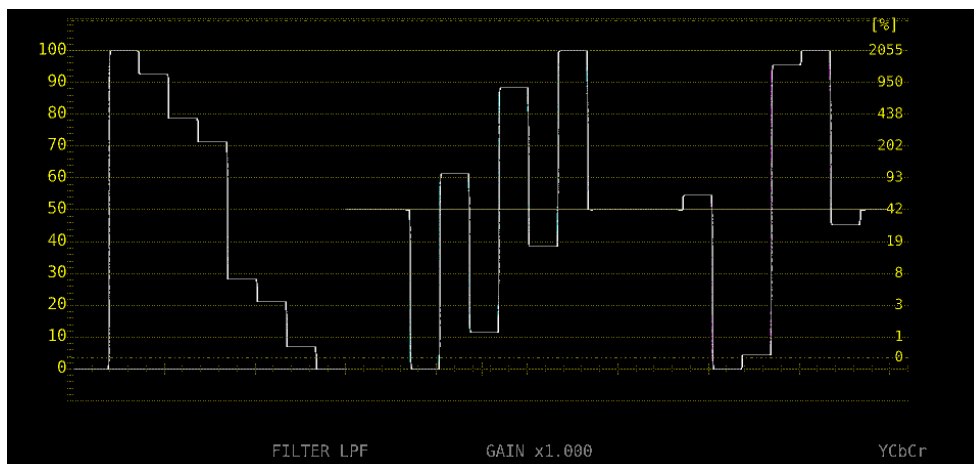
STANDARD = HLG, SYSTEM GAMMA (OOTF) = ON



STANDARD = PQ



STANDARD = S-Log3, SYSTEM GAMMA (OOTF) = OFF



14. HDR DISPLAY (SER07)

STANDARD = S-Log3, SYSTEM GAMMA (OOTF) = ON

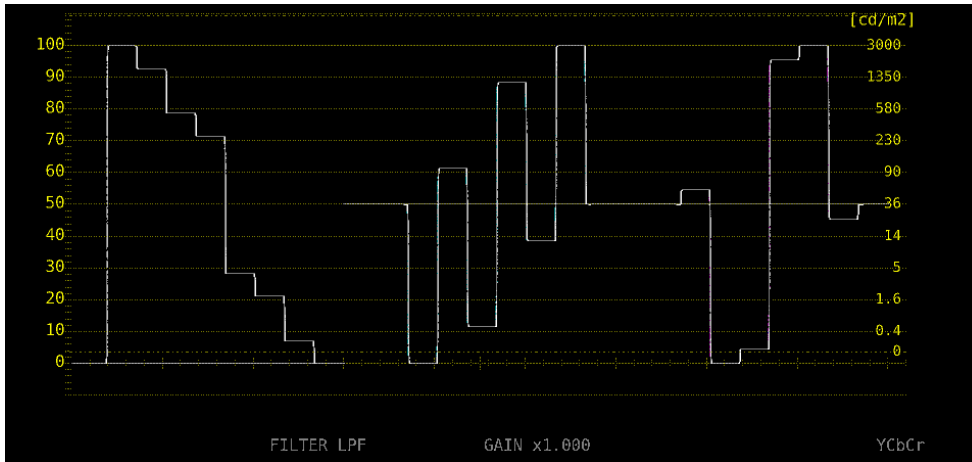


Figure 14-2 Scale display

14.1.2 Cursor Display

During cursor measurement, to display measured values for HDR signals, follow the procedure below.

The unit of measurement is % when on the HDR tab, STANDARD is HLG or S-Log3 and SYSTEM GAMMA (OOTF) is OFF and cd/m2 when STANDARD is HLG or S-Log3 and SYSTEM GAMMA (OOTF) is ON or when STANDARD is PQ.

If GAIN VARIABLE is set to VARIABLE or if GAIN MAG is set to X5, measured values for HDR signals will not be displayed even when HDR is selected. The display will be the same as when Y UNIT is set to mV.

Procedure

WFM	→	F•5	CURSOR	→	F•3	Y UNIT: HDR

Y UNIT = HDR

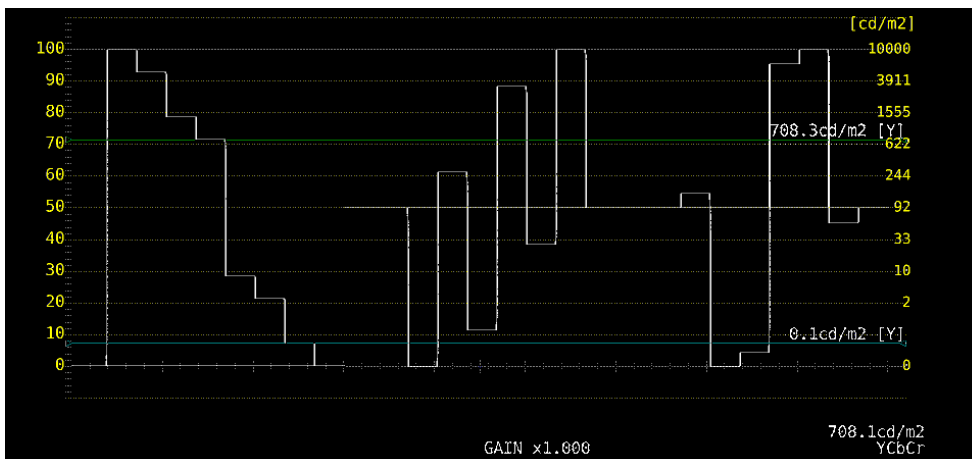


Figure 14-3 Cursor display (PQ)

14.2 Vector Waveform Display

On the vector display, a histogram for HDR signals can be displayed.

14.2.1 Histogram Display

During histogram display, to select the horizontal scale, follow the procedure below.

Procedure

VECT	→	F•1	SCALE →	F•3	HIST SCALE: % / HDR

The scale when HDR is selected varies depending on the settings on the HDR tab and HDR->SDR of the PIC menu.

Table 14-1 Histogram scale

		HDR->SDR		
		NORMAL	HIGH	DISABLE
HDR tab	HLG	0 to 100 [%]	0 to 1200 [%]	0 to 1200 [%]
	PQ	10000cd/m2	0 to 100 [cd/m2]	0 to 10000 [cd/m2]
		4000cd/m2	0 to 100 [cd/m2]	0 to 10000 [cd/m2]
		1000cd/m2	0 to 100 [cd/m2]	0 to 10000 [cd/m2]
	S-Log3	0 to 100 [%]	0 to 4000 [%]	0 to 2043 [%]

HIST SCALE = HDR

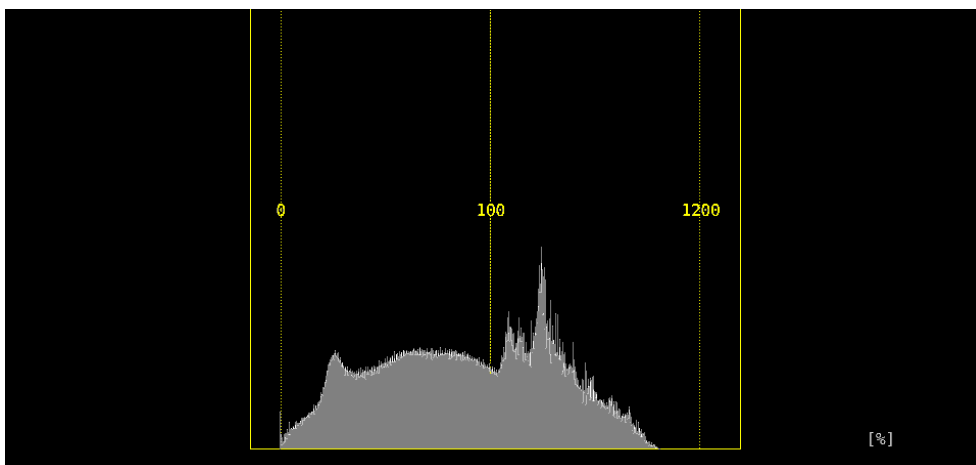


Figure 14-4 Histogram display (HLG)

14.3 Picture Display

On the picture display, CINELITE and CINEZONE for HDR signals can be displayed.
During HDR measurement **F•4** CINELITE of the PIC menu changes to **F•4** CINELITE/HDR.
You can use this to display CINELITE and CINEZONE.

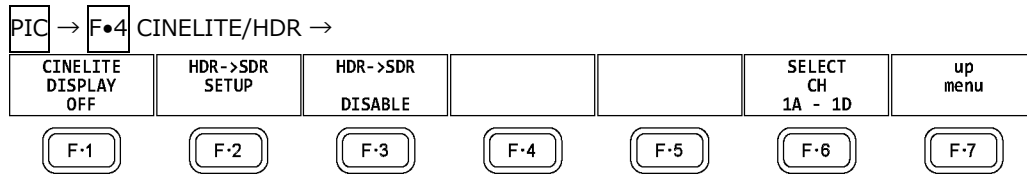


Figure 14-5 CINELITE/HDR menu

14.3.1 Turning Brightness Information On and Off

If ON is selected in the following procedure, the maximum brightness (MAX), minimum brightness (MIN), and average brightness (AVG) are displayed at the top of the screen. In addition, on the CINEZONE display, the HDR equivalents of the display color settings are displayed in the upper left corner of the screen.

Procedure

PIC → **F•4** CINELITE/HDR
 → **F•2** HDR->SDR SETUP → **F•5** BRIGHTNESS INFO: OFF / ON (Normal display)
 → **F•2** f Stop SETUP → **F•5** BRIGHTNESS INFO: OFF / ON (f Stop screen)
 → **F•2** %DISPLAY SETUP → **F•5** BRIGHTNESS INFO: OFF / ON (%DISPLAY screen)
 → **F•2** CINEZONE SETUP → **F•5** BRIGHTNESS INFO: OFF / ON (CINEZONE display)

BRIGHTNESS INFO = ON

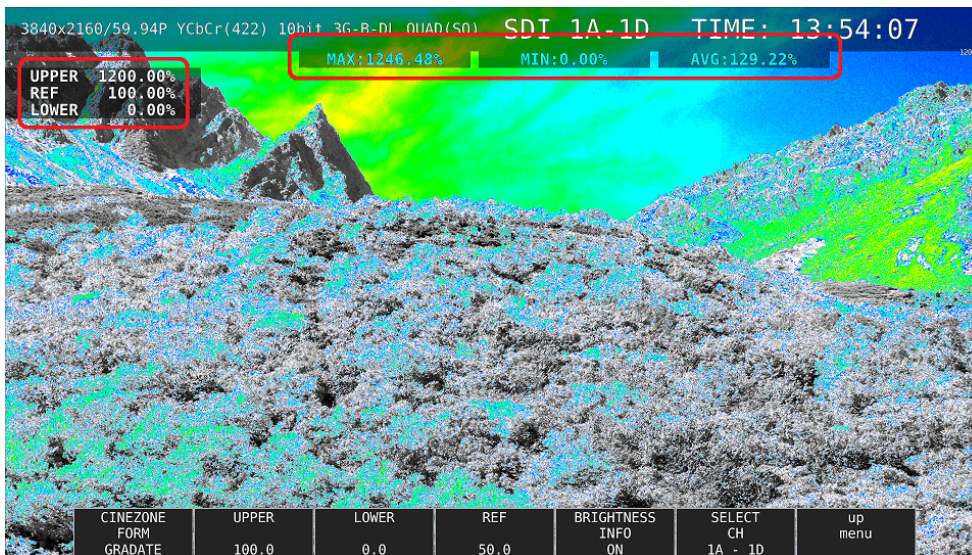


Figure 14-6 Turning brightness information on and off

14.3.2 Selecting the SDR Conversion Format

To select the conversion format for converting HDR signals to SDR signals, follow the procedure below.

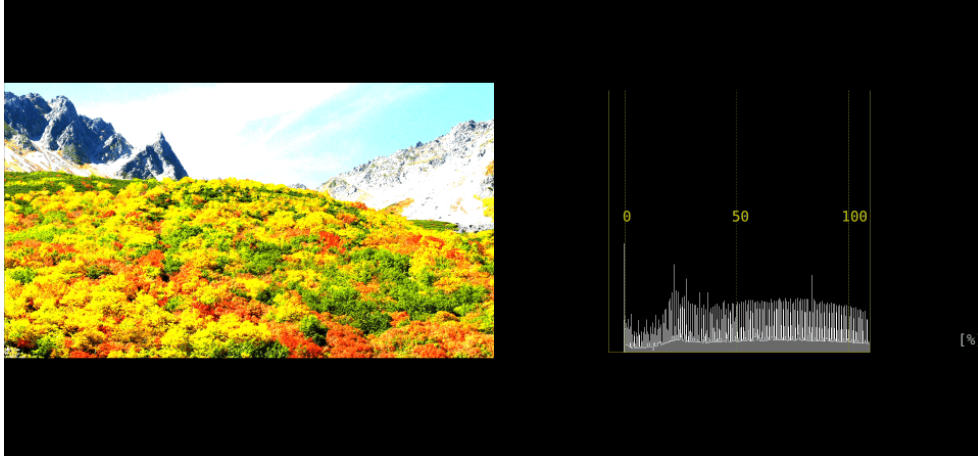
Procedure

PIC	→	F•4	CINELITE/HDR	→	F•3	HDR->SDR: NORMAL / HIGH / <u>DISABLE</u>

Settings

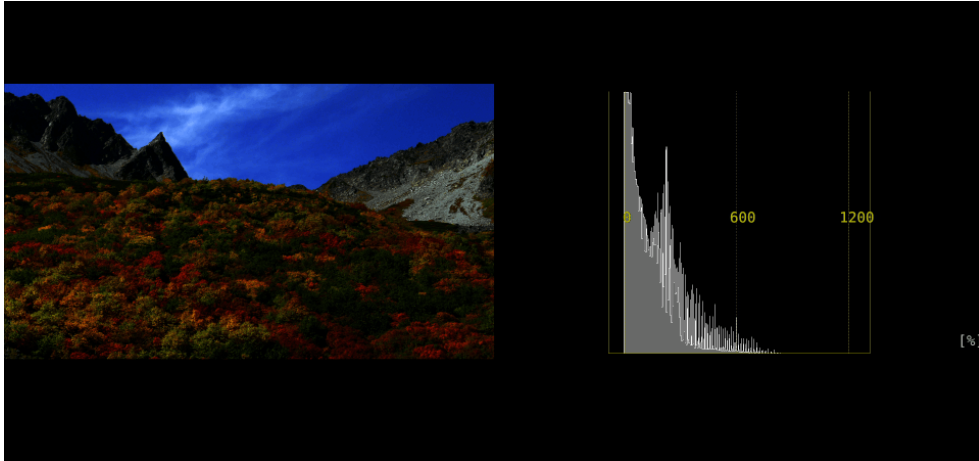
NORMAL:	HDR signals are converted into linear signals, and the SDR area is displayed. This option cannot be selected for CINEZONE display. This cannot be selected when 5-bar display, gamut error display on the picture, gamut error display on the status, composite gamut error display, luminance level error, or chrominance level error turns on.
HIGH:	HDR signals are converted into linear signals, and all areas are displayed. However, if STANDARD on the HDR tab is PQ, brightness up to the level specified by HDR->SDR HIGH UPPER LIMIT is displayed. This option cannot be selected for CINEZONE display. This cannot be selected when 5-bar display, gamut error display on the picture, gamut error display on the status, composite gamut error display, luminance level error, or chrominance level error turns on.
DISABLE:	The HDR signal is displayed as-is.

HDR->SDR = NORMAL



14. HDR DISPLAY (SER07)

HDR->SDR = HIGH



HDR->SDR = DISABLE

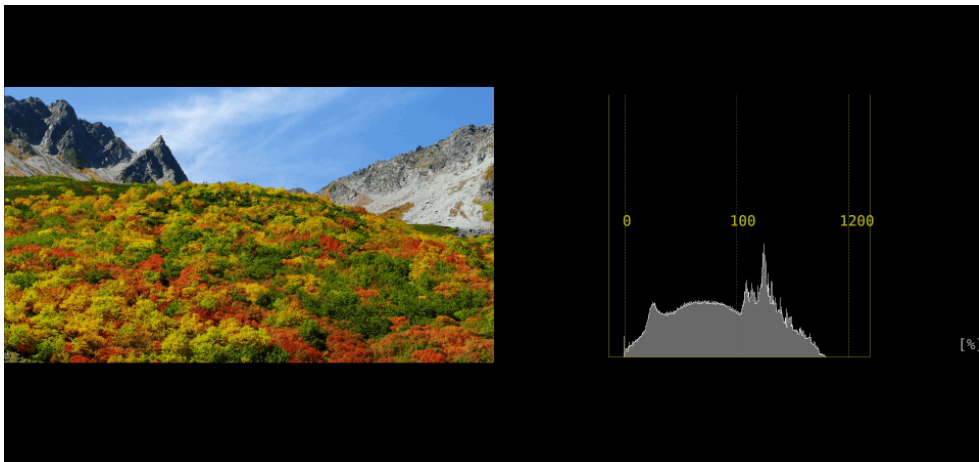


Figure 14-7 Selecting the SDR conversion format

14. HDR DISPLAY (SER07)

14.3.3 f Stop Screen

In the f Stop display of HDR signal, HLG, PQ, or S-Log3 is displayed for GAMMA in the upper left corner of the screen depending on the standard selected with STANDARD on the HDR tab. In addition, even if the brightness level is 80% or higher, measured values are displayed in white, not yellow.

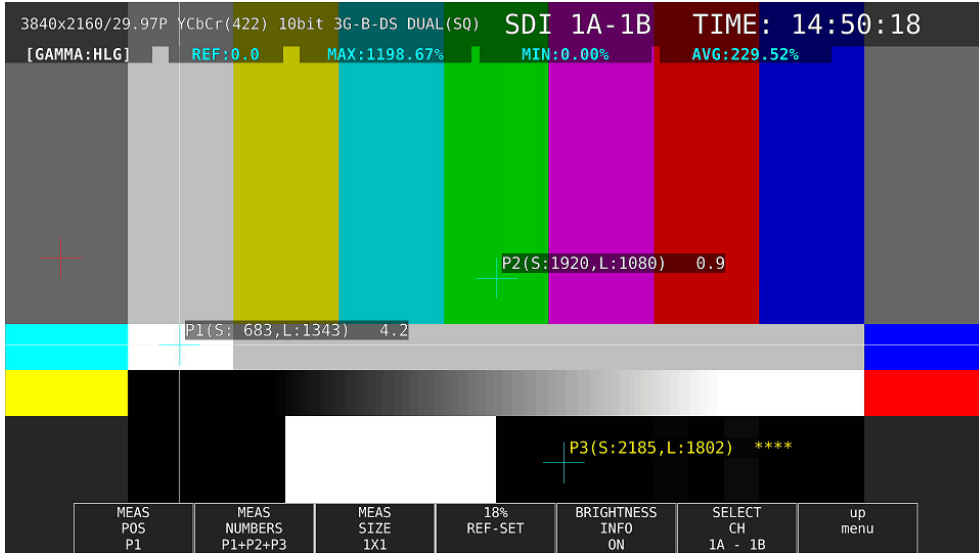


Figure 14-8 f Stop screen

14.3.4 %DISPLAY Screen

On the %DISPLAY of HDR signals, to display measured values for HDR signals, follow the procedure below. In addition, even if the brightness level is 80% or higher or 0% or lower, measured values are displayed in white, not yellow.

Procedure

PIC	→	F•4	CINELITE/HDR	→	F•2	%DISPLAY SETUP	→	F•4	UNIT SELECT: HDR

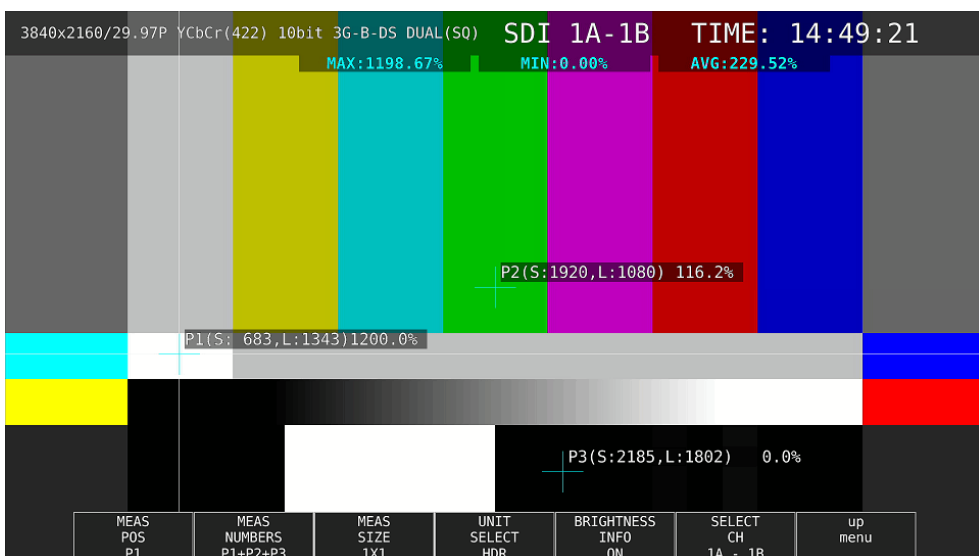


Figure 14-9 %DISPLAY screen

14. HDR DISPLAY (SER07)

14.3.5 CINEZONE Display

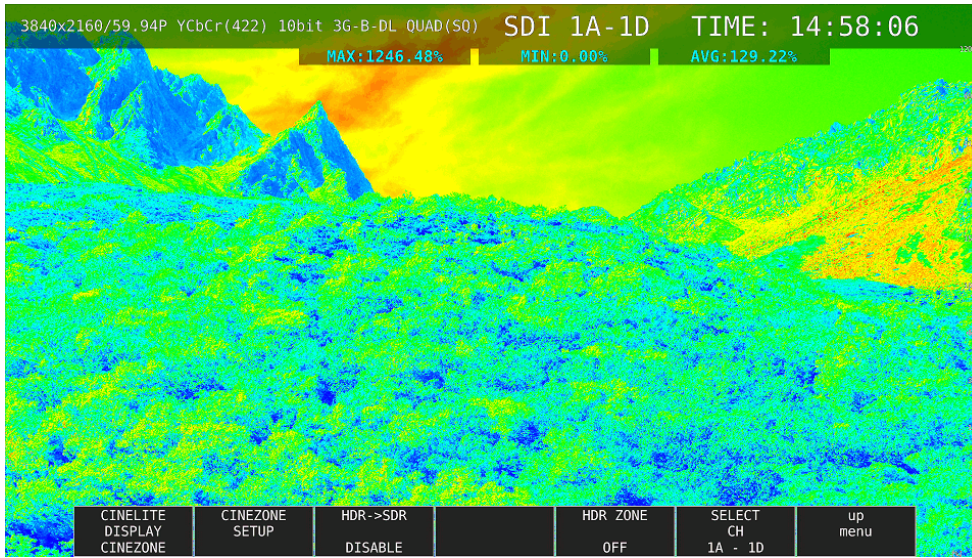
On the CINEZONE display of HDR signals, to display the SDR area in monochrome and HDR area in color, follow the procedure below to select ON.

Note that if **F•5** HDR ZONE is set to ON, STEP and SEARCH cannot be selected for **F•1** CINEZONE FORM.

Procedure

PIC → **F•4** CINELITE/HDR → **F•5** HDR ZONE: ON / OFF

HDR ZONE = OFF



HDR ZONE = ON

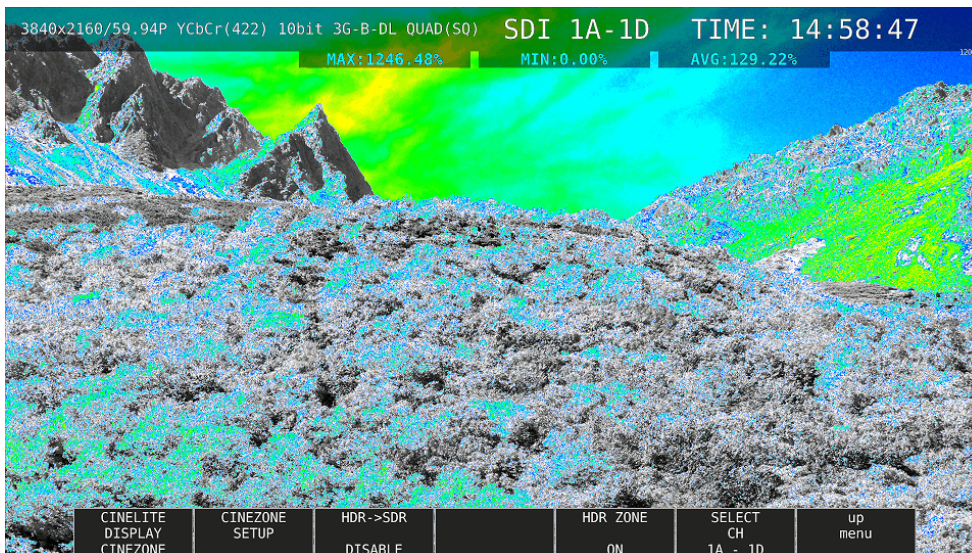


Figure 14-10 CINEZONE display

14. HDR DISPLAY (SER07)

To set the display colors, follow the procedure below. If you set REF at boundary of the SDR area and HDR area, the SDR area can be displayed in monochrome and HDR area in color.

UPPER or higher: magenta
 REF or higher, UPPER or lower: Gradation from blue to red
 LOWER or higher, REF or lower: monochrome
 LOWER or lower: black

Procedure

PIC → F•4 CINELITE/HDR → F•2 CINEZONE SETUP
 → F•2 UPPER
 → F•3 LOWER
 → F•4 REF

The values vary depending on the HDR tab settings as follows.

Set the values as percentages of the input video level. If F•5 BRIGHTNESS INFO is set to ON, HDR equivalent values are displayed in the upper left corner of the screen.

Table 14-2 Display color values

		Setting range	UPPER Default	LOWER Default	REF Default
HDR tab	HLG	0.0 to 100.0	100.0	0.0	50.0
	PQ	10000cd/m2	100.0	0.0	50.8
		4000cd/m2	90.0	0.0	50.8
		1000cd/m2	75.2	0.0	50.8
	S-Log3	3.5 to 109.4	100.0	3.5	61.0

15. AUDIO DISPLAY

To display audio, press AUDIO.

On the audio display, embedded audio signals applied to SDI INPUT and external audio signals applied to DIGITAL AUDIO INPUT can be measured. DIGITAL AUDIO INPUT can be used as output terminals by switching AUDIO IN/OUT in the system settings.

When measuring embedded audio, switching to simul mode enables SDI inputs A to D to be displayed in combination with the audio. (They can be displayed even if **F•1** 1A(2A) to **F•4** 1D(2D) on the INPUT menu are set to OFF.)

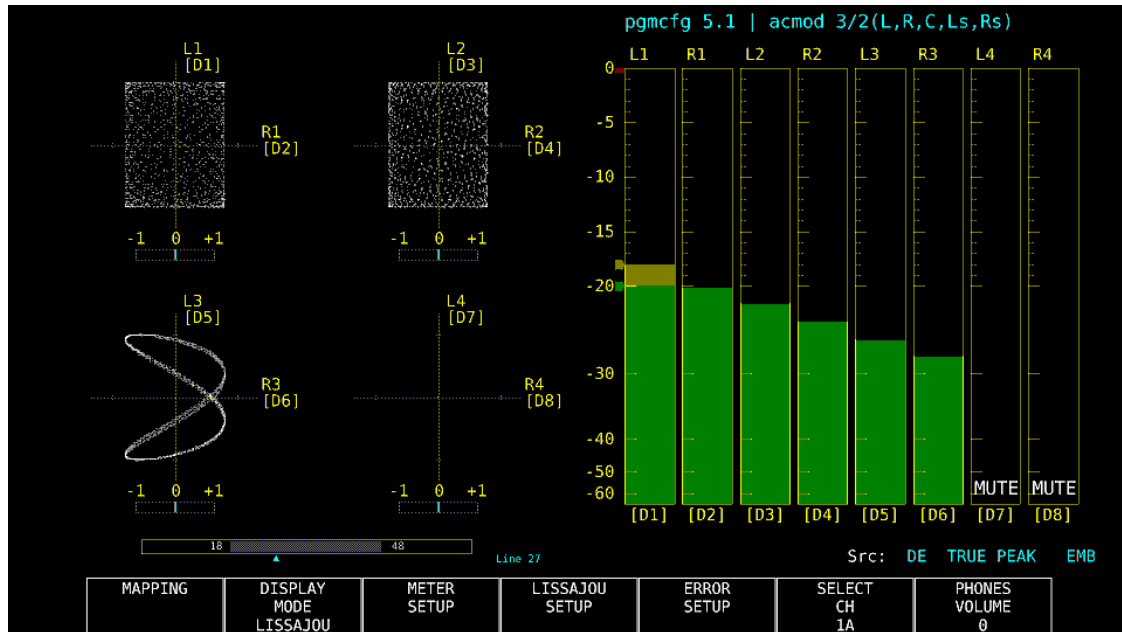


Figure 15-1 Audio display

- Indicators (option)

During Dolby E measurement, set Dolby E LINE POSITION on the DOLBY SETTING tab to ON to display the frame location value with a line and ▲ below the Lissajous and surround displays. These are normally shown in cyan, but when the value exceeds the specified threshold, they turn red.

- pgmcfgr, acmod (option)

During Dolby measurement, the program configuration and audio configuration mode are displayed in the upper right of the screen.

15. AUDIO DISPLAY

● Src

The Src line in the lower right of the display shows the following information in order from the left.

Table 15-1 Src explanation

	Display	Description	Reference
1. Input signal display	AES	Dolby off	15.1
	DE	Dolby E (option)	
	DD	Dolby Digital (option)	
	DDP	Dolby Digital Plus (option)	
2. Meter response model display	TRUE PEAK / PPM(I) / PPM(II) / VU+TRUE / VU+PPM(I) / VU+PPM(II)	-	0
3. Measurement signal display	EMB	Embedded audio	15.1
	AES	External audio	

15.1 Setting the Signals to Measure

To set the signal to measure, follow the procedure below.
Here you can select input signals and assign channels.

Procedure

AUDIO → F•1 MAPPING

AUDIO MAPPING DOLBY SETTING

INPUT ☒ SDI ☐ EXT AUDIO
3G-B STREAM SELECT LINK SELECT

DOLBY ☒ OFF ☐ ON
MIX ☒ OFF ☐ ON
DECODE CH GROUP

CH MODE ☒ 8ch ☐ 16ch

GROUP SELECT
1st GROUP 2nd GROUP 3rd GROUP 4th GROUP

EXT AUDIO INPUT GROUP

LISSAJOU MAPPING

SINGLE L R

MULTI 1st GROUP L1 R1 L2 R2
2nd GROUP L3 R3 L4 R4
3rd GROUP L5 R5 L6 R6
4th GROUP L7 R7 L8 R8

SURROUND L R C LFE
Ls Rs Lt/Lo(LL) Rt/Ro(RR)

PHONES L R

Figure 15-2 AUDIO MAPPING tab

15. AUDIO DISPLAY

Table 15-2 AUDIO MAPPING tab explanation

Item	Description
INPUT	Set the input signal to SDI or EXT AUDIO. If both Audio BNC settings are set to Output in the system settings, you cannot select EXT AUDIO. SDI: The embedded audio signal applied to SDI INPUT is measured. EXT AUDIO: The external audio signal applied to DIGITAL AUDIO INPUT is measured.
3G-B STREAM SELECT	If INPUT is set to SDI, select the 3G-B stream. This is invalid when the input signal is not 3G-B.
LINK SELECT	If INPUT is set to SDI and multi link or 12G is used, select the link.
DOLBY (option)	During single input mode, turn the Dolby signal measurement on or off. When turned on, Dolby E, Dolby Digital and Dolby Digital Plus are automatically detected and measured.
MIX (option)	When DOLBY is set to ON, turn mix mode on or off. For details, see the next section, "Mix mode."
DECODE CH GROUP (option)	When DOLBY is set to ON, select the decode channel. If INPUT is set to SDI and MIX is set to OFF, CH9/10 to CH15/16 cannot be selected.
CH MODE	Select the number of measurement channels. If INPUT is set to EXT AUDIO and if either Audio BNC setting is set to Output in the system settings, you cannot select 16ch.
GROUP SELECT	Select the audio group. If INPUT is set to SDI in simul mode, also select the input channel. (G1: 1 to 4ch, G2: 5 to 8ch, G3: 9 to 12ch, G4: 13 to 16ch)
EXT AUDIO INPUT GROUP	If INPUT is set to EXT AUDIO and if both Audio BNC settings are set to Input in the system settings, select the input group.
LISSAJOU MAPPING	Assign channels from the audio group selected with GROUP SELECT and Lt and Rt (excluding some channels).
SURROUND	Assign channels from the audio group selected with GROUP SELECT.
PHONES	Assign channels from the audio group selected with GROUP SELECT and Lt and Rt (excluding some channels).

15. AUDIO DISPLAY

- Mix mode

Mix mode is a feature that simultaneously displays the audio signal before decoding and the Dolby signal after decoding. The measurement signal varies as follows depending on the INPUT and MIX settings.

- When INPUT is set to SDI and MIX is set to OFF

Channels selected using DECODE CH GROUP are decoded and displayed as channels D1 to D8.

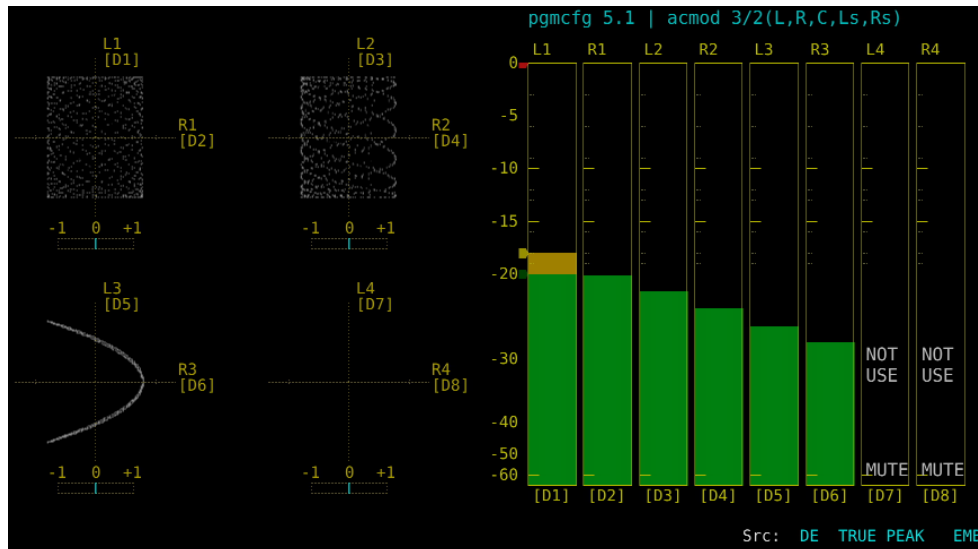


Figure 15-3 EMB Dolby display

- When INPUT is set to SDI and MIX is set to ON

The left half shows the embedded audio signals of the channels selected with GROUP SELECT.

The right half shows channels D1 to D8, which are the decoded signals of the channels selected using DECODE CH GROUP.

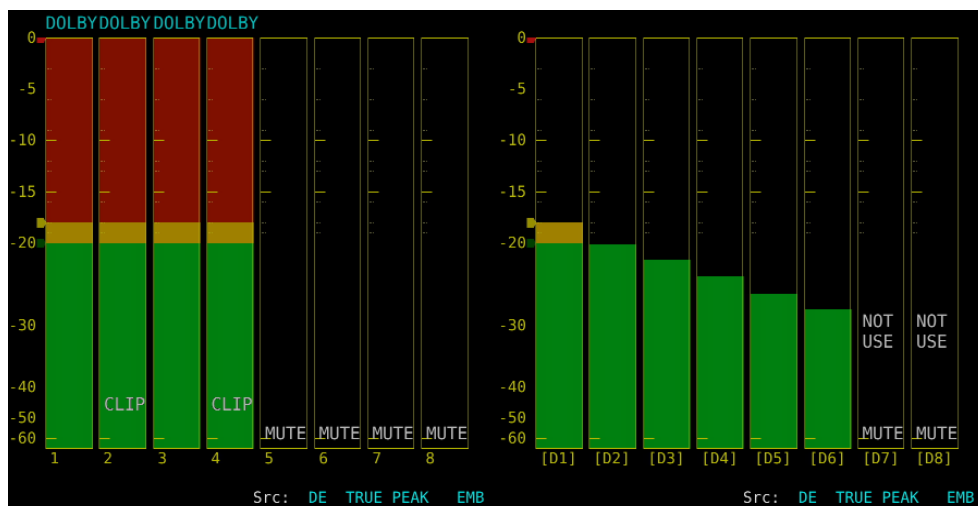


Figure 15-4 EMB Dolby display (MIX)

15. AUDIO DISPLAY

- When INPUT is set to EXT AUDIO and MIX is set to OFF

Channels selected using DECODE CH GROUP are decoded and displayed as channels D1 to D8.

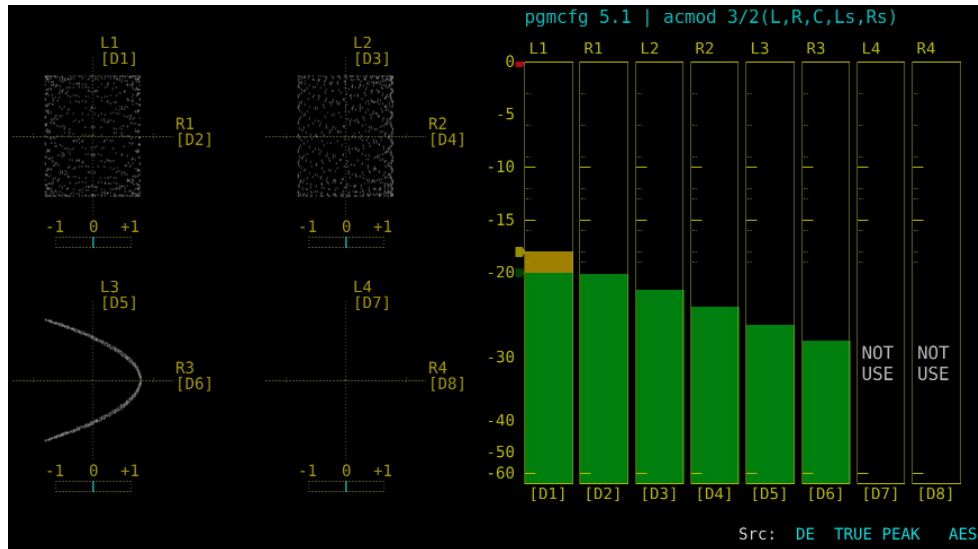


Figure 15-5 AES Dolby display

- When INPUT is set to EXT AUDIO and MIX is set to ON

The left half shows the external audio signals of the group selected with EXT AUDIO INPUT GROUP.

The right half shows channels D1 to D8, which are the decoded signals of the channels selected using DECODE CH GROUP.

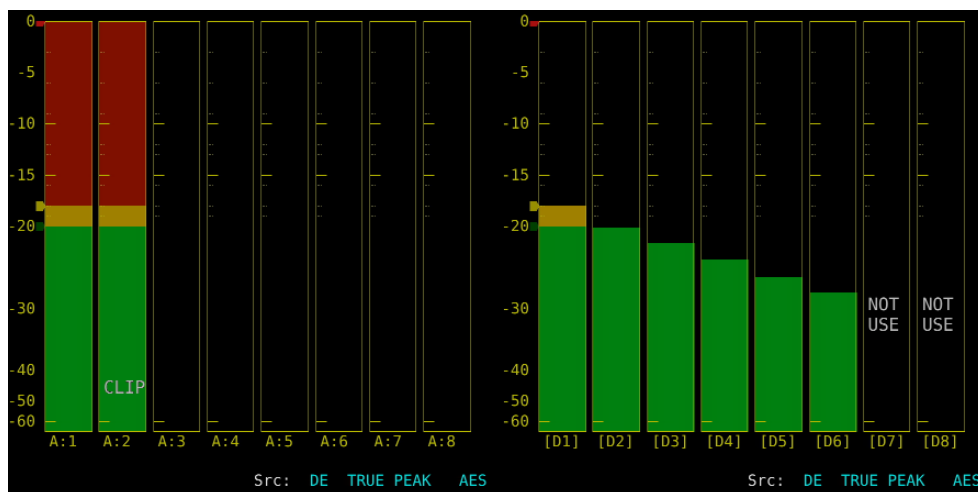


Figure 15-6 AES Dolby display (MIX)

15.2 Configuring the Dolby Settings (option)

When DOLBY is set to ON, to configure the Dolby settings, follow the procedure below.

Procedure

AUDIO	→	F•1	MAPPING	→	F•3	MAPPING

AUDIO MAPPING
DOLBY SETTING

Dolby E

ONAIR MODE OFF

DRC MAIN CH BYPASS

DRC AUX CH BYPASS

Dolby E LINE POSITION OFF

SELECT CUSTOM

AC-3

DRC MAIN CH LINE

DRC AUX CH LINE

Pro Logic OFF

DOWNMIX AUTO

EARLIEST 8

LATEST 105

Figure 15-7 DOLBY SETTING tab

Table 15-3 DOLBY SETTING tab explanation

Item		Description
Dolby E	ONAIR MODE	Turn ONAIR MODE on or off.
	DRC MAIN CH	Select DRC.
	DRC AUX CH	Select auxiliary DRC.
	Dolby E LINE POSITION	Turns the frame location indicator display on and off.
	SELECT	Select the type of frame location threshold value. The lower limit (EARLIEST) and upper limit (LATEST) when VALID or IDEAL is selected automatically change depending on the format. If you select CUSTOM, you can specify a value between 8 and 105.
AC-3 (Dolby Digital)	DRC MAIN CH	Select DRC.
	DRC AUX CH	Select auxiliary DRC.
	Pro Logic	Turn Pro Logic II on or off.
	DOWNMIX	Select the downmix mode.

15.3 Selecting the Display Mode

To select the display mode, follow the procedure below.

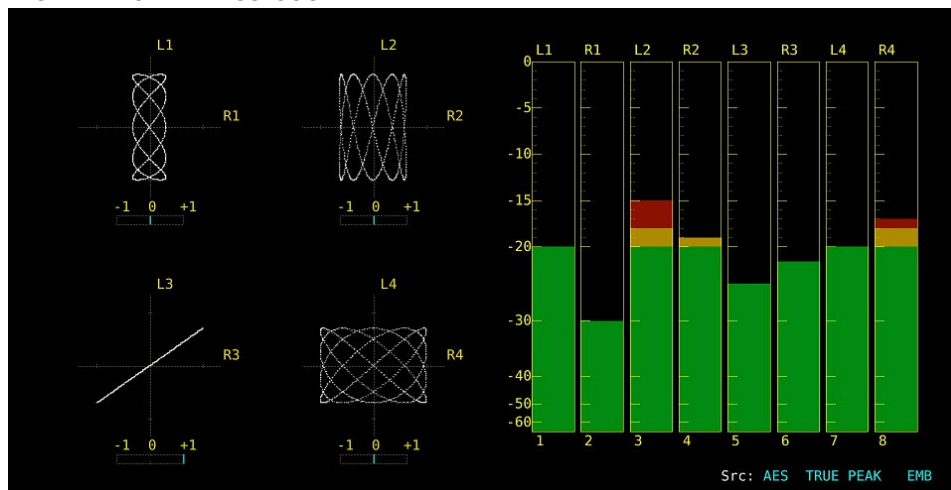
Procedure

AUDIO	→	F•2	DISPLAY MODE: <u>LISSAJOU</u> / METER / SURROUND / STATUS

Settings

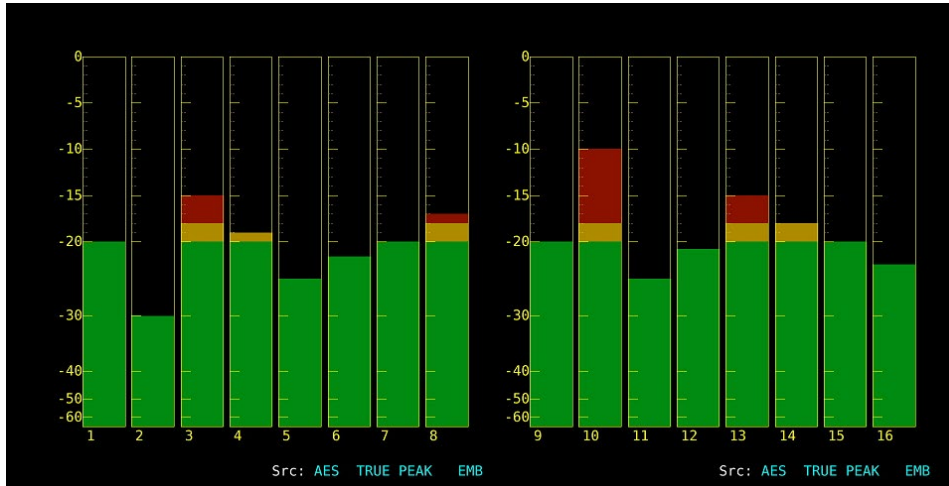
- LISSAJOU:** The Lissajous curves are displayed. During 8-channel measurement, audio meters are also displayed.
- METER:** The audio meters are displayed. This option cannot be selected during 8-channel measurement.
- SURROUND:** The surround display is shown on the left side of the screen, and the audio meter is displayed on the right side of the screen.
This option cannot be selected in simul mode when measuring 16 channels or embedded audio.
- STATUS:** The status is displayed. During 8-channel measurement, audio meters are also displayed.

DISPLAY MODE = LISSAJOU

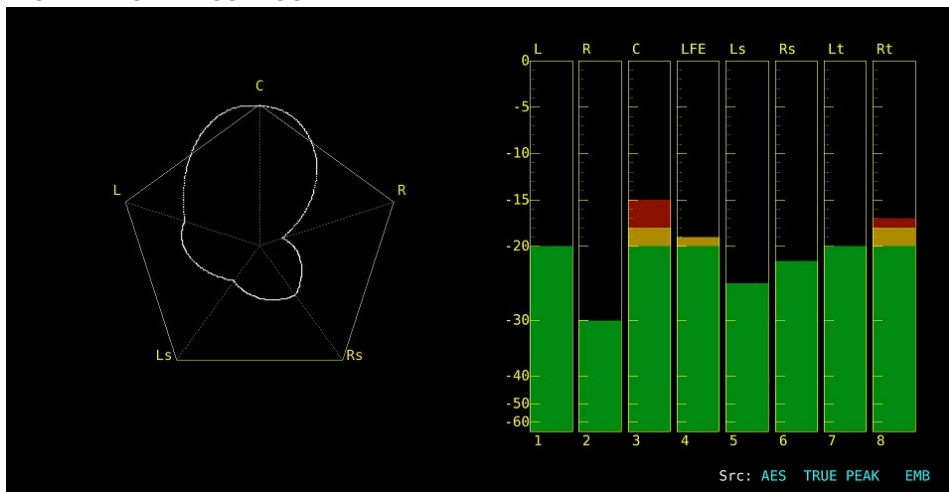


15. AUDIO DISPLAY

DISPLAY MODE = METER



DISPLAY MODE = SURROUND



DISPLAY MODE = STATUS

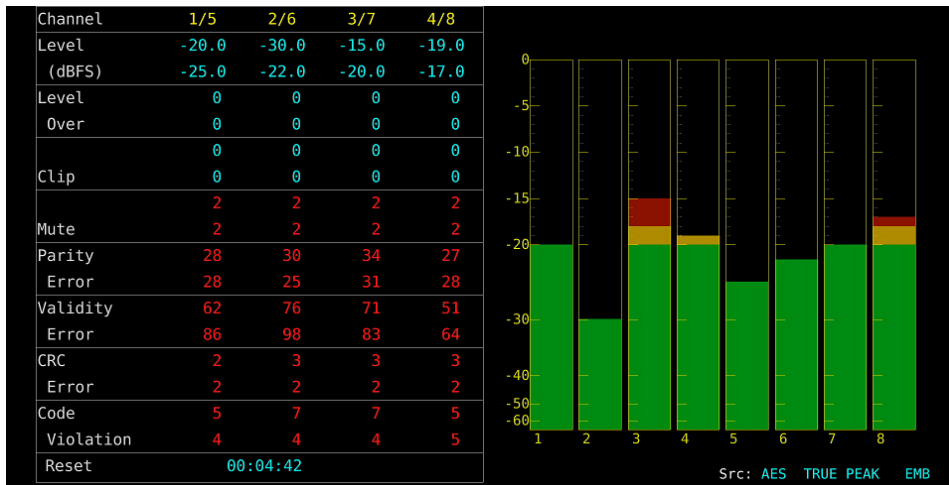


Figure 15-8 Selecting the display mode

15.4 Configuring Error Detection Settings

To configure the error detection and meter display settings, follow the procedure below.

Procedure

AUDIO → F•5 ERROR SETUP

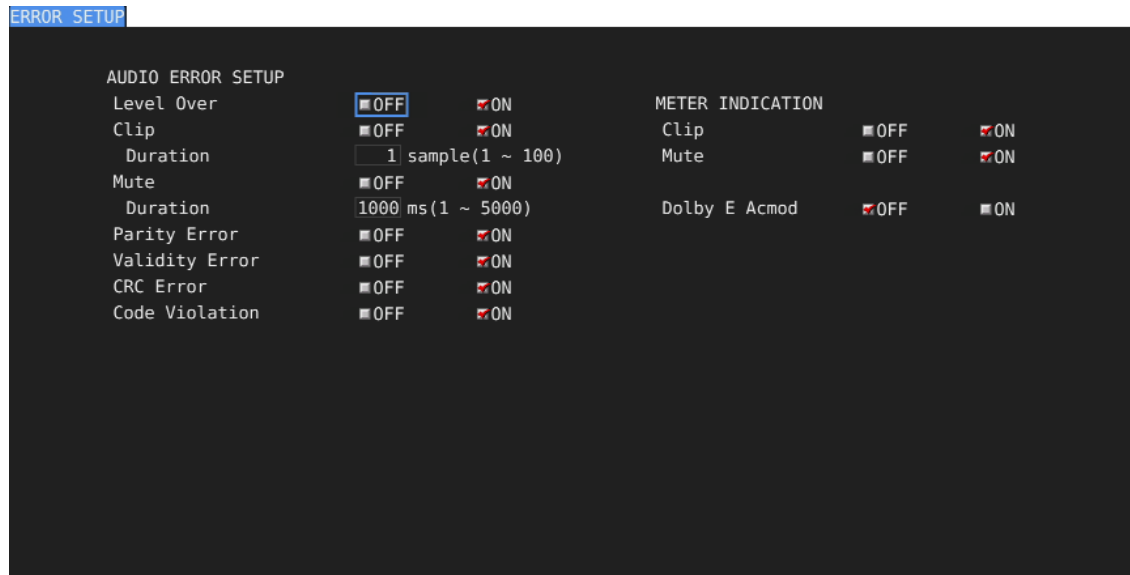


Figure 15-9 ERROR SETUP tab

Table 15-4 ERROR SETUP tab explanation

Item		Description
AUDIO ERROR SETUP		Turn the error detection on or off. When error detection is set to ON, the following actions are performed when an error occurs. - Counts errors on the status display - Displays errors in the event log of the status display
METER INDICATION	Clip	If Clip is set to ON, turn on or off the CLIP display that appears when errors occur.
	Mute	If Mute is set to ON, turn on or off the MUTE display that appears when errors occur.
	Dolby E Acmod (option)	During Dolby E measurement, turn on or off the NOT USE display that appears when LFEch is not used.

15.5 Adjusting the Volume

To adjust the headphone volume, follow the procedure below.

Press the function dial (F•D) to return the setting to its default value (0).

Procedure

AUDIO	→	F•7	PHONES VOLUME: 0 - 63

15.6 Meter Display

Meters are always displayed excluding the Lissajous display and status display during 16-channel management.

To configure meter display settings, press **F•3** METER SETUP on the AUDIO menu.

AUDIO	→	F•3	METER SETUP →

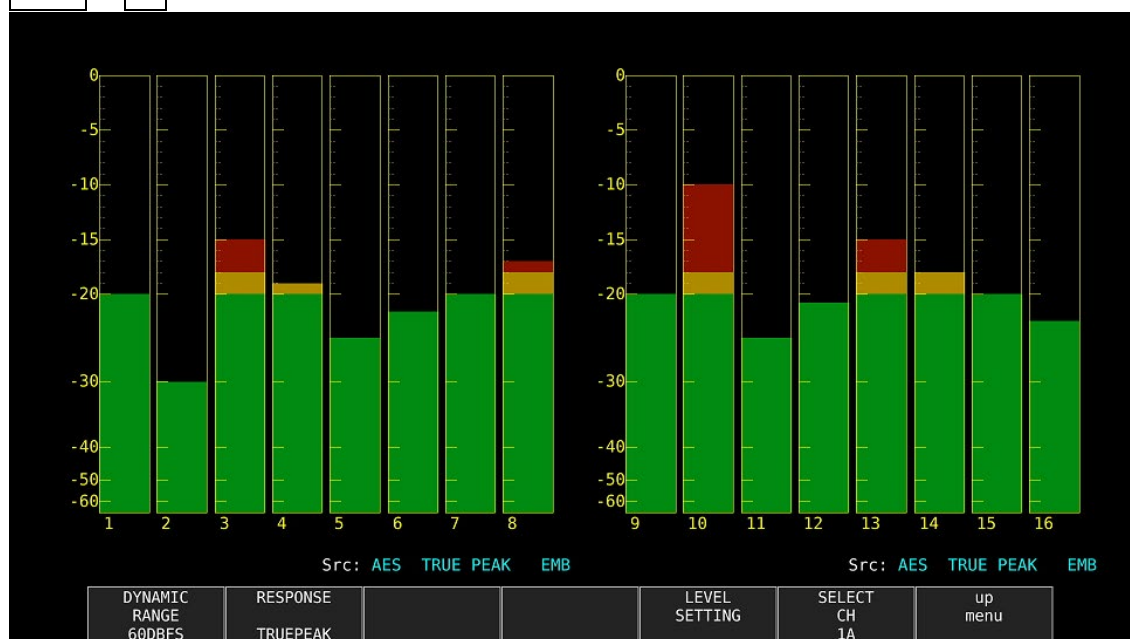


Figure 15-10 Meter display

15.6.1 Selecting the Scale

To select the meter's scale, follow the procedure below.

Procedure

AUDIO	→	F•3	METER SETUP →	F•1	DYNAMIC RANGE: 60DBFS / 90DBFS / MAG

Settings

60DBFS: The meter's scale is set to -60 to 0 (dBFS).

90DBFS: The meter's scale is set to -90 to 0 (dBFS).

MAG: The meter's scale is set to the level specified by **F•5** LEVEL SETTING → **F•3** REF dBFS ±3 dB.

15.6.2 Selecting the Response Model

To select the meter's response model, follow the procedure below. The selected response model is indicated in the lower right of the screen.

Procedure

AUDIO → F•3 METER SETUP
 → F•2 RESPONSE: TRUEPEAK / PPM / VU
 → F•3 PPM MODE: PPM(I) / PPM(II) (for PPM)
 → F•3 PEAK METER: TRUE / PPM(I) / PPM(II) (for VU)

The response model details are shown in the following table.

Table 15-5 Response model settings

F•2 RESPONSE	F•3 PPM MODE / F•3 PEAK METER	Display	Delay time (*1)	Return time (*2)	Average time
TRUEPEAK	-	TRUE PEAK	0 msec	1.7 sec	-
PPM	PPM(I)	PPM(I)	10 msec	1.7 sec	-
	PPM(II)	PPM(II)	10 msec	2.8 sec	-
VU	TRUE	VU+TRUE	-	-	300 msec
	PPM(I)	VU+PPM(I)	-	-	300 msec
	PPM(II)	VU+PPM(II)	-	-	300 msec

*1 The amount of time it takes for the meter to show -20 dBFS when a -20 dBFS/1 kHz sine-wave signal is applied with no input preceding it.

*2 The amount of time it takes for the meter to show -40 dBFS when a -20 dBFS/1 kHz sine-wave signal is removed from the input.

15.6.3 Setting the Peak Hold

When F•2 RESPONSE is set to VU, to set the peak hold time, follow the procedure below. The unit is seconds. You can set the value in 0.5-second steps.

Press the function dial (F•D) to return the setting to its default value (0.5).

Procedure

AUDIO → F•3 METER SETUP → F•4 PEAK HOLD: 0.0 - 0.5 - 5.0 / HOLD

15.6.4 Setting the Reference Level

To set the reference level, press **F•5** LEVEL SETTING on the METER SETUP menu.

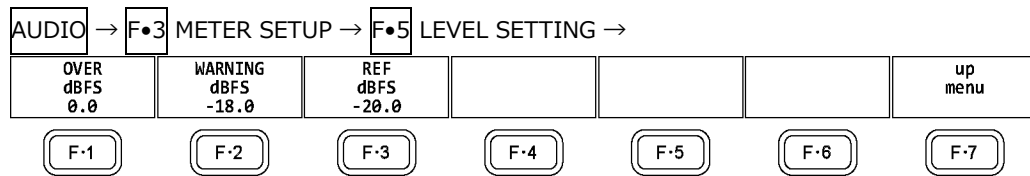


Figure 15-11 LEVEL SETTING menu

To set the meter reference level, follow the procedure below.

OVER dBFS: Set the threshold level for audio level errors.

WARNING dBFS: The portion of the meter that exceeds the level specified here is displayed in red. The portion of the meter below this level is displayed in yellow.

REF dBFS: The portion of the meter that exceeds the level specified here is displayed in yellow. The portion of the meter below this level is displayed in green.

Procedure

AUDIO → **F•3** METER SETUP → **F•5** LEVEL SETTING

→ **F•1** OVER dBFS: -40.0 - 0.0

→ **F•2** WARNING dBFS: -40.0 - -18.0 - 0.0

→ **F•3** REF dBFS: -40.0 - -20.0 - 0.0

15.7 Lissajous Display

To display Lissajous curves, set **F•2** DISPLAY MODE on the AUDIO menu to LISSAJOU. To configure the Lissajous display settings, press **F•4** LISSAJOU SETUP. This setting is available when **F•2** DISPLAY MODE is set to LISSAJOU.

AUDIO → set **F•2** DISPLAY MODE to LISSAJOU → **F•4** LISSAJOU SETUP →

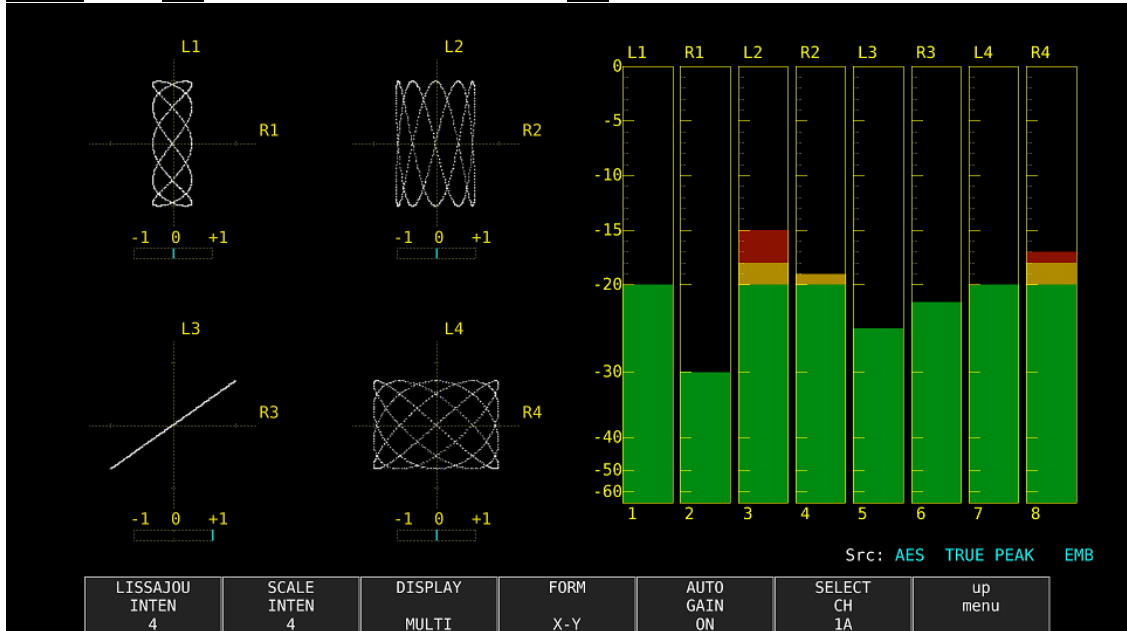


Figure 15-12 Lissajous display

● Correlation Meter

The correlation meter indicates the phase difference between the two signals. A reading of +1 indicates that the signals are in-phase, a reading of -1 indicates that the signals are 180 ° out of phase, and a reading of 0 indicates that the signals are not correlated.

15.7.1 Adjusting the Lissajous Curve Intensity

To set the Lissajous curve intensity, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (0).

Procedure

AUDIO → **F•4** LISSAJOU SETUP → **F•1** LISSAJOU INTEN: -8 - 0 - 7

15.7.2 Adjusting the Scale Intensity

To adjust the intensity of the Lissajous and meter scales, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (4).

Procedure

AUDIO → **F•4** LISSAJOU SETUP → **F•2** SCALE INTEN: -8 - 4 - 7

15.7.3 Selecting the Lissajous Curve Display Format

To select the Lissajous curve display format, follow the procedure below.

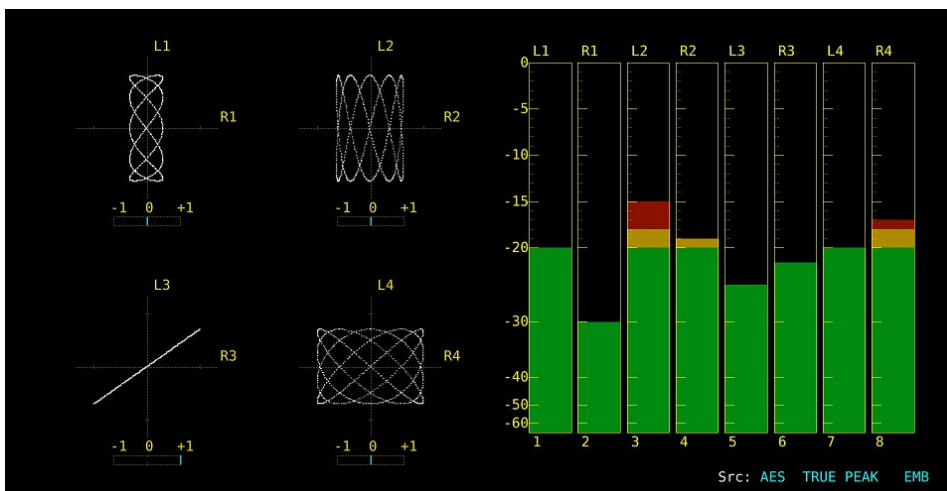
Procedure

AUDIO	→	F•4	LISSAJOU SETUP	→	F•3	DISPLAY: <u>MULTI</u> / SINGLE

Settings

MULTI:	Eight channels of Lissajous waveforms and eight channels of audio meters are displayed or 16 channels of Lissajous waveforms are displayed.
SINGLE:	Two channels of Lissajous waveforms and eight channels of audio meters are displayed. This option cannot be selected in simul mode or 16-channel measurement.

DISPLAY = MULTI



DISPLAY = SINGLE

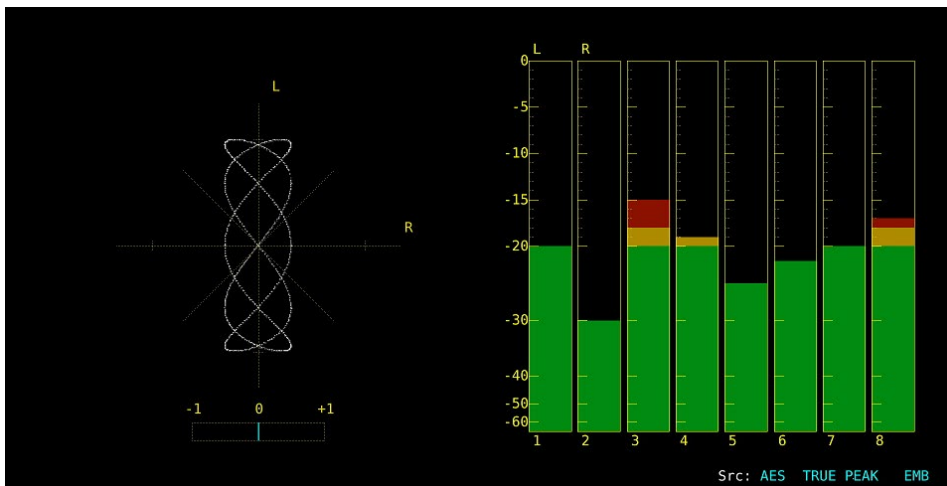


Figure 15-13 Selecting the Lissajous curve display format

15.7.4 Selecting the Scale Display Format

To select the scale display format, follow the procedure below.

Procedure

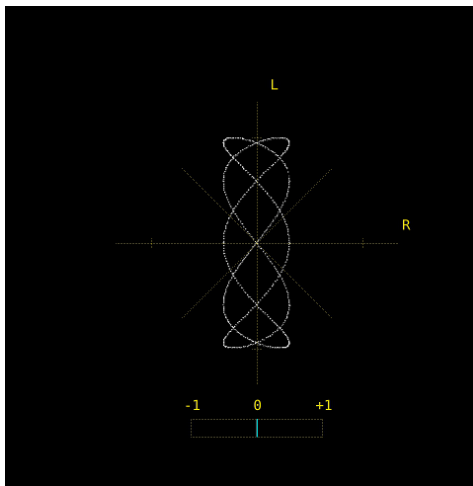
AUDIO	→	F•4	LISSAJOU SETUP →	F•4	FORM: <u>X-Y</u> / MATRIX

Settings

X-Y: R is assigned to the X-axis (horizontal), and L is assigned to the Y-axis (vertical).

MATRIX: The R and L axes are positioned at 45 ° angles to the X and Y axes.

FORM = X-Y



FORM = MATRIX

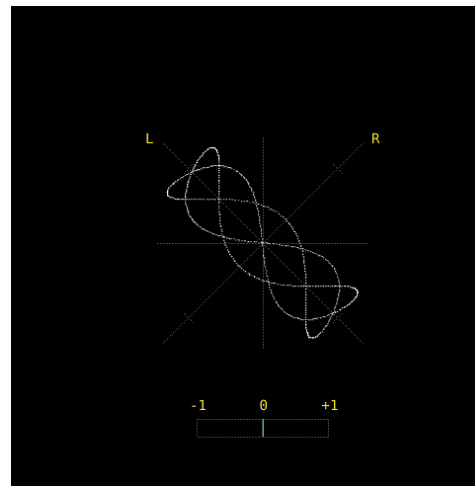


Figure 15-14 Selecting the scale display format

15.7.5 Setting the Lissajous Curve Gain

To select the Lissajous curve gain, follow the procedure below.

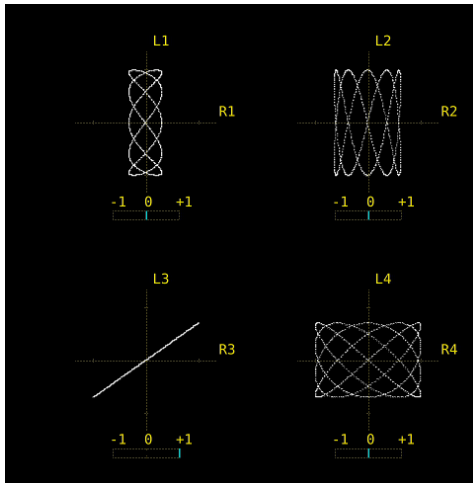
Procedure

AUDIO	→	F•4	LISAJOU SETUP	→	F•5	AUTO GAIN: <u>ON</u> / OFF

Settings

ON:	The gain is automatically adjusted so that the waveform fits the scale.
OFF:	The waveform is displayed with a fixed gain.

AUTO GAIN = ON



AUTO GAIN = OFF

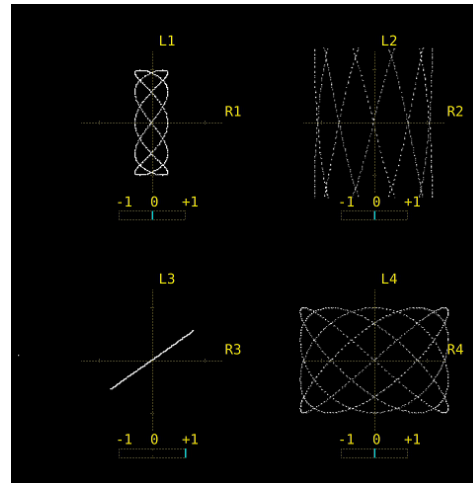


Figure 15-15 Setting the Lissajous curve gain

15.8 Surround Display

To show the surround display, set **F•2** DISPLAY MODE on the AUDIO menu to SURROUND. To configure the surround display settings, press **F•4** SURROUND SETUP. This setting is available when **F•2** DISPLAY MODE is set to SURROUND.

AUDIO → set **F•2** DISPLAY MODE to SURROUND → **F•4** SURROUND SETUP →

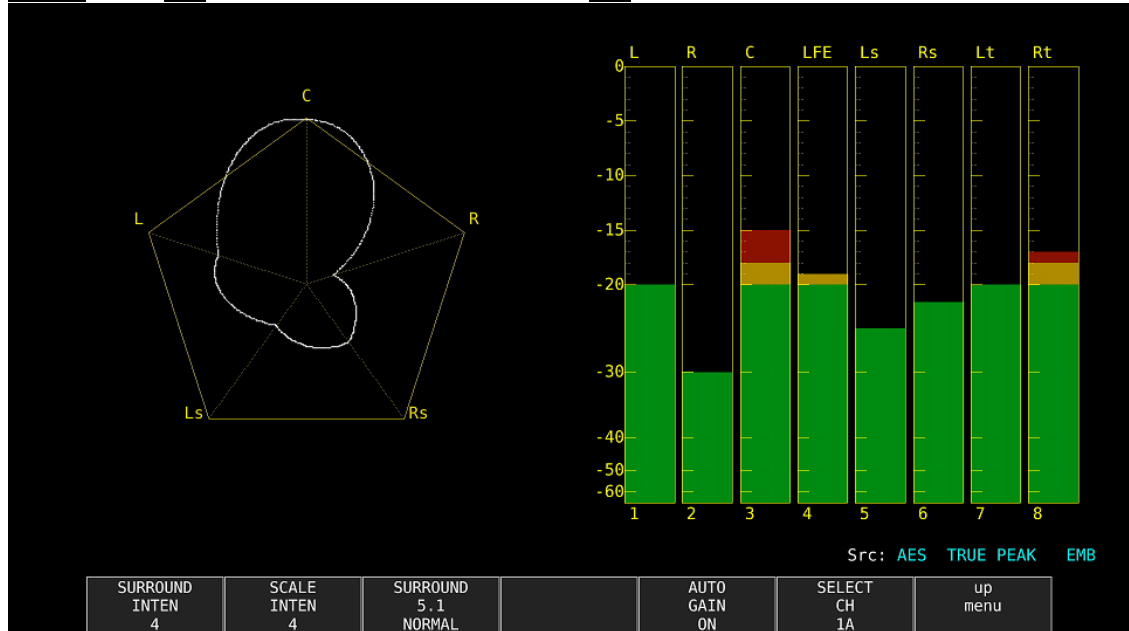


Figure 15-16 Surround display

15.8.1 Adjusting the Surround Waveform Intensity

To adjust the surround waveform intensity, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (4).

Procedure

AUDIO → **F•4** SURROUND SETUP → **F•1** SURROUND INTEN: -8 - 4 - 7

15.8.2 Adjusting the Scale Intensity

To adjust the intensity of the surround and meter scales, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (4).

Procedure

AUDIO → **F•4** SURROUND SETUP → **F•2** SCALE INTEN: -8 - 4 - 7

15.8.3 Selecting the Surround Display Format

To select the surround display format, follow the procedure below.

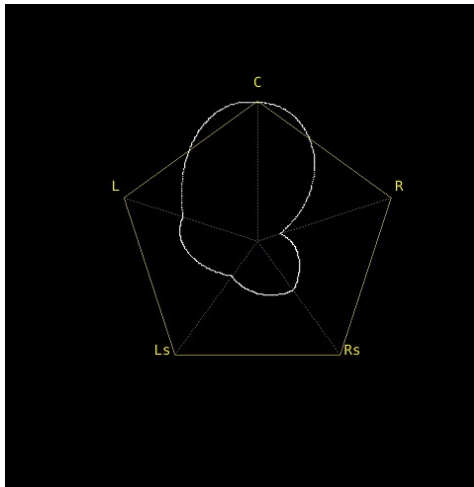
Procedure

AUDIO	→	F•4	SURROUND SETUP	→	F•3	SURROUND 5.1: <u>NORMAL</u> / PHANTOM

Settings

NORMAL:	A waveform that combines Lch, Rch, Lsch, Rsch, and Cch (hard center) is displayed.
PHANTOM:	A waveform that combines Lch, Rch, Lsch, Rsch, and phantom center and a Cch (hard center) waveform are displayed separately.

SURROUND 5.1 = NORMAL



SURROUND 5.1 = PHANTOM

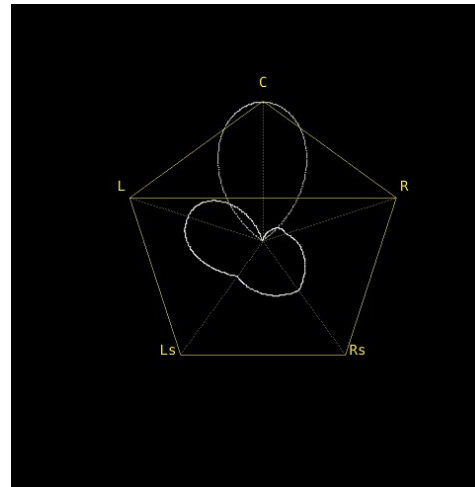


Figure 15-17 Selecting the surround display format

15.8.4 Setting the Surround Waveform Gain

To select the surround waveform gain, follow the procedure below.

Procedure

AUDIO	→	F•4	SURROUND SETUP	→	F•5	AUTO GAIN: <u>ON</u> / OFF

Settings

ON:	The gain is automatically adjusted so that the waveform fits the scale.
OFF:	The waveform is displayed with a fixed gain.

15.9 Status Display

To show the status display, set **F•2** DISPLAY MODE on the AUDIO menu to STATUS.

To configure the status display settings, press **F•4** STATUS SETUP. This setting is available when **F•2** DISPLAY MODE is set to STATUS.

AUDIO → set **F•2** DISPLAY MODE to STATUS → **F•4** STATUS SETUP →

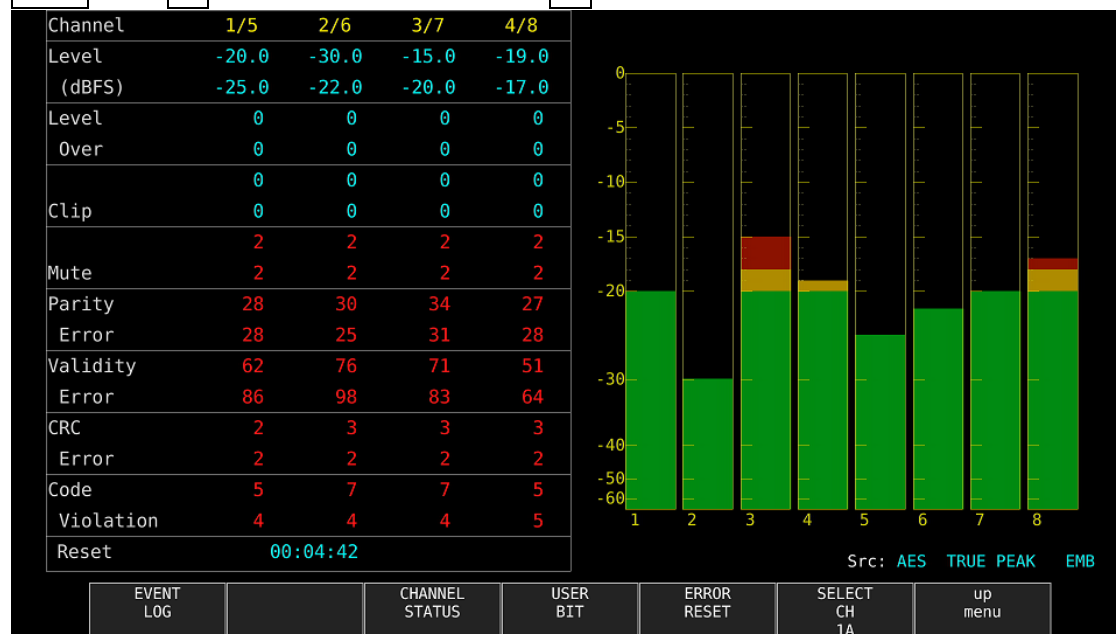


Figure 15-18 Status display

15.9.1 Status Display Explanation

On the status display, the levels and the number of detected errors are displayed for the selected channels (up to 9999). Errors are only detected for the items that have been set to ON in section 15.4, "Configuring Error Detection Settings."

- Channel

Displays audio channels. Each item below this item is displayed in two lines. The top line corresponds to the channel to the left of the slash, and the bottom line corresponds to the channel to the right of the slash.

- Level (dBFS)

Display audio levels numerically.

- Level Over

Displays the number of times the level is greater than equal to the OVER dBFS value set in section 15.6.4, "Setting the Reference Level."

- Clip

Displays the number of times that a received signal exceeds the maximum signal value for the number of consecutive samples specified in section 15.4, "Configuring Error Detection Settings."

15. AUDIO DISPLAY

- Mute

Displays the number of times that a mute signal exceeding the duration specified in section 15.4, “Configuring Error Detection Settings” is received.

- Parity Error

Counts the number of times that the input signal’s parity bit and the recalculated parity bit differ.

- Validity Error

Counts the number of times that the input signal’s validity bit is 1.

- CRC Error

Counts the number of times that the CRC of the channel status bits and the calculated CRC are different.

- Code Violation

Counts the number of times that the state of the input signal’s biphase modulation is abnormal.

- Reset

The time that has elapsed since **F•6** ERROR RESET was pressed is displayed here.

In Dolby signal measurements, Frame Location (header position and mode) is displayed in addition to the number of detected errors. During external digital audio measurements, H and mode are not displayed.

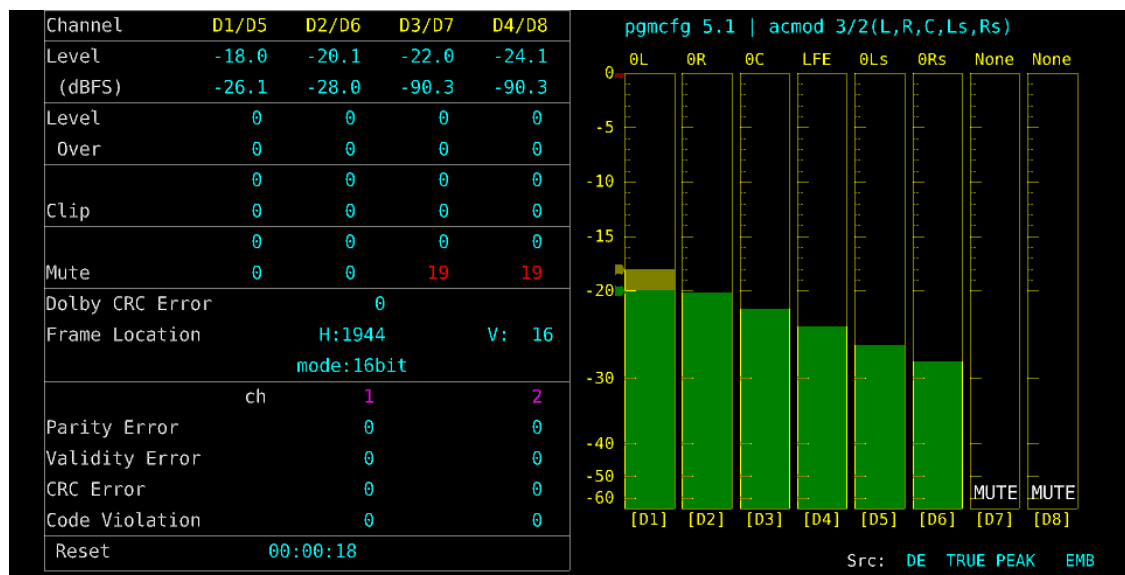


Figure 15-19 Status display (Dolby E)

15.9.2 Event Log Display

To view the event log, follow the procedure below.

This screen is the same as the event log screen of the status display. For details, see section 16.4, "Configuring Event Log Settings."

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•1	EVENT LOG

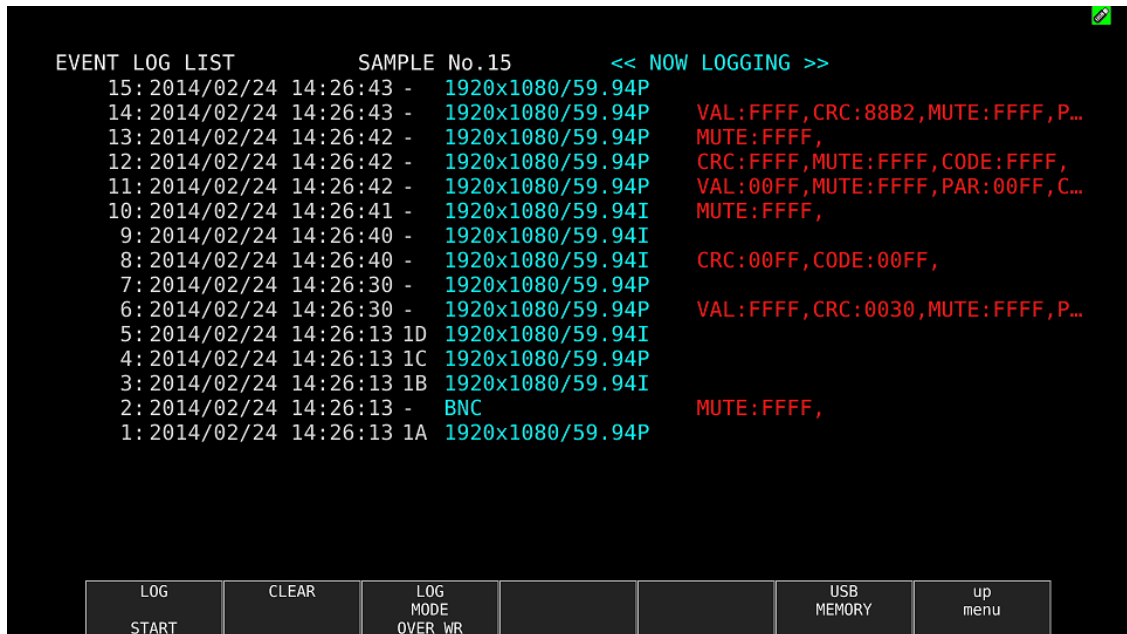


Figure 15-20 Event log

15.9.3 Metadata Display (Option)

- Dolby E Metadata Display

During Dolby E measurement, to view the metadata of the selected program number, follow the procedure below. To select the program number, press **F•1** DOLBY PROGRAM.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•1	DOLBY E METADATA

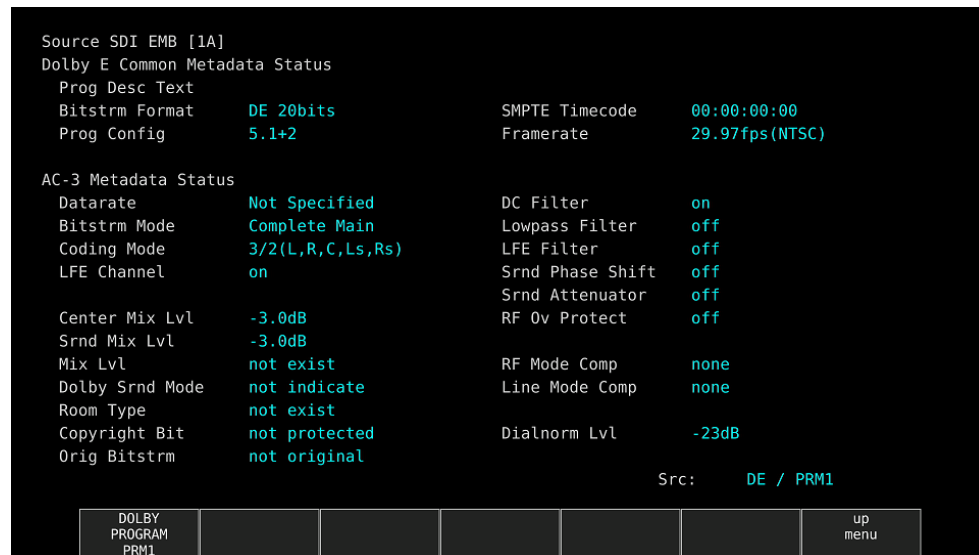


Figure 15-21 Dolby E metadata display

- Dolby E EBI Metadata Display

During Dolby E measurement, to view the EBI (Extended Bitstream Info) metadata of the selected program number, follow the procedure below. To select the program number, press **F•1** DISPLAY PROGRAM.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•2	EBI METADATA

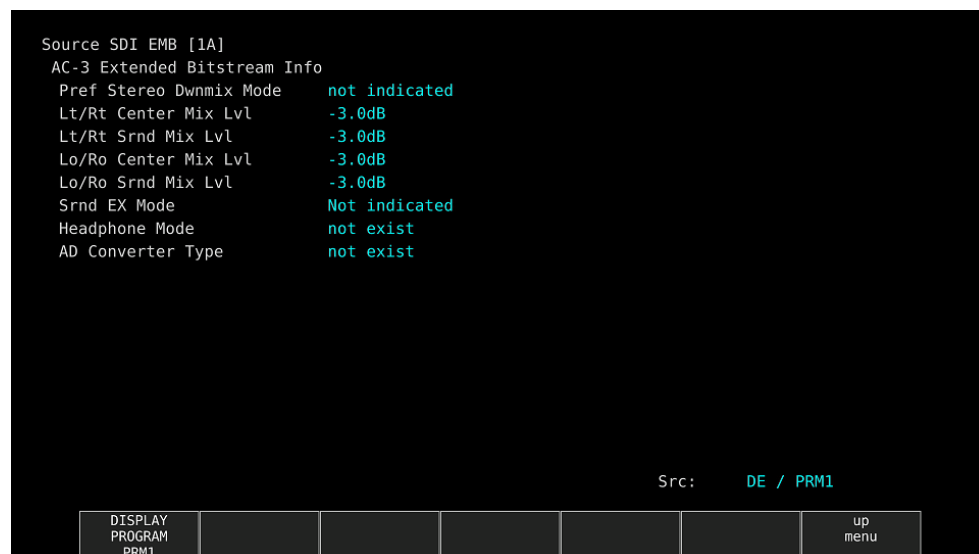


Figure 15-22 Dolby E EBI metadata display

15. AUDIO DISPLAY

- Dolby Digital Metadata Display

During Dolby Digital measurement, to view the metadata, follow the procedure below.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•1	DOLBY D METADATA



Figure 15-23 Dolby Digital metadata display

- Dolby Digital EBI Metadata Display

During Dolby Digital measurement, to view the EBI (Extended Bitstream Info) metadata, follow the procedure below.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•2	EBI METADATA

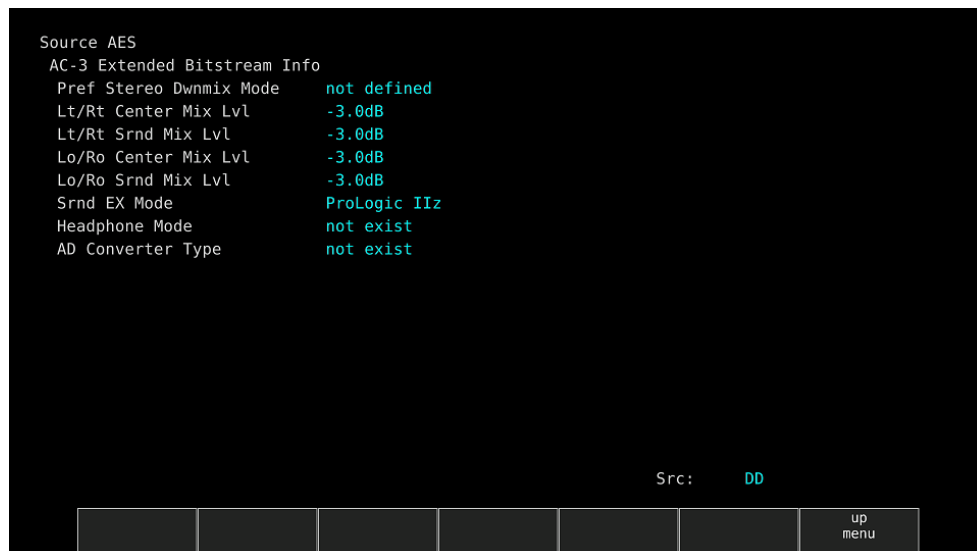


Figure 15-24 Dolby Digital EBI metadata display

15. AUDIO DISPLAY

- Dolby Digital Plus Metadata Display

During Dolby Digital Plus measurement, to view the metadata, follow the procedure below.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•1	DOLBY D+ METADATA

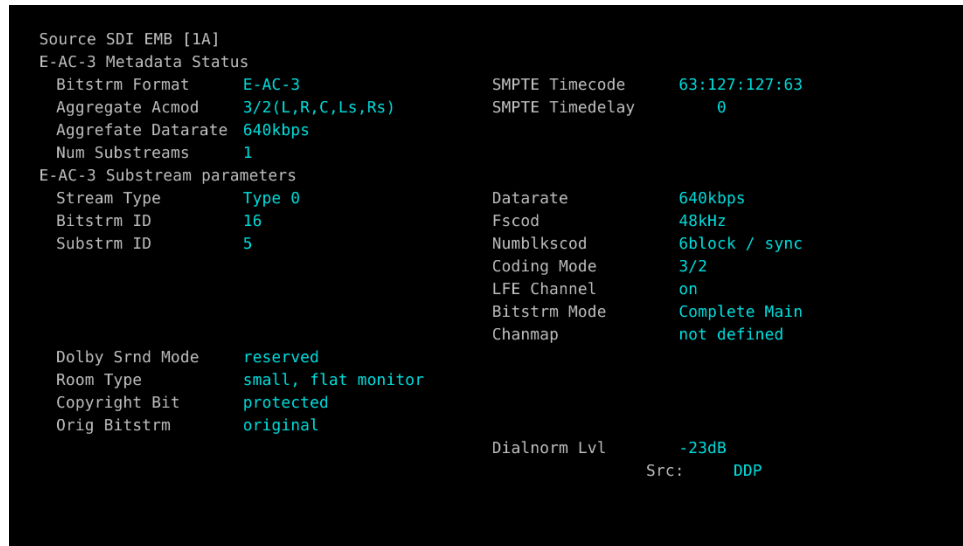


Figure 15-25 Dolby Digital Plus metadata display

- Dolby Digital Plus EBI Metadata Display

During Dolby Digital Plus measurement, to view the EBI (Extended Bitstream Info) metadata, follow the procedure below.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•2	METADATA	→	F•2	EBI METADATA

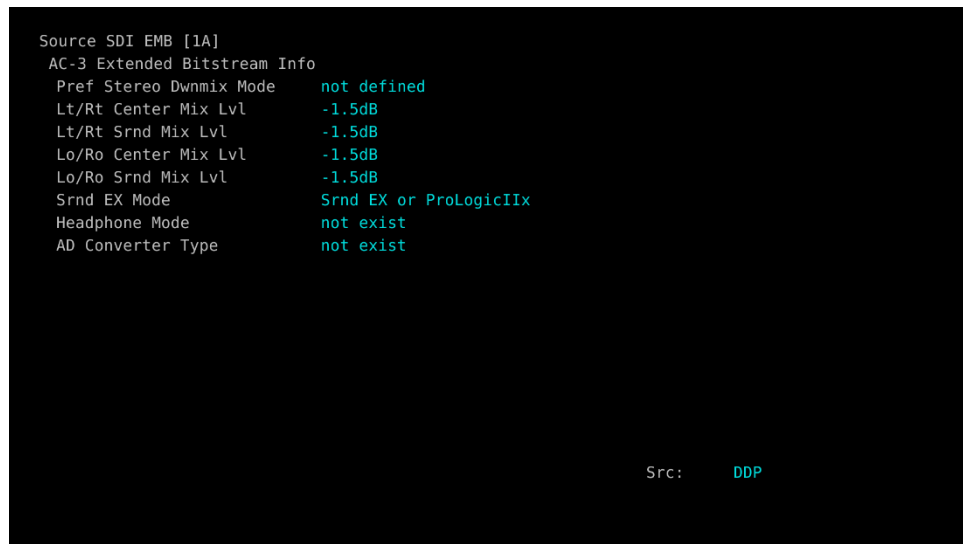


Figure 15-26 Dolby Digital Plus EBI metadata display

15.9.4 Displaying the Channel Status

To display the status of the selected channel, follow the procedure below.

Use **F•1** DISPLAY CHANNEL to select the channel. You can also use **F•2** ALIGN to select the bit order.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•3	CHANNEL STATUS

AES/EBU CHANNEL STATUS DISPLAY AES-3						
FORMAT	:	Professional	Byte	:	01234567	01234567
AUDIO DATA	:	PCM	00	:	10100001	12 : 00000000
EMPHASIS	:	No emphasis	01	:	00010001	13 : 00000000
SIGNAL LOCK	:	Locked	02	:	00010100	14 : 00000000
SAMPLING FREQ:	:	48kHz	03	:	00000000	15 : 00000000
REFERENCE	:	Not reference	04	:	00000000	16 : 00000000
CH MODE	:	Two-channel	05	:	00000000	17 : 00000000
			06	:	00000000	18 : 00000000
RESOLUTION	:	20bits	07	:	00000000	19 : 00000000
ALIGNMENT	:	Not indicated	08	:	00000000	20 : 00000000
ORIGIN	:		09	:	00000000	21 : 00000000
DESTINATION	:		10	:	00000000	22 : 00000000
TIME-OF-DAY	:	00:00:00	11	:	00000000	23 : 01010111
CRC	:	NORMAL				
DISPLAY CHANNEL		ALIGN			SELECT CH	up menu
1		LSB 1st			1A	

Figure 15-27 Channel status display

15.9.5 Displaying User Bits

To display the user bits of the selected channel, follow the procedure below.

Use **F•1** DISPLAY CHANNEL to select the channel. You can also use **F•2** ALIGN to select the bit order.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•4	USER BIT

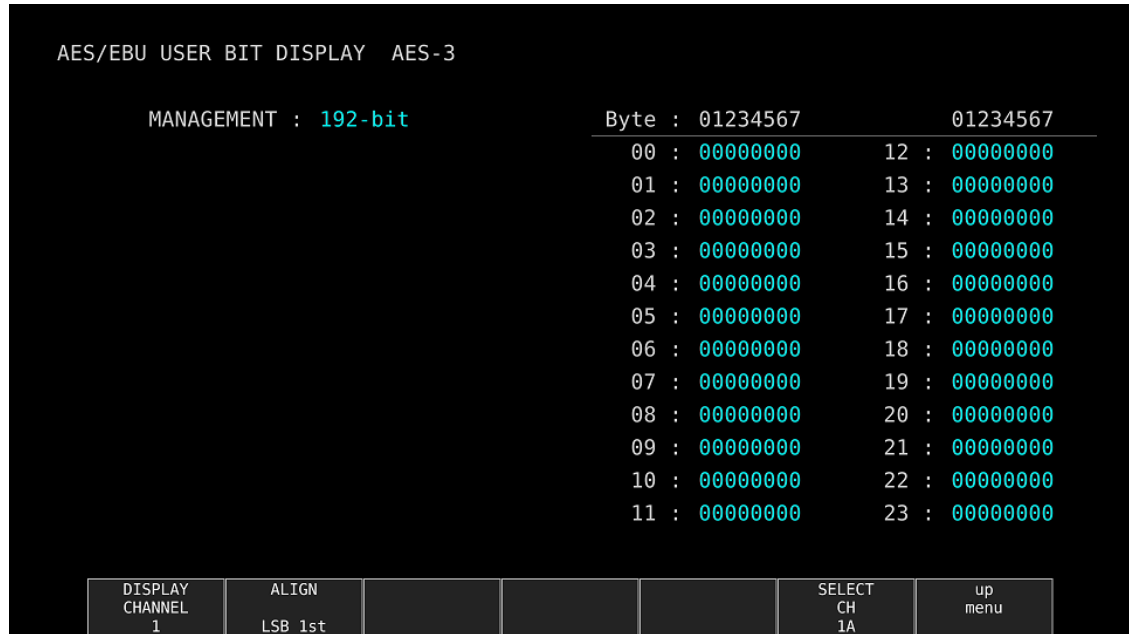


Figure 15-28 User bit display

15.9.6 Resetting Errors

To reset the error counts that appear on the audio status display to 0, follow the procedure below. Also, the Reset indication at the lower left of the screen will be reset to 00:00:00.

Procedure

AUDIO	→	F•4	STATUS SETUP	→	F•5	ERROR RESET

16. STATUS DISPLAY

To display the status, press STATUS.

If on the SDI IN tab in the system settings, SDI System is set to 4K NMI or NMI, pressing STATUS displays the IP (NMI) status.

Reference Section 16.10, "IP(NMI) Status Screen Explanation (SER08)"

To return to the normal status display from IP (NMI) status, press **F•1** STATUS. To return to the IP (NMI) status again, press **F•2** SDI ANALYSIS and then **F•3** NMI INFO.

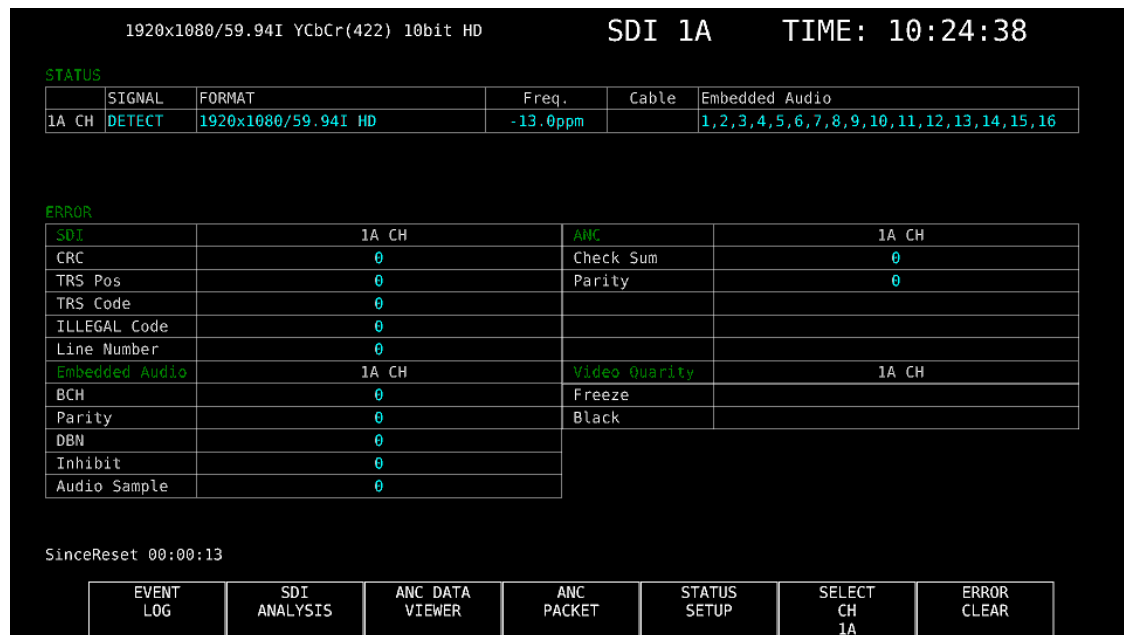


Figure 16-1 Status display

16.1 Status Screen Explanation

- SIGNAL

If the LV 5490SER01 or LV 5490SER02 is receiving an SDI signal, "DETECT" is displayed. Otherwise, "NO SIGNAL" is displayed.

If "NO SIGNAL" is displayed, the following items are not displayed.

- FORMAT/SUB IMAGE FORMAT

The input signal format is indicated here. It is normally displayed in light blue, but if the input is not appropriate, it turns red.

- Freq

The sampling frequency deviation is displayed.

Normally, this is displayed in light blue. If Frequency Error on the ERROR SETUP1 tab is set to ON, the color changes to red when ± 10 ppm is exceeded.

The display range is "<-100 ppm, -100 to +100 ppm, >+100 ppm," and the accuracy is ± 2 ppm.

Reference ERROR SETUP1 tab → section 16.2.1, "Error Setup 1"

16. STATUS DISPLAY

- Cable (1A to 1D on the SER01/SER02 only)

The input signal attenuation is converted into a cable length that you selected and displayed.

Normally the value is displayed in light blue, but by setting Cable Error on the ERROR SETUP1 tab to ON, if the value exceeds the specified Warning value, it will change to yellow. If the value exceeds the Error value, it will change to red.

The display range is shown below. The accuracy is ± 20 m.

3G: < 10 m, 10 to 105 m, > 105 m (5 m steps)

HD: < 5 m, 5 to 130 m, > 130 m (5 m steps)

SD: < 50 m, 50 to 300 m, > 300 m (5 m steps)

Reference ERROR SETUP1 tab → section 16.2.1, "Error Setup 1"

- Embedded Audio

The channels of the audio packets embedded in the input signal are displayed here.

If the input signal is 3G-B-DL, only stream 1 is displayed. (When measuring 3G-B-DS, stream 2 is also displayed.)

- ERROR

The counts of the errors for the items whose detection setting was set to ON with F•5 STATUS SETUP are displayed here. Errors are counted once per second or once per field. The maximum number of errors that can be counted is 999999.

Switching video formats or input channels may cause disturbances in the signal that will cause errors to be detected.

- CRC (Other than SD)

An error is counted when the CRC embedded in the input signal is different from the CRC that the LV 5490 detects.

- EDH (SD only)

An error is counted when the EDH packet contains an ancillary data error flag, an active picture error flag, or a full-field error flag and when the CRC in the EDH packet is different from the CRC that the LV 5490 calculates from the video data.

- TRS Pos

Input signal TRS (Timing Reference Signal) errors are displayed here.

An error is counted when the EAV (End of Active Video) and SAV (Start of Active Video) header word (3FFh, 000h, and 000h) locations are wrong and when the F, V, and H TRS protection bits do not conform to the video standard.

- TRS Code

Input signal TRS (Timing Reference Signal) protection bit errors are displayed here.

An error is counted when the F, V, and H protection bits in the XYZ word in the EAV (End of Active Video) and SAV (Start of Active Video) packets and the response to the P3, P2, P1, and P0 error correction flags do not conform to the video standard.

16. STATUS DISPLAY

- **ILLEGAL Code**

An error is counted when the input signal data falls within the timing reference signal (TRS) range or 000h to 003h and 3FCh to 3FFh are detected in the data other than those specified by the ancillary data flag (ADF).

In SDI signals, 10-bit levels 000h through 003h and 3FCh through 3FFh are reserved for the timing reference signal and the ancillary data flag, so they cannot be used for video signal data or ancillary data. When data other than TRS and ADF data is found in these bits, an error is counted.

- **Line Number (Other than SD)**

An error is counted when the line number that is embedded in the input signal does not match the line number that has been counted by the LV 5490.

- **Check Sum**

The LV 5490 uses the checksum in the input signal's ancillary data header to count errors.

- **Parity**

The LV 5490 uses the parity bit in the input signal's ancillary data header to count errors.

- **BCH (Other than SD)**

Errors in the BCH code in the input signal's embedded audio are displayed here.

- **Parity (Other than SD)**

Parity errors in the input signal's embedded audio are displayed here.

- **DBN**

Continuity errors in the input signal's embedded audio are displayed here.

Embedded audio packets contain data block number (DBN) words that indicate the packet's continuity. Packets are cyclically numbered from 1 to 255. An error is counted when a packet's DBN is out of sequence.

- **Inhibit**

An error is counted when embedded audio packets are found in lines where they should not be embedded.

The embedding inhibit lines are as follows.

However, for 3G-B-DL 60p, 59.94p, 50p, 48p, and 47.95p, the transmission scanning mode is interlace.

Table 16-1 Embedding Inhibit Lines

Format		Transmission Scanning Mode	
		Progressive	Interlace
HD/3G	1280×720	Line 8	-
	1920×1080	Line 8	Lines 8, 570
SD	720×487	-	Lines 11, 274
	720×576	-	Lines 7, 320

16. STATUS DISPLAY

- Audio Sample

An error is counted when audio that is asynchronous to the video is embedded. For the video and audio to be synchronized, there is a specific number of audio data samples that need to be embedded in a given number of video frames. If this rule is not met, it is considered an error.

- Freeze

An error is counted when the video data is the same between video frames. Specify an area of the video to use for detection and the number of continuous frames that is required for the condition to be detected as an error.

Video data is compared using checksums.

- Black

An error is counted when the video luminance level is less than the specified value.

Set the luminance level for detecting error pixels, the ratio of error pixels in a frame, and the number of continuous frames that is required for the condition to be detected as an error.

- Gamut

Gamut errors are counted.

Set the upper and lower limits for detecting errors, the ratio of error pixels in a frame, and the number of continuous frames that is required for the condition to be detected as an error.

- Comp Gamut

Composite gamut errors are counted.

Set the upper and lower limits for detecting errors, the ratio of error pixels in a frame, and the number of continuous frames that is required for the condition to be detected as an error.

- Level Y

An error is counted when the luminance level is outside the specified range.

Set the upper and lower limits for detecting errors.

- Level C

An error is counted when the chrominance level is outside the specified range.

Set the upper and lower limits for detecting errors.

- SinceReset

The time that has elapsed since F•7 ERROR CLEAR was pressed, the LV 5490 was initialized, or the LV 5490 was restarted is displayed here.

16.2 Configuring Error Detection Settings

To configure the error detection settings, use **F•5** STATUS SETUP.
When error detection is set to ON, the following actions are performed when an error occurs.

- Counts errors on the status display.
- Displays errors in the event log of the status display
- Displays “ERROR” in the upper-right of the display.
- Transmits a signal from the alarm output remote terminal

16.2.1 Error Setup 1

Use the ERROR SETUP1 tab to configure error detection settings for SDI signals.



Figure 16-2 ERROR SETUP1 tab

● Error Counter

Sec:	Errors are counted in units of seconds. Even if multiple errors occur within the same second, only a single error is counted.
Field:	Errors are counted in units of fields (frames). Even if multiple errors occur within the same field (frame), only a single error is counted.

● TRS Error

Select whether to detect TRS Pos and TRS Code errors.

OFF / ON

● Line Number Error(Except SD)

Select whether to detect line number errors. This setting is valid when the input signal is not SD.

OFF / ON

16. STATUS DISPLAY

- CRC Error(Except SD)

Select whether to detect CRC errors. This setting is valid when the input signal is not SD.

OFF / ON

- EDH Error(SD)

Select whether to detect EDH errors. This setting is valid when the input signal is SD.

OFF / ON

- Illegal Code Error

Select whether to detect illegal code errors.

OFF / ON

- Frequency Error

Select whether to detect frequency deviation errors.

Even when this is set to OFF, the frequency deviation is still shown in the status display.

OFF / ON

- Cable Error

Select whether to detect cable errors.

Even when this is set to OFF, the cable length is still shown in the status display.

OFF / ON

- 3G Cable

Select the cable to use for cable length measurements when the input signal is 3G.

LS-5CFB / 1694A

- 3G Cable Error

Set the upper limit for the cable error when the input signal is 3G. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

10 - 105 m

- 3G Cable Warning

Set the upper limit for the cable warning when the input signal is 3G. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

10 - 105 m

- HD Cable

Select the cable to use for cable length measurements when the input signal is HD.

LS-5CFB / 1694A

16. STATUS DISPLAY

- HD Cable Error

Set the upper limit for the cable error when the input signal is HD. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

5 - 130 m

- HD Cable Warning

Set the upper limit for the cable warning when the input signal is HD. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

5 - 130 m

- SD Cable

Select the cable to use for cable length measurements when the input signal is SD.

L-5C2V / 8281

- SD Cable Error

Set the upper limit for the cable error when the input signal is SD. If this value is exceeded, an error will occur, and the measured value on the status display will be displayed in red.

50 - 300 m

- SD Cable Warning

Set the upper limit for the cable warning when the input signal is SD. If this value is exceeded, a warning will occur, and the measured value on the status display will be displayed in yellow.

50 - 300 m

16.2.2 Error Setup 2

Use the ERROR SETUP2 tab to configure ancillary data and embedded audio error detection settings.

STATUS → F•5 STATUS SETUP → F•2 PREV TAB or F•3 NEXT TAB →

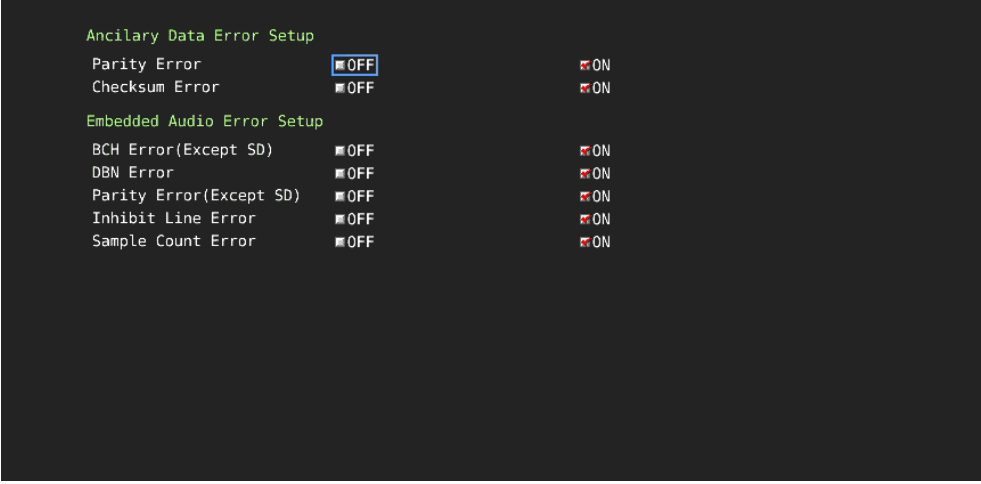


Figure 16-3 ERROR SETUP2 tab

● Parity Error

Select whether to detect parity errors in the ancillary data.

OFF / ON

● Checksum Error

Select whether to detect checksum errors in the ancillary data.

OFF / ON

● BCH Error(Except SD)

Select whether to detect BCH errors in the embedded audio. This setting is valid when the input signal is not SD.

OFF / ON

● DBN Error

Select whether to detect DBN errors in the embedded audio.

OFF / ON

● Parity Error(Except SD)

Select whether to detect parity errors in the embedded audio. This setting is valid when the input signal is not SD.

OFF / ON

16. STATUS DISPLAY

- Inhibit Line Error

Select whether to detect embedding errors in the embedded audio.

OFF / ON

- Sample Count Error

Select whether to detect sample number errors in the embedded audio.

An error is counted when audio that is asynchronous to the video is embedded. If a certain number of audio data samples are not embedded in a certain number of video frames, it will be considered an error (as defined in SMPTE ST 299 and SMPTE ST 272).

OFF / ON

16.2.3 Error Setup 3

Use the ERROR SETUP3 tab to configure gamut error settings.

STATUS → F•5 STATUS SETUP → F•2 PREV TAB or F•3 NEXT TAB →

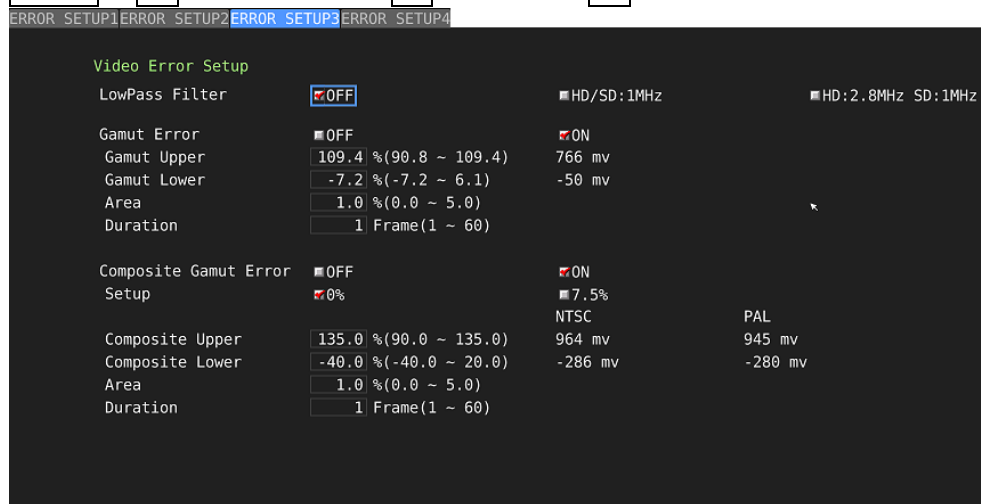


Figure 16-4 ERROR SETUP3 tab

- LowPass Filter

Select the frequency response of the low-pass filter used for gamut error and composite gamut error detection. Set this to remove transient errors caused by overshoot and other anomalies.

HD/SD: 1MHz / HD: 2.8MHz SD: 1MHz / OFF

16. STATUS DISPLAY

● Gamut Error

Select whether to detect gamut errors.

ON / OFF

● Gamut Upper

Set the gamut error upper limit. An error occurs when the input signal level exceeds the specified value.

In the 5-bar GBR display, levels that are greater than or equal to the specified value are displayed in red.

90.8 - 109.4 %

● Gamut Lower

Set the gamut error lower limit. An error occurs when the input signal level goes below the specified value.

In the 5-bar GBR display, levels that are less than or equal to the specified value are displayed in red.

-7.2 - 6.1 %

● Area

Specify the percentage of the active picture area over which errors must occur to be recognized as an error. You cannot configure this setting when Gamut Error is set to OFF.

0.0 - 1.0 - 5.0 %

● Duration

Set the number of consecutive video frames over which errors must occur to be recognized as an error. You cannot configure this setting when Gamut Error is set to OFF.

1 - 60 Frames

● Composite Gamut Error

Select whether to detect composite gamut errors.

ON / OFF

● Setup

Select the setup level to add when converting component signals to composite signals.

<u>0%</u> :	No setup level is added.
7.5%:	A setup level of 7.5 % is added.

16. STATUS DISPLAY

- Composite Upper

Set the composite gamut error upper limit. An error occurs when the input signal level exceeds the specified value.

In the 5-bar CMP display, levels that are greater than or equal to the specified value are displayed in red.

90.0 - 135.0 %

- Composite Lower

Set the composite gamut error lower limit. An error occurs when the input signal level goes below the specified value.

In the 5-bar CMP display, levels that are less than or equal to the specified value are displayed in red.

-40.0 - 20.0 %

- Area

Specify the percentage of the active picture area over which errors must occur to be recognized as an error. You cannot configure this setting when Composite Gamut Error is set to OFF.

0.0 - 1.0 - 5.0 %

- Duration

Set the number of consecutive video frames over which errors must occur to be recognized as an error. You cannot configure this setting when Composite Gamut Error is set to OFF.

1 - 60 Frames

16.2.4 Error Setup 4

Use the ERROR SETUP4 tab to configure freeze error, black error and level error settings.

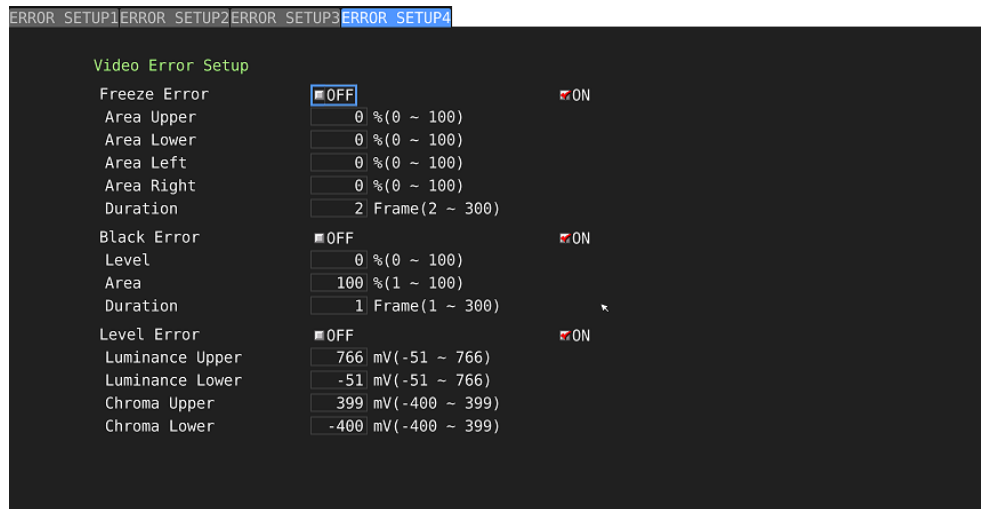


Figure 16-5 ERROR SETUP4 tab

- Freeze Error

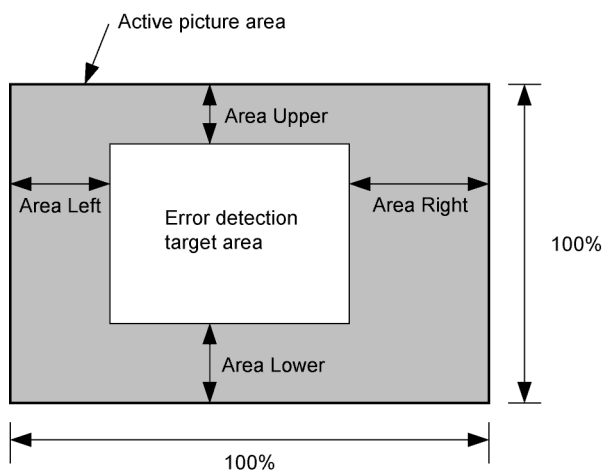
Select whether to detect freeze errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- Area Upper, Area Lower, Area Left, Area Right

Set what percent of each active picture area (the upper, lower, left, and right areas) will not be subject to error detection.

0 to 100 %



- Duration

Set the number of consecutive video frames over which errors must occur to be recognized as an error.

2 to 300 frames

16. STATUS DISPLAY

- Black Error

Select whether to detect black errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- Level

Set the black error level. Any signals that are less than or equal to the specified value will be detected as errors.

0 to 100 %

- Area

Specify the percentage of the active picture area over which errors must occur to be recognized as an error.

1 to 100 %

- Duration

Set the number of consecutive video frames over which errors must occur to be recognized as an error.

1 to 300 frames

- Level Error

Select whether to detect level errors. If you set this to OFF, you cannot configure the following settings.

ON / OFF

- Luminance Upper

Set the luminance level error upper limit. An error occurs when the input signal level exceeds the specified value.

In the 5-bar Y display, levels that are greater than or equal to the specified value are displayed in red.

-51 – 766 mV

- Luminance Lower

Set the luminance level error lower limit. An error occurs when the input signal level goes below the specified value.

In the 5-bar Y display, levels that are less than or equal to the specified value are displayed in red.

-51 – 766 mV

16. STATUS DISPLAY

- Chroma Upper

Set the chroma level error upper limit. An error occurs when the input signal level exceeds the specified value.

-400 – 399 mV

- Chroma Lower

Set the chroma level error lower limit. An error occurs when the input signal level goes below the specified value.

-400 – 399 mV

16. STATUS DISPLAY

16.3 Clearing Error Counts

To clear the error counts and SinceReset, follow the procedure below.

Procedure

STATUS	→	F•7	ERROR CLEAR

16.4 Configuring Event Log Settings

To display the event log, follow the procedure below.

The event log displays a list of the events that have occurred.

The applicable event-detection channels are all channels in the selected group (1A to 1D or 2A to 2D). However, when measuring 3G-B-DS, 3G (DL)-4K, or 12G events are detected only on the currently displayed channel. During NMI measurement, events are detected only on the channels selected on the NMI IN tab.

Procedure

STATUS	→	F•1	EVENT LOG

1920x1080/59.94I YCbCr(422) 10bit HD				SDI 1A	TIME: 11:25:47
EVENT LOG LIST		SAMPLE No.246		<< NOW LOGGING >>	
246:	2014/02/25	11:25:28 1C	1920x1080/59.94I		
245:	2014/02/25	11:25:28 1A	1920x1080/59.94I		
244:	2014/02/25	11:25:27 1C	1920x1080/59.94I	A_SMP,	
243:	2014/02/25	11:25:27 1A	1920x1080/59.94I	A_SMP,	
242:	2014/02/25	11:25:27 1C	1920x1080/59.94I	CABLE_ERR,	
241:	2014/02/25	11:25:27 1A	1920x1080/59.94I	CABLE_ERR,	
240:	2014/02/25	11:25:27 1C	1920x1080/59.94I		
239:	2014/02/25	11:25:27 1A	1920x1080/59.94I		
238:	2014/02/25	11:25:26 1C	NO SIGNAL		
237:	2014/02/25	11:25:26 1A	NO SIGNAL		
236:	2014/02/25	11:24:11 -	BNC	MUTE:FFFF,	
235:	2014/02/25	11:24:10 -	BNC	MUTE:FF00,	
234:	2014/02/25	11:24:10 -	BNC	CRC:FFFF,MUTE:FF00,CODE:FFFF,	
233:	2014/02/25	11:24:09 -	BNC	MUTE:FF00,	
232:	2014/02/25	11:23:59 1D	1920x1080/59.94I		
231:	2014/02/25	11:23:59 1C	1920x1080/59.94I		
230:	2014/02/25	11:23:59 1B	1920x1080/59.94I		
229:	2014/02/25	11:23:59 1A	1920x1080/59.94I		
228:	2014/02/25	11:23:58 -	1920x1080/59.94I	MUTE:FF00,	
227:	2014/02/25	11:23:58 -	1920x1080/59.94I	VAL:00FF,MUTE:FFFF,PAR:00FF,C...	
LOG		CLEAR	LOG MODE		up
START			OVER WR		menu

Figure 16-6 Event log display

16.4.1 Event Log Screen Explanation

Events are listed on the event log screen by the time of their occurrence.

Turn the function dial (F•D) to the right to scroll the screen and view older events in the log. Press the function dial (F•D) to display the latest events.

- Note

- When the same event occurs successively and when multiple events occur at the same time, they are treated as a single event.
- When multiple events occur at the same time, you may not be able to check all the events on the screen. When this happens, you can view all the events by saving them to a USB memory device.
- The event display is cleared when you turn the power off.
- Switching video formats or input channels may cause disturbances in the signal that will cause errors to be displayed.

- Time Display

The time is displayed in the format specified by Time that you select by pressing SYS and then F•2 SYSTEM SETUP.

- Channel Display

The input channel is displayed.

A “-” is displayed for audio events detected by SER03.

“N1/N2•N3/N4” is displayed for IP (NMI) input signal events detected by the SER08.

- Format Display

The input format is displayed.

If there is no input signal, “NO SIGNAL” is displayed.

“BNC” is displayed for external audio events detected by SER03.

16. STATUS DISPLAY

● Event Display

The events that are displayed in the event log are listed below.

Of the items listed below, only those whose detection settings have been set to ON in FORMAT ALARM tab of the SYS menu, STATUS SETUP of the STATUS menu, ERROR SETUP of the EYE menu, and ERROR SETUP of the AUDIO menu are displayed.

Table 16-2 Events

Applicable Unit	Event Name	Description
SER01/SER02/SER06/SER08	FORMAT_ALARM	Format Alarm
	TRS_P	TRS Position Error
	TRS_C	TRS Code Error
	LINE	Line Number Error(Except SD)
	CRC	CRC Error(Except SD)
	EDH	EDH Error(SD)
	ILLEGAL	Illegal Code Error
	FREQ	Frequency Error
	CABLE_ERR	Cable Error
	CABLE_WAR	Cable Warning
	PRTY	Ancillary Data Parity Error
	CHK	Ancillary Data Checksum Error
	A_BCH	Embedded Audio BCH Error(Except SD)
	A_DBN	Embedded Audio DBN Error
	A_PRTY	Embedded Audio Parity Error(Except SD)
	A_INH	Embedded Audio Inhibit Line Error
	A_SMP	Embedded Audio Sample Count Error
	GMUT	Gamut Error
	GMUT_ST1	Gamut Error Stream 1
	GMUT_ST2	Gamut Error Stream 2
	CGMUT	Composite Gamut Error
	CGMUT_ST1	Composite Gamut Error Stream 1
	CGMUT_ST2	Composite Gamut Error Stream 2
	FRZ	Freeze Error
	FRZ_ST1	Freeze Error Stream 1
	FRZ_ST2	Freeze Error Stream 2
	BLK	Black Error
	BLK_ST1	Black Error Stream 1
	BLK_ST2	Black Error Stream 2
	LVL_Y	Luminance Error
	LVL_Y_ST1	Luminance Error Stream 1
	LVL_Y_ST2	Luminance Error Stream 2
	LVL_C	Chroma Error
	LVL_C_ST1	Chroma Error Stream 1
	LVL_C_ST2	Chroma Error Stream 2
SER02/SER09	EYE_3G_AMP	3G Amplitude Error
	EYE_3G_TR	3G Risetime Error
	EYE_3G_TF	3G Falltime Error

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Applicable Unit	Event Name	Description
	EYE_3G_TR_TF	3G Deltatime Error(Tr-Tf)
	EYE_3G_T_JIT	3G Timing Jitter Error
	EYE_3G_A_JIT	3G Current Jitter Error
	EYE_3G_OR	3G OverShoot Rising Error
	EYE_3G_OF	3G OverShoot Falling Error
	EYE_HD_AMP	HD Amplitude Error
	EYE_HD_TR	HD Risetime Error
	EYE_HD_TF	HD Falltime Error
	EYE_HD_TR_TF	HD Deltatime Error(Tr-Tf)
	EYE_HD_T_JIT	HD Timing Jitter Error
	EYE_HD_A_JIT	HD Current Jitter Error
	EYE_HD_OR	HD OverShoot Rising Error
	EYE_HD_OF	HD OverShoot Falling Error
	EYE_SD_AMP	SD Amplitude Error
	EYE_SD_TR	SD Risetime Error
	EYE_SD_TF	SD Falltime Error
	EYE_SD_TR_TF	SD Deltatime Error(Tr-Tf)
	EYE_SD_T_JIT	SD Timing Jitter Error
	EYE_SD_A_JIT	SD Current Jitter Error
	EYE_SD_OR	SD OverShoot Rising Error
	EYE_SD_OF	SD OverShoot Falling Error
SER09	EYE_12G_AMP	12G Amplitude Error
	EYE_12G_TR	12G Risetime Error
	EYE_12G_TF	12G Falltime Error
	EYE_12G_TR_TF	12G Deltatime Error(Tr-Tf)
	EYE_12G_T_JIT	12G Timing Jitter Error
	EYE_12G_A_JIT	12G Current Jitter Error
	EYE_12G_OR	12G Overshoot Rising Error
	EYE_12G_OF	12G Overshoot Falling Error
SER03	OVER	Level Over
	CLIP	Clip
	MUTE	Mute
	PAR	Parity Error
	VAL	Validity Error
	CRC	CRC Error
	CODE	Code Violation

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- Event Generation Channel Display (SER03)

For audio events detected by SER03, the channel on which the event occurred is displayed after the event name in hexadecimal notation.

- 8-Channel Measurement

The 8 bits expressed by the hexadecimal number correspond to the following input channels.

INPUT	b8	b7	b6	b5	b4	b3	b2	b1
SDI (Single input mode)	2nd GROUP (G1 to G4)				1st GROUP (G1 to G4)			
SDI (Simul mode)	2nd GROUP (G1 to G4) (SDI A to SDI D)				1st GROUP (G1 to G4) (SDI A to SDI D)			
EXT AUDIO (*1)	A/B 8ch	A/B 7ch	A/B 6ch	A/B 5ch	A/B 4ch	A/B 3ch	A/B 2ch	A/B 1ch

*1 Corresponds to the channels selected using EXT AUDIO INPUT GROUP (A/B)

For example, if INPUT is set to SDI (simul mode), 1st GROUP is set to SDI B G3, and 2nd GROUP is set to SDI A G4, "48" indicates that events have occurred on B12ch and A15ch.

4				8			
0	1	0	0	1	0	0	0
A16ch	A15ch	A14ch	A13ch	B12ch	B11ch	B10ch	B9ch

- 16-Channel Measurement

The 16 bits expressed by the hexadecimal number correspond to the following input channels.

INPUT	b16	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1
SDI (Single input mode)	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
SDI (Simul mode)	4th GROUP (G1 to G4) (SDI A to SDI D)				3rd GROUP (G1 to G4) (SDI A to SDI D)				2nd GROUP (G1 to G4) (SDI A to SDI D)				1st GROUP (G1 to G4) (SDI A to SDI D)			
EXT AUDIO	B8	B7	B6	B5	B4	B3	B2	B1	A8	A7	A6	A5	A4	A3	A2	A1

For example, when INPUT SELECT is set to EXT AUDIO, "1248" indicates that events have occurred on channels A4, A7, B2, and B5.

1				2				4				8			
0	0	0	1	0	0	1	0	0	1	0	0	1	0	0	0
B8	B7	B6	B5	B4	B3	B2	B1	A8	A7	A6	A5	A4	A3	A2	A1

16.4.2 Starting the Event Log

To start the event log, follow the procedure below.

Procedure

STATUS	→	F•1	EVENT LOG →	F•1	LOG: START / <u>STOP</u>

Settings

START: The event log is started. "NOW LOGGING" appears in the upper right of the event log.

STOP: The event log is stopped. "LOGGING STOPPED" appears in the upper right of the event log.

16.4.3 Deleting the Event Log

To delete the event log, follow the procedure below.

Procedure

STATUS	→	F•1	EVENT LOG →	F•2	CLEAR

16.4.4 Selecting the Overwrite Mode

Up to 1000 events can be displayed. To select the action to perform when more than 1000 events occur, follow the procedure below.

Procedure

STATUS	→	F•1	EVENT LOG →	F•3	LOG MODE: <u>OVER WR</u> / STOP

Settings

OVER WR: Oldest events are overwritten.

STOP: Additional events are not recorded.

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16.4.5 Saving to USB Memory

You can save the event log to a USB memory device as a text file.
To save a file with a name that you specify, follow the procedure below.

1. Used to connect USB memory.
2. Press **F•6** USB MEMORY.

The file list display appears.

This setting appears when USB memory is connected.

No.	Filename	Date&Time	Size(byte)
1	20131217172614.txt	2013/12/17 17:26:14	231
2	20131217172618.txt	2013/12/17 17:26:18	231

Disk Size: 8,158,744,576 Byte
Free Size: 8,155,901,952 Byte

LOG Store File Name
.txt

AUTO FILENAME ON STORE FILE DELETE up menu

Figure 16-7 File list display

3. Set **F•1** AUTO FILENAME to OFF.
4. Press **F•2** NAME INPUT.

The file name input display appears.

0 1 2 3 4 5 6 7 8 9
A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z _

[F.D_NOB] = CHAR SELECT, [F.D_PUSH] = CHAR SET & Function Key Edit

LOG Store File Name
.txt

CLEAR ALL DELETE <= >= CHAR SET up menu

Figure 16-8 File name input screen

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5. Enter a file name using up to 14 characters.

The key operations that you can perform in the file name input display are as follows:

F•1	CLEAR ALL	Deletes all characters
F•2	DELETE	Deletes the character at the cursor
F•4	<=	Moves the cursor to the left
F•5	=>	Moves the cursor to the right
F•6	CHAR SET	Enters the character

Function dial (F•D) Turn to select a character, and press to enter the character.

You can also copy the file name of an already saved file. To copy a file name, move the cursor to the file in the file list whose name you want to copy, and then press the function dial (F•D).

6. Press **F•7** up menu.
7. Press **F•3** STORE.

If a file with the same name that you have specified already exists on the USB memory device, an overwrite confirmation menu appears. To overwrite the current file, press **F•1** OVER WR YES. To cancel the save operation, press **F•3** OVER WR NO.

● Deleting an Event Log

To delete an event log that has been saved to the USB memory device, select the log file on the file list display, and then press **F•4** FILE DELETE. To delete the file, press **F•1** DELETE YES. To cancel the delete operation, press **F•3** DELETE NO.

● Automatic File Name Generation

If you set **F•1** AUTO FILENAME to ON, the file name will be generated automatically in the format "YYYYMMDDhhmmss" when you save the file. In this situation, **F•2** NAME INPUT is not displayed.

● USB Memory Device Folder Structure

Event logs are saved in the LOG folder.

📁 USB memory device
└─ 📁 LV5490_USER
 └─ 📁 LOG
 └─ 📄 YYYYMMDDhhmmss.txt

16.5 Configuring Data Dump Settings

To view the data dump, follow the procedure below.

In the data dump, the data of the selected line is listed. You can change the line number using the V POS knob and the sample number using the H POS knob. (You can also use the function dial (F•D).

Changing this setting will also change the selected line on the video-signal-waveform, vector, and picture displays (excluding some of the 4K settings).

Procedure

STATUS	→	F•2	SDI ANALYSIS	→	F•1	DATA DUMP

1920x1080/50I YCbCr(422) 10bit HD				SDI 1A	TIME: 16:28:46
DATA DUMP		LINE No.1			
		SAMPLE	Y	Cb/Cr	
[EAV]		<1920>	3FF	3FF	
[EAV]		<1921>	000	000	
[EAV]		<1922>	000	000	
[EAV]		<1923>	2D8	2D8	
LN	LN	<1924>	204	204	
LN	LN	<1925>	200	200	
CRC	CRC	<1926>	2BB	2F7	
CRC	CRC	<1927>	23C	1E8	
		<1928>	040	000	
		<1929>	040	3FF	
		<1930>	040	3FF	
		<1931>	040	2E7	
		<1932>	040	28E	
		<1933>	040	218	
		<1934>	040	104	
		<1935>	040	203	
		<1936>	040	200	
		<1937>	040	116	
		<1938>	040	17F	
		<1939>	040	20F	
MODE		DUMP OPERATION	DISPLAY	SELECT CH	up menu
RUN			SERIAL	1A	

Figure 16-9 Data dump display

16.5.1 Data Dump Display Explanation

- Detection Code Display

The input signal's embedded ancillary data is detected, and the following detection codes are displayed.

Table 16-3 Detection code list

Detection Code	Color	Description
ADF	Cyan	Ancillary data flags (000h, 3FFh, and 3FFh)
DID	Cyan	Data identification (the data after ADF)
SDID	Cyan	Secondary data identification (the secondary format data when the DID is smaller than 80h)
DBN	Cyan	Data block numbers (the primary data format when the DID is larger than 80h)
DC	Cyan	Data count (the data after the SDID/DBN)
UDW	Cyan	User data words (the user data words of the data count length after ADF)
CS	Magenta	Checksum (the data immediately after UDW)
AP	Yellow	Active picture (the active picture from after the SAV to just before the EAV when the selected line is within the active video area)

- Line Number Display

Pictures sent in SDI signals are assigned line numbers as part of the transmission format.

The line number is displayed in one of the following formats at the top of the screen.

Table 16-4 Line number display

Line number display	Description
LINE No.	The picture scan line numbers and the line numbers during transmission are matched.
I/F LINE No.	The picture scan line numbers and the line numbers during transmission are not matched. Line numbers during transmission are displayed.
PIC LINE No.	The picture scan line numbers and the line numbers during transmission are not matched. Picture scan line numbers are displayed.

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Normally, the picture scan line numbers and the line numbers for storing those line numbers during transmission are matched. However, they do not match when the following format is received.

If this is the case, you can switch between the picture scan line number (PICTURE) and line numbers during transmission.

Table 16-5 Format

Format	Frame rate	Switching operation	
3G-B-DL	60/59.94/50/48/47.95/P	F•4	DISPLAY (PICTURE/STREAM1/STREAM2)
HD (DL)	60/59.94/50/48/47.95/P	F•5	LINK (PICTURE/A/B)
3G (DL)-2K	60/59.94/50/48/47.95/P	F•5	LINK (PICTURE/1/2)

As an example, the switching procedure for setting the picture scan line number to 42 when 3G-B-DL (1920×1080/59.94P) is applied is shown below.

1. Display the data dump.
2. Set F•4 DISPLAY to PICTURE.
3. Use the V POS knob to set PIC LINE No. to 42.
4. Set F•4 DISPLAY to STREAM1.

The line number display changes to I/F LINE No.21.

This indicates that the line number in which the picture scan line number 42 is stored for transmission is 21.

The relationship of other 3G-B-DL line numbers is shown below.

Table 16-6 3G-B-DL line number relationship

Picture scan line number (PIC LINE No.)	Line number during transmission (I/F LINE No.)	
	STREAM1	STREAM2
1	563	1125
2	1	563
n (odd number)	$(n+1)/2+562$	$(n-1)/2$
m (even number)	$m/2$	$m/2+562$

16.5.2 Selecting the Display Mode

To select the data dump display mode, follow the procedure below.

Procedure

STATUS	→	F•2	SDI ANALYSIS	→	F•1	DATA DUMP	→	F•1	MODE: <u>RUN</u> / HOLD / FRM CAP

Settings

RUN:	The input signal data is automatically updated and displayed.
HOLD:	The input signal data is displayed statically.
FRM CAP:	The frame data is displayed. If frame data has not been captured in the LV 5490, nothing is displayed. This setting can be selected in frame capture mode.

16.5.3 Selecting the Display Format

To select the data dump display format, follow the procedure below.

This menu does not appear when F•5 LINK or F•5 SUB is set to PICTURE.

Procedure

STATUS	→	F•2	SDI ANALYSIS	→	F•1	DATA DUMP	→	F•4	DISPLAY
: <u>SERIAL</u> / COMPO / BINARY (for HD, SD, 3G-A, HD (QL), 3G-A of 3G (QL), 12G)									
: PICTURE / <u>STREAM1</u> / STREAM2 (for 3G-B-DL, 3G-B-DL of 3G (QL))									
: STREAM12 / <u>STREAM1</u> / STREAM2 (for 3G-B-DL of 3G (DL)-2K)									
: <u>S1 SERIAL</u> / S1 COMPO / S1 BINARY / S2 SERIAL / S2 COMPO / S2 BINARY (for 3G (DL)-4K, 3G-B-DS)									

Settings

SERIAL:	The parallel converted data sequences are displayed.
COMPO:	The parallel converted data sequences are divided into each component and displayed.
BINARY:	The parallel converted data sequences are displayed in binary.
PICTURE:	Links or streams 1 and 2 are combined and displayed in a picture structure.
STREAM1:	Stream 1 is displayed.
STREAM2:	Stream 2 is displayed.
STREAM12:	Stream 1 and 2 are combined and displayed.
S1 SERIAL:	Stream 1 is displayed serially.
S1 COMPO:	Stream 1 is separated and displayed.
S1 BINARY:	Stream 1 is displayed in binary.
S2 SERIAL:	Stream 2 is displayed serially.
S2 COMPO:	Stream 2 is separated and displayed.
S2 BINARY:	Stream 2 is displayed in binary.

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DISPLAY = SERIAL

DATA DUMP	LINE No.1		
	SAMPLE	Y	Cb/Cr
[EAV]	<1920>	3FF	3FF
[EAV]	<1921>	000	000
[EAV]	<1922>	000	000
[EAV]	<1923>	2D8	2D8
LN LN	<1924>	204	204
LN LN	<1925>	200	200
CRC CRC	<1926>	2BB	2F7
CRC CRC	<1927>	23C	1E8
	<1928>	040	000
	<1929>	040	3FF
	<1930>	040	3FF
	<1931>	040	2E7
	<1932>	040	186
	<1933>	040	218
	<1934>	040	21E
	<1935>	040	104
	<1936>	040	200
	<1937>	040	16B
	<1938>	040	1D5
	<1939>	040	20F

DISPLAY = COMPO

DATA DUMP	LINE No.1			
	SAMPLE	Y	Cb	Cr
[EAV]	<1920>	3FF	3FF	
[EAV]	<1921>	000		000
[EAV]	<1922>	000	000	
[EAV]	<1923>	2D8		2D8
LN LN	<1924>	204	204	
LN LN	<1925>	200		200
CRC CRC	<1926>	2BB	2F7	
CRC CRC	<1927>	23C		1E8
	<1928>	040	000	
	<1929>	040		3FF
	<1930>	040	3FF	
	<1931>	040		2E7
	<1932>	040	17A	
	<1933>	040		218
	<1934>	040	1E9	
	<1935>	040		102
	<1936>	040	200	
	<1937>	040		1AD
	<1938>	040	137	
	<1939>	040		20F

DISPLAY = BINARY

DATA DUMP	LINE No.1		
	SAMPLE	Y	Cb/Cr
[EAV]	<1920>	1111111111	1111111111
[EAV]	<1921>	0000000000	0000000000
[EAV]	<1922>	0000000000	0000000000
[EAV]	<1923>	1011011000	1011011000
LN LN	<1924>	1000000100	1000000100
LN LN	<1925>	1000000000	1000000000
CRC CRC	<1926>	1010111011	1011110111
CRC CRC	<1927>	1000111100	0111101000
	<1928>	0001000000	0000000000
	<1929>	0001000000	1111111111
	<1930>	0001000000	1111111111
	<1931>	0001000000	1011100111
	<1932>	0001000000	1011011011
	<1933>	0001000000	1000011000
	<1934>	0001000000	1000011110
	<1935>	0001000000	0100000100
	<1936>	0001000000	1000000000
	<1937>	0001000000	0101100001
	<1938>	0001000000	1001111000
	<1939>	0001000000	0110000000

Figure 16-10 Selecting the display format

16.5.4 Selecting the Displayed Information

When the link format is set to multi, to select which link to display the data dump of, follow the procedure below. Links or streams 1 and 2 are combined and displayed in a picture structure.

Procedure (Multi link)

STATUS → F•2 SDI ANALYSIS → F•1 DATA DUMP → F•5 LINK
 : PICTURE / A[1A] / B[1B] / A[1C] / B[1D] / A[2A] / B[2B] / A[2C] / B[2D] (for HD (DL))
 : PICTURE / 1[1A] / 2[1B] / 1[1C] / 2[1D] / 1[2A] / 2[2B] / 1[2C] / 2[2D] (for 3G (DL))
 : PICTURE / 1[1A] / 2[1B] / 3[1C] / 4[1D] / 1[2A] / 2[2B] / 3[2C] / 4[2D] (for 3G (QL), HD(QL))

Procedure (12G)

STATUS → F•2 SDI ANALYSIS → F•1 DATA DUMP → F•5 SUB
 : PICTURE / 1[1A] / 2[1B] / 3[1C] / 4[1D]

16.5.5 Moving the Display Position

To configure data dump operation settings, press F•2 DUMP OPERATION in the DATA DUMP menu.

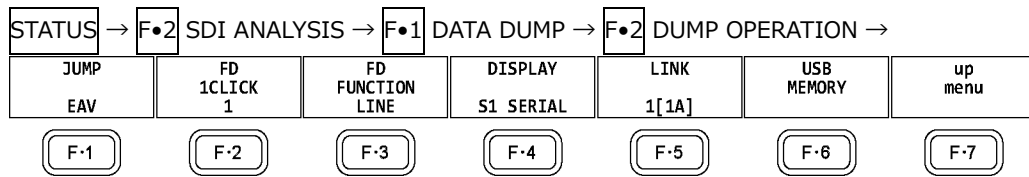


Figure 16-11 DUMP OPERATION menu

To move the data dump sample number to a specific location, follow the procedure below.

Procedure

STATUS → F•2 SDI ANALYSIS → F•1 DATA DUMP → F•2 DUMP OPERATION → F•1 JUMP
 : EAV / SAV
 : END / START (when the input signal is 4K and F•5 LINK or F•5 SUB is set to PICTURE)

Settings

EAV: The display starts with the EAV sample number.
 SAV: The display starts with the SAV sample number.
 END: The last sample number is displayed.
 START: The display starts with sample number 0.

16.5.6 Selecting the Adjustment Step Resolution

To select the line or sample number adjustment step resolution for when the function dial (F•D) is turned, follow the procedure below.

Procedure

STATUS → F•2 SDI ANALYSIS → F•1 DATA DUMP → F•2 DUMP OPERATION → F•2 FD
 1CLICK: 1 / 10 / 50

16.5.7 Selecting What the Function Dial Controls

To select whether the line number or sample number is controlled with the function dial (F•D), follow the procedure below. You can also change the line number using the V POS knob and the sample number using the H POS knob.

Procedure

STATUS → F•2 SDI ANALYSIS → F•1 DATA DUMP → F•2 DUMP OPERATION → F•3 FD
 FUNCTION: LINE / SAMPLE

Settings

LINE:	Turning the function dial (F•D) changes the line number. If you press the function dial (F•D), the data of line number 0 or 1 is displayed.
SAMPLE:	Turning the function dial (F•D) changes the sample number. If you press the function dial (F•D), EAV or sample number 0 is displayed.

16.5.8 Saving to USB Memory

You can save the data dump to a USB memory device as a text file. The procedure to follow to save data is the same as the procedure that was given for the event log. See section 16.4.5, "Saving to a USB Memory Device."

Data dumps are saved in the DUMP folder.

- 📁 USB memory device
 - └ 📁 LV5490_USER
 - └ 📁 DUMP
 - └ 📄 YYYYMMDDhhmmss.txt

16.6 Configuring Phase Difference Measurement Settings

To show the phase difference measurement display, follow the procedure below.
You can use the phase difference measurement display to measure the phase difference between an SDI signal and an external sync signal or the phase difference between a pair of SDI signals.

Procedure

STATUS → F•2 SDI ANALYSIS → F•2 EXT REF PHASE

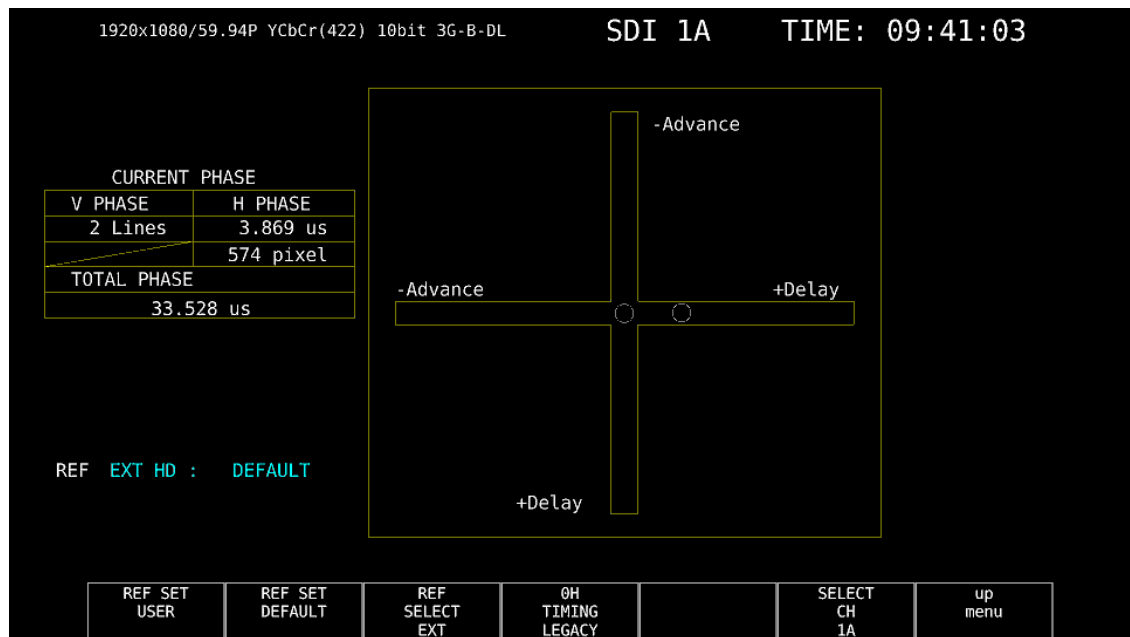


Figure 16-12 Phase difference measurement display

- Measuring the Phase Difference between an SDI Signal and an External Sync Signal

You can measure the phase difference between an SDI signal and an external sync signal by setting F•3 REF SELECT to EXT. Apply the external sync signal.

Note that the following input formats are not supported.

- 3G's 720/30P, 720/29.97P, 720/25P, 720/24P, and 720/23.98P
- Frame frequency 48P, 47.95P

- Measuring the Phase Difference between SDI Signals

You can measure the phase difference between SDI signals by setting F•3 REF SELECT to SDI. This measurement is not possible when SDI System is set to 3G-B-DS on the SYS > F•1 SIGNAL IN OUT > SDI IN tab.

The reference signal varies depending on the input signal as shown below.

Table 16-7 Reference signal

Input signal	Reference signal
SD, HD, 3G	A ch
HD (DL)	Link A
3G (DL)-2K, 3G (DL)-4K, 3G (QL), HD (QL)	Link 1

16.6.1 Phase Difference Measurement Display Explanation

● CURRENT PHASE

V PHASE: The phase difference is displayed in units of lines.

H PHASE: The phase difference is displayed in units of time and in units of pixels or dots. (*1)

TOTAL PHASE: The total of the V PHASE and H PHASE differences is displayed here in units of time.

*1 When the input signal is HD (DL) 1080/60P, 1080/59.94P, 1080/50P, or SD, the unit will be dots. Pixels are in units of the video's sampling frequency. Dots are in units of the parallel video's transmission clock frequency.

● REF

This displays the reference signal as shown below.

Table 16-8 REF indications

F•3 REF SELECT	Display Indication	Description
EXT	EXT BB : DEFAULT	Indicates that the external sync signal is BB and the phase difference is the default value.
	EXT BB : USER REF	Indicates that the external sync signal is BB and a user-defined reference is being used.
	EXT HD : DEFAULT	Indicates that the external sync signal is an HD tri-level sync signal and the phase difference is the default value.
	EXT HD : USER REF	Indicates that the external sync signal is an HD tri-level sync signal and a user-defined reference is being used.
	NO SIGNAL	Indicates that no external sync signal is being applied.
SDI	SDI 1A	Indicates that the input signal is SD, HD, or 3G and the reference signal is 1A
	SDI 2A	Indicates that the input signal is SD, HD, or 3G and the reference signal is 2A
	LINK A	Indicates that the input signal is HD (DL) and the reference signal is link A
	LINK 1	Indicates that the input signal is 3G (DL)-2K, 3G (DL)-4K, 3G (QL), or HD (QL) and the reference signal is link 1
	NO SIGNAL	Indicates that the reference SDI signal is not being received.

16. STATUS DISPLAY

- User-Defined References for the Phase Difference

When **F•3** REF SELECT is set to EXT, you can set the current phase difference to zero by pressing **F•1** REF SET USER. You can change the reference to match the system that you are using. (During multi link, the phase difference of link A or link 1 is set to zero.)

To reset the phase difference to its default value (see below), press **F•2** REF SET DEFAULT.

- Default Phase Difference Setting

If the input signal is HD or SD and **F•3** REF SELECT is set to EXT, you can use **F•4** OH TIMING to select the reference where the phase difference is assumed to be zero.

When using a LEADER signal generator that allows you to select LEGACY or SERIAL, this setting must be matched to the setting selected on the LV 5490. In addition, depending on the output accuracy of the signal generator and measurement accuracy of the LV 5490, there may be an offset of around 0 ± 4 clocks in the display.

LEGACY: The phase difference is zero when the external sync signal without timing offset transmitted from a LEADER signal generator and an SDI signal are received.

SERIAL: The phase difference is zero when the external sync signal and the SDI signal are received at the times defined in the signal standard.

- Graphical Display

The vertical axis indicates the V phase difference in lines. The horizontal axis represents the H phase difference in time. When the circles that represent V and H overlap with each other in the center, there is no phase difference.

The circles are normally displayed in white, but they will be displayed in green under the following circumstances.

Horizontal: When the circle is within ± 3 clocks of the center.

Vertical: When the circle is within ± 0 clocks of the center.

When the signal is behind the reference signal, the circle is displayed on the Delay (+) side. When the signal is ahead of the reference signal, the circle is displayed on the Advance (-) side. For both the V and H axes, differences of up to approximately $+1/2$ frames from the center are displayed on the Delay axis and differences of up to approximately $-1/2$ frames from the center are displayed on the Advance axis. (See the table below.)

When the phase difference between an SDI signal and an external sync signal is being measured, the H axis phase difference may vary within a range of ± 1 clock in cases such as when the signal is switched. When the phase difference between SDI signals is being measured, the H difference may vary within a range of ± 2 clock in cases such as when the signal is switched.

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Table 16-9 Delay and Advance axis display ranges (3G-A, 3G-B, HD, SD)

3G-A, 3G-B, HD, SD Format		Displayed on the Advance Axis			Displayed on the Delay Axis				
		V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]
3G-A	1080/59.94P	-562	-14.822	to	0	0	to	562	0
	1080/60P	-562	-14.808	to	0	0	to	562	0
	1080/50P	-532	-17.771	to	0	0	to	562	0
3G-B	1080/59.94P	-1124	-14.822	to	0	0	to	1125	0
	1080/60P	-1124	-14.808	to	0	0	to	1125	0
	1080/50P	-1124	-17.771	to	0	0	to	1125	0
3G-A 3G-B HD	1080/59.94I, 1080/29.97P, 1080/29.97PsF	-562	-29.645	to	0	0	to	562	0
	1080/60I, 1080/30P, 1080/30PsF	-562	-29.616	to	0	0	to	562	0
	1080/50I, 1080/25P, 1080/25PsF	-562	-35.542	to	0	0	to	562	0
	1080/23.98P, 1080/23.98PsF	-562	-37.060	to	0	0	to	562	0
	1080/24P, 1080/24PsF	-562	-37.023	to	0	0	to	562	0
	720/59.94P	-375	0	to	0	0	to	374	22.230
	720/60P	-375	0	to	0	0	to	374	22.208
	720/50P	-375	0	to	0	0	to	374	26.653
	720/29.97P	-375	0	to	0	0	to	374	44.475
	720/30P	-375	0	to	0	0	to	374	44.430
	720/25P	-375	0	to	0	0	to	374	53.319
	720/23.98P	-375	0	to	0	0	to	374	55.597
	720/24P	-375	0	to	0	0	to	374	55.542
SD	525/59.94I	-262	-63.518	to	0	0	to	262	0
	625/50I	-312	-63.962	to	0	0	to	312	0

Table 16-10 Delay and Advance axis display ranges (12G)

12G Sub Image Format		Displayed on the Advance Axis			Displayed on the Delay Axis				
		V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]		V PHASE [Lines]	H PHASE [us]
12G	1080/59.94P	-562	-14.822	to	0	0	to	562	0
	1080/60P	-562	-14.808	to	0	0	to	562	0
	1080/50P	-532	-17.771	to	0	0	to	562	0
	1080/29.97P	-562	-29.645	to	0	0	to	562	0
	1080/30P	-562	-29.616	to	0	0	to	562	0
	1080/25P	-562	-35.542	to	0	0	to	562	0
	1080/23.98P	-562	-37.060	to	0	0	to	562	0
	1080/24P	-562	-37.023	to	0	0	to	562	0

16.7 Setting the Lip Sync Measurement (SER03)

To show the lip sync measurement screen, follow the procedure below.

By combining a Leader signal generator that supports lip syncing with this instrument, you can use the lip sync measurement screen to measure the offset between the video signal and the audio signal that occurs in the transfer route.

Procedure

STATUS	→	F·2	SDI ANALYSIS	→	F·4	AV PHASE

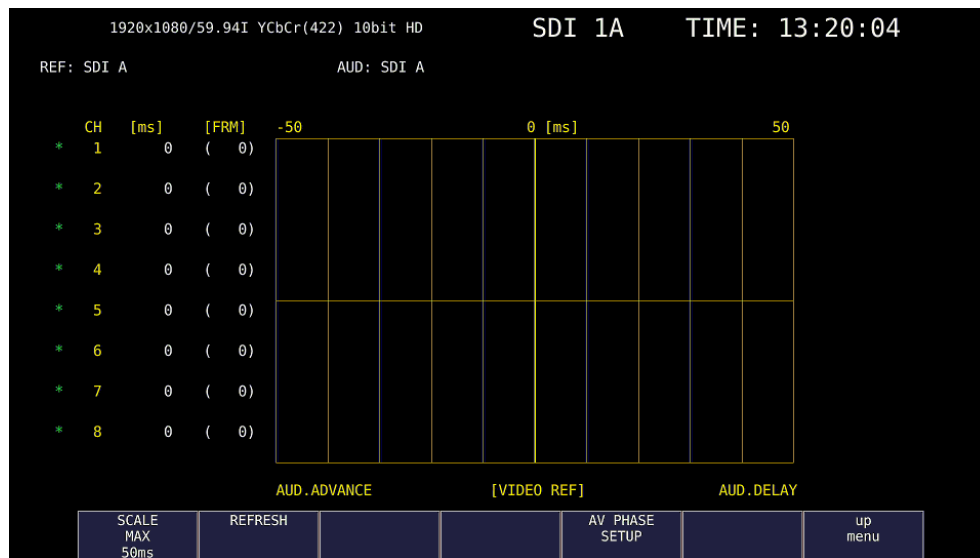


Figure 16-13 Lip sync measurement screen

As an example, below is the procedure for when the LT4600A, LT4610 (with LT4610-SER02 and LT4610-SER24 installed according to the format), or LT4611 (with LT4610-SER22 installed and LT4610-SER02 and LT4611-SER24 installed according to the format) is used for the signal generator with a lip sync feature when the audio output is set to SDI embedded audio.

- Turn the signal generator that supports lip syncing lip sync feature on.
 - On the LT4600A

Select SDI SETTING→SDI→LIPSYNC to turn lip sync on. Select AES/EBU SETTING→AES/EBU 1→LIPSYNC ENABLE to set the audio. For details, see the LT4600A instruction manual.
 - On the LT4610 or LT4611

Depending on the format, select ETC→LIPSYNC→SDI1+AES / SDI2 or 12G OPTION→SDI 1 / 2 / 3 / 4→VIDEO→LIPSYNC to turn lip sync on. Then, select SDI→SDI1 / 2→AUDIO or 12G OPTION→SDI 1 / 2 / 3 / 4→AUDIO to set the audio. For details, see the LT4610 / LT4611 instruction manual.
- Send the signal generated from the signal generator that supports lip syncing SDI output connector to the transfer route. Apply the signal received from the transfer route to the SDI connector of this instrument.

If the output audio is external audio, apply the video signal to the SDI input connector and the audio signal to the digital audio I/O connector.

3. Select the audio signal.

On the instrument's **AUDIO** → **F•1** MAPPING → AUDIO MAPPING tab, set the audio signal to EMB AUDIO (for embedded audio) or EXT AUDIO (for digital audio I/O connector). For EXT AUDIO, EXTERNAL AUDIO on the AUDIO IN/OUT tab must be set to INPUT.

4. The lip sync measurement screen is displayed.

Press **STATUS** → **F•2** SDI ANALYSIS → **F•4** AV PHASE.

The time difference when the luminance level of the video signal (the G signal level when the input signal is RGB) exceeds the specified value or when the audio level signal exceeds the specified value is measured, and the results are displayed numerically and graphically for each channel.

The measured value is displayed in units of time and frames. If the audio signal cannot be detected, "UNLOCK" is displayed. If the audio signal cannot be measured correctly, "MISSING" is displayed. Further, when the measured value is updated, an asterisk is displayed next to the channel.

You can set the video signal measurement range, video signal luminance level, and audio signal level using **F•5** AV PHASE SETUP.

16.7.1 Selecting the Measurement Range

To select the graph measurement range, follow the procedure below.

Procedure

STATUS → **F•2** SDI ANALYSIS → **F•4** AV PHASE → **F•1** SCALE MAX: 50ms / 100ms / 500ms / 1.0s / 2.5s

16.7.2 Updating the Measurement Screen

To update the measurement screen, follow the procedure below.

Procedure

STATUS → **F•2** SDI ANALYSIS → **F•4** AV PHASE → **F•2** REFRESH

16.7.3 Setting the Measurement Range

To set the measurement range, follow the procedure below. Use the AV PHASE SETUP tab to configure these settings.

Procedure

STATUS	→	F•2	SDI ANALYSIS	→	F•4	AV PHASE	→	F•5	AV PHASE SETUP

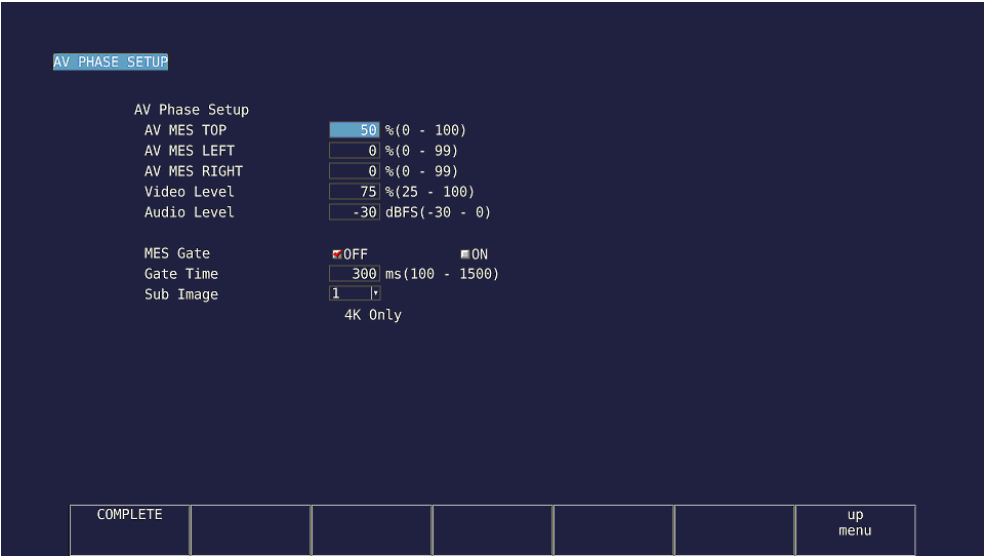


Figure 16-14 AV PHASE SETUP tab

● AV MES TOP

Set the video signal measurement line with the top edge of the picture taken to be 0 % and the bottom edge to be 100 %.

You can also set this using LINE SELECT on the PIC menu while viewing the picture.

[See also] 13.3.3, “Setting the Lip Sync Measurement Range (SER03)”

0 - 50 - 100%

● AV MES LEFT

Set the video signal measurement range (left side) with the left edge of the picture taken to be 0 % and the right edge to be 100 %. You cannot set this to the right of the line set with AV MES RIGHT.

You can also set this using LINE SELECT on the PIC menu while viewing the picture.

[See also] 13.3.3, “Setting the Lip Sync Measurement Range (SER03)”

0 - 99%

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● AV MES RIGHT

Set the video signal measurement range (right side) with the right edge of the picture taken to be 0 % and the left edge to be 100 %. You cannot set this to the left of the line set with AV MES LEFT.

You can also set this using LINE SELECT on the PIC menu while viewing the picture.

[See also] 13.3.3, "Setting the Lip Sync Measurement Range (SER03)"

0 - 99%

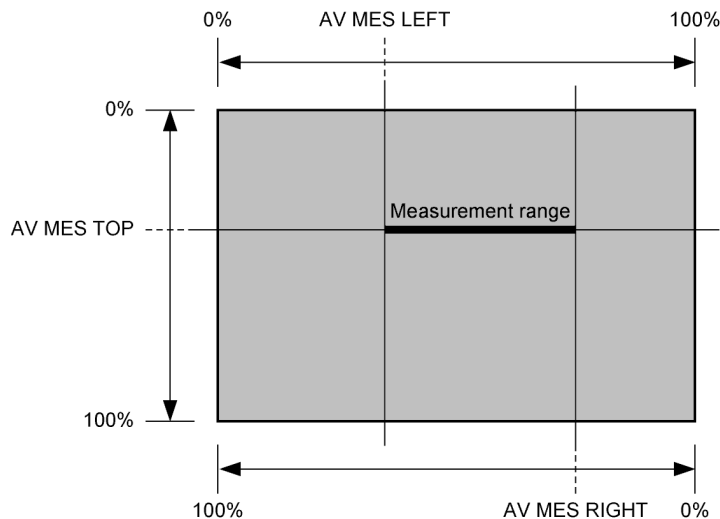


Figure 16-15 Setting the measurement range (video signal)

● Video Level

Set the video signal luminance level. The time difference from the audio signal is measured when the luminance level of the measurement range specified with AV MES exceeds the level specified here.

25 - 75 - 100%

● Audio Level

Set the audio signal level. The time difference from the video signal is measured when the audio signal level exceeds the level specified here.

-30 - 0dBFS

● MES Gate

Select whether to specify the measurement range of the audio signal. Set this to ON such as when using a pattern containing multiple audio signals for a single video signal.

OFF / ON

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- Gate Time

When MES Gate is set to ON, set the measurement range of the audio signal. The measurement range is "the rise time of the video signal $\pm$ the time set with Gate Time."

100 - 300 - 1500

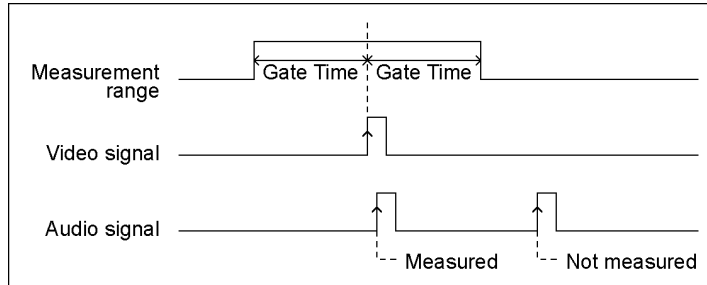


Figure 16-16 Setting the measurement range (audio signal)

- Sub Image

When the input signal is 4K (both square format and 2 sample interleave format), select the sub image for setting the measurement range.

1 / 2 / 3 / 4

16.8 Displaying a List of Ancillary Data

To display a list of ancillary data, follow the procedure below.

Procedure

STATUS	→	F•4	ANC DATA VIEWER

3840x2160/29.97P YCbCr(422) 10bit 3G-B-DS DUAL(SQ) SDI 1A-1B TIME: 10:47:25

ANC DATA VIEWER			LINK 1[1A]	1/4
STANDARD	DID/SDID	STATUS	LINE No.	PACKET
S291M MARK DEL	80/--	MISSING		
S291M END PKT	84/--	MISSING		
S291M START PKT	88/--	MISSING		
ARIB B.27 CC	CF/--	MISSING		
S299M ctrl G4	E0/--	DETECT	571/--	2/FRAME
S299M ctrl G3	E1/--	DETECT	571/--	2/FRAME
S299M ctrl G2	E2/--	DETECT	571/--	2/FRAME
S299M ctrl G1	E3/--	DETECT	571/--	2/FRAME
S299M aud G4	E4/--	DETECT	923/--	1601/FRAME
S299M aud G3	E5/--	DETECT	923/--	1601/FRAME
S299M aud G2	E6/--	DETECT	923/--	1601/FRAME
S299M aud G1	E7/--	DETECT	923/--	1601/FRAME
S272M ctrl G4	EC/--	MISSING		
S272M ctrl G3	ED/--	MISSING		
S272M ctrl G2	EE/--	MISSING		
S272M ctrl G1	EF/--	MISSING		
RP165 EDH	F4/--	MISSING		
S272M ext G4	F8/--	MISSING		
S272M aud G4	F9/--	MISSING		
S272M ext G3	FA/--	MISSING		
S272M aud G3	FB/--	MISSING		
S272M ext G2	FC/--	MISSING		

ANC DUMP

PAGE UP

PAGE DOWN

STREAM SELECT
STREAM1

LINK
1[1A]

SELECT CH
1A - 1B

up menu

Figure 16-17 Ancillary data display

16.8.1 Ancillary Data Display Explanation

On the ancillary data display, data is displayed as a list for each standard. If data is detected, "DETECT" is displayed in the STATUS column. If data is not detected, "MISSING" is displayed in the STATUS column.

- Data Viewing

By turning the function dial (F•D) to the right, you can scroll the screen to view all the data. You can also press **F•2** PAGE UP and **F•3** PAGE DOWN to move between pages. In the upper right of the screen, the "page number/total number of pages" is displayed. If you press the function dial (F•D), the cursor returns to the first data entry.

- Selecting Which Stream to Display

When the input signal is 3G or 12G, you can use **F•4** STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- Selecting the Displayed Information

When the input signal is multi link, you can use **F•5** LINK to select displayed information. When the input signal is 12G, you can use **F•5** SUB to select displayed information.

16.8.2 Displaying a Dump of Ancillary Data

To display a dump of the data that you have selected on the ancillary data display, follow the procedure below.

By turning the function dial (F•D) to the right, you can scroll the screen to view all the data. If you press the function dial (F•D), the cursor returns to the first data entry.

Procedure

STATUS	→	F•3	ANC DATA VIEWER	→	F•1	ANC DUMP

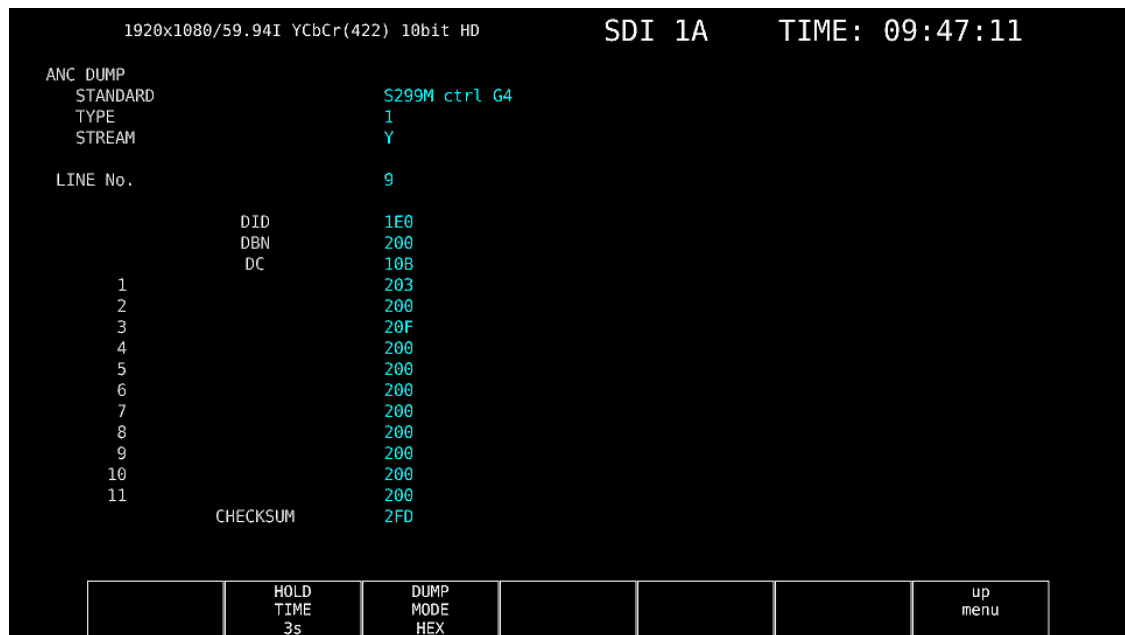


Figure 16-18 Ancillary dump display

16.8.3 Updating the Dump Display

When the selected data is embedded in multiple lines, the line number that is displayed on the ancillary dump display is switched at a regular interval. (However, the line numbers are switched at an irregular interval.)

To select the dump display update time, follow the procedure below.

Procedure

STATUS	→	F•3	ANC DATA VIEWER	→	F•1	ANC DUMP	→	F•2	HOLD TIME: HOLD / 1s / <u>3s</u>

Setting

HOLD:	The screen is not updated.
1s:	The screen is updated once per second.
3s:	The screen is updated once every 3 seconds.

16.8.4 Selecting the Dump Mode

To select the dump mode, follow the procedure below.

Procedure

STATUS	→	F•3	ANC DATA VIEWER	→	F•1	ANC DUMP	→	F•3	DUMP MODE: <u>HEX</u> / BINARY

Setting

HEX: Data is displayed in hexadecimal format.

BINARY: Data is displayed in binary format.

DUMP MODE = HEX

ANC DUMP			S299M ctrl G4
STANDARD			1
TYPE			Y
STREAM			
LINE No.			9
	DID		1E0
	DBN		200
	DC		10B
1			203
2			200
3			20F
4			200
5			200
6			200
7			200
8			200
9			200
10			200
11			200
	CHECKSUM		2FD

DUMP MODE = BINARY

ANC DUMP			S299M ctrl G4
STANDARD			1
TYPE			Y
STREAM			
LINE No.			9
	DID		0111100000
	DBN		1000000000
	DC		0100001011
1			100000101
2			1000000000
3			1000001111
4			1000000000
5			1000000000
6			1000000000
7			1000000000
8			1000000000
9			1000000000
10			1000000000
11			1000000000
	CHECKSUM		1011111111

Figure 16-19 Selecting the dump mode

16.9 Detecting Ancillary Packets

To display the ancillary packet display, follow the procedure below.

If an ancillary packet is detected, "DETECT" appears. If not, "MISSING" appears. If a dummy packet is detected, "DUMMY" appears.

Procedure

STATUS	→	F•5	ANC PACKET



Figure 16-20 Ancillary packet display

16.9.1 Ancillary Packet Display Explanation

- AUDIO CONTROL PACKET

The embedded audio consists of 4 groups that each contain 4 channels. This makes for a total of 16 channels. A single audio control packet is embedded in each group.

Reference Section 16.9.4, "Displaying Audio Control Packets"

- EDH (Error Detection and Handling) (for SD)

This packet is used for detecting transmission errors. When multiple devices are connected, this packet can be used to determine which device caused an error. Both full-field and active picture errors are detected.

Reference Section 16.9.2, "Displaying EDH Packets"

- LTC (Linear/Longitudinal Time Code)

This is a type of timecode. One is embedded per frame.

- VITC (Vertical Interval Time Code)

This is a type of timecode. One is embedded per field.

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- PAYLOAD ID

This is a packet that is used to identify the video format. It conforms to SMPTE ST 352.

Reference Section 16.9.3, "Displaying Payload IDs"

- AFD

A packet embedded in the V-ANC area.

Reference Section 16.9.11, "Displaying AFD Packets"

- CLOSED CAPTION 1 to 3 (for HD or SD)

This is a closed caption information packet that is embedded in the V-ANC area. Up to three closed caption data entries can be embedded.

Reference Section 16.9.6, "Displaying Closed Caption Packets"

- NET-Q (for HD or SD)

This is the inter-stationary control signal.

Reference Section 10.7.1, "Displaying the Inter-Stationary Control Signal"

- TRIGGER PACKET (for HD or SD)

This is the data broadcast trigger signal.

Reference Section 16.9.8, "Displaying the Data Broadcast Trigger Signal"

- USER DATA 1 and 2 (for HD or SD)

Up to two packets of user data.

Reference Section 16.9.9, "Displaying User Data"

16.9.2 Displaying EDH Packets

When the input signal is SD, to display EDH packets, follow the procedure below.

Procedure

STATUS	→	F•4	ANC PACKET	→	F•1	PACKET ANALYSIS	→	F•1	EDH

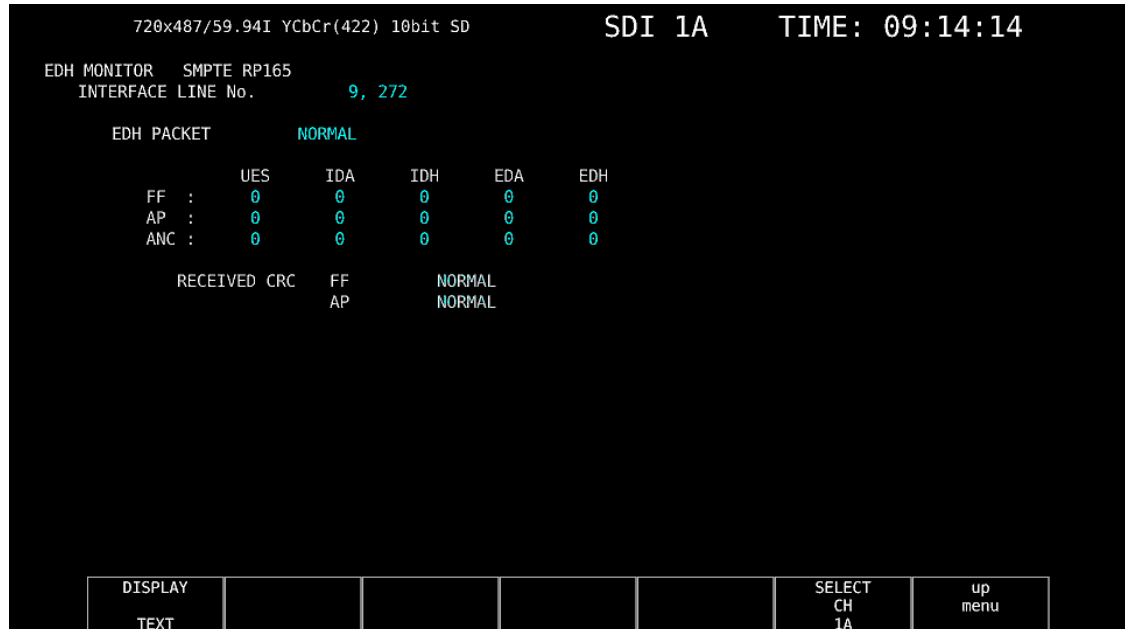


Figure 16-21 EDH packet display

- Selecting the Display Format

You can use **F•1** DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).

If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- Selecting the Dump Mode

When **F•1** DISPLAY is set to DUMP, you can use **F•2** DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

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16.9.3 Displaying Payload IDs

To show the payload ID display, follow the procedure below.

Procedure

STATUS	→	F•4	ANC PACKET	→	F•1	PACKET ANALYSIS	→	F•2	PAYLOAD ID

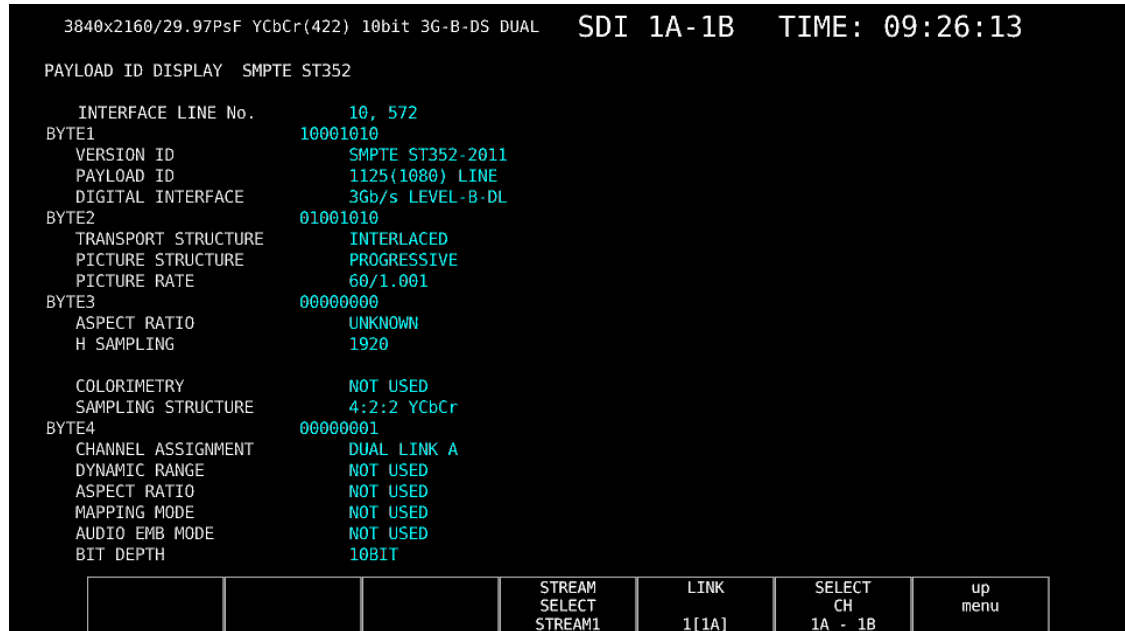


Figure 16-22 Payload ID display

- Selecting Which Stream to Display

When the input signal is 3G or 12G, you can use **F•4** STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- Selecting the Displayed Information

When the input signal is multi link, you can use **F•5** LINK to select displayed information. When the input signal is 12G, you can use **F•5** SUB to select displayed information.

16.9.4 Displaying Audio Control Packets

To display audio control packets, follow the procedure below.

Procedure

STATUS	→	F•4	ANC PACKET	→	F•1	PACKET ANALYSIS	→	F•3	CONTROL PACKET

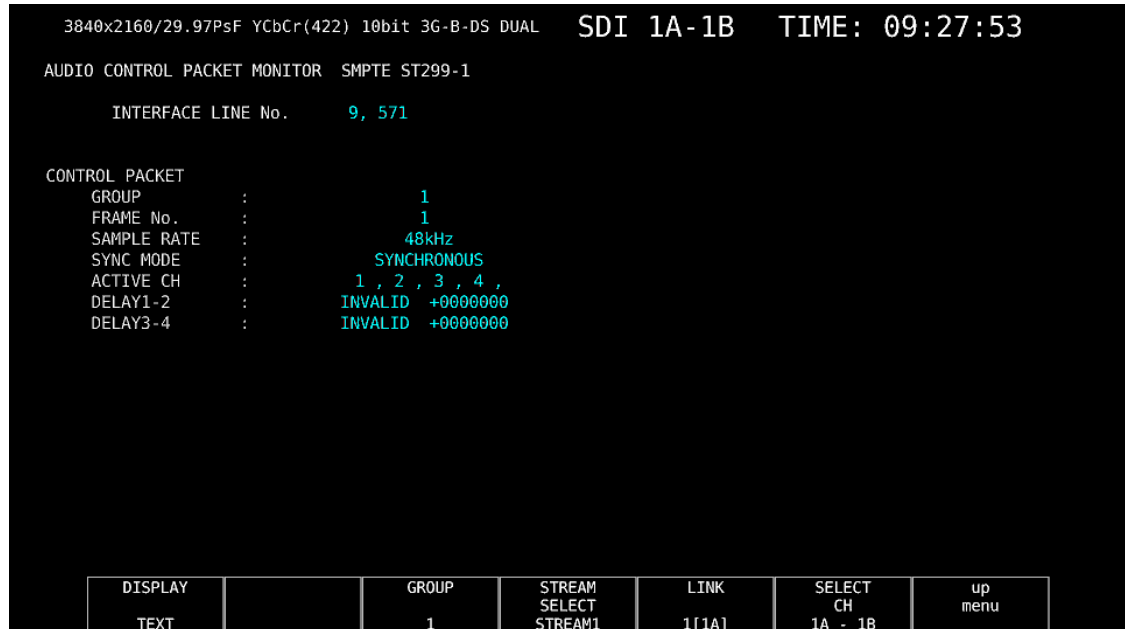


Figure 16-23 Audio control packet display

- Selecting the Display Format

You can use **F•1** DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).

If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- Selecting the Dump Mode

When **F•1** DISPLAY is set to DUMP, you can use **F•2** DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting the Group to Display

You can use **F•3** GROUP to set the group to display to a group from groups 1 to 4. A single group in the audio signal consists of four channels.

- Selecting Which Stream to Display

When the input signal is 3G-B, you can use **F•4** STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- Selecting the Displayed Information

When the input signal is multi link, you can use **F•5** LINK to select displayed information. When the input signal is 12G, you can use **F•5** SUB to select displayed information.

16.9.5 V-ANC ARIB Display

To display the V blanking ancillary packets defined in the ARIB standard, use the ARIB menu. When the input signal is 3G or 12G, this menu item is not displayed.

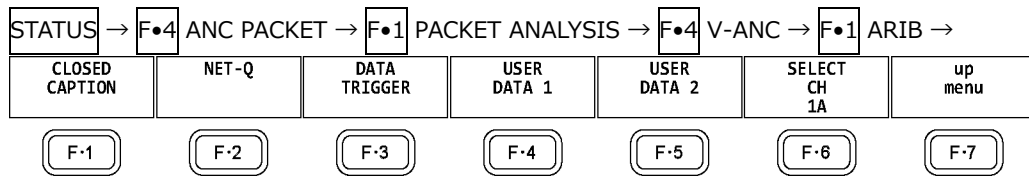


Figure 16-24 ARIB menu

16.9.6 Displaying Closed Caption Packets

To display closed caption packets, follow the procedure below.

Procedure

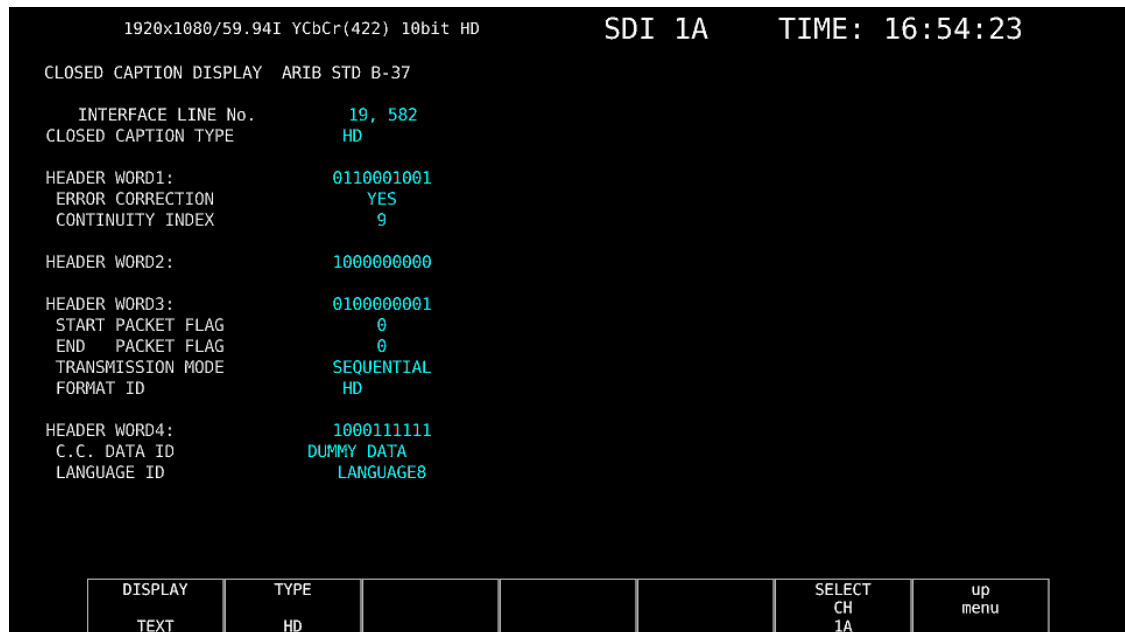


Figure 16-25 Closed caption packet display

- Selecting the Closed Caption Type

You can use F•2 TYPE to set the closed caption type to HD, SD, ANALOG, or CELLULAR.

- Selecting the Display Format

You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).

If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

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- Selecting the Dump Mode

When **F•1** DISPLAY is set to DUMP, you can use **F•2** DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting the Displayed Information

When the input signal is HD(DL) or HD(QL), you can use **F•5** LINK to select displayed information.

16.9.7 Displaying the Inter-Stationary Control Signal

To display the inter-stationary control signal, follow the procedure below.

Procedure

STATUS → **F•4** ANC PACKET → **F•1** PACKET ANALYSIS → **F•4** V-ANC → **F•1** ARIB → **F•2** NET-Q

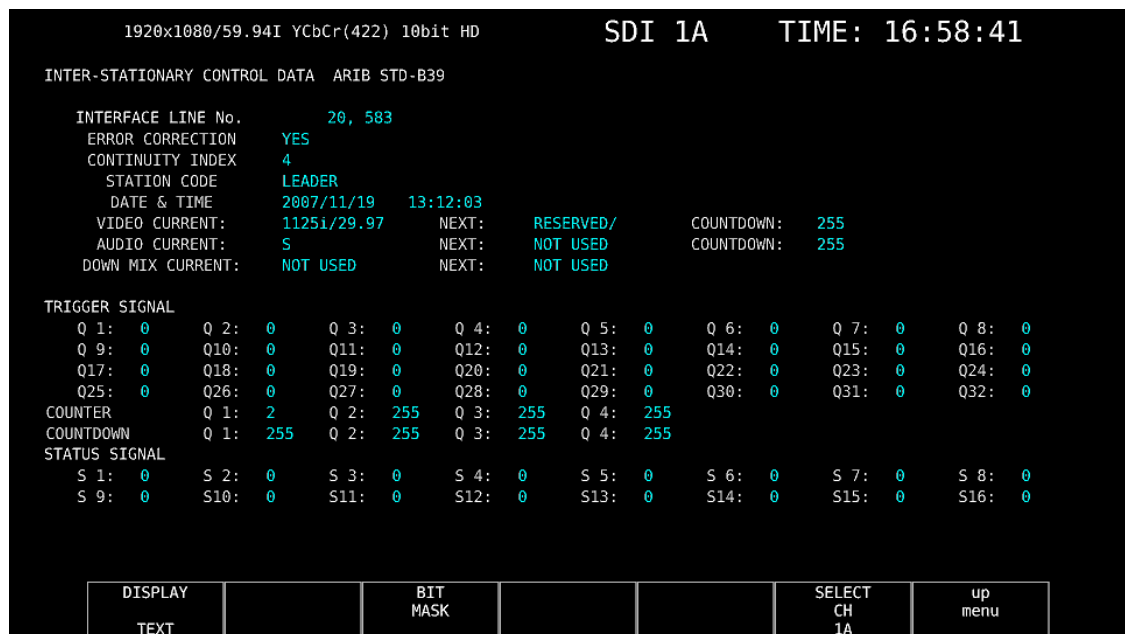


Figure 16-26 Inter-stationary control signal display

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● Selecting the Display Format

You can use **F•1** DISPLAY to set the display format to TEXT (text display), DUMP (dump display), Q LOG (Q-signal log display), or FORMAT (format ID display).

If you select DUMP, the dump display appears. If you select Q LOG, the log display appears. In either case, you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

DISPLAY = DUMP

INTER-STATIONARY CONTROL DATA ARIB STD-B39		
INTERFACE LINE No.	20, 583	
DID	25F	
SDID	1FE	
DC	2FF	
1 HEADER	18A	
2 STATION CODE1	14C	
3 STATION CODE2	145	
4 STATION CODE3	241	
5 STATION CODE4	244	
6 STATION CODE5	145	
7 STATION CODE6	152	
8 STATION CODE7	120	
9 STATION CODE8	120	
10 YEAR	107	
11 MONTH	211	
12 DAY	119	
13 WEEK	101	
14 HOUR	113	
15 MINUTE	212	
16 SECOND	239	
17 MULTI SECOND	200	
18 MULTI SECOND	271	

DISPLAY = QLOG

INTER-STATIONARY CONTROL DATA ARIB STD-B39		
NETQ LOG LIST	SAMPLE NO.= 3	<< NOW LOGGING >>
		Q32-----Q1
3	2014/06/18 16:53:18	A 00000000000000000000000000000000
2	2014/06/18 16:53:17	A 00000000000000000000000000000001
1	2014/06/18 16:45:38	A 00000000000000000000000000000000

DISPLAY = FORMAT

FORMAT ID DISPLAY ARIB STD-B39		
INTERFACE LINE No.	20, 583	
BYTE1	10000101	
VERSION ID	1	
PAYLOAD ID	1125(1080) LINE	
DIGITAL INTERFACE	1.485Gb/s	
BYTE2	00000110	
TRANSPORT STRUCTURE	INTERLACED	
PICTURE STRUCTURE	INTERLACED	
PICTURE RATE	30/1.001	
BYTE3	10100000	
ASPECT RATIO	16:9	
H SAMPLING	RESERVED	
DISP ASPECT RATIO	16:9	
SAMPLING STRUCTURE	4:2:2 YCbCr	
BYTE4	00000001	
CHANNEL ASSIGNMENT	RESERVED	
BIT DEPTH	10BIT	

Figure 16-27 Selecting the display format

16. STATUS DISPLAY

- Selecting the Dump Mode

When **F•1** DISPLAY is set to DUMP, you can use **F•2** DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Clearing the Q-Signal Log

When **F•1** DISPLAY is set to Q LOG, press **F•2** Q LOG CLEAR to clear the Q-signal log.

- Setting the Bit Mask

When **F•1** DISPLAY is set to TEXT, you can use **F•3** BIT MASK to mask the Q and status signals independently.

Press **F•4** ALL ON to set all the bit mask entries to ON. Press **F•5** ALL OFF to set all the bit mask entries to OFF.

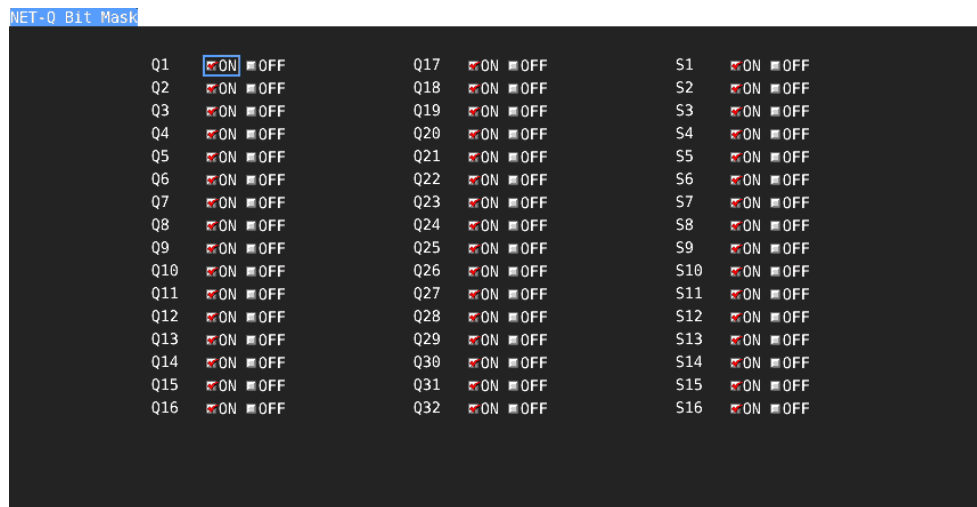


Figure 16-28 NET-Q Bit Mask tab

- Selecting the Displayed Information

When the input signal is HD(DL) or HD(QL), you can use **F•5** LINK to select displayed information.

- Saving to USB Memory

If **F•1** DISPLAY is set to Q LOG, you can press **F•6** USB MEMORY to save the Q signal log to a USB memory device in CSV format. The procedure to follow to save data is the same as the procedure that was given for the event log. See section 16.4.5, “Saving to a USB Memory Device.”

Q signal logs are saved in the NETQ folder.

- USB memory device
 - LV5490_USER
 - NETQ
 - YYYYMMDDhhmmss.csv

16.9.8 Displaying the Data Broadcast Trigger Signal

To display the data broadcast trigger signal, follow the procedure below.

Procedure

STATUS → F•4 ANC PACKET → F•1 PACKET ANALYSIS → F•4 V-ANC → F•1 ARIB → F•3
DATA TRIGGER



Figure 16-29 Data broadcast trigger signal display

- Selecting the Display Format

You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).

If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- Selecting the Dump Mode

When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting the Displayed Information

When the input signal is HD(DL) or HD(QL), you can use F•5 LINK to select displayed information.

16.9.9 Displaying User Data

To display user data entries 1 and 2, follow the procedure below.

You can use the function dial (F•D) to view all the data. If you press the function dial (F•D), the first data entry is displayed.

Procedure

STATUS → F•4 ANC PACKET → F•1 PACKET ANALYSIS → F•4 V-ANC → F•1 ARIB
 → F•4 USER DATA 1
 → F•5 USER DATA 2



Figure 16-30 User data display

- Selecting the Dump Mode

You can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting the Displayed Information

When the input signal is HD(DL) or HD(QL), you can use F•5 LINK to select displayed information.

16.9.10 V-ANC SMPTE Display

To display the V blanking ancillary packets defined in the SMPTE standard, use the SMPTE menu.

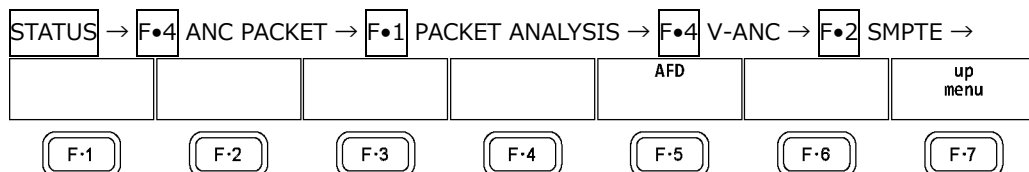


Figure 16-31 SMPTE menu

16.9.11 Displaying AFD Packets

To display AFD packets, follow the procedure below.

Procedure

STATUS → F•4 ANC PACKET → F•1 PACKET ANALYSIS → F•4 V-ANC → F•2 SMPTE → F•5 AFD



Figure 16-32 AFD packet display

- Selecting the Display Format

You can use F•1 DISPLAY to set the display format to TEXT (text display) or DUMP (dump display).

If you select DUMP, the dump display appears, and you can use the function dial (F•D) to view the entire data. If you press the function dial (F•D), the first data entry is displayed.

- Selecting the Dump Mode

When F•1 DISPLAY is set to DUMP, you can use F•2 DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting Which Stream to Display

When the input signal is 3G-B, you can use F•4 STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- Selecting the Displayed Information

When the input signal is multi link, you can use F•5 LINK to select displayed information. When the input signal is 12G, you can use F•5 SUB to select displayed information.

16.9.12 Performing Custom Searches

To show the custom search display, follow the procedure below.

You can use the function dial (F•D) to view all the data. If you press the function dial (F•D), the first data entry is displayed.

Procedure

STATUS → F•4 ANC PACKET → F•1 PACKET ANALYSIS → F•5 CUSTOM SEARCH

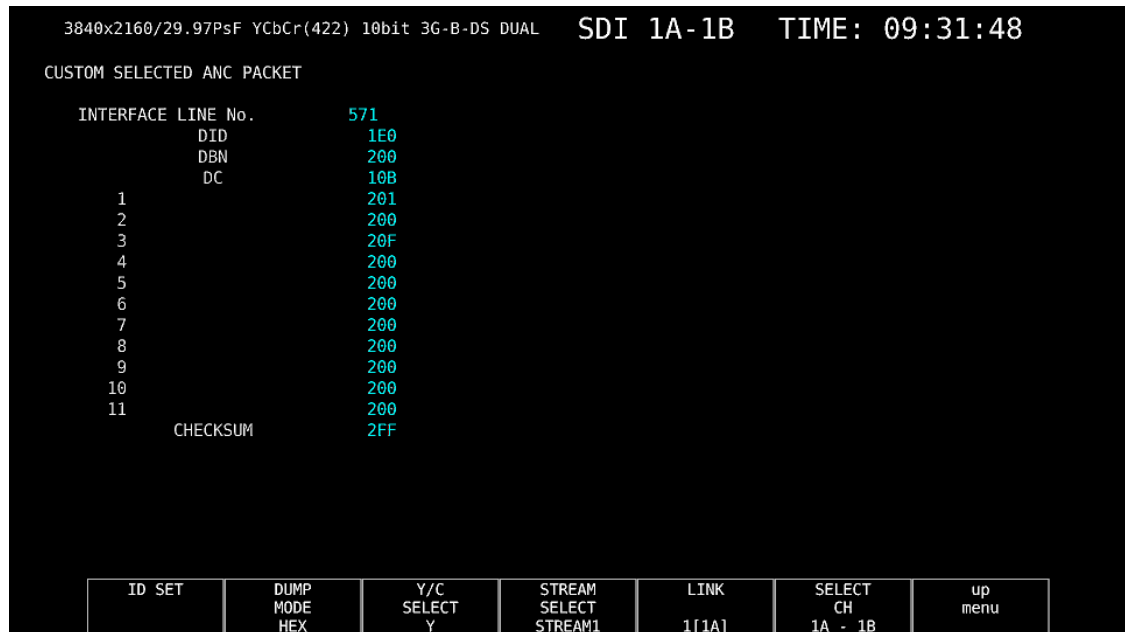


Figure 16-33 Custom search display

- Detecting Ancillary Packets

You can search ancillary packets by using F•1 ID SET in the CUSTOM SEARCH menu.

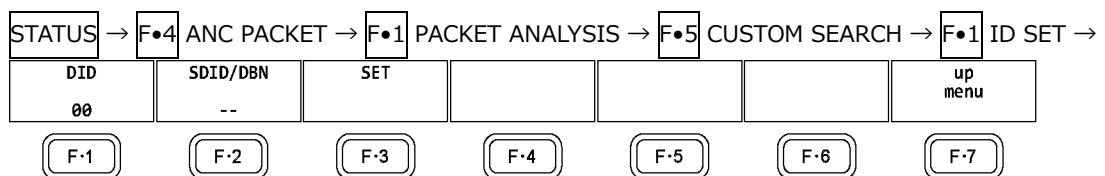


Figure 16-34 ID SET menu

Set F•1 DID and F•2 SDID/DBN to display ancillary packets on the basis of the combination of the DID and SDID/DBN.

You can set F•1 DID in the range of 00 to FF. Press the function dial (F•D) to return the setting to its default value (00).

You can set F•2 SDID/DBN in the range of 00 to FF or select "--" to not specify a value. Press the function dial (F•D) to return the setting to its default value (--).

Press F•3 SET to clear the blue cursor assigned to F•1 DID or F•2 SDID/DBN. Use this key when you want to view all the data using the function dial (F•D).

16. STATUS DISPLAY

- Selecting the Dump Mode

You can use **F•2** DUMP MODE to set the dump mode to HEX (hexadecimal display) or BINARY (binary display).

- Selecting Which Signal to Display

When the input signal is not SD, you can use **F•3** Y/C SELECT to set the data to display to that of the Y signal or the C signal.

- Selecting Which Stream to Display

When the input signal is 3G-B, you can use **F•4** STREAM SELECT to set the data to display to STREAM1 or STREAM2.

- Selecting the Displayed Information

When the input signal is multi link, you can use **F•5** LINK to select displayed information.
When the input signal is 12G, you can use **F•5** SUB to select displayed information.

16.10 IP(NMI) Status Screen Explanation (SER08)

If on the SDI IN tab in the system settings, SDI System is set to 4K NMI or NMI, pressing STATUS displays the IP (NMI) status.

To return to the normal status display from IP (NMI) status, press **F•1** STATUS.

3840x2160/59.94P YCbCr(422) 10bit NMI

NMI 1-4

TIME: 13:10:16

NMI

	IP Address	Gateway	Subnet Mask	PTP Domain Number
IP A	192.168.10.21	0.0.0.0	255.255.255.0	127
IP B	192.168.11.21	0.0.0.0	255.255.255.0	127

IP Live System Manager

	IP Address	Port	Protocol	Connection Status
IP A	192.168.10.1	9004	TLS	Connected
IP B	191.168.11.1	9004	TLS	Disable

NMI STATUS

Format	Reference
3840x2160/59.94P YCbCr(422) 10bit	Locked

STATUS					SELECT CH 1 - 4	

Figure 16-35 NMI Status screen

- NMI

- IP Address / Gateway / Subnet Mask / PTP Domain Number

These show the IP address, gateway address, subnet mask, and PTP domain number of NMI input connectors IP A and IP B on the rear panel.

- IP Live System Manager

- IP Address / Port / Protocol

These show the IP address, port, and protocol of IP Live System Manager connected to the NMI input connectors IP A and IP B on the rear panel.

- Connection Status

This shows the connection status of IP Live System Manager and the NMI input connectors IP A and IP B on the rear panel.

Displayed text	Color	Connection status
Connected	Cyan	Connected to IP Live System Manager
Connecting	White	Establishing connection to IP Live System Manager
Disable	White	Connection disabled

16. STATUS DISPLAY

- NMI STATUS

- Format

This shows the format information. Normally the text is cyan, but if the format is not appropriate, it turns red.

- Reference

This shows the IP (NMI) network genlock status.

Displayed text	Color	Connection status
Locked	Cyan	Locked
Unlocked	Yellow	Not locked

17. EYE PATTERN DISPLAY (SER02/SER09)

To display the eye pattern, press EYE.

On the eye pattern display you can use **F•2** MODE to display the eye pattern or jitter.

The channel that can be displayed is a single system selected with **F•6** SELECT CH and **F•5** LINK SELECT. Simul mode is not supported. In addition signals applied to 2A to 2D cannot be displayed.

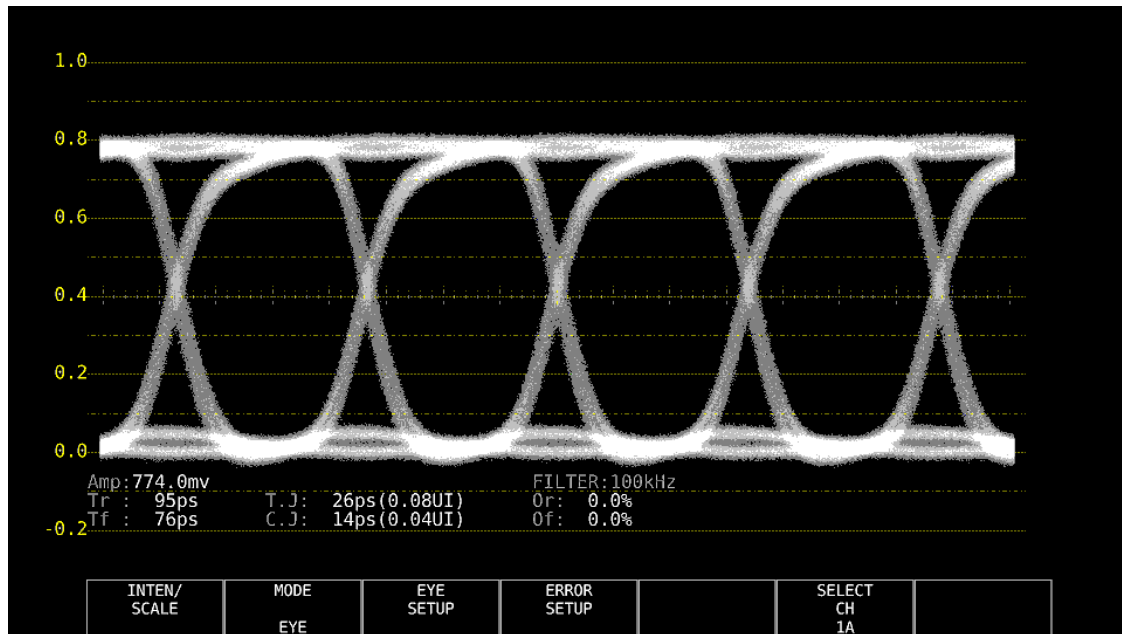


Figure 17-1 Eye pattern display

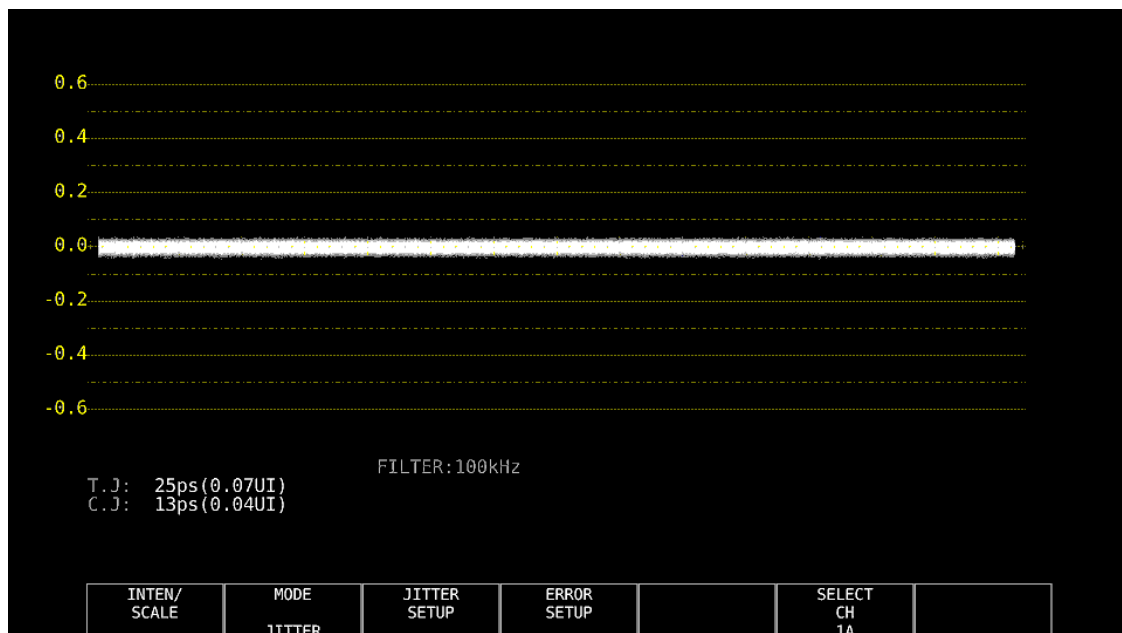


Figure 17-2 Jitter display

17. EYE PATTERN DISPLAY (SER02/SER09)

- Displaying the Eye Pattern and Jitter Simultaneously

By using the layout feature, you can display the eye pattern and jitter simultaneously. For details, see section, 6.4 "Arranging the Measurement Screen Layout."

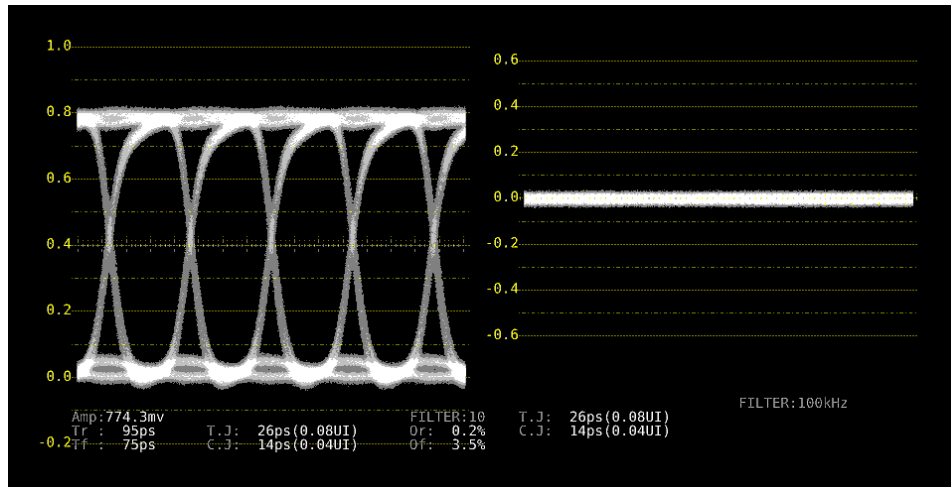


Figure 17-3 Eye pattern and jitter display

17.1 Eye Pattern Display Explanation

● Automatic Measurement

On the eye pattern display, values such as the amplitude of the eye pattern and the jitter are measured automatically and displayed. Measured values are normally displayed in white, but they are displayed in yellow until they stabilize and in red if they exceed the values that you have specified in the error setup. If automatic measurements cannot be performed due to noise in the waveform or other reason, measured values are displayed as "----." If this occurs, use cursors to measure manually.

Reference Section 17.9, "Configuring Error Detection Settings"

The timing jitter and current jitter measurement items show the values that were measured in jitter display mode. The LV 5490SER02 use a phase detector to perform these measurements.

Other measurement items show the measured values calculated from the eye pattern waveform. Therefore, if the waveform degrades significantly, the difference between the automatically measured values and the cursor-measured values may become large.

● Measurement items

The items that can be automatically measured are shown below.

Table 17-1 Measurement items

Symbol	Display	Description
a	Amp	Eye-pattern amplitude
b	Tr	Rise time (time from 20% to 80% of amplitude)
c	Tf	Fall time (time from 80% to 20% of amplitude, and not shown in the following figure)
d	T.J	Timing Jitter
e	C.J	Current jitter (jitter value when the currently selected filter is applied)
f	Or	Overshoot of the rising edge
g	Of	Overshoot of the falling edge

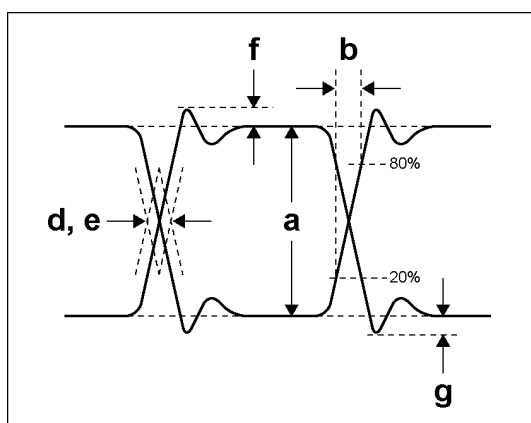


Figure 17-4 Explanation of measurement items

17. EYE PATTERN DISPLAY (SER02/SER09)

● Unit interval

This unit uses unit intervals (UI) as jitter measurement units.

One cycle of the eye pattern is 1 UI. The time that corresponds to 1 UI varies depending on the input signal, as shown below.

Table 17-2 Time that corresponds to 1 UI

Input Signal	Bit Rate	Time That Corresponds to 1 UI
3G	2.970/1.001Gbps	337.0ps
	2.970Gbps	336.7ps
HD	1.485/1.001Gbps	674.1ps
	1.485Gbps	673.4ps
SD	270Mbps	3.7ns

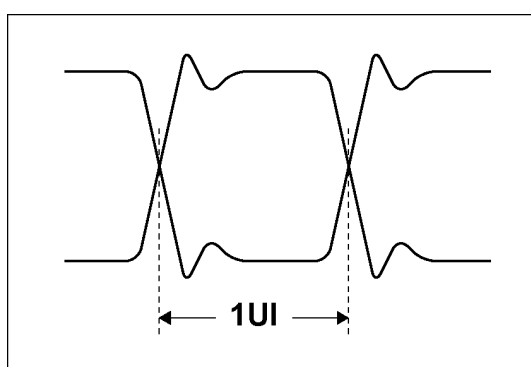


Figure 17-5 Unit interval

17.2 Jitter Display Explanation

- Measurement

In the jitter display mode, the jitter component is extracted from the input signal and plotted on a time graph. The time (horizontal) axis can be displayed in different ways depending on the data interval of the lines, fields, or frames, which are being transmitted in the SDI signal.

- Automatic Measurement

Timing jitter (T.J) and current jitter (C.J) are automatically measured and displayed on the jitter display screen. The measurement range is 0.00 to 9.60 UI.

SMPTE defines two methods of measuring jitter. One method uses an eye pattern, and the other method uses a phase detector.

The eye pattern method has disadvantages not only that measurements are difficult when the eye is not open but that measurements are prone to errors because the distinction between waveform distortion (such as noise and sags) and jitter is difficult.

In contrast, the phase detector method makes jitter measurements with small errors possible even when the eye pattern is closed and even when the amount of jitter is 1 UI or more.

The LV 5490SER02 uses the phase detector method.

Measured values are normally displayed in white, but they are displayed in red if they exceed the values that you have specified in the error setup. If 10.00 UI is exceeded, "OVER" is displayed.

Reference Section 17.9, "Configuring Error Detection Settings"

17.3 Setting the Waveform Display Position

Use the V POS and H POS knobs to adjust the display position of the waveform.
On the multi display, these are valid when you press **F•7** MULTI EYE on the MULTI menu.

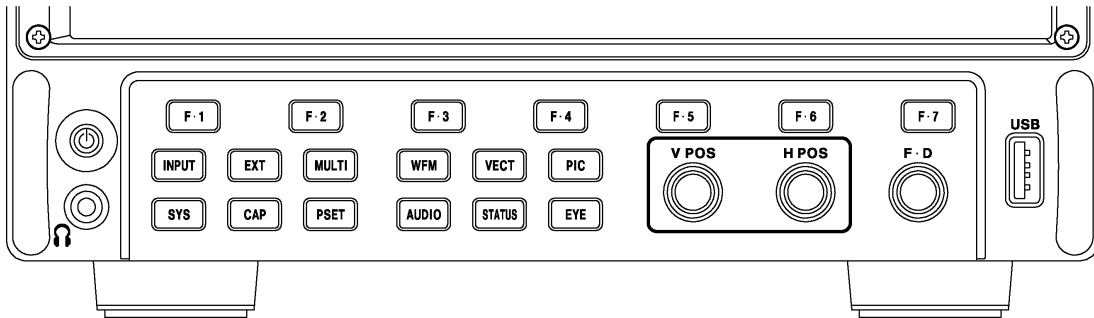


Figure 17-6 V POS and H POS knobs

- V POS Knob

Adjusts the vertical position of the waveform.
Pressing the knob returns the waveform to its default position.

- H POS Knob

Adjusts the horizontal position of the waveform.
Pressing the knob returns the waveform to its default position.

17.4 Switching between Eye Pattern and Jitter

To switch between eye pattern and jitter, follow the procedure below.

Procedure

EYE	→	F•2	MODE: <u>EYE</u> / JITTER

17.5 Selecting Which Link to Display

You cannot display eye patterns of multiple channels at the same time.

When the link format is set to multi, to select which link to display, follow the procedure below.

This menu appears in other menu hierarchies; you can select the link in the same manner.

Procedure (for HD (DL))

EYE	→	F•5	LINK SELECT: <u>A[1A]</u> / B[1B] or A[1C] / B[1D]

Procedure (for 3G (DL)-4K)

EYE	→	F•5	LINK SELECT: <u>1[1A]</u> / 2[1B] or 1[1C] / 2[1D]

Procedure (for 3G (QL))

EYE	→	F•5	LINK SELECT: <u>1[1A]</u> / 2[1B] / 3[1C] / 4[1D]

17.6 Configuring the Intensity and Scale Settings

To configure the intensity and scale settings, press **F•1** INTEN / SCALE on the EYE menu. You can configure these settings separately for the eye pattern and jitter.

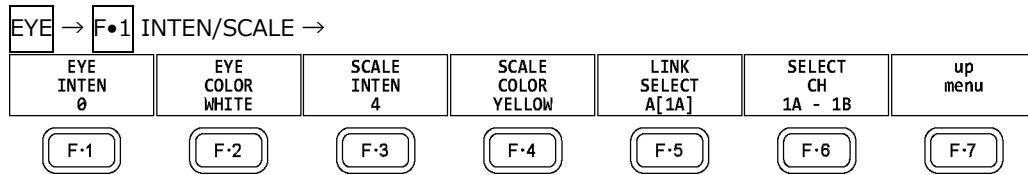


Figure 17-7 INTEN/SCALE menu

17.6.1 Adjusting the Waveform Intensity

To adjust the intensity of the eye pattern and jitter, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (0).

Procedure

EYE → **F•1** INTEN/SCALE
 → **F•1** EYE INTEN: -128 - 0 - 127
 → **F•1** JITTER INTEN: -128 - 0 - 127

17.6.2 Selecting the Waveform Color

To select the color of the eye-pattern and jitter, follow the procedure below.

Procedure

EYE → **F•1** INTEN/SCALE
 → **F•2** EYE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE
 → **F•2** JITTER COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

17.6.3 Adjusting the Scale Intensity

To adjust the scale intensity, follow the procedure below. Press the function dial (F•D) to return the setting to its default value (4).

Procedure

EYE → **F•1** INTEN/SCALE → **F•3** SCALE INTEN: -8 - 4 - 7

17.6.4 Selecting the Scale Color

To select the scale color, follow the procedure below.

Procedure

EYE → **F•1** INTEN/SCALE → **F•4** SCALE COLOR: WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE

17.7 Configuring Eye Pattern Display Settings

To configure eye pattern display settings, press **F•3** EYE SETUP on the EYE menu. This appears when **F•2** MODE is set to EYE.

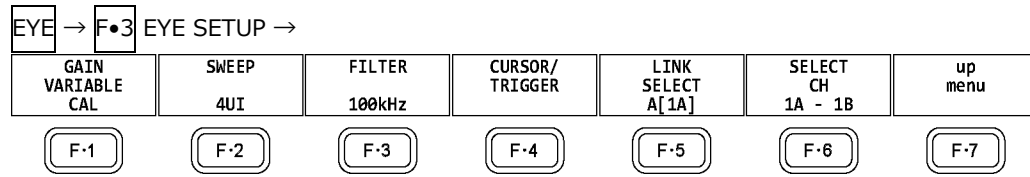


Figure 17-8 EYE SETUP menu

17.7.1 Adjusting the Gain

To adjust the eye-pattern gain, follow the procedure below.

Procedure

EYE → **F•3** EYE SETUP → **F•1** GAIN VARIABLE: CAL / VARIABLE

Settings

CAL:	The eye pattern is shown without gain.
VARIABLE:	The eye pattern is shown with the specified gain (x0.50 to x2.00). The gain value appears in the upper right of the screen. Turn the function dial (F•D) to adjust the gain. Press the function dial (F•D) to return the setting to its default value (x1.00).

17. EYE PATTERN DISPLAY (SER02/SER09)

17.7.2 Selecting the Sweep Time

To select the eye pattern sweep time, follow the procedure below.

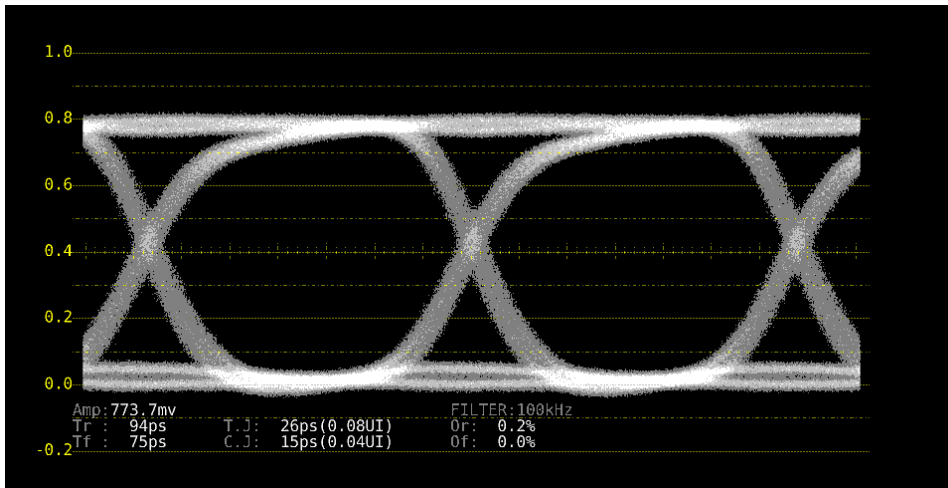
Procedure

EYE	→	F•3	EYE SETUP	→	F•2	SWEEP: 2UI / <u>4UI</u> / 16UI

Settings

2UI:	Two cycles of the eye pattern are shown.
4UI:	Four cycles of the eye pattern are shown.
16UI:	Sixteen cycles of the eye pattern are shown.

SWEEP = 2UI



SWEEP = 16UI

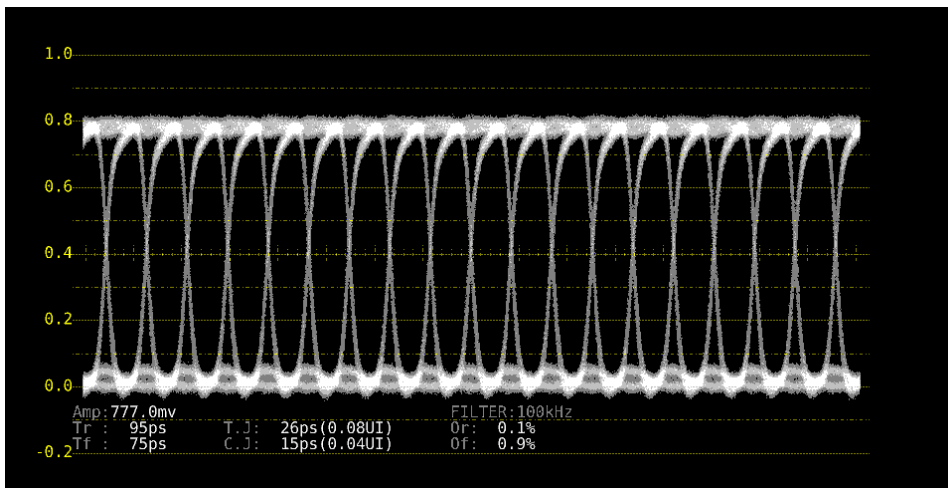


Figure 17-9 Selecting the sweep time

17.7.3 Selecting the Filter

To select the filter that is used during jitter measurement, follow the procedure below. The selected filter is indicated in the lower right of the display.

If you change this setting, the filter that you selected for jitter display also changes.

Reference Section 17.8.3, "Selecting the Filter"

Procedure

EYE → **F•3** EYE SETUP → **F•3** FILTER: 100kHz / 1kHz / 100Hz / 10Hz / TIMING /
ALIGNMENT

Settings

100kHz:	Jitter at 100 kHz or higher is measured.
1kHz:	Jitter at 1 kHz or higher is measured.
100Hz:	Jitter at 100 Hz or higher is measured.
10Hz:	Jitter at 10 Hz or higher is measured.
TIMING:	Timing jitter is measured. Jitter at 10 Hz or higher is measured.
ALIGNMENT:	Alignment jitter is measured. When the input signal is not SD, jitter at 100 kHz and higher is measured. When the input signal is SD, jitter at 1 kHz and higher is measured.

17.7.4 Turning Cursors On and Off

To configure cursor settings, press **F•4** CURSOR/TRIGGER on the EYE SETUP menu.

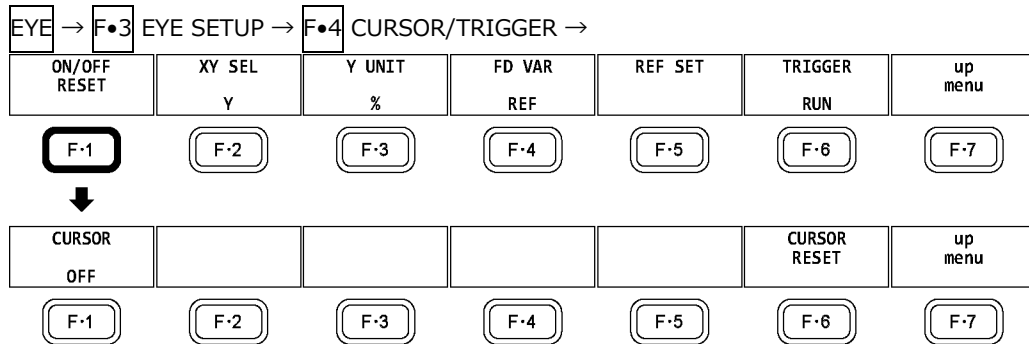


Figure 17-10 CURSOR/TRIGGER menu

To turn cursors on and off, follow the procedure shown below.

When the cursors are turned on, the REF cursors are displayed in yellow (X) and light blue (Y), and the DELTA cursors are displayed in purple (X) and green (Y). The values of DELTA-REF appear as measured values in the upper part of the screen.

Procedure

EYE → **F•3** EYE SETUP → **F•4** CURSOR/TRIGGER → **F•1** ON/OFF RESET → **F•1** CURSOR:
ON / OFF

CURSOR = ON

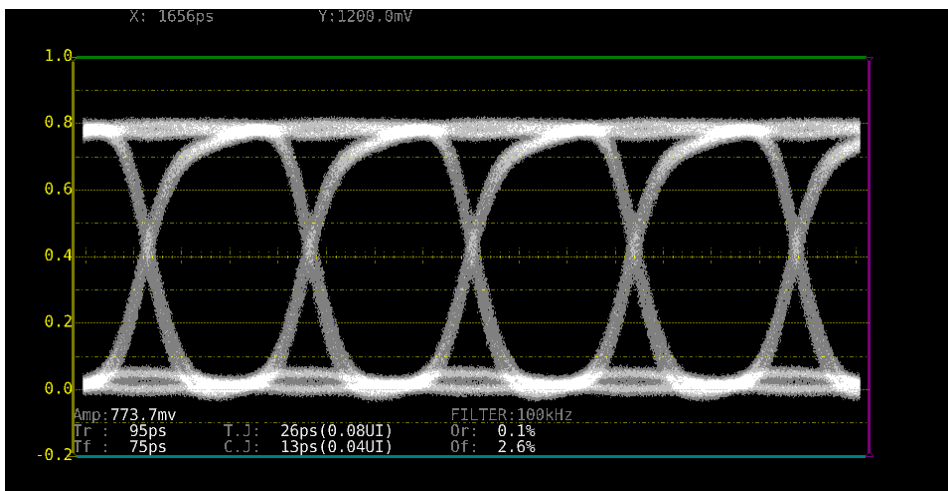


Figure 17-11 Cursor display

17.7.5 Selecting the Cursor

The X-axis and Y-axis cursors are displayed at the same time, but you can only use the function dial (F•D) to move one set of cursors at a time. To select which cursors you want to move, follow the procedure below.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•2	XY SEL: <u>X</u> / Y / Tr,Tf

If you select Tr,Tf, you can measure the rise time (Tr) and fall time (Tf). Follow the procedure below.

1. Set F•2 XY SEL to Tr,Tf.
This selects the Y-axis cursors.
2. Use the function dial (F•D) to align the cursors with the amplitude of the eye pattern.
This is the 100% amplitude position.

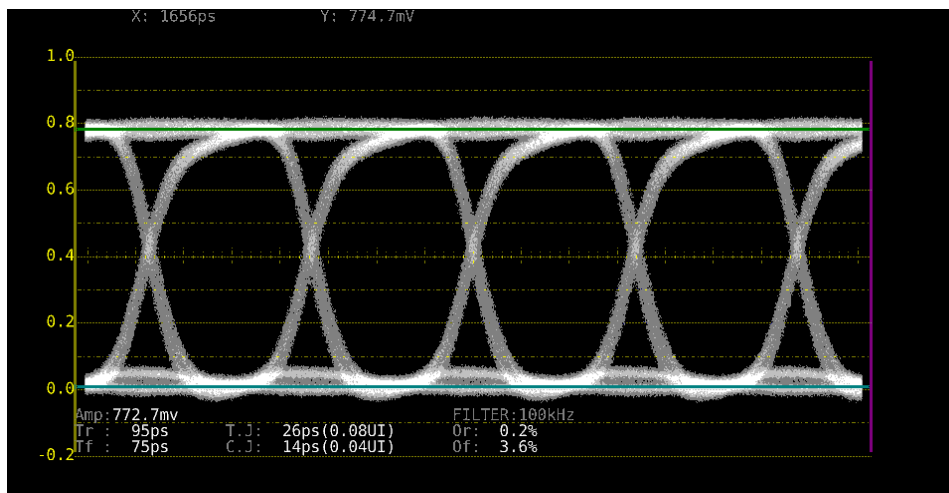


Figure 17-12 Tr,Tf measurement (1)

17. EYE PATTERN DISPLAY (SER02/SER09)

- Press **F•5** REF SET.

The Y-axis cursors move to the 20 % and 80 % positions of the amplitude, and then **F•2** XY SEL is automatically set to X.

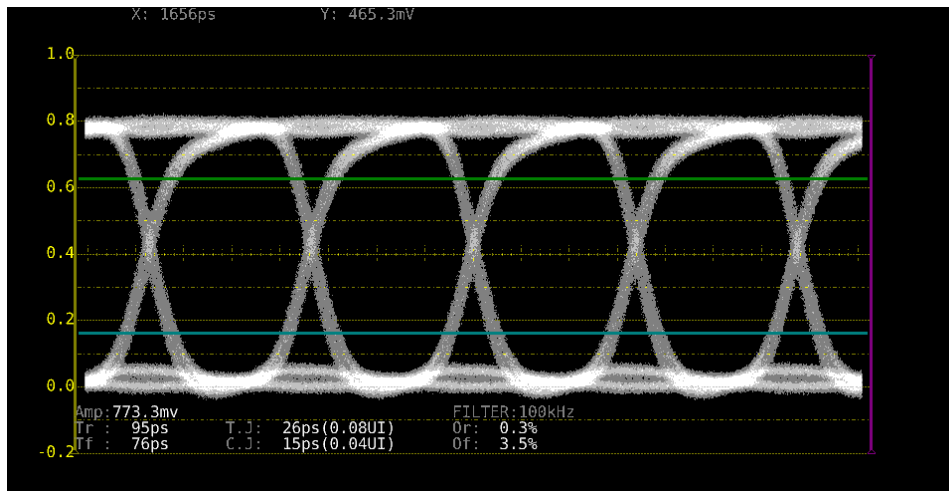


Figure 17-13 Tr,Tf measurement (2)

- Align the X-axis cursors with the intersections of the Y-axis cursors and the eye pattern.

Align with the rising edge of the pattern to measure Tr and the falling edge to measure Tf. (Figure 17-14 is an example for Tr)

The measured value is displayed next to X in the upper part of the screen.

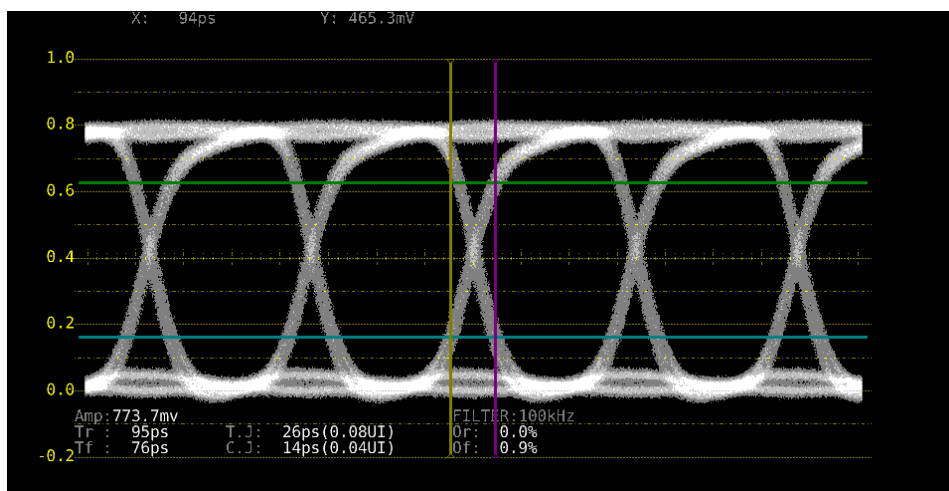


Figure 17-15 Tr,Tf measurement (3)

17.7.6 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•4	FD VAR: <u>REF</u> / DELTA / TRACK

Settings

REF:	The REF cursor (yellow or light blue) is selected.
DELTA:	The DELTA cursor (purple or green) is selected.
TRACK:	The REF cursor and DELTA cursor are both selected.

17.7.7 Selecting the X-Axis Measurement Unit

When **F•2** XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•3	X UNIT: <u>sec</u> / Hz / UIp-p

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.
UIp-p:	The measurement unit is UIp-p, with one UIp-p set to one cycle of the eye pattern.

17.7.8 Selecting the Y-Axis Measurement Unit

When **F•2** XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•3	Y UNIT: <u>V</u> / %

Settings

V:	The measurement unit is volts.
%:	The amplitude will be measured as a percentage of the amplitude at the time when you pressed F•5 REF SET.

17.7.9 Selecting the Display Mode

To select the eye pattern display mode, follow the procedure below.

If the eye pattern and jitter are displayed simultaneously, the setting specified here also applies to the jitter.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•6	TRIGGER: <u>RUN</u> / STOP

Settings

RUN:	The input signal is automatically updated and displayed.
STOP:	The input signal is displayed statically. This is convenient for cursor measurement.
	Even if STOP is selected, if you change the measurement conditions, such as switching to jitter, the mode switches to RUN.

17.7.10 Resetting Cursors

To reset the cursor positions, follow the procedure below.

Procedure

EYE	→	F•3	EYE SETUP	→	F•4	CURSOR/TRIGGER	→	F•1	ON/OFF RESET	→	F•6	CURSOR RESET

17.8 Configuring the Jitter Display Settings

To configure jitter display settings, press **F•3** JITTER SETUP on the EYE menu. This setting appears when **F•2** MODE is set to JITTER.

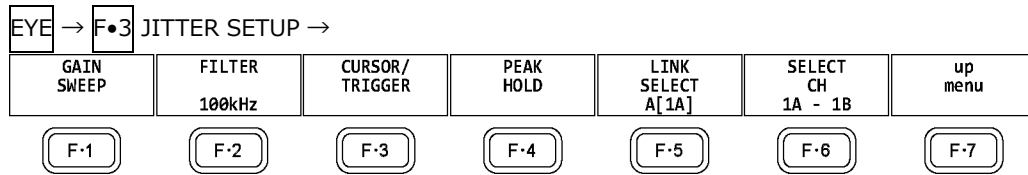


Figure 17-16 JITTER SETUP menu

17.8.1 Selecting the Magnification

To configure the gain and sweep settings, press **F•1** GAIN SWEEP on the JITTER SETUP menu.

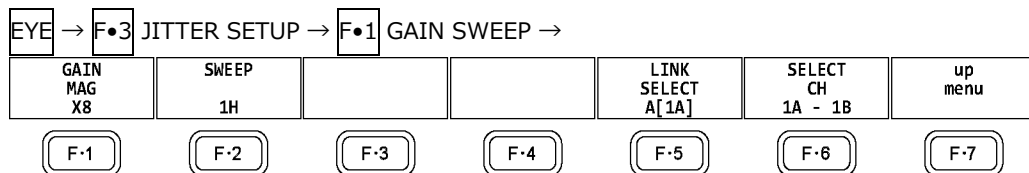


Figure 17-17 GAIN/SWEEP menu

To select the jitter magnification, follow the procedure below.

Procedure

EYE → **F•3** JITTER SETUP → **F•1** GAIN SWEEP → **F•1** GAIN MAG
 : x1 / x2 / x8 (excluding 12G)
 : X1 / X2 / X4 / X16 (12G)

17.8.2 Selecting the Sweep Time

To select the sweep time, follow the procedure below.

Procedure

EYE → **F•3** JITTER SETUP → **F•1** GAIN SWEEP → **F•2** SWEEP: 1H / 2H / 1V / 2V

Settings

1H:	The jitter from a period of one line is shown.
2H:	The jitter from a period of two lines is shown.
1V:	When the input signal is interlace or segmented frame, the jitter from a period of one field is shown. When the input signal is progressive, the jitter from a period of one frame is shown.
2V:	When the input signal is interlace or segmented frame, the jitter from a period of one frame is shown. When the input signal is progressive, the jitter from a period of two frames is shown. This option cannot be selected when the input signal is progressive except for 60/59.94/50P of HD (DL).

17.8.3 Selecting the Filter

To select the filter that is used during jitter measurement, follow the procedure below. The selected filter is indicated in the lower right of the display.

If you change this setting, the filter that you selected for the eye pattern display also changes.

Reference Section 17.7.3, "Selecting the Filter"

Procedure

EYE → F•3 JITTER SETUP → F•3 FILTER: 100kHz / 1kHz / 100Hz / 10Hz / TIMING / ALIGNMENT

17.8.4 Turning Cursors On and Off

To configure cursor settings, press F•3 CURSOR/TRIGGER on the JITTER SETUP menu.

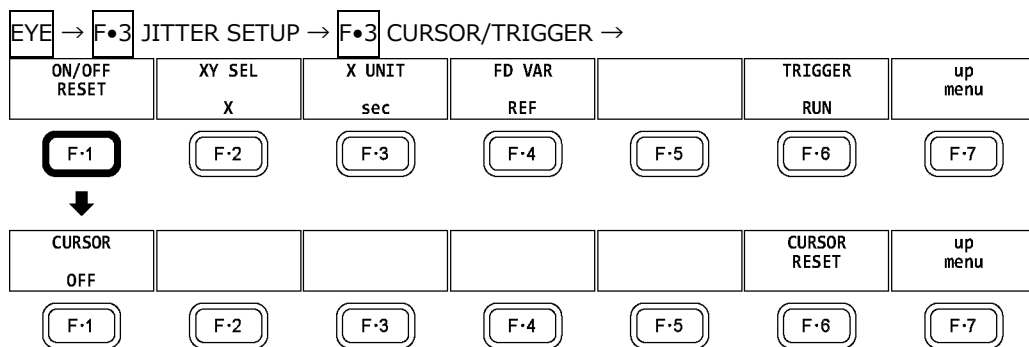


Figure 17-18 CURSOR/TRIGGER menu

To turn cursors on and off, follow the procedure shown below.

When the cursors are turned on, the REF cursors are displayed in yellow (X) and light blue (Y), and the DELTA cursors are displayed in purple (X) and green (Y). The values of DELTA-REF appear as measured values in the upper part of the screen.

Procedure

EYE → F•3 JITTER SETUP → F•3 CURSOR/TRIGGER → F•1 ON/OFF RESET → F•1
CURSOR: ON / OFF

17. EYE PATTERN DISPLAY (SER02/SER09)

CURSOR = ON

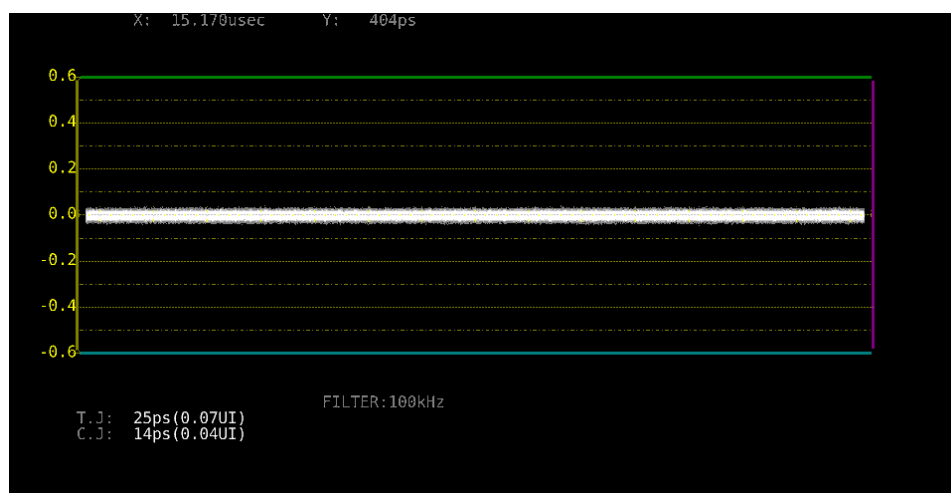


Figure 17-19 Cursor display

17.8.5 Selecting the Cursor

The X-axis and Y-axis cursors are displayed at the same time, but you can only use the function dial (F•D) to move one set of cursors at a time. To select which cursors you want to move, follow the procedure below.

Procedure

EYE → F.3 JITTER SETUP → F.3 CURSOR/TRIGGER → F.2 XY SEL: X / Y

17.8.6 Moving Cursors

To move a cursor, follow the procedure shown below to select a cursor. Then, move the cursor by turning the function dial (F•D). Triangles appear on both ends of the selected cursor.

You can also select a cursor by pressing the function dial (F•D). Each time you press the function dial (F•D), the selected cursor switches from REF, to DELTA, to TRACK, and then back to REF.

Procedure

EYE → F.3 JITTER SETUP → F.3 CURSOR/TRIGGER → F.4 FD VAR: REF / DELTA / TRACK

Settings

REF:	The REF cursor (yellow or light blue) is selected.
DELTA:	The DELTA cursor (purple or green) is selected.
TRACK:	The REF cursor and DELTA cursor are both selected.

17.8.7 Selecting the X-Axis Measurement Unit

When **F•2** XY SEL is set to X, to select the X-axis cursor measurement unit, follow the procedure below.

Procedure

EYE	→	F•3	JITTER SETUP	→	F•3	CURSOR/TRIGGER	→	F•3	X UNIT: <u>sec</u> / Hz

Settings

sec:	The measurement unit is seconds.
Hz:	The measurement unit is frequency, with the length of one period set to the distance between the two cursors.

17.8.8 Selecting the Y-Axis Measurement Unit

When **F•2** XY SEL is set to Y, to select the Y-axis cursor measurement unit, follow the procedure below.

Procedure

EYE	→	F•3	JITTER SETUP	→	F•3	CURSOR/TRIGGER	→	F•3	Y UNIT: <u>sec</u> / UIp-p

Settings

sec:	The measurement unit is seconds.
UIp-p:	The measurement unit is UIp-p, with one UIp-p set to one cycle of the eye pattern.

17.8.9 Selecting the Display Mode

To select the jitter display mode, follow the procedure below.

If the eye pattern and jitter are displayed simultaneously, the setting specified here also applies to the eye pattern.

Procedure

EYE	→	F•3	JITTER SETUP	→	F•3	CURSOR/TRIGGER	→	F•6	TRIGGER: <u>RUN</u> / STOP

Settings

RUN:	The input signal is automatically updated and displayed.
STOP:	The input signal is displayed statically. This is convenient for cursor measurement.
	Even if STOP is selected, if you change the measurement conditions, such as switching to eye pattern, the mode switches to RUN.

17.8.10 Resetting Cursors

To reset the cursor positions, follow the procedure below.

Procedure

EYE	→	F•3	JITTER SETUP	→	F•3	CURSOR/TRIGGER	→	F•1	ON/OFF RESET	→	F•6
CURSOR RESET											

17.8.11 Turning the Peak Hold On and Off

To configure the peak hold settings, press **F•4** PEAK HOLD on the JITTER SETUP menu.

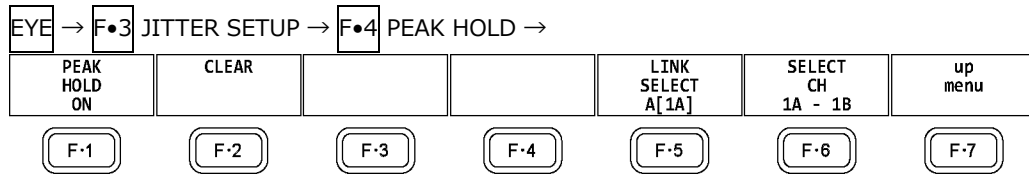


Figure 17-20 PEAK HOLD menu

To measure the peak values of the timing jitter (T.J) and the current jitter (C.J), follow the procedure below.

When you set **F•1** PEAK HOLD to ON, the peak values are displayed in the lower part of the screen next to "PEAK." The peak values are retained until you press **F•2** CLEAR. If a peak value exceeds 10.00UI, "OVER" is displayed.

Procedure

EYE → **F•3** JITTER SETUP → **F•4** PEAK HOLD → **F•1** PEAK HOLD: ON / OFF

PEAK HOLD = ON

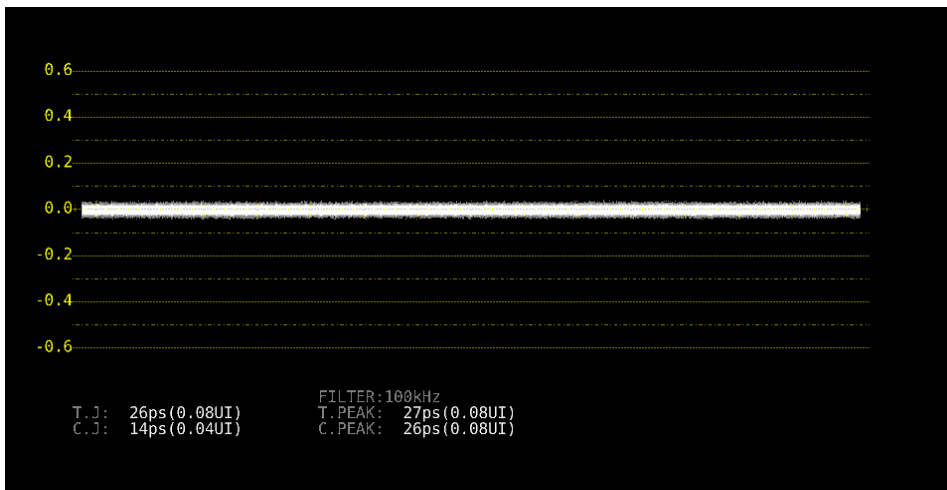


Figure 17-21 Peak hold display

17.8.12 Clearing the Peak Hold

When **F•1** PEAK HOLD is set to ON, to clear the peak hold, follow the procedure below.

Procedure

EYE → **F•3** JITTER SETUP → **F•4** PEAK HOLD → **F•2** CLEAR

17.9 Configuring Error Detection Settings

To configure the error detection settings, use **F•4** ERROR SETUP.

When error detection is set to ON, the following actions are performed when an error occurs.

- Displays measured values on the eye pattern display and jitter display in red
- Displays errors in the event log of the status display
- Displays "ERROR" in the upper-right of the display.
- Transmits a signal from the alarm output remote terminal

Reference Section 16.4.1, "Event Log Screen Explanation"

17.9.1 Configuring 12G Error Settings

Use the 12G-SDI ERROR SETUP tab to configure error detection settings for 12G signals.

You can set the threshold values when you set the error detection to ON. Measured values given in SMPTE ST 2082-1 are used as 100 %.

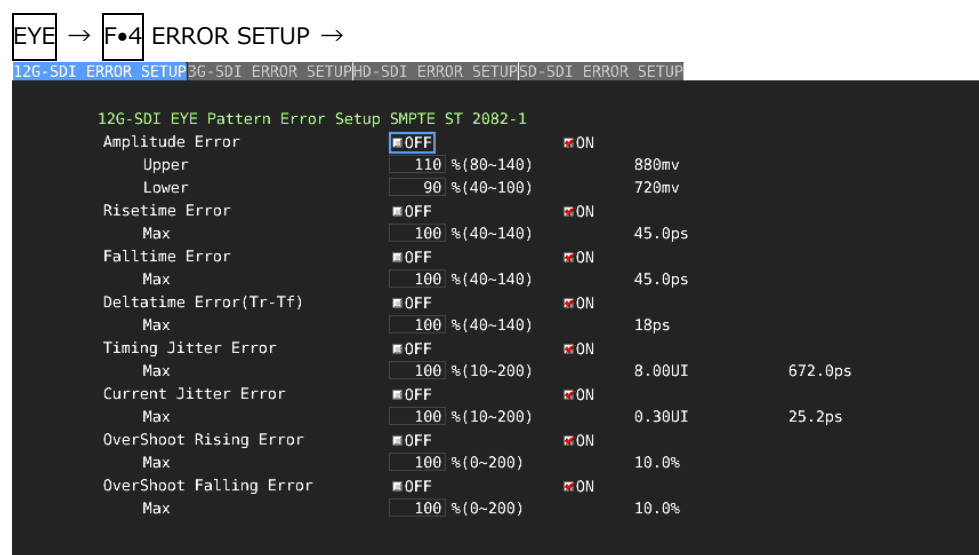


Figure 17-22 12G-SDI ERROR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 2082-1 is given below.

Table 17-3 12G-SDI ERROR SETUP configuration example

Item		Setting Example	Corresponding Value
Amplitude Error	Upper	110%	880mV
	Lower	90%	720mV
Risetime Error	Max	100%	45.0ps
Falltime Error	Max	100%	45.0ps
Deltatime Error(Tr-Tf)	Max	100%	18ps
Timing Jitter Error	Max	100%	8.00UI (672.0ps)
Current Jitter Error	Max	100%	0.30UI (25.2ps)
Overshoot Rising Error	Max	100%	10.0%
Overshoot Falling Error	Max	100%	10.0%

17. EYE PATTERN DISPLAY (SER02/SER09)

● Amplitude Error

Turns the eye pattern's amplitude error detection on and off.

You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	<u>80</u> - 140% (640 - 1120mV)
Lower:	<u>40</u> - 100% (320 - 800mV)

● Risetime Error

Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max:	<u>40</u> - 140% (18.0 - 63.0ps)

● Falltime Error

Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max:	<u>40</u> - 140% (18.0 - 63.0ps)

● Deltatime Error(Tr-Tf)

Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max:	<u>40</u> - 140% (7 - 25ps)

● Timing Jitter Error

Turns the eye pattern and jitter's timing jitter error detection on and off.

Max:	<u>10</u> - 200% (0.80 - 16.00UI, 67.2 - 1344.0ps)

● Current Jitter Error

Turns the eye pattern and jitter's current jitter error detection on and off.

Max:	<u>10</u> - 200% (0.03 - 0.60UI, 2.5 - 50.4ps)

● OverShoot Rising Error

Turns the overshoot of the rising edge error detection on and off.

Max:	0 - <u>100</u> - 200% (0.0 - 20.0%)

● OverShoot Falling Error

Turns the overshoot of the falling edge error detection on and off.

Max:	0 - <u>100</u> - 200% (0.0 - 20.0%)

17.9.2 Configuring 3G Error Settings

Use the 3G-SDI ERROR SETUP tab to configure error detection settings for 3G signals.

You can set the threshold values when you set the error detection to ON. Measured values given in SMPTE ST 424 are used as 100 %.

EYE → F•4 ERROR SETUP → F•2 PREV TAB or F•3 NEXT TAB →

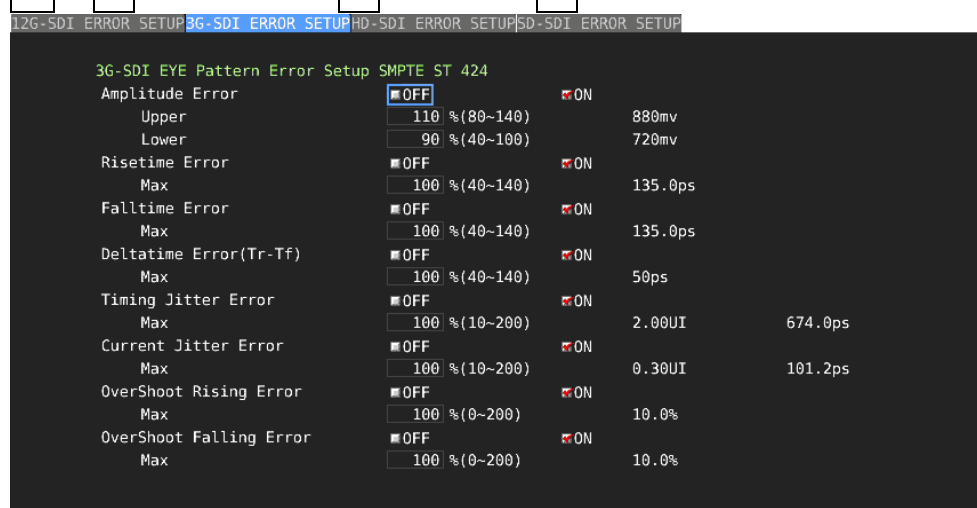


Figure 17-23 3G-SDI ERROR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 424 is given below.

Table 17-4 3G-SDI ERROR SETUP configuration example

Item		Setting Example	Corresponding Value
Amplitude Error	Upper	110%	880mV
	Lower	90%	720mV
Risetime Error	Max	100%	135.0ps
Falltime Error	Max	100%	135.0ps
Deltatime Error(Tr-Tf)	Max	100%	50ps
Timing Jitter Error	Max	100%	2.00UI (674.0ps)
Current Jitter Error	Max	100%	0.30UI (101.2ps)
OverShoot Rising Error	Max	100%	10.0%
OverShoot Falling Error	Max	100%	10.0%

17. EYE PATTERN DISPLAY (SER02/SER09)

● Amplitude Error

Turns the eye pattern's amplitude error detection on and off.

You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	<u>80</u> - 140% (640 - 1120mV)
Lower:	<u>40</u> - 100% (320 - 800mV)

● Risetime Error

Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max:	<u>40</u> - 140% (54.0 - 189.0ps)

● Falltime Error

Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max:	<u>40</u> - 140% (54.0 - 189.0ps)

● Deltatime Error(Tr-Tf)

Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max:	<u>40</u> - 140% (20 - 70ps)

● Timing Jitter Error

Turns the eye pattern and jitter's timing jitter error detection on and off.

Max:	<u>10</u> - 200% (0.20 - 4.00UI, 67.4 - 1348.0ps)

● Current Jitter Error

Turns the eye pattern and jitter's current jitter error detection on and off.

Max:	<u>10</u> - 200% (0.03 - 0.60UI, 10.1 - 202.5ps)

● OverShoot Rising Error

Turns the overshoot of the rising edge error detection on and off.

Max:	0 - <u>100</u> - 200% (0.0 - 20.0%)

● OverShoot Falling Error

Turns the overshoot of the falling edge error detection on and off.

Max:	0 - <u>100</u> - 200% (0.0 - 20.0%)

17.9.3 Configuring HD Error Settings

Use the HD-SDI ERROR SETUP tab to configure error detection settings for HD signals.

You can set the threshold values when you set the error detection to ON. Measured values given in SMPTE ST 292 are used as 100 %.

EYE → F•4 ERROR SETUP → F•2 PREV TAB or F•3 NEXT TAB →

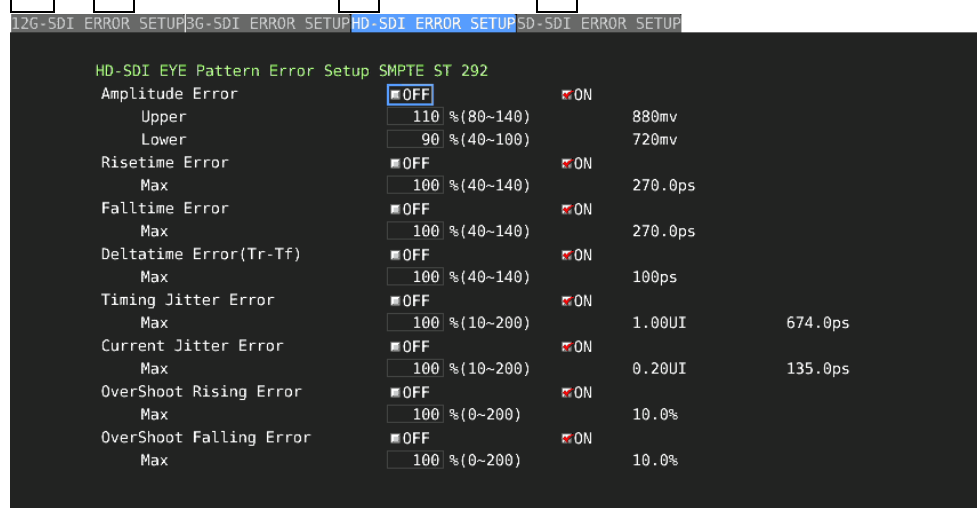


Figure 17-24 HD-SDI ERROR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 292 is given below.

Table 17-5 HD-SDI ERROR SETUP configuration example

Item		Setting Example	Corresponding Value
Amplitude Error	Upper	110%	880mV
	Lower	90%	720mV
Risetime Error	Max	100%	270.0ps
Falltime Error	Max	100%	270.0ps
Deltatime Error(Tr-Tf)	Max	100%	100ps
Timing Jitter Error	Max	100%	1.00UI (674.0ps)
Current Jitter Error	Max	100%	0.20UI (135.0ps)
OverShoot Rising Error	Max	100%	10.0%
OverShoot Falling Error	Max	100%	10.0%

- Amplitude Error

Turns the eye pattern's amplitude error detection on and off.

You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	<u>80</u> - 140% (640 - 1120mV)
Lower:	<u>40</u> - 100% (320 - 800mV)

17. EYE PATTERN DISPLAY (SER02/SER09)

- Risetime Error

Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max: 40 - 140% (108.0 - 378.0ps)

- Falltime Error

Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max: 40 - 140% (108.0 - 378.0ps)

- Deltatime Error(Tr-Tf)

Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max: 40 - 140% (40 - 140ps)

- Timing Jitter Error

Turns the eye pattern and jitter's timing jitter error detection on and off.

Max: 10 - 200% (0.10 - 2.00UI, 67.4 - 1348.0ps)

- Current Jitter Error

Turns the eye pattern and jitter's current jitter error detection on and off.

Max: 10 - 200% (0.02 - 0.40UI, 13.5 - 270.0ps)

- OverShoot Rising Error

Turns the overshoot of the rising edge error detection on and off.

Max: 0 - 100 - 200% (0.0 - 20.0%)

- OverShoot Falling Error

Turns the overshoot of the falling edge error detection on and off.

Max: 0 - 100 - 200% (0.0 - 20.0%)

17.9.4 Configuring SD Error Settings

Use the SD-SDI ERROR SETUP tab to configure error detection settings for SD signals.

You can set the threshold values when you set the error detection to ON. Measured values given in SMPTE ST 259 are used as 100 %.

EYE → F•4 ERROR SETUP → F•2 PREV TAB or F•3 NEXT TAB →



Figure 17-25 SD-SDI ERROR SETUP tab

A configuration example showing threshold values that correspond to SMPTE ST 259 is given below.

Table 17-6 SD-SDI ERROR SETUP configuration example

Item		Setting Example	Corresponding Value
Amplitude Error	Upper	110%	880mV
	Lower	90%	720mV
Risettime Error	Max	100%	1.50ns
Falltime Error	Max	100%	1.50ns
Deltatime Error(Tr-Tf)	Max	100%	0.50ns
Timing Jitter Error	Max	100%	0.20UI (0.74ns)
Current Jitter Error	Max	100%	0.20UI (0.74ns)
OverShoot Rising Error	Max	100%	10.0%
OverShoot Falling Error	Max	100%	10.0%

- Amplitude Error

Turns the eye pattern's amplitude error detection on and off.

You cannot set Lower to a value that is greater than Upper, even if the value is within the selectable range.

Upper:	<u>80</u> - 140% (640 - 1120mV)
Lower:	<u>40</u> - 100% (320 - 800mV)

17. EYE PATTERN DISPLAY (SER02/SER09)

- Risetime Error

Turns the eye pattern's rise time (the time for the signal to rise from 20 to 80 % of its amplitude) error detection on and off.

Max: 40 - 140% (0.60 - 2.10ns)

- Falltime Error

Turns the eye pattern's fall time (the time for the signal to fall from 80 to 20 % of its amplitude) error detection on and off.

Max: 40 - 140% (0.60 - 2.10ns)

- Deltatime Error(Tr-Tf)

Turns the eye pattern's time difference (between the rise and fall times) error detection on and off. When the measured values exceed the specified value, Tr and Tf are displayed in red.

Max: 40 - 140% (0.20 - 0.70ns)

- Timing Jitter Error

Turns the eye pattern and jitter's timing jitter error detection on and off.

Max: 10 - 200% (0.02 - 0.40UI, 0.07 - 1.48ns)

- Current Jitter Error

Turns the eye pattern and jitter's current jitter error detection on and off.

Max: 10 - 200% (0.02 - 0.40UI, 0.07 - 1.48ns)

- OverShoot Rising Error

Turns the overshoot of the rising edge error detection on and off.

Max: 0 - 100 - 200% (0.0 - 20.0%)

- OverShoot Falling Error

Turns the overshoot of the falling edge error detection on and off.

Max: 0 - 100 - 200% (0.0 - 20.0%)

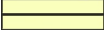
18. Installing the Plug-In (SER08)

To control SER08 from IP Live System Manager, you need to install the plug-in.

Plug-in name: LEADERCorporation.LV5490SER08.V*.**.Jar

*.** is the plugin version.

To install the plug-in to IP Live System Manager, follow the procedure below.

1. When you boot IP Live System Manager, the login screen is displayed. Enter your user name in the upper row of  and your password in the lower row, and click  to log in.

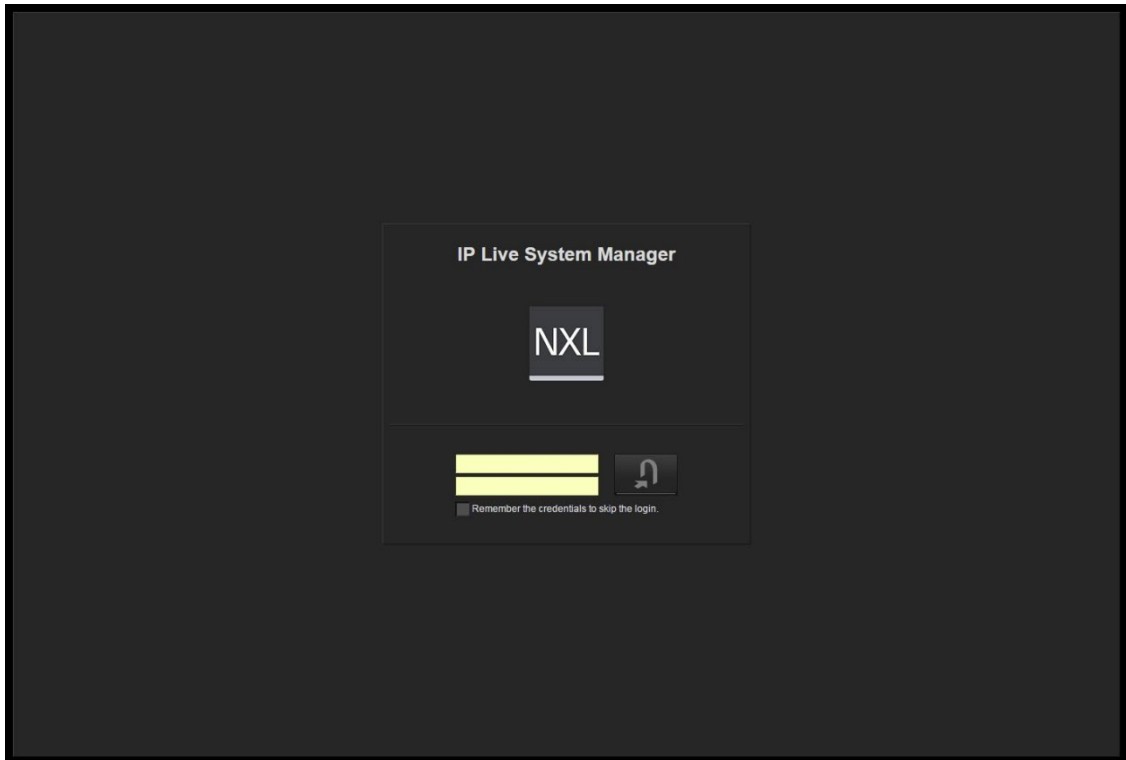


Figure 18-1 The login screen

18. Installing the Plug-In (SER08)

2. The top screen is displayed. Click Plug-in in the second column on the left.

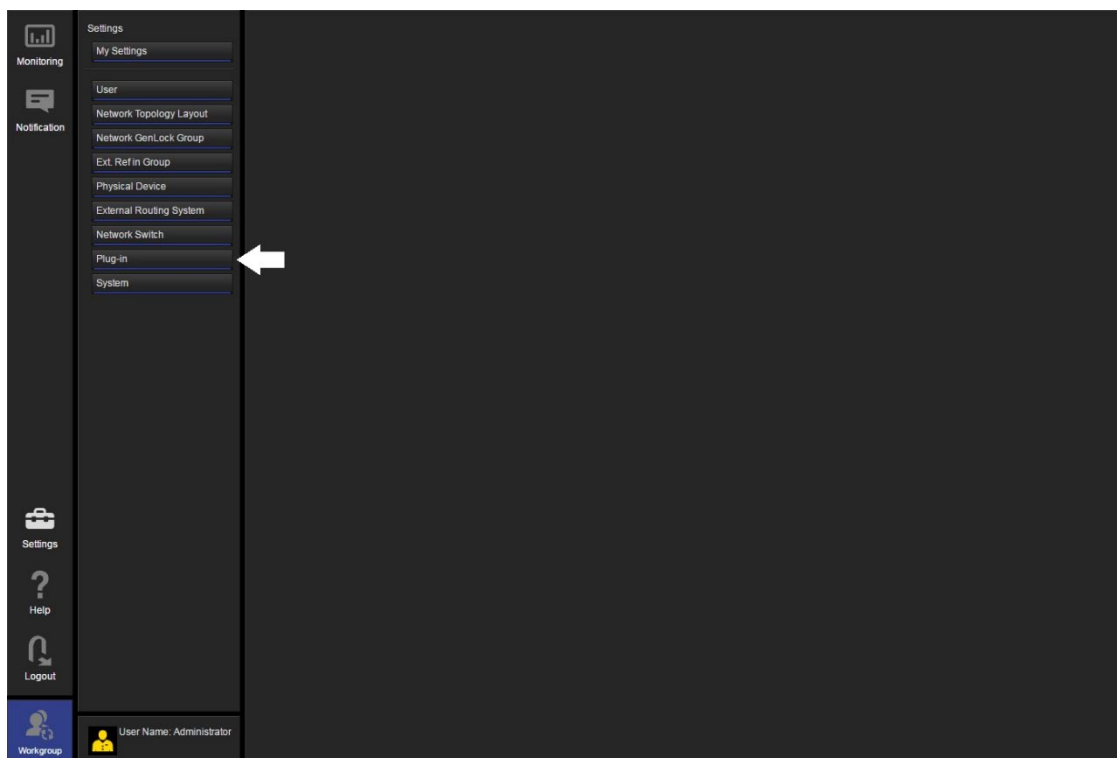


Figure 18-2 The top screen

3. The plug-in list screen is displayed. Click Install at the bottom right.

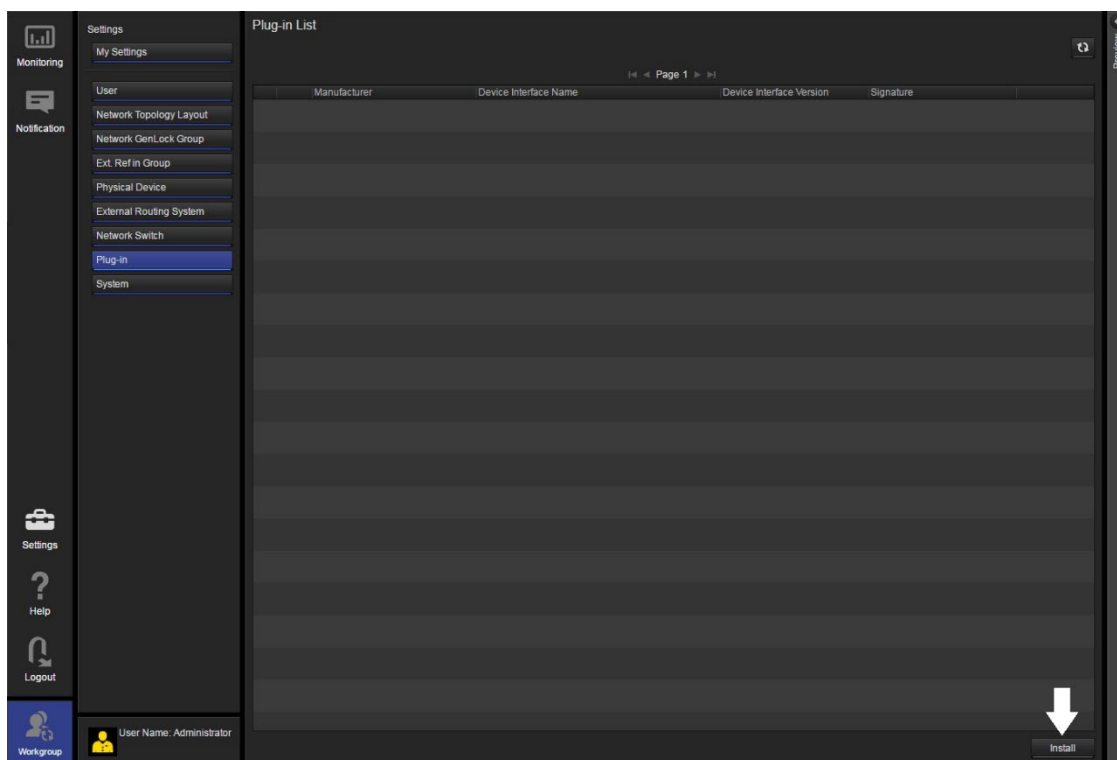


Figure 18-3 The plug-in list screen

18. Installing the Plug-In (SER08)

4. The Select Installation File dialog is displayed in the center of the screen. Click Browse on the right side of Plug-in (LEADERCorporation.LV5490SER08.V *. *. Jar), select a plug-in and click OK.

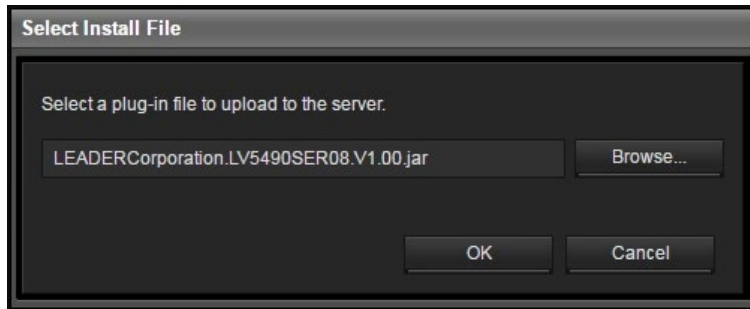


Figure 18-4 The Select Installation File dialog

5. If the installation is successful, File upload is succeeded is displayed in the Select Install File dialog. Click OK to complete the installation.

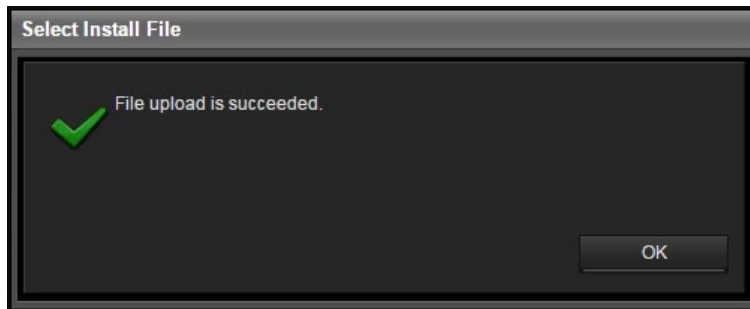


Figure 18-5 The Select Install File dialog

18. Installing the Plug-In (SER08)

6. The screen returns to the plug-in list screen, and the installed plug-ins are displayed in the plug-in list screen.

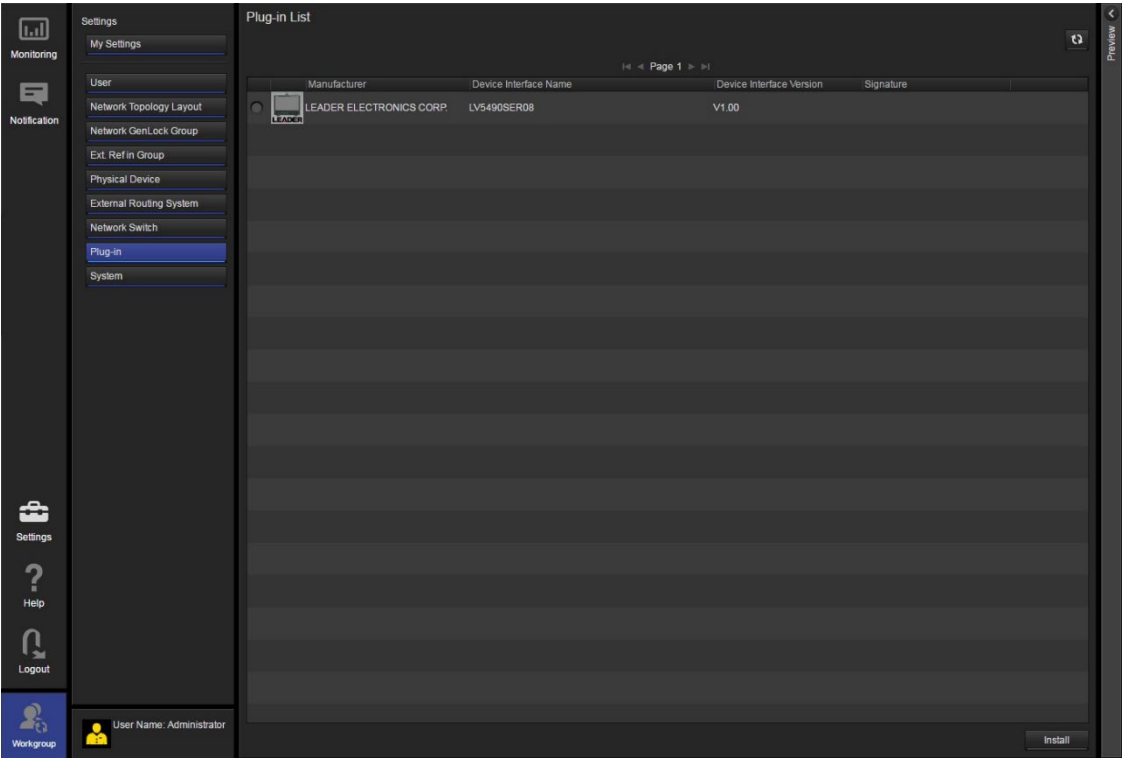


Figure 18-6 The plug-in list screen (after installation)

19. REMOTE CONTROL

You can use the remote control connector on the rear panel to load presets, transmit alarm signals, and perform other operations. Use the supplied 15-pin D-sub connector to control the LV 5490.

● Pinout Example

This section contains a diagram of the remote control connector, displayed as it appears on the rear panel, and a table that describes the connector's pinout.

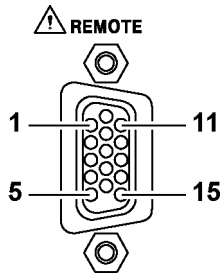


Figure 19-1 Remote control connector (female, inch screws)

Table 19-1 Remote control connector pinout example

Pin No.	Name	I/O (*1)	Function
1	OPEN	-	Open (*2)
2	/P1	I	Loads preset 1
3	/P2	I	Loads preset 2
4	/P3	I	Loads preset 3
5	/P4	I	Loads preset 4
6	/P5	I	Loads preset 5
7	/P6	I	Loads preset 6
8	/P7	I	Loads preset 7
9	/P8	I	Loads preset 8
10	/ACH	I	Selects channel A
11	/BCH	I	Selects channel B
12	/CCH	I	Selects channel C
13	/DCH	I	Selects channel D
14	ALARM	O	Transmits alarms
15	GND	-	Ground

*1 Is (inputs) are all pulled up to +3.3 V but can also receive +5 V.

*2 Do not connect anything.

19. REMOTE CONTROL

● Configuring the LV 5490

To set the remote control connector, use the system settings. For details, see section 7.2.3, "Remote Control Settings."

SYS → F•2 SYSTEM SETUP → F•3 NEXT TAB (×2) →

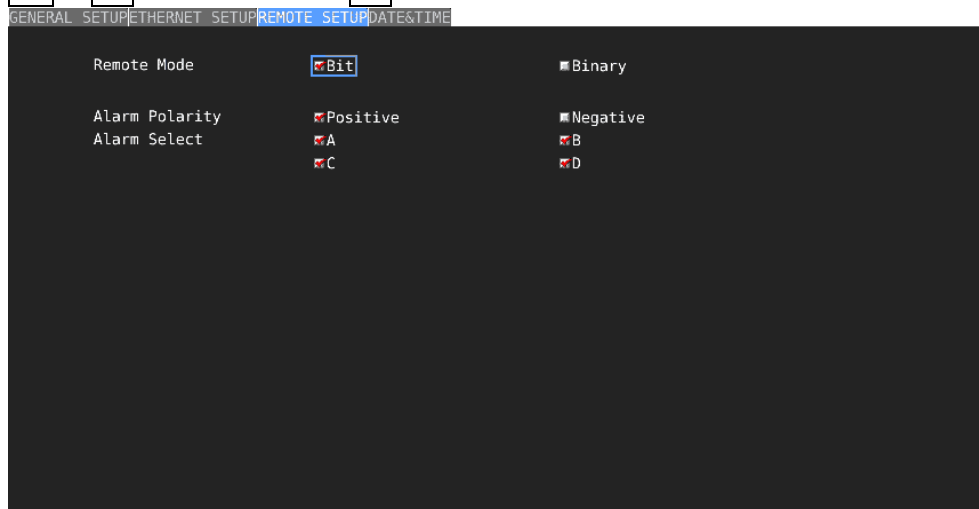


Figure 19-2 REMOTE SETUP tab

● Remote Control

The input connectors respond to active-low signals. Do not apply negative voltages or voltages that exceed +5 V. After you make a setting, a period of time of 350 ms or more in which the electrical potential is stable is required, so wait at least 1 second before you make the subsequent setting.

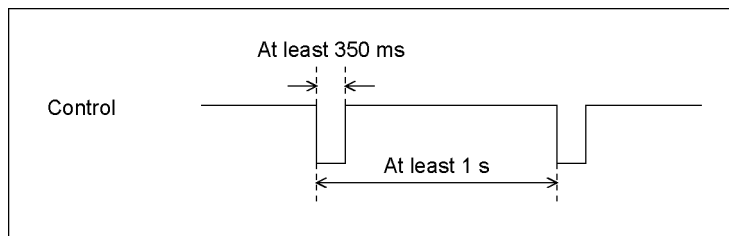


Figure 19-3 Remote control timing 1

19. REMOTE CONTROL

After a setting is made, it may take about 3 seconds for the operation to finish. If you configure subsequent settings before the initial operation finishes, only the last setting will take effect. All settings in between will be discarded. (In the following example, remote control 2 will be discarded.)

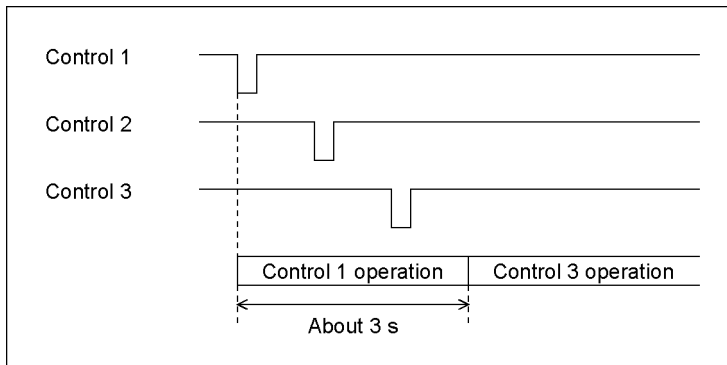


Figure 19-4 Remote control timing 2

● Loading Presets

The control table when Remote Mode is set to Bit is shown below.

When Remote Select is set to Recall and Loudness, preset No. 7 and 8 cannot be recalled.

Table 19-2 Loading presets (Bit)

Preset No.	9p /P8	8p /P7	7p /P6	6p /P5	5p /P4	4p /P3	3p /P2	2p /P1
1	H	H	H	H	H	H	H	L
2	H	H	H	H	H	H	L	H
3	H	H	H	H	H	L	H	H
4	H	H	H	H	L	H	H	H
5	H	H	H	L	H	H	H	H
6	H	H	L	H	H	H	H	H
7	H	L	H	H	H	H	H	H
8	L	H	H	H	H	H	H	H

19. REMOTE CONTROL

The control table when Remote Mode is set to Binary is shown below.

Table 19-3 Loading presets (Binary)

Preset No.	7p	6p	5p	4p	3p	2p
	/P6	/P5	/P4	/P3	/P2	/P1
1	H	H	H	H	H	L
2	H	H	H	H	L	H
3	H	H	H	H	L	L
4	H	H	H	L	H	H
5	H	H	H	L	H	L
6	H	H	H	L	L	H
7	H	H	H	L	L	L
8	H	H	L	H	H	H
9	H	H	L	H	H	L
10	H	H	L	H	L	H
11	H	H	L	H	L	L
12	H	H	L	L	H	H
13	H	H	L	L	H	L
14	H	H	L	L	L	H
15	H	H	L	L	L	L
16	H	L	H	H	H	H
17	H	L	H	H	H	L
18	H	L	H	H	L	H
19	H	L	H	H	L	L
20	H	L	H	L	H	H
21	H	L	H	L	H	L
22	H	L	H	L	L	H
23	H	L	H	L	L	L
24	H	L	L	H	H	H
25	H	L	L	H	H	L
26	H	L	L	H	L	H
27	H	L	L	H	L	L
28	H	L	L	L	H	H
29	H	L	L	L	H	L
30	H	L	L	L	L	H
31	H	L	L	L	L	L
32	L	H	H	H	H	H
33	L	H	H	H	H	L
34	L	H	H	H	L	H
35	L	H	H	H	L	L
36	L	H	H	L	H	H
37	L	H	H	L	H	L
38	L	H	H	L	L	H
39	L	H	H	L	L	L
40	L	H	L	H	H	H
41	L	H	L	H	H	L

19. REMOTE CONTROL

Preset No.	7p /P6	6p /P5	5p /P4	4p /P3	3p /P2	2p /P1
42	L	H	L	H	L	H
43	L	H	L	H	L	L
44	L	H	L	L	H	H
45	L	H	L	L	H	L
46	L	H	L	L	L	H
47	L	H	L	L	L	L
48	L	L	H	H	H	H
49	L	L	H	H	H	L
50	L	L	H	H	L	H
51	L	L	H	H	L	L
52	L	L	H	L	H	H
53	L	L	H	L	H	L
54	L	L	H	L	L	H
55	L	L	H	L	L	L
56	L	L	L	H	H	H
57	L	L	L	H	H	L
58	L	L	L	H	L	H
59	L	L	L	H	L	L
60	L	L	L	L	H	H

● Alarm Output

The LV 5490 outputs an alarm from pin 14 (ALARM) when any of the conditions below is true.

The applicable alarm output channels are all the channels in the selected group (1A to 1D or 2A to 2D). However, when measuring 3G-B-DS or 3G (DL)-4K, alarms are output only for the currently displayed channels.

- When a format other than that specified with Format Set on the FORMAT ALARM tab of the SYS menu is received
- When an error occurs in the item that you have set to ON using **F•5** STATUS SETUP on the STATUS menu
- When an error occurs in the item that you have set to ON using **F•4** ERROR SETUP on the EYE menu
- When a fan error occurs
- When the internal temperature rises to an abnormal level
(When Temperature of **F•3** SYSTEM INFO on the SYS menu turns red.)

20. ETHERNET REMOTE CONTROL

The LV 5490 can be remotely controlled through its Ethernet port on the rear panel. Controlling an LV 5490 remotely through its Ethernet interface has only been confirmed to work in a local network environment. LEADER does not guarantee that this feature will work in any network environment.

20.1 TELNET

From a PC connected to the same network as the LV 5490, most of the operations that you can perform from the front panel can be controlled remotely.

20.1.1 Procedure

1. Configure the Ethernet settings on the LV 5490's ETHERNET SETUP tab.

Set the IP Address, and set TELNET Server Select to ON.

You cannot use the LV 5490-01 (REMOTE CONTROLLER) while you are using TELNET.

Conversely, if you set LV 5490-01 to ON, you cannot use TELNET.

Reference 7.2.2, "Configuring Ethernet Settings"

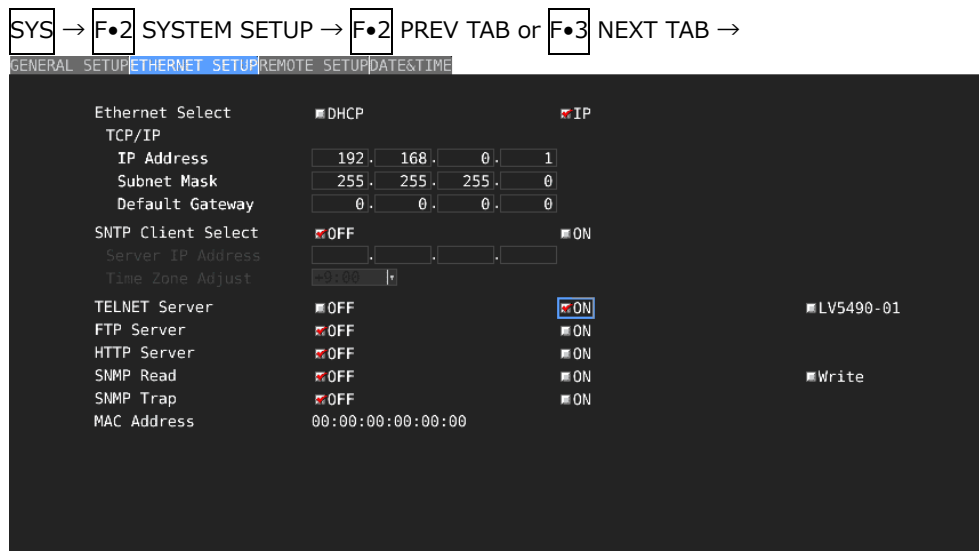


Figure 20-1 ETHERNET SETUP tab

2. Press F•1 COMPLETE.
3. Connect the LV 5490's Ethernet port to the network.
4. On the PC, start a TELNET client.

On Windows 7, on the taskbar, click Start, and then click Run. Type "TELNET " and the IP address that you set in step 1. Then, click OK.

(To use TELNET, open Control Panel, click Turn Windows features on or off under Program and Features, and select the Telnet Client check box.)

20. ETHERNET REMOTE CONTROL

5. Type the login name and password.

The login name and password are "LV5490". Use uppercase for all characters.
When the login name and password are entered correctly, "LV5490@LV5490:~\$" appears.

```
LV5490 login: LV5490
Password: *****
LV5490@LV5490:~$
```

6. Enter TELNET commands.

Enter commands while referring to sections 20.1.2, "How to Enter Commands," and 20.1.3, "TELNET Commands."
To end a TELNET session, type "exit" in lowercase letters.

```
LV5490@LV5490:~$ exit
```

20.1.2 How to Enter Commands

The command syntax is explained below. (Some commands do not have parameters.)
To query a current setting, use a question mark as the parameter.

```
LV5490@LV5490: ~$ [Command] + [Space] + [Parameter]
```

Examples of how to enter commands are shown below.

● Showing the Status Display

```
LV5490@LV5490: ~$ STATUS
```

● Displaying the Center Marker in the Picture Display

```
LV5490@LV5490: ~$ PIC:MARKER:CENTER ON
```

● Querying the Vector Intensity

```
LV5490@LV5490: ~$ VECTOR:INTEN ?
```

- * You can enter commands using uppercase or lowercase letters.
- * Because the display channel selection command is different depending on the display mode (single or simul) and SDI signal input settings, check the INPUT KEY command.
- * To query the measured value or detected value, you must use the INPUT KEY command to show the measurement screen of the appropriate channel.
Further, for 4K 3G QUAD LINK, 4K 3G DUAL LINK, 4K HD QUAD LINK, 3G DUAL LINK, and HD DUAL LINK settings, you must also select the link according to the link selection command of each measurement item.

20.1.3 TELNET Commands

TELNET commands follow the LV 5490 or the unit menu structure. For explanations of each item, see this manual or the FUNCTION MENU EXPLANATIONS. Depending on the current settings, some of the items that are described in this manual may be invalid.

● INPUT KEY

r/w Limitation	Command	Parameter	
-	INP:SIMUL	SINGLE / SIMUL / ?	
-	INP_SINGLE:A	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	SD/HD/3G-A/3G-B-DL or 3G-B-DS setting, Select the display channel in single input mode.
-	INP_SINGLE:B	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP_SINGLE:C	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP_SINGLE:D	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP:SIMUL:A	OFF / ON / ? (Return value: Channel A display on/off)	SD/HD/3G-A/3G-B-DL or 3G-B-DS setting, Select the display channel in simul mode.
-	INP:SIMUL:B	OFF / ON / ? (Return value: Channel B display on/off)	
-	INP:SIMUL:C	OFF / ON / ? (Return value: Channel C display on/off)	
-	INP:SIMUL:D	OFF / ON / ? (Return value: Channel D display on/off)	
-	INP_12G:A	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	4K 12G setting, Select the display channel.
-	INP_12G:B	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP_12G:C	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP_12G:D	ON / ? (Return value: ON (channel A selected) / OFF (not selected))	
-	INP:D_SINGLE:AB	ON / ? (Return value: Channel A-B pair display on/off)	4K 3G Dual Link, HD Dual Link or 3G Dual Link setting, Select the display channel in single input mode.
-	INP:D_SINGLE:CD	ON / ? (Return value: Channel C-Ddisplay on/off)	
-	INP:D_SIMUL:AB	OFF / ON / ? (Return value: Channel A-B pair display on/off)	HD Dual Link or 3G Dual Link setting, Select the display channel in simul mode.
-	INP:D_SIMUL:CD	OFF / ON / ? (Return value:Channel C-D pair display on/off)	
-	INP_GROUP	GROUP1 / GROUP2 / ?	
-	INP_OPERATE	COM / INDIVIDUAL / ?	

● EXT KEY

r/w Limitation	Command	Parameter
-	EXT	INT / EXT / ?

● MULTI KEY

r/w Limitation	Command	Parameter
WO	MULTI	None
-	USER:LYT	USER1 / USER2 / USER3 / USER4 / USER5 / ?

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● CAP KEY

r/w Limitation	Command	Parameter
-	CAP:TRIGGER	MANUAL / ERROR / ?
WO	CAP:REFRESH	None
-	CAP:DISPLAY	REAL / HOLD / BOTH / ?
-	CAP:FILE:BMP	OFF / ON / ?
-	CAP:FILE:BSG	OFF / ON / ?
-	CAP:FILE:DPX	OFF / ON / ?
-	CAP:FILE:TIF	OFF / ON / ?
-	CAP:FILE:FRM	OFF / ON / ?
WO	CAP:FILE:STORE	None
WO	MAKE	CAP_BMP / CAP_BSG / CAP_FRM / CAP_DPX / CAP_TIF / LOG / DUMP * File make command. Use FTP to retrieve created files.

● PSET KEY

r/w Limitation	Command	Parameter
WO	PSET	1 to 60

● SYS KEY

r/w Limitation	Command	Parameter
WO	SYS:INITIALIZE	None
WO	SYS:LAYOUT:INIT	None
WO	SYS:ALL:INIT	None
WO	SYS:LCD:OFF	None
WO	SYS:LCD:ON	None
-	SYS:LCD:BACKLIGHT	1 to 32 / ?

● SDI IN TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:SDI:SYSTEM	4K_12G / 4K_3G_QLINK / 4K_3G_DLINK / 4K_HD_QLINK / SINGLE_LINK / HD_DLINK / 3G_DLINK / 3GB_DSTREAM / ? * Correspondence between parameters and settings 4K_12G : 4K 12G 4K_3G_QLINK : 4K 3G QUAD LINK 4K_3G_DLINK : 4K 3G DUAL LINK 4K_HD_QLINK : 4K HD QUAD LINK SINGLE_LINK : SD/HD/3G-A/3G-B-DL HD_DLINK : HD DUAL LINK 3G_DLINK : 3G DUAL LINK 3GB_DSTREAM : 3G-B-DS
-	SYS:COLORIMETRY	PID / BT709 / BT2020 / DCI / ?
-	SYS:HFR_MODE	OFF / X2 / X4 / X8 / ?
-	SYS:FMT:PID	USE / NOTUSE / ?
-	SYS:FMT:IPSF	INTERLACE / SEGMENTFRAME / ?
-	SYS:FMT:DIVISION	SQUARE / 2SAMPLE / ?
-	SYS:FMT:COLORSYS	YCBCR422 / YCBCR444 / RGB444 / XYZ444 / ?
-	SYS:FMT:PIXDEPTH	10BIT / 12BIT / ?
-	SYS:XYZ_GAMMA	BOTTOM_ZERO / DCI / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

20. ETHERNET REMOTE CONTROL

● FORMAT ALARM TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:FMT_ALM	OFF / ON / ?
-	SYS:FMT_ALM:SYSTEM	3840_2160_12G_TYPE1 / 4096_2160_12G_TYPE1 / 3840_2160_3GBDL_QUAD / 4096_2160_3GBDL_QUAD / 3840_2160_3GA_QUAD / 4096_2160_3GA_QUAD / 3840_2160_3GBDS_DUAL / 4096_2160_3GBDS_DUAL / 3840_2160_HD_QUAD / 4096_2160_HD_QUAD / 1920_1080_3GBDL / 2048_1080_3GBDL / 1280_720_3GA / 1920_1080_3GA / 2048_1080_3GA / 1280_720_HD / 1920_1080_HD / 720_487_SD / 720_576_SD / 1920_1080_HD_DUAL / 2048_1080_HD_DUAL / 1280_720_3GBDS / 1920_1080_3GBDS / 1920_1080_3GBDL_DUAL / 2048_1080_3GBDL_DUAL / 1920_1080_3GA_DUAL / 2048_1080_3GA_DUAL / ?
-	SYS:FMT_ALM:STRUCT	YCBCR422_10BIT / YCBCR422_12BIT / YCBCR444_10BIT / YCBCR444_12BIT / RGB444_10BIT / RGB444_12BIT / XYZ444_12BIT / ?
-	SYS:FMT_ALM:FRAME_FIELD	60P / 5994P / 50P / 48P / 30P / 2997P / 25P / 4795P / 24P / 2398P / 60I / 5994I / 50I / 30PSF / 2997PSF / 25PSF / 24PSF / 2398PSF / ?
-	SYS:FMT_ALM:DIVI	SQUARE / 2SAMPLE / ?
-	SYS:FMT_ALM:FLAG:COLOR	OFF / ON / ?
-	SYS:FMT_ALM:COLOR	BT_709 / BT_2020 / DCI / ?
RO	SYS:FMT:SDIIN:A	? * Video format information of channel A
RO	SYS:FMT:SDIIN:B	? * Video format information of channel B
RO	SYS:FMT:SDIIN:C	? * Video format information of channel C
RO	SYS:FMT:SDIIN:D	? * Video format information of channel D
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

● SDI OUT TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:SDI:BNC	OUTPUT / INPUT / ?
-	SYS:SDI:OUTPUT:MODE	INPUT_THROUGH / TEST_SIGNAL / ?
-	SYS:SDI:OUTPUT	ACH / ABCD / ?
-	SYS:TSG:SYSTEM	3840_2160_3GBDL_QUAD / 4096_2160_3GBDL_QUAD / 3840_2160_3GA_QUAD / 4096_2160_3GA_QUAD / 3840_2160_3GBDS_DUAL / 4096_2160_3GBDS_DUAL / 1920_1080_3GBDL / 2048_1080_3GBDL / 1920_1080_3GA / 2048_1080_3GA / 1920_1080_HD / ?
-	SYS:TSG:STRUCT	YCBCR422_10BIT / YCBCR444_10BIT / RGB444_10BIT / XYZ444_12BIT / ?
-	SYS:TSG:FRAME_FIELD	60P / 5994P / 50P / 48P / 30P / 2997P / 25P / 4795P / 24P / 2398P / 60I / 5994I / 50I / 30PSF / 2997PSF / 25PSF / 24PSF / 2398PSF / ?
-	SYS:TSG:DIVI	SQUARE / 2SAMPLE / ?
-	SYS:TSG:PTN	COLOR_BAR_100 / COLOR_BAR_75 / MULTI_COL_BAR / COLOR_RASTER / CROSS_HATCH / 10STEP / LIMIT_RAMP / ?
-	SYS:TSG:YCB:Y	OFF / ON / ?
-	SYS:TSG:YCB:Y:VAL	4 to 1019 / ?

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r/w Limitation	Command	Parameter
-	SYS:TSG:YCB:CB	OFF / ON / ?
-	SYS:TSG:YCB:CB:VAL	4 to 1019 / ?
-	SYS:TSG:YCB:CR	OFF / ON / ?
-	SYS:TSG:YCB:CR:VAL	4 to 1019 / ?
-	SYS:TSG:RGB:R	OFF / ON / ?
-	SYS:TSG:RGB:R:VAL	4 to 1019 / ?
-	SYS:TSG:RGB:G	OFF / ON / ?
-	SYS:TSG:RGB:G:VAL	4 to 1019 / ?
-	SYS:TSG:RGB:B	OFF / ON / ?
-	SYS:TSG:RGB:B:VAL	4 to 1019 / ?
-	SYS:TSG:SCRL	OFF / ON / ?
-	SYS:TSG:SCRL:DIREC	RIGHT / LEFT / UP / DOWN / RIGHT_UP / RIGHT_DOWN / LEFT_UP / LEFT_DOWN / ?
-	SYS:TSG:SCRL:SPEED	4 to 124 / ?
-	SYS:TSG:BOX	OFF / ON / ?
-	SYS:TSG:BOX:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / BLACK / ?
-	SYS:TSG:BOX:SPEED	1 to 3 / ?
-	SYS:TSG:PHS	OFF / ON / ?
-	SYS:TSG:PHS:DIREC	H / V / ?
-	SYS:TSG:PHS:H:BCH	-1374 to 1374 / ?
-	SYS:TSG:PHS:H:CCH	-1374 to 1374 / ?
-	SYS:TSG:PHS:H:DCH	-1374 to 1374 / ?
-	SYS:TSG:PHS:V:BCH	-562 to 562 / ?
-	SYS:TSG:PHS:V:CCH	-562 to 562 / ?
-	SYS:TSG:PHS:V:DCH	-562 to 562 / ?
-	SYS:TSG:AUDIO:G1	OFF / ON / ?
-	SYS:TSG:AUDIO:G2	OFF / ON / ?
-	SYS:TSG:AUDIO:G3	OFF / ON / ?
-	SYS:TSG:AUDIO:G4	OFF / ON / ?
-	SYS:TSG:AUDIO:LVL	M20DBFS / M18DBFS / 0DBFS / MUTE / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

● HDR TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:HDR:ENABLE	OFF / ON / ?
-	SYS:HDR:HDR_CURVE	HLG / PQ / SLOG3 / ?
-	SYS:HDR:MAX	MAX_10000 / MAX_4000 / MAX_1000 / ?
-	SYS:HDR:GAMMA	OFF / ON / ?
-	SYS:HDR:REF:PQ	P51 / P58 / ?
-	SYS:HDR:REF:HLG	P50 / P75 / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

● AUDIO IN/OUT TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:AUD:BNC:A	INPUT / OUTPUT / ?
-	SYS:AUD:BNC:B	INPUT / OUTPUT / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

20. ETHERNET REMOTE CONTROL

● MONITOR OUT TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:RASTER:SYNC	INT / EXTSIG / ?
-	SYS:RASTER:FORMAT	1080_60P / 1080_5994P / 1080_50P / ?
-	SYS:RASTER:SDIOUT:MODE	RASTER / ROUTER / ?
-	SYS:RASTER:SDIOUT:FMT	HD_SDI / 3G_SDI-A / 3G_SDI-B / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

● 12G SDI OUT TAB MENU (SYS → SIGNAL IN OUT) (*1)

r/w Limitation	Command	Parameter
-	SYS:12G:OUTPUT	INPUT / 12G / NO / ?
-	SYS:12G:FRAME_RATE	60P / 5994P / 50P / ?
WO	SYS:SIGNAL_IN_OUT:COMPLETE	None (must be executed after changing the tab menu)

*1 Execute SYS:SIGNAL_IN_OUT:COMPLETE after changing the setting.

● GENERAL SETUP TAB MENU (SYS → SYSTEM SETUP) (*2)

r/w Limitation	Command	Parameter
-	SYS:BOOT:MODE	NORMAL / FAST / ?
-	SYS:CAPMODE	SCREEN / VIDEO_FRAME / ?
-	SYS:INFODISP:FORMAT	OFF / ON / ?
-	SYS:INFODISP:DATE	OFF / YMD / MDY / DMY / ?
-	SYS:INFODISP:TIME	OFF / REALTIME / LTC / VITC / DVITC / ?
-	SYS:INFODISP:INPUT	OFF / ON / ?
-	SYS:INFODISP:ICON	OFF / ON / ?
-	SYS:INFODISP:ERROR	OFF / ON / ?
-	SYS:MENUE:AUTOOFF	OFF / ON / ?
-	SYS:MENUE:OFFTIME	1 to 60 / ?
-	SYS:MENUE:RECALL_MENU	RECALL / FUNCTION / ?
-	SYS:LCD:AUTO:OFF	OFF / 5MIN / 30MIN / 60MIN / ?
-	SYS:FAN:SPEED	1 to 5 / ?
-	SYS:FAN:WARNING	OFF / ON / ?
WO	SYS:SYSTEM_SETUP:COMPLETE	None (must be executed after changing the tab menu)

*2 Execute SYS:SYSTEM_SETUP:COMPLETE after changing the setting.

● ETHERNET SETUP TAB MENU (SYS → SYSTEM SETUP) (*3)

r/w Limitation	Command	Parameter
-	SYS:ETHERNET:SELECT	DHCP / IP / ?
-	SYS:IP:IPADR:SEG1	0 to 255 / ?
-	SYS:IP:IPADR:SEG2	0 to 255 / ?
-	SYS:IP:IPADR:SEG3	0 to 255 / ?
-	SYS:IP:IPADR:SEG4	0 to 255 / ?
-	SYS:IP:MASK:SEG1	0 to 255 / ?
-	SYS:IP:MASK:SEG2	0 to 255 / ?
-	SYS:IP:MASK:SEG3	0 to 255 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	SYS:IP:MASK:SEG4	0 to 255 / ?
-	SYS:IP:GATE:SEG1	0 to 255 / ?
-	SYS:IP:GATE:SEG2	0 to 255 / ?
-	SYS:IP:GATE:SEG3	0 to 255 / ?
-	SYS:IP:GATE:SEG4	0 to 255 / ?
-	SYS:SNTP:SELECT	OFF / ON / ?
-	SYS:SNTP:IPADR:SEG1	0 to 255 / ?
-	SYS:SNTP:IPADR:SEG2	0 to 255 / ?
-	SYS:SNTP:IPADR:SEG3	0 to 255 / ?
-	SYS:SNTP:IPADR:SEG4	0 to 255 / ?
-	SYS:SNTP:TZ:ADJ	0(-12) to 24(+12)
-	SYS:TELNET:SELECT	OFF / ON / ?
-	SYS:FTP:SELECT	OFF / ON / ?
-	SYS:HTTP:SELECT	OFF / ON / ?
-	SYS:SNMP:READ	OFF / ONLY(read only) / WRITE / ?
-	SYS:SNMP:TRAP	OFF / ON / ?
WO	SYS:ETHERNET:UPDATE	None

*3 Execute SYS:ETHERNET:UPDATE after changing the setting.

● REMOTE SETUP TAB MENU (SYS → SYSTEM SETUP) (*2)

r/w Limitation	Command	Parameter
-	SYS:REMOTE:MODE	BIT / BINARY / ?
-	SYS:REMOTE:ALM:POLARITY	POSITIVE / NEGATIVE / ?
-	SYS:REMOTE:ALM:A	OFF / ON / ?
-	SYS:REMOTE:ALM:B	OFF / ON / ?
-	SYS:REMOTE:ALM:C	OFF / ON / ?
-	SYS:REMOTE:ALM:D	OFF / ON / ?
WO	SYS:SYSTEM_SETUP:COMPLETE	None (must be executed after changing the tab menu)

*2 Execute SYS:SYSTEM_SETUP:COMPLETE after changing the setting.

● DATA & TIME TAB MENU (SYS → SYSTEM SETUP) (*4)

r/w Limitation	Command	Parameter
-	SYS:DATE:DAY	1 to 31 / ?
-	SYS:DATE:MONTH	1 to 12 / ?
-	SYS:DATE:YEAR	2000 to 2099 / ?
-	SYS:TIME:HOURL	0 to 23 / ?
-	SYS:TIME:MIN	0 to 59 / ?
-	SYS:TIME:SEC	0 to 59 / ?
WO	SYS:SET:DATE_TIME	None * To synchronize the clock to a specific time, specify all commands: DAY, MONTH, YEAR, HOUR, MIN, and SEC.

*4 Execute SYS:SET:DATE_TIME after changing the setting.

20. ETHERNET REMOTE CONTROL

● INFORMATION TAB MENU (SYS → SYSTEM INFO)

r/w Limitation	Command	Parameter
RO	SYS:INFO:FIRMWARE	?
RO	SYS:INFO:BOARD:SDIIN	? / not installed / installed * LV5490SER01 SDI INPUT board, LV 5490SER02 SDI INPUT/EYE board, LV 5490SER06 12G INPUT/EYE board installation status
RO	SYS:INFO:BOARD:SDIEYE	? / not installed / installed * LV5490SER02 SDI INPUT/EYE board, LV 5490SER06 12G INPUT/EYE board installation status
RO	SYS:INFO:BOARD:AUDIO	? / not installed / installed * LV5490SER03 DIGITAL AUDIO board installation status
RO	SYS:IP:MAC	?

● WFM KEY

r/w Limitation	Command	Parameter
WO	WFM	None
-	WFM:INTEN	-128 to 127 / ?
-	WFM:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI / ?
-	WFM:COLOR:S1	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI / ?
-	WFM:COLOR:S2	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / MULTI / ?
-	WFM:SCALE:INTEN	-8 to 7 / ?
-	WFM:SCALE:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	WFM:SCALE:UNIT	HDV_SDP / HDV_SDV / HDP_SDP / 150P / 1023_NRM / 1023_255 / 3FF / ?
-	WFM:SCALE:UNIT:NTSC	HDP_SDP / ?
-	WFM:SCALE:UNIT:PAL	HDV_SDV / ?
-	WFM:SCALE:75_COLOR	OFF / ON / ?
-	WFM:GAIN:VAR	CAL / VAR / ?
-	WFM:GAIN:MAG	X1 / X5 / ?
-	WFM:GAIN:VAL	20 to 200 / ? * Correspondence 20: x0.200 to 200: x2.000
-	WFM:FILTER:NORMAL	LOWPASS / FLAT / ?
-	WFM:FILTER:COMPST	FLAT / LUM / FLAT_LUM / LUM_CRMA / ?
-	WFM:SWEEP:SWEEP	H / V / ?
-	WFM:SWEEP:H_MAG	X1 / X10 / X20 / BLANK / ACTIVE / ?
-	WFM:SWEEP:V_MAG	X1 / X20 / X40 / ?
-	WFM:SWEEP:H_SWEEP	1H / 2H / ?
-	WFM:SWEEP:V_SWEEP	1V / 2V / ?
-	WFM:SWEEP:FIELD	FIELD1 / FIELD2 / ?
-	WFM:BLANKING:NORMAL	REMOVE / V_VIEW / H_VIEW / ALL_VIEW / ?
-	WFM:BLANKING:COMPST	REMOVE / V_VIEW / ?
-	WFM:CUSOR	ON / ON_XY / OFF / ?
-	WFM:CUSOR:SEL	X / Y / ?
-	WFM:CUSOR:FD	REF / DELTA / TRACK / ?
-	WFM:CUSOR:UNIT	sec / Hz / ? (when X is selected) MV / % / R% / DEC / HEX / HDR / ? (when Y is selected)
-	WFM:CUSOR:REF	0 to 927 / ? (when X is selected) 0 to 504 / ? (when Y is selected)
-	WFM:CUSOR:DELTA	0 to 927 / ? (when X is selected) 0 to 504 / ? (when Y is selected)

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
WO	WFM:CUSOR:TRACK	-927 to 927 / ? (when X is selected) -504 to 504 / ? (when Y is selected)
WO	WFM:CUSOR:REFSET	None
-	WFM:MATRIX:YCBCR	YCBCR / GBR / RGB / COMPOSIT / ?
-	WFM:MATRIX:RGB	GBR / RGB / COMPOSIT / ?
-	WFM:MATRIX:YGBR	OFF / ON / ?
-	WFM:MATRIX:YRGB	OFF / ON / ?
-	WFM:MATRIX:XYZ	XYZ / GBR / RGB / COMPOSIT / ?
-	WFM:MATRIX:CMPT:FORMAT	AUTO / NTSC / PAL / ?
-	WFM:MATRIX:CMPT:SETUP	0P / 7.5P / ?
-	WFM:DISP:OVLAY	PARADE / OVERLAY / ?
-	WFM:DISP:YCBCR:CH1	OFF / ON / ?
-	WFM:DISP:YCBCR:CH2	OFF / ON / ?
-	WFM:DISP:YCBCR:CH3	OFF / ON / ?
-	WFM:DISP:GBR:CH1	OFF / ON / ?
-	WFM:DISP:GBR:CH2	OFF / ON / ?
-	WFM:DISP:GBR:CH3	OFF / ON / ?
-	WFM:DISP:RGB:CH1	OFF / ON / ?
-	WFM:DISP:RGB:CH2	OFF / ON / ?
-	WFM:DISP:RGB:CH3	OFF / ON / ?
-	WFM:DISP:XYZ:CH1	OFF / ON / ?
-	WFM:DISP:XYZ:CH2	OFF / ON / ?
-	WFM:DISP:XYZ:CH3	OFF / ON / ?
-	WFM:DISP:3G-B-DS	STREAM1 / STREAM2 / MIX / ALIGN / ?
-	WFM:DISP:4Y_PARADE	OFF / ON / ?
WO	WFM:POS:MOVE:H	-32768 to 32767
WO	WFM:POS:MOVE:V	-32768 to 32767
RO	WFM:POS:ABS:H	?
RO	WFM:POS:ABS:V	?
-	WFM:LINE_SELECT	OFF / ON / ?
-	WFM:LINE_NUMBER	-32768 to 32767 / ?
-	WFM:LINE_FIELD	FRAME / FIELD1 / FIELD2 / ?

● VECTOR KEY

r/w Limitation	Command	Parameter
WO	VECTOR	None
-	VECTOR:MODE	VECTOR / 5BAR / HISTOGRAM / CIE_DIAGRAM / ?
-	VECTOR:INTEN	-128 to 127 / ?
-	VECTOR:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	VECTOR:COLOR:S1	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ? * Valid for 3G-B-DS stream 1
-	VECTOR:COLOR:S2	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ? * Valid for 3G-B-DS stream 2
-	VECTOR:SCALE:INTEN	-8 to 7 / ?
-	VECTOR:SCALE:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	VECTOR:SCALE:IQ	OFF / ON / ?
-	VECTOR:SCALE:VEC	AUTO / BT_601 / BT_709 / DCI / BT_2020 / ?
-	VECTOR:SCALE:5BAR	P / MV
-	VECTOR:SCALE:5BAR:SEQ	GBR / RGB
-	VECTOR:GAIN:VARIABLE	CAL / VARIABLE / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	VECTOR:GAIN:MAG	X1 / X5 / IQ / ?
-	VECTOR:GAIN:VAR	200 to 10000 / ? * Correspondence 200: x0.200 to 10000: x10.000
-	VECTOR:MATRIX	COMPONENT / COMPOSITE / ?
-	VECTOR:MATRIX:COLORBAR	100P / 75P / ?
-	VECTOR:MATRIX:CMPS:FORMAT	AUTO / NTSC / PAL / ?
-	VECTOR:MATRIX:CMPS:SETUP	0P / 7.5P / ?
-	VECTOR:MARKER	OFF / ON / ?
-	VECTOR:MARKER:POS_H	-32768 to 32767 / ?
-	VECTOR:MARKER:POS_V	-32768 to 32767 / ?
-	VECTOR:DISP:3G-B-DS	STREAM1 / STREAM2 / MIX / ALIGN / ?
-	VEC:LINE_SELECT	OFF / ON / ?
-	VEC:LINE_NUMBER	-32768 to 32767 / ?
-	VEC:LINE_FIELD	FRAME / FIELD1 / FIELD2 / ?
-	VECTOR:HIST:SCALE:HDR	% / HDR / ?

● LV 5490SER05 CIE DIAGRAM

r/w Limitation	Command	Parameter
-	VECTOR:CIE:CURSOR	OFF / ON / ?
-	VECTOR:CIE:CURSOR:POS_H	-32768 to 32767 / ?
-	VECTOR:CIE:CURSOR:POS_V	-32768 to 32767 / ?
-	VECTOR:CIE:SCALE:SUB:TEMP_SCALE	OFF / ON / ?
-	VECTOR:CIE:SCALE:COLOR	VEC_CIE_COLOR_BG_COLOR / VEC_CIE_COLOR_BG_WHITE / VEC_CIE_COLOR_BG_BLACK / ?
-	VECTOR:CIE:SCALE:TRIANGLE1	OFF / BT_601_525 / BT_601_625 / BT_709 / DCI / BT_2020 / ?
-	VECTOR:CIE:SCALE:TRIANGLE2	OFF / BT_601_525 / BT_601_625 / BT_709 / DCI / BT_2020 / ?
-	VECTOR:CIE:SCALE:SUB:GRID	OFF / ON / ?
-	VECTOR:CIE:SCALE:SUB:D65	OFF / ON / ?
-	VECTOR:CIE:SCALE:SUB:CAP	OFF / ON / ?
-	VECTOR:CIE:SCALE:USER_TRIANGLE	OFF / 1 / 2 / ?
-	VECTOR:CIE:SCALE:USER_TRIANGLE:COLOR	G / B / R / ?
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:G:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:B:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:R:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:G:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:B:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE1:R:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:G:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:B:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:R:X	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:G:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:B:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:SCALE:USER_TRIANGLE2:R:Y	0 to 1000 / ? * Correspondence 0: 0.000 to 1000: 1.000
-	VECTOR:CIE:DIAGRAM:TYPE	DIAGRAM / TEMP / ?
-	VECTOR:CIE:DIAGRAM:FILTER	OFF / ON / ?
-	VECTOR:CIE:DIAGRAM:CLIP	OFF / ON / ?
-	VECTOR:CIE:DIAGRAM:CIE_STD	CIE1931 / CIE1976 / ?
-	VECTOR:CIE:DIAGRAM:MANUAL	OFF / ON / ?
-	VECTOR:CIE:DIAGRAM:MANUAL:GAMMA	2_2 / 2_6 / ?
-	VECTOR:CIE:DIAGRAM:MANUAL:COLORIMETRY	BT_601_525 / BT_601_625 / BT_709 / DCI / BT_2020 / ?
-	VECTOR:CIE:DIAGRAM:MANUAL:GAMMA:SETUP	150 to 300 / ? * Correspondence 150: 1.50 to 300: 3.00

● PICTURE KEY

r/w Limitation	Command	Parameter
WO	PICTURE	None
-	PIC:COLOR	COLOR / MONO / ?
-	PIC:CHROMA	NORMAL / UP / ?
-	PIC:BRIGHTNESS	-500 to 500 / ? * -500: -50.0% to 500: 50.0%
-	PIC:CONTRAST	0 to 2000 / ? * 0: 0.0% to 2000: 200.0%
-	PIC:GAIN:R	0 to 2000 / ? * 0: 0.0% to 2000: 200.0%
-	PIC:GAIN:G	0 to 2000 / ? * 0: 0.0% to 2000: 200.0%
-	PIC:GAIN:B	0 to 2000 / ? * 0: 0.0% to 2000: 200.0%
-	PIC:BIAS:R	-500 to 500 / ? * -500: -50.0% to 500: 50.0%
-	PIC:BIAS:G	-500 to 500 / ? * -500: -50.0% to 500: 50.0%
-	PIC:BIAS:B	-500 to 500 / ? * -500: -50.0% to 500: 50.0%
-	PIC:GAIN:CHROMA	0 to 2000 / ? * 0: 0.0% to 2000: 200.0%
-	PIC:MARKER:FRAME	OFF / ON / ?
-	PIC:MARKER:CENTER	OFF / ON / ?
-	PIC:MARKER:ASPECT	OFF / 17_9 / 16_9 / 14_9 / 13_9 / 4_3 / 2.39_1 / AFD / ?
-	PIC:MARKER:ASPECT:SHADOW	0 to 100 / ?
-	PIC:MARKER:SAFETY:ACTION	OFF / ARIB / SMPTE / USER1 / ?
-	PIC:MARKER:SAFETY:TITLE	OFF / ARIB / SMPTE / USER2 / ?
-	PIC:MARKER:SAFETY:USER1_W	0 to 100 / ?
-	PIC:MARKER:SAFETY:USER1_H	0 to 100 / ?
-	PIC:MARKER:SAFETY:USER2_W	0 to 100 / ?
-	PIC:MARKER:SAFETY:USER2_H	0 to 100 / ?
-	PIC:DISPLAY:SIZE	FIT / REAL / X2 / FULL_FRM / ?
-	PIC:DISPLAY:GAMUT	OFF / WHITE / RED / MESH
-	PIC:DISPLAY:3G-B-DS	STREAM1 / STREAM2 / MIX / ALIGN / ?
-	PIC:POS:H	-32768 to 32767 / ?
-	PIC:POS:V	-32768 to 32767 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	PIC:CINELITE:DISPLAY	OFF / f_Stop / P_DISPLAY / CINEZONE / ?
-	PIC:CINELITE:ADVANCE	OFF / ON / ?
-	PIC:CINELITE:MEAS_POS	P1 / P2 / P3 / ?
-	PIC:CINELITE:MEAS_NUMS	P1 / P1+P2 / P1+P2+P3 / ?
-	PIC:CINELITE:MEAS_SIZE	1X1 / 3X3 / 9X9 / ?
-	PIC:CINELITE:RGB:UNIT	Y_P / RGB_P / RGB_255 / REAL / CODE_VALUE/ CODE_VALUE_DEC / HDR / ?
WO	PIC:CINELITE:FSTOP:18P_REFSET	None
-	PIC:CINELITE:FSTOP:GAMMA_SEL	0.45 / USER1 / USER2 / USER3 / USER_A / USER_B / USER_C / USER_D / USER_E / ?
-	PIC:CINELITE:FSTOP:GAMMA:CAL:F	22_0 / 16_0 / 11_0 / 8_0 / 5_6 / 4_0 / 2_8 / 2_0 / ?
WO	PIC:CINELITE:FSTOP:GAMMA:CAL:SET	None
WO	PIC:CINELITE:FSTOP:GAMMA:CAL:1DATACLEAR	None
WO	PIC:CINELITE:FSTOP:GAMMA:CAL:TABLECLEAR	None
WO	PIC:CINELITE:FSTOP:GAMMA:FILE:TABLECLEAR	None
RO	PIC:CINELITE:DATA:P1	?
RO	PIC:CINELITE:DATA:P2	?
RO	PIC:CINELITE:DATA:P3	?
-	PIC:CINELITE:CINEZONE:FORM	GRADATE / STEP / SEARCH / ?
-	PIC:CINELITE:CINEZONE:UPPER	-63 to 1094 / ? * -63: -6.3 to 1094: 109.4
-	PIC:CINELITE:CINEZONE:LOWER	-73(-7.3) to 1084(108.4) / ? * -73: -7.3 to 1084: 108.4
-	PIC:CINELITE:CINEZONE:LEVEL	-73(-7.3) to 1094(109.4) / ? * -73: -7.3 to 1094: 109.4
-	PIC:LINE_SELECT	OFF / ON
-	PIC:LINE_NUMBER	-32768 to 32767 / ?
-	PIC:LINE_FIELD	FRAME / FIELD1 / FIELD2 / ?
-	PIC:STATUS_INFO	OFF / ON
-	PIC:SN:NOISE	STOP / START / ?
-	PIC:SN:CH	A1 / A2 / TRACK / OFF / ?
-	PIC:SN:SIGNAL	Y / G / B / R / ?
-	PIC:SN:LPF	0_404 / 0_323 / 0_269 / 0_202 / 0_101 / 0_0505 / THROUGH / ?
-	PIC:SN:SIZE	SMALL / LARGE / ?
-	PIC:SN:HPF	ON / OFF / ?
-	PIC:SN:ALART:UNIT	ON / OFF / ?
-	PIC:SN:ALART:LEVEL	-80 to 0 / ?

● LV5490SER04 FOCUS ASSIST

r/w Limitation	Command	Parameter
-	PIC:FOCUS:ASSIST	OFF / ON / ?
-	PIC:FOCUS:EDGE_COLOR	WHITE / GREEN / RED / BLUE / ?
-	PIC:FOCUS:PIC_LEVEL	OFF / LVL25 / LVL50 / LVL75 / LVL100 / EMBOSS / ?
-	PIC:FOCUS:SENSITIVE	LOW / MIDDLE / HIGH / V_HIGH / U_HIGH / ?

20. ETHERNET REMOTE CONTROL

● LV 5490SER07 HDR

r/w Limitation	Command	Parameter
-	PIC:HDR:UPPER:HLG	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:LOWER:HLG	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:REF:HLG	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:UPPER:PQ_10000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:LOWER:PQ_10000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:REF:PQ_10000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:UPPER:PQ_4000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:LOWER:PQ_4000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:REF:PQ_4000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:UPPER:PQ_1000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:LOWER:PQ_1000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:REF:PQ_1000	0 to 1000 / ? * 0: 0.0% to 1000: 100.0%
-	PIC:HDR:UPPER:SLOG	35 to 1094 / ? * 35: 3.5% to 1094: 109.4%
-	PIC:HDR:REF:SLOG	35 to 1094 / ? * 35: 3.5% to 1094: 109.4%
-	PIC:HDR:LOWER:SLOG	35 to 1094 / ? * 35: 3.5% to 1094: 109.4%
-	PIC:HDR:D_RANGE	NORMAL / HIGH / DISABLE / ?
-	PIC:HDR:MODE	OFF / ON / ?
-	PIC:HDR:BRIGHTNESS	OFF / ON / ?

● STATUS KEY

r/w Limitation	Command	Parameter
WO	STATUS	None
WO	STS:SDI_ANALYS:DUMP	None
WO	STS:SDI_ANALYS:EXT_REF	None
WO	STS:ANCVIEW	None
WO	STS:ANCVIEW:DUMP	None
WO	STS:LOG	None
WO	STS:ANCPKT	None
WO	STS:ANCPKT:PKT_ANALYS:EDH	None
WO	STS:ANCPKT:PKT_ANALYS:PAYLOAD	None
WO	STS:ANCPKT:PKT_ANALYS:CTRL_PKT	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:CC	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:TRIG	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER1	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER2	None
WO	STS:ANCPKT:PKT_ANALYS:V Anc:SMPTE:AFD	None
WO	STS:ANCPKT:PKT_ANALYS:SEARCH	None

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
WO	STS:ERROR:CLEAR	None
-	STS:LOG:LOG	STOP / START / ?
-	STS:LOG:MODE	OVER_WR / STOP / ?
-	STS:LOG:USB:AUTO_NAME	OFF / ON / ?
WO	STS:LOG:USB:FILE:STORE	None * Valid only when STS:LOG:USB:AUTO_NAME is set to ON
-	STS:SDI_ANALYS:DUMP:MODE	RUN / HOLD / ?
-	STS:SDI_ANALYS:DUMP:MODE_CAP	RUN / HOLD / FRMCAP / ?
-	STS:SDI_ANALYS:DUMP:DISPLAY	SERIAL / COMPONENT / BINARY / LINK_A / LINK_B / LINK_AB / STREAM1 / STREAM2 / PICTURE / S1_SERIAL / S1_COMPONENT / S1_BINARY / S2_SERIAL / S2_COMPONENT / S2_BINARY / ?
-	STS:SDI_ANALYS:DUMP:OPE:JUMP	EAV / SAV / END / START / ?
-	STS:SDI_ANALYS:DUMP:OPE:USB:AUTO_NAME	OFF / ON / ?
WO	STS:SDI_ANALYS:DUMP:OPE:USB:FILE:STORE	None * Valid only when STS:SDI_ANALYS:DUMP:OPE:USB:AUTO_NAME is set to ON
-	STS:SDI_ANALYS:DUMP:OPE:SAMPLE	0 to 32767 / ?
-	STS:SDI_ANALYS:DUMP:OPE:LINE	0 to 32767 / ?
-	STS:SDI_ANALYS:DUMP:LINK_SELECT	PICTURE / LINK_A / LINK_B / LINK_C / LINK_D / LINK_1 / LINK_2 / ? * Supports links LINK_A: channel A, and LINK_B: channel B : when using 4K 3G DUAL LINK, 3G DUAL LINK, or HD DUAL LINK and channel A-B is selected Supports links LINK_A: channel C and LINK_B: channel D link selection : when channel C-D is selected Supports LINK_1: channel 1 and LINK_2: channel 2 link selection : when SIMUL is selected
WO	STS:SDI_ANALYS:EXT_REF:USER_REF	None
WO	STS:SDI_ANALYS:EXT_REF:DEFAULT	None
-	STS:SDI_ANALYS:EXT_REF:SELECT	EXT / SDI / ?
-	STS:SDI_ANALYS:EXT_REF:TIMING	LEGACY / SERIAL / ?
-	STS:ANCVIEW:CORSOR	0 to 73 / ? * 0: S291M MARK DEL to 73: RP196 VITC
-	STS:ANCVIEW:DUMP:HOLD	HOLD / 1S / 3S / ?
-	STS:ANCVIEW:DUMP:MODE	HEX / BINARY / ?
-	STS:ANCVIEW:DUMP:SAMPLE	0 to 258 / ?
WO	STS:ANCVIEW:PAGE:UP	None
WO	STS:ANCVIEW:PAGE:DOWN	None
-	STS:ANCVIEW:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:EDH:DISP	TEXT / DUMP / ?
-	STS:ANCPKT:PKT_ANALYS:EDH:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:PAYLOAD_ID:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:CTRL_PKT:DISPLAY	TEXT / DUMP / ?
-	STS:ANCPKT:PKT_ANALYS:CTRL_PKT:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:CTRL_PKT:GROUP	0 / 1 / 2 / 3 / ? * 0: 1GROUP / 1: 2GROUP / 2: 3GROUP / 3: 4GROUP

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	STS:ANCPKT:PKT_ANALYS:CTRL_PKT:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:CC:DISP	TEXT / DUMP / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:CC:TYPE	HD / SD / ANALOG / CELLULAR / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:CC:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:CC:SMPL	0 to 258 / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:CC:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:DISP	TEXT / DUMP / Q_LOG / FORMAT / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:DUMP	0 to 258 / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:LOG	-50 to 50 / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:STREAM	STREAM1 / STREAM2 / ?
WO	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:CLEAR	None
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q1	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q2	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q3	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q4	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q5	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q6	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q7	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q8	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q9	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q10	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q11	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q12	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q13	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q14	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q15	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ:BIT:Q16	OFF / ON / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q17	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q18	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q19	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q20	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q21	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q22	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q23	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q24	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q25	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q26	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q27	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q28	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q29	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q30	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q31	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:Q32	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S1	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S2	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S3	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S4	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S5	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S6	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S7	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S8	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S9	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S10	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S11	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V_ANC:ARIB:NETQ: BIT:S12	OFF / ON / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:BIT:S13	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:BIT:S14	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:BIT:S15	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:BIT:S16	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:USB:AUTO_NAME	OFF / ON / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:NETQ:USB:FILE:STORE	None
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:TRIG:DISP	TEXT / DUMP / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:TRIG:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:TRIG:SMPL	0 to 258 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:TRIG:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER1:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER1:DUMP	0 to 258 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER1:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER2:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER2:DUMP	0 to 258 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:ARIB:USER2:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:SMPTE:AFD:DISP	TEXT / DUMP / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:SMPTE:AFD:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:V Anc:SMPTE:AFD:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:CSTM:ID_SET:DID	0 to 255 / ?
-	STS:ANCPKT:PKT_ANALYS:CSTM:ID_SET:SDID	-1 to 255 / ?
WO	STS:ANCPKT:PKT_ANALYS:CSTM:ID_SET:SET	None
-	STS:ANCPKT:PKT_ANALYS:CSTM:MODE	HEX / BINARY / ?
-	STS:ANCPKT:PKT_ANALYS:CSTM:YC	Y / C / ?
-	STS:ANCPKT:PKT_ANALYS:CSTM:STREAM	STREAM1 / STREAM2 / ?
-	STS:ANCPKT:PKT_ANALYS:CSTM:SMPL	0 to 258 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	STS:ANCPKT:LINK_SELECT	PICTURE / LINK_A / LINK_B / LINK_C / LINK_D / LINK_1 / LINK_2 / ? * Supports links LINK_A: channel A, and LINK_B: channel B : when using 4K 3G DUAL LINK, 3G DUAL LINK, or HD DUAL LINK and channel A-B is selected Supports links LINK_A: channel C and LINK_B: channel D link selection : when channel C-D is selected Supports LINK_1: channel 1 and LINK_2: channel 2 link selection : when SIMUL is selected

● ERROR SETUP1 TAB MENU (STATUS → STATUS SETUP) (*5)

r/w Limitation	Command	Parameter
-	STS:ERROR:SDI:COUNTER	SEC / FIELD / ?
-	STS:ERROR:SDI:TRS	OFF / ON / ?
-	STS:ERROR:SDI:HD_LINE	OFF / ON / ?
-	STS:ERROR:SDI:HD_CRC	OFF / ON / ?
-	STS:ERROR:SDI:SD_EDH	OFF / ON / ?
-	STS:ERROR:SDI:ILLEGAL_CODE	OFF / ON / ?
-	STS:ERROR:SDI:FREQ	OFF / ON / ?
-	STS:ERROR:SDI:CABLE	OFF / ON / ?
-	STS:ERROR:SDI:CABLE_3G	LS_5CFB / 1694A / ?
-	STS:ERROR:SDI:CABLE_HD	LS_5CFB / 1694A / ?
-	STS:ERROR:SDI:CABLE_SD	L_5C2V / SD_8281 / ?
-	STS:ERROR:SDI:CABLE_ERR_3G	10 to 105 / ?
-	STS:ERROR:SDI:CABLE_WAR_3G	10 to 105 / ?
-	STS:ERROR:SDI:CABLE_ERR_HD	5 to 130 / ?
-	STS:ERROR:SDI:CABLE_WAR_HD	5 to 130 / ?
-	STS:ERROR:SDI:CABLE_ERR_SD	50 to 300 / ?
-	STS:ERROR:SDI:CABLE_WAR_SD	50 to 300 / ?
WO	STS:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*5 Execute STS:SETUP:COMPLETE after changing the setting.

● ERROR SETUP2 TAB MENU (STATUS → STATUS SETUP) (*5)

r/w Limitation	Command	Parameter
-	STS:ERROR:ANC:PARITY	OFF / ON / ?
-	STS:ERROR:ANC:CHECKSUM	OFF / ON / ?
-	STS:ERROR:AUDIO:BCH	OFF / ON / ?
-	STS:ERROR:AUDIO:DBN	OFF / ON / ?
-	STS:ERROR:AUDIO:PARITY	OFF / ON / ?
-	STS:ERROR:AUDIO:INHIBIT	OFF / ON / ?
-	STS:ERROR:AUDIO:SAMPLE	OFF / ON / ?
WO	STS:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*5 Execute STS:SETUP:COMPLETE after changing the setting.

20. ETHERNET REMOTE CONTROL

● ERROR SETUP3 TAB MENU (STATUS → STATUS SETUP) (*5)

r/w Limitation	Command	Parameter
-	STS:ERROR:GAMUT:LPF	OFF / HD1M_SD1M / HD28M_SD1M / ?
-	STS:ERROR:GAMUT	OFF / ON / ?
-	STS:ERROR:GAMUT:UPPER	908 to 1094 / ?
-	STS:ERROR:GAMUT:LOWER	-72 to 61 / ?
-	STS:ERROR:GAMUT:AREA	0 to 50 / ?
-	STS:ERROR:GAMUT:DURATION	1 to 60 / ?
-	STS:ERROR:C_GAMUT	OFF / ON / ?
-	STS:ERROR:C_GAMUT:SETUP	0% / 7.5 % / ?
-	STS:ERROR:C_GAMUT:UPPER	900 to 1350 / ?
-	STS:ERROR:C_GAMUT:LOWER	-400 to 200 / ?
-	STS:ERROR:C_GAMUT:AREA	0 to 50 / ?
-	STS:ERROR:C_GAMUT:DURATION	1 to 60 / ?
WO	STS:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*5 Execute STS:SETUP:COMPLETE after changing the setting.

● ERROR SETUP4 TAB MENU (STATUS → STATUS SETUP) (*5)

r/w Limitation	Command	Parameter
-	STS:ERROR:FREEZE	OFF / ON / ?
-	STS:ERROR:FREEZE:UPPER	0 to 100 / ?
-	STS:ERROR:FREEZE:LOWER	0 to 100 / ?
-	STS:ERROR:FREEZE:LEFT	0 to 100 / ?
-	STS:ERROR:FREEZE:RIGHT	0 to 100 / ?
-	STS:ERROR:FREEZE:DURATION	2 to 300 / ?
-	STS:ERROR:BLACK	OFF / ON / ?
-	STS:ERROR:BLACK:LEVEL	0 to 100 / ?
-	STS:ERROR:BLACK:AREA	1 to 100 / ?
-	STS:ERROR:BLACK:DURATION	1 to 300 / ?
-	STS:ERROR:LEVEL	OFF / ON / ?
-	STS:ERROR:LEVEL:LUMA:UPPER	-51 to 766 / ?
-	STS:ERROR:LEVEL:LUMA:LOWER	-51 to 766 / ?
-	STS:ERROR:LEVEL:CHROMA:UPPER	-400 to 399 / ?
-	STS:ERROR:LEVEL:CHROMA:LOWER	-400 to 399 / ?
WO	STS:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*5 Execute STS:SETUP:COMPLETE after changing the setting.

● STATUS Query measured or detected values

r/w Limitation	Command	Parameter
RO	STS:DATA:SIGNAL_A	? (Return value: DETECT(installed) / NO_SIGNAL(not installed)) * Signal available or not available only

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
RO	STS:DATA:SIGNAL_B	? (Return value: DETECT(installed) / NO_SIGNAL(not installed)) * Signal available or not available only
RO	STS:DATA:SIGNAL_C	? (Return value: DETECT(installed) / NO_SIGNAL(not installed)) * Signal available or not available only
RO	STS:DATA:SIGNAL_D	? (Return value: DETECT(installed) / NO_SIGNAL(not installed)) * Signal available or not available only
RO	STS:DATA:LINK_A	? * The returned values are the SDI signal type and the number of links. SD / HD / 3G-B-DL / 3G-A / 3G-B-DS / HD DUAL / HD QUAD / 3G-B-DS-DUAL / 3G-B-DL QUAD / 3G-A QUAD / 12G-TYPE1
RO	STS:DATA:LINK_B	? * The returned values are the SDI signal type and the number of links. SD / HD / 3G-B-DL / 3G-A / 3G-B-DS / HD DUAL / HD QUAD / 3G-B-DS-DUAL / 3G-B-DL QUAD / 3G-A QUAD / 12G-TYPE1
RO	STS:DATA:LINK_C	? * The returned values are the SDI signal type and the number of links. SD / HD / 3G-B-DL / 3G-A / 3G-B-DS / HD DUAL / HD QUAD / 3G-B-DS-DUAL / 3G-B-DL QUAD / 3G-A QUAD / 12G-TYPE1
RO	STS:DATA:LINK_D	? * The returned values are the SDI signal type and the number of links. SD / HD / 3G-B-DL / 3G-A / 3G-B-DS / HD DUAL / HD QUAD / 3G-B-DS-DUAL / 3G-B-DL QUAD / 3G-A QUAD / 12G-TYPE1
RO	STS:DATA:FORMAT_A	? (Return value: Resolution and frame rate) * Example: 3840×2160 /59.94P
RO	STS:DATA:FORMAT_B	? (Return value: Resolution and frame rate) * Example: 3840×2160 /59.94P
RO	STS:DATA:FORMAT_C	? (Return value: Resolution and frame rate) * Example: 3840×2160 /59.94P
RO	STS:DATA:FORMAT_D	? (Return value: Resolution and frame rate) * Example: 3840×2160 /59.94P
RO	STS:DATA:AUDIO_A	? (Return value: 1 / 2 / .. / 16(embedded audio channel display) * 1: 1ch to 16: 16ch, - : Channels without
RO	STS:DATA:AUDIO_B	? (Return value: 1 / 2 / .. / 16(embedded audio channel display) * 1: 1ch to 16: 16ch, - : Channels without
RO	STS:DATA:AUDIO_C	? (Return value: 1 / 2 / .. / 16(embedded audio channel display) * 1: 1ch to 16: 16ch, - : Channels without
RO	STS:DATA:AUDIO_D	? (Return value: 1 / 2 / .. / 16(embedded audio channel display) * 1: 1ch to 16: 16ch, - : Channels without
RO	STS:DATA:EXTREF_A	? (Return value: USER_REF / DEFAULT)
RO	STS:DATA:EXTREF_STAT_A	? (Return value: INT / 1A / 2A / 1C / 2C / LINKA / LINK1 / EXTHD / EXTBB / NOSIGNAL)

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
RO	STS:DATA:EXTREF_HTIME_A	? (Return value: time (us)) * Horizontal axis phase difference of channel A
RO	STS:DATA:EXTREF_HPIX_A	? (Return value: Number of samples) * Horizontal axis phase difference of channel A
RO	STS:DATA:EXTREF_VLINE_A	? (Return value: Number of lines) * Vertical axis phase difference of channel A
RO	STS:DATA:EXTREF_TOTAL_A	? (Return value: time (us)) * Total phase difference of horizontal and vertical axes of channel A
RO	STS:DATA:EXTREF_B	? (Return value: USER_REF / DEFAULT)
RO	STS:DATA:EXTREF_STAT_B	? (Return value: INT / 1A / 2A / 1C / 2C / LINKA / LINK1 / EXTHD / EXTBB / NOSIGNAL)
RO	STS:DATA:EXTREF_HTIME_B	? (Return value: time(us)) * Horizontal axis phase difference of channel B
RO	STS:DATA:EXTREF_HPIX_B	? (Return value: Number of samples) * Horizontal axis phase difference of channel B
RO	STS:DATA:EXTREF_VLINE_B	? (Return value: Number of lines) * Vertical axis phase difference of channel B
RO	STS:DATA:EXTREF_TOTAL_B	? (Return value: time (us)) * Total phase difference of horizontal and vertical axes of channel B
RO	STS:DATA:EXTREF_C	? (Return value: USER_REF / DEFAULT)
RO	STS:DATA:EXTREF_STAT_C	? (Return value: INT / 1A / 2A / 1C / 2C / LINKA / LINK1 / EXTHD / EXTBB / NOSIGNAL)
RO	STS:DATA:EXTREF_HTIME_C	? (Return value: time(us)) * Horizontal axis phase difference of channel C
RO	STS:DATA:EXTREF_HPIX_C	? (Return value: Number of samples) * Horizontal axis phase difference of channel C
RO	STS:DATA:EXTREF_VLINE_C	? (Return value: Number of lines) * Vertical axis phase difference of channel C
RO	STS:DATA:EXTREF_TOTAL_C	? (Return value: time (us)) * Total phase difference of horizontal and vertical axes of channel C
RO	STS:DATA:EXTREF_D	? (Return value: USER_REF / DEFAULT)
RO	STS:DATA:EXTREF_STAT_D	? (Return value: INT / 1A / 2A / 1C / 2C / LINKA / LINK1 / EXTHD / EXTBB / NOSIGNAL)
RO	STS:DATA:EXTREF_HTIME_D	? (Return value: time(us)) * Horizontal axis phase difference of channel D
RO	STS:DATA:EXTREF_HPIX_D	? (Return value: Number of samples) * Horizontal axis phase difference of channel D
RO	STS:DATA:EXTREF_VLINE_D	? (Return value: Number of lines) * Vertical axis phase difference of channel D
RO	STS:DATA:EXTREF_TOTAL_D	? (Return value: time (us)) * Total phase difference of horizontal and vertical axes of channel C
RO	STS:DATA:ANC:AUDIO_CTRL1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:AUDIO_CTRL2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:EDH	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:LTC1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:LTC2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:VLTC1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:VLTC2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:PAYLOAD1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:PAYLOAD2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:AFD1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:AFD2	? (Return value: DETECT / MISSING)

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
RO	STS:DATA:ANC:JPN_CC1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:JPN_CC2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:JPN_CC3	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:NETQ1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:NETQ2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:TRIGGER	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:USER1	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:USER2	? (Return value: DETECT / MISSING)
RO	STS:DATA:ANC:PKT:PAYLOAD	? (Return value: Payload ID (4 byte display)) * Example: 8A 4A 20 01
RO	STS:DATA:ANC:PKT:ARIB:NETQ:STATION	? (Return value: Station code)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:VCURR	? (Return value: Current video format)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:VNEXT	? (Return value: Next video format)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:ACURR	? (Return value: Current audio mode)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:ANEXT	? (Return value: Next audio mode)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:DCURR	? (Return value: Current audio downmix mode)
RO	STS:DATA:ANC:PKT:ARIB:NETQ:DNEXT	? (Return value: Next audio downmix mode)
RO	STS:DATA:ANC:PKT:SMPTE:AFD:CODE	? (Return value: AFD code)
RO	STS:DATA:ANC:PKT:SMPTE:AFD:FRAME	? (Return value: Aspect ratio)
RO	STS:DATA:ANC:PKT:SMPTE:AFD:BAR:FLG	? (Return value: AFD bar data flag)
RO	STS:DATA:ANC:PKT:SMPTE:AFD:BAR:VAL1	? (Return value: AFD bar data 1)
RO	STS:DATA:ANC:PKT:SMPTE:AFD:BAR:VAL2	? (Return value: AFD bar data 2)

● EYE KEY

r/w Limitation	Command	Parameter
WO	EYE	None
-	EYE:EYE:INTEN	-128 to 127 / ?
-	EYE:EYE:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	EYE:EYE:SCALE:INTEN	-8 to 7 / ?
-	EYE:EYE:SCALE:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	EYE:MODE	EYE / JITTER / ?
-	EYE:EYE:SETUP:GAIN:VAR	CAL / VAR / ?
-	EYE:EYE:SETUP:GAIN:VAL	50 to 200 / ? * 50: x0.50 to 200: x2.00
-	EYE:EYE:SETUP:SWEEP	2UI / 4UI / 16UI / ?
-	EYE:EYE:SETUP:FILTER	100KHZ / 1KHZ / 100HZ / 10HZ / TIMING / ALIGNMENT / ?
-	EYE:EYE:SETUP:CURSOR	OFF / ON
-	EYE:EYE:SETUP:CURSOR:XY_SEL	X / Y / TR_TF / ?
-	EYE:EYE:SETUP:CURSOR:FD	REF / DELTA / TRACK / ?
WO	EYE:EYE:SETUP:CURSOR:REFSET	None
WO	EYE:EYE:SETUP:CURSOR:RESET	None
WO	EYE:JIT:SETUP:CURSOR:RESET	None
-	EYE:EYE:SETUP:CURSOR:X:UNIT	SEC / HZ / UI_PP / ?
-	EYE:EYE:SETUP:CURSOR:X:REF	0 to 1710 / ?
WO	EYE:EYE:SETUP:CURSOR:X:TRACK	-1710 to 1710
-	EYE:EYE:SETUP:CURSOR:X:DELTA	0 to 1710 / ?
-	EYE:EYE:SETUP:CURSOR:Y:UNIT	V / P / ?
-	EYE:EYE:SETUP:CURSOR:Y:REF	0 to 900 / ?
WO	EYE:EYE:SETUP:CURSOR:Y:TRACK	-900 to 900
-	EYE:EYE:SETUP:CURSOR:Y:DELTA	0 to 900 / ?
-	EYE:JIT:INTEN	-128 to 127 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	EYE:JIT:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	EYE:JIT:SCALE:INTEN	-8 to 7 / ?
-	EYE:JIT:SCALE:COLOR	WHITE / YELLOW / CYAN / GREEN / MAGENTA / RED / BLUE / ?
-	EYE:JIT:SETUP:GAIN_SWEEP:MAG	X1 / X2 / X8 / ?
-	EYE:JIT:SETUP:GAIN_SWEEP:12G:MAG	X1 / X2 / X4 / X16 / ?
-	EYE:JIT:SETUP:GAIN_SWEEP:SWEEP	1H / 2H / 1V / 2V / ?
-	EYE:JIT:SETUP:FILTER	100KHZ / 1KHZ / 100HZ / 10HZ / TIMING / ALIGNMENT / ?
-	EYE:JIT:SETUP:PEAK_HOLD	OFF / ON
WO	EYE:JIT:SETUP:PEAK_CLEAR	None
-	EYE:JIT:SETUP:CURSOR	OFF / ON
-	EYE:JIT:SETUP:CURSOR:XY_SEL	X / Y / ?
-	EYE:JIT:SETUP:CURSOR:FD	REF / DELTA / TRACK / ?
-	EYE:JIT:SETUP:CURSOR:X:UNIT	SEC / HZ / ?
-	EYE:JIT:SETUP:CURSOR:X:REF	0 to 1710 / ?
WO	EYE:JIT:SETUP:CURSOR:X:TRACK	-1710 to 1710
-	EYE:JIT:SETUP:CURSOR:X:DELTA	0 to 1710 / ?
-	EYE:JIT:SETUP:CURSOR:Y:UNIT	SEC / UI_PP / ?
-	EYE:JIT:SETUP:CURSOR:Y:REF	0 to 624 / ?
WO	EYE:JIT:SETUP:CURSOR:Y:TRACK	-624 to 624
-	EYE:JIT:SETUP:CURSOR:Y:DELTA	0 to 624 / ?
-	EYE:LINK_SEL:HD_DLINK:AB	A / B / ? * Displayed link selection for HD DUAL LINK
-	EYE:LINK_SEL:HD_DLINK:CD	C / D / ? * Displayed link selection for HD DUAL LINK
-	EYE:LINK_SEL:4K3G_DLINK:AB	A / B / ? * Displayed link selection for 4K 3G DUAL LINK / 3G DHUAL LINK
-	EYE:LINK_SEL:4K3G_DLINK:CD	C / D / ? * Displayed link selection for 4K 3G DUAL LINK / 3G DHUAL LINK
-	EYE:LINK_SEL:QLINK	A / B / C / D / ? * Displayed link selection for 4K 3G QUAD LINK / 4K HD QUAD LINK

● 12G-SDI ERROR SETUP TAB MENU (EYE → ERROR SETUP) (*6)

r/w Limitation	Command	Parameter
-	EYE:ERROR:12G:AMP	OFF / ON / ?
-	EYE:ERROR:12G:AMP:UPPER	80 to 140 / ?
-	EYE:ERROR:12G:AMP:LOWER	40 to 100 / ?
-	EYE:ERROR:12G:RISE	OFF / ON / ?
-	EYE:ERROR:12G:RISE:MAX	40 to 140 / ?
-	EYE:ERROR:12G:FALL	OFF / ON / ?
-	EYE:ERROR:12G:FALL:MAX	40 to 140 / ?
-	EYE:ERROR:12G:DELTA	OFF / ON / ?
-	EYE:ERROR:12G:DELTA:MAX	40 to 140 / ?
-	EYE:ERROR:12G:TIMING_JIT	OFF / ON / ?
-	EYE:ERROR:12G:TIMING_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:12G:CURRENT_JIT	OFF / ON / ?
-	EYE:ERROR:12G:CURRENT_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:12G:OVERSHOOT_RISE	OFF / ON / ?
-	EYE:ERROR:12G:OVERSHOOT_RISE:MAX	0 to 200 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	EYE:ERROR:12G:OVERSHOOT_FALL	OFF / ON / ?
-	EYE:ERROR:12G:OVERSHOOT_FALL:MAX	0 to 200 / ?
WO	EYE:ERROR:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*6 Execute EYE:ERROR:SETUP:COMPLETE after changing the setting.

● 3G-SDI ERROR SETUP TAB MENU (EYE → ERROR SETUP) (*6)

r/w Limitation	Command	Parameter
-	EYE:ERROR:3G:AMP	OFF / ON / ?
-	EYE:ERROR:3G:AMP:UPPER	80 to 140 / ?
-	EYE:ERROR:3G:AMP:LOWER	40 to 100 / ?
-	EYE:ERROR:3G:RISE	OFF / ON / ?
-	EYE:ERROR:3G:RISE:MAX	40 to 140 / ?
-	EYE:ERROR:3G:FALL	OFF / ON / ?
-	EYE:ERROR:3G:FALL:MAX	40 to 140 / ?
-	EYE:ERROR:3G:DELTA	OFF / ON / ?
-	EYE:ERROR:3G:DELTA:MAX	40 to 140 / ?
-	EYE:ERROR:3G:TIMING_JIT	OFF / ON / ?
-	EYE:ERROR:3G:TIMING_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:3G:CURRENT_JIT	OFF / ON / ?
-	EYE:ERROR:3G:CURRENT_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:3G:OVERSHOOT_RISE	OFF / ON / ?
-	EYE:ERROR:3G:OVERSHOOT_RISE:MAX	0 to 200 / ?
-	EYE:ERROR:3G:OVERSHOOT_FALL	OFF / ON / ?
-	EYE:ERROR:3G:OVERSHOOT_FALL:MAX	0 to 200 / ?
WO	EYE:ERROR:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*6 Execute EYE:ERROR:SETUP:COMPLETE after changing the setting.

● HD-SDI ERROR SETUP TAB MENU (EYE → ERROR SETUP) (*6)

r/w Limitation	Command	Parameter
-	EYE:ERROR:HD:AMP	OFF / ON / ?
-	EYE:ERROR:HD:AMP:UPPER	80 to 140 / ?
-	EYE:ERROR:HD:AMP:LOWER	40 to 100 / ?
-	EYE:ERROR:HD:RISE	OFF / ON / ?
-	EYE:ERROR:HD:RISE:MAX	40 to 140 / ?
-	EYE:ERROR:HD:FALL	OFF / ON / ?
-	EYE:ERROR:HD:FALL:MAX	40 to 140 / ?
-	EYE:ERROR:HD:DELTA	OFF / ON / ?
-	EYE:ERROR:HD:DELTA:MAX	40 to 140 / ?
-	EYE:ERROR:HD:TIMING_JIT	OFF / ON / ?
-	EYE:ERROR:HD:TIMING_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:HD:CURRENT_JIT	OFF / ON / ?
-	EYE:ERROR:HD:CURRENT_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:HD:OVERSHOOT_RISE	OFF / ON / ?
-	EYE:ERROR:HD:OVERSHOOT_RISE:MAX	0 to 200 / ?
-	EYE:ERROR:HD:OVERSHOOT_FALL	OFF / ON / ?
-	EYE:ERROR:HD:OVERSHOOT_FALL:MAX	0 to 200 / ?
WO	EYE:ERROR:SETUP:COMPLETE	None (must be executed after changing the tab menu)

20. ETHERNET REMOTE CONTROL

*6 Execute EYE:ERROR:SETUP:COMPLETE after changing the setting.

● SD-SDI ERROR SETUP TAB MENU (EYE → ERROR SETUP) (*6)

r/w Limitation	Command	Parameter
-	EYE:ERROR:SD:AMP	OFF / ON / ?
-	EYE:ERROR:SD:AMP:UPPER	80 to 140 / ?
-	EYE:ERROR:SD:AMP:LOWER	40 to 100 / ?
-	EYE:ERROR:SD:RISE	OFF / ON / ?
-	EYE:ERROR:SD:RISE:MAX	40 to 140 / ?
-	EYE:ERROR:SD:FALL	OFF / ON / ?
-	EYE:ERROR:SD:FALL:MAX	40 to 140 / ?
-	EYE:ERROR:SD:DELTA	OFF / ON / ?
-	EYE:ERROR:SD:DELTA:MAX	40 to 140 / ?
-	EYE:ERROR:SD:TIMING_JIT	OFF / ON / ?
-	EYE:ERROR:SD:TIMING_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:SD:CURRENT_JIT	OFF / ON / ?
-	EYE:ERROR:SD:CURRENT_JIT:MAX	10 to 200 / ?
-	EYE:ERROR:SD:OVERSHOOT_RISE	OFF / ON / ?
-	EYE:ERROR:SD:OVERSHOOT_RISE:MAX	0 to 200 / ?
-	EYE:ERROR:SD:OVERSHOOT_FALL	OFF / ON / ?
-	EYE:ERROR:SD:OVERSHOOT_FALL:MAX	0 to 200 / ?
-	EYE:EYE:OFFSET:X	-32768 to 32767 / ?
-	EYE:EYE:OFFSET:Y	-32768 to 32767 / ?
-	EYE:JIT:OFFSET:X	-32768 to 32767 / ?
-	EYE:JIT:OFFSET:Y	-32768 to 32767 / ?
-	EYE:TRIGGER	RUN / STOP / ?
WO	EYE:ERROR:SETUP:COMPLETE	None (must be executed after changing the tab menu)

*6 Execute EYE:ERROR:SETUP:COMPLETE after changing the setting.

● EYE Query measured or detected values

r/w Limitation	Command	Parameter
RO	EYE:DATA:AMP	?
RO	EYE:DATA:TR	?
RO	EYE:DATA:TF	?
RO	EYE:DATA:TJ	?
RO	EYE:DATA:CJ	?
RO	EYE:DATA:OR	?
RO	EYE:DATA:OF	?

● AUDIO KEY

r/w Limitation	Command	Parameter
WO	AUDIO	None
-	AUDIO:DISPLAY_MODE	LISSAJOU / SURROUND / METER / STATUS / ?
-	AUDIO:METER:RANGE	60DBFS / 90DBFS / MAG / ?
-	AUDIO:METER:RESPONSE	TRUEPEAK / PPM / VU / ?
-	AUDIO:METER:RESPONSE:PPM	PPM_I / PPM_II / ?
-	AUDIO:METER:RESPONSE:VU	TRUE / PPM_I / PPM_II / ?
-	AUDIO:METER:PEAK_HOLD	0 / 5 / 10 / 15 / 20 / 25 / 30 / 35 / 40 / 45 / 50 / 55 / ? * 0: 0.0, 5: 0.5, to 50: 5.0, 55: HOLD
-	AUDIO:METER:LEVEL_SET:OVER_LEVEL_DB	-400 to 0 / ? * -400: -40.0 to 0: 0.0

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	AUDIO:METER:LEVEL_SET:WARNING_LEVEL_DB	-400 to 0 / ? * -400: -40.0 to 0: 0.0
-	AUDIO:METER:LEVEL_SET:REF_LEVEL_DB	-400 to 0 / ? * -400: -40.0 to 0: 0.0
-	AUDIO:LISSAJOU:LISSAJOU:INTEN	-8 to 7 / ?
-	AUDIO:LISSAJOU:SCALE:INTEN	-8 to 7 / ?
-	AUDIO:LISSAJOU:DISPLAY	MULTI / SINGLE / ?
-	AUDIO:LISSAJOU:FORM	X_Y / MATRIX / ?
-	AUDIO:LISSAJOU:AUTO_GAIN	OFF / ON / ?
-	AUDIO:SURROUND:SURROUND:INTEN	-8 to 7 / ?
-	AUDIO:SURROUND:SCALE:INTEN	-8 to 7 / ?
-	AUDIO:SURROUND:5.1	NORMAL / PHANTOM / ?
-	AUDIO:SURROUND:AUTO_GAIN	OFF / ON / ?
-	AUDIO:DOLBY:META:PROGRAM	PRM1 / PRM2 / PRM3 / PRM4 / PRM5 / PRM6 / PRM7 / PRM8 / ?
-	AUDIO:STATUS:CH_STATUS	1 to 16 / ?
-	AUDIO:STATUS:CH_STATUS_SIMUL	A1 to A16 / B1 to B16 / C1 to C16 / D1 to D16 / ?
-	AUDIO:STATUS:CH_STATUS_DOLBY	1 to 16 / ?
-	AUDIO:STATUS:CH_STATUS_EXT	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:STATUS:CH_STATUS:ALIGN	LSB 1st / MSB 1st / ?
-	AUDIO:STATUS:USER_BIT	1 to 16 / ?
-	AUDIO:STATUS:USER_BIT_SIMUL	A1 to A16 / B1 to B16 / C1 to C16 / D1 to D16 / ?
-	AUDIO:STATUS:USER_BIT_DOLBY	1 to 16 / ?
-	AUDIO:STATUS:USER_BIT_EXT	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:STATUS:USER_BIT:ALIGN	LSB / MSB / ?
WO	AUDIO:STATUS:ERROR_RESET	None
-	AUDIO:PHONES:VOLUME	0 to 63 / ?
RO	AUDIO:DOLBY:DETECT	? (Return value: E / D / DP)

● AUDIO MAPPING (AUDIO → MAPPING) (*7)

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:INPUT	SDI / EXT DIGI / ?
-	AUDIO:MAPPING:LINK_SELECT	1 / 2 / 3 / 4 / ? * Supports links 1: channel A, 2: channel B, 3: channel C, and 4: channel D : when using 4K 3G QUAD LINK or 4K HD QUAD LINK Supports links 1: channel A and 2: channel B : when using 4K 3G DUAL LINK, 3G DUAL LINK, or HD DUAL LINK and channels A and B are selected Supports links 1: channel C and 2: channel D : when channels C and D are selected
-	AUDIO:MAPPING:STREAM:SELECT	STREAM1 / STREAM2 / ?
-	AUDIO:MAPPING:CH_MODE	8ch / 16ch / ?
-	AUDIO:MAPPING:SOURCE:SDI:1ST_GRP	G1 / G2 / G3 / G4 / ?
-	AUDIO:MAPPING:SOURCE:SDI:2ND_GRP	G1 / G2 / G3 / G4 / ?
-	AUDIO:MAPPING:SOURCE:SDI:3RD_GRP	G1 / G2 / G3 / G4 / ?
-	AUDIO:MAPPING:SOURCE:SDI:4TH_GRP	G1 / G2 / G3 / G4 / ?
-	AUDIO:MAPPING:PHONES:L	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / LT / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:PHONES:R	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / RT / ?
-	AUDIO:MAPPING:DOLBY	OFF / ON / ?
-	AUDIO:MAPPING:DOLBY:E:LINE:POS	OFF / ON / ?
-	AUDIO:MAPPING:DOLBY:E:LINE:SELECT	VALID / IDEAL / CUSTOM / ?
-	AUDIO:MAPPING:DOLBY:E:EARLIEST	8 to 104 / ?
-	AUDIO:MAPPING:DOLBY:E:LATEST	9 to 105 / ?
-	AUDIO:MAPPING:LISSAJOU:SINGLE_L	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / LT / ?
-	AUDIO:MAPPING:LISSAJOU:SINGLE_R	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / RT / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L1	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R1	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L2	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R2	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L3	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R3	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L4	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R4	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L5	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R5	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L6	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R6	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_L7	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R7	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:LISSAJOU:MULTI_L8	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:MULTI_R8	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:L	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:R	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:C	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:LFE	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:LS	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:RS	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:LL	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:SURROUND:CH:RR	CH1 / CH2 / CH3 / CH4 / CH5 / CH6 / CH7 / CH8 / CH9 / CH10 / CH11 / CH12 / CH13 / CH14 / CH15 / CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:SINGLE_L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / LT / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:SINGLE_R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / RT / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_L1	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_R1	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_L2	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_R2	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_L3	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_R3	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_L4	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:LISSAJOU:DOLBY:MULTI_R4	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:C	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:LFE	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:LS	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:RS	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:LL	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:SURROUND:CH:DOLBY:RR	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:PHONES:DOLBY:L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / DAUX / ?
-	AUDIO:MAPPING:PHONES:DOLBY:R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / DAUX / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:SOURCE:SIM:SDI:1ST_GRP	G1 / G2 / G3 / G4 / ? * 0: GROUP1 / 1: GROUP2 / 2: GROUP3 / 3: GROUP4
-	AUDIO:MAPPING:SOURCE:SIM:SDI:2ND_GRP	G1 / G2 / G3 / G4 / ? * 0: GROUP1 / 1: GROUP2 / 2: GROUP3 / 3: GROUP4
-	AUDIO:MAPPING:SOURCE:SIM:SDI:3RD_GRP	G1 / G2 / G3 / G4 / ? * 0: GROUP1 / 1: GROUP2 / 2: GROUP3 / 3: GROUP4
-	AUDIO:MAPPING:SOURCE:SIM:SDI:4TH_GRP	G1 / G2 / G3 / G4 / ? * 0: GROUP1 / 1: GROUP2 / 2: GROUP3 / 3: GROUP4
-	AUDIO:MAPPING:SOURCE:SIM:SDI:1ST_GRP_CH	SDI_A / SDI_B / SDI_C / SDI_D / ?
-	AUDIO:MAPPING:SOURCE:SIM:SDI:2ND_GRP_CH	SDI_A / SDI_B / SDI_C / SDI_D / ?
-	AUDIO:MAPPING:SOURCE:SIM:SDI:3RD_GRP_CH	SDI_A / SDI_B / SDI_C / SDI_D / ?
-	AUDIO:MAPPING:SOURCE:SIM:SDI:4TH_GRP_CH	SDI_A / SDI_B / SDI_C / SDI_D / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L1	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R1	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L2	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R2	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L3	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R3	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L4	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R4	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L5	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R5	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L6	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R6	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L7	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R7	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_L8	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:LISSAJOU:SIM:MULTI_R8	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:SIM:PHONES:L	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:SIM:PHONES:R	A:CH1 to A:CH16 / B:CH1 to B:CH16 / C:CH1 to C:CH16 / D:CH1 to D:CH16 / ?
-	AUDIO:MAPPING:SOURCE:EXT:GRP	A / B / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:SINGLE_L	A:CH1 to A:CH8 / B:CH1 to B:CH8 / LT / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:SINGLE_R	A:CH1 to A:CH8 / B:CH1 to B:CH8 / RT / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L1	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?

20. ETHERNET REMOTE CONTROL

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R1	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L2	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R2	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L3	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R3	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L4	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R4	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L5	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R5	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L6	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R6	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L7	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R7	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_L8	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:MULTI_R8	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:L	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:R	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:C	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:LFE	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:LS	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:RS	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:LL	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:RR	A:CH1 to A:CH8 / B:CH1 to B:CH8 / ?
-	AUDIO:MAPPING:EXT:PHONES:L	A:CH1 to A:CH8 / B:CH1 to B:CH8 / LT / ?
-	AUDIO:MAPPING:EXT:PHONES:R	A:CH1 to A:CH8 / B:CH1 to B:CH8 / RT / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:SINGLE_L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / LT / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:SINGLE_R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / RT / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_L1	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_R1	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_L2	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_R2	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_L3	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_R3	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_L4	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:LISSAJOU:DOLBY:MULTI_R4	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:C	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:LFE	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:LS	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:RS	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:LL	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:SURROUND:CH:DOLBY:RR	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / ?
-	AUDIO:MAPPING:EXT:PHONES:DOLBY:L	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / DAUX / ?
-	AUDIO:MAPPING:EXT:PHONES:DOLBY:R	D1 / D2 / D3 / D4 / D5 / D6 / D7 / D8 / DAUX / ?
WO	AUDIO:MAPPING:MAPPING_COMPLETE	None (must be executed after changing the tab menu)

*7 Execute AUDIO:MAPPING:MAPPING_COMPLETE after changing the setting.

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● DOLBY SETTING (AUDIO → MAPPING) (*7)

r/w Limitation	Command	Parameter
-	AUDIO:MAPPING:DOLBY:GROUP	CH_1_2 / CH_3_4 / CH_5_6 / CH_7_8 / CH_9_10 / CH11_12 / CH13_14 / CH15_16 / ?
-	AUDIO:MAPPING:DOLBY:E:ONAIR	OFF / ON / ?
-	AUDIO:MAPPING:DOLBY:E:DRC:MAIN	BYPASS / DIALNORM / LINE / RF / ?
-	AUDIO:MAPPING:DOLBY:E:DRC:AUX	BYPASS / DIALNORM / LINE / RF / ?
-	AUDIO:MAPPING:DOLBY:D:DRC:MAIN	DIALNORM / LINE / RF / ?
-	AUDIO:MAPPING:DOLBY:D:DRC:AUX	DIALNORM / LINE / RF / ?
-	AUDIO:MAPPING:DOLBY:D:PROLOGIC	OFF / ON / ?
-	AUDIO:MAPPING:DOLBY:D:DOWNMIX	AUTO / LT_RT / LO_RO / PROLOGIC_II / PROLOGIC_IIP / ?
-	AUDIO:MAPPING:DOLBY:MIX	OFF / ON / ?
WO	AUDIO:MAPPING:MAPPING_COMPLETE	None (must be executed after changing the tab menu)

*7 Execute AUDIO:MAPPING:MAPPING_COMPLETE after changing the setting.

● ERROR SETUP (AUDIO → ERROR SETUP) (*8)

r/w Limitation	Command	Parameter
-	AUDIO:ERROR_SETUP:LEVEL_OVER	OFF / ON / ?
-	AUDIO:ERROR_SETUP:CLIP	OFF / ON / ?
-	AUDIO:ERROR_SETUP:MUTE	OFF / ON / ?
-	AUDIO:ERROR_SETUP:PARITY	OFF / ON / ?
-	AUDIO:ERROR_SETUP:VALIDITY	OFF / ON / ?
-	AUDIO:ERROR_SETUP:CRC	OFF / ON / ?
-	AUDIO:ERROR_SETUP:CODE_VIOLATION	OFF / ON / ?
-	AUDIO:ERROR_SETUP:CLIP:DURATION	1 to 100 / ?
-	AUDIO:ERROR_SETUP:MUTE:DURATION	1 to 5000 / ?
-	AUDIO:ERROR_SETUP:METER:CLIP	OFF / ON / ?
-	AUDIO:ERROR_SETUP:METER:MUTE	OFF / ON / ?
-	AUDIO:ERROR_SETUP:METER:E_ACMOD	OFF / ON / ?
WO	AUDIO:ERROR_SETUP:COMPLETE	None (must be executed after changing the tab menu)

*8 Execute AUDIO:ERROR_SETUP:COMPLETE after changing the setting.

● AUDIO Query measured or detected values

r/w Limitation	Command	Parameter
RO	AUDIO:DATA:STATUS:LEVEL:CH1	?
RO	AUDIO:DATA:STATUS:LEVEL:CH2	?
RO	AUDIO:DATA:STATUS:LEVEL:CH3	?
RO	AUDIO:DATA:STATUS:LEVEL:CH4	?
RO	AUDIO:DATA:STATUS:LEVEL:CH5	?
RO	AUDIO:DATA:STATUS:LEVEL:CH6	?
RO	AUDIO:DATA:STATUS:LEVEL:CH7	?
RO	AUDIO:DATA:STATUS:LEVEL:CH8	?
RO	AUDIO:DATA:STATUS:LEVEL:CH9	?
RO	AUDIO:DATA:STATUS:LEVEL:CH10	?
RO	AUDIO:DATA:STATUS:LEVEL:CH11	?
RO	AUDIO:DATA:STATUS:LEVEL:CH12	?
RO	AUDIO:DATA:STATUS:LEVEL:CH13	?
RO	AUDIO:DATA:STATUS:LEVEL:CH14	?
RO	AUDIO:DATA:STATUS:LEVEL:CH15	?
RO	AUDIO:DATA:STATUS:LEVEL:CH16	?

20.2 FTP

The files that are generated by the LV 5490 can be transferred to a PC connected to the same network.

20.2.1 Procedure

1. Configure the Ethernet settings on the LV 5490's ETHERNET SETUP tab.

Set the IP Address, and set FTP Server Select to ON.

Reference 7.2.2, "Configuring Ethernet Settings"

SYS → F•2 SYSTEM SETUP → F•2 PREV TAB or F•3 NEXT TAB →



Figure 20-2 ETHERNET SETUP tab

2. Press F•1 COMPLETE.
3. Connect the LV 5490's Ethernet port to the network.
4. On the PC, start an FTP client.

On Windows 7, on the taskbar, click Start, and then click Run. Type "FTP" and the IP address that you set in step 1. Then, click OK.

5. Type the user name and password.

The user name and password are "LV5490". Use uppercase for all characters. When the user name and password are entered correctly, "ftp>" appears.

```
Connected to *.*.*.*.*.*.*.*.*.*.
220 Walcome to LV5490 FTP service.
User (*.*.*.*.*.*.*.*.*.*:(none)): LV5490          user name
331 Please specify the password.
Password: LV5490 password (The password is not actually displayed.)
230 Login successful
ftp>
```

20. ETHERNET REMOTE CONTROL

6. Enter FTP commands.

Enter commands while referring to sections 20.2.2, "How to Enter Commands," and 20.2.3, "FTP Commands." You must generate files using the TELNET "MAKE" command before you use FTP commands.

To end an FTP session, type "bye."

```
ftp> bye
```

20.2.2 How to Enter Commands

The command syntax is explained below.

```
ftp> [Command] + [Space] + [Parameter 1] + [Space] + [Parameter 2]
```

Examples of how to enter commands are shown below.

```
ftp> get log.txt D:¥log.txt    Transfer the event log file to the PC.  
200 PORT Command successful    Return value  
:  
ftp>
```

20.2.3 FTP Commands

Table 20-1 FTP commands

Command	Parameter 1	Parameter 2
get	log.txt	Storage location on the PC and file name (example: D:¥log.txt)
	dump.txt	Storage location on the PC and file name (example: D:¥dump.txt)
	cap_bmp.bmp	Storage location on the PC and file name (example: D:¥capture.bmp)
	cap_bsg.bsg	Storage location on the PC and file name (example: D:¥capture.bsg)
	cap_frm.frm	Storage location on the PC and file name (example: D:¥capture.frm)
	cap_dpx.dpx	Storage location on the PC and file name (example: D:¥capture.dpx)
	cap_tif.tif	Storage location on the PC and file name (example: D:¥capture.tif)

20.3 SNMP

By using SNMP (Simple Network Management Protocol), you can control an LV 5490 from SNMP managers. Additionally, you can notify the SNMP managers of errors that the LV 5490 generates.

The LV 5490 supports SNMPv2.

20.3.1 SMI Definitions

IMPORTS

MODULE-IDENTITY, OBJECT-TYPE, NOTIFICATION-TYPE, enterprises

FROM SNMPv2-SMI

DisplayString

FROM SNMPv2-TC

OBJECT-GROUP, MODULE-COMPLIANCE

FROM SNMPv2-CONF;

20.3.2 Procedure

1. Configure the Ethernet settings on the LV 5490's ETHERNET SETUP tab.

Set the IP Address, and set SNMP READ to WRITE and SNMP TRAP to ON.

Reference 7.2.2, "Configuring Ethernet Settings"

SYS → F•2 SYSTEM SETUP → F•2 PREV TAB or F•3 NEXT TAB →



Figure 20-3 ETHERNET SETUP tab

2. Press F•1 COMPLETE.
3. Connect the LV 5490's Ethernet port to the network.
4. On the PC, start an SNMP manager.

You must provide the SNMP manager yourself.

The community name is shown below.

Read community : LDRUser

Write community : LDRAdm

TRAP community : LDRUser

20. ETHERNET REMOTE CONTROL

5. Check that the SNMP managers can perform GET and SET operations.
6. From the SNMP manager, set the following MIB items to the SNMP managers' IP addresses.

Up to four locations can be set.

[IP address of TRAP transmission destination 1]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp1TBL(1).l30trapManagerIp1(1).0

[IP address of TRAP transmission destination 2]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp2TBL(2).l30trapManagerIp1(1).0

[IP address of TRAP transmission destination 3]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp3TBL(3).l30trapManagerIp1(1).0

[IP address of TRAP transmission destination 4]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp4TBL(4).l30trapManagerIp1(1).0

7. Enable the TRAP transmission destinations.

To alleviate communication load, disable the transmission destinations that you are not using. The factory default setting is disabled.

[Enable (1) or disable (2) TRAP transmission destination 1]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp1TBL(1).l30trapManagerIp1Act(2).0

[Enable (1) or disable (2) TRAP transmission destination 2]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp2TBL(2).l30trapManagerIp1Act(2).0

[Enable (1) or disable (2) TRAP transmission destination 3]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp3TBL(3).l30trapManagerIp1Act(2).0

[Enable (1) or disable (2) TRAP transmission destination 4]

1.3.6.1.4.1.leader(20111).lv5490(30).lv5490ST1(1).l30trapTBL(9).l30trapIpTBL(1).l30trapIp4TBL(4).l30trapManagerIp1Act(2).0

8. Restart the LV 5490.
9. When the LV 5490 starts, it transmits the standard TRAP "coldStart(0)." Check that this is received by the SNMP managers.

20.3.3 Standard MIB

The LV 5490 uses the following standard MIBs:

- RFC1213 (MIB- II)
- RFC1354 (IP Forwarding Table MIB)

In the tables, "ACCESS" and "SUPPORT" indicate the following:

	Indication	Description
ACCESS	R/O	Information that can be read from the SNMP managers.
	R/W	Information that can be read and written from the SNMP managers.
SUPPORT	Y	Supports the MIB object as defined by the standard.
	R/O	Reading and writing are possible according to the standard, but the LV 5490 only supports reading.
	N	Not supported.

● system group

MIB	OID	SYNTAX	ACCESS	SUPPORT
sysDescr	system.1	DisplayString	R/O	Y
sysObjectID	system.2	ObjectID	R/O	Y
sysUpTime	system.3	TimeTicks	R/O	Y
sysContact	system.4	DisplayString	R/W	Y
sysName	system.5	DisplayString	R/O	R/O
sysLocation	system.6	DisplayString	R/W	Y
sysServices	system.7	INTEGER	R/O	Y

● interface group

MIB	OID	SYNTAX	ACCESS	SUPPORT
ifNumber	interfaces.1	INTEGER	R/O	Y
ifTable	interfaces.2	Aggregate	-	Y
ifEntry	ifTable.1	Aggregate	-	Y
ifIndex	ifEntry.1	INTEGER	R/O	Y
ifDescr	ifEntry.2	DisplayString	R/O	Y
ifType	ifEntry.3	INTEGER	R/O	Y
ifMtu	ifEntry.4	INTEGER	R/O	Y
ifSpeed	ifEntry.5	Gauge	R/O	Y
ifPhysAddress	ifEntry.6	OctetString	R/O	Y
ifAdminStatus	ifEntry.7	INTEGER	R/O	R/O
ifOperStatus	ifEntry.8	INTEGER	R/O	Y
ifLastChange	ifEntry.9	TimeTicks	R/O	Y
ifInOctets	ifEntry.10	Counter	R/O	Y
ifInUcastPkts	ifEntry.11	Counter	R/O	Y
ifInNUcastPkts	ifEntry.12	Counter	R/O	Y
ifInDiscards	ifEntry.13	Counter	R/O	Y
ifInErrors	ifEntry.14	Counter	R/O	Y
ifInUnknownProtos	ifEntry.15	Counter	R/O	Y
ifOutOctets	ifEntry.16	Counter	R/O	Y
ifOutUcastPkts	ifEntry.17	Counter	R/O	Y
ifOutNUcastPkts	ifEntry.18	Counter	R/O	Y
ifOutDiscards	ifEntry.19	Counter	R/O	Y
ifOutErrors	ifEntry.20	Counter	R/O	Y
ifOutQLen	ifEntry.21	Gauge	R/O	Y
ifSpecific	ifEntry.22	ObjectID	R/O	Y

20. ETHERNET REMOTE CONTROL

● ip group

MIB	OID	SYNTAX	ACCESS	SUPPORT
ipForwarding	ip.1	INTEGER	R/O	Y
ipDefaultTTL	ip.2	INTEGER	R/O	R/O
ipInReceives	ip.3	Counter	R/O	Y
ipInHdrErrors	ip.4	Counter	R/O	Y
ipInAddrErrors	ip.5	Counter	R/O	Y
ipForwDatagrams	ip.6	Counter	R/O	Y
ipInUnknownProtos	ip.7	Counter	R/O	Y
ipInDiscards	ip.8	Counter	R/O	Y
ipInDelivers	ip.9	Counter	R/O	Y
ipOutRequests	ip.10	Counter	R/O	Y
ipOutDiscards	ip.11	Counter	R/O	Y
ipOutNoRoutes	ip.12	Counter	R/O	Y
ipReasmTimeout	ip.13	INTEGER	R/O	Y
ipReasmReqds	ip.14	Counter	R/O	Y
ipReasmOKs	ip.15	Counter	R/O	Y
ipReasmFails	ip.16	Counter	R/O	Y
ipFragOKs	ip.17	Counter	R/O	Y
ipFragFails	ip.18	Counter	R/O	Y
ipFragCreates	ip.19	Counter	R/O	Y
ipAddrTable	ip.20	Aggregate	-	-
ipAddrEntry	ipAddrTable.1		R/O	Y
ipAdEntAddr	ipAddrEntry.1	IpAddress	R/O	Y
ipAdEntIfIndex	ipAddrEntry.2	INTEGER	R/O	Y
ipAdEntNetMask	ipAddrEntry.3	IpAddress	R/O	Y
ipAdEntBcastAddr	ipAddrEntry.4	INTEGER	R/O	Y
ipAdEntReasmMaxSize	ipAddrEntry.5	INTEGER	R/O	Y
ipRouteTable	ip.21	Aggregate	-	-
ipRouteEntry	ipRouteTable.1	Aggregate	-	-
ipRouteDest	ipRouteEntry.1	IpAddress	R/O	R/O
ipRouteIfIndex	ipRouteEntry.2	INTEGER	R/O	R/O
ipRouteMetric1	ipRouteEntry.3	INTEGER	R/O	R/O
ipRouteMetric2	ipRouteEntry.4	INTEGER	R/O	R/O
ipRouteMetric3	ipRouteEntry.5	INTEGER	R/O	R/O
ipRouteMetric4	ipRouteEntry.6	INTEGER	R/O	R/O
ipRouteNextHop	ipRouteEntry.7	IpAddress	R/O	R/O
ipRouteType	ipRouteEntry.8	INTEGER	R/O	R/O
ipRouteProto	ipRouteEntry.9	INTEGER	R/O	Y
ipRouteAge	ipRouteEntry.10	INTEGER	-	N
ipRouteMask	ipRouteEntry.11	IpAddress	R/O	R/O
ipRouteMetric5	ipRouteEntry.12	INTEGER	-	N
ipRouteInfo	ipRouteEntry.13	ObjectID	R/O	Y
ipNetToMediaTable	ip.22	Aggregate	-	-
ipNetToMediaEntry	ipNetToMediaTable.1	Aggregate	-	-
ipNetToMediaIfIndex	ipNetToMediaEntry.1	INTEGER	R/O	R/O
ipNetToMediaPhysAddress	ipNetToMediaEntry.2	OctetString	R/O	R/O
ipNetToMediaNetAddress	ipNetToMediaEntry.3	IpAddress	R/O	R/O
ipNetToMediaType	ipNetToMediaEntry.4	INTEGER	R/O	R/O
ipRoutingDiscards	ip.23	Counter	R/O	Y

20. ETHERNET REMOTE CONTROL

● icmp group

MIB	OID	SYNTAX	ACCESS	SUPPORT
icmpInMsgs	icmp.1	Counter	R/O	Y
icmpInErrors	icmp.2	Counter	R/O	Y
icmpInDestUnreachs	icmp.3	Counter	R/O	Y
icmpInTimeExcds	icmp.4	Counter	R/O	Y
icmpInParmProbs	icmp.5	Counter	R/O	Y
icmpInSrcQuenchs	icmp.6	Counter	R/O	Y
icmpInRedirects	icmp.7	Counter	R/O	Y
icmpInEchos	icmp.8	Counter	R/O	Y
icmpInEchoReps	icmp.9	Counter	R/O	Y
icmpInTimestamps	icmp.10	Counter	R/O	Y
icmpInTimestampReps	icmp.11	Counter	R/O	Y
icmpInAddrMasks	icmp.12	Counter	R/O	Y
icmpInAddrMaskReps	icmp.13	Counter	R/O	Y
icmpOutMsgs	icmp.14	Counter	R/O	Y
icmpOutErrors	icmp.15	Counter	R/O	Y
icmpOutDestUnreachs	icmp.16	Counter	R/O	Y
icmpOutTimeExcds	icmp.17	Counter	R/O	Y
icmpOutParmProbs	icmp.18	Counter	R/O	Y
icmpOutSrcQuenchs	icmp.19	Counter	R/O	Y
icmpOutRedirects	icmp.20	Counter	R/O	Y
icmpOutEchos	icmp.21	Counter	R/O	Y
icmpOutEchoReps	icmp.22	Counter	R/O	Y
icmpOutTimestamps	icmp.23	Counter	R/O	Y
icmpOutTimestampReps	icmp.24	Counter	R/O	Y
icmpOutAddrMasks	icmp.25	Counter	R/O	Y
icmpOutAddrMaskReps	icmp.26	Counter	R/O	Y

● tcp group

MIB	OID	SYNTAX	ACCESS	SUPPORT
tcpRtoAlgorithm	tcp.1	INTEGER	R/O	Y
tcpRtoMin	tcp.2	INTEGER	R/O	Y
tcpRtoMax	tcp.3	INTEGER	R/O	Y
tcpMaxConn	tcp.4	INTEGER	R/O	Y
tcpActiveOpens	tcp.5	Counter	R/O	Y
tcpPassiveOpens	tcp.6	Counter	R/O	Y
tcpAttemptFails	tcp.7	Counter	R/O	Y
tcpEstabResets	tcp.8	Counter	R/O	Y
tcpCurrEstab	tcp.9	Gauge	R/O	Y
tcpInSegs	tcp.10	Counter	R/O	Y
tcpOutSegs	tcp.11	Counter	R/O	Y
tcpRetransSegs	tcp.12	Counter	R/O	Y
tcpConnTable	tcp.13	Aggregate	-	-
tcpConnEntry	tcpConnTable.1	Aggregate	-	-
tcpConnState	tcpConnEntry.1	INTEGER	R/O	R/O
tcpConnLocalAddress	tcpConnEntry.2	IpAddress	R/O	Y
tcpConnLocalPort	tcpConnEntry.3	INTEGER	R/O	Y
tcpConnRemAddress	tcpConnEntry.4	IpAddress	R/O	Y
tcpConnRemPort	tcpConnEntry.5	INTEGER	R/O	Y
tcpInErrs	tcp.14	Counter	R/O	Y
tcpOutRsts	tcp.15	Counter	R/O	Y

20. ETHERNET REMOTE CONTROL

● udp group

MIB	OID	SYNTAX	ACCESS	SUPPORT
udpInDatagrams	udp.1	Counter	R/O	Y
udpNoPorts	udp.2	Counter	R/O	Y
udpInErrors	udp.3	Counter	R/O	Y
udpOutDatagrams	udp.4	Counter	R/O	Y
udpTable	udp.5	Aggregate	-	-
udpEntry	udpTable.1	Aggregate	-	-
udpLocalAddress	udpEntry.1	IpAddress	R/O	Y
udpLocalPort	udpEntry.2	INTEGER	R/O	Y

● snmp group

MIB	OID	SYNTAX	ACCESS	SUPPORT
snmpInPkts	snmp.1	Counter	R/O	Y
snmpOutPkts	snmp.2	Counter	R/O	Y
snmpInBadVersions	snmp.3	Counter	R/O	Y
snmpInBadCommunityNames	snmp.4	Counter	R/O	Y
snmpInBadCommunityUses	snmp.5	Counter	R/O	Y
snmpInASNParseErrs	snmp.6	Counter	R/O	Y
snmpInTooBigs	snmp.7	Counter	R/O	Y
snmpInNoSuchNames	snmp.8	Counter	R/O	Y
snmpInBadValues	snmp.9	Counter	R/O	Y
snmpInReadOnlys	snmp.10	Counter	R/O	Y
snmpInGenErrs	snmp.11	Counter	R/O	Y
snmpInTotalReqVars	snmp.12	Counter	R/O	Y
snmpInTotalSetVars	snmp.13	Counter	R/O	Y
snmpInGetRequests	snmp.14	Counter	R/O	Y
snmpInGetNexts	snmp.15	Counter	R/O	Y
snmpInSetRequests	snmp.16	Counter	R/O	Y
snmpInGetResponses	snmp.17	Counter	R/O	Y
snmpInTraps	snmp.18	Counter	R/O	Y
snmpOutTooBigs	snmp.19	Counter	R/O	Y
snmpOutNoSuchNames	snmp.20	Counter	R/O	Y
snmpOutBadValues	snmp.21	Counter	R/O	Y
snmpOutGenErrs	snmp.22	Counter	R/O	Y
snmpOutGetRequests	snmp.23	Counter	R/O	Y
snmpOutGetNexts	snmp.24	Counter	R/O	Y
snmpOutSetRequests	snmp.25	Counter	R/O	Y
snmpOutGetResponses	snmp.26	Counter	R/O	Y
snmpOutTraps	snmp.27	Counter	R/O	Y
snmpEnableAuthenTraps	snmp.28	IpAddress	R/W	Y

20.3.4 Enterprise MIB

● Enterprise Number

The Enterprise Number of LEADER ELECTRONICS CORP. is 20111.
 iso(1).org(3).dod(6).internet(1).private(4).enterprises(1).leader(20111)

● Enterprise MIB File

Download the enterprise MIB file using FTP.
 The file name is "lv5490.my." (Example: get lv5490.my D:¥lv5490.my)

● Enterprise MIB Structure

The enterprise MIB structure is shown below. On products that do not have units installed, the MIBs for the units cannot be controlled.

```

leader          OBJECT IDENTIFIER ::= { enterprises 20111 }
lv5490          OBJECT IDENTIFIER ::= { leader 30 }
lv5490ST1       OBJECT IDENTIFIER ::= { lv5490 1 }
l30notificationTBL OBJECT IDENTIFIER ::= { lv5490ST1 0 }
l30basicTBL     OBJECT IDENTIFIER ::= { lv5490ST1 1 }
l30systemTBL    OBJECT IDENTIFIER ::= { lv5490ST1 2 }
l30wfmTBL       OBJECT IDENTIFIER ::= { lv5490ST1 3 }
l30vectorTBL    OBJECT IDENTIFIER ::= { lv5490ST1 4 }
l30pictureTBL   OBJECT IDENTIFIER ::= { lv5490ST1 5 }
l30statusTBL    OBJECT IDENTIFIER ::= { lv5490ST1 6 }
l30eyeTBL       OBJECT IDENTIFIER ::= { lv5490ST1 7 }
l30audioTBL     OBJECT IDENTIFIER ::= { lv5490ST1 8 }
l30trapTBL      OBJECT IDENTIFIER ::= { lv5490ST1 9 }
  
```

● ACCESS

In the tables, "ACCESS" indicates the following:

	Indication	Description
ACCESS	R/O	Information that can be read from the SNMP managers.
	R/W	Information that can be read and written from the SNMP managers.
	R/WO	Information that can be read and written from the SNMP managers. (However, the retrieved data consists of meaningless fixed values.)

20. ETHERNET REMOTE CONTROL

● I30basicTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30basInputTBL	I30basicTBL.1	Aggregate	-	-
I30basInputCh	I30basInputTBL.1	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30basInputSimul	I30basInputTBL.2	INTEGER	R/W	1 = off 2 = on
I30basInputOperate	I30basInputTBL.3	INTEGER	R/W	1 = com 2 = individual
I30basInputExtref	I30basInputTBL.4	INTEGER	R/W	1 = int 2 = ext
I30basInputGroupSelect	I30basInputTBL.5	INTEGER	R/W	1 = group1 2 = group2
I30basInput12gCh	I30basInputTBL.6	INTEGER	R/W	1 = ch-1a 2 = ch-1b 3 = ch-1c 4 = ch-1d
I30basDispTBL	I30basicTBL.3	Aggregate	-	-
I30basDispMulti	I30basDispTBL.1	INTEGER	R/WO	1 (fixed)
I30basDispAssignWfm	I30basDispTBL.2	INTEGER	R/WO	1 (fixed)
I30basDispAssignVec	I30basDispTBL.3	INTEGER	R/WO	1 (fixed)
I30basDispAssignPic	I30basDispTBL.4	INTEGER	R/WO	1 (fixed)
I30basDispAssignSts	I30basDispTBL.5	INTEGER	R/WO	1 (fixed)
I30basDispAssignEye	I30basDispTBL.6	INTEGER	R/WO	1 (fixed)
I30basDispAssignAud	I30basDispTBL.7	INTEGER	R/WO	1 (fixed)
I30basPresetTBL	I30basicTBL.4	Aggregate	-	-
I30basPresetStore	I30basPresetTBL.1	INTEGER	R/W	1 to 60
I30basPresetDelete	I30basPresetTBL.2	INTEGER	R/W	1 to 60
I30basPresetCopyUsbInt	I30basPresetTBL.3	INTEGER	R/WO	1 (fixed)
I30basPresetCopyIntUsb	I30basPresetTBL.4	INTEGER	R/WO	1 (fixed)
I30basPresetRecall	I30basPresetTBL.5	INTEGER	R/W	1 to 60
I30basCaptureTBL	I30basicTBL.5	Aggregate	-	-
I30basCaptureMode	I30basCaptureTBL.1	INTEGER	R/W	1 = screen 2 = frame
I30basCaptureTrigger	I30basCaptureTBL.2	INTEGER	R/W	1 = manual 2 = error
I30basCaptureRefresh	I30basCaptureTBL.3	INTEGER	R/WO	1 (fixed)
I30basCaptureDisplay	I30basCaptureTBL.4	INTEGER	R/W	1 = real 2 = hold 3 = both
I30basCaptureFileBmp	I30basCaptureTBL.5	INTEGER	R/W	1 = off 2 = on
I30basCaptureFileBsg	I30basCaptureTBL.6	INTEGER	R/W	1 = off 2 = on
I30basCaptureFileDpx	I30basCaptureTBL.7	INTEGER	R/W	1 = off 2 = on
I30basCaptureFileTif	I30basCaptureTBL.8	INTEGER	R/W	1 = off 2 = on
I30basCaptureFileFrm	I30basCaptureTBL.9	INTEGER	R/W	1 = off 2 = on
I30basCaptureFileStore	I30basCaptureTBL.10	INTEGER	R/WO	1 (fixed)
I30basMakeTBL	I30basicTBL.6	Aggregate	-	-
I30basMakeFile	I30basMakeTBL.1	INTEGER	R/WO	1 = cap-bmp 2 = cap-bsg 3 = cap-frm

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				4 = cap-dpx-a 5 = cap-tif-a 6 = cap-frm-b 7 = cap-dpx b 8 = cap-tif-b 9 = cap-frm-c 10 = cap-dpx-c 11 = cap-tif-c 12 = cap-frm-d 13 = cap-dpx-d 14 = cap-tif-d 15 = log 16 = dump

● I30systemTBL(2) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30sysInitTBL	I30systemTBL.1	Aggregate	-	-
I30sysSystemInit	I30sysInitTBL.1	INTEGER	R/WO	1 (fixed)
I30sysLayoutInit	I30sysInitTBL.4	INTEGER	R/WO	1 (fixed)
I30sysSystemLayoutInit	I30sysInitTBL.5	INTEGER	R/WO	1 (fixed)
I30sysLcdTBL	I30systemTBL.2	Aggregate	-	-
I30sysLcdDisp	I30sysLcdTBL.1	INTEGER	R/W	1 = off 2 = on
I30sysLcdBackLight	I30sysLcdTBL.2	INTEGER	R/W	1 to 32
I30sysLcdAutoOff	I30sysLcdTBL.3	INTEGER	R/W	1 = auto-off 2 = auto-5min 3 = auto-30min 4 = auto-60min
I30sysSdiInTBL	I30systemTBL.3	Aggregate	-	-
I30sysSdiInSystem	I30sysSdiInTBL.1	INTEGER	R/W	1 = sys-4k-3g-qlink 2 = sys-4k-3g-dlink 3 = sys-4k-hd-qlink 4 = sys-single-link 5 = sys-hd-dlink 6 = sys-3g-dlink 7 = sys-3gb-dstream 11 = sys-4k-12g
I30sysSdiInColorimetry	I30sysSdiInTBL.2	INTEGER	R/W	1 = pid 2 = bt709 3 = bt2020 4 = dci
I30sysSdiInSettingPid	I30sysSdiInTBL.3	INTEGER	R/W	1 = use 2 = notuse
I30sysSdiInSettingIpsf	I30sysSdiInTBL.4	INTEGER	R/W	1 = interlace 2 = psf
I30sysSdiInSettingDivision	I30sysSdiInTBL.5	INTEGER	R/W	1 = div-square 2 = div-2sampleinterleave
I30sysSdiInSettingColorsys	I30sysSdiInTBL.6	INTEGER	R/W	1 = ycbcr422 2 = ycbcr444 3 = rgb444 4 = xyz444
I30sysSdiInSettingPixDepth	I30sysSdiInTBL.7	INTEGER	R/W	1 = dep-10bit 2 = dep-12bit
I30sysSdiInFormatA	I30sysSdiInTBL.8	DisplayString	R/O	Input A Format
I30sysSdiInFormatB	I30sysSdiInTBL.9	DisplayString	R/O	Input B Format

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30sysSdiInFormatC	I30sysSdiInTBL.10	DisplayString	R/O	Input C Format
I30sysSdiInFormatD	I30sysSdiInTBL.11	DisplayString	R/O	Input D Format
I30sysSdiInXyzGammaSelect	I30sysSdiInTBL.12	INTEGER	R/W	1 = bottom-zero 2 = dci
I30sysSdiInHfrMode	I30sysSdiInTBL.13	INTEGER	R/W	1 = off 2 = x2 3 = x4 4 = x8
I30sysSdiOutTBL	I30systemTBL.4	Aggregate	-	-
I30sysSdiOutBncInOut	I30sysSdiOutTBL.1	INTEGER	R/W	1 = input 2 = output
I30sysSdiOutInOut	I30sysSdiOutTBL.2	INTEGER	R/W	1 = a 2 = abcd
I30sysSdiOutMode	I30sysSdiOutTBL.3	INTEGER	R/W	1 = through 2 = test
I30sysSdiOutSystem	I30sysSdiOutTBL.4	INTEGER	R/W	1 = sys-3840-3gbdl-quad 2 = sys-4096-3gbdl-quad 3 = sys-3840-3ga-quad 4 = sys-4096-3ga-quad 5 = sys-3840-3gbds-dual 6 = sys-4096-3gbds-dual 7 = sys-1920-3gbdl 8 = sys-2048-3gbdl 9 = sys-1920-3ga 10 = sys-2048-3ga 11 = sys-1920-hd
I30sysSdiOutStruct	I30sysSdiOutTBL.5	INTEGER	R/W	1 = ybcr422 2 = ybcr444 3 = rgb444 4 = xyz444
I30sysSdiOutFrameRate	I30sysSdiOutTBL.6	INTEGER	R/W	1 = frm-60p 2 = frm-5994p 3 = frm-50p 4 = frm-48p 5 = frm-30p 6 = frm-2997p 7 = frm-25p 8 = frm-4795p 9 = frm-24p 10 = frm-2398p 11 = frm-60i 12 = frm-5994i 13 = frm-50i 14 = frm-30psf 15 = frm-2997psf 16 = frm-25psf 17 = frm-24psf 18 = frm-2398psf
I30sysSdiOutDivision	I30sysSdiOutTBL.7	INTEGER	R/W	1 = div-square 2 = div-2sampleinterleave
I30sysSdiOutPattern	I30sysSdiOutTBL.8	INTEGER	R/W	1 = ptn-colbar100 2 = ptn-colbar75 3 = ptn-multicol 4 = ptn-colraster 5 = ptn-cross 6 = ptn-10step 7 = ptn-ramp

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				8 = ptn-limitramp
I30sysSdiOutYOn	I30sysSdiOutTBL.9	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutYValue	I30sysSdiOutTBL.10	INTEGER	R/W	4 to 1019
I30sysSdiOutCbOn	I30sysSdiOutTBL.11	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutCbValue	I30sysSdiOutTBL.12	INTEGER	R/W	4 to 1019
I30sysSdiOutCrOn	I30sysSdiOutTBL.13	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutCrValue	I30sysSdiOutTBL.14	INTEGER	R/W	4 to 1019
I30sysSdiOutROn	I30sysSdiOutTBL.15	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutRValue	I30sysSdiOutTBL.16	INTEGER	R/W	4 to 1019
I30sysSdiOutGOn	I30sysSdiOutTBL.17	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutGValue	I30sysSdiOutTBL.18	INTEGER	R/W	4 to 1019
I30sysSdiOutBOn	I30sysSdiOutTBL.19	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutBValue	I30sysSdiOutTBL.20	INTEGER	R/W	4 to 1019
I30sysSdiOutScroll	I30sysSdiOutTBL.21	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutScrollDirection	I30sysSdiOutTBL.22	INTEGER	R/W	1 = right 2 = left 3 = up 4 = down 5 = right_up 6 = right_down 7 = left_up 8 = left_down
I30sysSdiOutScrollSpeed	I30sysSdiOutTBL.23	INTEGER	R/W	4 to 124
I30sysSdiOutBox	I30sysSdiOutTBL.24	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutBoxColor	I30sysSdiOutTBL.25	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue 8 = black
I30sysSdiOutBoxSpeed	I30sysSdiOutTBL.26	INTEGER	R/W	1 to 3
I30sysSdiOutPhaseDiff	I30sysSdiOutTBL.27	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutPhaseDirection	I30sysSdiOutTBL.28	INTEGER	R/W	1 = h 2 = v
I30sysSdiOutPhaseHBch	I30sysSdiOutTBL.29	INTEGER	R/W	-1374 to 1374
I30sysSdiOutPhaseHCch	I30sysSdiOutTBL.30	INTEGER	R/W	-1374 to 1374
I30sysSdiOutPhaseHDch	I30sysSdiOutTBL.31	INTEGER	R/W	-1374 to 1374
I30sysSdiOutPhaseVBch	I30sysSdiOutTBL.32	INTEGER	R/W	-562 to 562
I30sysSdiOutPhaseVCch	I30sysSdiOutTBL.33	INTEGER	R/W	-562 to 562
I30sysSdiOutPhaseVDch	I30sysSdiOutTBL.34	INTEGER	R/W	-562 to 562
I30sysSdiOutAudioG1	I30sysSdiOutTBL.35	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutAudioG2	I30sysSdiOutTBL.36	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutAudioG3	I30sysSdiOutTBL.37	INTEGER	R/W	1 = off 2 = on

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30sysSdiOutAudioG4	I30sysSdiOutTBL.38	INTEGER	R/W	1 = off 2 = on
I30sysSdiOutAudioLevel	I30sysSdiOutTBL.39	INTEGER	R/W	1 = lvl-20dBFS 2 = lvl-18 dBFS 3 = lvl-0 dBFS 4 = lvl-mute
I30sysAudioInOutTBL	I30systemTBL.5	Aggregate	-	-
I30sysAudBncGrpA	I30sysAudioInOutTBL.1	INTEGER	R/W	1 = input 2 = output
I30sysAudBncGrpB	I30sysAudioInOutTBL.2	INTEGER	R/W	1 = input 2 = output
I30sysMonitorOutTBL	I30systemTBL.6	Aggregate	-	-
I30sysRasterSync	I30sysMonitorOutTBL.1	INTEGER	R/W	1 = int 2 = external
I30sysRasterFmt	I30sysMonitorOutTBL.2	INTEGER	R/W	1 = fmt-1080-60p 2 = fmt-1080-59p 3 = fmt-1080-50p
I30sysRasterSdiOut	I30sysMonitorOutTBL.3	INTEGER	R/W	1 = raster 2 = input
I30sysRasterSdiOutFmt	I30sysMonitorOutTBL.4	INTEGER	R/W	1 = fmt-hd 2 = fmt-3ga 3 = fmt-3gb
I30sysGeneralTBL	I30systemTBL.7	Aggregate	-	-
I30sysGeneralBootMode	I30sysGeneralTBL.1	INTEGER	R/W	1 = Normal 2 = Fast
I30sysGeneralInfoDispFmt	I30sysGeneralTBL.2	INTEGER	R/W	1 = off 2 = on
I30sysGeneralInfoDispDate	I30sysGeneralTBL.3	INTEGER	R/W	1 = off 2 = ymd 3 = mdy 4 = dmy
I30sysGeneralInfoDispTime	I30sysGeneralTBL.4	INTEGER	R/W	1 = off 2 = real 3 = ltc 4 = vitc 5 = d-vitc
I30sysGeneralInfoDispInput	I30sysGeneralTBL.6	INTEGER	R/W	1 = off 2 = on
I30sysGeneralInfoDispIcon	I30sysGeneralTBL.7	INTEGER	R/W	1 = off 2 = on
I30sysGeneralMenuAutoOff	I30sysGeneralTBL.8	INTEGER	R/W	1 = off 2 = on
I30sysGeneralMenuAutoOffTime	I30sysGeneralTBL.9	INTEGER	R/W	1 to 60
I30sysGeneralFanSpeed	I30sysGeneralTBL.11	INTEGER	R/W	1 to 5
I30sysGeneralFanWarning	I30sysGeneralTBL.12	INTEGER	R/W	1 = off 2 = on
I30sysGeneralInfoDispError	I30sysGeneralTBL.13	INTEGER	R/W	1 = off 2 = on
I30sysEthernetTBL	I30systemTBL.8	Aggregate	-	-
I30sysEthernetSel	I30sysEthernetTBL.1	INTEGER	R/O	1 = dhcp 2 = ip
I30sysEthernetAddress	I30sysEthernetTBL.2	IpAddress	R/O	IP Address
I30sysEthernetSubnet	I30sysEthernetTBL.3	IpAddress	R/O	Subnet Mask
I30sysEthernetGateway	I30sysEthernetTBL.4	IpAddress	R/O	Default Gateway
I30sysEthernetSntp	I30sysEthernetTBL.5	INTEGER	R/W	1 = off 2 = on

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30sysEthernetSntpAddress	I30sysEthernetTBL.6	IpAddress	R/W	IP Address
I30sysEthernetSntpTz	I30sysEthernetTBL.7	INTEGER	R/W	1 = m12 2 = m11 3 = m10 4 = m9 5 = m8 6 = m7 7 = m6 8 = m5 9 = m4 10 = m3 11 = m2 12 = m1 13 = p0 14 = p1 15 = p2 16 = p3 17 = p4 18 = p5 19 = p6 20 = p7 21 = p8 22 = p9 23 = p10 24 = p11 25 = p12
I30sysEthernetTelnet	I30sysEthernetTBL.8	INTEGER	R/W	1 = off 2 = on
I30sysEthernetFtp	I30sysEthernetTBL.9	INTEGER	R/W	1 = off 2 = on
I30sysEthernetSnmpTrap	I30sysEthernetTBL.11	INTEGER	R/W	1 = off 2 = on
I30sysEthernetMacAddr	I30sysEthernetTBL.12	DisplayString	R/O	MAC Address
I30sysRemoteTBL	I30systemTBL.9	Aggregate	-	-
I30sysRemoteMode	I30sysRemoteTBL.1	INTEGER	R/W	1 = bit 2 = binary
I30sysRemotePole	I30sysRemoteTBL.2	INTEGER	R/W	1 = positive 2 = negative
I30sysRemoteAlarmAch	I30sysRemoteTBL.3	INTEGER	R/W	1 = off 2 = on
I30sysRemoteAlarmBch	I30sysRemoteTBL.4	INTEGER	R/W	1 = off 2 = on
I30sysRemoteAlarmCch	I30sysRemoteTBL.5	INTEGER	R/W	1 = off 2 = on
I30sysRemoteAlarmDch	I30sysRemoteTBL.6	INTEGER	R/W	1 = off 2 = on
I30sysRemoteTallyColor1	I30sysRemoteTBL.8	INTEGER	R/W	1 = white 2 = red 3 = green 4 = blue 5 = cyan 6 = magenta 7 = yellow 8 = orange
I30sysRemoteTallyColor2	I30sysRemoteTBL.9	INTEGER	R/W	1 = white 2 = red 3 = green 4 = blue

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				5 = cyan 6 = magenta 7 = yellow 8 = orange
I30sysRemoteTallyColor3	I30sysRemoteTBL.10	INTEGER	R/W	1 = white 2 = red 3 = green 4 = blue 5 = cyan 6 = magenta 7 = yellow 8 = orange
I30sysRemoteTallyFrame	I30sysRemoteTBL.11	INTEGER	R/W	1 = off 2 = on
I30sysRemoteTallyLayout	I30sysRemoteTBL.12	INTEGER	R/W	1 = left 2 = right
I30sysDateTBL	I30systemTBL.10	Aggregate	-	-
I30sysDateTime	I30sysDateTBL.3	DisplayString	R/O	Date and Time
I30sysFormatAlarmTBL	I30systemTBL.11	Aggregate	-	-
I30sysFormatAlarm	I30sysFormatAlarmTBL.1	INTEGER	R/W	1 = off 2 = on
I30sysFormatAlarmSystem	I30sysFormatAlarmTBL.2	INTEGER	R/W	1 = fmt-3840-3gbdl-quad 2 = fmt-4096-3gbdl-quad 3 = fmt-3840-3ga-quad 4 = fmt-4096-3ga-quad 5 = fmt-3840-3gbds-dual 6 = fmt-4096-3gbds-dual 7 = fmt-3840-hd-quad 8 = fmt-4096-hd-quad 9 = fmt-1920-3gbdl 10 = fmt-2048-3gbdl 11 = fmt-1280-3ga 12 = fmt-1920-3ga 13 = fmt-2048-3ga 14 = fmt-1280-hd 15 = fmt-1920-hd 16 = fmt-487-sd 17 = fmt-576-sd 18 = fmt-1920-hd-dual 19 = fmt-2048-hd-dual 20 = fmt-1280-3gbds 21 = fmt-1920-3gbds 22 = fmt-1920-3gbdl-dual 23 = fmt-2048-3gbdl-dual 24 = fmt-1920-3ga-dual 25 = fmt-2048-3ga-dual 26 = fmt-3840-12g-type1 27 = fmt-4096-12g-type1
I30sysFormatAlarmStruct	I30sysFormatAlarmTBL.3	INTEGER	R/W	1 = ycocr422-10bit 2 = ycocr422-12bit

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				3 = ybcr444-10bit 4 = ybcr444-12bit 5 = rgb444-10bit 6 = rgb444-12bit 7 = xyz444-12bit
I30sysFormatAlarmFramerate	I30sysFormatAlarmTBL.4	INTEGER	R/W	1 = fmt-60p 2 = fmt-5994p 3 = fmt-50p 4 = fmt-48p 5 = fmt-30p 6 = fmt-2997p 7 = fmt-25p 8 = fmt-4795p 9 = fmt-24p 10 = fmt-2398p 11 = fmt-60i 12 = fmt-5994i 13 = fmt-50i 14 = fmt-30psf 15 = fmt-2997psf 16 = fmt-25psf 17 = fmt-24psf 18 = fmt-2398psf
I30sysFormatAlarmDiv	I30sysFormatAlarmTBL.5	INTEGER	R/W	1 = div-square 2 = div-2sampleinterleave
I30sysFormatAlarmColor	I30sysFormatAlarmTBL.6	INTEGER	R/W	1 = bt709 2 = bt2020 3 = dci
I30sysFormatAlarmFlagColor	I30sysFormatAlarmTBL.7	INTEGER	R/W	1 = off 2 = on
I30sysCompleteTBL	I30systemTBL.12	Aggregate	-	-
I30sysSignalInOutComplete	I30sysCompleteTBL.1	INTEGER	R/WO	1 (fixed)
I30sysSystemSetupComplete	I30sysCompleteTBL.2	INTEGER	R/WO	1 (fixed)
I30sysEthernetSettingUpdate	I30sysCompleteTBL.3	INTEGER	R/WO	1 (fixed)
I30sysInfoTBL	I30systemTBL.13	Aggregate	-	-
I30sysInfoFirmware	I30sysInfoTBL.1	DisplayString	R/O	Firmware Version
I30sysInfoBoardSdiIn	I30sysInfoTBL.2	INTEGER	R/O	1 = notavailable 2 = available
I30sysInfoBoardSdiEye	I30sysInfoTBL.3	INTEGER	R/O	1 = notavailable 2 = available
I30sysInfoBoardAudio	I30sysInfoTBL.4	INTEGER	R/O	1 = notavailable 2 = available
I30sysHdrTBL	I30systemTBL.14	Aggregate	-	-
I30sysHdrEnable	I30sysHdrTBL.1	INTEGER	R/W	1 = off 2 = on
I30sysHdrHdrCurve	I30sysHdrTBL.2	INTEGER	R/W	2 = hlg 3 = pq 4 = slog3
I30sysHdrMax	I30sysHdrTBL.3	INTEGER	R/W	1 = cd10000 2 = cd4000 3 = cd1000
I30sysHdrGamma	I30sysHdrTBL.4	INTEGER	R/W	1 = off 2 = on
I30sysHdrRefPq	I30sysHdrTBL.5	INTEGER	R/W	3 = p51 4 = p58
I30sysHdrRefHlg	I30sysHdrTBL.6	INTEGER	R/W	1 = p50

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = p75

● I30wfmTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30wfmIntenTBL	I30wfmTBL.1	Aggregate	-	-
I30wfmInten	I30wfmIntenTBL.1	INTEGER	R/W	-128 to 127
I30wfmColor	I30wfmIntenTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue 8 = multi
I30wfmColorS1	I30wfmIntenTBL.3	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue 8 = multi
I30wfmColorS2	I30wfmIntenTBL.4	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue 8 = multi
I30wfmScaleTBL	I30wfmTBL.2	Aggregate	-	-
I30wfmScaleInten	I30wfmScaleTBL.1	INTEGER	R/W	-8 to 7
I30wfmScaleColor	I30wfmScaleTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30wfmScaleUnit	I30wfmScaleTBL.3	INTEGER	R/W	1 = unit-hdv-sdp 2 = unit-hdv-sdv 3 = unit-hdp-sdp 4 = unit-150p 5 = unit-1023 6 = unit-1023-255 7 = unit-3ff
I30wfmScaleUnitNtsc	I30wfmScaleTBL.4	INTEGER	R/W	3 = unit-hdp-sdp
I30wfmScaleUnitPal	I30wfmScaleTBL.5	INTEGER	R/W	2 = unit-hdv-sdv
I30wfmScale75perCol	I30wfmScaleTBL.6	INTEGER	R/W	1 = off 2 = on
I30wfmGainTBL	I30wfmTBL.3	Aggregate	-	-
I30wfmGainVar	I30wfmGainTBL.1	INTEGER	R/W	1 = cal 2 = variable
I30wfmGainMag	I30wfmGainTBL.2	INTEGER	R/W	1 = x1 2 = x5
I30wfmGainValue	I30wfmGainTBL.3	DisplayString	R/W	0.2 to 2.000
I30wfmGainFilter	I30wfmGainTBL.4	INTEGER	R/W	1 = lowpass

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = flat
I30wfmGainFilterCmp	I30wfmGainTBL.5	INTEGER	R/W	2 = flat 3 = lum 4 = flatlum 5 = lumchroma
I30wfmSweepTBL	I30wfmTBL.4	Aggregate	-	-
I30wfmSweep	I30wfmSweepTBL.1	INTEGER	R/W	1 = h 2 = v
I30wfmSweepMagH	I30wfmSweepTBL.2	INTEGER	R/W	1 = x1 2 = x10 3 = x20 4 = blank 5 = active
I30wfmSweepMagV	I30wfmSweepTBL.3	INTEGER	R/W	1 = x1 2 = x20 3 = x40
I30wfmSweepH	I30wfmSweepTBL.4	INTEGER	R/W	1 = sweep-1h 2 = sweep-2h
I30wfmSweepV	I30wfmSweepTBL.5	INTEGER	R/W	1 = sweep-1v 2 = sweep-2v
I30wfmSweepField	I30wfmSweepTBL.6	INTEGER	R/W	1 = field1 2 = field2
I30wfmBlanking	I30wfmSweepTBL.7	INTEGER	R/W	1 = remove 2 = v 3 = h 4 = all
I30wfmBlankingCmp	I30wfmSweepTBL.8	INTEGER	R/W	1 = remove 2 = v
I30wfmMatrixTBL	I30wfmTBL.5	Aggregate	-	-
I30wfmMatrix	I30wfmMatrixTBL.1	INTEGER	R/W	1 = ycbcr 2 = gbr 3 = rgb 4 = composite
I30wfmMatrixRgb	I30wfmMatrixTBL.2	INTEGER	R/W	2 = gbr 3 = rgb 4 = composite
I30wfmMatrixYgbr	I30wfmMatrixTBL.3	INTEGER	R/W	1 = off 2 = on
I30wfmMatrixYrgb	I30wfmMatrixTBL.4	INTEGER	R/W	1 = off 2 = on
I30wfmCmpFormat	I30wfmMatrixTBL.5	INTEGER	R/W	1 = auto 2 = ntsc 3 = pal
I30wfmCmpSetup	I30wfmMatrixTBL.6	INTEGER	R/W	1 = setup-0p 2 = setup-75p
I30wfmMatrixXyz	I30wfmMatrixTBL.7	INTEGER	R/W	2 = gbr 3 = rgb 4 = composite 5 = xyz
I30wfmDisplayTBL	I30wfmTBL.6	Aggregate	-	-
I30wfmDisplayMode	I30wfmDisplayTBL.1	INTEGER	R/W	1 = parade 2 = overlay
I30wfmDisplayCh1Y	I30wfmDisplayTBL.2	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh2Cb	I30wfmDisplayTBL.3	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh3Cr	I30wfmDisplayTBL.4	INTEGER	R/W	1 = off

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = on
I30wfmDisplayCh1G	I30wfmDisplayTBL.5	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh2B	I30wfmDisplayTBL.6	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh3R	I30wfmDisplayTBL.7	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh1R	I30wfmDisplayTBL.8	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh2G	I30wfmDisplayTBL.9	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh3B	I30wfmDisplayTBL.10	INTEGER	R/W	1 = off 2 = on
I30wfmDisplay3gbds	I30wfmDisplayTBL.11	INTEGER	R/W	1 = stream1 2 = stream2 3 = mix 4 = align
I30wfmDisplayYParade	I30wfmDisplayTBL.12	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh1X	I30wfmDisplayTBL.13	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh2Y	I30wfmDisplayTBL.14	INTEGER	R/W	1 = off 2 = on
I30wfmDisplayCh3Z	I30wfmDisplayTBL.15	INTEGER	R/W	1 = off 2 = on
I30wfmLineselTBL	I30wfmTBL.7	Aggregate	-	-
I30wfmLinesel	I30wfmLineselTBL.1	INTEGER	R/W	1 = off 2 = on
I30wfmLineselNo	I30wfmLineselTBL.2	INTEGER	R/W	0 to 32767
I30wfmLineselField	I30wfmLineselTBL.3	INTEGER	R/W	1 = frame 2 = field1 3 = field2

● I30vectorTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30vectorIntenTBL	I30vectorTBL.1	Aggregate	-	-
I30vctorInten	I30vectorIntenTBL.1	INTEGER	R/W	-128 to 127
I30vctorColor	I30vectorIntenTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30vectorColorS1	I30vectorIntenTBL.3	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30vectorColorS2	I30vectorIntenTBL.4	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				7 = blue
I30vctorScaleTBL	I30vctorScaleTBL.2	Aggregate	-	-
I30vectorScaleInten	I30vctorScaleTBL.1	INTEGER	R/W	-8 to 7
I30vectorScaleColor	I30vctorScaleTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30vectorScaleIq	I30vctorScaleTBL.3	INTEGER	R/W	1 = off 2 = on
I30vectorScaleVec	I30vctorScaleTBL.4	INTEGER	R/W	1 = auto 2 = bt601 3 = bt709 4 = bt2020 5 = dci
I30vectorScale5Bar	I30vctorScaleTBL.5	INTEGER	R/W	1 = p 2 = mv
I30vectorScale5BarSeq	I30vctorScaleTBL.6	INTEGER	R/W	1 = gbr 2 = rgb
I30vectorGainTBL	I30vectorTBL.3	Aggregate	-	-
I30vectorGainVariable	I30vectorGainTBL.1	INTEGER	R/W	1 = cal 2 = variable
I30vectorGainMag	I30vectorGainTBL.2	INTEGER	R/W	1 = x1 2 = x5 3 = iq
I30vectorGainVar	I30vectorGainTBL.3	DisplayString	R/W	0.200 to 10.000
I30vectorDispTBL	I30vectorTBL.4	Aggregate	-	-
I30vectorDispMode	I30vectorDispTBL.1	INTEGER	R/W	1 = vec 2 = bar 3 = hist 4 = ciediagram
I30vectorDisp3gbds	I30vectorDispTBL.2	INTEGER	R/W	1 = stream1 2 = stream2 3 = mix 4 = align
I30vectorMatrixTBL	I30vectorTBL.5	Aggregate	-	-
I30vectorMatrixColor	I30vectorMatrixTBL.1	INTEGER	R/W	1 = component 2 = composit
I30vectorMatrixColorBar	I30vectorMatrixTBL.2	INTEGER	R/W	1 = bar-100p 2 = bar-75p
I30vectorMatrixCompositFmt	I30vectorMatrixTBL.3	INTEGER	R/W	1 = auto 2 = ntsc 3 = pal
I30vectorMatrixCompositSetup	I30vectorMatrixTBL.4	INTEGER	R/W	1 = setup-0p 2 = setup-75p
I30vectorHistTBL	I30vectorTBL.6	Aggregate	-	-
I30vectorHistScaleHdr	I30vectorHistTBL.6	INTEGER	R/W	1 = per 2 = hdr
I30vectorMarkerTBL	I30vectorTBL.7	Aggregate	-	-
I30vectorMarker	I30vectorMarkerTBL.1	INTEGER	R/W	1 = off 2 = on
I30vectorCieTBL	I30vectorTBL.8	Aggregate	-	-
I30vectorCieCursor	I30vectorCieTBL.1	INTEGER	R/W	1 = off 2 = on
I30vectorCieTempScale	I30vectorCieTBL.2	INTEGER	R/W	1 = off

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = on
I30vectorCieMode	I30vectorCieTBL.3	INTEGER	R/W	1 = diagram 2 = temp
I30vectorCieFilter	I30vectorCieTBL.4	INTEGER	R/W	1 = off 2 = on
I30vectorCieColor	I30vectorCieTBL.6	INTEGER	R/W	1 = bg-white 2 = bg-color 3 = bg-black
I30vectorCieFigure1	I30vectorCieTBL.7	INTEGER	R/W	1 = off 4 = bt601-525 5 = bt601-625 6 = bt709 7 = dci 8 = bt2020
I30vectorCieFigure2	I30vectorCieTBL.8	INTEGER	R/W	1 = off 4 = bt601-525 5 = bt601-625 6 = bt709 7 = dci 8 = bt2020
I30vectorCieGamma	I30vectorCieTBL.9	INTEGER	R/W	2 = gamma22 3 = gamma26
I30vectorCieColorimetry	I30vectorCieTBL.10	INTEGER	R/W	1 = bt601-525 2 = bt601-625 3 = bt709 4 = dci 5 = bt2020
I30vectorCieStandard	I30vectorCieTBL.11	INTEGER	R/W	5 = cie1391 6 = cie1976
I30vectorCieGrid	I30vectorCieTBL.12	INTEGER	R/W	1 = off 2 = on
I30vectorCieD65	I30vectorCieTBL.13	INTEGER	R/W	1 = off 2 = on
I30vectorCieFigureCap	I30vectorCieTBL.14	INTEGER	R/W	1 = off 2 = on
I30vectorCieClip	I30vectorCieTBL.15	INTEGER	R/W	1 = off 2 = on
I30vectorCieManualSetup	I30vectorCieTBL.16	INTEGER	R/W	1 = off 2 = on
I30vectorCieGammaSetup	I30vectorCieTBL.17	DisplayString	R/W	1.50 to 3.00
I30vectorCieUserTriangle	I30vectorCieTBL.18	INTEGER	R/W	1 = off 2 = user1 3 = user2
I30vectorCieUserTriangleColor	I30vectorCieTBL.19	INTEGER	R/W	1 = g 2 = b 3 = r
I30vectorCieUserTriangle1GX	I30vectorCieTBL.20	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle1BX	I30vectorCieTBL.21	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle1RX	I30vectorCieTBL.22	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle1GY	I30vectorCieTBL.23	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle1BY	I30vectorCieTBL.24	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle1RY	I30vectorCieTBL.25	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle2GX	I30vectorCieTBL.26	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle2BX	I30vectorCieTBL.27	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle2RX	I30vectorCieTBL.28	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle2GY	I30vectorCieTBL.29	DisplayString	R/W	0 to 1.000
I30vectorCieUserTriangle2BY	I30vectorCieTBL.30	DisplayString	R/W	0 to 1.000

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30vectorCieUserTriangle2RY	I30vectorCieTBL.31	DisplayString	R/W	0 to 1.000
I30vectorLineselTBL	I30vectorTBL.9	Aggregate	-	-
I30vectorLinesel	I30vectorLineselTBL.1	INTEGER	R/W	1 = off 2 = on
I30vectorLineselNo	I30vectorLineselTBL.2	INTEGER	R/W	0 to 32767
I30vectorLineselField	I30vectorLineselTBL.7	INTEGER	R/W	1 = frame 2 = field1 3 = field2

● I30pictureTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30pictureAdjustTBL	I30pictureTBL.1	Aggregate	-	-
I30pictureAdjustColor	I30pictureAdjustTBL.1	INTEGER	R/W	1 = color 2 = mono
I30pictureChroma	I30pictureAdjustTBL.2	INTEGER	R/W	1 = normal 2 = up
I30pictureBrightness	I30pictureAdjustTBL.3	DisplayString	R/W	-50.0 to 50.0
I30pictureContrast	I30pictureAdjustTBL.4	DisplayString	R/W	0 to 200.0
I30pictureGainR	I30pictureAdjustTBL.5	DisplayString	R/W	0 to 200.0
I30pictureGainG	I30pictureAdjustTBL.6	DisplayString	R/W	0 to 200.0
I30pictureGainB	I30pictureAdjustTBL.7	DisplayString	R/W	0 to 200.0
I30pictureBiasR	I30pictureAdjustTBL.8	DisplayString	R/W	-50.0 to 50.0
I30pictureBiasG	I30pictureAdjustTBL.9	DisplayString	R/W	-50.0 to 50.0
I30pictureBiasB	I30pictureAdjustTBL.10	DisplayString	R/W	-50.0 to 50.0
I30pictureGainChroma	I30pictureAdjustTBL.11	DisplayString	R/W	0 to 200.0
I30pictureMarkerTBL	I30pictureTBL.2	Aggregate	-	-
I30pictureMarkerFrame	I30pictureMarkerTBL.1	INTEGER	R/W	1 = off 2 = on
I30pictureMarkerCenter	I30pictureMarkerTBL.2	INTEGER	R/W	1 = off 2 = on
I30pictureMarkerAspect	I30pictureMarkerTBL.3	INTEGER	R/W	1 = off 2 = asp-17x9 3 = asp-16x9 4 = asp-14x9 5 = asp-13x9 6 = asp-4x3 7 = asp-239x1 8 = asp-afd
I30pictureAspectShadow	I30pictureMarkerTBL.4	INTEGER	R/W	0 to 100
I30pictureSafeAction	I30pictureMarkerTBL.5	INTEGER	R/W	1 = off 2 = arib 3 = smpte 4 = user
I30pictureSafeTitle	I30pictureMarkerTBL.6	INTEGER	R/W	1 = off 2 = arib 3 = smpte 4 = user
I30pictureUserZone1W	I30pictureMarkerTBL.7	INTEGER	R/W	0 to 100
I30pictureUserZone1H	I30pictureMarkerTBL.8	INTEGER	R/W	0 to 100
I30pictureUserZone2W	I30pictureMarkerTBL.9	INTEGER	R/W	0 to 100
I30pictureUserZone2H	I30pictureMarkerTBL.10	INTEGER	R/W	0 to 100
I30pictureDispTBL	I30pictureTBL.4	Aggregate	-	-
I30pictureDispSize	I30pictureDispTBL.1	INTEGER	R/W	1 = fit 2 = real 3 = x2 4 = full

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30pictureDispGamut	I30pictureDispTBL.2	INTEGER	R/W	1 = off 2 = white 3 = red 4 = mesh
I30pictureDisp3gbds	I30pictureDispTBL.3	INTEGER	R/W	1 = Stream1 2 = Stream2 3 = Mix 4 = Align
I30pictureDispPosH	I30pictureDispTBL.4	INTEGER	R/W	-32768 to 32767
I30pictureDispPosV	I30pictureDispTBL.5	INTEGER	R/W	-32768 to 32767
I30pictureDispStatusInfo	I30pictureDispTBL.6	INTEGER	R/W	1 = off 2 = on
I30pictureEdgeTBL	I30pictureTBL.6	Aggregate	-	-
I30pictureAperture	I30pictureEdgeTBL.1	INTEGER	R/W	0 to 100
I30pictureEdgeDetect	I30pictureEdgeTBL.2	INTEGER	R/W	1 = off 2 = on
I30pictureEdgeLevel	I30pictureEdgeTBL.3	INTEGER	R/W	0 to 100
I30pictureEdgeColor	I30pictureEdgeTBL.4	INTEGER	R/W	1 = white 4 = green 6 = red 7 = blue
I30pictureEdgePicLevel	I30pictureEdgeTBL.5	INTEGER	R/W	1 = lvl-off 2 = lvl-25 3 = lvl-50 4 = lvl-75 5 = lvl-100 6 = lvl-emboss
I30pictureEdgeDisp	I30pictureEdgeTBL.6	INTEGER	R/W	1 = off 2 = on
I30pictureEdgeSensitive	I30pictureEdgeTBL.7	INTEGER	R/W	1 = low 2 = middle 3 = high 4 = v-high 5 = u-high
I30pictureCITBL	I30pictureTBL.7	Aggregate	-	-
I30pictureCIDisplay	I30pictureCITBL.1	INTEGER	R/W	1 = off 2 = fstop 3 = perdisplay 4 = cinezone
I30pictureCIAdvance	I30pictureCITBL.2	INTEGER	R/W	1 = off 2 = on
I30pictureCIMeasurePos	I30pictureCITBL.3	INTEGER	R/W	1 = p1 2 = p2 3 = p3
I30pictureCIMeasureNums	I30pictureCITBL.4	INTEGER	R/W	1 = p1 2 = p1p2 3 = p1p2p3
I30pictureCIMeasureSize	I30pictureCITBL.5	INTEGER	R/W	1 = size-1x1 2 = size-3x3 3 = size-9x9
I30pictureCIRgbUnit	I30pictureCITBL.6	INTEGER	R/W	1 = yper 2 = rgbper 3 = rgb255 4 = codevalue 5 = hdr 6 = codevaluedec
I30pictureCIFstopRefSet	I30pictureCITBL.7	INTEGER	R/WO	1 (fixed)

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30pictureCIFstopGammaSel	I30pictureCITBL.8	INTEGER	R/W	2 = user1 3 = user2 4 = user3 5 = usera 6 = userb 7 = userc 8 = userd 9 = usare
I30pictureCIFstopGammaCalF	I30pictureCITBL.9	INTEGER	R/W	1 = gamma220 2 = gamma160 3 = gamma110 4 = gamma080 5 = gamma056 6 = gamma040 7 = gamma028 8 = gamma020
I30pictureCIFstopGammaCalSet	I30pictureCITBL.10	INTEGER	R/WO	1 (fixed)
I30pictureCIFstopGammaCalDataClear	I30pictureCITBL.11	INTEGER	R/WO	1 (fixed)
I30pictureCIFstopGammaCalTableClear	I30pictureCITBL.12	INTEGER	R/WO	1 (fixed)
I30pictureCISample	I30pictureCITBL.13	INTEGER	R/W	0 to 32767
I30pictureCISLine	I30pictureCITBL.14	INTEGER	R/W	0 to 32767
I30pictureCICzDisplay	I30pictureCITBL.15	INTEGER	R/W	1 = gradate 2 = step 3 = search
I30pictureCICzUpper	I30pictureCITBL.16	DisplayString	R/W	-6.3 to 109.4
I30pictureCICzLower	I30pictureCITBL.17	DisplayString	R/W	-7.3 to 108.4
I30pictureCICzLevel	I30pictureCITBL.18	DisplayString	R/W	-7.3 to 109.4
I30pictureLineselTBL	I30pictureTBL.8	Aggregate	-	-
I30pictureLinesel	I30pictureLineselTBL.1	INTEGER	R/W	1 = off 2 = on
I30pictureLineselNo	I30pictureLineselTBL.2	INTEGER	R/W	0 to 32767
I30pictureLineselField	I30pictureLineselTBL.3	INTEGER	R/W	1 = frame 2 = field1 3 = field2
I30pictureDataTBL	I30pictureTBL.9	Aggregate	-	-
I30pictureDataCineliteP1	I30pictureDataTBL.1	DisplayString	R/O	Cinelite Data
I30pictureDataCineliteP2	I30pictureDataTBL.2	DisplayString	R/O	Cinelite Data
I30pictureDataCineliteP3	I30pictureDataTBL.3	DisplayString	R/O	Cinelite Data
I30pictureHdrTBL	I30pictureTBL.10	Aggregate	-	-
I30pictureHdrUpperPq10000	I30pictureHdrTBL.1	DisplayString	R/W	0.0 to 100.0
I30pictureHdrUpperPq4000	I30pictureHdrTBL.2	DisplayString	R/W	0.0 to 100.0
I30pictureHdrUpperPq1000	I30pictureHdrTBL.3	DisplayString	R/W	0.0 to 100.0
I30pictureHdrUpperHlg	I30pictureHdrTBL.4	DisplayString	R/W	0.0 to 100.0
I30pictureHdrUpperSlog	I30pictureHdrTBL.5	DisplayString	R/W	3.5 to 109.4
I30pictureHdrRefPq10000	I30pictureHdrTBL.6	DisplayString	R/W	0.0 to 100.0
I30pictureHdrRefPq4000	I30pictureHdrTBL.7	DisplayString	R/W	0.0 to 100.0
I30pictureHdrRefPq1000	I30pictureHdrTBL.8	DisplayString	R/W	0.0 to 100.0
I30pictureHdrRefHlg	I30pictureHdrTBL.9	DisplayString	R/W	0.0 to 100.0
I30pictureHdrRefSlog	I30pictureHdrTBL.10	DisplayString	R/W	3.5 to 109.4
I30pictureHdrLowerPq10000	I30pictureHdrTBL.11	DisplayString	R/W	0.0 to 100.0
I30pictureHdrLowerPq4000	I30pictureHdrTBL.12	DisplayString	R/W	0.0 to 100.0
I30pictureHdrLowerPq1000	I30pictureHdrTBL.13	DisplayString	R/W	0.0 to 100.0

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30pictureHdrLowerHlg	I30pictureHdrTBL.14	DisplayString	R/W	0.0 to 100.0
I30pictureHdrLowerSlog	I30pictureHdrTBL.15	DisplayString	R/W	3.5 to 109.4
I30pictureHdrDrange	I30pictureHdrTBL.16	INTEGER	R/W	1 = normal 2 = high 4 = disable
I30pictureHdrMode	I30pictureHdrTBL.17	INTEGER	R/W	1 = off 2 = on
I30pictureHdrBrightness	I30pictureHdrTBL.18	INTEGER	R/W	1 = off 2 = on

● I30statusTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusModeTBL	I30statusTBL.1	Aggregate	-	-
I30statusModeTop	I30statusModeTBL.1	INTEGER	R/WO	1 (fixed)
I30statusModeDump	I30statusModeTBL.2	INTEGER	R/WO	1 (fixed)
I30statusModeExtref	I30statusModeTBL.3	INTEGER	R/WO	1 (fixed)
I30statusModeAncView	I30statusModeTBL.5	INTEGER	R/WO	1 (fixed)
I30statusModeAncViewDump	I30statusModeTBL.6	INTEGER	R/WO	1 (fixed)
I30statusModeLog	I30statusModeTBL.7	INTEGER	R/WO	1 (fixed)
I30statusModeAncPkt	I30statusModeTBL.8	INTEGER	R/WO	1 (fixed)
I30statusModeEdh	I30statusModeTBL.9	INTEGER	R/WO	1 (fixed)
I30statusModePayload	I30statusModeTBL.10	INTEGER	R/WO	1 (fixed)
I30statusCtrlPkt	I30statusModeTBL.11	INTEGER	R/WO	1 (fixed)
I30statusModeAribCc	I30statusModeTBL.12	INTEGER	R/WO	1 (fixed)
I30statusAribNetq	I30statusModeTBL.13	INTEGER	R/WO	1 (fixed)
I30statusModeAribTrig	I30statusModeTBL.14	INTEGER	R/WO	1 (fixed)
I30statusModeAribUser1	I30statusModeTBL.15	INTEGER	R/WO	1 (fixed)
I30statusModeAribUser2	I30statusModeTBL.16	INTEGER	R/WO	1 (fixed)
I30statusModeSmpteAfd	I30statusModeTBL.19	INTEGER	R/WO	1 (fixed)
I30statusModeSearch	I30statusModeTBL.22	INTEGER	R/WO	1 (fixed)
I30statusErrClear	I30statusModeTBL.23	INTEGER	R/WO	1 (fixed)
I30statusLogTBL	I30statusTBL.2	Aggregate	-	-
I30statusLogging	I30statusLogTBL.1	INTEGER	R/W	1 = stop 2 = start
I30statusLogMode	I30statusLogTBL.2	INTEGER	R/W	1 = overwr 2 = stop
I30statusLogAutoFilename	I30statusLogTBL.3	INTEGER	R/W	1 = off 2 = on
I30statusLogClear	I30statusLogTBL.4	INTEGER	R/WO	1 (fixed)
I30statusLogStore	I30statusLogTBL.5	INTEGER	R/WO	1 (fixed)
I30statusDumpTBL	I30statusTBL.3	Aggregate	-	-
I30statusDumpMode	I30statusDumpTBL.1	INTEGER	R/W	1 = run 2 = hold
I30statusDumpModeCap	I30statusDumpTBL.2	INTEGER	R/W	1 = run 2 = hold 3 = frmcap
I30statusDumpDisp	I30statusDumpTBL.3	INTEGER	R/W	1 = serial 2 = compo 3 = binary 4 = linka 5 = linkb 6 = linkab 7 = stream1 8 = stream2 9 = stream12 10 = s1serial

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				11 = s1compo 12 = s1binary 13 = s2serial 14 = s2compo 15 = s2binary
I30statusDumpJump	I30statusDumpTBL.4	INTEGER	R/W	1 = eav 2 = sav
I30statusDumpAutoFilename	I30statusDumpTBL.6	INTEGER	R/W	1 = off 2 = on
I30statusDumpUsbFileStore	I30statusDumpTBL.7	INTEGER	R/W	1 (fixed)
I30statusDumpSample	I30statusDumpTBL.8	INTEGER	R/W	0 to 32767
I30statusDumpLine	I30statusDumpTBL.9	INTEGER	R/W	0 to 32767
I30statusExtrefTBL	I30statusTBL.4	Aggregate	-	-
I30statusExtrefUserRef	I30statusExtrefTBL.1	INTEGER	R/WO	1 (fixed)
I30statusExtrefDefaultRef	I30statusExtrefTBL.2	INTEGER	R/WO	1 (fixed)
I30statusExtrefSel	I30statusExtrefTBL.3	INTEGER	R/W	1 = ext 2 = sdi
I30statusExtrefTiming	I30statusExtrefTBL.4	INTEGER	R/W	1 = legacy 2 = serial
I30statusAncTBL	I30statusTBL.6	Aggregate	-	-
I30statusAncDumpHold	I30statusAncTBL.1	INTEGER	R/W	1 = hold-hold 2 = hold-1s 3 = hold-3s
I30statusAncDumpMode	I30statusAncTBL.2	INTEGER	R/W	1 = hex 2 = binary
I30statusAncDumpSample	I30statusAncTBL.3	INTEGER	R/W	0 to 258
I30statusAncEdhDisp	I30statusAncTBL.4	INTEGER	R/W	1 = text 2 = dump
I30statusAncEdhMode	I30statusAncTBL.5	INTEGER	R/W	1 = hex 2 = binary
I30statusAncEdhSample	I30statusAncTBL.6	INTEGER	R/W	0 to 19
I30statusAncViewStream	I30statusAncTBL.7	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAncPayloadStream	I30statusAncTBL.8	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAncCtrlDisp	I30statusAncTBL.9	INTEGER	R/W	1 = text 2 = dump
I30statusAncCtrlMode	I30statusAncTBL.10	INTEGER	R/W	1 = hex 2 = binary
I30statusAncCtrlGroup	I30statusAncTBL.11	INTEGER	R/W	1 = group1 2 = group2 3 = group3 4 = group4
I30statusAncCtrlStream	I30statusAncTBL.12	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAribTBL	I30statusTBL.7	Aggregate	-	-
I30statusAribCcDisp	I30statusAribTBL.1	INTEGER	R/W	1 = text 2 = dump
I30statusAribCcType	I30statusAribTBL.2	INTEGER	R/W	1 = hd 2 = sd 3 = analog 4 = cellular
I30statusAribCcMode	I30statusAribTBL.3	INTEGER	R/W	1 = hex 2 = binary
I30statusAribCcSample	I30statusAribTBL.4	INTEGER	R/W	0 to 258
I30statusAribCcStream	I30statusAribTBL.5	INTEGER	R/W	1 = stream1 2 = stream2

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusAribNetqDisp	I30statusAribTBL.6	INTEGER	R/W	1 = text 2 = dump 3 = qlog 4 = format
I30statusAribNetqMode	I30statusAribTBL.7	INTEGER	R/W	1 = hex 2 = binary
I30statusAribNetqSample	I30statusAribTBL.9	INTEGER	R/W	0 to 258
I30statusAribNetqLogPos	I30statusAribTBL.10	INTEGER	R/W	-50 to 50
I30statusAribNetqStream	I30statusAribTBL.11	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAribNetqClear	I30statusAribTBL.12	INTEGER	R/WO	1 (fixed)
I30statusAribNetqMaskNetQ1	I30statusAribTBL.13	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ2	I30statusAribTBL.14	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ3	I30statusAribTBL.15	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ4	I30statusAribTBL.16	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ5	I30statusAribTBL.17	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ6	I30statusAribTBL.18	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ7	I30statusAribTBL.19	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ8	I30statusAribTBL.20	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ9	I30statusAribTBL.21	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ10	I30statusAribTBL.22	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ11	I30statusAribTBL.23	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ12	I30statusAribTBL.24	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ13	I30statusAribTBL.25	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ14	I30statusAribTBL.26	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ15	I30statusAribTBL.27	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ16	I30statusAribTBL.28	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ17	I30statusAribTBL.29	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ18	I30statusAribTBL.30	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ19	I30statusAribTBL.31	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ20	I30statusAribTBL.32	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ21	I30statusAribTBL.33	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ22	I30statusAribTBL.34	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ23	I30statusAribTBL.35	INTEGER	R/W	1 = off 2 = on

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusAribNetqMaskNetQ24	I30statusAribTBL.36	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ25	I30statusAribTBL.37	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ26	I30statusAribTBL.38	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ27	I30statusAribTBL.39	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ28	I30statusAribTBL.40	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ29	I30statusAribTBL.41	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ30	I30statusAribTBL.42	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ31	I30statusAribTBL.43	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetQ32	I30statusAribTBL.44	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS1	I30statusAribTBL.45	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS2	I30statusAribTBL.46	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS3	I30statusAribTBL.47	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS4	I30statusAribTBL.48	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS5	I30statusAribTBL.49	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS6	I30statusAribTBL.50	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS7	I30statusAribTBL.51	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS8	I30statusAribTBL.52	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS9	I30statusAribTBL.53	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS10	I30statusAribTBL.54	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS11	I30statusAribTBL.55	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS12	I30statusAribTBL.56	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS13	I30statusAribTBL.57	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS14	I30statusAribTBL.58	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS15	I30statusAribTBL.59	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqMaskNetS16	I30statusAribTBL.60	INTEGER	R/W	1 = off 2 = on
I30statusAribTriggerDisp	I30statusAribTBL.61	INTEGER	R/W	1 = text 2 = dump
I30statusAribTriggerMode	I30statusAribTBL.62	INTEGER	R/W	1 = hex 2 = binary
I30statusAribTriggerSample	I30statusAribTBL.63	INTEGER	R/W	0 to 258
I30statusAribTriggerStream	I30statusAribTBL.64	INTEGER	R/W	1 = stream1 2 = stream2

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusAribTriggerUser1Mode	I30statusAribTBL.65	INTEGER	R/W	1 = hex 2 = binary
I30statusAribTriggerUser1Sample	I30statusAribTBL.66	INTEGER	R/W	0 to 258
I30statusAribTriggerUser1Stream	I30statusAribTBL.67	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAribTriggerUser2Mode	I30statusAribTBL.68	INTEGER	R/W	1 = hex 2 = binary
I30statusAribTriggerUser2Sample	I30statusAribTBL.69	INTEGER	R/W	0 to 258
I30statusAribTriggerUser2Stream	I30statusAribTBL.70	INTEGER	R/W	1 = stream1 2 = stream2
I30statusAribNetqUsbAutoFilename	I30statusAribTBL.71	INTEGER	R/W	1 = off 2 = on
I30statusAribNetqUsbFileStore	I30statusAribTBL.72	INTEGER	R/W	1 (fixed)
I30statusSmppteTBL	I30statusTBL.8	Aggregate	-	-
I30statusSmppteAfdDisp	I30statusSmppteTBL.11	INTEGER	R/W	1 = text 2 = dump
I30statusSmppteAfdMode	I30statusSmppteTBL.12	INTEGER	R/W	1 = hex 2 = binary
I30statusSmppteAfdStream	I30statusSmppteTBL.13	INTEGER	R/W	1 = stream1 2 = stream2
I30statusCustomTBL	I30statusTBL.9	Aggregate	-	-
I30statusCustomSearchDid	I30statusCustomTBL.1	DisplayString	R/W	0 to FF
I30statusCustomSearchSdid	I30statusCustomTBL.2	DisplayString	R/W	-1 to FF
I30statusCustomSearchMode	I30statusCustomTBL.3	INTEGER	R/W	1 = hex 2 = binary
I30statusCustomSearchYc	I30statusCustomTBL.4	INTEGER	R/W	1 = y 2 = c
I30statusCustomSearchStream	I30statusCustomTBL.5	INTEGER	R/W	1 = stream1 2 = stream2
I30statusCustomSearchSet	I30statusCustomTBL.6	INTEGER	R/WO	1 (fixed)
I30statusCustomSearchSample	I30statusCustomTBL.7	INTEGER	R/W	0 to 258
I30statusLinkTBL	I30statusTBL.10	Aggregate	-	-
I30statusLinkSelect	I30statusLinkSelect	INTEGER	R/W	1 = picture 2 = ach 3 = bch 4 = cch 5 = dch
I30statusLinkAncSelect	I30statusLinkTBL.2	INTEGER	R/W	1 = ach 2 = bch 3 = cch 4 = dch
I30statusSetupTBL	I30statusTBL.11	Aggregate	-	-
I30statusSetupErrCounter	I30statusSetupTBL.1	INTEGER	R/W	1 = sec 2 = field
I30statusSetupTrsErr	I30statusSetupTBL.2	INTEGER	R/W	1 = off 2 = on
I30statusSetupLineErr	I30statusSetupTBL.3	INTEGER	R/W	1 = off 2 = on
I30statusSetupCrcErr	I30statusSetupTBL.4	INTEGER	R/W	1 = off 2 = on
I30statusSetupEdhErr	I30statusSetupTBL.5	INTEGER	R/W	1 = off 2 = on
I30statusSetupIllegalErr	I30statusSetupTBL.6	INTEGER	R/W	1 = off 2 = on
I30statusSetupFreqErr	I30statusSetupTBL.7	INTEGER	R/W	1 = off

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = on
I30statusSetupCableErr	I30statusSetupTBL.8	INTEGER	R/W	1 = off 2 = on
I30statusSetupCable3g	I30statusSetupTBL.9	INTEGER	R/W	1 = cable-ls5cfb 2 = cable-1694a
I30statusSetupCableHd	I30statusSetupTBL.10	INTEGER	R/W	1 = cable-ls5cfb 2 = cable-1694a
I30statusSetupCableSd	I30statusSetupTBL.11	INTEGER	R/W	1 = cable-l5c2v 2 = cable-8281
I30statusSetupCable3gErr	I30statusSetupTBL.12	INTEGER	R/W	10 to 105
I30statusSetupCable3gWarn	I30statusSetupTBL.13	INTEGER	R/W	10 to 105
I30statusSetupCableHdErr	I30statusSetupTBL.14	INTEGER	R/W	5 to 130
I30statusSetupCableHdWarn	I30statusSetupTBL.15	INTEGER	R/W	5 to 130
I30statusSetupCableSdErr	I30statusSetupTBL.16	INTEGER	R/W	50 to 300
I30statusSetupCableSdWarn	I30statusSetupTBL.17	INTEGER	R/W	50 to 300
I30statusSetupParityErr	I30statusSetupTBL.18	INTEGER	R/W	1 = off 2 = on
I30statusSetupChecksumErr	I30statusSetupTBL.19	INTEGER	R/W	1 = off 2 = on
I30statusSetupAudioBch	I30statusSetupTBL.20	INTEGER	R/W	1 = off 2 = on
I30statusSetupAudioDbnErr	I30statusSetupTBL.21	INTEGER	R/W	1 = off 2 = on
I30statusSetupAudioPrityErr	I30statusSetupTBL.22	INTEGER	R/W	1 = off 2 = on
I30statusSetupAudioInhibitErr	I30statusSetupTBL.23	INTEGER	R/W	1 = off 2 = on
I30statusSetupAudioSampleErr	I30statusSetupTBL.24	INTEGER	R/W	1 = off 2 = on
I30statusSetupLowpassFreq	I30statusSetupTBL.25	INTEGER	R/W	1 = off 2 = hdsd1mhz 3 = hd2p8sd1mhz
I30statusSetupGamutErr	I30statusSetupTBL.26	INTEGER	R/W	1 = off 2 = on
I30statusSetupGamutUpper	I30statusSetupTBL.27	INTEGER	R/W	908 to 1094
I30statusSetupGamutLower	I30statusSetupTBL.28	INTEGER	R/W	-72 to 61
I30statusGamutArea	I30statusSetupTBL.31	INTEGER	R/W	0 to 50
I30statusGamutDuration	I30statusSetupTBL.32	INTEGER	R/W	1 to 60
I30statusCmpstGamut	I30statusSetupTBL.33	INTEGER	R/W	1 = off 2 = on
I30statusCmstSetup	I30statusSetupTBL.34	INTEGER	R/W	1 = setup-0 2 = setup-75
I30statusCmpstUpper	I30statusSetupTBL.35	INTEGER	R/W	900 to 1350
I30statusCmpstLower	I30statusSetupTBL.36	INTEGER	R/W	-400 to 200
I30statusCmpstArea	I30statusSetupTBL.39	INTEGER	R/W	0 to 50
I30statusCmpstDuration	I30statusSetupTBL.40	INTEGER	R/W	1 to 60
I30statusFreezeErr	I30statusSetupTBL.41	INTEGER	R/W	1 = off 2 = on
I30statusFreezeUpper	I30statusSetupTBL.42	INTEGER	R/W	0 to 100
I30statusFreezeLower	I30statusSetupTBL.43	INTEGER	R/W	0 to 100
I30statusFreezeLeft	I30statusSetupTBL.44	INTEGER	R/W	0 to 100
I30statusFreezeRight	I30statusSetupTBL.45	INTEGER	R/W	0 to 100
I30statusFreezeDuration	I30statusSetupTBL.46	INTEGER	R/W	2 to 300
I30statusBlackErr	I30statusSetupTBL.47	INTEGER	R/W	1 = off 2 = on
I30statusBlackLevel	I30statusSetupTBL.48	INTEGER	R/W	0 to 100
I30statusBlackArea	I30statusSetupTBL.49	INTEGER	R/W	1 to 100

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusBlackDuration	I30statusSetupTBL.50	INTEGER	R/W	1 to 300
I30statusLevelErr	I30statusSetupTBL.51	INTEGER	R/W	1 = off 2 = on
I30statusLevelLumUpper	I30statusSetupTBL.52	INTEGER	R/W	-51 to 766
I30statusLevelLumLower	I30statusSetupTBL.53	INTEGER	R/W	-51 to 766
I30statusLevelChromaUpper	I30statusSetupTBL.54	INTEGER	R/W	-400 to 399
I30statusLevelChromaLower	I30statusSetupTBL.55	INTEGER	R/W	-400 to 399
I30statusDataTBL	I30statusTBL.12	Aggregate	-	-
I30statusDataSignalA	I30statusDataTBL.1	DisplayString	R/O	Signal Data
I30statusDataSignalB	I30statusDataTBL.2	DisplayString	R/O	Signal Data
I30statusDataSignalC	I30statusDataTBL.3	DisplayString	R/O	Signal Data
I30statusDataSignalD	I30statusDataTBL.4	DisplayString	R/O	Signal Data
I30statusDataLinkA	I30statusDataTBL.5	DisplayString	R/O	Link Data
I30statusDataLinkB	I30statusDataTBL.6	DisplayString	R/O	Link Data
I30statusDataLinkC	I30statusDataTBL.7	DisplayString	R/O	Link Data
I30statusDataLinkD	I30statusDataTBL.8	DisplayString	R/O	Link Data
I30statusDataFormatA	I30statusDataTBL.9	DisplayString	R/O	Format Data
I30statusDataFormatB	I30statusDataTBL.10	DisplayString	R/O	Format Data
I30statusDataFormatC	I30statusDataTBL.11	DisplayString	R/O	Format Data
I30statusDataFormatD	I30statusDataTBL.12	DisplayString	R/O	Format Data
I30statusDataAudioA	I30statusDataTBL.13	DisplayString	R/O	Audio Data
I30statusDataAudioB	I30statusDataTBL.14	DisplayString	R/O	Audio Data
I30statusDataAudioC	I30statusDataTBL.15	DisplayString	R/O	Audio Data
I30statusDataAudioD	I30statusDataTBL.16	DisplayString	R/O	Audio Data
I30statusDataExtrefA	I30statusDataTBL.17	INTEGER	R/O	1 = userref 2 = default
I30statusDataExtrefStatA	I30statusDataTBL.18	INTEGER	R/O	1 = int 2 = sdi1a 3 = sdi2a 4 = sdi1c 5 = sdi2c 6 = linka 7 = link1 8 = exthd 9 = extbb 10 = nosignal
I30statusDataExtrefHtimeA	I30statusDataTBL.19	DisplayString	R/O	H Phase [us]
I30statusDataExtrefHpixA	I30statusDataTBL.20	DisplayString	R/O	H Phase [pix/dot]
I30statusDataExtrefVlineA	I30statusDataTBL.21	DisplayString	R/O	V Phase
I30statusDataExtrefTotalA	I30statusDataTBL.22	DisplayString	R/O	Total Pahse
I30statusDataExtrefB	I30statusDataTBL.23	INTEGER	R/O	1 = userref 2 = default
I30statusDataExtrefStatB	I30statusDataTBL.24	INTEGER	R/O	1 = int 2 = sdi1a 3 = sdi2a 4 = sdi1c 5 = sdi2c 6 = linka 7 = link1 8 = exthd 9 = extbb 10 = nosignal
I30statusDataExtrefHtimeB	I30statusDataTBL.25	DisplayString	R/O	H Phase [us]
I30statusDataExtrefHpixB	I30statusDataTBL.26	DisplayString	R/O	H Phase [pix/dot]
I30statusDataExtrefVlineB	I30statusDataTBL.27	DisplayString	R/O	V Phase
I30statusDataExtrefTotalB	I30statusDataTBL.28	DisplayString	R/O	Total Phase
I30statusDataExtrefC	I30statusDataTBL.29	INTEGER	R/O	1 = userref

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = default
I30statusDataExtrefStatC	I30statusDataTBL.30	INTEGER	R/O	1 = int 2 = sdi1a 3 = sdi2a 4 = sdi1c 5 = sdi2c 6 = linka 7 = link1 8 = exthd 9 = extbb 10 = nosignal
I30statusDataExtrefHtimeC	I30statusDataTBL.31	DisplayString	R/O	H Phase [us]
I30statusDataExtrefHpixC	I30statusDataTBL.32	DisplayString	R/O	H Phase [pix/dot]
I30statusDataExtrefVlineC	I30statusDataTBL.33	DisplayString	R/O	V Phase
I30statusDataExtrefTotalC	I30statusDataTBL.34	DisplayString	R/O	Total Phase
I30statusDataExtrefD	I30statusDataTBL.35	INTEGER	R/O	1 = userref 2 = default
I30statusDataExtrefStatD	I30statusDataTBL.36	INTEGER	R/O	1 = int 2 = sdi1a 3 = sdi2a 4 = sdi1c 5 = sdi2c 6 = linka 7 = link1 8 = exthd 9 = extbb 10 = nosignal
I30statusDataExtrefHtimeD	I30statusDataTBL.37	DisplayString	R/O	H Phase [us]
I30statusDataExtrefHpixD	I30statusDataTBL.38	DisplayString	R/O	H Phase [pix/dot]
I30statusDataExtrefVlineD	I30statusDataTBL.39	DisplayString	R/O	V Phase
I30statusDataExtrefTotalD	I30statusDataTBL.40	DisplayString	R/O	Total Phase
I30statusDataAncAudioCtrl1	I30statusDataTBL.49	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncAudioCtrl2	I30statusDataTBL.50	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncEdh	I30statusDataTBL.51	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncLtc1	I30statusDataTBL.52	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncLtc2	I30statusDataTBL.53	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncVitc1	I30statusDataTBL.54	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncVitc2	I30statusDataTBL.55	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncPayload1	I30statusDataTBL.56	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncPayload2	I30statusDataTBL.57	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncAfd1	I30statusDataTBL.64	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncAfd2	I30statusDataTBL.65	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncJpnCc1	I30statusDataTBL.66	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncJpnCc2	I30statusDataTBL.67	INTEGER	R/O	1 = detect 2 = missing

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30statusDataAncJpnCc3	I30statusDataTBL.68	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncNetq1	I30statusDataTBL.69	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncNetq2	I30statusDataTBL.70	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncTrigger	I30statusDataTBL.71	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncUser1	I30statusDataTBL.72	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncUser2	I30statusDataTBL.73	INTEGER	R/O	1 = detect 2 = missing
I30statusDataAncPktPayload	I30statusDataTBL.74	DisplayString	R/O	Payload ID
I30statusDataAncPktAribNetqStation	I30statusDataTBL.75	DisplayString	R/O	Station Code
I30statusDataAncPktAribNetqVcurr	I30statusDataTBL.76	DisplayString	R/O	Video Current
I30statusDataAncPktAribNetqVNext	I30statusDataTBL.77	DisplayString	R/O	Video Next
I30statusDataAncPktAribNetqACurr	I30statusDataTBL.78	DisplayString	R/O	Audio Current
I30statusDataAncPktAribNetqANext	I30statusDataTBL.79	DisplayString	R/O	Audio Next
I30statusDataAncPktAribNetqDCurr	I30statusDataTBL.80	DisplayString	R/O	Downmix Current
I30statusDataAncPktAribNetqDNext	I30statusDataTBL.81	DisplayString	R/O	Downmix Next
I30statusDataAncPktSmpteAfdCode	I30statusDataTBL.82	DisplayString	R/O	AFD Code
I30statusDataAncPktSmpteAfdFrame	I30statusDataTBL.83	DisplayString	R/O	Coded Frame
I30statusDataAncPktSmpteAfdBarFlg	I30statusDataTBL.84	DisplayString	R/O	Bar Data Flags
I30statusDataAncPktSmpteAfdBarVal1	I30statusDataTBL.85	DisplayString	R/O	Bar Data Value1
I30statusDataAncPktSmpteAfdBarVal2	I30statusDataTBL.86	DisplayString	R/O	Bar Data Value2

● I30eyeTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30eyeModeTBL	I30eyeTBL.1	Aggregate	-	-
I30eyeMode	I30eyeModeTBL.1	INTEGER	R/W	1 = eye 2 = jit
I30eyeIntenTBL	I30eyeTBL.2	Aggregate	-	-
I30eyeInten	I30eyeIntenTBL.1	INTEGER	R/W	-128 to 127
I30eyeColor	I30eyeIntenTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30eyeScaleTBL	I30eyeTBL.3	Aggregate	-	-
I30eyeScaleInten	I30eyeScaleTBL.1	INTEGER	R/W	-8 to 7
I30eyeScaleColor	I30eyeScaleTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				4 = green 5 = magenta 6 = red 7 = blue
I30eyeGainTBL	I30eyeTBL.4	Aggregate	-	-
I30eyeGainMode	I30eyeGainTBL.1	INTEGER	R/W	1 = cal 2 = variable
I30eyeGainVar	I30eyeGainTBL.2	DisplayString	R/W	0.50 to 2.00
I30eyeSweep	I30eyeGainTBL.3	INTEGER	R/W	1 = sweep-2ui 2 = sweep-4ui 3 = sweep-16ui
I30eyeFilter	I30eyeGainTBL.4	INTEGER	R/W	1 = filter-100khz 2 = filter-1khz 3 = filter-100hz 4 = filter-10hz 5 = filter-timing 6 = filter-alignment
I30eyeJitTBL	I30eyeTBL.5	Aggregate	-	-
I30eyeJitIntenTBL	I30eyeJitTBL.5	Aggregate	-	-
I30eyeJitInten	I30eyeJitIntenTBL.1	INTEGER	R/W	-128 to 127
I30eyeJitColor	I30eyeJitIntenTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30eyeJitScaleTBL	I30eyeJitTBL.5	Aggregate	-	-
I30eyeJitScaleInten	I30eyeJitScaleTBL.1	INTEGER	R/W	-8 to 7
I30eyeJitScaleColor	I30eyeJitScaleTBL.2	INTEGER	R/W	1 = white 2 = yellow 3 = cyan 4 = green 5 = magenta 6 = red 7 = blue
I30eyeJitSweepTBL	I30eyeJitTBL.5	Aggregate	-	-
I30eyeJitMag	I30eyeJitSweepTBL.1	INTEGER	R/W	1 = x1 2 = x2 3 = x8
I30eyeJitSweep	I30eyeJitSweepTBL.2	INTEGER	R/W	1 = sweep-1h 2 = sweep-2h 3 = sweep-1v 4 = sweep-2v
I30eyeJitMag12g	I30eyeJitSweepTBL.3	INTEGER	R/W	1 = x1 2 = x2 3 = x4 4 = x16
I30eyeJitFilterTBL	I30eyeJitTBL.5	Aggregate	-	-
I30eyeJitFilter	I30eyeJitFilterTBL.1	INTEGER	R/W	1 = filter-100khz 2 = filter-1khz 3 = filter-100hz 4 = filter-10hz 5 = filter-timing 6 = filter-alignment
I30eyeJitFilterPeakHold	I30eyeJitFilterTBL.2	INTEGER	R/W	1 = off 2 = on

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30eyeJitFileterPeakClear	I30eyeJitFilterTBL.3	INTEGER	R/WO	1 (fixed)
I30eyeLinkTBL	I30eyeTBL.6	Aggregate	-	-
I30eyeHdDlinkSelAb	I30eyeLinkTBL.1	INTEGER	R/W	1 = sel-1 2 = sel-2
I30eyeHdDlinkSelCd	I30eyeLinkTBL.2	INTEGER	R/W	1 = sel-3 2 = cel-4
I30eye4k3gDlinkSelAb	I30eyeLinkTBL.3	INTEGER	R/W	1 = sel-1 2 = sel-2
I30eye4k3gDlinkSelCd	I30eyeLinkTBL.4	INTEGER	R/W	1 = sel-3 2 = cel-4
I30eyeQlinkSel	I30eyeLinkTBL.5	INTEGER	R/W	1 = sel-1 2 = sel-2 3 = sel-3 4 = sel-4
I30eyeSetupTBL	I30eyeTBL.7	Aggregate	-	-
I30eyeSetupErr3gAmp	I30eyeSetupTBL.1	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gAmpUpper	I30eyeSetupTBL.2	INTEGER	R/W	80 to 140
I30eyeSetupErr3gAmpLower	I30eyeSetupTBL.3	INTEGER	R/W	40 to 100
I30eyeSetupErr3gRise	I30eyeSetupTBL.4	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gRizeMax	I30eyeSetupTBL.5	INTEGER	R/W	40 to 140
I30eyeSetupErr3gFall	I30eyeSetupTBL.6	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gFallMax	I30eyeSetupTBL.7	INTEGER	R/W	40 to 140
I30eyeSetupErr3gDelta	I30eyeSetupTBL.8	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gDeltaMax	I30eyeSetupTBL.9	INTEGER	R/W	40 to 140
I30eyeSetupErr3gTjit	I30eyeSetupTBL.10	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gTjitMax	I30eyeSetupTBL.11	INTEGER	R/W	10 to 200
I30eyeSetupErr3gCjit	I30eyeSetupTBL.12	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gCjitMax	I30eyeSetupTBL.13	INTEGER	R/W	10 to 200
I30eyeSetupErr3gOsR	I30eyeSetupTBL.14	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gOsRMax	I30eyeSetupTBL.15	INTEGER	R/W	0 to 200
I30eyeSetupErr3gOsF	I30eyeSetupTBL.16	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr3gOsFMax	I30eyeSetupTBL.17	INTEGER	R/W	0 to 200
I30eyeSetupErrHdAmp	I30eyeSetupTBL.18	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdAmpUpper	I30eyeSetupTBL.19	INTEGER	R/W	80 to 140
I30eyeSetupErrHdAmpLower	I30eyeSetupTBL.20	INTEGER	R/W	40 to 100
I30eyeSetupErrHdRise	I30eyeSetupTBL.21	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdRizeMax	I30eyeSetupTBL.22	INTEGER	R/W	40 to 140
I30eyeSetupErrHdFall	I30eyeSetupTBL.23	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdFallMax	I30eyeSetupTBL.24	INTEGER	R/W	40 to 140
I30eyeSetupErrHdDelta	I30eyeSetupTBL.25	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdDeltaMax	I30eyeSetupTBL.26	INTEGER	R/W	40 to 140
I30eyeSetupErrHdTjit	I30eyeSetupTBL.27	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdTjitMax	I30eyeSetupTBL.28	INTEGER	R/W	10 to 200
I30eyeSetupErrHdCjit	I30eyeSetupTBL.29	INTEGER	R/W	1 = off

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = on
I30eyeSetupErrHdCjitMax	I30eyeSetupTBL.30	INTEGER	R/W	10 to 200
I30eyeSetupErrHdOsR	I30eyeSetupTBL.31	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdOsRMax	I30eyeSetupTBL.32	INTEGER	R/W	0 to 200
I30eyeSetupErrHdOsF	I30eyeSetupTBL.33	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrHdOsFMax	I30eyeSetupTBL.34	INTEGER	R/W	0 to 200
I30eyeSetupErrSdAmp	I30eyeSetupTBL.35	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdAmpUpper	I30eyeSetupTBL.36	INTEGER	R/W	80 to 140
I30eyeSetupErrSdAmpLower	I30eyeSetupTBL.37	INTEGER	R/W	40 to 100
I30eyeSetupErrSdRise	I30eyeSetupTBL.38	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdRizeMax	I30eyeSetupTBL.39	INTEGER	R/W	40 to 140
I30eyeSetupErrSdFall	I30eyeSetupTBL.40	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdFallMax	I30eyeSetupTBL.41	INTEGER	R/W	40 to 140
I30eyeSetupErrSdDelta	I30eyeSetupTBL.42	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdDeltaMax	I30eyeSetupTBL.43	INTEGER	R/W	40 to 140
I30eyeSetupErrSdTjit	I30eyeSetupTBL.44	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdTjitMax	I30eyeSetupTBL.45	INTEGER	R/W	10 to 200
I30eyeSetupErrSdCjit	I30eyeSetupTBL.46	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdCjitMax	I30eyeSetupTBL.47	INTEGER	R/W	10 to 200
I30eyeSetupErrSdOsR	I30eyeSetupTBL.48	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdOsRMax	I30eyeSetupTBL.49	INTEGER	R/W	0 to 200
I30eyeSetupErrSdOsF	I30eyeSetupTBL.50	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErrSdOsFMax	I30eyeSetupTBL.51	INTEGER	R/W	0 to 200
I30eyeSetupComplete	I30eyeSetupTBL.52	INTEGER	R/WO	1 (fixed)
I30eyeSetupErr12gAmp	I30eyeSetupTBL.53	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gAmpUpper	I30eyeSetupTBL.54	INTEGER	R/W	80 to 140
I30eyeSetupErr12gAmpLower	I30eyeSetupTBL.55	INTEGER	R/W	40 to 100
I30eyeSetupErr12gRise	I30eyeSetupTBL.56	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gRizeMax	I30eyeSetupTBL.57	INTEGER	R/W	40 to 140
I30eyeSetupErr12gFall	I30eyeSetupTBL.58	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gFallMax	I30eyeSetupTBL.59	INTEGER	R/W	40 to 140
I30eyeSetupErr12gDelta	I30eyeSetupTBL.60	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gDeltaMax	I30eyeSetupTBL.61	INTEGER	R/W	40 to 140
I30eyeSetupErr12gTjit	I30eyeSetupTBL.62	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gTjitMax	I30eyeSetupTBL.63	INTEGER	R/W	10 to 200
I30eyeSetupErr12gCjit	I30eyeSetupTBL.64	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gCjitMax	I30eyeSetupTBL.65	INTEGER	R/W	10 to 200
I30eyeSetupErr12gOsR	I30eyeSetupTBL.66	INTEGER	R/W	1 = off 2 = on
I30eyeSetupErr12gOsRMax	I30eyeSetupTBL.67	INTEGER	R/W	0 to 200
I30eyeSetupErr12gOsF	I30eyeSetupTBL.68	INTEGER	R/W	1 = off

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				2 = on
I30eyeSetupErr12gOsFMax	I30eyeSetupTBL.69	INTEGER	R/W	0 to 200
I30eyeTrigTBL	I30eyeTBL.8	Aggregate	-	-
I30eyeTrigStop	I30eyeSetupTBL.1	INTEGER	R/W	1 = off 2 = on
I30eyeDataTBL	I30eyeTBL.10	Aggregate	-	-
I30eyeDataAmp	I30eyeSetupTBL.1	DisplayString	R/O	Amp
I30eyeDataTr	I30eyeSetupTBL.2	DisplayString	R/O	Tr
I30eyeDataTf	I30eyeSetupTBL.3	DisplayString	R/O	Tf
I30eyeDataTj	I30eyeSetupTBL.4	DisplayString	R/O	Tj
I30eyeDataCj	I30eyeSetupTBL.5	DisplayString	R/O	Cj
I30eyeDataOr	I30eyeSetupTBL.6	DisplayString	R/O	Or
I30eyeDataOf	I30eyeSetupTBL.7	DisplayString	R/O	Of

● I30audioTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30audioMapTBL	I30audioTBL.1	Aggregate	-	-
I30audioMapInputSrc	I30audioMapTBL.1	INTEGER	R/W	1 = sdi 2 = ext-digi
I30audioMapLinkSelect	I30audioMapTBL.2	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30audioMapStreamSelect	I30audioMapTBL.3	INTEGER	R/W	1 = stream1 2 = stream2
I30audioMapChMode	I30audioMapTBL.4	INTEGER	R/W	1 = mode-8ch 2 = mode-16ch
I30audioMapSdiGroup1	I30audioMapTBL.5	INTEGER	R/W	1 = g1 2 = g2 3 = g3 4 = g4
I30audioMapSdiGroup2	I30audioMapTBL.6	INTEGER	R/W	1 = g1 2 = g2 3 = g3 4 = g4
I30audioMapSdiGroup3	I30audioMapTBL.7	INTEGER	R/W	1 = g1 2 = g2 3 = g3 4 = g4
I30audioMapSdiGroup4	I30audioMapTBL.8	INTEGER	R/W	1 = g1 2 = g2 3 = g3 4 = g4
I30audioMapPhonesL	I30audioMapTBL.9	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16 17 = chlt
I30audioMapPhonesR	I30audioMapTBL.10	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16 18 = chrt
I30audioMapDolbyDec	I30audioMapTBL.13	INTEGER	R/W	1 = off 2 = on
I30audioMapDolbyCh	I30audioMapTBL.14	INTEGER	R/W	1 = ch1-2 2 = ch3-4 3 = ch5-6 4 = ch7-8

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				5 = ch9-10 6 = ch11-12 7 = ch13-14 9 = ch15-16
I30audioDolbyDetect	I30audioMapTBL.15	INTEGER	R/W	2 = e 3 = d 4 = dp
I30audioDolbyEOnair	I30audioMapTBL.16	INTEGER	R/W	1 = off 2 = on
I30audioDolbyEDrcMain	I30audioMapTBL.17	INTEGER	R/W	1 = bypass 2 = dialnorm 3 = line 4 = rf
I30audioDolbyEDrcAux	I30audioMapTBL.18	INTEGER	R/W	1 = bypass 2 = dialnorm 3 = line 4 = rf
I30audioDolbyELinePos	I30audioMapTBL.19	INTEGER	R/W	1 = off 2 = on
I30audioDolbyELineSelect	I30audioMapTBL.20	INTEGER	R/W	1 = valid 2 = ideal 3 = custom
I30audioDolbyEEarliest	I30audioMapTBL.21	DisplayString	R/W	8 to 104
I30audioDolbyELatest	I30audioMapTBL.22	DisplayString	R/W	9 to 105
I30audioDolbyDDrcMain	I30audioMapTBL.23	INTEGER	R/W	1 = dialnorm 2 = line 3 = rf
I30audioDolbyDDrcAux	I30audioMapTBL.24	INTEGER	R/W	1 = dialnorm 2 = line 3 = rf
I30audioDolbyDPrologic	I30audioMapTBL.25	INTEGER	R/W	1 = off 2 = on
I30audioDolbyDDownmix	I30audioMapTBL.26	INTEGER	R/W	1 = auto 2 = lt-rt 3 = lo-ro 4 = pro-ii 5 = pro-ii-pro
I30audioMapDolbyMix	I30audioMapTBL.31	INTEGER	R/W	1 = off 2 = on
I30audioMapLissajouSL	I30audioMapTBL.32	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16 17 = chlt
I30audioMapLissajouSR	I30audioMapTBL.33	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16 18 = chrt
I30audioMapLissajouML1	I30audioMapTBL.34	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR1	I30audioMapTBL.35	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML2	I30audioMapTBL.36	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR2	I30audioMapTBL.37	INTEGER	R/W	1 = ch1

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				(omitted) 16 = ch16
I30audioMapLissajouML3	I30audioMapTBL.38	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR3	I30audioMapTBL.39	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML4	I30audioMapTBL.40	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR4	I30audioMapTBL.41	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML5	I30audioMapTBL.42	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR5	I30audioMapTBL.43	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML6	I30audioMapTBL.44	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR6	I30audioMapTBL.45	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML7	I30audioMapTBL.46	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR7	I30audioMapTBL.47	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouML8	I30audioMapTBL.48	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapLissajouMR8	I30audioMapTBL.49	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundL	I30audioMapTBL.50	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundR	I30audioMapTBL.51	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundC	I30audioMapTBL.52	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundLfe	I30audioMapTBL.53	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundLs	I30audioMapTBL.54	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundRs	I30audioMapTBL.55	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapSurroundLI	I30audioMapTBL.56	INTEGER	R/W	1 = ch1

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				(omitted) 16 = ch16
I30audioMapSurroundRr	I30audioMapTBL.57	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioMapDolbyLissajouSL	I30audioMapTBL.58	INTEGER	R/W	17 = chlt 83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouSR	I30audioMapTBL.59	INTEGER	R/W	18 = chrt 83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouML1	I30audioMapTBL.60	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouMR1	I30audioMapTBL.61	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouML2	I30audioMapTBL.62	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouMR2	I30audioMapTBL.63	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouML3	I30audioMapTBL.64	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouMR3	I30audioMapTBL.65	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouML4	I30audioMapTBL.66	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyLissajouMR4	I30audioMapTBL.67	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundL	I30audioMapTBL.68	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundR	I30audioMapTBL.69	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundC	I30audioMapTBL.70	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundLfe	I30audioMapTBL.71	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundLs	I30audioMapTBL.72	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundRs	I30audioMapTBL.73	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioDolbySurroundLI	I30audioMapTBL.74	INTEGER	R/W	83 = d1 (omitted)

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				90 = d8
I30audioDolbySurroundRr	I30audioMapTBL.75	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapDolbyPhonesL	I30audioMapTBL.76	INTEGER	R/W	17 = chlt 83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapDolbyPhonesR	I30audioMapTBL.77	INTEGER	R/W	18 = chrt 83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapSimSdiGroup1	I30audioMapTBL.78	INTEGER	R/W	1 = group1 2 = group2 3 = group3 4 = group4
I30audioMapSimSdiGroup2	I30audioMapTBL.79	INTEGER	R/W	1 = group1 2 = group2 3 = group3 4 = group4
I30audioMapSimSdiGroup3	I30audioMapTBL.80	INTEGER	R/W	1 = group1 2 = group2 3 = group3 4 = group4
I30audioMapSimSdiGroup4	I30audioMapTBL.81	INTEGER	R/W	1 = group1 2 = group2 3 = group3 4 = group4
I30audioMapSimSdiGroup1Ch	I30audioMapTBL.82	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30audioMapSimSdiGroup2Ch	I30audioMapTBL.83	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30audioMapSimSdiGroup3Ch	I30audioMapTBL.84	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30audioMapSimSdiGroup4Ch	I30audioMapTBL.85	INTEGER	R/W	1 = a 2 = b 3 = c 4 = d
I30audioMapSimLissajouML1	I30audioMapTBL.88	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR1	I30audioMapTBL.89	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML2	I30audioMapTBL.90	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR2	I30audioMapTBL.91	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30audioMapSimLissajouML3	I30audioMapTBL.92	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR3	I30audioMapTBL.93	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML4	I30audioMapTBL.94	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR4	I30audioMapTBL.95	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML5	I30audioMapTBL.96	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR5	I30audioMapTBL.97	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML6	I30audioMapTBL.98	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR6	I30audioMapTBL.99	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML7	I30audioMapTBL.100	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR7	I30audioMapTBL.101	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouML8	I30audioMapTBL.102	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimLissajouMR8	I30audioMapTBL.103	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimPhonesL	I30audioMapTBL.104	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapSimPhonesR	I30audioMapTBL.105	INTEGER	R/W	19 = a-ch1 (omitted) 82 = d-ch16
I30audioMapExtInputGroup	I30audioMapTBL.108	INTEGER	R/W	1 = group1 2 = group2
I30audioMapExtLissajouSL	I30audioMapTBL.109	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16 17 = chlt
I30audioMapExtLissajouSR	I30audioMapTBL.110	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16 18 = chrt
I30audioMapExtLissajouML1	I30audioMapTBL.111	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR1	I30audioMapTBL.112	INTEGER	R/W	19 = a-ch1 (omitted)

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				50 = b-ch16
I30audioMapExtLissajouML2	I30audioMapTBL.113	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR2	I30audioMapTBL.114	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML3	I30audioMapTBL.115	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR3	I30audioMapTBL.116	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML4	I30audioMapTBL.117	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR4	I30audioMapTBL.118	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML5	I30audioMapTBL.119	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR5	I30audioMapTBL.120	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML6	I30audioMapTBL.121	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR6	I30audioMapTBL.122	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML7	I30audioMapTBL.123	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR7	I30audioMapTBL.124	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouML8	I30audioMapTBL.125	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtLissajouMR8	I30audioMapTBL.126	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundL	I30audioMapTBL.127	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundR	I30audioMapTBL.128	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundC	I30audioMapTBL.129	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundLfe	I30audioMapTBL.130	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundLs	I30audioMapTBL.131	INTEGER	R/W	19 = a-ch1 (omitted)

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				50 = b-ch16
I30audioMapExtSurroundRs	I30audioMapTBL.132	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundLI	I30audioMapTBL.133	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtSurroundRr	I30audioMapTBL.134	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16
I30audioMapExtPhonesL	I30audioMapTBL.135	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16 17 = chlt
I30audioMapExtPhonesR	I30audioMapTBL.136	INTEGER	R/W	19 = a-ch1 (omitted) 50 = b-ch16 18 = chrt
I30audioMapExtDolbyLissajouS L	I30audioMapTBL.139	INTEGER	R/W	83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapExtDolbyLissajouS R	I30audioMapTBL.140	INTEGER	R/W	83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapExtDolbyLissajou ML1	I30audioMapTBL.141	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou MR1	I30audioMapTBL.142	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou ML2	I30audioMapTBL.143	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou MR2	I30audioMapTBL.144	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou ML3	I30audioMapTBL.145	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou MR3	I30audioMapTBL.146	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou ML4	I30audioMapTBL.147	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyLissajou MR4	I30audioMapTBL.148	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurround L	I30audioMapTBL.149	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurround R	I30audioMapTBL.150	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurround	I30audioMapTBL.151	INTEGER	R/W	83 = d1

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
C				(omitted) 90 = d8
I30audioMapExtDolbySurroundLfe	I30audioMapTBL.152	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurroundLs	I30audioMapTBL.153	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurroundRs	I30audioMapTBL.154	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurroundLi	I30audioMapTBL.155	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbySurroundRr	I30audioMapTBL.156	INTEGER	R/W	83 = d1 (omitted) 90 = d8
I30audioMapExtDolbyPhonesL	I30audioMapTBL.157	INTEGER	R/W	83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapExtDolbyPhonesR	I30audioMapTBL.158	INTEGER	R/W	83 = d1 (omitted) 90 = d8 91 = daux
I30audioMapComplete	I30audioMapTBL.160	INTEGER	R/WO	1 (fixed)
I30audioDispTBL	I30audioTBL.2	Aggregate	-	-
I30audioDispMode	I30audioDispTBL.1	INTEGER	R/W	1 = lissajou 2 = surround 3 = meter 4 = error 5 = chstatus 6 = userbit 7 = status 9 = dolbymdeebi 10 = dolbymddebi 11 = dolbymddpebi 15 = dolbymde 16 = dolbymdd 17 = dolbymddp 18 = log
I30audioMeterTBL	I30audioTBL.3	Aggregate	-	-
I30audioMeterRange	I30audioMeterTBL.1	INTEGER	R/W	1 = range-60dBFS 2 = range-90dBFS 3 = range-mag
I30audioMeterResponse	I30audioMeterTBL.2	INTEGER	R/W	1 = truepeak 2 = ppm 3 = vu
I30audioMeterPpmMode	I30audioMeterTBL.3	INTEGER	R/W	1 = mode1 2 = mode2
I30audioMeterPeakMeter	I30audioMeterTBL.4	INTEGER	R/W	1 = true 2 = ppm1 3 = ppm2
I30audioMeterPeakHold	I30audioMeterTBL.5	INTEGER	R/W	0 = hold-0 5 = hold-500ms 10 = hold-1000ms 15 = hold-1500ms

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				20 = hold-2000ms 25 = hold-2500ms 30 = hold-3000ms 35 = hold-3500ms 40 = hold-4000ms 45 = hold-4500ms 50 = hold-5000ms 55 = hold-hold
I30audioMeterOverDbfs	I30audioMeterTBL.6	DisplayString	R/W	-40.0 to 0
I30audioMeterWarnDbfs	I30audioMeterTBL.8	DisplayString	R/W	-40.0 to 0
I30audioMeterRefDbfs	I30audioMeterTBL.10	DisplayString	R/W	-40.0 to 0
I30audioLissajouIntenTBL	I30audioTBL.4	Aggregate	-	-
I30audioLissajouInten	I30audioLissajouIntenTBL.1	INTEGER	R/W	-8 to 7
I30audioLissajouScaleInten	I30audioLissajouIntenTBL.2	INTEGER	R/W	-8 to 7
I30audioLissajouMode	I30audioLissajouIntenTBL.3	INTEGER	R/W	1 = multi 2 = single
I30audioLissajouForm	I30audioLissajouIntenTBL.4	INTEGER	R/W	1 = xy 2 = matrix
I30audioLissajouAutoGain	I30audioLissajouIntenTBL.5	INTEGER	R/W	1 = off 2 = on
I30audioSurroundTBL	I30audioTBL.5	Aggregate	-	-
I30audioSurroundInten	I30audioSurroundTBL.1	INTEGER	R/W	-8 to 7
I30audioSurroundScaleInten	I30audioSurroundTBL.2	INTEGER	R/W	-8 to 7
I30audioSurroundMode	I30audioSurroundTBL.3	INTEGER	R/W	1 = normal 2 = phantom
I30audioSurroundAutoGain	I30audioSurroundTBL.4	INTEGER	R/W	1 = off 2 = on
I30audioStatusTBL	I30audioTBL.6	Aggregate	-	-
I30audioStatusDolbyProg	I30audioStatusTBL.1	INTEGER	R/W	1 = prm1 (omitted) 8 = prm8
I30audioStatusCh	I30audioStatusTBL.3	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioStatusChSimul	I30audioStatusTBL.4	INTEGER	R/W	19 = cha1 (omitted) 34 = cha16 35 = chb1 (omitted) 50 = chb16 51 = chc1 (omitted) 66 = chc16 67 = chd1 (omitted) 82 = chd16
I30audioStatusChDolby	I30audioStatusTBL.5	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioStatusChExt	I30audioStatusTBL.6	INTEGER	R/W	19 = cha1 (omitted) 26 = cha8 35 = chb1 (omitted) 42 = chb8

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30audioStatusChAlign	I30audioStatusTBL.7	INTEGER	R/W	1 = lsb 2 = msb
I30audioStatusBitDisp	I30audioStatusTBL.8	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioStatusBitDispSimul	I30audioStatusTBL.9	INTEGER	R/W	19 = cha1 (omitted) 34 = cha16 35 = chb1 (omitted) 50 = chb16 51 = chc1 (omitted) 66 = chc16 67 = chd1 (omitted) 82 = chd16
I30audioStatusBitDispDolby	I30audioStatusTBL.10	INTEGER	R/W	1 = ch1 (omitted) 16 = ch16
I30audioStatusBitDispExt	I30audioStatusTBL.11	INTEGER	R/W	19 = cha1 (omitted) 26 = cha8 35 = chb1 (omitted) 42 = chb8
I30audioStatusBitDispAlign	I30audioStatusTBL.12	INTEGER	R/W	1 = lsb 2 = msb
I30audioPhonesTBL	I30audioTBL.8	Aggregate	-	-
I30audioPhonesVolume	I30audioPhonesTBL.1	INTEGER	R/W	0 to 63
I30audioErrorTBL	I30audioTBL.9	Aggregate	-	-
I30audioErrorLevel	I30audioErrorTBL.1	INTEGER	R/W	1 = off 2 = on
I30audioErrorClip	I30audioErrorTBL.2	INTEGER	R/W	1 = off 2 = on
I30audioErrorMute	I30audioErrorTBL.3	INTEGER	R/W	1 = off 2 = on
I30audioErrorParity	I30audioErrorTBL.4	INTEGER	R/W	1 = off 2 = on
I30audioErrorVaridity	I30audioErrorTBL.5	INTEGER	R/W	1 = off 2 = on
I30audioErrorCrc	I30audioErrorTBL.6	INTEGER	R/W	1 = off 2 = on
I30audioErrorCode	I30audioErrorTBL.7	INTEGER	R/W	1 = off 2 = on
I30audioErrorClipDuration	I30audioErrorTBL.8	INTEGER	R/W	1 to 100
I30audioErrorMuteDuration	I30audioErrorTBL.9	INTEGER	R/W	1 to 5000
I30audioErrorReset	I30audioErrorTBL.10	INTEGER	R/WO	1 (fixed)
I30audDataTBL	I30audioTBL.11	Aggregate	-	-
I30audDataStatusLevelCh1	I30audDataTBL.1	DisplayString	R/O	Ch1 Level
I30audDataStatusLevelCh2	I30audDataTBL.2	DisplayString	R/O	Ch2 Level
I30audDataStatusLevelCh3	I30audDataTBL.3	DisplayString	R/O	Ch3 Level
I30audDataStatusLevelCh4	I30audDataTBL.4	DisplayString	R/O	Ch4 Level
I30audDataStatusLevelCh5	I30audDataTBL.5	DisplayString	R/O	Ch5 Level
I30audDataStatusLevelCh6	I30audDataTBL.6	DisplayString	R/O	Ch6 Level
I30audDataStatusLevelCh7	I30audDataTBL.7	DisplayString	R/O	Ch7 Level
I30audDataStatusLevelCh8	I30audDataTBL.8	DisplayString	R/O	Ch8 Level

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30audDataStatusLevelCh9	I30audDataTBL.9	DisplayString	R/O	Ch9 Level
I30audDataStatusLevelCh10	I30audDataTBL.10	DisplayString	R/O	Ch10 Level
I30audDataStatusLevelCh11	I30audDataTBL.11	DisplayString	R/O	Ch11 Level
I30audDataStatusLevelCh12	I30audDataTBL.12	DisplayString	R/O	Ch12 Level
I30audDataStatusLevelCh13	I30audDataTBL.13	DisplayString	R/O	Ch13 Level
I30audDataStatusLevelCh14	I30audDataTBL.14	DisplayString	R/O	Ch14 Level
I30audDataStatusLevelCh15	I30audDataTBL.15	DisplayString	R/O	Ch15 Level
I30audDataStatusLevelCh16	I30audDataTBL.16	DisplayString	R/O	Ch16 Level

● I30trapTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30trapIpTBL	I30trapTBL.1	Aggregate	-	-
I30trapIp1TBL	I30trapIpTBL.1	Aggregate	-	-
I30trapManagerIp1	I30trapIp1TBL.1	IpAddress	R/W	IP Address
I30trapManagerIp1Act	I30trapIp1TBL.2	INTEGER	R/W	1 = enable 2 = disable
I30trapIp2TBL	I30trapIpTBL.2	Aggregate	-	-
I30trapManagerIp2	I30trapIp2TBL.1	IpAddress	R/W	IP Address
I30trapManagerIp2Act	I30trapIp2TBL.2	INTEGER	R/W	1 = enable 2 = disable
I30trapIp3TBL	I30trapIpTBL.3	Aggregate	-	-
I30trapManagerIp3	I30trapIp3TBL.1	IpAddress	R/W	IP Address
I30trapManagerIp3Act	I30trapIp3TBL.2	INTEGER	R/W	1 = enable 2 = disable
I30trapIp4TBL	I30trapIpTBL.4	Aggregate	-	-
I30trapManagerIp4	I30trapIp4TBL.1	IpAddress	R/W	IP Address
I30trapManagerIp4Act	I30trapIp4TBL.2	INTEGER	R/W	1 = enable 2 = disable

20.3.5 Extended TRAP (Variable Binding List)

● index 1

OID : iso(1).org(3).dod(6).internet(1).mgmt(2).mib-2(1).system(1).sysUpTime(3).0

Syntax : TimeTicks

Range: 1 to 4294967295 (overflow occurs if this range is exceeded)

Description: Elapsed time after starting the agent

● index 2

OID : iso(1).org(3).dod(6).internet(1).snmpV2(6).snmpModules(3).snmpMIB(1).snmpMIBObjects(1).snmpTrap(4).snmpTrapOID(1).0

Syntax : OBJECT IDENTIFIER

Range: ---

Description: Trap OID

● index 3

OID : leader(20111).lv5490(30).lv5490ST1(1).l30notificationTBL(0).l30trapStrTBL(2).l30trapCounter(1)

Syntax : Counter32

Range: 1 to 4294967295

Description: The total number of enterprise traps sent after starting up

● index 4

OID : leader(20111).lv5490(30).lv5490ST1(1).l30notificationTBL(0).l30trapStrTBL(2).l30trapInternalTimestamp(2)

Syntax : DisplayString

Range: Up to 20 characters

Description: Date and time of error occurrence

● index 5

OID : leader(20111).lv5490(30).lv5490ST1(1).l30notificationTBL(0).l30trapStrTBL(2).l30trapInputCh(3)

Syntax : INTEGER

Range: a(1), b(2), c(3), d(4)

Description: Input channel where the error occurred (A/B/C/D)

● index 6

OID : leader(20111).lv5490(30).lv5490ST1(1).l30notificationTBL(0).l30trapStrTBL(2).l30trapInputSignal(4)

Syntax : DisplayString

Range: Up to 20 characters

Description: Format information

- index 7

OID : leader(20111).lv5490(30).lv5490ST1(1).I30notificationTBL(0).
I30trapContentTBL(1).I30trapErrorTBL(1).X
Or
leader(20111).lv5490(30).lv5490ST1(1).I30notificationTBL(0).
I30trapContentTBL(1).I30trapNormalTBL(2).X

Syntax : DisplayString

Range: Up to 16 characters

Description: OID indicating the error and error information character string (see the table below)

When an error occurs, OID and error information character string of I30notificationTBL(0).I30trapContentTBL(1).I30trapErrorTBL(1).X (see the table below)

When an error restores, OID and error information character string of I30notificationTBL(0).I30trapContentTBL(1). I30trapNormalTBL(2).X (see the table below)

- index 8

OID : leader(20111).lv5490(30).lv5490ST1(1).I30notificationTBL(0).
I30trapStrTBL(2).I30trapCableLen(5)

Syntax : INTEGER

Range: 1 to 32767

Description: Cable length

Output only when index7 is I30trapContentTBL(1).I30TrapErrorTBL(1). I30trapErrorCableWarn(5)

20. ETHERNET REMOTE CONTROL

● I30notificationTBL(1) group

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30trapContentTBL	I30notificationTBL.1		-	-
I30trapErrorTBL	I30trapContentTBL.1	Aggregate	-	-
I30trapErrorFan	I30TrapErrorTBL.1	-	-	FAN_STOP
I30trapErrorNoSignal	I30TrapErrorTBL.2	-	-	NO_SIGNAL
I30trapErrorUnknown	I30TrapErrorTBL.3	-	-	FORMAT_UNKNOWN
I30trapErrorCable	I30TrapErrorTBL.4	-	-	CABLE_ERR
I30trapErrorCableWarn	I30TrapErrorTBL.5	-	-	CABLE_WAR
I30trapErrorAudioSample	I30TrapErrorTBL.6	-	-	A_SMPL_ERR
I30trapErrorAudioInhibit	I30TrapErrorTBL.7	-	-	A_INH_ERR
I30trapErrorAudioDbn	I30TrapErrorTBL.8	-	-	A_DBN_ERR
I30trapErrorAudioParity	I30TrapErrorTBL.9	-	-	A_PRTY_ERR
I30trapErrorAudioBch	I30TrapErrorTBL.10	-	-	A_BCH_ERR
I30trapErrorSdiLevelC	I30TrapErrorTBL.11	-	-	LVL_C_ERR
I30trapErrorSdiLevelY	I30TrapErrorTBL.12	-	-	LVL_Y_ERR
I30trapErrorSdiBlack	I30TrapErrorTBL.13	-	-	BLK_ERR
I30trapErrorSdiFreeze	I30TrapErrorTBL.14	-	-	FRZ_ERR
I30trapErrorSdiCompGamut	I30TrapErrorTBL.15	-	-	CGMUT_ERR
I30trapErrorSdiGamut	I30TrapErrorTBL.16	-	-	GMUT_ERR
I30trapErrorSdiAncParity	I30TrapErrorTBL.17	-	-	PRTY_ERR
I30trapErrorSdiAncChecksum	I30TrapErrorTBL.18	-	-	CHK_ERR
I30trapErrorSdiLineNumber	I30TrapErrorTBL.19	-	-	LINE_ERR
I30trapErrorSdiIllegalCode	I30TrapErrorTBL.20	-	-	ILLEGAL_ERR
I30trapErrorSdiTrsCode	I30TrapErrorTBL.21	-	-	TRS_C_ERR
I30trapErrorSdiTrsPos	I30TrapErrorTBL.22	-	-	TRS_P_ERR
I30trapErrorSdiEdh	I30TrapErrorTBL.23	-	-	EDH_ERR
I30trapErrorSdiCrc	I30TrapErrorTBL.24	-	-	CRC_ERR
I30trapErrorSdiDualDelay	I30TrapErrorTBL.25	-	-	SDI_DELAY_ERR
I30trapErrorSdiFrequency	I30TrapErrorTBL.26	-	-	FREQ_ERR
I30trapErrorEyeSdUndershoot	I30TrapErrorTBL.27	-	-	EYE_SD_OF_ERR
I30trapErrorEyeSdOvershoot	I30TrapErrorTBL.28	-	-	EYE_SD_OR_ERR
I30trapErrorEyeSdCjit	I30TrapErrorTBL.29	-	-	EYE_SD_C_JIT_ERR
I30trapErrorEyeSdTjit	I30TrapErrorTBL.30	-	-	EYE_SD_T_JIT_ERR
I30trapErrorEyeSdTrTf	I30TrapErrorTBL.31	-	-	EYE_SD_TR_TF_ERR
I30trapErrorEyeSdTf	I30TrapErrorTBL.32	-	-	EYE_SD_TF_ERR
I30trapErrorEyeSdTr	I30TrapErrorTBL.33	-	-	EYE_SD_TR_ERR
I30trapErrorEyeSdAmp	I30TrapErrorTBL.34	-	-	EYE_SD_AMP_ERR
I30trapErrorEyeHdUndershoot	I30TrapErrorTBL.35	-	-	EYE_HD_OF_ERR
I30trapErrorEyeHdOvershoot	I30TrapErrorTBL.36	-	-	EYE_HD_OR_ERR
I30trapErrorEyeHdCjit	I30TrapErrorTBL.37	-	-	EYE_HD_C_JIT_ERR
I30trapErrorEyeHdTjit	I30TrapErrorTBL.38	-	-	EYE_HD_T_JIT_ERR
I30trapErrorEyeHdTrTf	I30TrapErrorTBL.39	-	-	EYE_HD_TR_TF_ERR
I30trapErrorEyeHdTf	I30TrapErrorTBL.40	-	-	EYE_HD_TF_ERR
I30trapErrorEyeHdTr	I30TrapErrorTBL.41	-	-	EYE_HD_TR_ERR
I30trapErrorEyeHdAmp	I30TrapErrorTBL.42	-	-	EYE_HD_AMP_ERR
I30trapErrorEye3gUndershoot	I30TrapErrorTBL.43	-	-	EYE_3G_OF_ERR
I30trapErrorEye3gOvershoot	I30TrapErrorTBL.44	-	-	EYE_3G_OR_ERR
I30trapErrorEyeCjit	I30TrapErrorTBL.45	-	-	EYE_3G_C_JIT_ERR
I30trapErrorEyeTjit	I30TrapErrorTBL.46	-	-	EYE_3G_T_JIT_ERR
I30trapErrorEyeTrTf	I30TrapErrorTBL.47	-	-	EYE_3G_TR_TF_ERR
I30trapErrorEyeTf	I30TrapErrorTBL.48	-	-	EYE_3G_TF_ERR
I30trapErrorEyeTr	I30TrapErrorTBL.49	-	-	EYE_3G_TR_ERR
I30trapErrorEyeAmp	I30TrapErrorTBL.50	-	-	EYE_3G_AMP_ERR
I30trapErrorAudioValidity	I30TrapErrorTBL.51	-	-	VAL:XX (where XX is the channel on which

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
				the error is occurring in hexadecimal notation)
I30trapErrorAudioCrc	I30TrapErrorTBL.52	-	-	CRC:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorAudioClip	I30TrapErrorTBL.53	-	-	CLIP:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorAudioMute	I30TrapErrorTBL.54	-	-	MUTE:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorAudioLevel	I30TrapErrorTBL.55	-	-	OVER:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorAudioParity	I30TrapErrorTBL.56	-	-	PAR:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorAudioCode	I30TrapErrorTBL.57	-	-	CODE:XX (where XX is the channel on which the error is occurring in hexadecimal notation)
I30trapErrorSdiBlackSt2	I30TrapErrorTBL.58	-	-	BLK_ST2_ERR
I30trapErrorSdiFreezeSt2	I30TrapErrorTBL.59	-	-	FRZ_ST2_ERR
I30trapErrorSdiLevelC_St2	I30TrapErrorTBL.69	-	-	LVL_C_ST2_ERR
I30trapErrorSdiLevelY_St2	I30TrapErrorTBL.70	-	-	LVL_Y_ST2_ERR
I30trapErrorSdiCompGamutSt2	I30TrapErrorTBL.71	-	-	CGMUT_ST2_ERR
I30trapErrorSdiGamutSt2	I30TrapErrorTBL.72	-	-	GMUT_ST2_ERR
I30trapNormalTBL	I30trapContentTBL.2	Aggregate	-	-
I30trapNormalFan	I30TrapNormalTBL.1	-	-	FAN_STOP
I30trapNormalNoSignal	I30TrapNormalTBL.2	-	-	NO_SIGNAL
I30trapNormalUnknown	I30TrapNormalTBL.3	-	-	FORMAT_UNKNOWN
I30trapNormalCable	I30TrapNormalTBL.4	-	-	CABLE_ERR
I30trapNormalCableWarn	I30TrapNormalTBL.5	-	-	CABLE_WAR
I30trapNormalAudioSample	I30TrapNormalTBL.6	-	-	A_SMPL_ERR
I30trapNormalAudioInhibit	I30TrapNormalTBL.7	-	-	A_INH_ERR
I30trapNormalAudioDbn	I30TrapNormalTBL.8	-	-	A_DBN_ERR
I30trapNormalAudioParity	I30TrapNormalTBL.9	-	-	A_PRTY_ERR
I30trapNormalAudioBch	I30TrapNormalTBL.10	-	-	A_BCH_ERR
I30trapNormalSdiLevelC	I30TrapNormalTBL.11	-	-	LVL_C_ERR

20. ETHERNET REMOTE CONTROL

MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30trapNormalSdiLevelY	I30TrapNormalTBL.1 2	-	-	LVL_Y_ERR
I30trapNormalSdiBlack	I30TrapNormalTBL.1 3	-	-	BLK_ERR
I30trapNormalSdiFreeze	I30TrapNormalTBL.1 4	-	-	FRZ_ERR
I30trapNormalSdiCompGamut	I30TrapNormalTBL.1 5	-	-	CGMUT_ERR
I30trapNormalSdiGamut	I30TrapNormalTBL.1 6	-	-	GMUT_ERR
I30trapNormalSdiAncParity	I30TrapNormalTBL.1 7	-	-	PRTY_ERR
I30trapNormalSdiAncChecksum	I30TrapNormalTBL.1 8	-	-	CHK_ERR
I30trapNormalSdiLineNumber	I30TrapNormalTBL.1 9	-	-	LINE_ERR
I30trapNormalSdiIllegalCode	I30TrapNormalTBL.2 0	-	-	ILLEGAL_ERR
I30trapNormalSdiTrsCode	I30TrapNormalTBL.2 1	-	-	TRS_C_ERR
I30trapNormalSdiTrsPos	I30TrapNormalTBL.2 2	-	-	TRS_P_ERR
I30trapNormalSdiEdh	I30TrapNormalTBL.2 3	-	-	EDH_ERR
I30trapNormalSdiCrc	I30TrapNormalTBL.2 4	-	-	CRC_ERR
I30trapNormalSdiDualDelay	I30TrapNormalTBL.2 5	-	-	SDI_DELAY_ERR
I30trapNormalSdiFrequency	I30TrapNormalTBL.2 6	-	-	FREQ_ERR
I30trapNormalEyeSdUndershoot	I30TrapNormalTBL.2 7	-	-	EYE_SD_OF_ERR
I30trapNormalEyeSdOvershoot	I30TrapNormalTBL.2 8	-	-	EYE_SD_OR_ERR
I30trapNormalEyeSdCjit	I30TrapNormalTBL.2 9	-	-	EYE_SD_C_JIT_ERR
I30trapNormalEyeSdTjit	I30TrapNormalTBL.3 0	-	-	EYE_SD_T_JIT_ERR
I30trapNormalEyeSdTrTf	I30TrapNormalTBL.3 1	-	-	EYE_SD_TR_TF_ERR
I30trapNormalEyeSdTf	I30TrapNormalTBL.3 2	-	-	EYE_SD_TF_ERR
I30trapNormalEyeSdTr	I30TrapNormalTBL.3 3	-	-	EYE_SD_TR_ERR
I30trapNormalEyeSdAmp	I30TrapNormalTBL.3 4	-	-	EYE_SD_AMP_ERR
I30trapNormalEyeHdUndershoot	I30TrapNormalTBL.3 5	-	-	EYE_HD_OF_ERR
I30trapNormalEyeHdOvershoot	I30TrapNormalTBL.3 6	-	-	EYE_HD_OR_ERR
I30trapNormalEyeHdCJit	I30TrapNormalTBL.3 7	-	-	EYE_HD_C_JIT_ERR
I30trapNormalEyeHdTJit	I30TrapNormalTBL.3 8	-	-	EYE_HD_T_JIT_ERR
I30trapNormalEyeHdTrTf	I30TrapNormalTBL.3 9	-	-	EYE_HD_TR_TF_ERR
I30trapNormalEyeHdTf	I30TrapNormalTBL.4	-	-	EYE_HD_TF_ERR

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
	0			
I30trapNormalEyeHdTr	I30TrapNormalTBL.4 1	-	-	EYE_HD_TR_ERR
I30trapNormalEyeHdAmp	I30TrapNormalTBL.4 2	-	-	EYE_HD_AMP_ERR
I30trapNormalEye3gUndershoot	I30TrapNormalTBL.4 3	-	-	EYE_3G_OF_ERR
I30trapNormalEye3gOvershoot	I30TrapNormalTBL.4 4	-	-	EYE_3G_OR_ERR
I30trapNormalEyeCJit	I30TrapNormalTBL.4 5	-	-	EYE_3G_C_JIT_ERR
I30trapNormalEyeTJit	I30TrapNormalTBL.4 6	-	-	EYE_3G_T_JIT_ERR
I30trapNormalEyeTrTf	I30TrapNormalTBL.4 7	-	-	EYE_3G_TR_TF_ERR
I30trapNormalEyeTf	I30TrapNormalTBL.4 8	-	-	EYE_3G_TF_ERR
I30trapNormalEyeTr	I30TrapNormalTBL.4 9	-	-	EYE_3G_TR_ERR
I30trapNormalEyeAmp	I30TrapNormalTBL.5 0	-	-	EYE_3G_AMP_ERR
I30trapNormalAudioValidity	I30TrapNormalTBL.5 1	-	-	VAL
I30trapNormalAudioCrc	I30TrapNormalTBL.5 2	-	-	CRC
I30trapNormalAudioClip	I30TrapNormalTBL.5 3	-	-	CLIP
I30trapNormalAudioMute	I30TrapNormalTBL.5 4	-	-	MUTE
I30trapNormalAudioLevel	I30TrapNormalTBL.5 5	-	-	OVER
I30trapNormalAudioParity	I30TrapNormalTBL.5 6	-	-	PAR
I30trapNormalAudioCode	I30TrapNormalTBL.5 7	-	-	CODE
I30trapNormalSdiBlackSt2	I30TrapNormalTBL.5 8	-	-	BLK_ST2_ERR
I30trapNormalSdiFreezeSt2	I30TrapNormalTBL.5 9	-	-	FRZ_ST2_ERR
I30trapNormalNoError	I30TrapNormalTBL.6 0	-	-	NO_ERROR
I30trapErrorSdiLevelC_St2	I30TrapNormalTBL.6 9	-	-	LVL_C_ST2_ERR
I30trapErrorSdiLevelY_St2	I30TrapNormalTBL.7 0	-	-	LVL_Y_ST2_ERR
I30trapErrorSdiCompGamutSt2	I30TrapNormalTBL.7 1	-	-	CGMUT_ST2_ERR
I30trapErrorSdiGamutSt2	I30TrapNormalTBL.7 2	-	-	GMUT_ST2_ERR
I30trapStrTBL	I30notificationTBL.2	Aggregate	-	-
I30trapCounter	I30trapStrTBL.1	INTEGER	R/O	1 to 4294967295
I30trapInternalTimestamp	I30trapStrTBL.2	DisplayString	R/O	Date and time
I30trapInputCh	I30trapStrTBL.3	INTEGER	R/O	1 = a 2 = b 3 = c 4 = d
I30trapInputSignal	I30trapStrTBL.4	DisplayString	R/O	Signal format

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MIB	OID	SYNTAX	ACCESS	VALUE/RANGE
I30trapCableLen	I30trapStrTBL.5	INTEGER	R/O	0 to 32767

20. ETHERNET REMOTE CONTROL

● Error information

Error Number (*1)	Error Information Character String	Description
1	FAN_STOP	Fan stop detection
2	NO_SIGNAL	No input signal detection
3	FORMAT_UNKNOWN	Unknown signal format detection
4	CABLE_ERR	Cable length measurement error detection
5	CABLE_WAR	Cable length measurement warning detection
6	A_SMPL_ERR	(EMB AUDIO) SAMPLE error detection
7	A_INH_ERR	(EMB AUDIO) INH error detection
8	A_DBN_ERR	(EMB AUDIO) DBN error detection
9	A_PRTY_ERR	(EMB AUDIO) PARITY error detection
10	A_BCH_ERR	(EMB AUDIO) BCH error detection
11	LVL_C_ERR	Chroma level error detection
12	LVL_Y_ERR	Luminance level error detection
13	BLK_ERR	Black error detection
14	FRZ_ERR	Freeze error detection
15	CGMUT_ERR	Composite gamut error detection
16	GMUT_ERR	Gamut error detection
17	PRTY_ERR	Parity error detection
18	CHK_ERR	Checksum error detection
19	LINE_ERR	Line number error detection
20	ILLEGAL_ERR	Illegal command error detection
21	TRS_C_ERR	TRS Code error detection
22	TRS_P_ERR	TRS Pos error detection
23	EDH_ERR	EDH error detection
24	CRC_ERR	CRC error detection
25	SDI_DELAY_ERR	SDI delay error detection
26	FREQ_ERR	FREQUENCY error detection
27	EYE_SD_OF_ERR	(EYE) SD Overshoot Falling error detection
28	EYE_SD_OR_ERR	(EYE) SD Overshoot Rising error detection
29	EYE_SD_C_JIT_ERR	(EYE) SD Current jitter error detection
30	EYE_SD_T_JIT_ERR	(EYE) SD Timing jitter error detection
31	EYE_SD_TR_TF_ERR	(EYE) SD Delta Time error detection
32	EYE_SD_TF_ERR	(EYE) SD Fall Time error detection
33	EYE_SD_TR_ERR	(EYE) SD Rise Time error detection
34	EYE_SD_AMP_ERR	(EYE) SD amplitude error detection
35	EYE_HD_OF_ERR	(EYE) HD Overshoot Falling error detection
36	EYE_HD_OR_ERR	(EYE) HD Overshoot Rising error detection
37	EYE_HD_C_JIT_ERR	(EYE) HD Current jitter error detection
38	EYE_HD_T_JIT_ERR	(EYE) HD Timing jitter error detection
39	EYE_HD_TR_TF_ERR	(EYE) HD Delta Time error detection
40	EYE_HD_TF_ERR	(EYE) HD Fall Time error detection
41	EYE_HD_TR_ERR	(EYE) HD Rise Time error detection
42	EYE_HD_AMP_ERR	(EYE) HD amplitude error detection
43	EYE_3G_OF_ERR	(EYE) 3G Overshoot Falling error detection
44	EYE_3G_OR_ERR	(EYE) 3G Overshoot Rising error detection
45	EYE_3G_C_JIT_ERR	(EYE) 3G Current jitter error detection
46	EYE_3G_T_JIT_ERR	(EYE) 3G Timing jitter error detection
47	EYE_3G_TR_TF_ERR	(EYE) 3G Delta Time error detection
48	EYE_3G_TF_ERR	(EYE) 3G Fall Time error detection
49	EYE_3G_TR_ERR	(EYE) 3G Rise Time error detection
50	EYE_3G_AMP_ERR	(EYE) 3G amplitude error detection
51	VAL	(AUDIO) VALIDITY error detection
52	CRC	(AUDIO) CRC error detection
53	CLIP	(AUDIO) CLIP error detection
54	MUTE	(AUDIO) MUTE error detection

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Error Number (*1)	Error Information Character String	Description
55	OVER	(AUDIO) LEVEL error detection
56	PAR	(AUDIO) PARITY error detection
57	CODE	(AUDIO) CODE VIOLATION error detection
58	BLK_ST2_ERR	Black error detection (stream2)
59	FRZ_ST2_ERR	Freeze error detection (stream2)
60 (*2)	NO_ERROR	No error
61	EYE_12G_OF_ERR	(EYE) 12G Overshoot Falling error detection
62	EYE_12G_OR_ERR	(EYE) 12G Overshoot Rising error detection
63	EYE_12G_C_JIT_ERR	(EYE) 12G Current jitter error detection
64	EYE_12G_T_JIT_ERR	(EYE) 12G Timing jitter error detection
65	EYE_12G_TR_TF_ERR	(EYE) 12G Delta Time error detection
66	EYE_12G_TF_ERR	(EYE) 12G Fall Time error detection
67	EYE_12G_TR_ERR	(EYE) 12G Rise Time error detection
68	EYE_12G_AMP_ERR	(EYE) 12G amplitude error detection
69	LVL_C_ST2_ERR	Chroma level error detection (stream2)
70	LVL_Y_ST2_ERR	Luminance level error detection (stream2)
71	CGMUT_ST2_ERR	Composite gamut error detection (stream2)
72	GMUT_ST2_ER	Gamut error detection (stream2)

*1 Each OID number of I30TrapErrorTBL(1) and I30TrapNormalTBL(2) of I30trapContentTBL(1)

*2 I30trapNormalNoError(60) is only defined for I30trapNormalTBL(2) and is not available for I30trapErrorTBL(1).

20.4 HTTP Server Feature

You can use this feature to control the LV 5490 from a web browser on a PC in the same manner as you would control the LV 5490 from the panel.

20.4.1 Operating Environment

The following web browsers have been confirmed to work.

- Internet Explorer Ver.11.0
- Mozilla Firefox Ver.37.0.2

20.4.2 Precautions

- After you press a key in the web browser interface, wait for the screen to update before you perform the next operation. The screen cannot redraw fast enough to keep up with consecutive key presses. In this situation, a completely gray screen may be displayed temporarily. (After a few seconds the screen will return to normal.)
- When you are using the HTTP server feature, perform as few panel operations on the LV 5490 as possible. The LV 5490's internal processing load increases when it is redrawing the web browser screen, so there is a lag of 1 to 2 seconds from the time that you perform panel operations on the LV 5490 to the time that the operations are actually carried out.
- The HTTP server feature only supports a single connection to a PC at any one time. Multiple simultaneous connections are not supported.

20.4.3 Procedure

1. Configure the Ethernet settings on the LV 5490's ETHERNET SETUP tab.

Set the IP Address, and set HTTP Server Select to ON.

See section 7.2.2, "Configuring Ethernet Settings."

SYS → F•2 SYSTEM SETUP → F•2 PREV TAB or F•3 NEXT TAB →



Figure 20-4 ETHERNET SETUP display

2. Press F•1 COMPLETE.
3. Connect the LV 5490's Ethernet port to the network.
4. Start the web browser on your PC.
The HTTP server feature uses JavaScript.
Enable JavaScript in your web browser.
5. In the address box, enter "http://" and the IP address that you set in step 1.

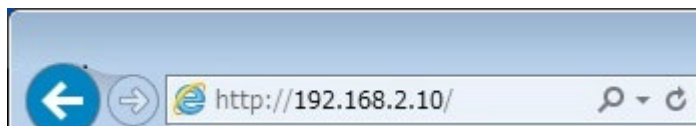


Figure 20-5 IP address input

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- When the display selection page appears, select Web Server (with Display) or Web Server.

If you select Web Server (with Display), a screen much like the screen on the LV 5490 is displayed, but responses to operations can take 4 to 10 seconds, and auto display updating is every 10 seconds.

If you select Web Server, a screen is not displayed, but the response time is reduced to 2 to 3 seconds.

Select the mode that meets your needs.

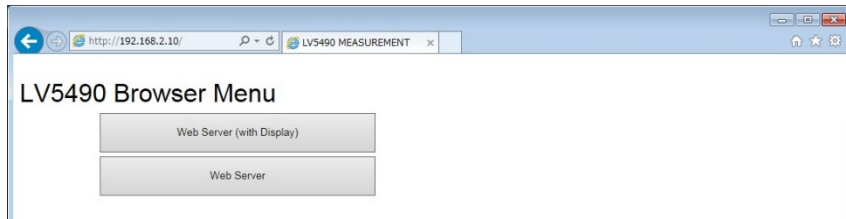


Figure 20-6 Display selection page

- After the main screen is displayed, you can click the keys in the web browser to control the LV 5490.

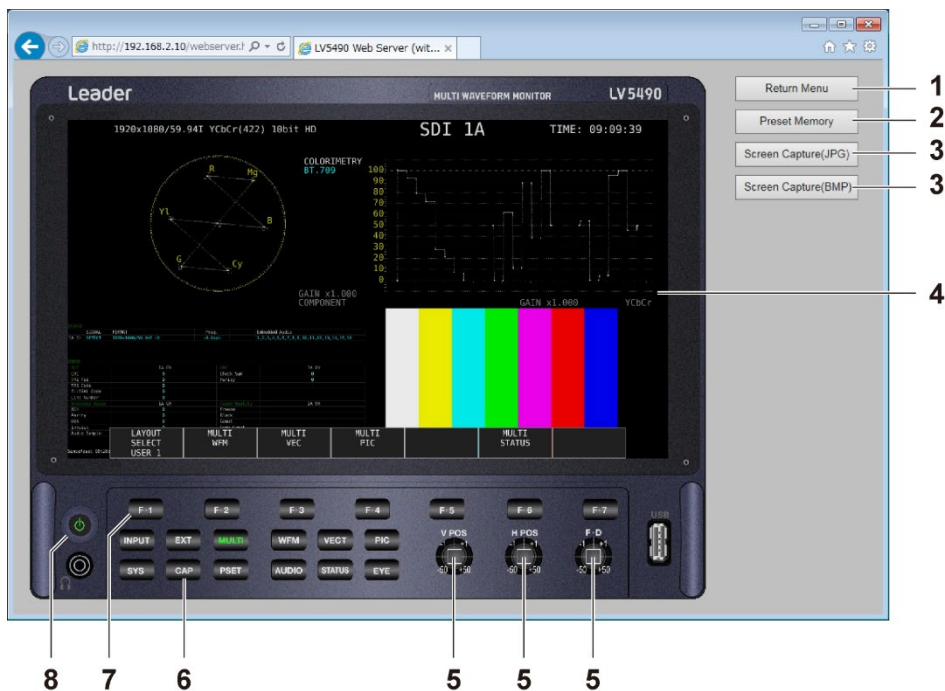


Figure 20-7 Main display

20. ETHERNET REMOTE CONTROL

Table 20-2 Main display description

No.	Name	Description
1	Return Menu	Click this to return to the display selection page.
2	Preset Memory	Click this to perform the same action as when the PSET key is held down. See chapter 9, "PRESET SETTINGS."
3	Screen Capture(JPG) Screen Capture(BMP) (*1)	Click this to capture the currently displayed screen and display it in a different window. You can use the window's menu to save the screen as a jpeg file or a .bmp file.
4	Display screen (*1)	Click this to update the screen. (The screen updates automatically every 10 seconds even if you do not click the screen.)
5	V POS H POS F•D	-50, -1, +1, and +50 are assigned to the four areas. Click the square in the center of each of these controls to perform the same operation as pressing the corresponding control on the LV 5490. On tab menus and some screens, -50 operates as -5 and +50 operates as +5. Also, in places where the setting resolution is a value other than 1, the value that is set is "resolution × the setting specified by the knob."
6	CAP	Pressing the CAP key does not capture the screen correctly. Use the Screen Capture button on the Web Server (with Display).
8	Power switch	Pressing the power switch has no effect.
7	Function keys	When you use the function keys to select settings, pop-ups are displayed in the web browser, so select the option within 2 seconds of the pop-up being displayed. Also, since the function menu disappears automatically, the display and operation may not match. In this case, set MENU Auto Off for a long time in the system menu. For information on the MENU Auto Off setting, see section 7.2.1, "General Settings."

*1 Not displayed in Web Server mode.

20.5 SNTP Client Function

The LV 5490 can display time that is synchronized to an NTP server on the network.

20.5.1 Procedure

1. Configure the Ethernet settings on the LV 5490's ETHERNET SETUP tab.

Set SNTP Client Select to ON, and set the IP address, server IP address, and time zone adjustment. For details on time zone adjustment, see the next section.

Reference 7.2.2, "Configuring Ethernet Settings"

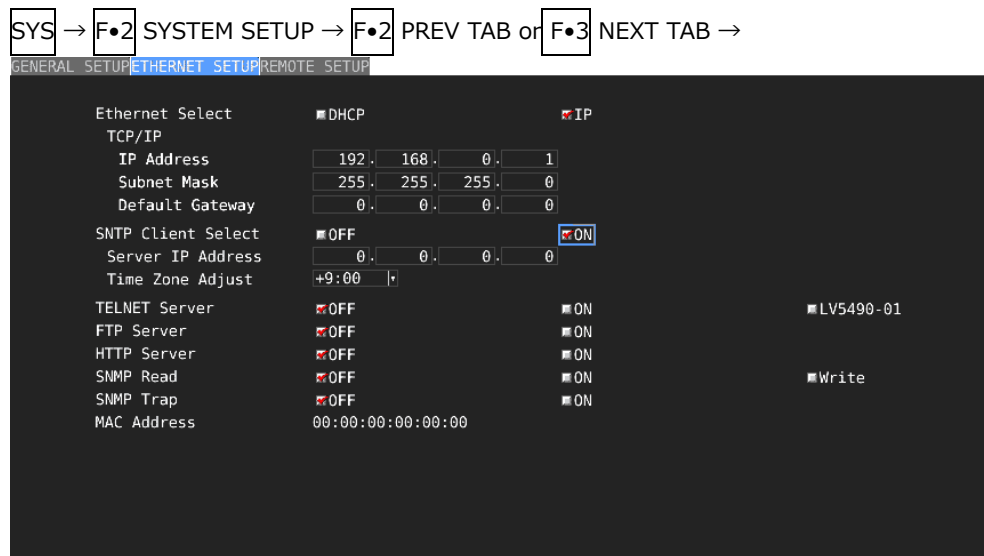


Figure 20-8 ETHERNET SETUP tab

2. Press F•1 COMPLETE.
3. Connect the LV 5490's Ethernet port to the network.

The LV 5490 connects to the NTP server at the following times.

- When you press F•1 COMPLETE in SYSTEM SETUP
- Once every approximately 10 minutes

When the LV 5490 connects normally to an NTP server, the date and time are displayed at the upper right of the screen.

Otherwise, "NTP ERR" appears next to TIME.

20.5.2 Time Adjustment Value

The date and time exchanged with an NTP (SNTP) are basically Coordinated Universal Time (UTC). Therefore, the time must be adjusted in accordance with the country or region where the device is used in. On the ETHERNET SETUP tab, set Time Zone Adjust to one of the following values.

Table 20-3 Time adjustment values

Country or region	Time Zone Adjust
Eniwetok, Kwajalein	-12:0
Midway Island, Samoa	-11:0
Hawaii	-10:0
Alaska	-9:0
Pacific Time (US & Canada), Tijuana	-8:0
Mountain Time (US & Canada), Arizona	-7:0
Central Time (US & Canada), Central America, Saskatchewan, Mexico City	-6:0
Eastern Time (US & Canada), Indiana (East), Bogota, Lima, Quito	-5:0
Atlantic Time (Canada), Caracas, La Paz, Santiago	-4:0
Greenland, Buenos Aires, Georgetown, Brasilia	-3:0
Mid-Atlantic	-2:0
Azores, Cape Verde Is.	-1:0
Greenwich Mean Time (Dublin, Edinburgh, Lisbon, London), Casablanca, Monrovia	-/+0:0
Amsterdam, Berlin, Bern, Rome, Stockholm, Sarajevo, Skopje, Sofija, Vilnius, Warsaw, Zagreb, Brussels, Madrid, Copenhagen, Paris, Belgrade, Bratislava, Budapest, Ljubljana, Prague, West Central Africa	+1:0
Athens, Istanbul, Minsk, Jerusalem, Cairo, Harare, Pretoria, Bucharest, Helsinki, Riga, Tallinn	+2:0
Kuwait, Riyadh, Nairobi, Baghdad, Moscow, Volgograd, St. Petersburg	+3:0
Abu Dhabi, Muscat, Baku, Tbilisi, Yerevan	+4:0
Islamabad, Karachi, Tashkent, Ekaterinburg	+5:0
Astana, Dhaka, Almaty, Novosibirsk, Sri Jayawardenepura	+6:0
Krasnoyarsk, Bangkok, Hanoi, Jakarta	+7:0
Irkutsk, Ulaan Bataar, Kuala Lumpur, Singapore, Perth, Taipei, Beijing, Chongqing, Hong Kong SAR, Urumqi	+8:0
Seoul, Yakutsk, Osaka, Sapporo, Tokyo	+9:0
Vladivostok, Canberra, Melbourne, Sydney, Guam, Port Moresby, Brisbane, Hobart	+10:0
Magadan, Solomon Is., New Caledonia	+11:0
Auckland, Wellington, Fiji Islands, Kamchatka, Marshall Is.	+12:0

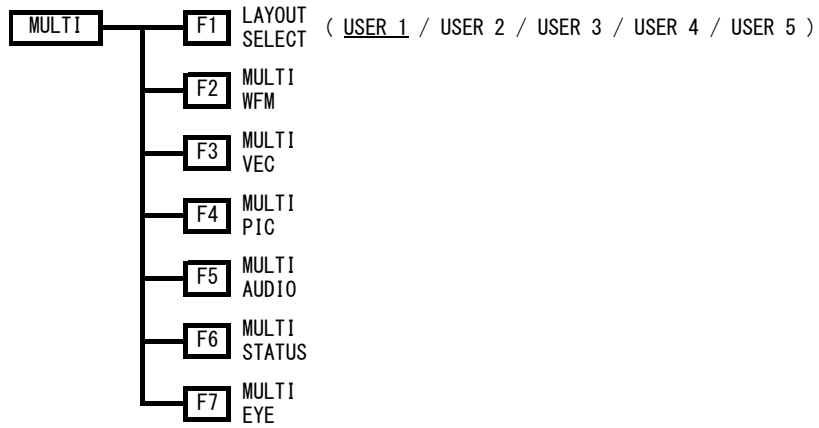
21. MENU TREE

This chapter shows the menu trees that correspond to each key.

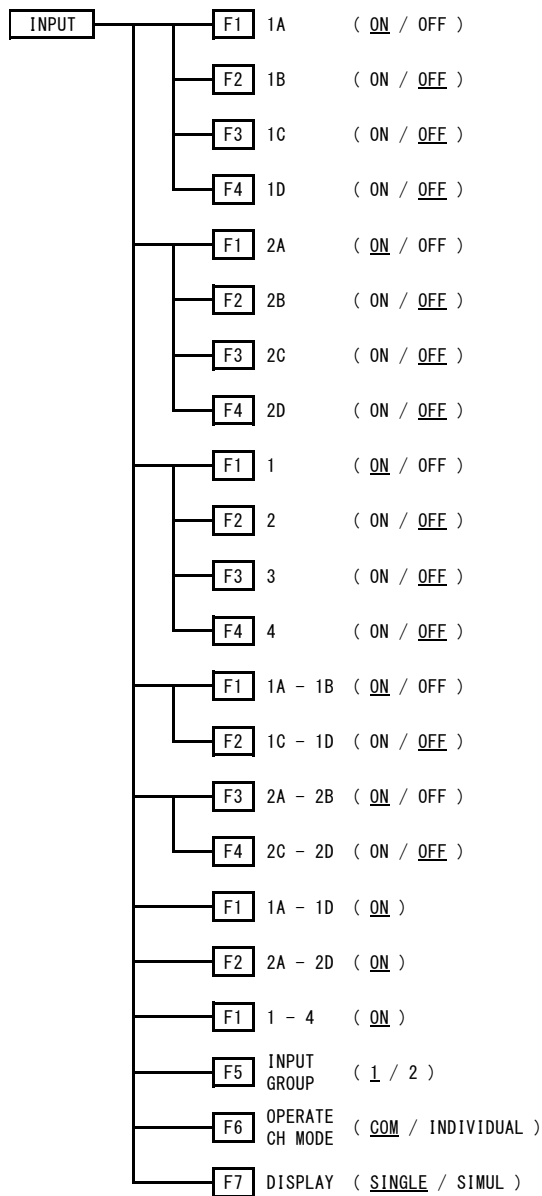
The default settings are underlined.

The menus that are displayed vary depending on the LV 5490 settings and whether a USB memory device is connected to the LV 5490.

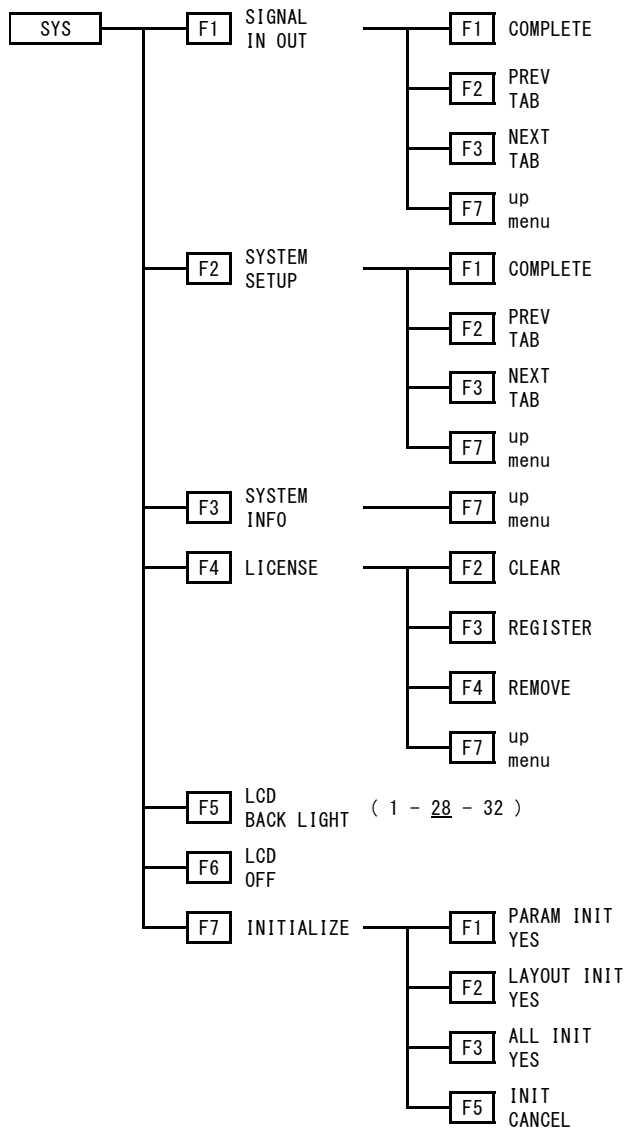
21.1 MULTI Menu



21.2 INPUT Menu

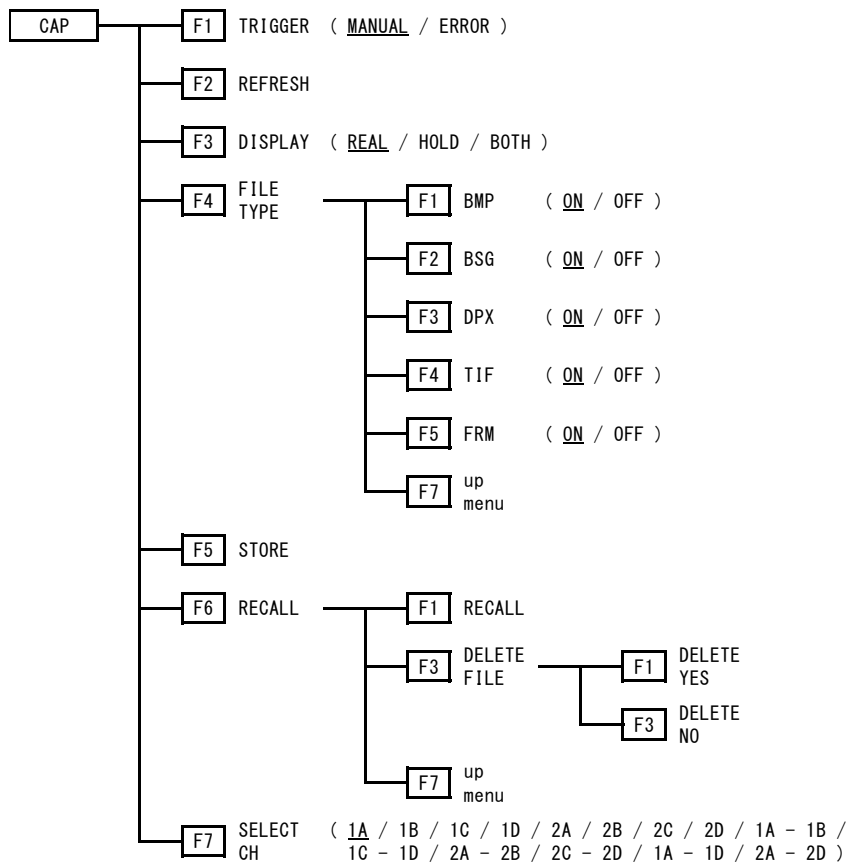


21.3 SYS Menu

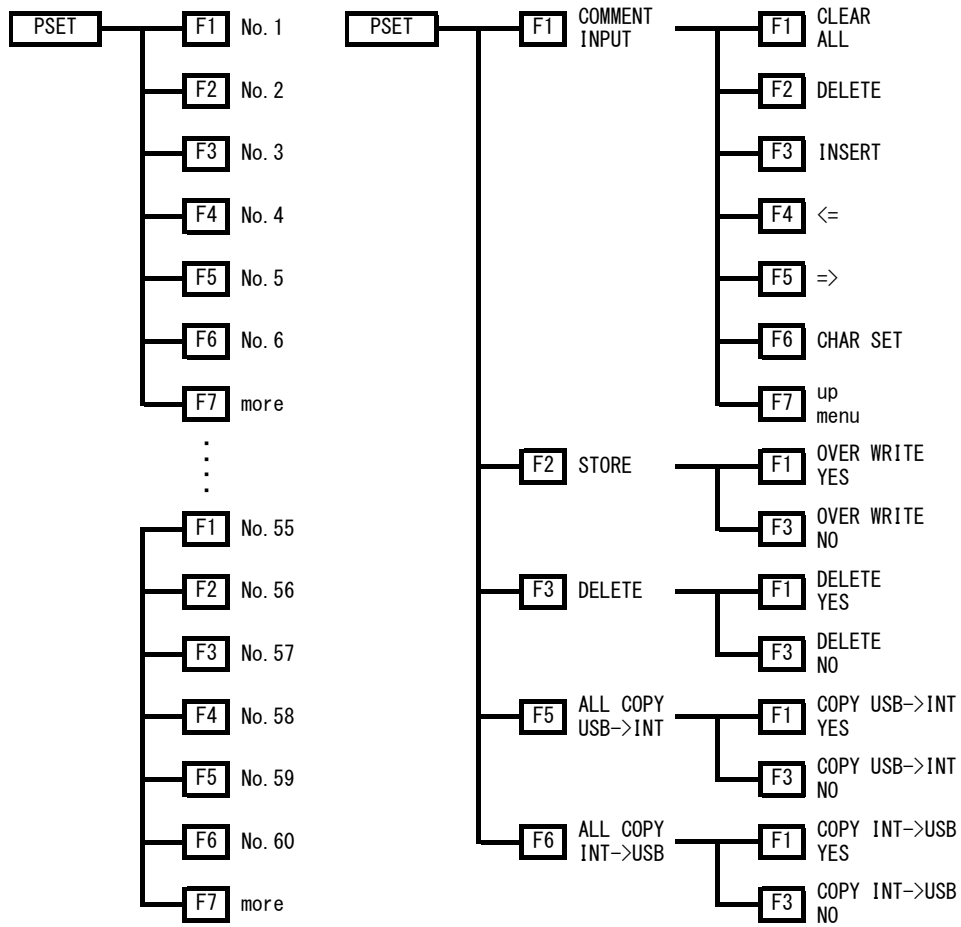


21. MENU TREE

21.4 CAP Menu

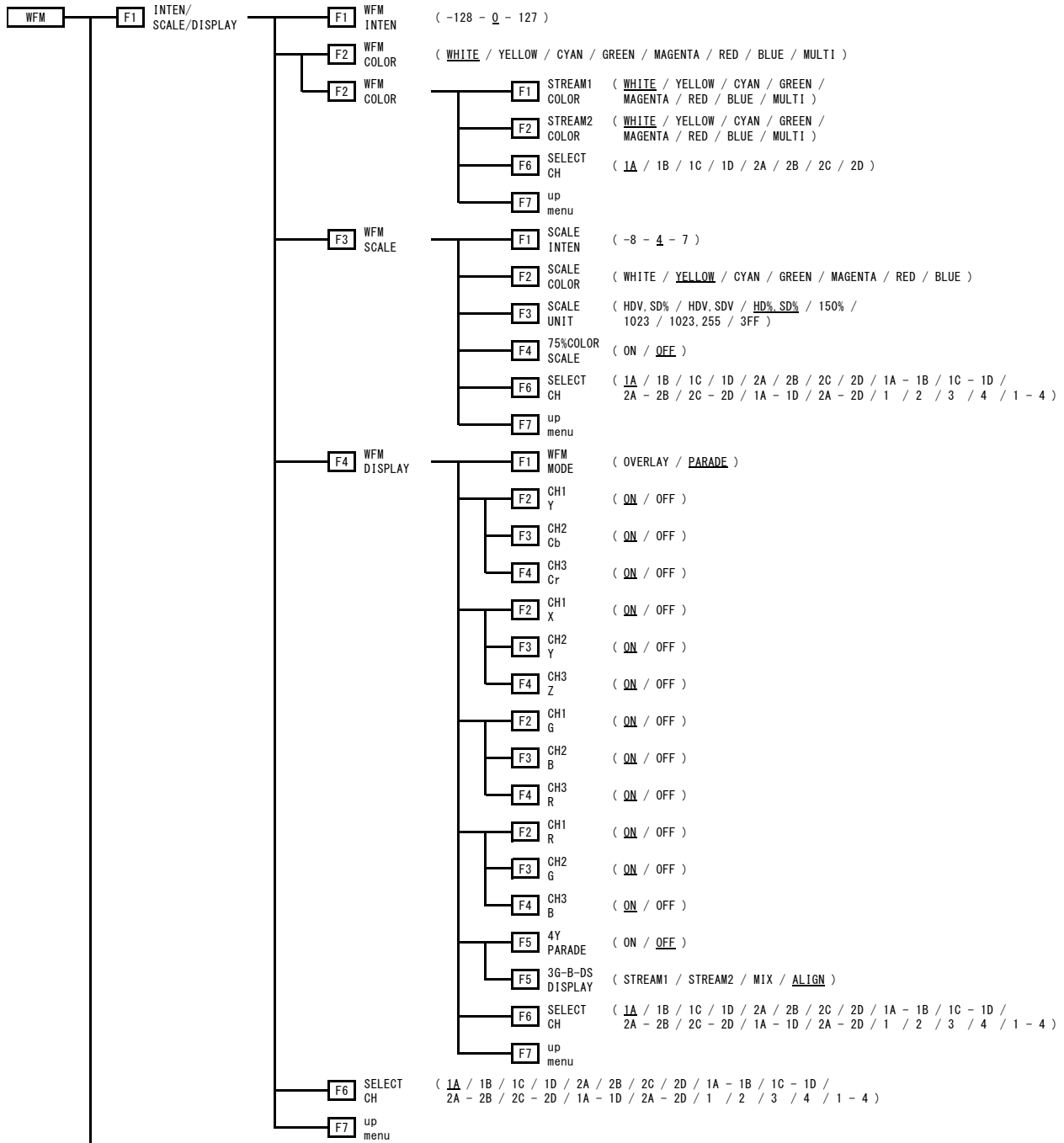


21.5 PSET Menu

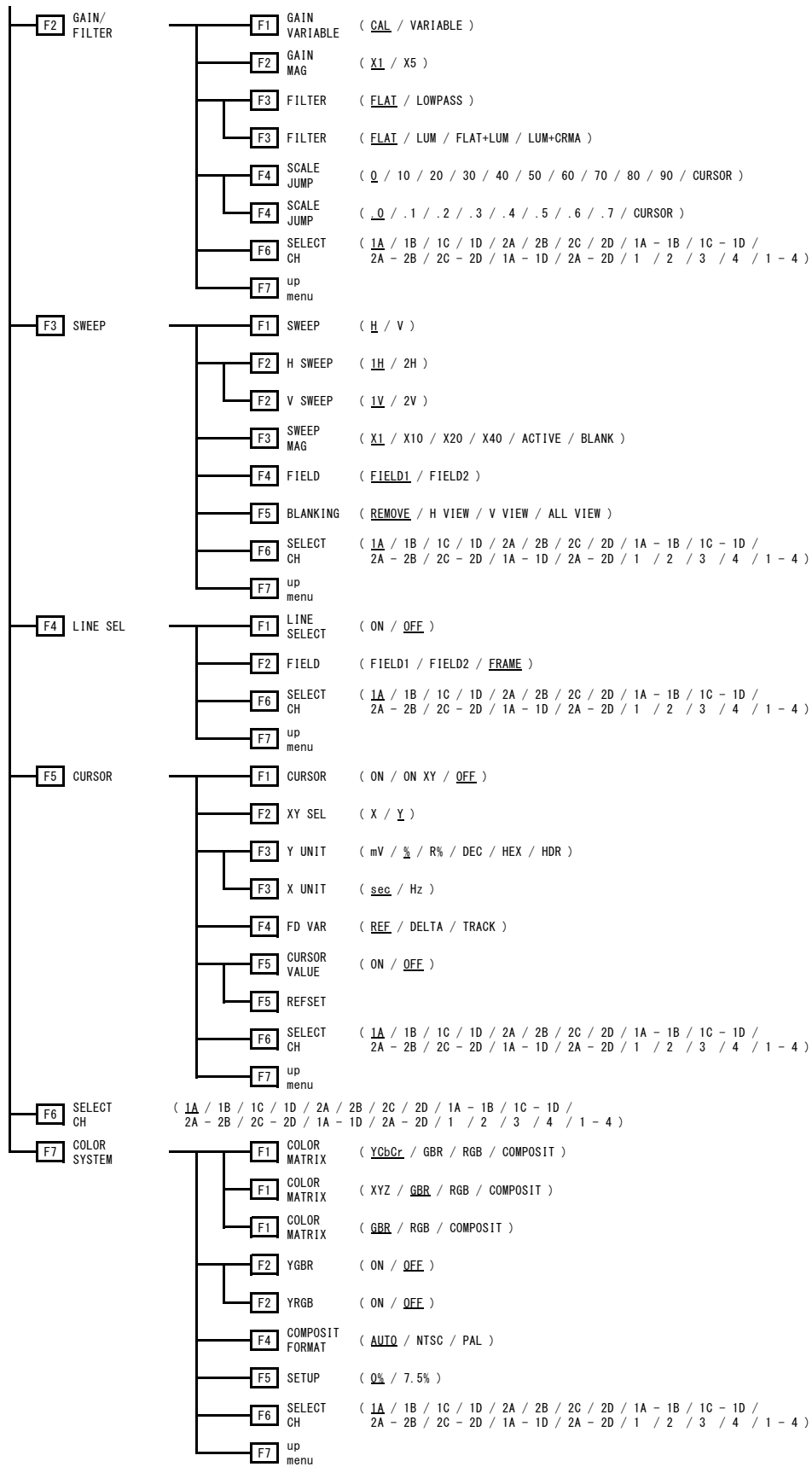


21. MENU TREE

21.6 WFM Menu

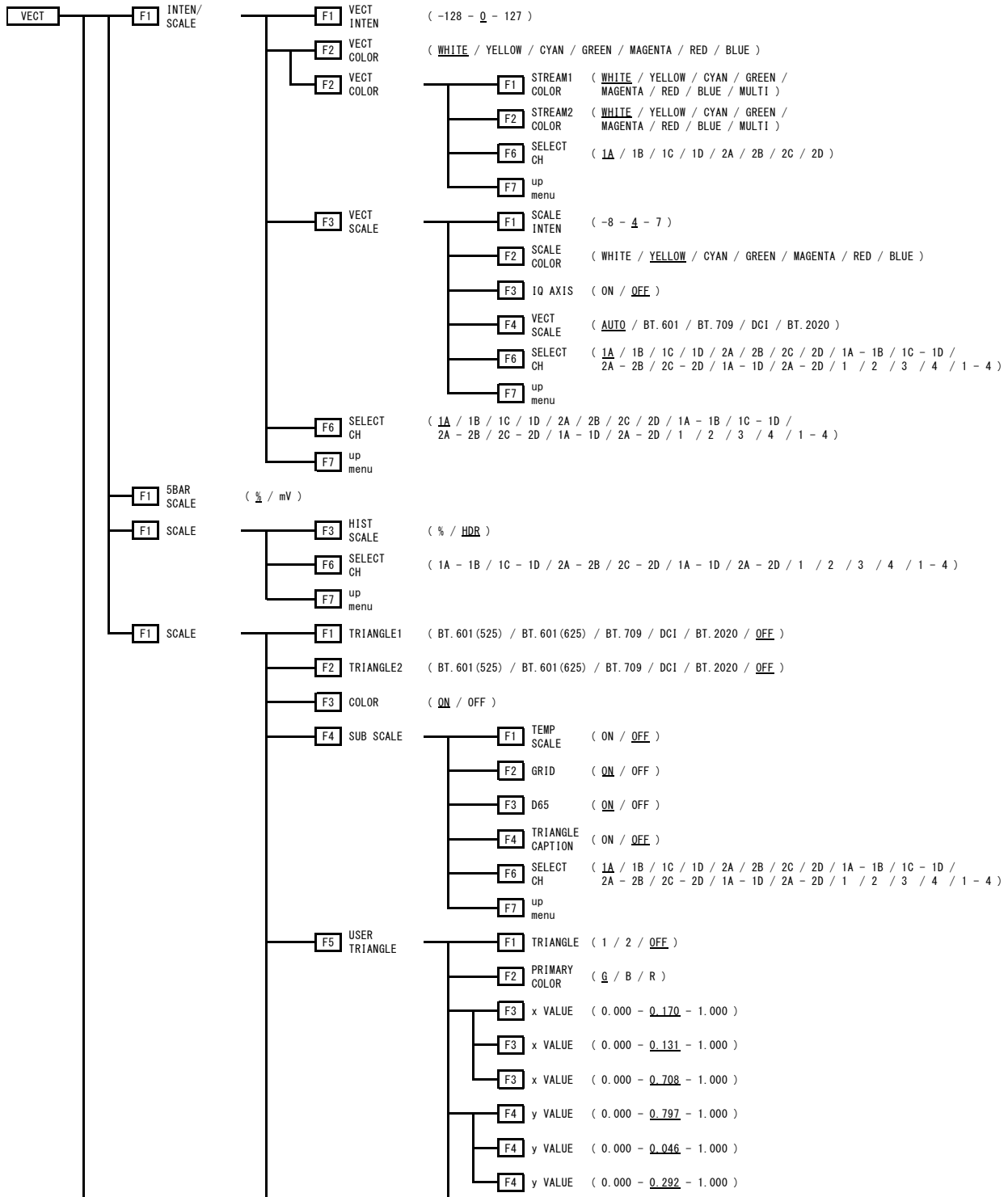


21. MENU TREE

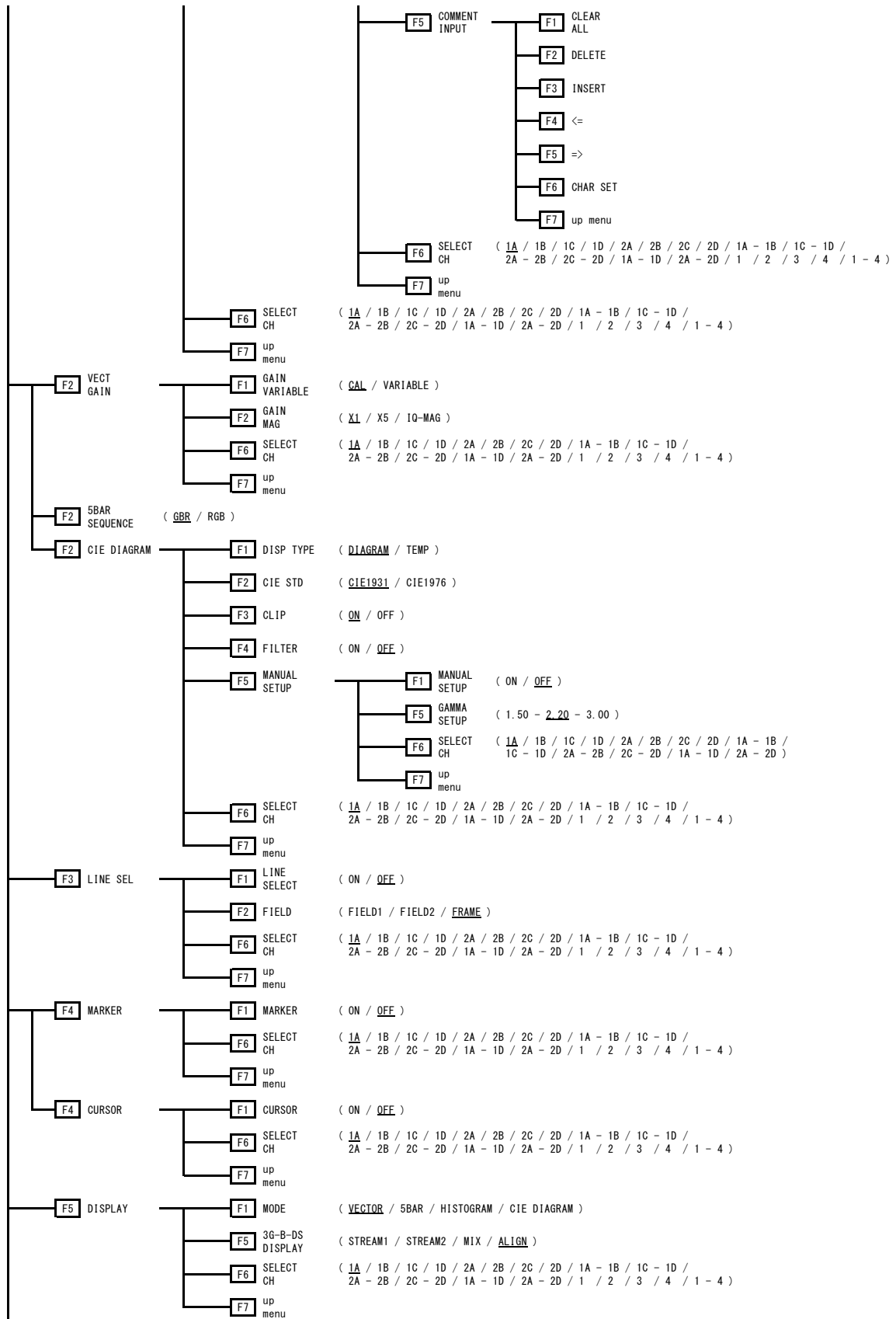


21. MENU TREE

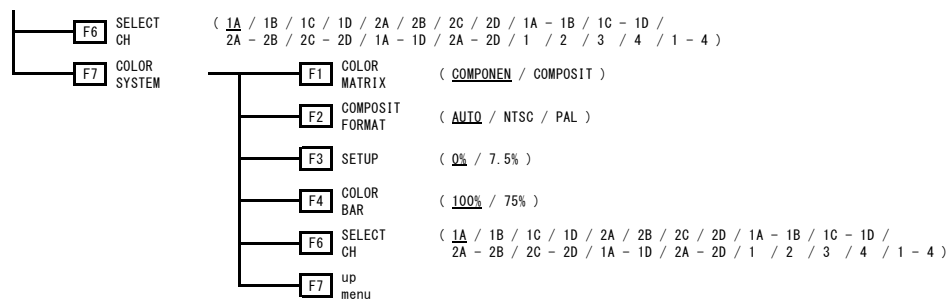
21.7 VECT Menu



21. MENU TREE

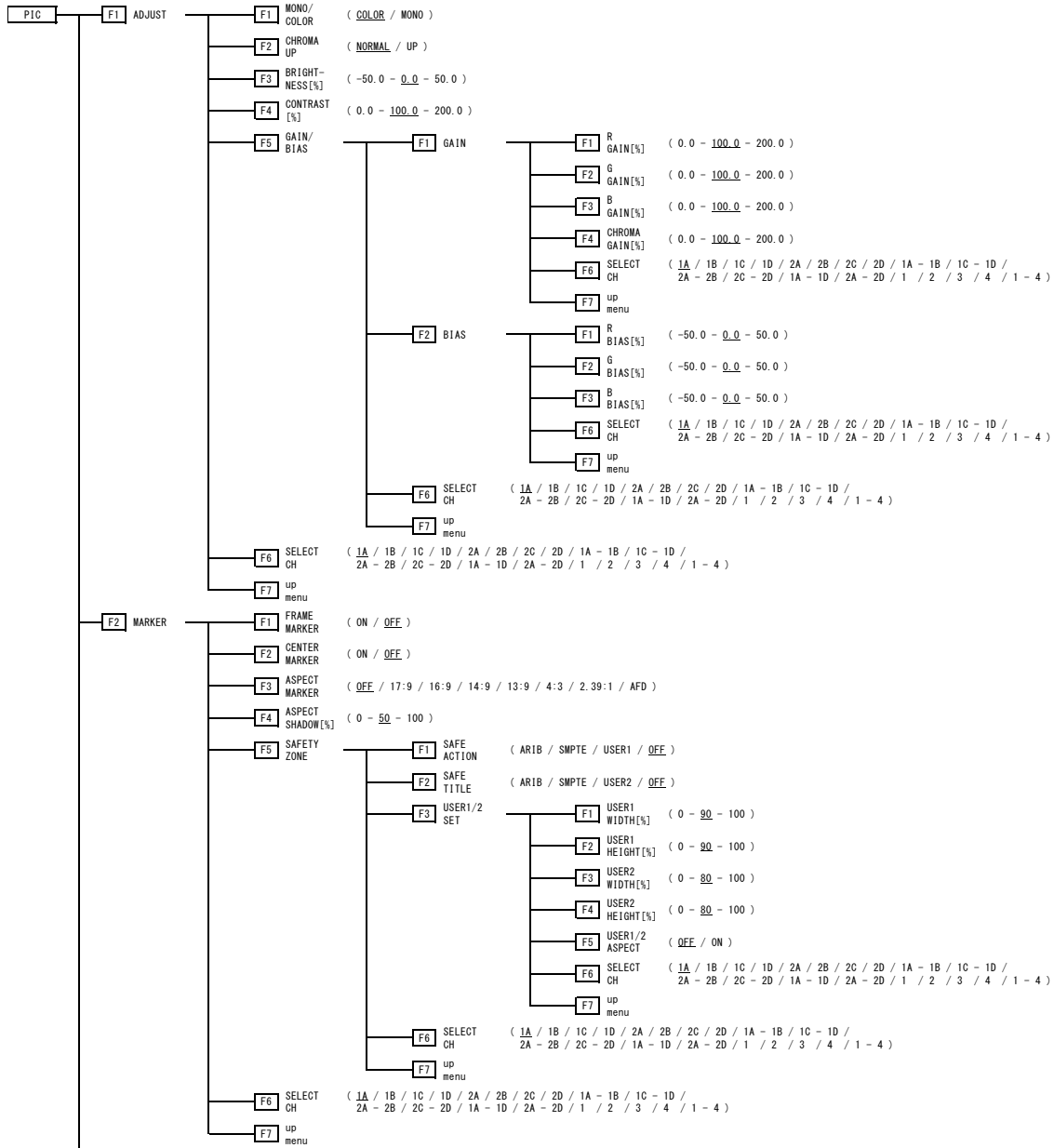


21. MENU TREE

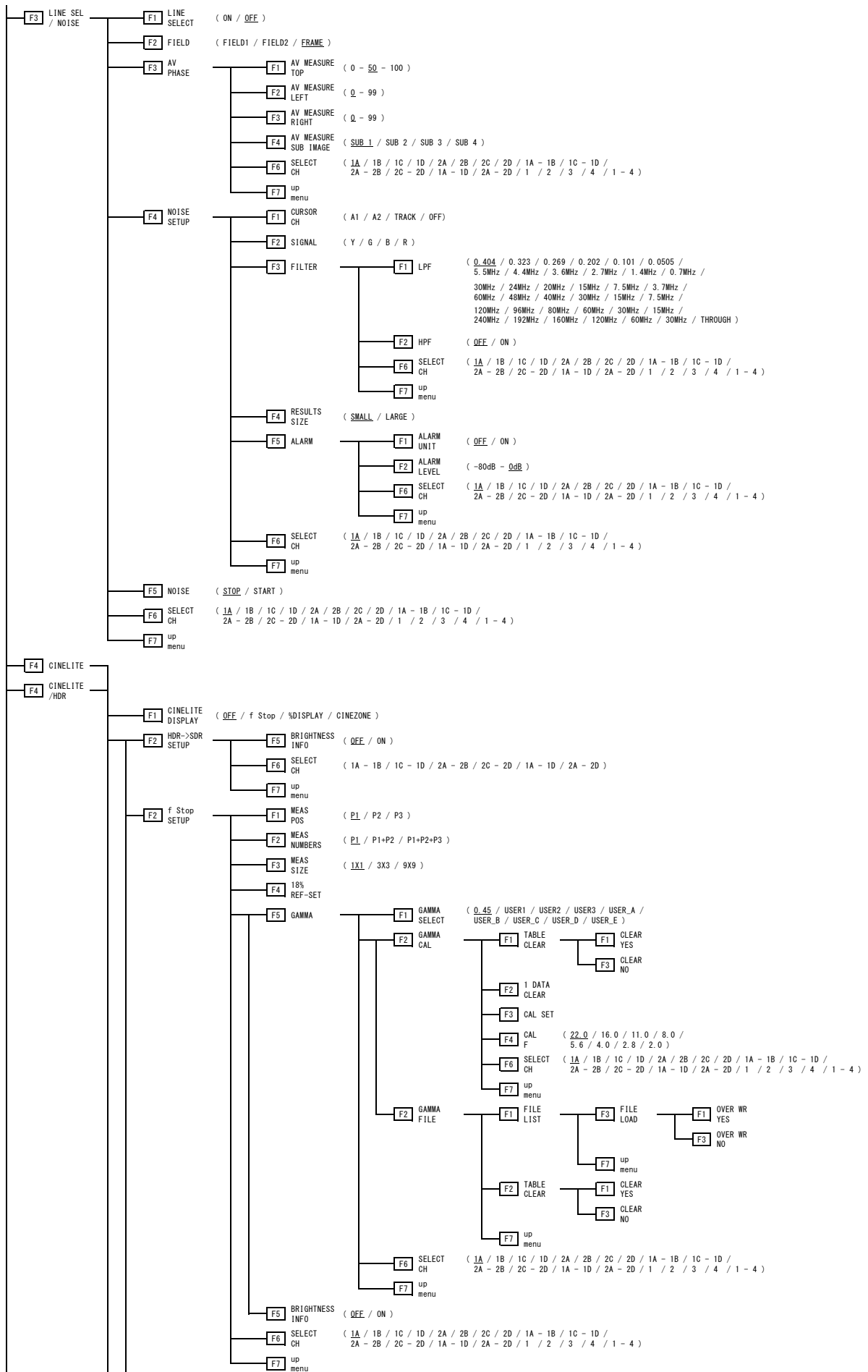


21. MENU TREE

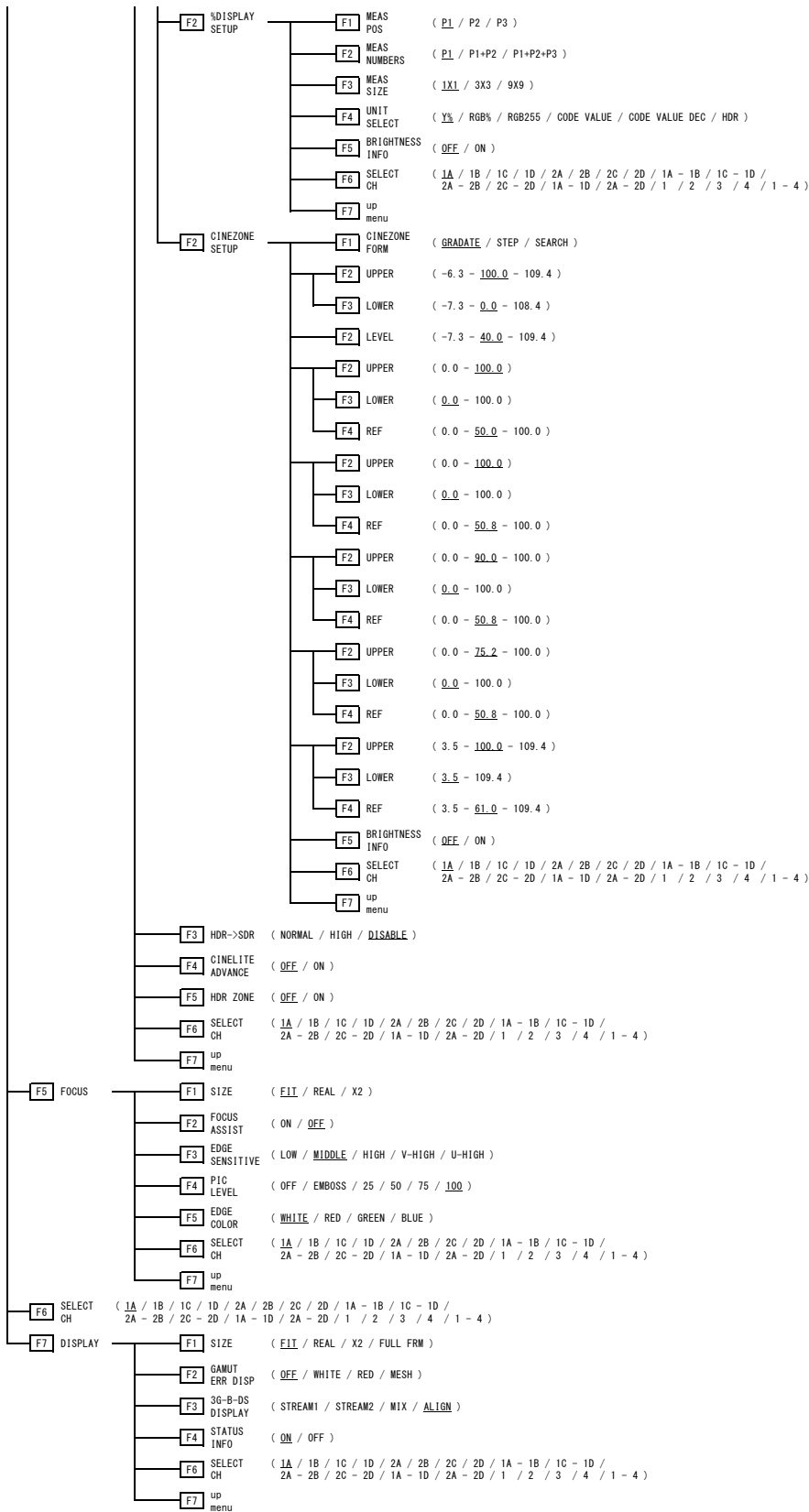
21.8 PIC Menu



21. MENU TREE

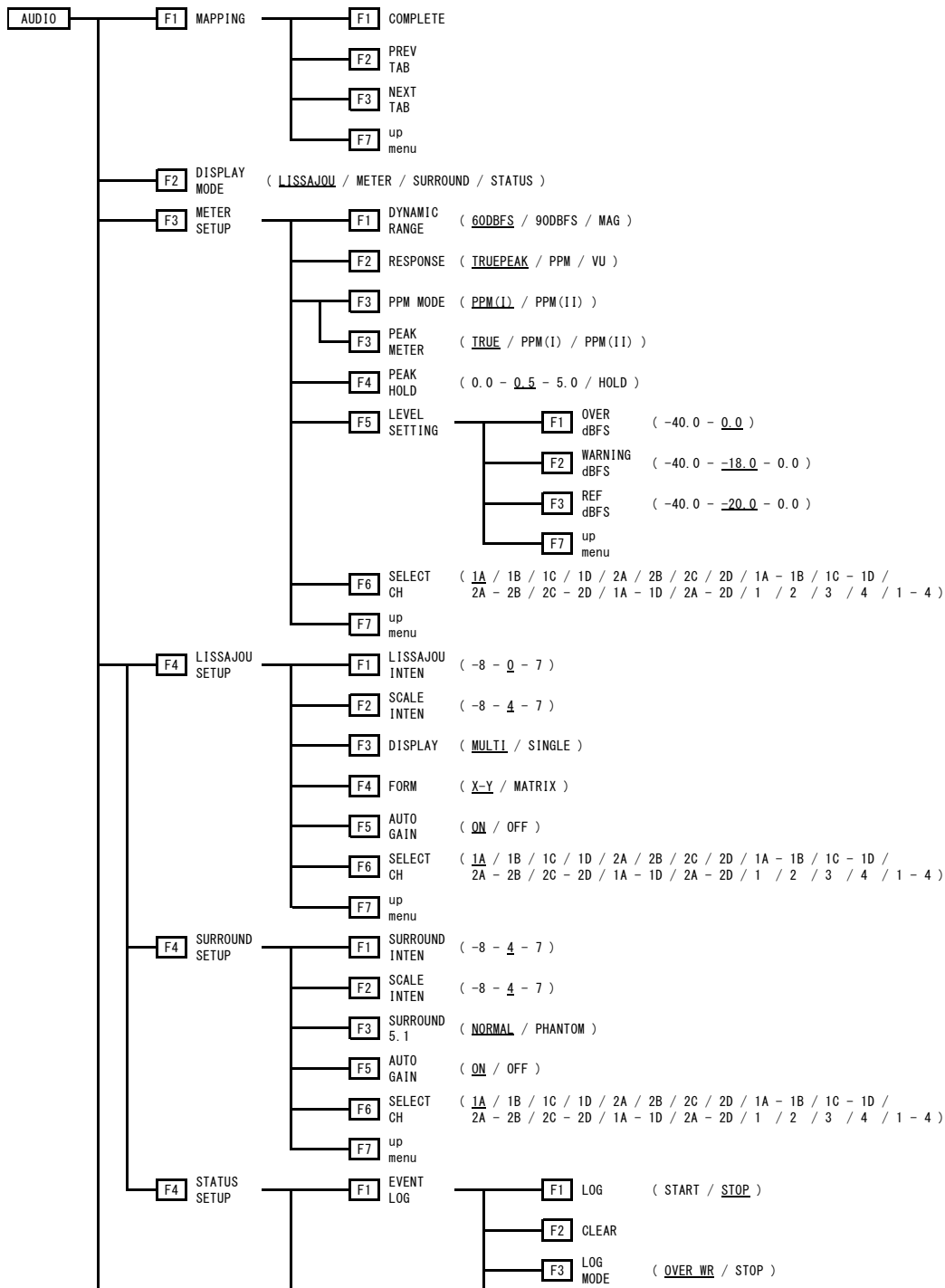


21. MENU TREE

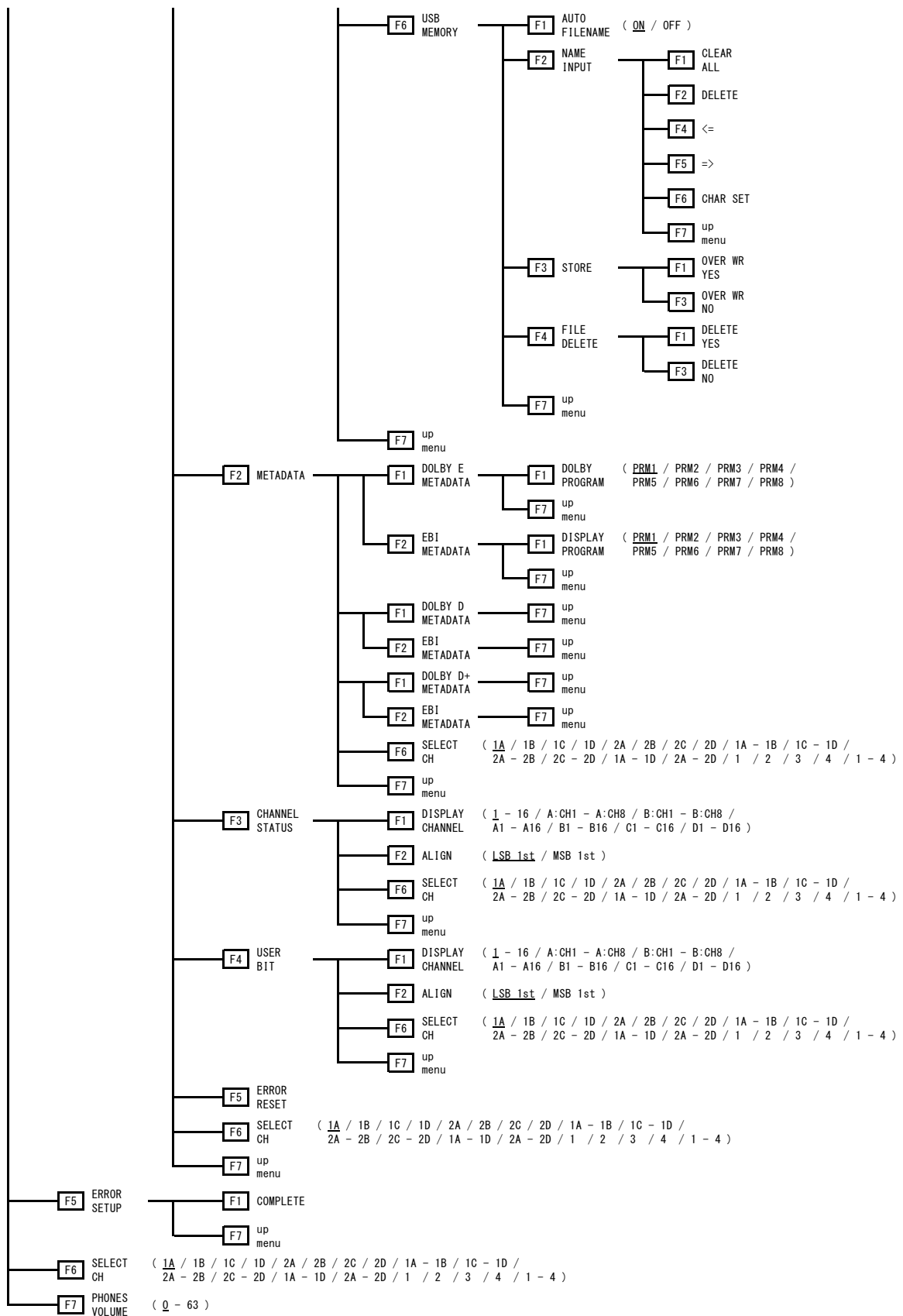


21. MENU TREE

21.9 AUDIO Menu (SER03)

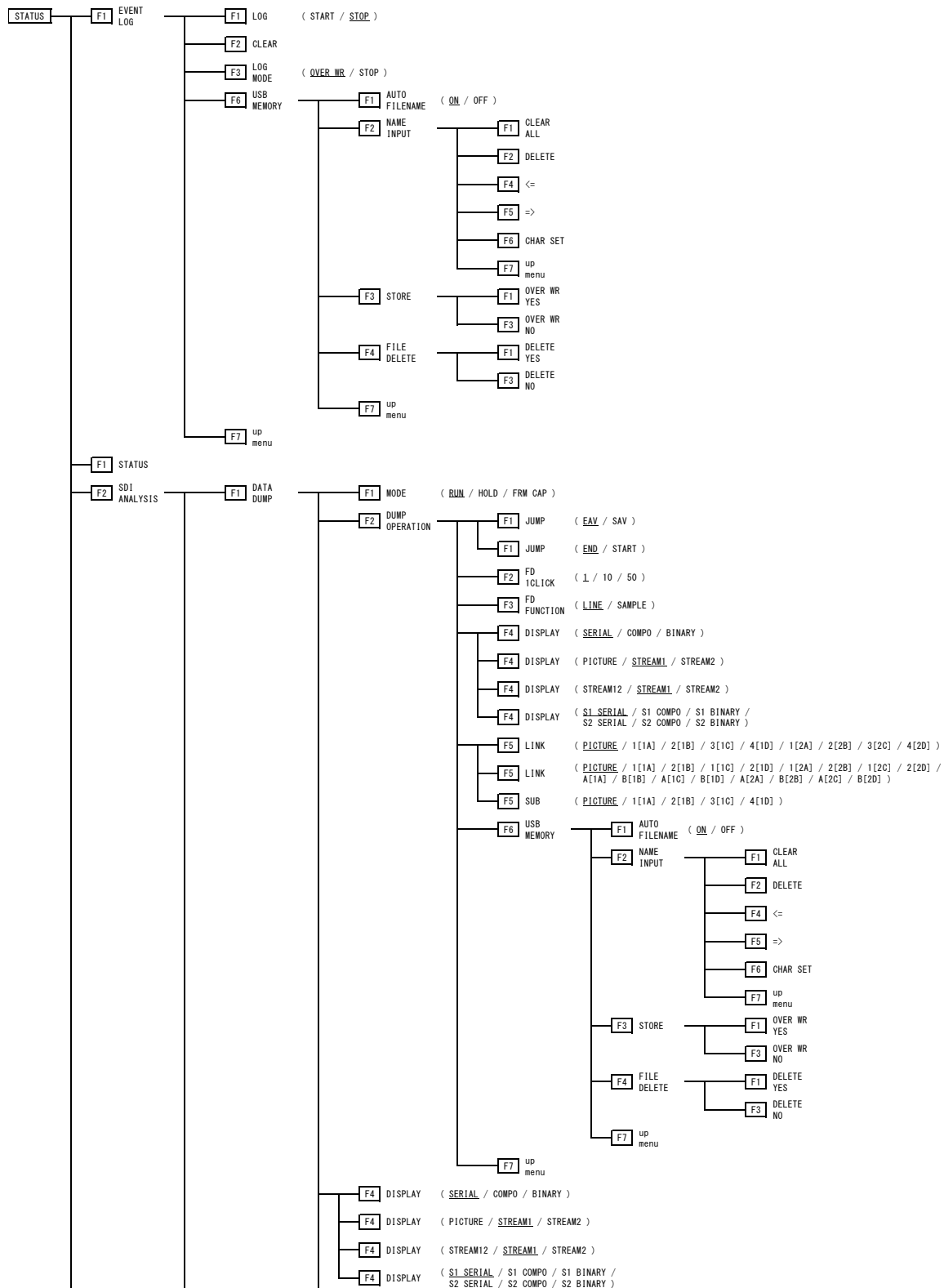


21. MENU TREE

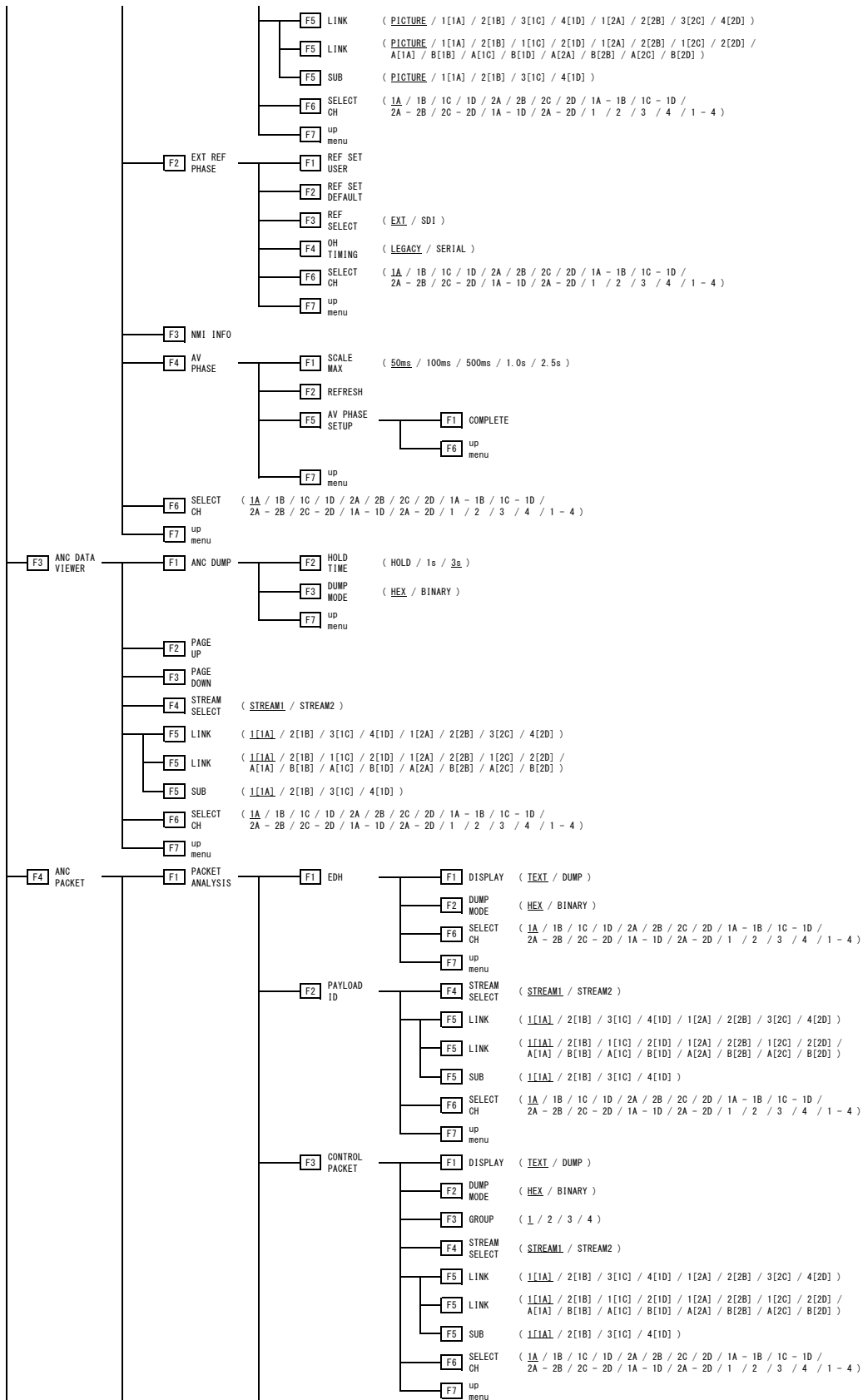


21. MENU TREE

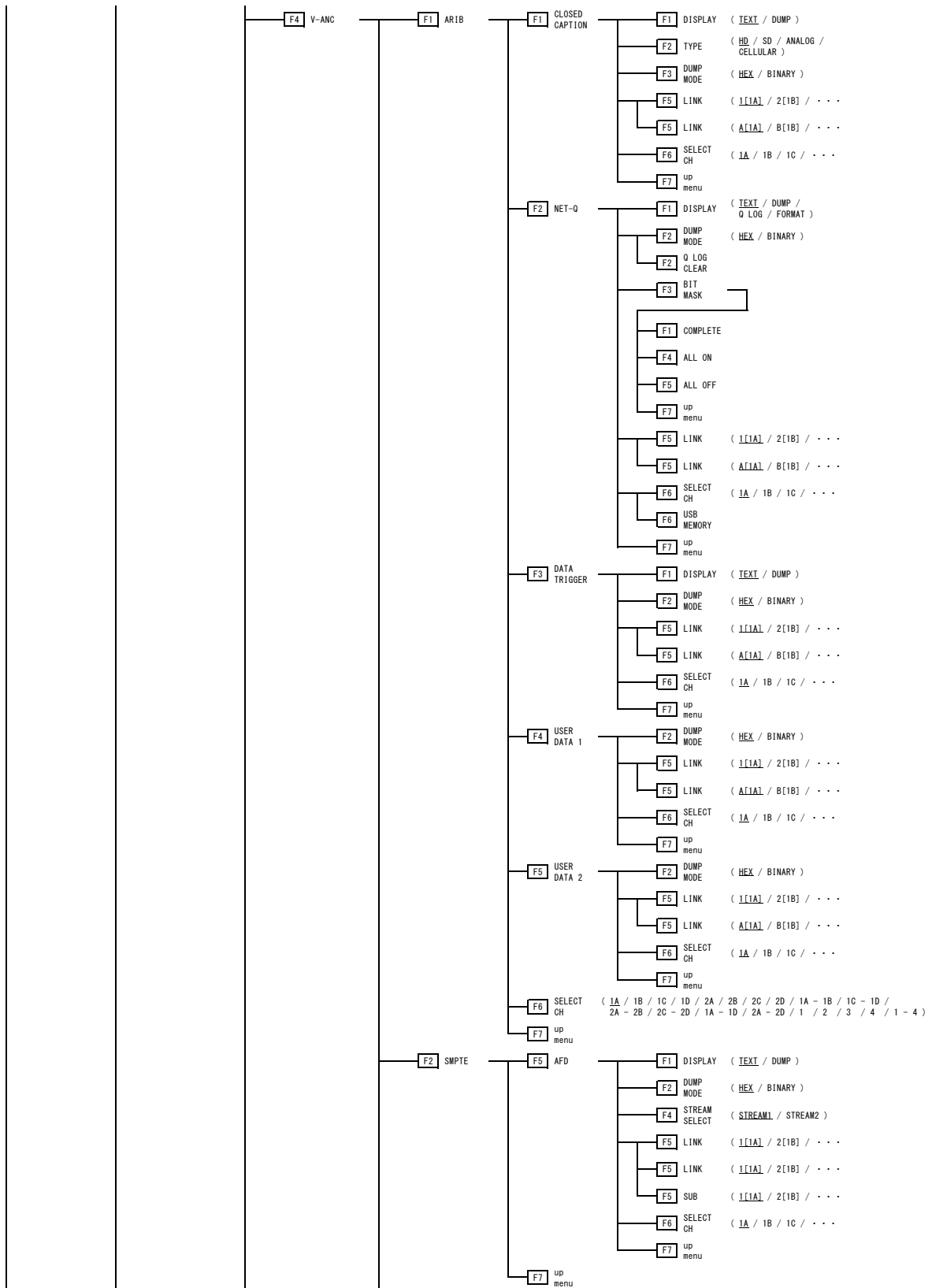
21.10 STATUS Menu



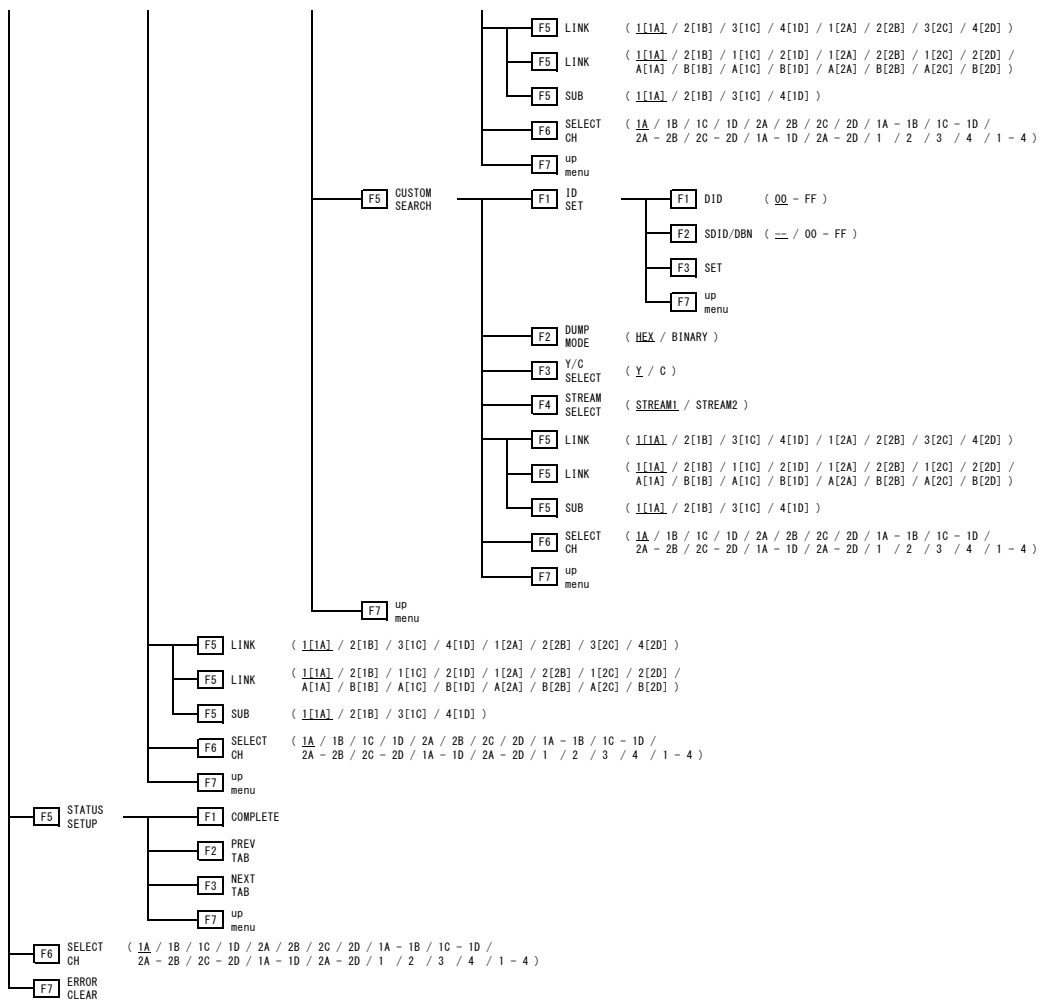
21. MENU TREE



21. MENU TREE

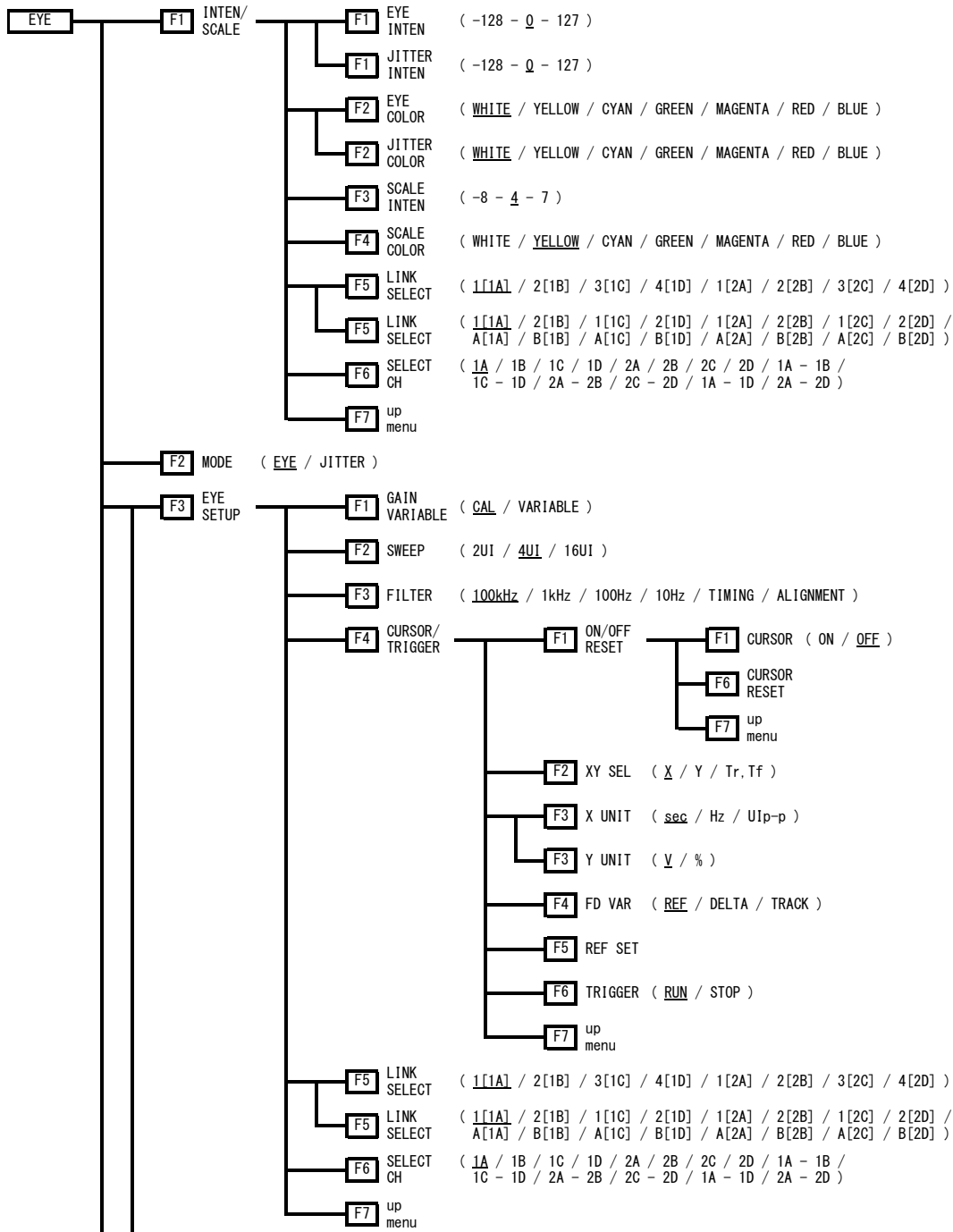


21. MENU TREE

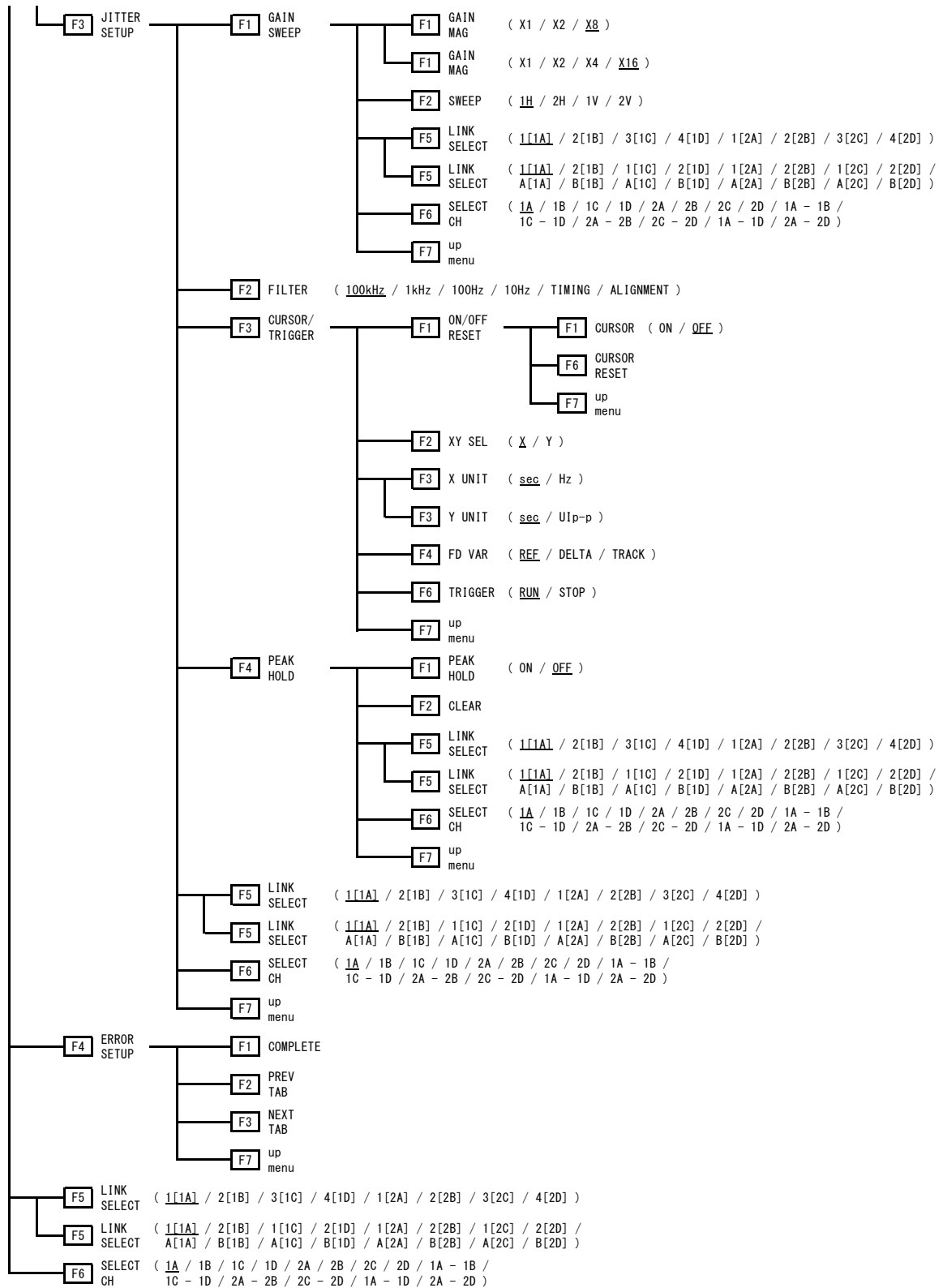


21. MENU TREE

21.11 EYE Menu (SER02/SER09)



21. MENU TREE



22. FIRMWARE UPDATE HISTORY

This manual was written for the following firmware version:

- Ver. 6.0 on the LV 5490
- Ver. 4.4 on the LV 5480

You can view the firmware version by pressing **F•3** SYSTEM INFO on the SYS menu.

Ver. 6.0 on the LV 5490, Ver. 4.4 on the LV 5480

- Minor changes

Ver. 5.9 on the LV 5490, Ver. 4.3 on the LV 5480

- [SER08] PTP BMCA for NMI signals is now supported.

Ver. 5.8 on the LV 5490, Ver. 4.2 on the LV 5480

- Minor changes

Ver. 5.7 on the LV 5490, Ver. 4.1 on the LV 5480

- Minor changes

Ver. 5.6 on the LV 5490, Ver. 4.0 on the LV 5480

- Minor changes

Ver. 5.5 on the LV 5490, Ver. 3.9 on the LV 5480

- [SER06] Fixed so that SDI signals including CRC errors on all lines can be received.

Ver. 5.4 on the LV 5490, Ver. 3.8 on the LV 5480

- Minor changes

Ver. 5.3 on the LV 5490, Ver. 3.7 on the LV 5480

- Minor changes

Ver. 5.2 on the LV 5490, Ver. 3.6 on the LV 5480

- [SER03] Lip sync measurement was added.

Ver. 5.1 on the LV 5490, Ver. 3.5 on the LV 5480

- [SER01/02/06/08] Improved to support 4K NETQ.

Ver. 5.0 on the LV 5490, Ver. 3.4 on the LV 5480

- Minor changes

Ver. 4.9 on the LV 5490, Ver. 3.3 on the LV 5480

- [SER07] For PQ, improved the ease of observation by changing the waveform scale for HD% / 1023 / 1023,255 / 3FF to rounding values such as 4000, 2000, 1000 cd/m², and adding auxiliary lines.
- [SER07] Improved to display more than 3000cd/m² for Slog3 system gamma.

Ver. 4.8 on the LV 5490, Ver. 3.2 on the LV 5480

- Minor changes

22. FIRMWARE UPDATE HISTORY

Ver. 4.7 on the LV 5490, Ver. 3.1 on the LV 5480

- [LV 5490/5480] Improved so that ERROR displayed on the upper left of the screen can be turned ON / OFF.
- [LV 5490/5480] Corrected the logo display at startup to support the new logo.
- [SER05] A black background is added to improve visibility when displaying CIE diagram waveforms in color.

Ver. 4.6 on the LV 5490, Ver. 3.0 on the LV 5480

- Minor changes

Ver. 4.5 on the LV 5490, Ver. 2.9 on the LV 5480

- Minor changes

Ver. 4.4 on the LV 5490, Ver. 2.8 on the LV 5480

- [SER06] For the 12G-SDI eye pattern, added the Improved mode that applies optimization processing to TrTf automatic measurement, and improved the measurement difference with the latest wideband oscilloscope. It also supports normal mode, which is compatible with conventional displaying. These modes can be selected on the 12G-SDI tab menu. The TrTf setting is not subject to the preset function.

Ver. 4.3 on the LV 5490, Ver. 2.7 on the LV 5480

- Minor changes

Ver. 4.2 on the LV 5490, Ver. 2.6 on the LV 5480

- Minor changes

Ver. 4.1 on the LV 5490, Ver. 2.5 on the LV 5480

- Minor changes

Ver. 4.0 on the LV 5490, Ver. 2.4 on the LV 5480

- Minor changes

Ver. 3.9 on the LV 5490, Ver. 2.3 on the LV 5480

- [LV 5490/5480] Improved the speed of the preset recall function by external remote control (15-pin D-SUB terminal).

Ver. 3.8 on the LV 5490, Ver. 2.2 on the LV 5480

- [SER06/08] Supports 12G-SDI phase difference display function.

Ver. 3.7 on the LV 5490, Ver. 2.1 on the LV 5480)

- [SER10] Support has been added for LV 5490SER10 (VIDEO NOISE METER).

Ver. 3.6 on the LV 5490, Ver.2.0 on the LV 5480

- Minor changes

Ver. 3.5 on the LV 5490, Ver. 1.9 on the LV 5480

- Minor changes

Ver. 3.4 on the LV 5490, Ver. 1.8 on the LV 5480

- Minor changes

22. FIRMWARE UPDATE HISTORY

Ver. 3.3 on the LV 5490, Ver. 1.7 on the LV 5480)

- [SER08] Support has been added for LV 5490SER08 (IP(NMI)).

Ver. 3.2 on the LV 5490, Ver. 1.6 on the LV 5480)

- [SER01/02/06] Gamut error detection function was added.
- [SER01/02/06] 5-bar display function was added.
- [SER01/02/06] Aspect ratio display was added to the user markers on the picture display.

Ver. 3.1 on the LV 5490, Ver. 1.5 on the LV 5480

- Minor changes

Ver. 3.0 on the LV 5490, Ver. 1.4 on the LV 5480

- Minor changes

Ver. 2.9 on the LV 5490, Ver. 1.3 on the LV 5480)

- [SER06] Support has been added for LV 5490SER06 (12G-SDI INPUT).
- [SER09] Support has been added for LV 5490SER09 (12G-SDI EYE).

Ver. 2.7 on the LV 5490, Ver. 1.1 on the LV 5480

- [LV 5490/5480] The waveform color during capturing has been changed to cyan.
- [LV 5490/5480] BT.709 and BT.2020 color spaces is now supported for XYZ input.
- [LV 5490/5480] Colorimetry alarm function has been added.
- [SER01/SER02] Simultaneous display of cursor values and X/Y is now supported in the cursor measurement of waveform display.
- [SER01/SER02] In the frequency deviation measurement of the status display, the display range has been improved from ± 50 ppm to ± 100 ppm.
- [LV 5480SER01/SER02] The Q signal log of the status display has been improved so that it can be saved to a USB memory device.
- [SER03] The Dolby option now supports frame location display.
- [SER07] Support has been added for LV 5490SER07 (HDR).

Ver. 2.6 on the LV 5490

- Minor changes

Ver. 2.5 on the LV 5490

- [SER01/SER02] Support for XYZ signals has been added.
- [SER01/SER02] A histogram function has been added to the vector display.
- [LV 5490SER01/SER02] The Q signal log of the status display has been improved so that it can be saved to a USB memory device.

Ver. 2.4 on the LV 5490

- Minor changes

22. FIRMWARE UPDATE HISTORY

Ver. 2.3 on the LV 5490, Ver. 1.0 on the LV 5480

- [LV 5490] WEB server support has been added.
- [LV 5480] Support has been added for LV 5480 (MULTI WAVEFORM MONITOR).
- [SER01/SER02] Support for freeze and black errors has been added.
- [SER01/SER02] Pattern diagonal scrolling has been added to the test signal generation function.
- [SER01/SER02] DCI color space has been added to the waveform display, vectorscope display, and CINELITE display.
- [SER01/SER02] The color space settings of the waveform display and vectorscope display has been improved so that they can be set at once on the system menu.
- [SER05] The color spaces of the chromaticity diagram has been improved so that they can be set at once on the system menu. Manual color space settings has been deleted.

Ver. 2.2 on the LV 5490

- Minor changes

Ver. 2.1 on the LV 5490

- Minor changes

Ver. 2.0 on the LV 5490

- [LV 5490] Support for remote control using TELNET, FTP, and SNMP has been added.
- [LV 5490] Support for time configuration function using an SNTP server has been added.
- [LV 5490] Support for the LV5490-01 remote controller (sold separately) has been added.
- [LV 5490] ALIGN-H and ALIGN-V have been added to DISPLAY MODE of user-defined layout.
- [SER01/SER02] Embedded audio has been added to the test signal generation function.
- [SER01/SER02] Multiformat color bar pattern has been added to the test signal generation function.
- [SER01/SER02] Support for double-speed format display has been added.
- [SER01/SER02] CODE VALUE, which shows the video data value on the CINELITE % display, has been added.
- [SER03] Dolby support (option)
- [SER05] User-defined triangle, which shows a specified triangle on the chromaticity diagram, has been added.
- [SER05] User-defined gamma, which is used to vary the gamma between 1.5 and 3.0, has been added.
- [SER05] Coordinate value display has been added to the link marker of CINELITE Advanced.

Ver. 1.9 on the LV 5490

- Minor changes

22. FIRMWARE UPDATE HISTORY

Ver. 1.8 on the LV 5490

- [SER01/SER02] Support for 3G-SDI dual link RGB444 and other formats has been added.
- [SER01/SER02] A function that indicates a warning when an SDI signal in a format other than the expected format is received has been added.
- [SER01/SER02] ANC DATA VIEWER is now supported in the status display.
- [SER01/SER02] Support for 2020 color space on the waveform and vectorscope displays has been added.
- [SER01/SER02] Support for the CINELITE II.
- [SER01/SER02] A progress bar is now displayed when saving to USB memory during a frame capture.
- [SER01/SER02] Waveform display now includes 1023 and 255 scales.

Ver. 1.7 on the LV 5490

- Minor changes

Ver. 1.6 on the LV 5490

- Minor changes

Ver. 1.5 on the LV 5490

- [SER01/SER02] Support for the focus assist option (LV 5490SER04) has been added.
- [SER01/SER02] Support for the CIE chromaticity diagram option (LV 5490SER05) has been added.
- [SER01/SER02] Square (SQ) and 2 sample interleave (2S) have been added to the format display.
- [SER01/SER02] 16:9 has been added to the aspect marker of the picture display (during 17:9 aspect ratio input).
- [SER01/SER02] Data dump in the status display has been improved so that line and sample can be selected using the V POS and H POS knobs.
- [SER01/SER02] In the phase difference measurement of the status display, the measurement range for 3G-B (1080/60P, 59.94P, and 60P) has been changed to ± 1 frame.
- [SER01/SER02] A 0H reference setting (legacy or serial) has been added to the phase difference measurement of the status display.
- [SER01/SER02] An ARIB ancillary analysis feature has been added to the status display.

22. FIRMWARE UPDATE HISTORY

Ver. 1.4 on the LV 5490

- [LV 5490] A test signal generation function has been added.
- [LV 5490] Fast startup mode has been added.
- [LV 5490] A feature has been added that allows multiple functions to be arranged simultaneously in the status and audio of the free layout.
- [LV 5490] A preset feature has been added that allows either the recall menu or function menu to be displayed when a preset is recalled.
- [LV 5490] A feature for clearing icons, such as that appears when a USB connection is made, has been added.
- [LV 5490] The tab menu that was used previously is now displayed until the power is turn off and on.
- [LV 5490] ALL INIT has been added to the initialization feature in the system settings.
- [SER01/SER02] A frame capture feature has been added.
- [SER01/SER02] 4K HD quad link is now supported.
- [SER01/SER02] A phase difference display feature has been added to the status.
- [SER01/SER02] EDH, payload ID, audio control packet, custom search, and AFD ancillary analysis features have been added to the status.
- [SER01/SER02] A shadow feature has been added to the picture aspect marker.
- [SER01/SER02] An AFD feature has been added to the picture aspect marker.
- [SER01/SER02] Full frame display and 2x display have been added to picture.
- [SER01/SER02] The format display now appears in red when the SDI signal is inconsistent with the payload ID embedded in the SDI signal or the SDI system settings.
- [SER03] A status display feature has been added.
- [SER03] The scale and Lissajous waveform are now updated simultaneously when a switch is made between multi-Lissajous display and single-Lissajous display.

Ver. 1.2 on the LV 5490

- [LV 5490] Remote control feature using a 15-pin D-sub connector has been added.
- [LV 5490] The LCD backlight can now be turned off automatically.
- [LV 5490] The layouts of all measurement displays can now be initialized at once.
- [SER01] Support has been added for HD dual link and 3G-SDI level B dual stream.
- [SER01] An event logging feature has been added to the status display.
- [SER02] Support has been added for LV 5490SER02(SDI INPUT /EYE).

Ver. 1.1 on the LV 5490

- New release

Ver. 3

Contact Us

Head office Sales Department

Tel 81-45-541-2123 Fax 81-45-541-2823

Email sales@leader.co.jp

Leader Electronics Corporation

2-6-33 Tsunashimahigashi , Kohoku-ku , Yokohama-shi ,
Kanagawa , 223-8505 , Japan

www.leader.co.jp

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