ASTRO

HDMI Protocol Analyzer

VA-1831

Instruction Manual

Ver.1.07

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VA-1831

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2011.9

Ver.1.07

ASTRODESIGN,Inc

Contents

BEFORE OPERATION

Introduction

Thank you very much for purchasing this model VA-1831 HDMI protocol analyzer.

This manual contains details on the operation procedures to be followed when the VA-1831 is used, the checkpoints and precautions to be observed, and so on. Improper handling may result in malfunctioning so before using the VA-1831, please read through these instructions to ensure that you will operate the protocol analyzer correctly.

After reading this manual, please keep it in an accessible place for future use.

Safety Precautions

⚠ WARNING

Concerning the Unit

- **Do not apply strong impact or throw the unit. Doing so may result in damage to the unit, explosion, overheating, or fire.**
- **Do not use the unit in a location where there is risk of catching fire or explosion.**
- **High-voltage parts are contained inside the unit. Do not disassemble, repair, or modify the unit as there is a risk of electric shock or burn injury as well as possible damage to the unit.**
- **If you hear thunder while using the unit outdoors, immediately turn the power off, disconnect the power cord from the unit, and move to a safe location.**

Concerning the Power Cord

- **Always grasp the power cord by the plug when disconnecting.**
- **Do not forcibly bend or twist the power cord during use. This may result in a fire hazard.**
- **Do not place heavy objects on the power cord. This may lead to damage to the cord resulting in fire hazard or electric shock.**

Concerning the Foreign Matter

- **Do not drop liquid, flammables and metal objects inside this unit. Using this unit in such a condition will cause fire, electric shock or failure.**

⚠ CAUTION

Concerning this product

- **When connecting the product to another device (such as a TV set or DVD player), use the accessory FG cable or a similar connecting cable to ensure that the frame ground (FG) terminal of the device and frame ground terminal of the VA-1831 are connected together. If this connection is not made, the product may malfunction.**

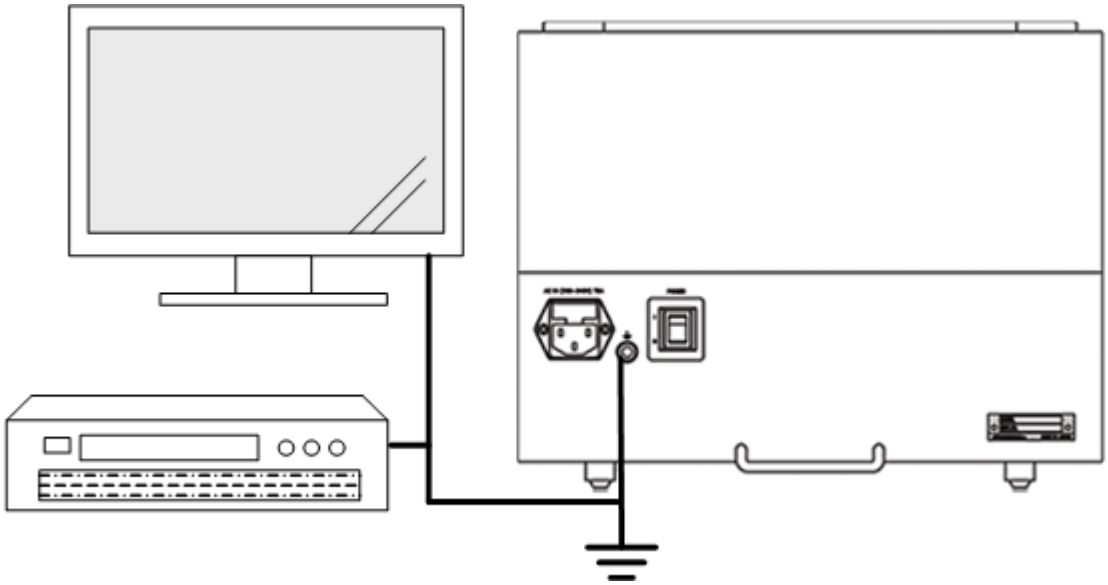


Fig. FG terminal connections

Concerning installation

- **Install the product in a stable location. Do not install it on either of its side panels. Doing so will cause the temperature of the product to rise due the heat generated by the product itself, in turn possibly causing the product to malfunction.**

Concerning the liquid crystal

- **Due to the nature of liquid crystal, some picture elements may be missing (bright spots, flashing spots, etc.).**
- **Do not touch liquid crystal if it leaked from the display.**

  If the liquid crystal panel has been damaged inadvertently, and the liquid crystal has leaked out, keep the liquid away from your mouth and skin, and do not inhale its vapors. In the event that liquid crystal has made contact with your eyes or mouth, rinse it off with water immediately. If it has contact with your skin or clothing, wipe it off immediately with alcohol, then wash it off with soap. Leaving it in place may damage your skin or clothing.

■ **Care with the glass of a broken liquid crystal panel.**

If the LCD panel has broken, take care not to cut your hands on the glass shards. If you touch an area where the glass has broken off, you may injure yourself.

■ **Take care handling the LCD panel because it is a high-precision component.**

- Wiping the panel's surface with benzene, paint thinners will cause deterioration in its quality.
- If water (salt water) is left on the display surface, discoloration and staining will result.
- Exposing the panel directly to ultraviolet rays for an extended period may cause the deflection panel to turn brown, in turn causing the contrast to drop and other forms of deterioration to develop in the display quality.
- Moisture inside the monitor due to condensation may cause unevenness in the colors.
- Directly tapping the surface or bumping it into objects may crack the panel.
- Do not attempt to disassemble the panel since leaking liquid crystal may make contact with your skin, which is hazardous.

When trouble or problems have occurred

■ **In the event that trouble or a problem has occurred, disconnect the power cable, and contact your dealer or an Astrodesign sales representative.**

Concerning the product configuration

This product is configured as described below.

The terms “program data” refers to both the timing data and pattern data.

Chapter	Contents
Before use	This chapter describes the safety precautions, configuration of this manual and what is contained in the package of the product.
Concerning the VA-1831	This chapter gives an outline of the VA-1831, and it describes its characteristics.
Examples of peripheral equipment connections and operations	This chapter describes the methods used to control the VA-1831.
Menu configuration Source ANALYSIS Signal Generate Device Config Setup Sub Window Internal data Error table	This chapter describes the functions of the VA-1831.
VA-1831 Specifications	This chapter describes the functions of the VA-1831.

Concerning the packaged contents

This product comes with the following items. Use of any items in place of accessories which are supplied with the product may cause problems so be absolutely sure to use the accessories supplied.

Packaged contents	Quantity
VA-1831 main unit	1
VA-1831 operating instructions CD (PDF file you are now reading)	1
USB mouse	1
USB flash memory	1
Power cable	1
FG cable	1

1 Concerning the VA-1831

1.1 Overview

The model VA-1831 HDMI protocol analyzer (hereafter referred to as the “VA-1831”) enables the protocol parts required in the development of HDMI transmission equipment to be checked. Using its front-panel LCD monitor and internal speaker, HDMI images and sound can easily be checked.

Furthermore, the performance information (EDID, SINK) of the VA-1831 can be rewritten so that various kinds of receivers (monitors) can be virtualized. The unit can also be used as a repeater by channeling the signals through its HDMI output connector. This makes it possible to use the analyzer in the development of set-top boxes, DVD players and other devices equipped with HDMI connectors.

Finally, using its “generate” functions, the unit can check the reception of sink device signals.

* In these instructions, those devices such as monitors and TV sets which come with HDMI input connectors but without HDMI output connectors are collectively referred to as “receivers” (monitors), and those devices which come with HDMI output and input connectors and which output signals on the basis of input signals are collectively referred to as “repeaters.”

1.2 Features

- **Analyzer (measurement) functions**

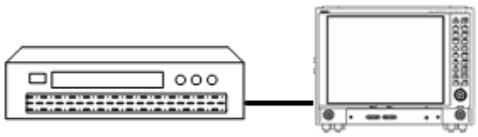
  This is used to analyze (measure) the HDMI and DVI video timing data.

  It is used to analyze (measure) the packet contents of DMI.

  It is used to check for differences from the HDMI standard values.

- **Receiver (monitor) function**

  This enables HDMI input signals to be received.



- **Repeater function**

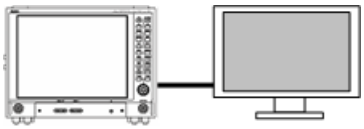
  This enables the unit to function as a repeater by supplying signals through its HDMI output connector.

- **Through function**

  By passing the input and outputs signals of the VA-1831 straight through the unit, it is possible to check the direct transfer of the DDCs and CECs of the source devices and sink devices.

- **Generator function**

  This makes it possible to check the reception at the sink device using the timing data and a number of patterns incorporated inside the VA-1831. 3D timing data can also be output.



- **Emulator function**

  This enables the performance information of the VA-1831 unit to be changed to the performance of various other types of monitors (such as TV sets which support high definition or support NTSC).

- **Internal LCD monitor and speakers**

  On the front-panel LCD monitor, 8-bit, 10-bit and 12-bit HDMI images can easily be checked.

  Using the internal speakers, linear PCM sound can easily be checked.

- **Program function**

  The data used to virtualize monitors can be managed using programs.

  By simply calling these programs, the performance of various types of monitors can easily be changed.

  A group function is also provided for selecting only those programs which will be used from among the large number of programs available.

- **Registration of data into USB flash memory**

  The analyzed (measured) data, programs, equipment settings and so on can be saved in the USB flash memory.

- **Hot plug function**

  This function makes it possible, without plugging and unplugging any cables, to initiate reset for the transmitter when the transmitter and VA-1831 are connected.

- **Log trigger function**

  This enables triggers to be set and the analyzed data to be imported.

- **Line monitor function**

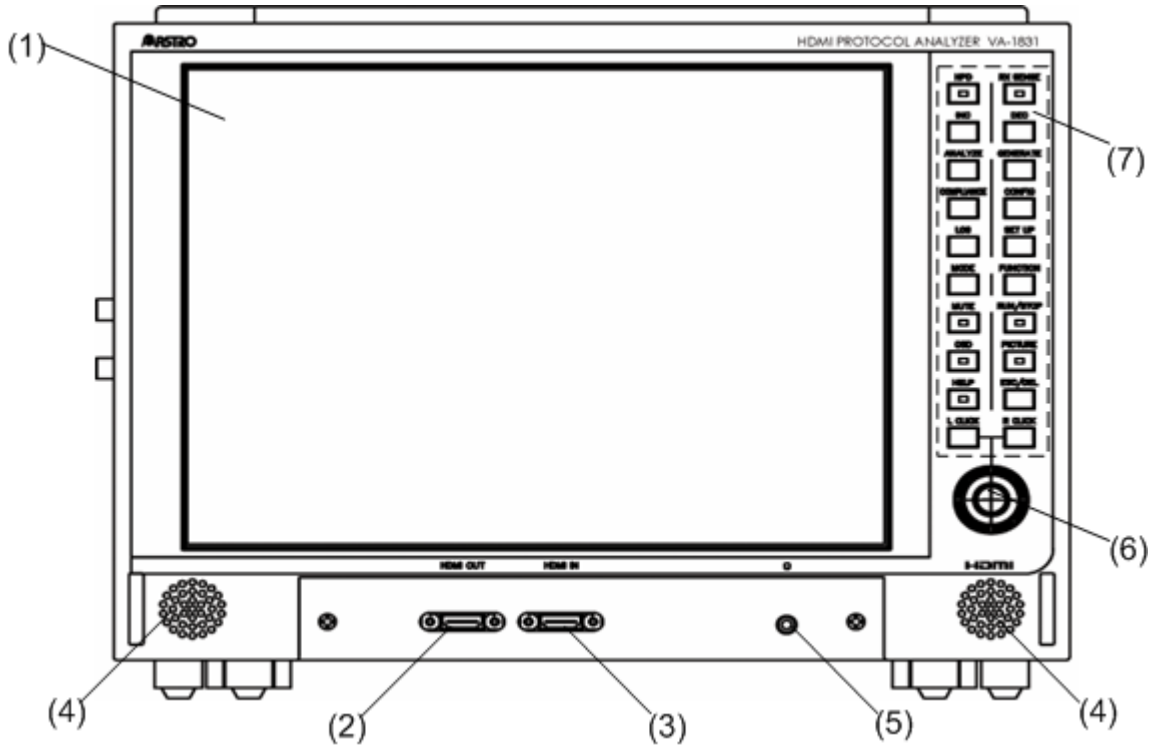
  This makes it possible to check the transmission and reception of commands using DDC and CEC lines.

- **HDMI Ver.1.4a supported**

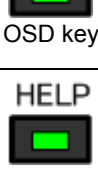
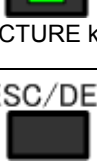
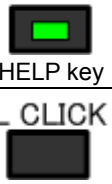
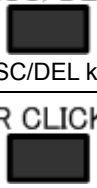
  The unit supports HDMI 1.4a timing and InfoFrame data.

1.3 Parts and Their Functions

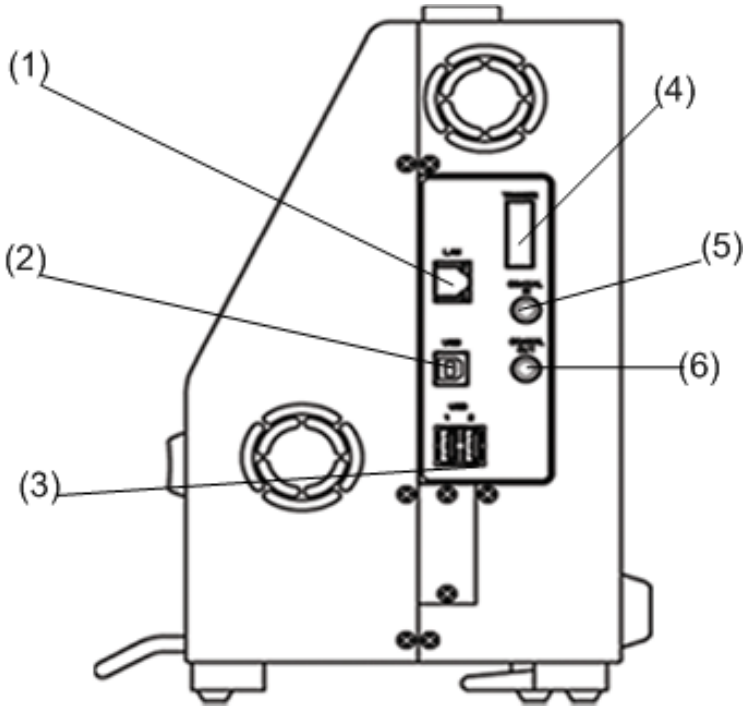
1.3.1 VA-1831 front panel



(1)	LCD	This displays the HDMI input images and the results of the analyses carried out.		
(2)	HDMI output connector	The HDMI signals to be supplied to the HDMI TV, monitor or other device are output from this output connector.		
(3)	HDMI input connector	The HDMI output signals of the DVD player or other device are supplied to this input connector.		
(4)	Speakers	The sound is output from these speakers.		
(5)	Headphone jack	This is used to output the sound from the headphones.		
(6)	Joystick	This is used to move the cursor in 8 directions.		
(7)	Key	Function	Key	Function
	HPD HPD key	When the LED of this key is lighted, the hot plug status is High. When it is off, the hot plug status is Low.	RX SENSE RX SENSE key	When the LED of this key is lighted, RX SENSE is ON. When it is off, RX SENSE is OFF.
	INC INC key	This is used when selecting the setting items and parameters.	DEC DEC key	This is used when selecting the setting items and parameters.
	ANALYZE ANALYZE key	This is used to open the Source ANALYSIS.	GENERATE GENERATE key	This is used to open the Signal Generate.
	COMPLIANCE COMPLIANCE key	This is used to display the Compliance menu. (Not currently supported)	CONFIG CONFIG key	This is used to open the Device Config.

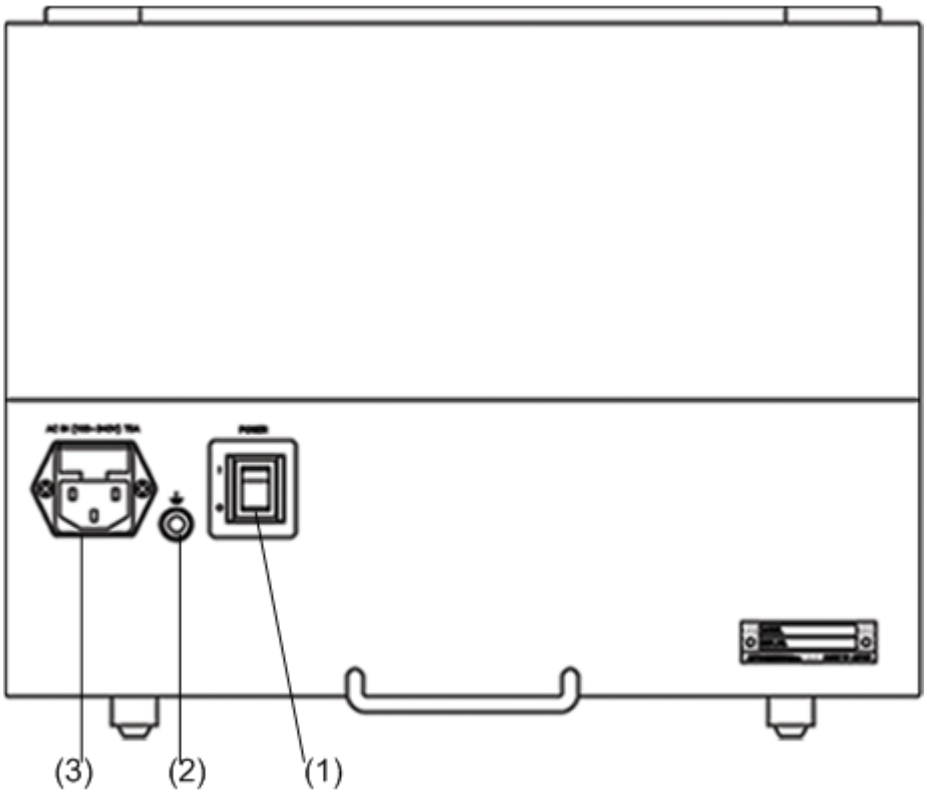
	 LOG key	When the LED of this key is lighted, log data can be acquired.	 SET UP key	This is used to open the Setup.
	 MODE key	This is used to switch between the Receiver Mode, Repeater Mode and Through Mode.	 FUNCTION key	Function operation for ENABLE window.
	 MUTE key	When the LED of this key is lighted, the internal speakers are muted. When it is off, sound is heard through the internal speakers.	 RUN/STOP key	This is used to switch between RUN and STOP.
	 OSD key	When the LED of this key is lighted, the on-screen display (OSD) appears. When it is off, the OSD is hidden.	 PICTURE key	When the LED of this key is lighted, the input images are displayed. When it is off, the input images are hidden.
	 HELP key	When the LED of this key is lighted, the HELP display appears.	 ESC/DEL key	This is used to close the current ENABLE window.
	 L CLICK key	This functions in the same way as the left-clicking of the mouse.	 R CLICK key	This functions in the same way as the right-clicking of the mouse.

1.3.2 VA-1831 side panel



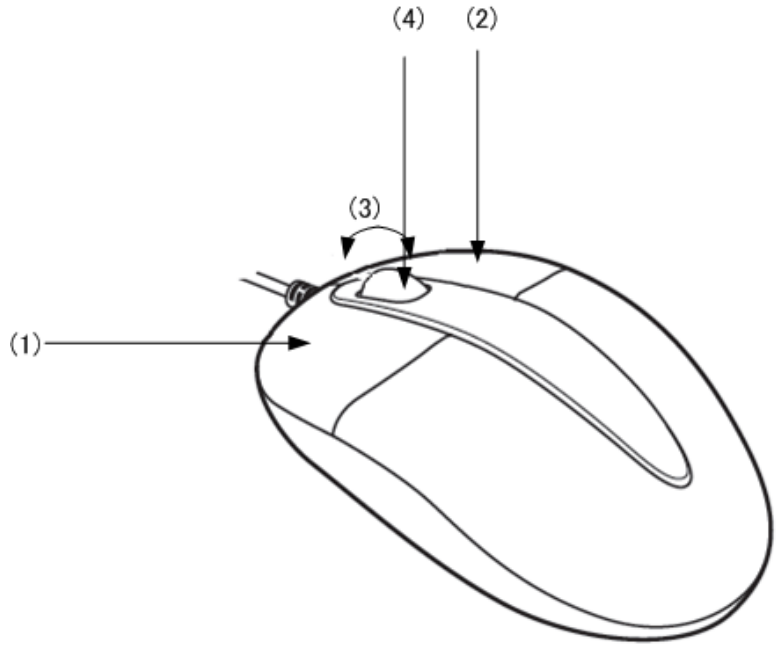
(1)	Ethernet port	This port is used to connect to the LAN using an Ethernet cable.
(2)	USB port (B)	This is connected to the PC, and it enables the functions of the VA-1831 to be controlled by commands which are sent and received between the two units.
(3)	USB port (A)	The mouse is connected or the USB flash memory is inserted into this port.
(4)	TRIGGER	The TRIGGER or I2S signals are output from this connector.
(5)	Coaxial input	This is the digital audio input connector.
(6)	Coaxial output	This is the digital audio output connector.

1.3.3 VA-1831 rear panel



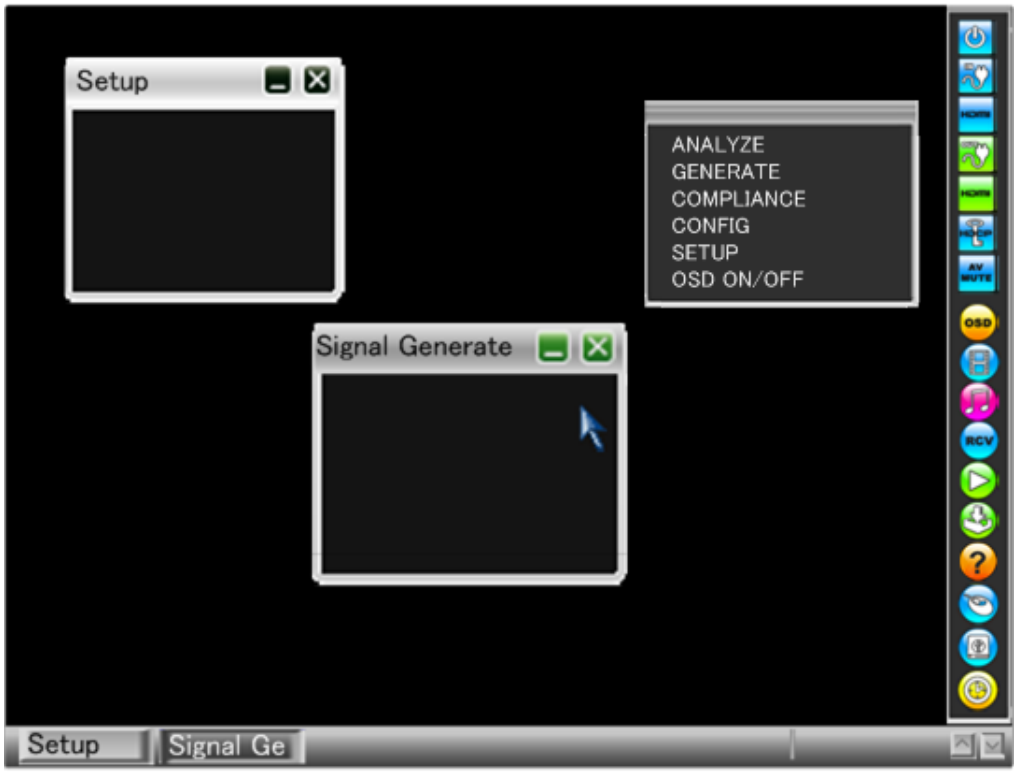
(1)	Power switch	This is used to turn the power of the VA-1831 ON or OFF.
(2)	Frame ground (FG)	This is connected to the FG terminal of the device to be connected to the VA-1831.
(3)	AC power socket	The power cable is connected to this socket.

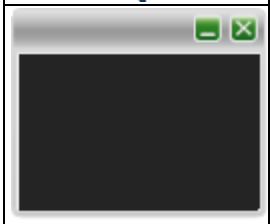
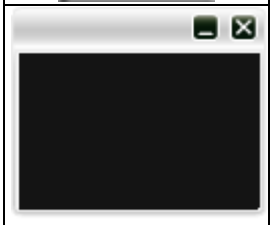
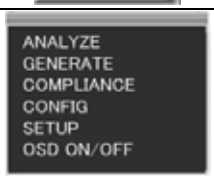
1.3.4 Mouse operation



(1)	Left click	Same function as L CLICK key.
(2)	Right click	Same function as R CLICK key.
(3)	Wheel scroll	Up/down scroll in the ENABLE window.
(4)	Wheel click	Same function as FUNCTION key.

OSD Display



	Cursor	This is operated using the mouse of joystick.
	ENABLE window	This is the window on which the operations are currently performed. It can be moved up or down or to the left or right, and its size can also be increased or reduced. * Up to five windows including ENABLE can be displayed.
	ENABLE shutdown	This closes the ENABLE window.
	ENABLE window minimize	This minimizes the ENABLE window.
	ENABLE task bar	This is the ENABLE window task bar.
	DISABLE window	This is the window on which the no operations are currently performed.
	DISABLE shutdown	This closes the DISABLE window.
	DISABLE window minimize	This minimizes the DISABLE window.
	DISABLE task bar	This is the DISABLE window task bar.
	Menu window	This is displayed by right-clicking at any point outside the window or by pressing R CLICK.

1.3.5 Icons

Designation	Icon	Description
Video signal input icon		While the icon is blue, video signals are input all the time.
		While the icon is gray, no video signals are input.
Input hot plug icon		When the hot plug status at the input side is High, this icon appears in blue.
		When the hot plug status at the input side is Low, this icon appears in gray.
Input signal format icon		When the input signal format is HDMI, “HDMI” is displayed in blue for this icon. When the icon is clicked or the L CLICK button is pressed, the currently input simplified video timing data and color signals are displayed. * No data or signals are displayed while the clock display is shown.
		When the input signal format is DVI, “DVI” is displayed in blue for this icon. When the icon is clicked or the L CLICK button is pressed, the currently input simplified video timing data and color signals are displayed. * No data or signals are displayed while the clock display is shown.
		When no signals are input, “HDMI” is displayed in gray for this icon.
Output hot plug icon		When the hot plug status at the output side is High, this icon appears in green.
		When the hot plug status at the output side is Low, this icon appears in gray.
Output signal format icon		When the output signal format is HDMI, “HDMI” is displayed in green for this icon.
		When the output signal format is DVI, “DVI” is displayed in green for this icon.

		When no signals are output, “HDMI” is displayed in gray for this icon as shown in the figure on the left.
HDCP icon		When HDCP is applied to the input images, this icon appears in blue.
		When initial certification of HDCP starts, this icon appears in yellow.
		When HDCP is not applied to the input images, this icon appears in gray.
AV MUTE icon		When AV muting is ON, this icon appears in blue.
		When AV muting is OFF, this icon appears in gray.
OSD icon		When this icon is clicked or the L CLICK button is pressed, the OSD display is cleared. (When this icon is clicked or the L CLICK button is pressed again with the display cleared, the OSD re-appears.)
PICTURE icon		While this icon appears in blue, input images are displayed.
		When the icon is gray, no input images are displayed.
Speaker icon		While sound is being output from the internal speakers, this icon appears in pink.
		While the sound output from the internal speakers is muted, this icon appears in gray.
MODE icon		In the Receiver Mode, this icon appears in blue.

		In the Repeater Mode, the icon appears in green.
		In the Through Mode, the icon appears in yellow.
RUN/STOP icons		When RUN (update) is selected as the RUN/STOP icon setting, the icon appears in green.
		When STOP (update) is selected as the RUN/STOP setting, the icon appears in red.
LOG icon		While log data is being acquired, this icon appears in green.
		When the acquisition of the log data is suspended, the icon appears in gray.
HELP icon		While this icon appears in yellow, HELP is displayed.
		While the icon appears in gray, HELP is hidden.
Mouse icon		When the mouse is connected to USB port (A), this icon appears in blue.
		When the mouse is disconnected from USB port (A), the icon appears in gray.
USB icon		When the USB flash memory is inserted into USB port (A), this icon appears in blue.
		When the USB flash memory is ejected from USB port (A), the icon appears in gray.

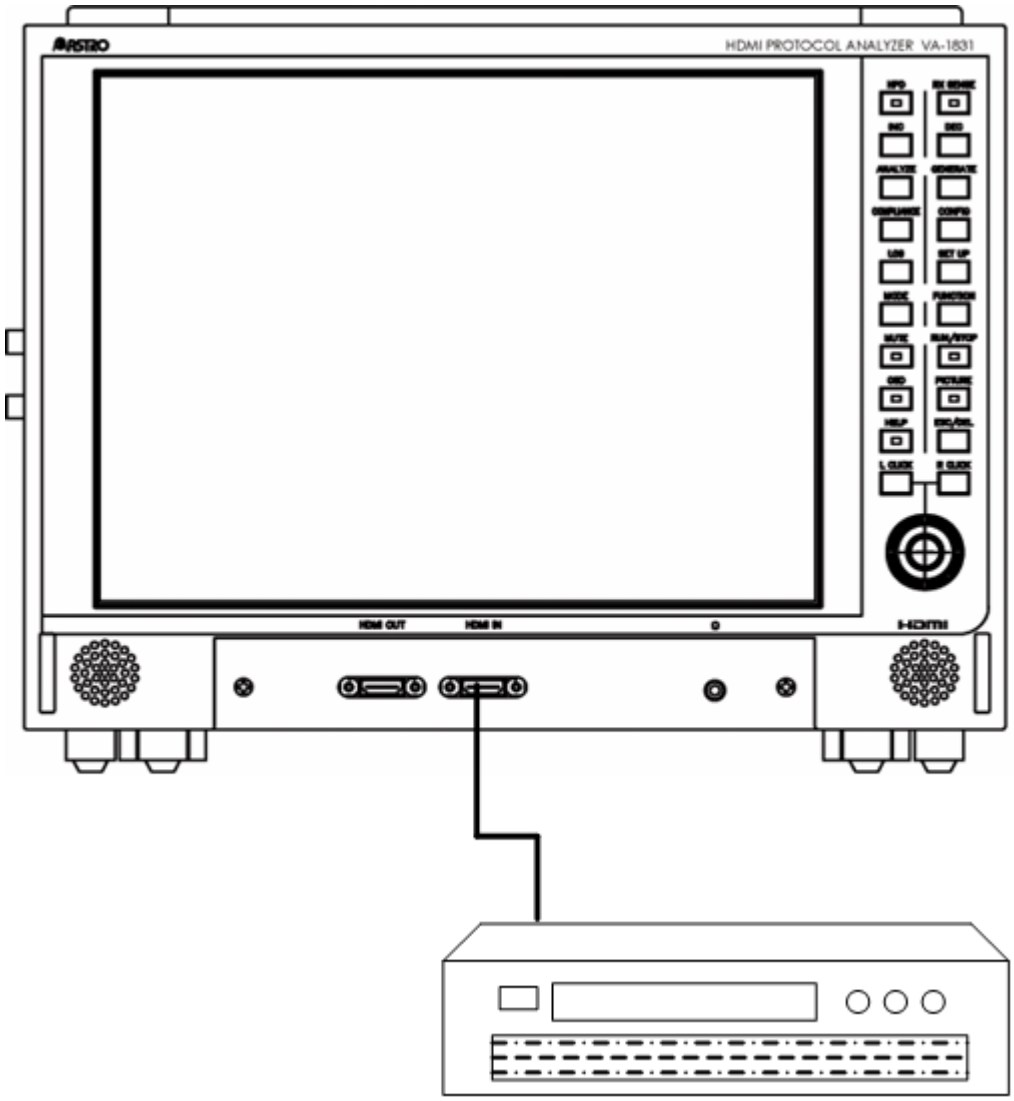
Clock icon		The current time is displayed when the clock icon is clicked or the L CLICK button is pressed. (The clock settings can be selected using Version Information on the SETUP menu.) When the icon is clicked while the clock is displayed, the clock display is cleared. * The clock is not displayed while simplified video timing data and color signals based on the input signals are displayed.

2 Examples of Peripheral Equipment Connections and Operations

2.1 Example of connections in the Receiver Mode

In this example, the VA-1831 is set as the receiver (monitor), and the HDMI protocols of an HDMI output device are analyzed.

Even with a DVI output device with no HDMI functions, the timing data can still be analyzed.



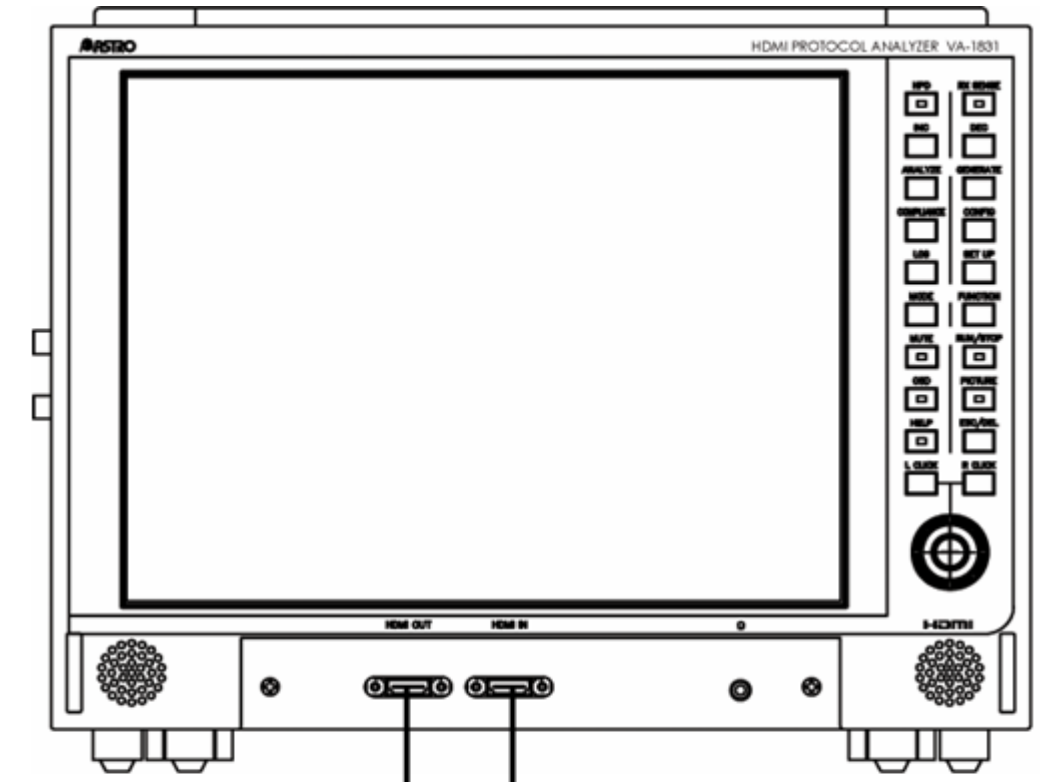
Device equipped with an HDMI output connector such as DVD player

Select the RCV icon when the VA-1831 is to be used as a receiver.

2.2 Example of connections in the Repeater Mode

In this example, the VA-1831 is set as a repeater, and the HDMI protocols of an HDMI output device are analyzed.

By connecting an HDMI-compatible monitor to the HDMI output connector of the VA-1831, it can be checked that the output device is operating normally as a repeater-compatible device.



Device equipped with an HDMI input connector such as an LCD TV set

Device equipped with an HDMI output connector such as DVD player

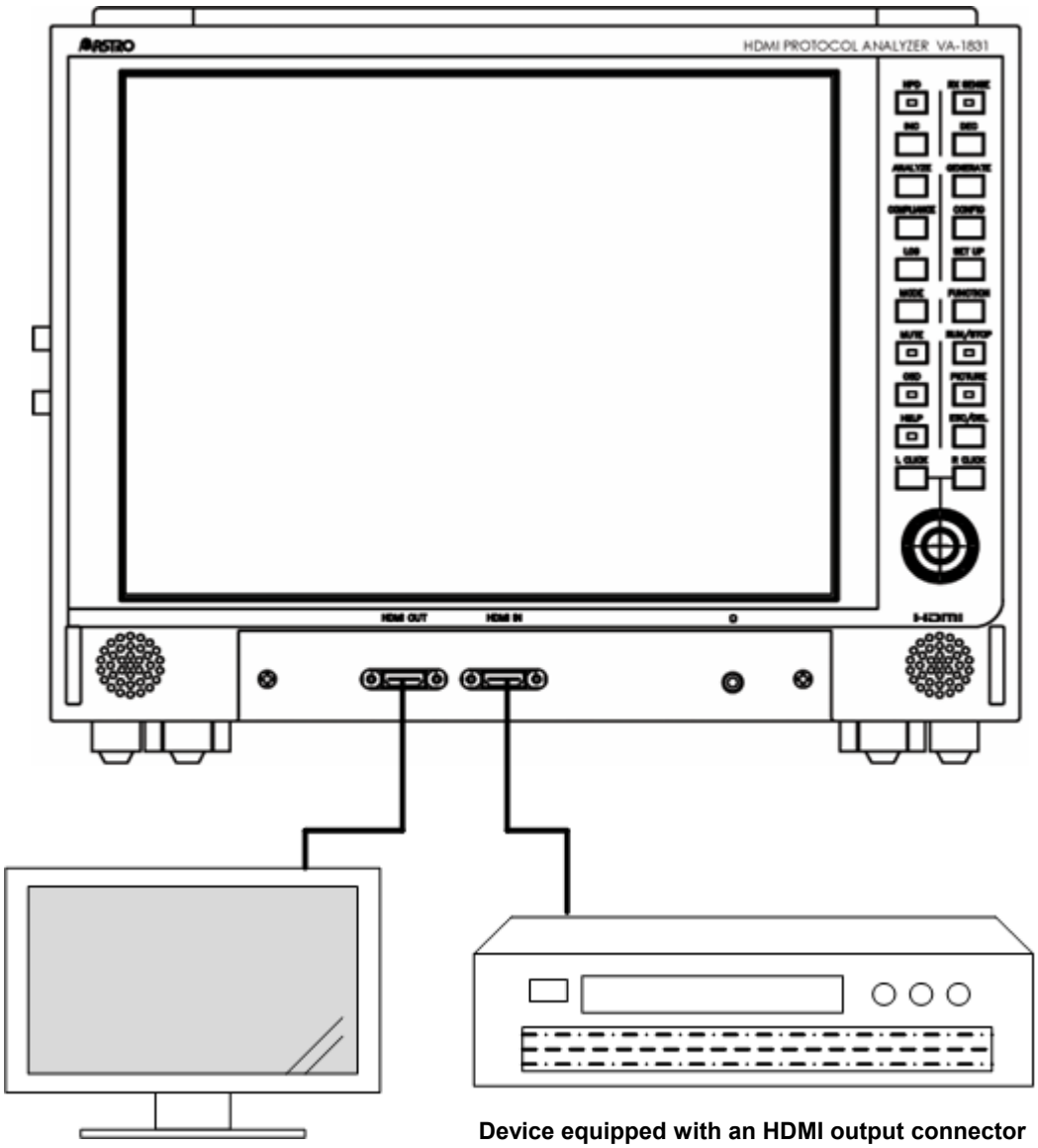
Select the  **icon when the VA-1831 is to be used as a repeater.**

2.3 Example of connections in the Through Mode

In this example, the VA-1831 is set as the through mode device, and the DDC and CEC lines of HDMI input and output devices are analyzed.

By connecting an HDMI-compatible monitor to the HDMI output connector of the VA-1831, it can be checked that the HDMI input and output devices are operating normally.

In addition, the DDC and CEC lines can be monitored, and the direct transfer between the input device and output device can be checked.



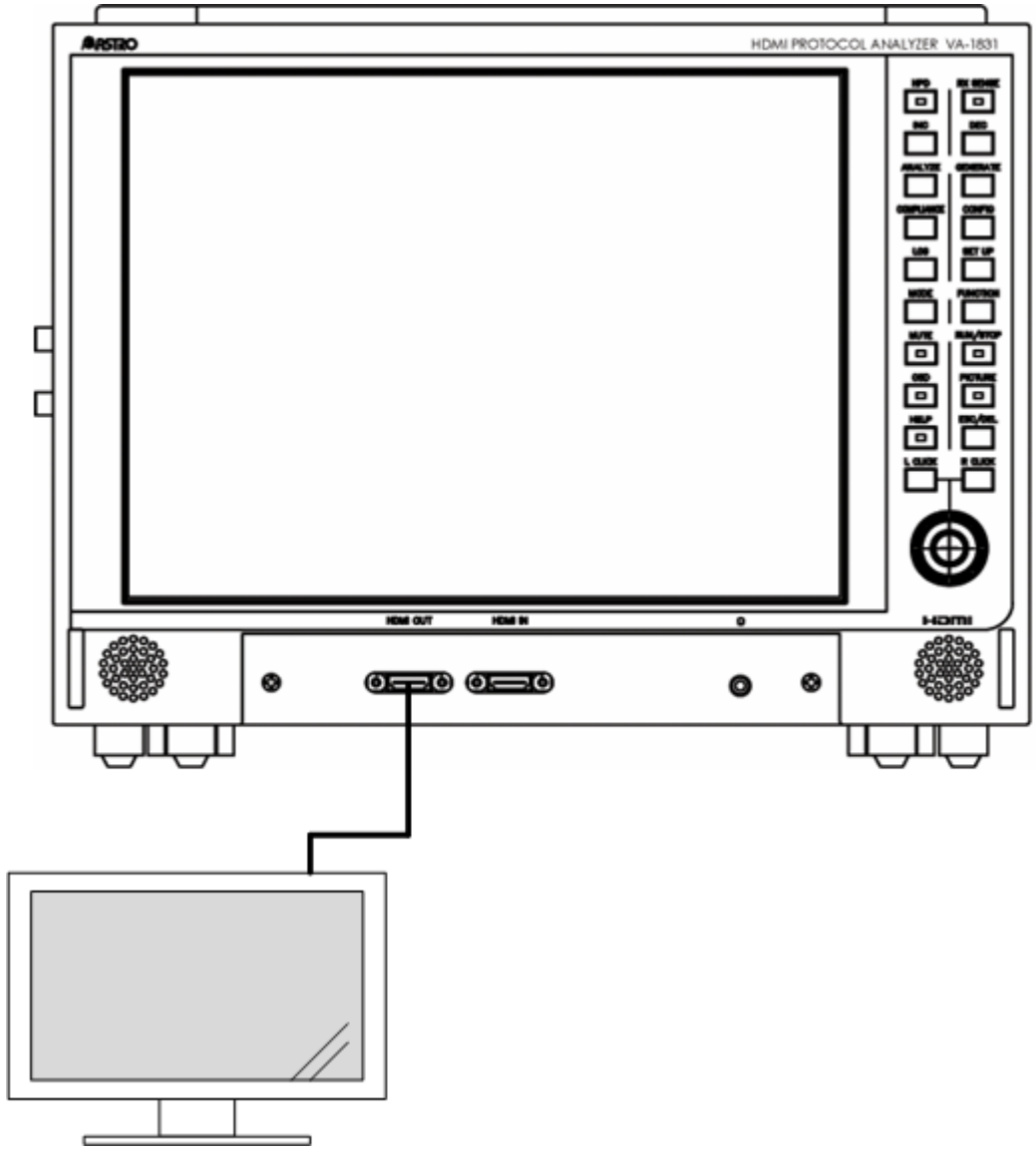
Device equipped with an HDMI input connector such as an LCD TV set

Device equipped with an HDMI output connector such as DVD player

Select the THR icon when the VA-1831 is to be used as the through mode device.

2.4 Example of connections in the Generate

In this example, video signals are generated in the VA-1831, and the display analyses of an HDMI-compatible monitor are undertaken.

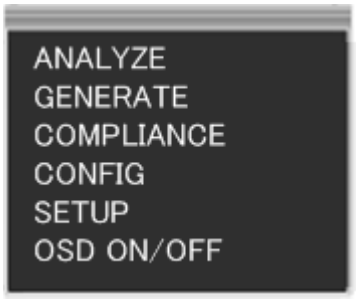


Device equipped with an HDMI input connector such as an LCD TV set

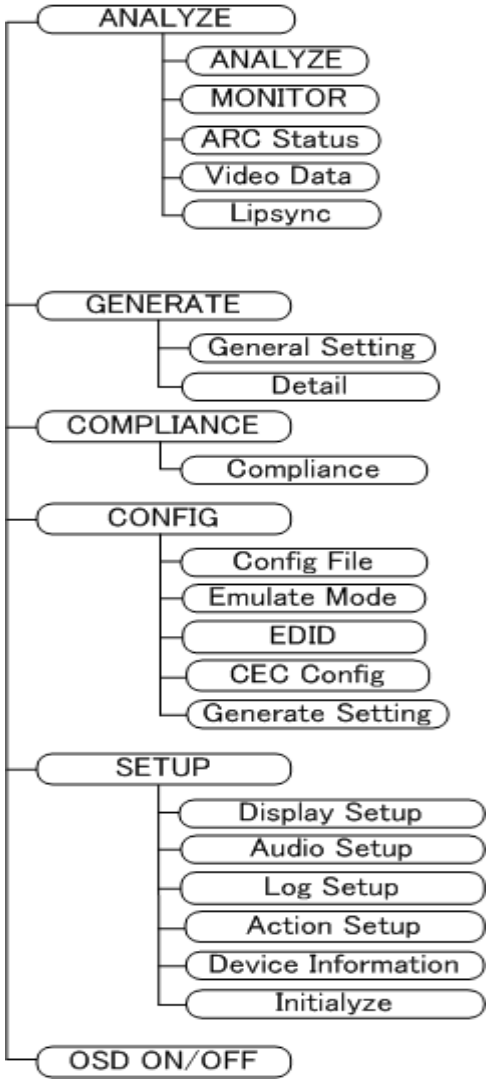
* These connections can be used only when the VA-1831 is used in the Receiver Mode.

3 Menu Configuration

By right-clicking or pressing the R CLICK button, the window shown in the figure below is opened, and menus can be selected.



The figure below shows an overview of the menu configuration.

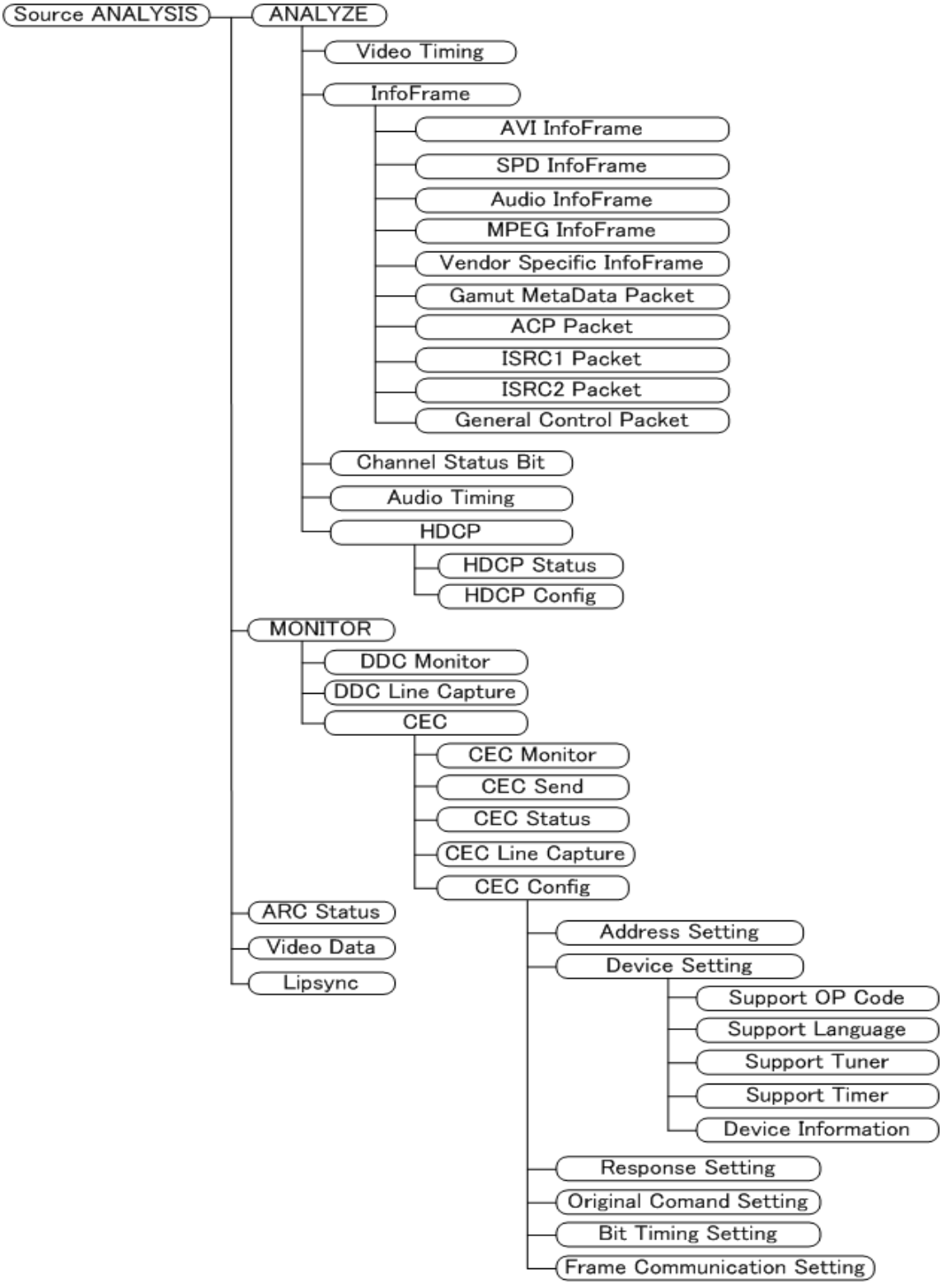


The OSD display is turned OFF by clicking on OSD ON/OFF or pressing the L CLICK button.

3.1 ANALYZE

The ANALYZE menu is used to measure the input HDMI statuses.

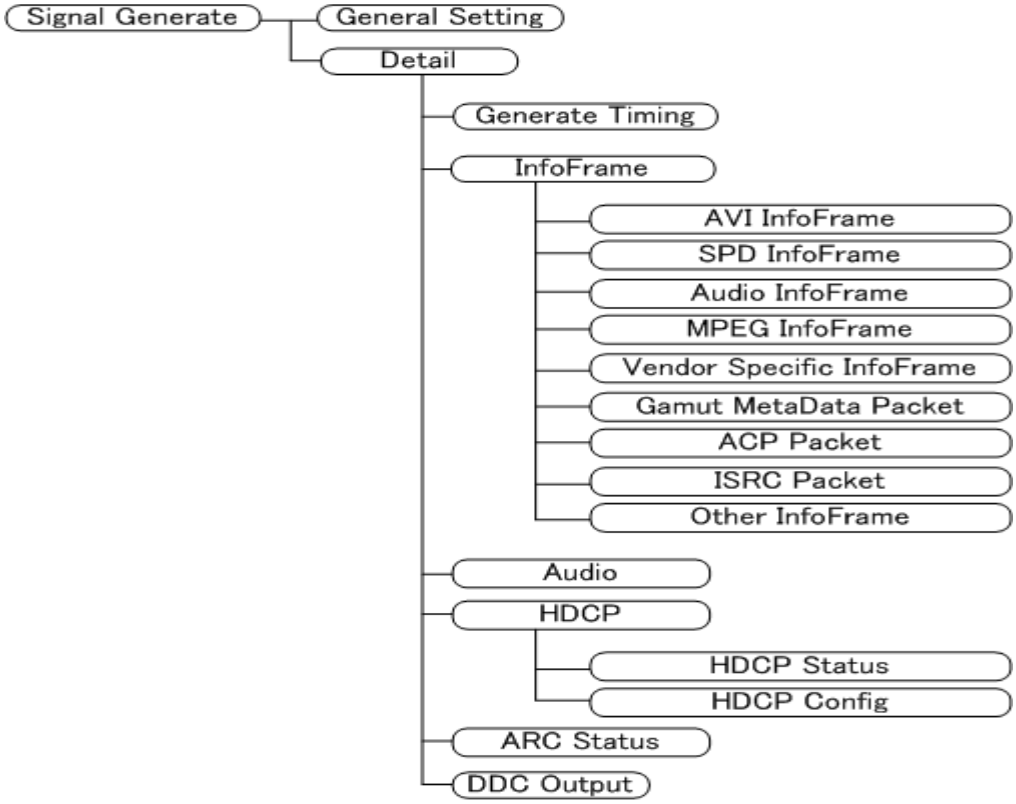
Mouse operations	Right-click -> left-click ANALYZE
Main unit operations	Press the [ANALYZE] key. Alternatively, press [R CLICK] followed by pressing [L CLICK] on ANALYZE.



3.2 GENERATE

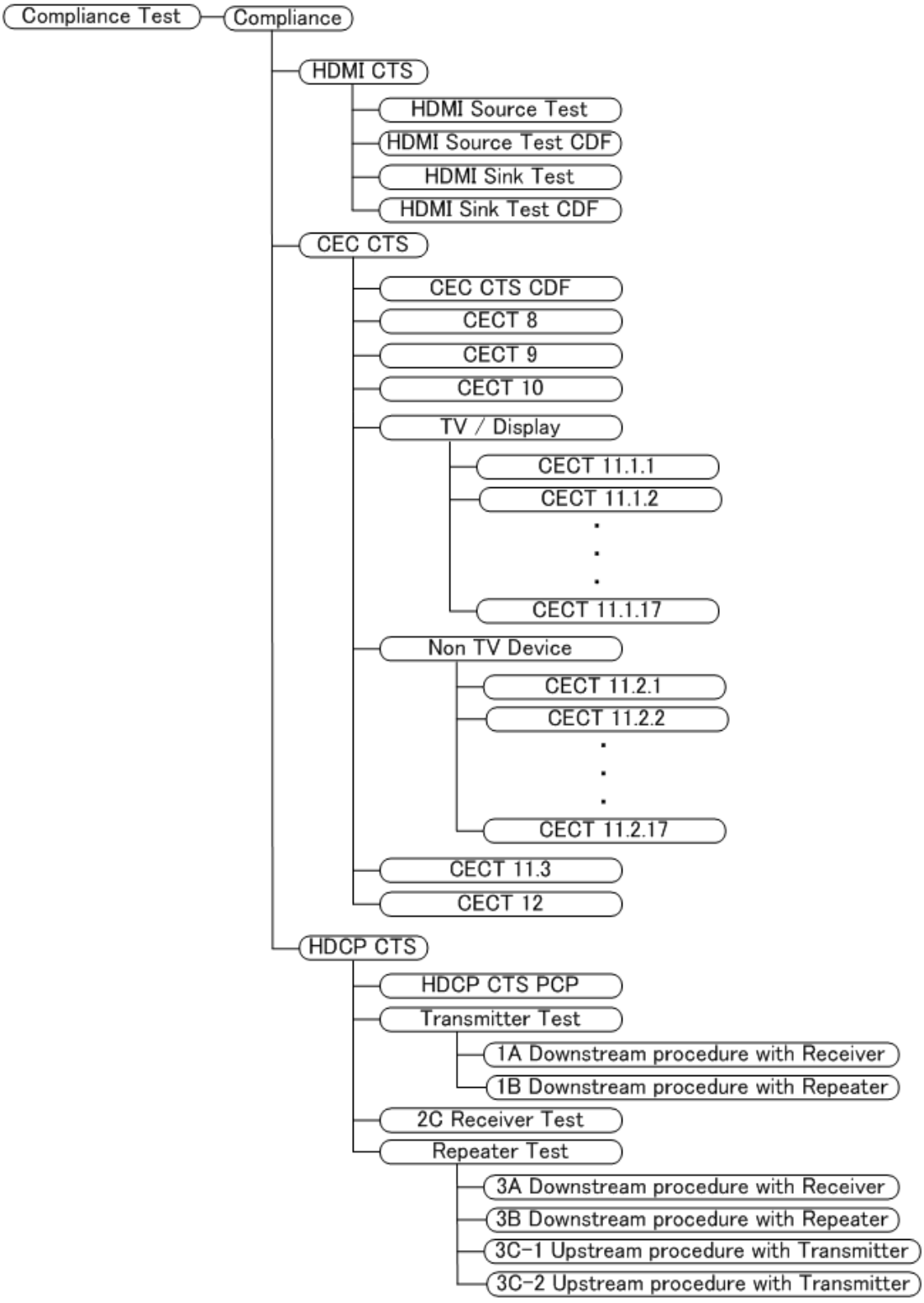
The GENERATE menu is used when the video signals are to be generated.

Mouse operations	Right-click → left-click GENERATE
Main unit operations	Press the GENERATE key. Alternatively, press R CLICK followed by pressing L CLICK on GENERATE.



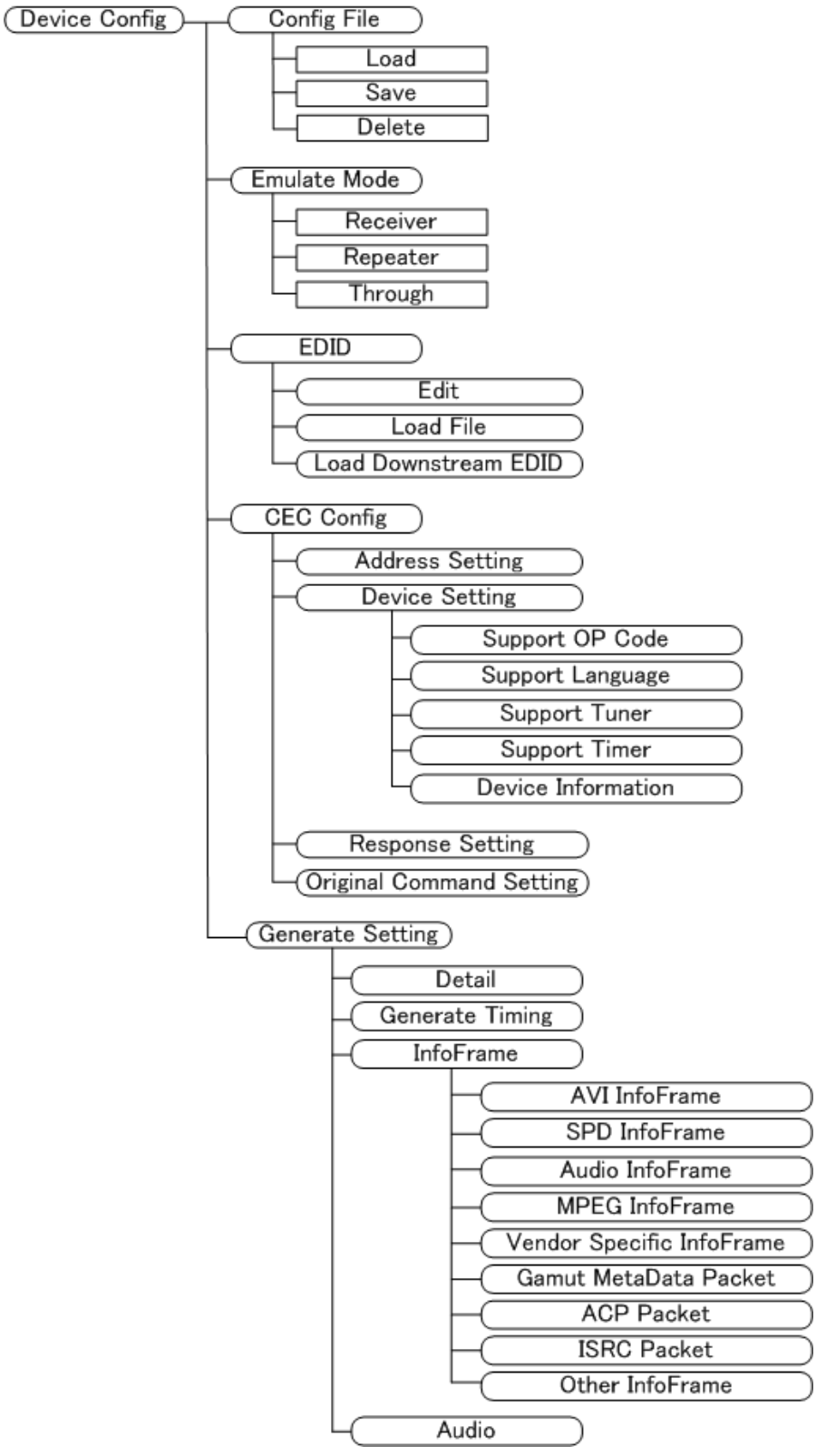
3.3 COMPLIANCE

Mouse operations	Right-click → left-click COMPLIANCE
Main unit operations	Press the [CONFIG] key. Alternatively, press [R CLICK] followed by [L CLICK] on COMPLIANCE.



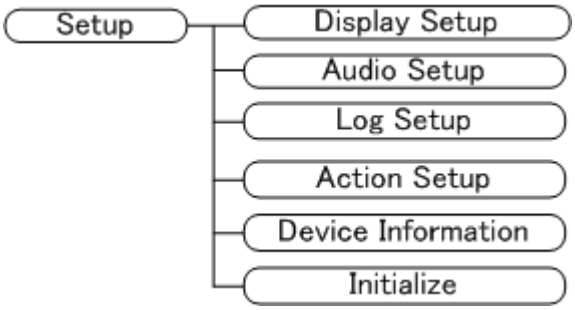
3.4 CONFIG

Mouse operations	Right-click → left-click CONFIG
Main unit operations	Press the [CONFIG] key. Alternatively, press [R CLICK] followed by [L CLICK] on CONFIG.



3.5 SETUP

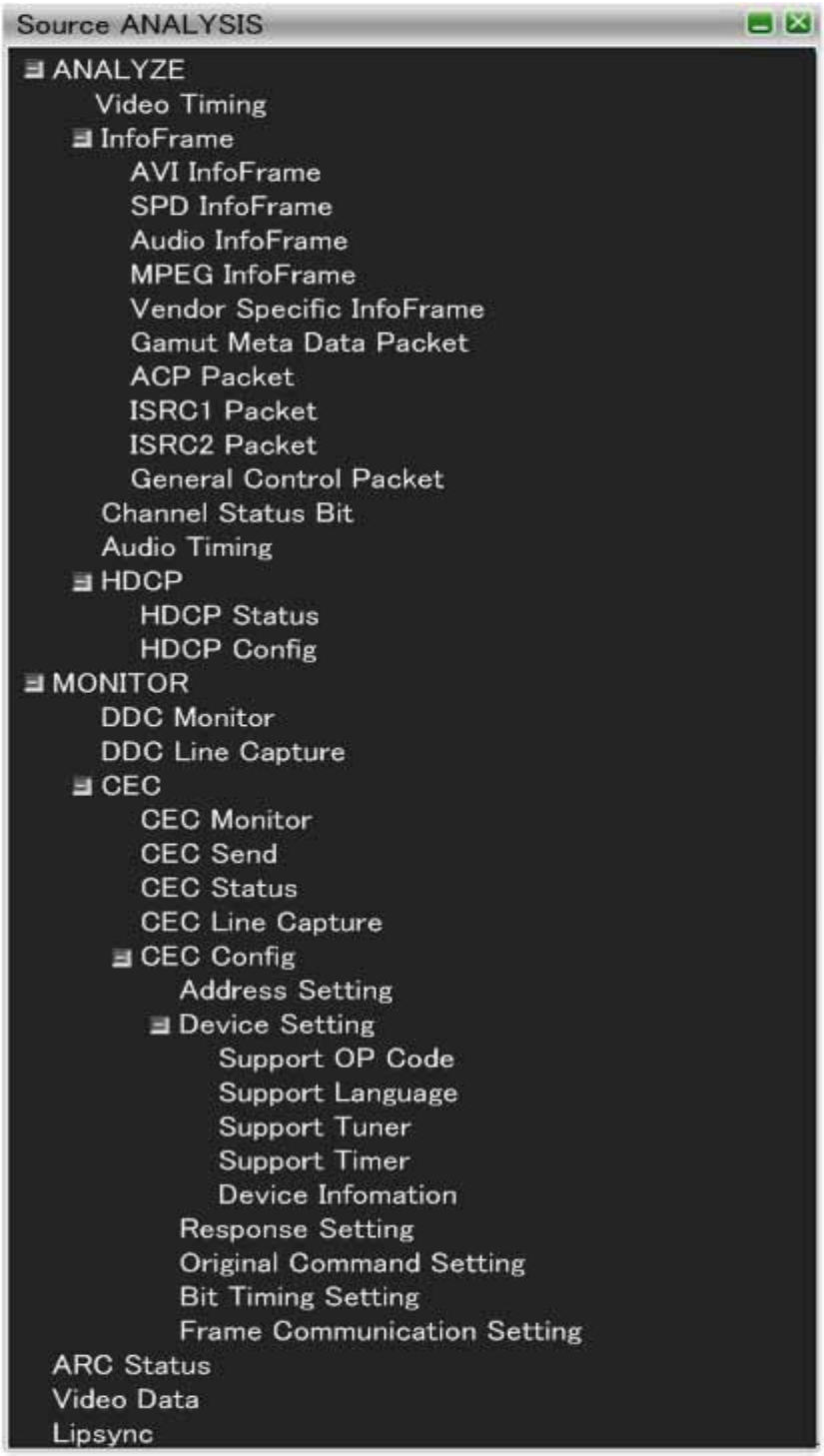
Mouse operations	Right-click → left-click SETUP
Main unit operations	Press the [SETUP] key. Alternatively, press [R CLICK] followed by [L CLICK] on SETUP.



4 Source ANALYSIS

HDMI signal timing data can be analyzed or InfoFrame and other contents can be decoded, and displayed.

The items in the analysis result display area are as shown in the figure below.



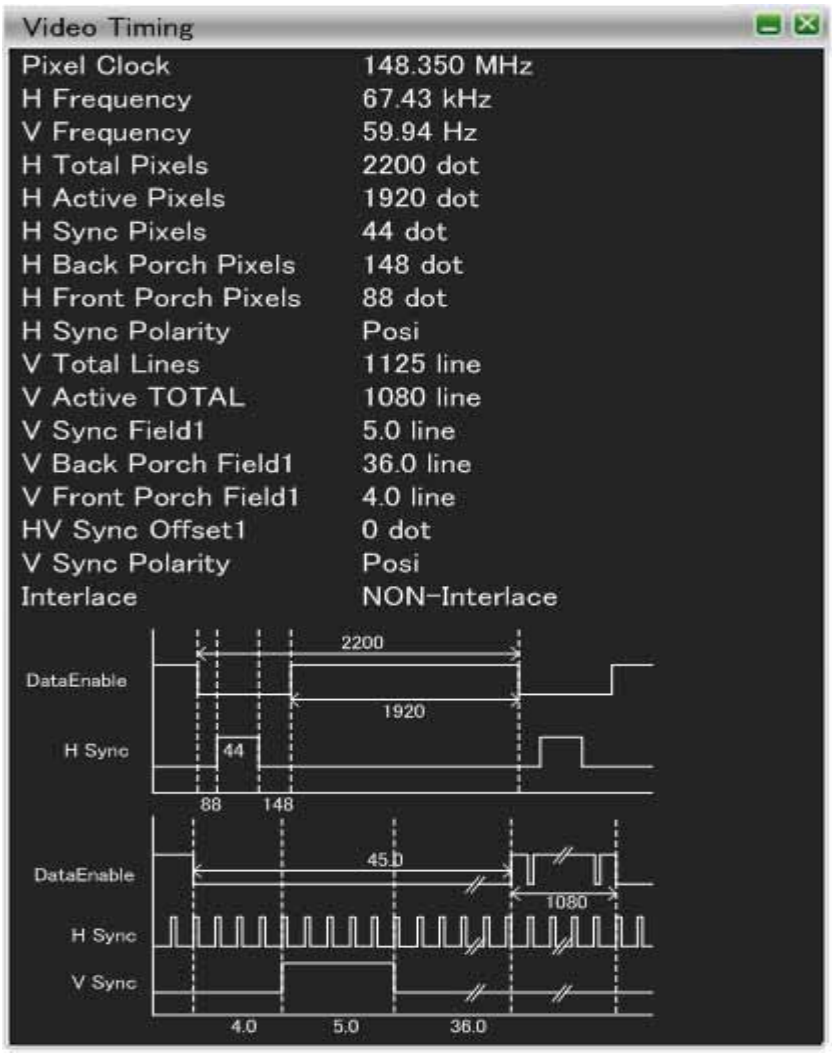
4.1 ANALYZE

4.1.1 Video Timing

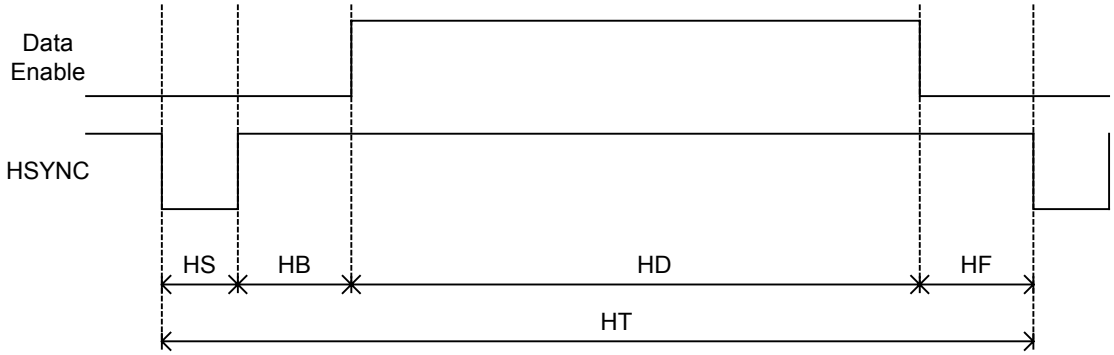
On this screen, the input timing data are analyzed.

The display method used is shown below.

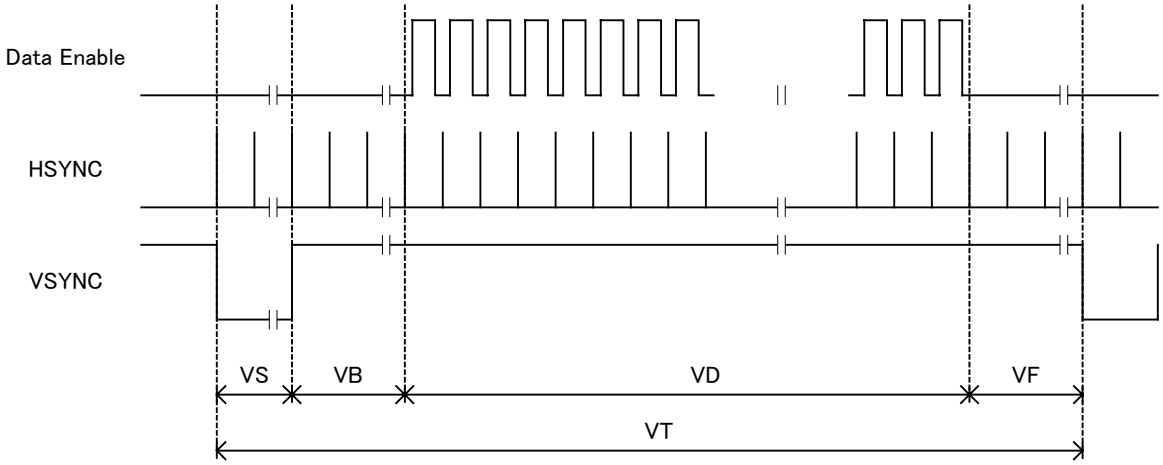
Mouse operations	Right-click → left-click ANALYZE → left-click Video Timing	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Video Timing.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



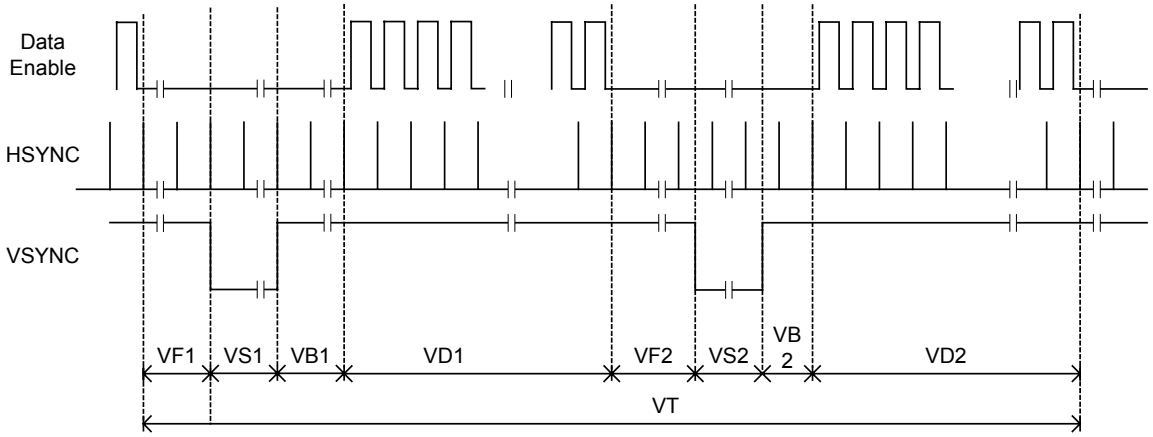
Item	Period	Details	
Pixel Clock		Pixel frequency	
H Frequency		HSYNC frequency	
V Frequency		VSYNC frequency	
H Total Pixels	HT	HTOTAL width	
H Active Pixels	HD	HDISP width	
H Sync Pixels	HS	HSYNC width	
H Back Porch Pixels	HB	HSYNC back porch width	
H Front Porch Pixels	HF	HSYNC Front Porch width	
H Sync Polarity		HSYNC polarity	
V Total Lines	VT	VTOTAL width (in 1-frame increments)	
V Active TOTAL	VD (VD1+VD2)	VDISP width (in 1-frame increments)	
V Active Field1	VD (1)	VDISP width	Value in 1-frame increments at the non-interlace setting; value of 1st field at the interlace setting.
V Sync Field1	VS (1)	VSYNC width	
V Back Porch Field1	VB (1)	VSYNC Back Porch width	
V Front Porch Field1	VF (1)	VSYNC Front Porch width	
HV Sync OffSet1		Phase difference between H and V	
V Active Field2	VD2	VDISP width of 2nd field at the interlace setting	
V Sync Field2	VS2	VSYNC width of 2nd field at the interlace setting	
V Back Porch Field2	VB2	Back porch width of VSYNC in 2nd field at the interlace setting	
V Front Porch Field2	VF2	Front porch width of VSYNC in 2nd field at the interlace setting	
HV Sync OffSet2		Phase difference between H and B in 2nd field at the interlace setting	
V Sync Polarity		VSYNC polarity	
Interlace		Interlace or non-interlace	
V Active L ODD		VDISP width of L ODD file at the field alternative setting	
V Active R ODD		VDISP width of R ODD file at the field alternative setting	
V Blank3 ODD		VBlank3 width of ODD file at the field alternative setting	
V Active L EVEN		VDISP width of L EVEN file at the field alternative setting	
V Active R EVEN		VDISP width of R EVEN file at the field alternative setting	
V Blank3 EVEN		VBlank3 width of EVEN file at the field alternative setting	



Horizontal sync signal



Vertical sync signal (at non-interlace setting)



Vertical sync signal (at interlace setting)

4.1.2 AVI InfoFrame

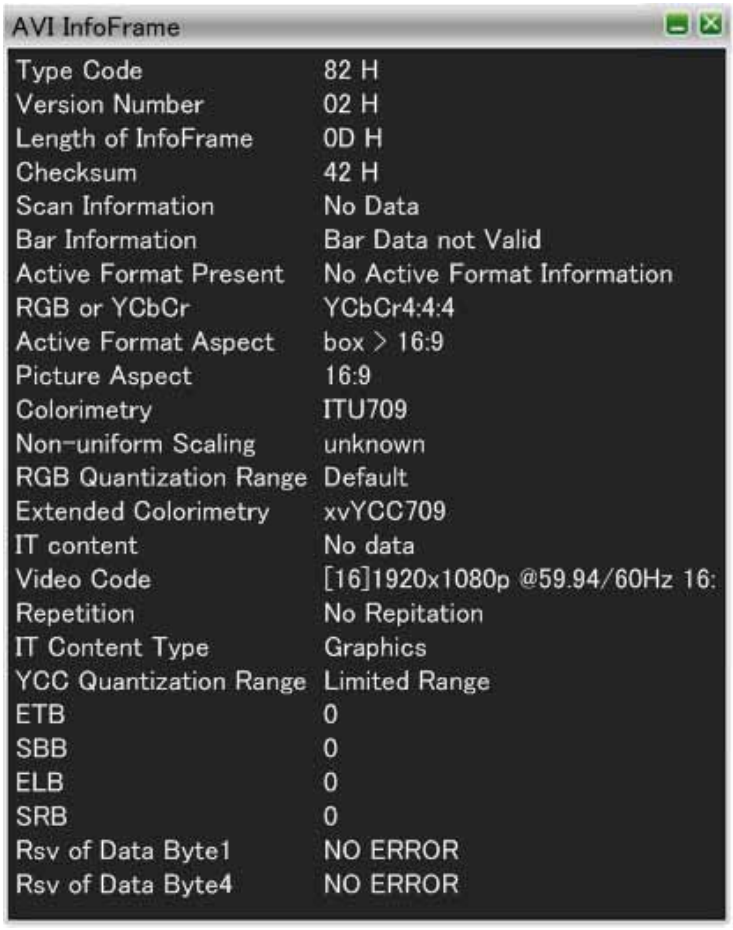
The items on this screen are used to decode and display AVI InfoFrame of the HDMI input.

“AVI” is short for Auxiliary Video Information, and it refers to the video-related information output by the transmitter which is input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click AVI InfoFrame	
Main unit operations	Press the [ANALYZE] key.	Press [L CLICK] on AVI InfoFrame.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the AVI InfoFrame display contents in the GUI display mode.

Display item	What is displayed
Type Code	82 H
Version Number	XX H
Length of AVI InfoFrame	XX H
Checksum	XX H
Scan Information	No Data
	Overscanned
	Underscanned
	Future
Bar Information	Bar Data not valid
	Vert.Bar Info valid

	Horiz. Bar Info valid
	Vert. and Horiz. Bar Info valid
Active Format Information Present	No Active Format Information valid
	Active Format Information valid
RGB or YCbCr	RGB
	YCbCr4:2:2
	YCbCr4:4:4
	Future
Active Format Aspect	Same as picture aspect ratio
	4:3
	16:9
	14:9
	box 16:9
	box 14:9
	box > 16:9
	4:3 (H Just)
	16:9 (14:9 V Just)
	16:9 (4:3 V Just)
	reserved
Picture Aspect	No Data
	4:3
	16:9
	Future
Colorimetry	No Data
	SMPTE 170M / ITU601
	ITU709
	Extended Colorimetry Valid
Non-uniform Picture Scaling	Unknown
	Scaled H
	Scaled V
	Scaled H&V
RGB Quantization Range	Default
	Limited Range
	Full Range
	Reserved
Extended Colorimetry	xvYCC601
	xvYCC709
	SYCC601
	AdobeYCC601
	AdobeRGB
	Reserved
IT content	No data
	IT content
Video Code	[X] XXX x XXX@XXX / XXX Hz X : X
	Reserved
	No Video Code Available
Repetition	No Repetition

	pixel sent X times
	Reserved
IT Content Type	Graphics
	Photo
	Cinema
	Game
YCC Quantization Range	Limited Range
	Full Range
	Reserved
	Reserved
Line Number of End of Top Bar (ETB)	0 to FFFF
Line Number of Start of Bottom Bar (SBB)	0 to FFFF
Pixel Number of End of Top Bar (ELB)	0 to FFFF
Pixel Number of Start of Bottom Bar (SRB)	0 to FFFF
Rsv of Data Byte1	NO ERROR
	ERROR
Rsv of Data Byte4	NO ERROR
	ERROR

4.1.3 SPD InfoFrame

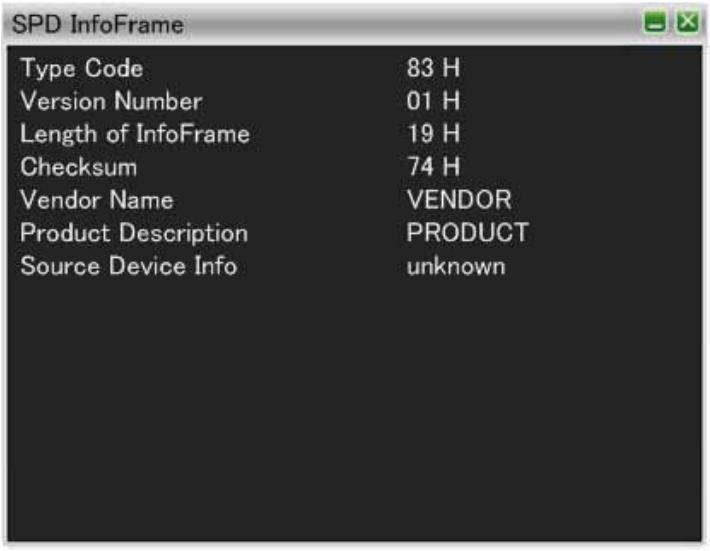
The items on this screen are used to decode and display SPD InfoFrame of the HDMI input.

“SPD” is short for Source Product Description, and it refers to the information of the transmitter which is input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click SPD InfoFrame	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on SPD InfoFrame.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the SPD InfoFrame display contents in the GUI display mode.

Display item	What is displayed
Type Code	83 H
Version Number	XX H
Length of SPD InfoFrame	XX H
Checksum	XX H
Vendor Name Charanalyze_acter	(8 characters)
Product Description Charanalyze_acter	(16 characters)
Source Device Information	unknown
	Digital STB
	DVD
	D-VHS
	HDD Video
	DVC
	DSC
	Video CD
	GAME
	PC general
	Blu-Ray Disc
	Super Audio CD
	HD DVD
	PMP
	Reserved

4.1.4 Audio InfoFrame

The items on this screen are used to decode and display Audio InfoFrame of the HDMI input.

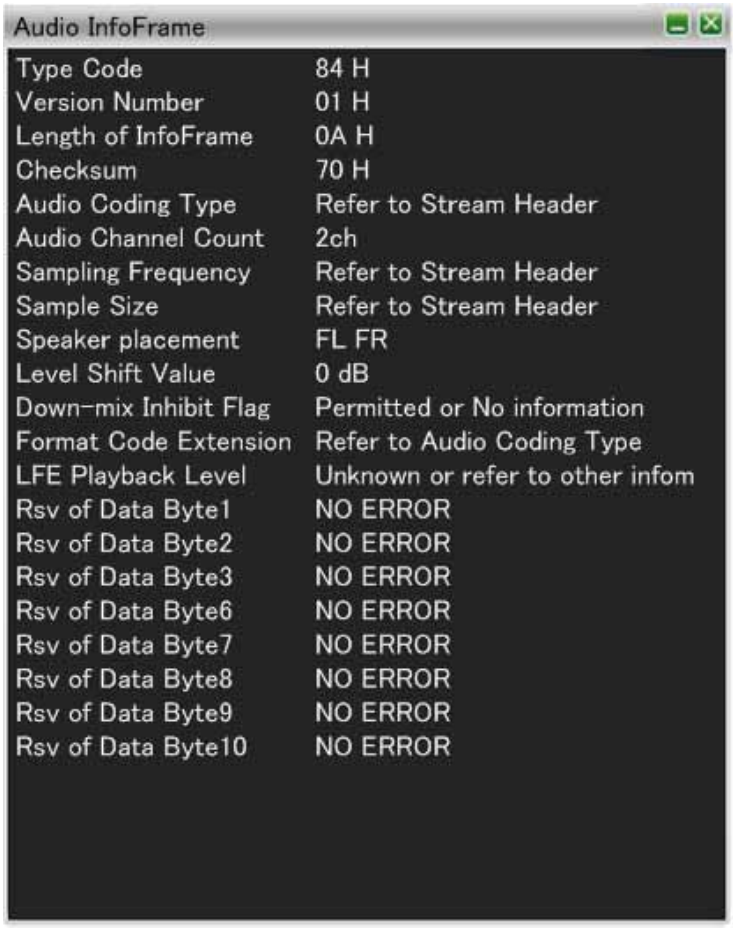
For Audio InfoFrame, the information relating to the audio signals output by the transmitter is input.

The Audio InfoFrame input is decoded and displayed.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Audio InfoFrame	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Audio InfoFrame.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the Audio InfoFrame display contents in the GUI display mode.

Display item	What is displayed
Type Code	84 H
Version Number	XX H
Length of Audio InfoFrame	XX H
Checksum	XX H
Audio Coding Type	Refer to Stream Header
	IEC60958 PCM
	AC-3
	MPEG1 (Layers 1 & 2)
	MP3 (MPEG1 Layer 3)

	MPEG2 (multichannel)
	AAC
	DTS
	ATRAC
	One Bit Audio
	Dolby Digital+
	DTS-HD
	MLP
	DST
	WMA Pro
	Reserved
Audio Channel Count	Refer to Stream Header
	2 - 8ch
Sampling Frequency	Refer to Stream Header
	32 KHz
	44.1 KHz
	48 KHz
	88.2 KHz
	96 KHz
	176.4 KHz
	192 KHz
Sample Size	Refer to Stream header
	16 bits
	20 bits
	24 bits
Speaker Placement	TC FCH FLH FRH FLW FRW FRC FLC RR RL FC LFE FR FL (refer to written standards)
	Reserved
Level Shift Value	0 - 15dB
Down-mix Inhibit Flag	Permitted or No information
	Prohibited
Format Code Extension	Refer to Audio Coding Type
	HE-AAC
	HE-AACv2
	MPEG Surround
	Reserved
LFE Playback Level	Unknown or refer to other information
	0 dB playback
	+10 dB playback
	Reserved
Rsv of Data Byte1	NO ERROR
	ERROR
Rsv of Data Byte2	NO ERROR
	ERROR
Rsv of Data Byte3	NO ERROR
	ERROR

Rsv of Data Byte6	NO ERROR
	ERROR
Rsv of Data Byte7	NO ERROR
	ERROR
Rsv of Data Byte8	NO ERROR
	ERROR
Rsv of Data Byte9	NO ERROR
	ERROR
Rsv of Data Byte10	NO ERROR
	ERROR

4.1.5 MPEG InfoFrame

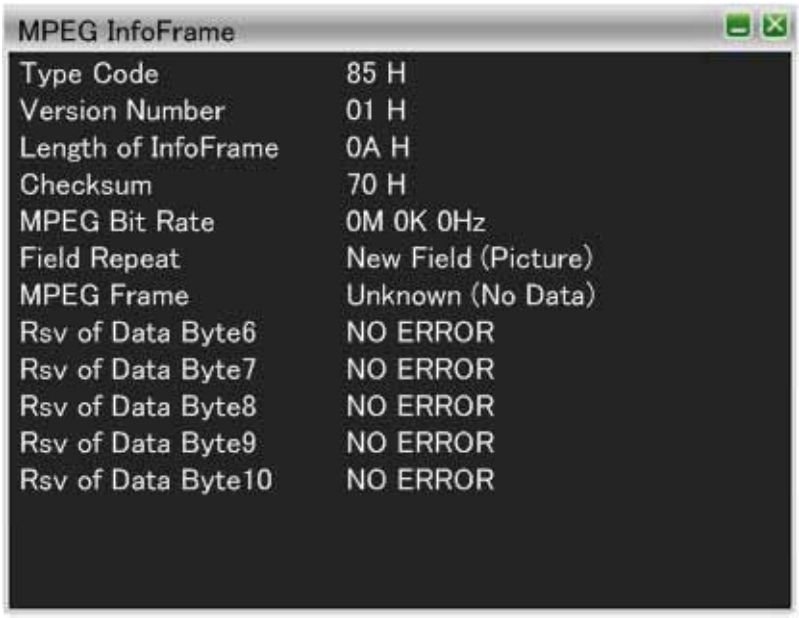
The items on this screen are used to decode and display MPEG InfoFrame of the HDMI input.

With MPEG InfoFrame, if compressed images sent by the transmitter have been converted into non-compressed images, the video information of the compressed images will be input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click MPEG InfoFrame	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on MPEG InfoFrame.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the Audio InfoFrame display contents in the GUI display mode.

Display item	What is displayed
Type Code	85 H
Version Number	XX H
Length of MPEG InfoFrame	XX H
Checksum	XX H
MPEG Bit Rate	X M XXX k XXXX Hz
Field Repeat	Ner Field (picture)
	Repeated Field
MPEG Frame	Unknown (No Data)
	I Picture
	B Picture
	P Picture
Rsv of Data Byte6	NO ERROR
	ERROR
Rsv of Data Byte7	NO ERROR
	ERROR
Rsv of Data Byte8	NO ERROR
	ERROR
Rsv of Data Byte9	NO ERROR
	ERROR

Rsv of Data Byte10	NO ERROR
	ERROR

4.1.6 Vendor Specific InfoFrame

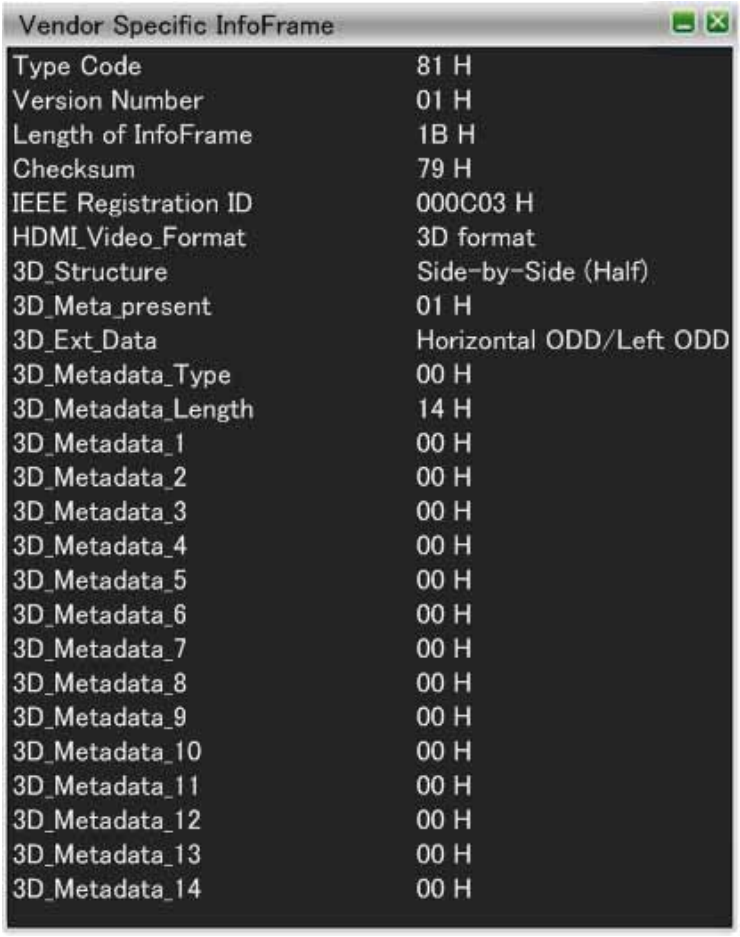
The items on this screen are used to decode and display Vendor Specific InfoFrame of the HDMI input.

With Vendor Specific InfoFrame, information relating to the 3D format and 4Kx2K is input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE→ left-click Vendor Specific InfoFrame	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Vendor Specific InfoFrame.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the Vendor Specific InfoFrame display contents in the GUI display mode.

Display item	What is displayed
Type Code	81 H
Version Number	XX H
Length of Vendor InfoFrame	XX H
Checksum	XX H
24-bit IEEE Resistance Identifier	XXXXXX H (000C03 H)
HDMI Video Format	no video format
	4Kx2K
	3D format
	Reserved
HDMI Video Format = Extended resolution format	

	HDMI VIC	4Kx2K 29.97/30 Hz
		4Kx2K 25 Hz
		4Kx2K 23.98/24 Hz
		4Kx2K 24 Hz (SMPTE)
		Reserved
HDMI Video Format = 3D format		
	Structure	Frame packing
		Field alternative
		Line alternative
		Side-by-Side (Full)
		L + depth
		L + depth + graphics + graphics-depth
		Top-and-Bottom
		Side-by-Side (Half)
		Reserved
	Meta_present	0H or 1H
	Structure = side-by-side (half)	
	Ext_Data	Horizontal Odd/Left Odd/Right
		Horizontal Odd/Left Even/Right
		Horizontal Even/Left Odd/Right
		Horizontal Even/Left Even/Right
		Quincunx Odd/Left Odd/Right
		Quincunx Odd/Left Even/Right
		Quincunx Even/Left Odd/Right
		Quincunx Even/Left Even/Right
		Reserved
	Meta_present = 1H	
	Metadata_type	XX H
	Metadata_length	XX H
	Metadata_1 to 20	XX H

4.1.7 Gamut MetaData Packet

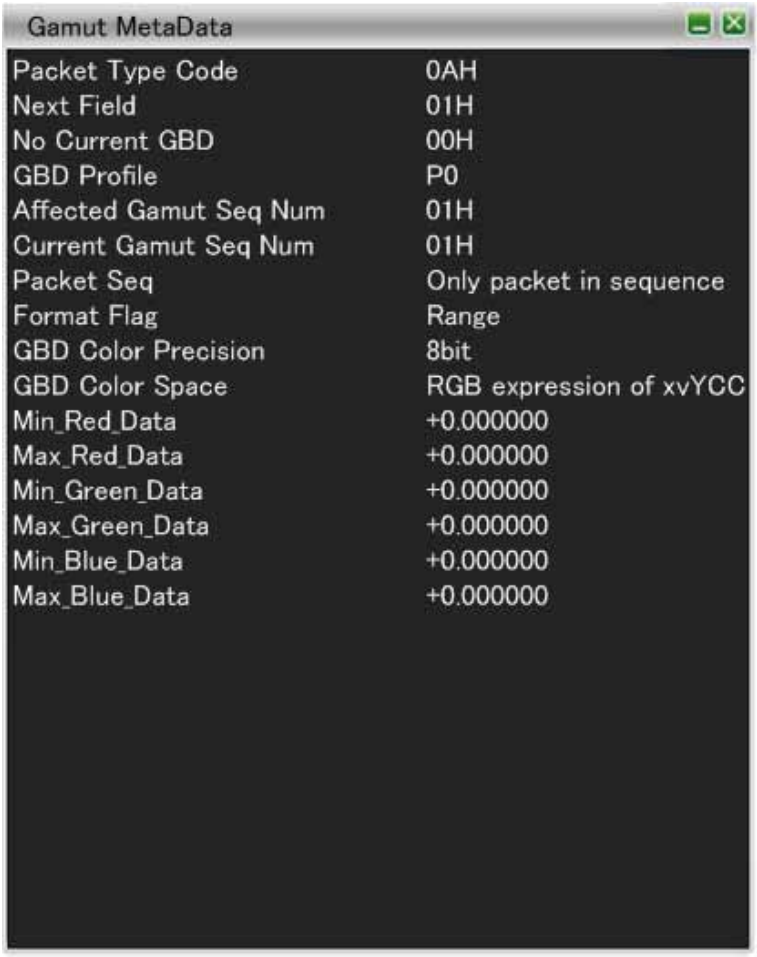
The items on this screen are used to decode and display Gamut Metadata Packet of the HDMI input.

With Gamut Metadata Packet, the gamut boundary descriptions (GBD) and other related metadata information are input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → Left-click Gamut MetaData Packet	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Gamut MetaData Packet.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the Gamut Metadata Packet display contents in the GUI display mode.

Display item	What is displayed
Packet Type Code	0A H
Next Field	XX H
No Current GBD	XX H
GBD Profile	P0
	P1
	P2
	P3
	Reserved
Affected Gamut Seq Num	XX H

Current Gamut Seq Num		XX H
Packet Seq		Intermediate packet in sequence
		First packet in sequence
		Last packet in sequence
		Only packet in sequence
GBD profile = P1 and Packet Seq = First packet in sequence		
	GBD Length H	XX H
	GBD Length L	XX H
	Checksum	XX H
Format Flag		Vertices/Facets
		Range
GBD Color Precision		8 bits
		10 bits
		12 bits
Format Flag = Vertices/Facets		
	GBD Color Space	ITU-R BT.709 (using RGB)
		xvYCC601 (IEC 61966-2-4-SD) (using YCbCr)
		xvYCC709 (IEC 61966-2-4-HD) (using YCbCr)
		XYZ
Format Flag = Range		
	GBD Color Space	Reserved
		RGB expression of xvYCC601
		RGB expression of xvYCC709
		Reserved
Format Flag = Vertices/Facets		
	Facet Mode	0 or 1
	Number Vertices H	XX H
	Number Vertices L	XX H
	Packed GBD Vertices Data	±X.XX
Format Flag = Range		
	Packed Range Data	±X.XX
Gamut Rsv pb0		XX H

4.1.8 ACP Packet

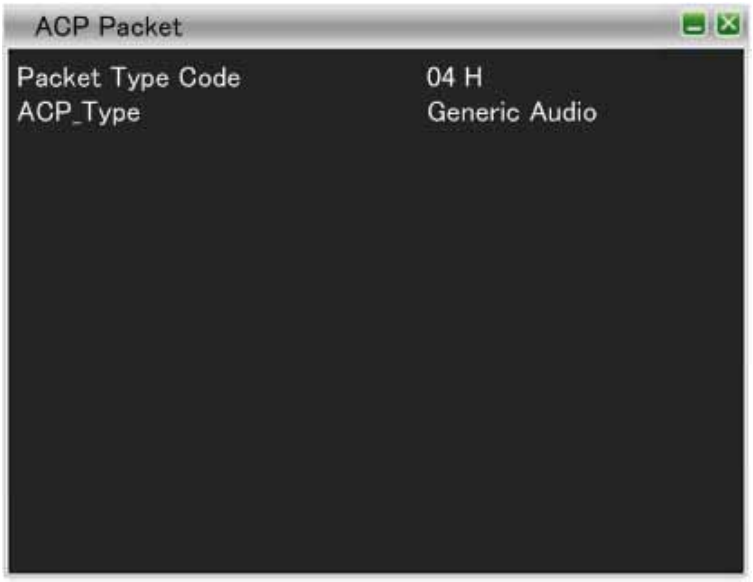
The items on this screen are used to decode and display ACP Packet of the HDMI input.

“ACP” is short for Audio Content Protection, and it refers to the information for protecting the copyrights of the audio transmitted by the transmitter which is input.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click ACP Packet	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on ACP Packet.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the ACP Packet display contents in the GUI display mode.

*1 is displayed with the DVD Audio ACP Type; *2 is displayed when the ACP Type is Super Audio CD.

Display item		What is displayed
Packet Type Code		04 H
ACP_Type		Generic Audio
		IEC60958-Identified Audio
		DVD Audio *1
		Super Audio CD *2
		Reserved
*1	DVD-Audio_Type_dependent _Generation	XX H
	Copy_Permission	Copy Freely
		Reserved
		audio_copy_number
		Can’t copy
	Copy_Number	Number of permitted copies is ‘1’
		Number of permitted copies is ‘2’
		Number of permitted copies is ‘4’
		Number of permitted copies is ‘6’
		Number of permitted copies is ‘8’
		Number of permitted copies is ‘10’
		Number of permitted copies is ‘3’

		Number of permitted copy is not restricted. (Copy One Generation)
	Quality	CH < 2, fs < 48 KHz, Q < 16 bits
		CH < 2, fs&Q is not restricted
		CH&fs&Q is not restricted
		CH is not restricted, fs < 48 KHz, Q < 16 bits
	Transaction	not present
		reserved
	Rsv of Header Byte2	NO ERROR
		ERROR
	Rsv of Data Byte2-27	NO ERROR
		ERROR
*2	Count_A	XX times
	Count_S	XX times
	Count_U	XX times
	CCI_Flags Q_A	CD Quality
		unlimited DSD quality
	CCI_Flags Q_S	CD Quality
		unlimited DSD quality
	CCI_Flags Q_U	CD Quality
		unlimited DSD quality
	CCI_Flags Move_A	not allowed for the content
		allowed for the content
	CCI_Flags Move_S	not allowed for the content
		allowed for the content
	CCI_Flags Move_U	not allowed for the content
		allowed for the content
	CCI_Flags Reserved	NO ERROR
		ERROR
	CCI Rsv of Data Byte5-16	NO ERROR
		ERROR
	Rsv of Data Byte17-27	NO ERROR
		ERROR

4.1.9 ISRC1 Packet

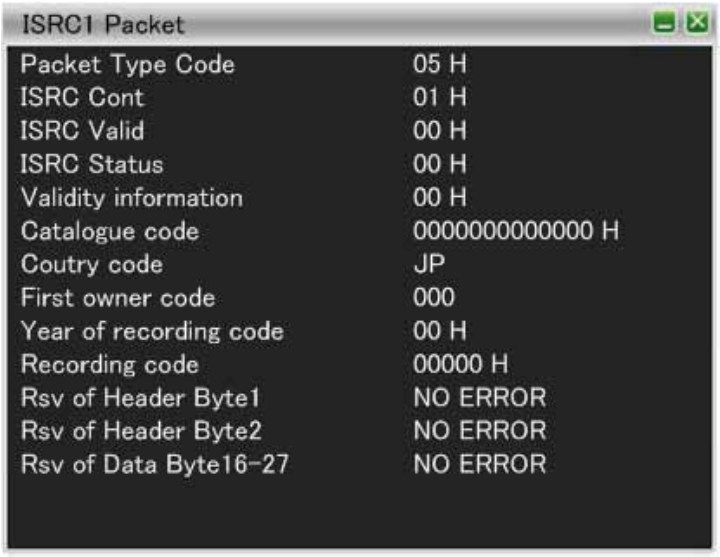
The items on this screen are used to decode and display ISRC1 Packet of the HDMI input.

ISRC stands for International Standard Recording Code, and it refers to the audio source identification codes which are input when DVD audio is transmitted by the transmitter. With ISRC1, the values of UPC_EAN_ISRC_numbers 0 to 15 as defined by the DVD Audio standards are applied in addition to the values defined by the HDMI standards.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click ISRC1 Packet	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on ISRC1 Packet.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the ISRC1 Packet display contents in the GUI display mode.

Display item	What is displayed
Packet Type Code	05H
ISRC_Cont	XX H
ISRC_Valid	XX H
ISRC_Status	XX H
Validity information	0H UPC/EAN and ISRC are invalid
	4H UPC/EAN is invalid and ISRC is valid
	8H UPC/EAN is valid and ISRC is invalid
	CH UPC/EAN and ISRC are valid
Catalogue code (UPC/EAN #1- #13)	XXXXXXXXXXXXX H
Country code (ISRC #1 - #2)	XX
First owner code (ISRC #3 - #5)	XXX
Year of recording code (ISRC #6 - #7)	XX H
Recording code (Recording-item code)	XXXXXH
Rsv of Header Byte1	NO ERROR
	ERROR
Rsv of Header Byte2	NO ERROR
	ERROR
Rsv of Data Byte16-27	NO ERROR
	ERROR

4.1.10 ISRC2 Packet

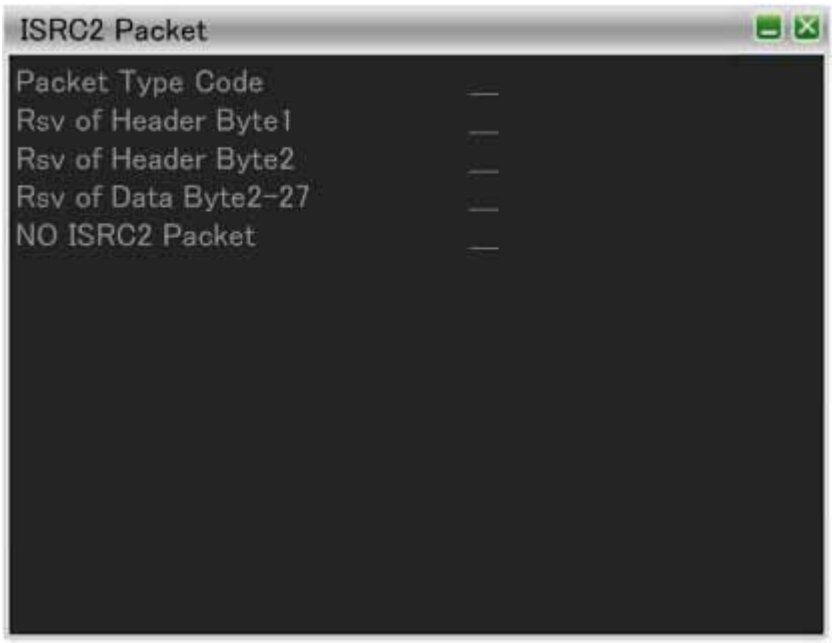
The items on this screen are used to decode and display ISRC2 Packet of the HDMI input.

With ISRC2, the values of UPC_EAN_ISRC_numbers 16 to 31 as defined by the DVD Audio standards are applied.
(Currently, these are reserved by the DVD Audio standards.)

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click ISRC2 Packet	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on ISRC2 Packet.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the ISRC2 Packet display contents in the GUI display mode.

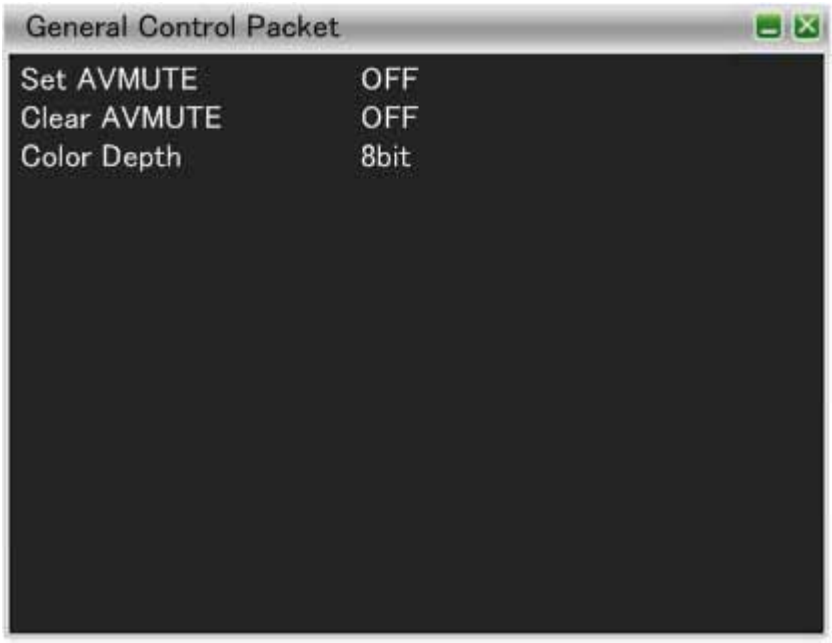
Display item	What is displayed
Packet Type Code	06H
Header Byte1-2	XXH for each byte
Data Byte16-27	XXH for each byte
NO ISRC2 Packet	

4.1.11 General Control Packet

The items on this screen are used to decode and display General Control Packet of the HDMI input.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click General Control Packet	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on General Control Packet.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



The figure below shows the General Control Packet display contents in the GUI display mode.

Display item	What is displayed
Set AV Mute	ON
	OFF
Clear AV Mute	ON
	OFF
Color Depth	8 bits
	10 bits
	12 bits

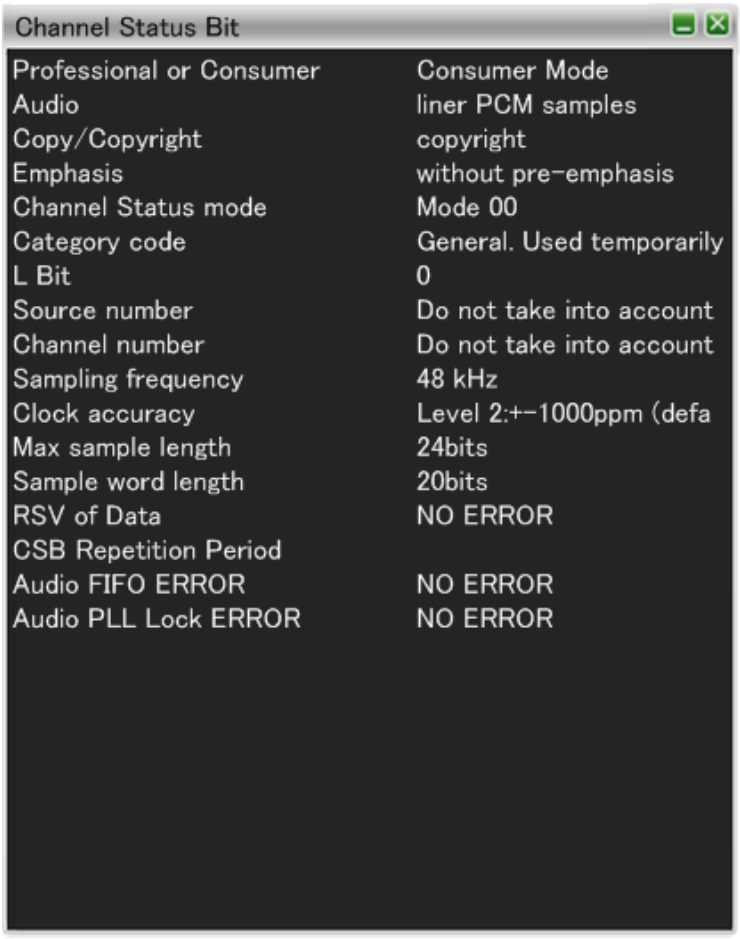
4.1.12 Channel Status Bit

The items displayed on this screen are used to decode and display the Channel Status Bits (the sub codes that identify the sending device and sampling frequency) of the HDMI input audio streams.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click Channel Status Bit	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Channel Status Bit.
	Press [R CLICK] -> press [L CLICK] on ANALYZE.	

Furthermore, when [HEX <-> GUI] is clicked after right-clicking on the window, it is possible to switch between the HEX display and the GUI display.



The figure below shows the Channel Status Bit display contents in the GUI display mode.

Display item	What is displayed
Professional or Consumer	Professional Mode
	Consumer Mode
Audio	linear PCM samples
	other than linear PCM samples
Copy / Copyright	copyright
	no copyright
Emphasis	Audio = Linear PCM samples
	without pre-emphasis
	with 50/15 us pre-emphasis
	Reserved - 2channel audio
	Reserved - 4channel audio

	Audio = other than Linear PCM samples
	Default state
Channel Status Mode	Mode 00
	Reserved
Category code	General. Used temporarily
	Laser optical (Compact disc)
	Laser optical (Laser optical digital audio system)
	Laser optical (Mini disc system)
	Laser optical (Digital versatile disc)
	Laser optical (Reserved)
	Digital/digital conv.&signal (PCM encoder/decoder)
	Digital/digital conv.&signal (Digital signal mixer)
	Digital/digital conv.&signal (Sampling rate converter)
	Digital/digital conv.&signal (Digital sound sampler)
	Digital/digital conv.&signal (Digital sound processor)
	Digital/digital conv.&signal (Reserved)
	Digital compact cassette
	Magnetic tape or disc (DAT)
	Magnetic tape or disc (Video tape recorder)
	Magnetic tape or disc (Digital compact recorder)
	Magnetic tape or disc (Reserved)
	Broadcast reception (Japan)
	Broadcast reception (Europe)
	Broadcast reception (USA)
	Broadcast reception (Electronic software delivery)
	Broadcast reception (Reserved)
	Without copyright information (Synthesizer)
	Without copyright information (Microphone)
	Without copyright information (Reserved)
	Category code without copyright (A/D converter)
	Category code without copyright (Reserved)
	Category code with copyright (A/D converter)
	Category code with copyright (Reserved)
	Category code groups for solid state memory (Reserved)
	Experiment products not for commercial sale
	Not define. Reserved
L (Generation Status) Bit	0 - 1
Source number	Do not take into account.
	1 - 15 CH
Channel number	Do not take into account.
	A - O (0x1: A; 0x2: B; …… 0xF: O)
Sampling frequency	no indicate
	32 KHz
	44.1 KHz
	48 KHz
	88.2 KHz (- HDMI Original)

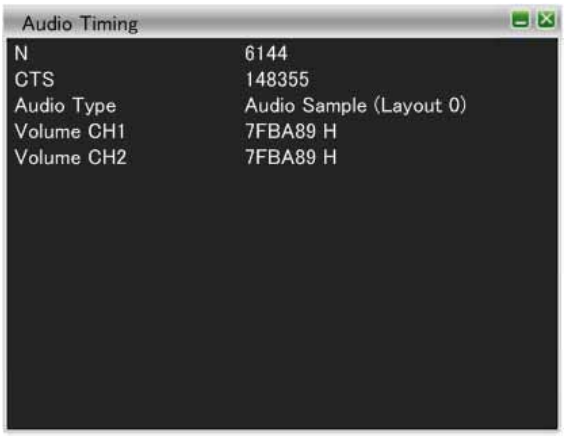
	96 KHz (- HDMI Original)
	176.4 KHz (- HDMI Original)
	192 KHz (- HDMI Original)
	768 KHz
	Reserved
Clock accuracy	Level 2, ±1000 ppm (default)
	Level 3, variable pitch
	Level 1, ±50 ppm - high accuracy
	Reserved
Maximum audio sample word length	20 bits
	24 bits
Sample word length	Maximum audio sample word length = 20 bits
	Word length not indicated (default)
	20 bits
	22 bits
	23 bits
	24 bits
	21 bits
	Reserved
	Maximum audio sample word length = 24 bits
	Word length not indicated (default)
	16 bits
	18 bits
	19 bits
	20 bits
	17 bits
	Reserved
Rsv of Data CSB Repetition Period	NO ERROR ERROR
Audio FIFO ERROR	NO ERROR ERROR
AudioPLL Lock ERROR	NO ERROR ERROR

4.1.13 Audio Timing

The items on this screen are used display the constants (N,CTS) used when playing back the HDMI input audio clock from the video pixel clock and the input HDMI audio volume level.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click Audio Timing	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Audio Timing.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



The figure below shows the Audio Timing display contents in the GUI display mode.

Display item	What is displayed	
N	Each register value displayed (DEC)	
CTS		
Audio	Audio Sample	
	One Bit Audio	
	Compression Audio *1	
		NULL
		AC-3
		Refer to SMPTE 338M
		Pause
		MPEG1-L1
		MPEG1-L2,L3 or MPEG2 without extension
		MPEG2 extension
		MPEG2 AAC
		MPEG2-1
		MPEG2-2
		MPEG2-3
		DTS type1
		DTS type2
		DTS type3
		ATRAC

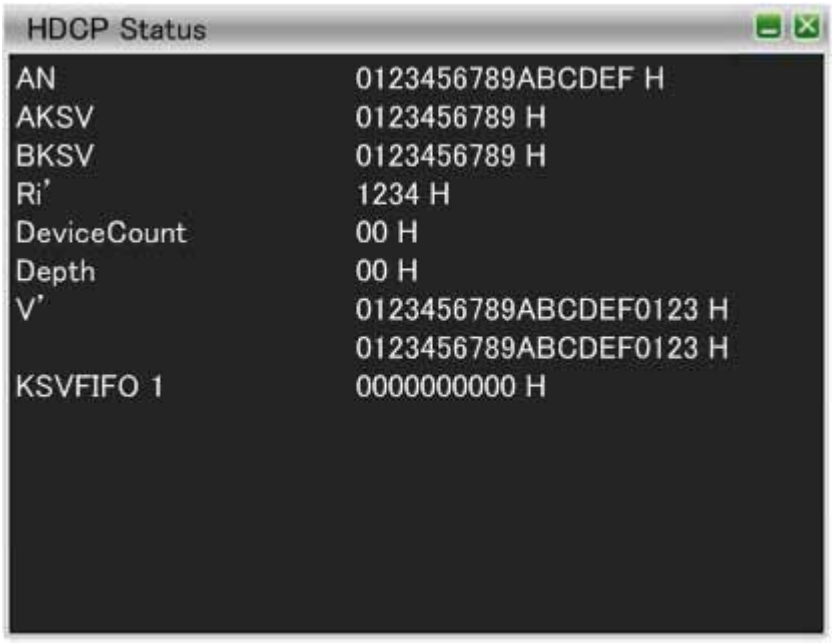
		ATRAC2/3
		ATRAC-X
		DTS HD
		WMA pro
		MPEG2 AAC half
		MPEG2 AAC quarter
		DD+
		Dolby True HD Master Audio
		Reserved
		Refer to SMPTE 338M
		Extended data type
CH1	Volume level of each channel dB display (left picture in the previous page) and value display (right picture of the previous page) in the Audio Monitor of Sub window should be switched.	
CH2		
CH3		
CH4		
CH5		
CH6		
CH7		
CH8		

4.1.14 HDCP Status

This screen is used to display the constants used during HDCP certification at the HDMI reception end.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click HDCP Status	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on HDCP Status.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



The figure below shows the HDCP display contents in the GUI display mode.

Display item	What is displayed
AN	Dummy random value used for HDCP certification and sent from the transmitter to the VA-1831
AKSV	Key Selection Vector of transmission end
BKSV	Key Selection Vector of VA-1831
Ri'	Certified value calculated by VA-1831
DeviceCount	Total number of devices connected downstream *
Depth	Total number of stages connected downstream *
KSVFIFO	Value of KSV of receiver/repeater connected downstream and collected by VA-1831 *
V'	Value for determining whether the KSV list generated by VA-1831 is adequate

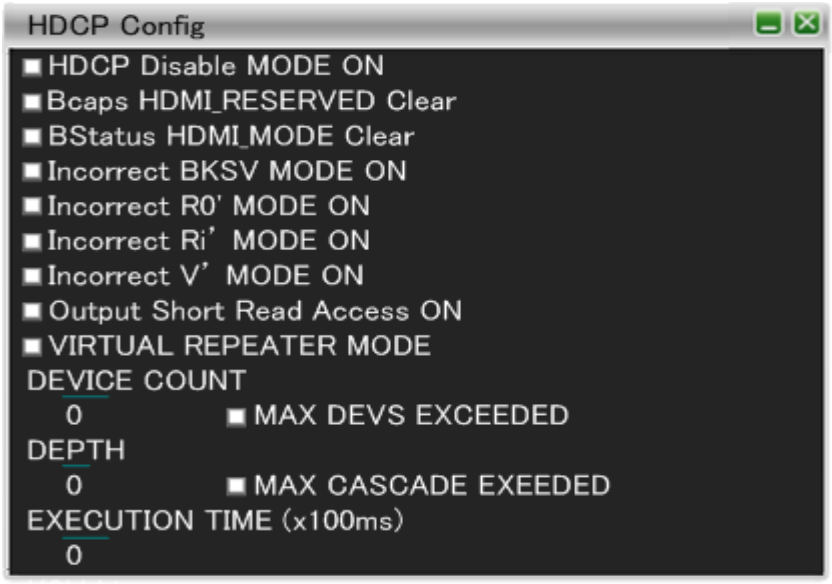
* These displays appear only when the VA-1831 is used as a repeater.

4.1.15 HDCP Config

The items displayed on this screen are used to the select the HDCP-related settings.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click HDCP Config	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on HDCP Config.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Listed below are the HDCP Config setting items.

Setting item	Description
HDCP Disable MODE	« HDCP Disable » is set to the Sink.
Bcaps HDMI_RESERVED Clear	Clear the setting of HDMI_RESERVED of Bcaps.
BStatus HDMI_MODE Clear	0 is continued to be set in HDMI_MODE of Bcaps.
Incorrect BKSV MODE	This is set so that an incorrect BKSV is returned.
Incorrect R0' MODE	This is set so that an incorrect R0' is returned.
Incorrect Ri' MODE	This is set so that an incorrect Ri' is returned.
Incorrect V' MODE	This is set so that an incorrect V' is returned.
Output Short Read Access On	This checks R0/Ri with the device at the output end using Short Read Access.
VIRTUAL REPEATER MODE	When VA-1831 is being used as a repeater, this provides emulation for the device whose signals are output to the VA-1831 in such a way that the HDMI device is connected to the output side of VA-1831.
DEVICE COUNT	This sets the total number of devices connected to the output destination of the VA-1831. In addition, when MAX DEVS EXCEEDED ON is set, MAX DEVS EXCEEDED will be 1.
DEPTH	This sets the number of hierarchical levels of the output destination of the VA-1831. In addition, when MAX CASCADE EXCEEDED ON is set, MAX CASCADE EXCEEDED will be 1.
EXECUTION TIME	This is the time taken for KSV FIFO READY to be returned after it has been recognized at the input end of the VA-1831 that HDCP has started.
KSV list	Set the value of KSV list when using VIRTUAL REPEATER Mode.

4.2 Monitor

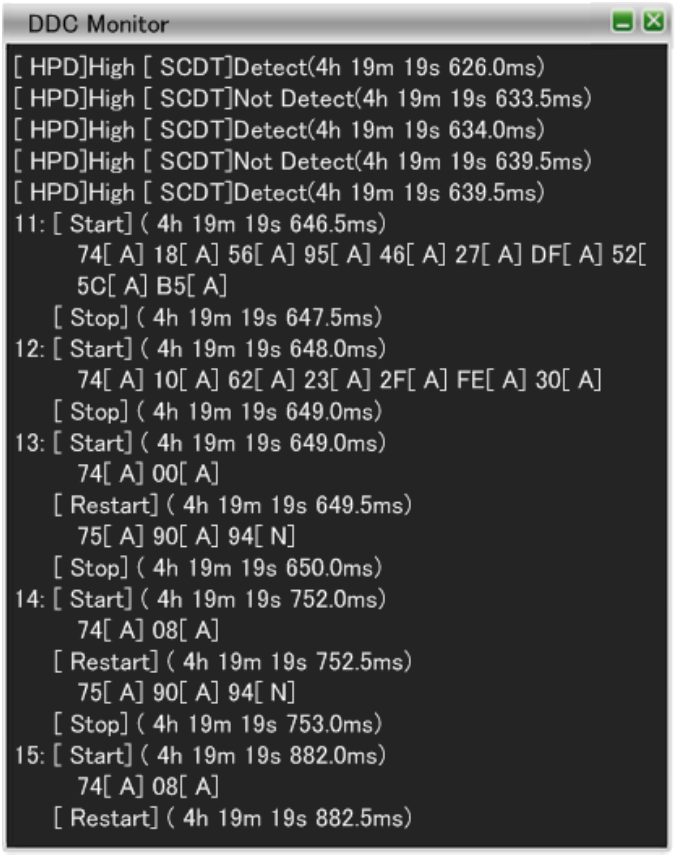
“DDC” is short for Display Data Channel and, under the standards for sending the monitor information specified by VESA to the Source, it is also used for sending and receiving the HDCP data. The data is sent and received over a DDC line using the I2C bus system.

4.2.1 DDC Monitor

This function makes it possible to display the data flowing along the DDC line between the input end of the VA-1831 and HDMI source device when the VA-1831 is used in the Receiver Mode or display the data flowing along the DDC line between the HDMI sink device and HDMI source device when the unit is used in the Through Mode on the unit’s front panel LCD. By using the function, it is possible to check whether the HDMI sink device and HDMI source device are sending and receiving the DDC command correctly.

The display method used is shown below.

Mouse operations	Right-click → click ANALYZE → click DDC Monitor	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on DDC Monitor.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



The table below shows what is displayed for DDC Monitor.

Display item	What is displayed
[Start]	Start Condition
[Restart]	Restart Condition
[Stop]	Stop Condition
[A]	Acknowledge
[N]	Not Acknowledge
[HPD]	Hot plug change
[SCDT]	Whether video signals are present
(XXh XXm XXs XXX.Xms)	Acquisition time

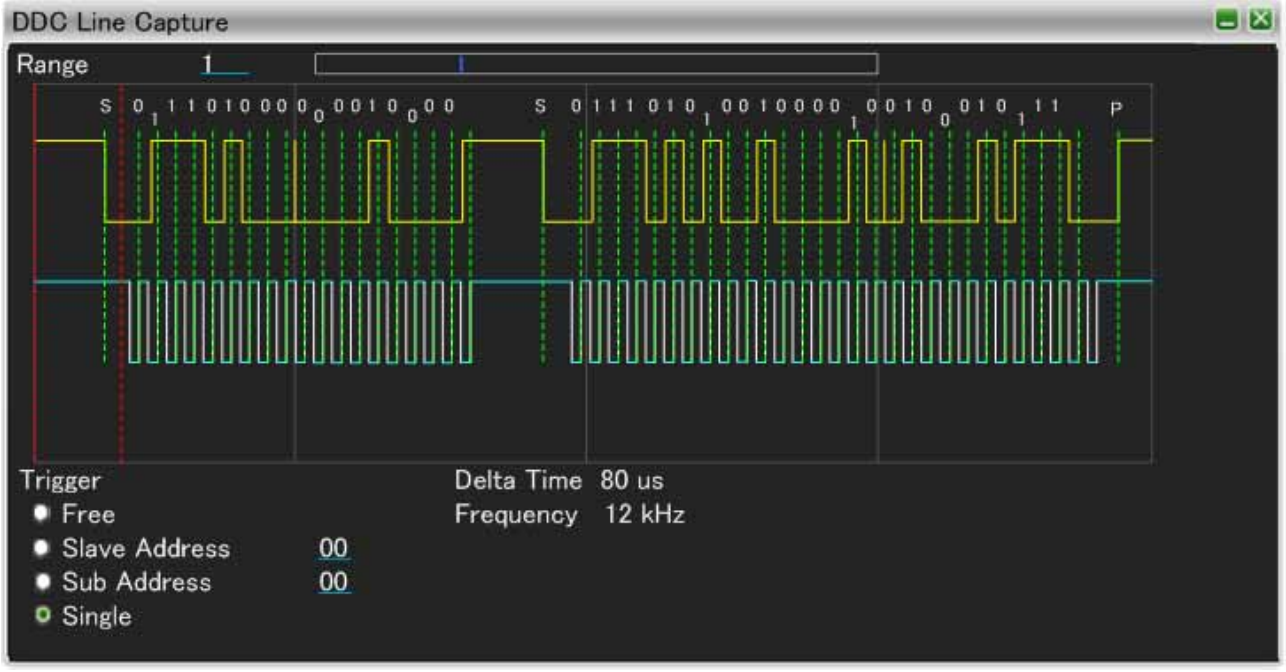
The data types are classified by Slave Address as indicated below.

Slave Address	Details
A0 H	EDID Read command
60 H	EDID Segment Pointer switching command
74 H	HDCP-related commands
All other addresses	Commands other than EDID and HDCP commands

4.2.2 DDC Line Capture

Display the waveform of DDC Line. (Upper part : serial data line (SDA), Lower part : serial clock line (SCL).)

Mouse operation	Right click → Left click of ANALYZE → Left click of DDC Line Capture → Wheel click on the display.	
Main unit	Press ANALYZE.	→ Press L CLICK on the DDC Line capture.
	Press R CLICK → On the ANALYZE, press L CLICK	



Item		Description
Trigger	Free	Trigger is set as Free.
	Slave Address	Set Slave address that you want to set a Trigger.
	Sub Address	Set Slave Address and Sub Address that you want to set Trigger.
	Single	Trigger is set as Single.
Delta Time		Show the time between dotted red lines.
Frequency		Show the frequency between dotted red lines.

4.2.3 CEC Monitor

"CEC" is short for Consumer Electronics Control, and it is a function for exercising reciprocal control between HDMI-connected devices.

For instance, it enables a DVD player to be played from a TV set or the power of a TV set or DVD player to be turned ON or OFF from an AV amplifier (AV center). CEC is achieved by sending messages between the devices through the HDMI CEC line.

Using the CEC Monitor function, the CEC line is monitored.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click CEC Monitor	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on CEC Monitor.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

The table below shows what is displayed for CEC Monitor.

Display item	What is displayed
[OP]	OP Code
[PA]	Parameter
(XXh XXm XXs XXX.Xms)	Acquisition time
X -> X	Logical Address

The errors output on the CEC Monitor screen are listed in the table below.

Item	Details
Error Handling	The Follower, which has detected an error where the bit period is less than the rating, sends a low level signal with approximately 1.5 times the length of the bit period to the bus in order to notify the Initiator that an error has occurred in the CEC bus. (Error handling) When the VA-1831 has detected this operation, it displays this message. (If the low level period is more than 3.30-3.35 ms, this is treated as "Error Handling.")
Error Handling Act	This message is displayed when the VA-1831 has executed Error Handling.
Bit Period Short Error	This message is displayed when the bit period of the CEC command is shorter than the rating.

	(If the bit period is under 2.00-2.05 ms, this is treated as a “Bit Period Short Error.”)
Bit Period Long Error	This message is displayed when the bit period of the CEC command is longer than the rating. (If the bit period is more than 2.80-2.85 ms, this is treated as a “Bit Period Long Error.”)
Bus Free Error	This message is displayed when, in those parts of the items which are checked by the VA-1831 up to the command re-send time of the CEC Compliance Test Item Check, this re-send time is shorter than the rating.
ACK Error	This message is displayed when ACK is not present in the CEC command.
Send Bus Busy Error	This message is displayed if the bus continues to be busy (low level) when an attempt has been made to send commands from the VA-1831.
Send Error Handling	This message is displayed if for some reason the 1-bit period is shorter than the rating when commands have been sent from the VA-1831, and this has been notified by the Follower. (If the low level period is more than 3.30-3.35 ms, this is treated as “Error Handling.”)
Send Arbitration Error	This message is displayed if a device other than the VA-1831 is also judged to be the Initiator when commands have been sent from the VA-1831.
Send Ack Error	This message is displayed if it was not possible to detect ACK when commands have been sent from the VA-1831.
Send Impedance Error	This message is displayed if for some reason another device has set the bus to the low level at a point where it should not be set to the low level when commands have been sent from the VA-1831.
Send the other Error	This message is displayed when an error is judged to have occurred for some other reason.
Corrupted bit Error	This message is displayed when an unintended low level has been output to the bus.

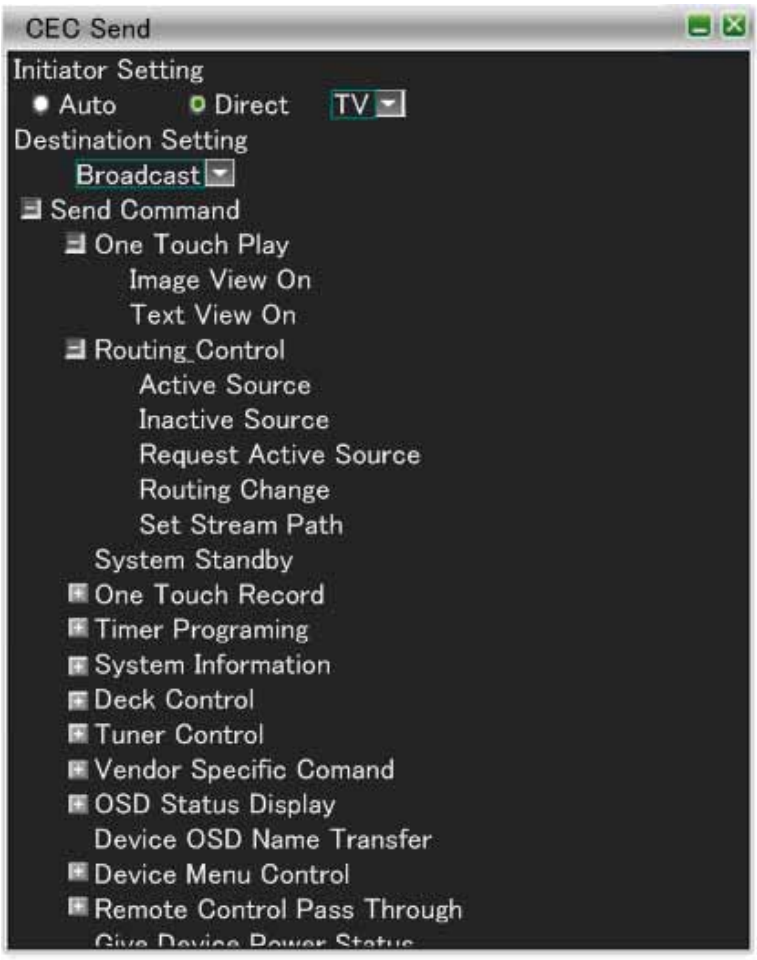
4.2.4 CEC Send

This displays the setting screen for the send data.

The Logical Addresses of the send destinations are specified from Destination Setting.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click CEC Send	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on CEC Send.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Initiator Setting

Item	Description
Auto	Set Logical address that is set in the 4.2.7 Address Setting.
Direct	Select Logical Address from the choices in the right side.

The Logical Addresses are listed in the table below.

Address	Device
0	TV
1	Recording Device1
2	Recording Device2
3	Tuner1

4	Playback Device1
5	Audio System
6	Tuner2
7	Tuner3
8	Playback Device2
9	Recording Device3
A	Tuner4
B	Playback Device3
C	Reserved
D	Reserved
E	Specific Use
F	Broadcast

The send data can be set using the command names from Send Command.

The table below lists the data which can be sent.

Function item	Send data	Description	Remarks
One Touch Play	Image View On	Image View On is sent. After it is sent, Active Source is sent.	A setting other than TV is selected for the VA-1831. TV is set as the send destination.
	Text View On	Text View On is sent. After it is sent, Active Source is sent.	A setting other than TV is selected for the VA-1831. TV is set as the send destination.
Routing Control	Active Source	Active Source is broadcast.	
	Request Active Source	Request Active Source is broadcast.	
	Routing Change	If the VA-1831 is emulating two or more devices, the least significant bit of the currently notified Physical Address is changed, and the Routing Change is broadcast.	
	Set Stream Path	The Give Physical Address is sent, and Set Stream Path is broadcast to the Physical Address returned.	TV is selected as the VA-1831 setting.
System Standby		System Standby is sent.	
One Touch Record	Record OFF	Record OFF is sent.	
	Record ON	Record ON is sent.	TV is selected as the VA-1831 setting. Alternatively: A setting other than TV is selected for the VA-1831. A setting other than TV is selected for the send destination.
		Record TV Screen is sent.	A setting other than TV is selected for the VA-1831. TV is set as the send destination.
Timer Programming	Clear Analogue Timer	Clear Analogue Timer is sent.	
	Clear Digital Timer	Clear Digital Timer is sent.	
	Clear External Timer	Clear External Timer is sent.	
	Set Analogue Timer	Set Analogue Timer is sent.	
	Set Digital Timer	Set Digital Timer is sent.	
	Set External Timer	Set External Timer is sent.	

	Set Timer Program Title	Set Timer Program Title [TEST TITLE STR] is sent.	
	Get CEC Version	Get CEC Version is sent.	
	CEC Version	CEC Version is sent.	
	Get Menu Language	Get Menu Language is sent.	TV is selected as the VA-1831 setting. TV is set as the send destination.
	Set Menu Language	Set Menu Language is sent.	TV is selected as the VA-1831 setting.
	Give Physical Address	Give Physical Address is sent.	
	Report Physical Address	Report Physical Address is sent.	
Deck Control	Give Deck Status ON	Give Deck Status [ON] is sent.	
	Give Deck Status OFF	Give Deck Status [OFF] is sent.	
	Give Deck Status ONCE	Give Deck Status [ONCE] is sent.	
	Skip Forward / Wind Forward	Deck Control [Skip Forward / Wind Forward] is sent.	
	Skip Backward / Rewind	Deck Control [Skip Backward / Rewind] is sent.	
	Stop	Deck Control [Stop] is sent.	
	Eject	Deck Control [Eject] is sent.	
	Play Forward	Play [Play Forward] is sent.	
	Play Reverse	Play [Play Reverse] is sent.	
	Play Still	Play [Play Still] is sent.	
	Fast Forward Min Speed	Play [Fast Forward Min Speed] is sent.	
	Fast Forward Medium Speed	Play [Fast Forward Medium Speed] is sent.	
	Fast Forward Max Speed	Play [Fast Forward Max Speed] is sent.	
	Fast Reverse Min Speed	Play [Fast Reverse Min Speed] is sent.	
	Fast Reverse Medium Speed	Play [Fast Reverse Medium Speed] is sent.	
	Fast Reverse Max Speed	Play [Fast Reverse Max Speed] is sent.	
	Slow Forward Min Speed	Play [Slow Forward Min Speed] is sent.	
	Slow Forward Medium Speed	Play [Slow Forward Medium Speed] is sent.	
	Slow Forward Max Speed	Play [Slow Forward Max Speed] is sent.	
	Slow Reverse Min Speed	Play [Slow Reverse Min Speed] is sent.	
	Slow Reverse Medium Speed	Play [Slow Reverse Medium Speed] is sent.	

	Slow Reverse Max Speed	Play [Slow Reverse Max Speed] is sent.	
Tuner Control	Give Tuner Device Status ON	Give Tuner Device Status [ON] is sent.	
	Give Tuner Device Status OFF	Give Tuner Device Status [OFF] is sent.	
	Give Tuner Device Status Once	Give Tuner Device Status [Once] is sent.	
	Select Digital Service 1	Digital Service 1, which has been set by the Support tuner, is used as the parameter, and Select Digital Service is sent.	
	Select Digital Service 2	Digital Service 2, which has been set by the Support tuner, is used as the parameter, and Select Digital Service is sent.	
	Select Digital Service 3	Digital Service 3, which has been set by the Support tuner, is used as the parameter, and Select Digital Service is sent.	
	Select Analogue Service 1	Analogue Service 1, which has been set by the Support tuner, is used as the parameter, and Select Analogue Service is sent.	
	Select Analogue Service 2	Analogue Service 2, which has been set by the Support tuner, is used as the parameter, and Select Analogue Service is sent.	
	Select Analogue Service 3	Analogue Service 3, which has been set by the Support tuner, is used as the parameter, and Select Analogue Service is sent.	
	Tuner Step Decrement	Tuner Step Decrement is sent.	
	Tuner Step Increment	Tuner Step Increment is sent.	
Vendor Specific Commands	Device Vendor ID	VendorID, which has been set by the Device Information, is used as the parameter, and Device Vendor ID is sent.	
	Give Device Vendor ID	Give Device Vendor ID is sent.	
OSD Status Display	Display for default time	Set OSD String [Display for default time] is sent.	TV is set as the send destination.
	Display until cleared	Set OSD String [Display until cleared] is sent.	TV is set as the send destination.
	Clear previous message	Set OSD String [Clear previous message] is sent.	TV is set as the send destination.
	Reserved for future use	Set OSD String [Reserved for future use] is sent.	TV is set as the send destination.

Device OSD Name Transfer		Give OSD Name is sent.	
Device Menu Control	Activate	Menu Request [Activate] is sent.	
	Deactivate	Menu Request [Deactivate] is sent.	
	Query	Menu Request [Query] is sent.	
	Select	[Select] of User Control Pressed is sent.	
	Up	[Up] of User Control Pressed is sent.	
	Down	[Down] of User Control Pressed is sent.	
	Left	[Left] of User Control Pressed is sent.	
	Right	[Right] of User Control Pressed is sent.	
	Right-Up	[Right-Up] of User Control Pressed is sent.	
	Right-Down	[Right-Down] of User Control Pressed is sent.	
	Left-Up	[Left-Up] of User Control Pressed is sent.	
	Left-Down	[Left-Down] of User Control Pressed is sent.	
	Root Menu	[Root Menu] of User Control Pressed is sent.	
	Setup Menu	[Setup Menu] of User Control Pressed is sent.	
	Contents Menu	[Contents Menu] of User Control Pressed is sent.	
	Favorite Menu	[Favorite Menu] of User Control Pressed is sent.	
	Exit	[Exit] of User Control Pressed is sent.	
	Reserved (0x0E) : Reserved (0x1F)	[Reserved] of User Control Pressed is sent.	
	Numbers 0 : Numbers 9	User Control Pressed [Numbers X] is sent.	
	Dot	[Dot] of User Control Pressed is sent.	
	Enter	[Enter] of User Control Pressed is sent.	
	Clear	[Clear] of User Control Pressed is sent.	

Reserved (0x2D)	[Reserved] of User Control Pressed is sent.	
Reserved (0x2E)	[Reserved] of User Control Pressed is sent.	
Next Favorite	[Next Favorite] of User Control Pressed is sent.	
Channel Up	[Channel Up] of User Control Pressed is sent.	
Channel Down	[Channel Down] of User Control Pressed is sent.	
Previous Channel	[Previous Channel] of User Control Pressed is sent.	
Sound Select	[Sound Select] of User Control Pressed is sent.	
Input Select	[Input Select] of User Control Pressed is sent.	
Display Information	[Display Information] of User Control Pressed is sent.	
Help	[Help] of User Control Pressed is sent.	
Page Up	[Page Up] of User Control Pressed is sent.	
Page Down	[Page Down] of User Control Pressed is sent.	
Reserved (0x39) : Reserved (0x3F)	[Reserved] of User Control Pressed is sent.	
Power	[Power] of User Control Pressed is sent.	
Volume Up	[Volume Up] of User Control Pressed is sent.	
Volume Down	[Volume Down] of User Control Pressed is sent.	
Mute	[Mute] of User Control Pressed is sent.	
Play	[Play] of User Control Pressed is sent.	
Stop	[Stop] of User Control Pressed is sent.	
Pause	[Pause] of User Control Pressed is sent.	
Record	[Record] of User Control Pressed is sent.	
Rewind	[Rewind] of User Control Pressed is sent.	
Fast forward	[Fast forward] of User Control Pressed is sent.	

Eject	[Eject] of User Control Pressed is sent.	
Forward	[Forward] of User Control Pressed is sent.	
Backward	[Backward] of User Control Pressed is sent.	
Stop-Record	[Stop-Record] of User Control Pressed is sent.	
Pause-Record	[Pause-Record] of User Control Pressed is sent.	
Reserved (0x4F)	[Reserved] of User Control Pressed is sent.	
Angle	[Angle] of User Control Pressed is sent.	
Sub picture	[Sub picture] of User Control Pressed is sent.	
Video on Demand	[Video on Demand] of User Control Pressed is sent.	
Electronic Program Guide	[Electronic Program Guide] of User Control Pressed is sent.	
Timer Programming	[Timer Programming] of User Control Pressed is sent.	
Initial Configuration	[Initial Configuration] of User Control Pressed is sent.	
Reserved (0x56) : Reserved (0x5F)	[Reserved] of User Control Pressed is sent.	
Play Function	[Play Function] of User Control Pressed is sent.	
Pause-Play Function	[Pause-Play Function] of User Control Pressed is sent.	
Record Function	[Record Function] of User Control Pressed is sent.	
Pause-Record Function	[Pause-Record Function] of User Control Pressed is sent.	
Stop Function	[Stop Function] of User Control Pressed is sent.	
Mute Function	[Mute Function] of User Control Pressed is sent.	
Restore Volume Function	[Restore Volume Function] of User Control Pressed is sent.	
Tune Function	[Tune Function] of User Control Pressed is sent.	
Select Disk Function	[Select Disk Function] of User Control Pressed is sent.	

	Select A/V Input Function	[Select A/V Input Function] of User Control Pressed is sent.	
	Select Audio Input Function	[Select Audio Input Function] of User Control Pressed is sent.	
	Power Toggle Function	[Power Toggle Function] of User Control Pressed is sent.	
	Power Off Function	[Power Off Function] of User Control Pressed is sent.	
	Power On Function	[Power On Function] of User Control Pressed is sent.	
	Reserved (0x6B) : Reserved (0x70)	[Reserved] of User Control Pressed is sent.	
	F1 (Blue)	[F1 (Blue)] of User Control Pressed is sent.	
	F2 (Red)	[F2 (Red)] of User Control Pressed is sent.	
	F3 (Green)	[F3 (Green)] of User Control Pressed is sent.	
	F4 (Yellow)	[F4 (Yellow)] of User Control Pressed is sent.	
	F5	[F5] of User Control Pressed is sent.	
	Data	[Data] of User Control Pressed is sent.	
	Reserved (0x77) : Reserved (0x7F)	[Reserved] of User Control Pressed is sent.	
Remote Control Pass Through	Select	[Select] of User Control Pressed is sent.	
	Up	[Up] of User Control Pressed is sent.	
	Down	[Down] of User Control Pressed is sent.	
	Left	[Left] of User Control Pressed is sent.	
	Right	[Right] of User Control Pressed is sent.	
	Right-Up	[Right-Up] of User Control Pressed is sent.	
	Right-Down	[Right-Down] of User Control Pressed is sent.	
	Left-Up	[Left-Up] of User Control Pressed is sent.	
	Left-Down	[Left-Down] of User Control Pressed is sent.	

Root Menu	[Root Menu] of User Control Pressed is sent.	
Setup Menu	[Setup Menu] of User Control Pressed is sent.	
Contents Menu	[Contents Menu] of User Control Pressed is sent.	
Favorite Menu	[Favorite Menu] of User Control Pressed is sent.	
Exit	[Exit] of User Control Pressed is sent.	
Reserved (0x0E) : Reserved (0x1F)	[Reserved] of User Control Pressed is sent.	
Numbers 0 : Numbers 9	[Numbers X] of User Control Pressed is sent.	
Dot	[Dot] of User Control Pressed is sent.	
Enter	[Enter] of User Control Pressed is sent.	
Clear	[Clear] of User Control Pressed is sent.	
Reserved (0x2D)	[Reserved] of User Control Pressed is sent.	
Reserved (0x2E)	[Reserved] of User Control Pressed is sent.	
Next Favorite	[Next Favorite] of User Control Pressed is sent.	
Channel Up	[Channel Up] of User Control Pressed is sent.	
Channel Down	[Channel Down] of User Control Pressed is sent.	
Previous Channel	[Previous Channel] of User Control Pressed is sent.	
Sound Select	[Sound Select] of User Control Pressed is sent.	
Input Select	[Input Select] of User Control Pressed is sent.	
Display Information	[Display Information] of User Control Pressed is sent.	
Help	[Help] of User Control Pressed is sent.	
Page Up	[Page Up] of User Control Pressed is sent.	
Page Down	[Page Down] of User Control Pressed is sent.	

Reserved (0x39) : Reserved (0x3F)	[Reserved] of User Control Pressed is sent.	
Power	[Power] of User Control Pressed is sent.	
Volume Up	[Volume Up] of User Control Pressed is sent.	
Volume Down	[Volume Down] of User Control Pressed is sent.	
Mute	[Mute] of User Control Pressed is sent.	
Play	[Play] of User Control Pressed is sent.	
Stop	[Stop] of User Control Pressed is sent.	
Pause	[Pause] of User Control Pressed is sent.	
Record	[Record] of User Control Pressed is sent.	
Rewind	[Rewind] of User Control Pressed is sent.	
Fast forward	[Fast forward] of User Control Pressed is sent.	
Eject	[Eject] of User Control Pressed is sent.	
Forward	[Forward] of User Control Pressed is sent.	
Backward	[Backward] of User Control Pressed is sent.	
Stop-Record	[Stop-Record] of User Control Pressed is sent.	
Pause-Record	[Pause-Record] of User Control Pressed is sent.	
Reserved (0x4F)	[Reserved] of User Control Pressed is sent.	
Angle	[Angle] of User Control Pressed is sent.	
Sub picture	[Sub picture] of User Control Pressed is sent.	
Video on Demand	[Video on Demand] of User Control Pressed is sent.	
Electronic Program Guide	[Electronic Program Guide] of User Control Pressed is sent.	
Timer Programming	[Timer Programming] of User Control Pressed is sent.	
Initial Configuration	[Initial Configuration] of User Control Pressed is sent.	

Reserved (0x56) : Reserved (0x5F)	[Reserved] of User Control Pressed is sent.	
Play Function	P sends the [Play Function] of User Control Pressed.	
Pause-Play Function	P sends the [Pause-Play Function] of User Control Pressed.	
Record Function	[Record Function] of User Control Pressed is sent.	
Pause-Record Function	P sends the [Pause-Record Function] of User Control Pressed.	
Stop Function	[Stop Function] of User Control Pressed is sent.	
Mute Function	User Control Pressed [Mute Function] is sent.	
Restore Volume Function	[Restore Volume Function] of User Control Pressed	
Tune Function	[Tune Function] of User Control Pressed	
Select Disk Function	[Select Disk Function] of User Control Pressed is sent.	
Select A/V Input Function	[Select A/V Input Function] of User Control Pressed is sent.	
Select Audio Input Function	[Select Audio Input Function] of User Control Pressed is sent.	
Power Toggle Function	[Power Toggle Function] of User Control Pressed is sent.	
Power Off Function	[Power Off Function] of User Control Pressed is sent.	
Power On Function	[Power On Function] of User Control Pressed is sent.	
Reserved (0x6B) : Reserved (0x70)	P sends the [Reserved] of User Control Pressed.	
F1 (Blue)	P sends the [F1 (Blue)] of User Control Pressed.	
F2 (Red)	P sends the [F2 (Red)] of User Control Pressed.	
F3 (Green)	P sends the [F3 (Green)] of User Control Pressed.	
F4 (Yellow)	[F4 (Yellow)] of User Control Pressed is sent.	
F5	[F5] of User Control Pressed is sent.	

	Data	[Data] of User Control Pressed is sent.	
	Reserved (0x76) : Reserved (0x7F)	[Reserved] of User Control Pressed is sent.	
Give Device Power Status		Give Device Power Status is sent.	
System Audio Control	Give Audio Status	Give Audio Status is sent.	
	Give System Audio Mode Status	Give System Audio Mode Status is sent.	
	Set System Audio Mode ON	Set System Audio Mode [ON] is sent. After it has been sent, Set System Audio Mode [ON] is sent by BroadCast.	
	Set System Audio Mode OFF	Set System Audio Mode [OFF] is sent. After it has been sent, Set System Audio Mode [OFF] is sent by Broadcast.	
	System Audio Mode Request ON	System Audio Mode Request is sent.	
	System Audio Mode Request OFF	System Audio Mode Request is sent.	
Audio Rate Control	Rate Control Off	Audio Rate Control [Rate Control Off] is sent.	
	Standard Rate (Wide Range Control)	Audio Rate Control [Standard Rate (Wide Range Control)] is sent.	
	Fast Rate (Wide Range Control)	Audio Rate Control [Fast Rate (Wide Range Control) is sent.	
	Slow Rate (Wide Range Control)	Audio Rate Control [Slow Rate (Wide Range Control)] is sent.	
	Standard Rate (Narrow Range Control)	Audio Rate Control [Standard Rate (Narrow Range Control)] is sent.	
	Fast Rate (Narrow Range Control)	Audio Rate Control [Fast Rate (Narrow Range Control)] is sent.	
	Slow Rate (Narrow Range Control)	Audio Rate Control [Slow Rate (Narrow Range Control)] is sent.	
Audio Return Channel	Initiate ARC	Initiate ARC is sent.	
	Request ARC Initiation	Request ARC Initiation is sent.	
	Request ARC Termination	Request ARC Termination is sent.	
	Terminate ARC	Terminate ARC is sent.	

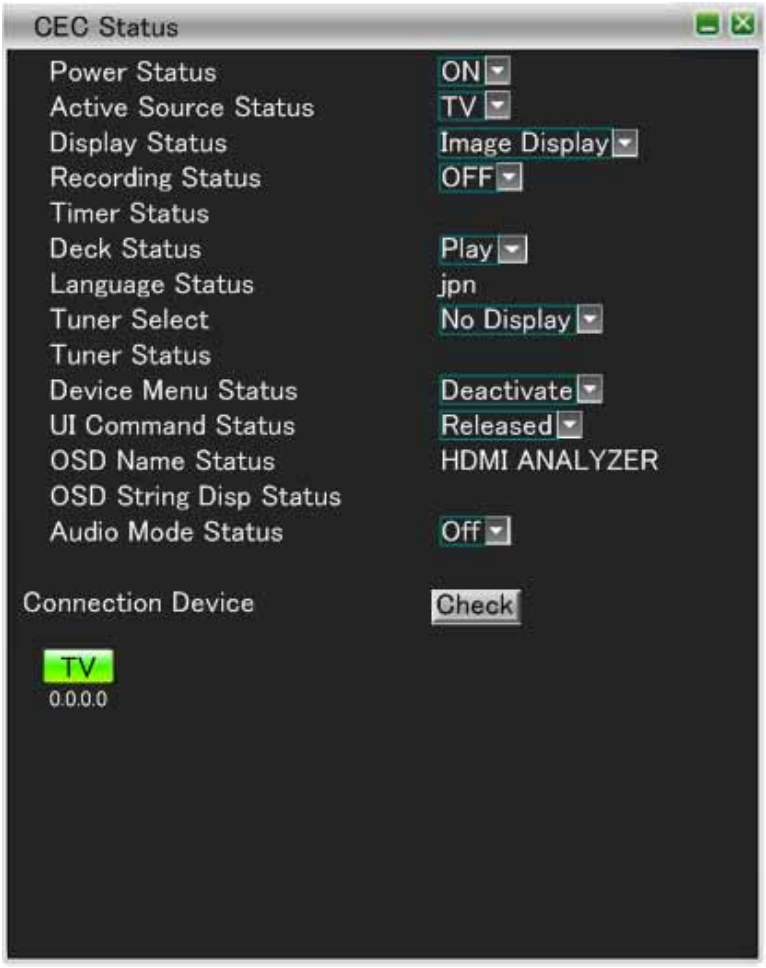
4.2.5 CEC Status

The items on this screen are used to display the current VA-1831 status.

If changes have been made using a CEC command from an external source, the VA-1831 status may be changed from the VA-1831 unit.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click CEC Status	
Main unit operations	Press the [ANALYZE] key.	→ Press [L LICK] on CEC Status.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



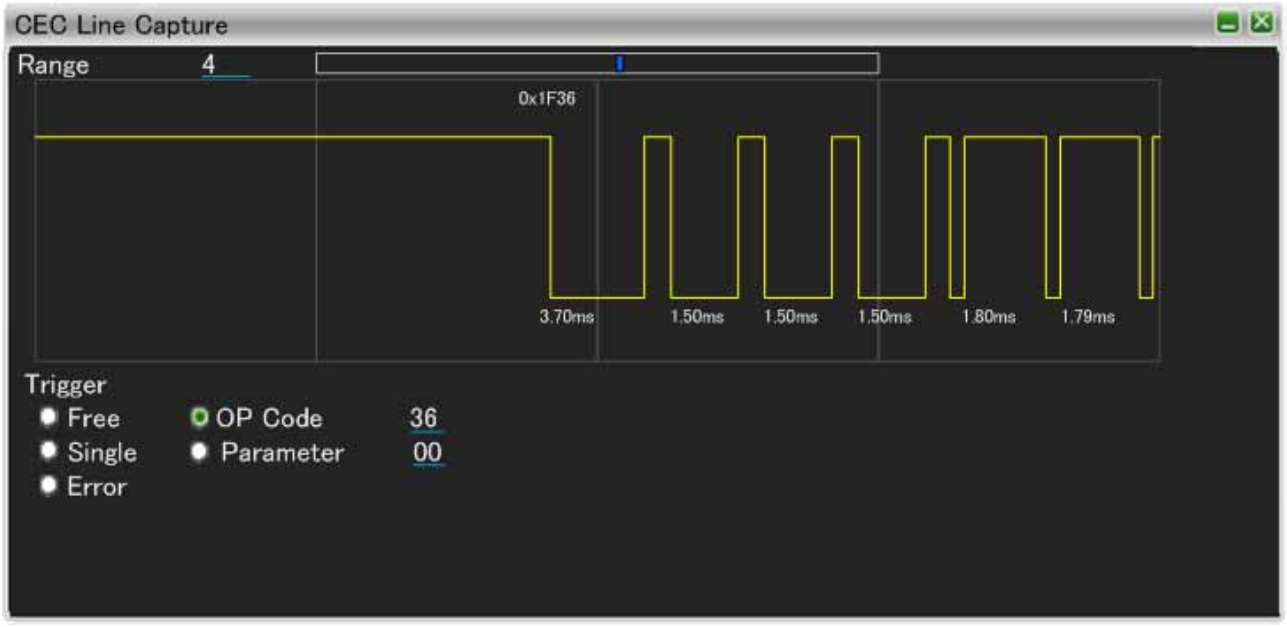
Item	Description
Power Status	The power status currently being emulated is displayed.
Active Source Device	The current Active Source Device is displayed.
Display Status	The display status currently being emulated is displayed. * This takes effect only when the VA-1831 is emulating a TV set.
Recording Status	The video recording status currently being emulated is displayed. * This takes effect only when the VA-1831 is emulating a Recording Device.
Timer Status	The timer status currently being emulated is displayed.
Deck Status	The deck status currently being emulated is displayed. * This takes effect only when the VA-1831 is emulating a Deck Device.
Language Status	The language status currently being emulated is displayed.
Tuner Status	The tuner status currently being emulated is displayed.

Device Menu Status	The menu status currently being emulated is displayed. * This takes effect only when the VA-1831 is emulating a TV set.
UI Command Status	The status of the UI COMMAND sent is displayed.
OSD Name Status	The OSD name of the device currently being emulated is displayed. * The setting is established in the [ANALYZE] -> [Device Information] OSD Name part.
OSD String Disp Status	The OSD string sent is displayed. * This takes effect only when the VA-1831 is emulating a TV set.
Audio Mode Status	The audio mode status currently being emulated is displayed.

4.2.6 CEC Line Capture

Display the waveform of CEC line.

Mouse operation	Right click → left-click ANALYZE → left-click CEC Line Capture → wheel click on display	
Main unit operation	Press ANALYZE key	→ Press L CLICK on CEC Line Capture
	Press R CLICK key → Perss L CLICK on ANALYZE.	



Item		Description
Trigger	Free	Trigger is set as Free.
	OP Code	Set OP Code that is set Trigger.
	Single	Trigger is set as Single.
	Parameter	Set Parameter that is set Trigger.
	Error	Trigger is set as Error.

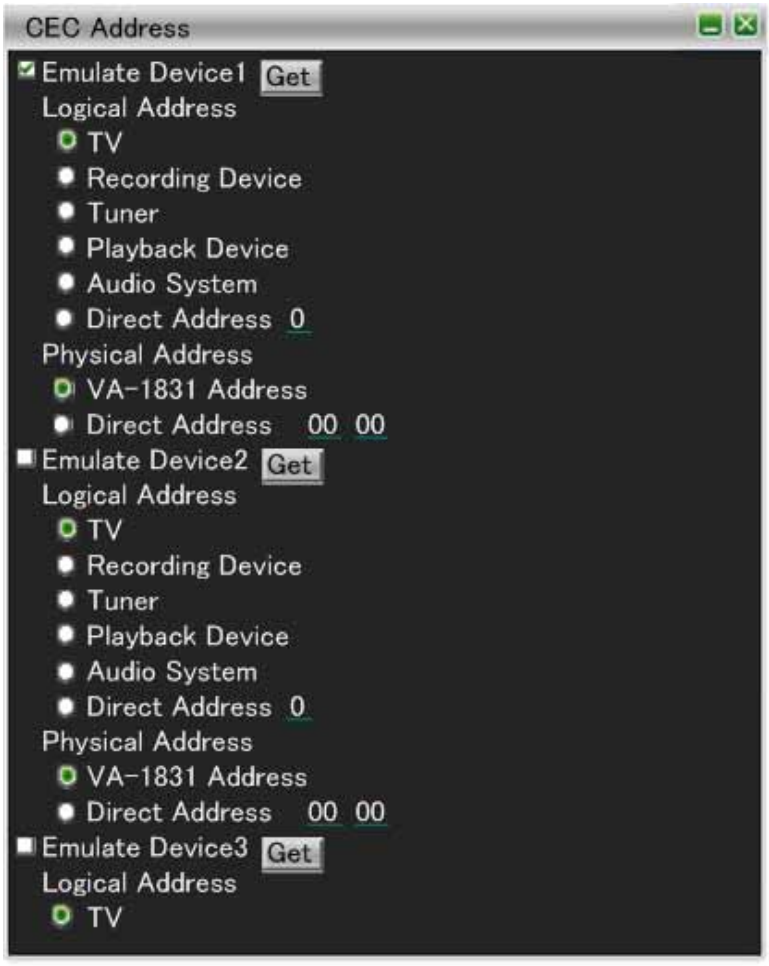
4.2.7 Address Setting

With CEC, the Logical Addresses must be acquired by the devices.

With the VA-1831, a maximum of any four Logical Addresses can be acquired. Check ☑, and when ◉ of the address to be set is checked and [GET] is pressed, the Logical Address is set.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Address Setting	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Address Setting.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



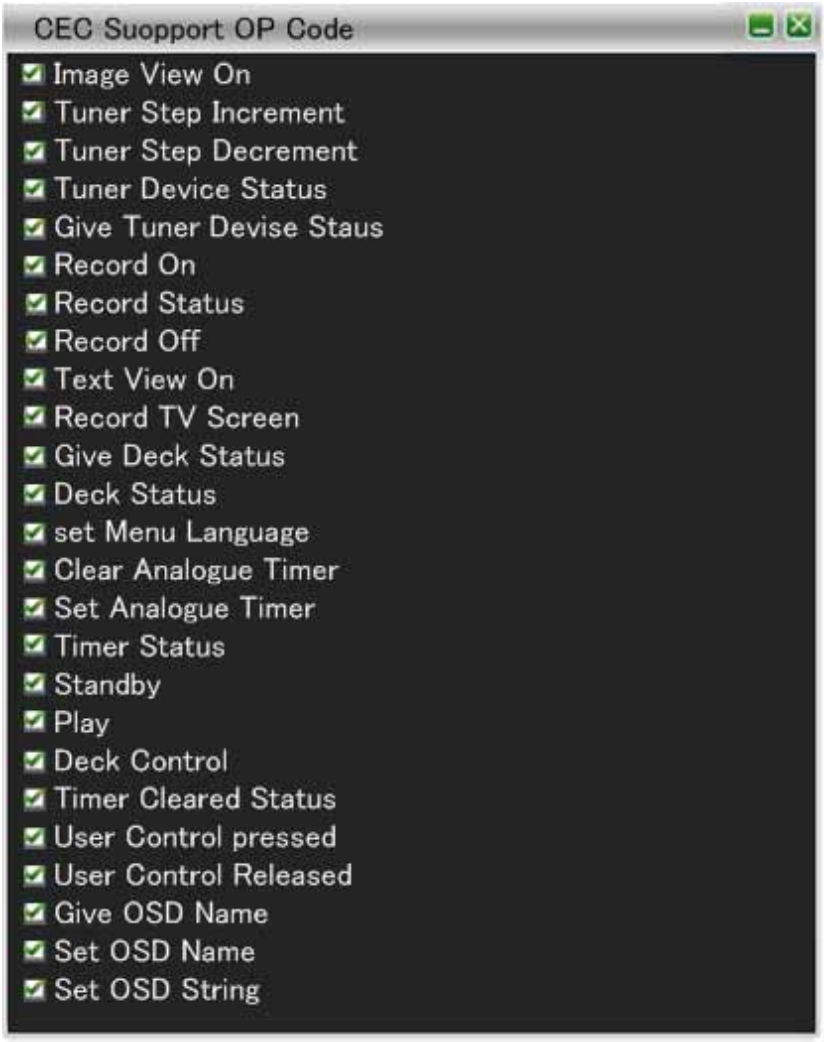
Item		Description
Logical Address	TV	Logical Address is set as TV.
	Recording Device	Logical Address is set as Recording Device.
	Tuner	Logical Address is set as Tuner.
	Playback Device	Logical Address is set as Playback Device.
	Audio System	Logical Address is set as Audio System.
	Direct Address	The setting value is set as Logical Address.
Physical Address	VA-1831 Address	Physical Address that is set by VA is set spuriously.
	Direct Address	Setting values is set as Physical Address spuriously.

4.2.7 Support OP Code

The OP codes with the checked ☑ are supported.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Support OP Code	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Support OP Code.
	Press [R CLICK] → Press [L CLICK] on ANALYZE.	



The table below lists the OP Codes supported.

OP CODE	Description
Image View On	Image View On reception is supported.
Tuner Step Increment	Tuner Step Increment reception is supported.
Tuner Step Decrement	Tuner Step Decrement reception is supported.
Tuner Device Status	Tuner Device Status reception is supported.
Give Tuner Device Status	Give Tuner Device Status reception is supported.
Record On	Record On reception is supported.
Record Status	Record Status reception is supported.
Record Off	Record Off reception is supported.
Text View On	Text View On reception is supported.
Record TV Screen	Record TV Screen reception is supported.
Give Deck Status	Give Deck Status reception is supported.

Deck Status	Deck Status reception is supported.
Set Menu Language	Set Menu Language reception is supported.
Clear Analogue Timer	Clear Analogue Timer reception is supported.
Set Analogue Timer	Set Analogue Timer reception is supported.
Timer Status	Timer Status reception is supported.
Standby	Standby reception is supported.
Play	Play reception is supported.
Deck Control	Deck Control reception is supported.
Timer Cleared Status	Timer Cleared Status reception is supported.
User Control Pressed	User Control Pressed reception is supported.
User Control Released	User Control Released reception is supported.
Give OSD Name	Give OSD Name reception is supported.
Set OSD Name	Set OSD Name reception is supported.
Set OSD String	Set OSD String reception is supported.
Set Timer Config Title	Set Timer Config Title reception is supported.
System Audio Mode Request	System Audio Mode Request reception is supported.
Give Audio Status	Give Audio Status reception is supported.
Set System Audio Mode	Set System Audio Mode reception is supported.
Report Audio Status	Report Audio Status reception is supported.
Give System Audio Mode Status	Give System Audio Mode Status reception is supported.
System Audio Mode Status	System Audio Mode Status reception is supported.
Routing Change	Routing Change reception is supported.
Routing Information	Routing Information reception is supported.
Active Source	Active Source reception is supported.
Give Physical Address	Give Physical Address reception is supported.
Report Physical Address	Report Physical Address reception is supported.
Request Active Source	Request Active Source reception is supported.
Set Stream Path	Set Stream Path reception is supported.
Device Vendor ID	Device Vendor ID reception is supported.
Vendor Command	Vendor Command reception is supported.
Vendor Remote Button Down	Vendor Remote Button Down reception is supported.
Vendor Remote Button Up	Vendor Remote Button Up reception is supported.
Give Device Vendor ID	Give Device Vendor ID reception is supported.
Menu Request	Menu Request reception is supported.
Menu Status	Menu Status reception is supported.
Give Device Power Status	Give Device Power Status reception is supported.
Report Power Status	Report Power Status reception is supported.
Get Menu language	Get Menu language reception is supported.
Select Analogue Service	Select Analogue Service reception is supported.
Select Digital Service	Select Digital Service reception is supported.
Set Digital Timer	Set Digital Timer reception is supported.
Clear Digital Timer	Clear Digital Timer reception is supported.
Set Audio Rate	Set Audio Rate reception is supported.
Inactive Source	Inactive Source reception is supported.
CEC Version	CEC Version reception is supported.

Get CEC Version	Get CEC Version reception is supported.
Vendor Command With ID	Vendor Command With ID reception is supported.
Clear External Timer	Clear External Timer reception is supported.
Set External Timer	Set External Timer reception is supported.
Report Short Audio Descriptor	Report Short Audio Descriptor reception is supported.
Request Short Audio Descriptor	Request Short Audio Descriptor reception is supported.
Initiate ARC	Initiate ARC reception is supported.
Report ARC Initiated	Report ARC Initiated reception is supported.
Report ARC Terminated	Report ARC Terminated reception is supported.
Request ARC Initiation	Request ARC Initiation reception is supported.
Request ARC Termination	Request ARC Termination reception is supported.
Terminate ARC	Terminate ARC reception is supported.
CDC Message	CDC Message reception is supported.

4.2.9 Support Language

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Support Language	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Support Language.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

Code (a)	Language	Code (a)	Language
aar	Afar	abk	Abkhazian
ace	Achinese	ach	Acoli
ada	Adangme	ady	Adyghe; Adygei
afa	Afro-Asiatic (Other)	afh	Afrihili
afr	Afrikaans	ain	Ainu
aka	Akan	akk	Akkadian
alb (sqi)	Albanian	ale	Aleut
alg	Algonquian languages	alt	Southern Altai
amh	Amharic	ang	English, Old (ca.450-1100)
anp	Angika	apa	Apache languages
ara	Arabic	arc	Aramaic
arg	Aragonese	arm (hye)	Armenian
arn	Araucanian	arp	Arapaho

art	Artificial (Other)	arw	Arawak
asm	Assamese	ast	Austrian; Bable
ath	Athapascan languages	aus	Australian languages
ava	Avaric	ave	Avestan
awa	Awadhi	aym	Aymara
aze	Azerbaijani		
Code (b)	Language	Code (b)	Language
bad	Banda	bai	Bamileke languages
bak	Bashkir	bal	Baluchi
bam	Bambara	ban	Balinese
baq (eus)	Basque	bas	Basa
bat	Baltic (Other)	bej	Beja
bel	Belarusian	bem	Bemba
ben	Bengali	ber	Berber (Other)
bho	Bhojpuri	bih	Bihari
bik	Bikol	bin	Bini
bis	Bislama	bla	Siksika
bnt	Bantu (Other)	bod (tib)	Tibetan
bos	Bosnian	bra	Braj
bre	Breton	btk	Batak (Indonesia)
bua	Buriat	bug	Buginese
bul	Bulgarian	bur (mya)	Burmese
byn	Blin; Bilin		
Code (c)	Language	Code (c)	Language
cad	Caddo	cai	Central American Indian (Other)
car	Carib	cat	Catalan; Valencian
cau	Caucasian (Other)	ceb	Cebuano
cel	Celtic (Other)	ces (cze)	Czech
cha	Chamorro	chb	Chibcha
che	Chechen	chg	Chagatai
chi (zho)	Chinese	chk	Chuukese
chm	Mari	chn	Chinook jargon
cho	Choctaw	chp	Chipewyan
chr	Cherokee	chu	Church Slavic; Old Slavonic; Church Slavonic; Old Bulgarian; Old Church Slavonic
chv	Chuvash	chy	Cheyenne
cmc	Chamic languages	cop	Coptic
cor	Cornish	cos	Corsican
cpe	Creoles and pidgins, English based (Other)	cpf	Creoles and pidgins, French-based (Other)
cpp	Creoles and pidgins, Portuguese-based (Other)	cre	Cree
crh	Crimean Tatar; Crimean Turkish	crp	Creoles and pidgins (Other)
csb	Kashubian	cus	Cushitic (Other)
cym (wel)	Welsh	cze (ces)	Czech

Code (d)	Language	Code (d)	Language
dak	Dakota	dan	Danish
dar	Dargwa	day	Dayak
del	Delaware	den	Slave (Athapascan)
deu (ger)	German	dgr	Dogrib
din	Dinka	div	Divehi; Dhivehi; Maldivian
doi	Dogri	dra	Dravidian (Other)
dsb	Lower Sorbian	dua	Duala
dum	Dutch, Middle (ca.1050-1350)	dut (nld)	Dutch; Flemish
dyu	Dyula	dzo	Dzongkha
Code (e)	Language	Code (e)	Language
efi	Efik	egy	Egyptian (Ancient)
eka	Ekajuk	ell (gre)	Greek, Modern (1453-)
elx	Elamite	eng	English
enm	English, Middle (1100-1500)	epo	Esperanto
est	Estonian	eus (baq)	Basque
ewe	Ewe	ewo	Ewondo
Code (f)	Language	Code (f)	Language
fan	Fang	fao	Faroese
fas (per)	Persian	fat	Fanti
fij	Fijian	fil	Filipino; Pilipino
fin	Finnish	fiu	Finno-Ugrian (Other)
fon	Fon	fra (fre)	French
fre (fra)	French	frm	French, Middle (ca.1400-1600)
fro	French, Old (842-ca.1400)	frr	Northern Frisian
frs	Eastern Frisian	fry	Western Frisian
ful	Fulah	fur	Friulian
Code (g)	Language	Code (g)	Language
gaa	Ga	gay	Gayo
gba	Gbaya	gem	Germanic (Other)
geo (kat)	Georgian	ger (deu)	German
gez	Geez	gil	Gilbertese
gla	Gaelic; Scottish Gaelic	gle	Irish
glg	Galician	glv	Manx
gmh	German, Middle High (ca.1050-1500)	goh	German, Old High (ca.750-1050)
gon	Gondi	gor	Gorontalo
got	Gothic	grb	Grebo
grc	Greek, Ancient (to 1453)	gre (ell)	Greek, Modern (1453-)
grn	Guarani	gsw	Alemanic; Swiss German
guj	Gujarati	gwi	Gwich´in
Code (h)	Language	Code (h)	Language
hai	Haida	hat	Haitian; Haitian Creole
hau	Hausa	haw	Hawaiian
heb	Hebrew	her	Herero

hil	Hiligaynon	him	Himachali
hin	Hindi	hit	Hittite
hmn	Hmong	hmo	Hiri Motu
hrv (scr)	Croatian	hsb	Upper Sorbian
hun	Hungarian	hup	Hupa
hye (arm)	Armenian		
Code (i)	Language	Code (i)	Language
iba	Iban	ibo	Igbo
ice (isl)	Icelandic	ido	Ido
iii	Sichuan Yi	ijo	Ijo
iku	Inuktitut	ile	Interlingue
ilo	Iloko	ina	Interlingua (International Auxiliary Language Association)
inc	Indic (Other)	ind	Indonesian
ine	Indo-European (Other)	inh	Ingush
ipk	Inupiaq	ira	Iranian (Other)
iro	Iroquoian languages	isl (ice)	Icelandic
ita	Italian		
Code (j)	Language	Code (j)	Language
jav	Javanese	jbo	Lojban
jpn	Japanese	jpr	Judeo-Persian
jrb	Judeo-Arabic		
Code (k)	Language	Code (k)	Language
kaa	Kara-Kalpak	kab	Kabyle
kac	Kachin	kal	Kalaallisut; Greenlandic
kam	Kamba	kan	Kannada
kar	Karen	kas	Kashmiri
kat (geo)	Georgian	kau	Kanuri
kaw	Kawi	kaz	Kazakh
kbd	Kabardian	kha	Khasi
khi	Khoisan (Other)	khm	Khmer
kho	Khotanese	kik	Kikuyu; Gikuyu
kin	Kinyarwanda	kir	Kirghiz
kmb	Kimbundu	kok	Konkani
kom	Komi	kon	Kongo
kor	Korean	kos	Kosraean
kpe	Kpelle	krc	Karachay-Balkar
krl	Karelian	kro	Kru
kru	Kurukh	kua	Kuanyama; Kwanyama
kum	Kumyk	kur	Kurdish
kut	Kutenai		
Code (l)	Language	Code (l)	Language
lad	Ladino	lah	Lahnda
lam	Lamba	lao	Lao
lat	Latin	lav	Latvian

lez	Lezghian	lim	Limburgan; Limburger; Limburgish
lin	Lingala	lit	Lithuanian
lol	Mongo	loz	Lozi
ltz	Luxembourgish; Letzeburgesch	lua	Luba-Lulua
lub	Luba-Katanga	lug	Ganda
lui	Luiseno	lun	Lunda
luo	Luo (Kenya and Tanzania)	lus	lushai
Code (m)	Language	Code (m)	Language
mac (mkd)	Macedonian	mad	Madurese
mag	Magahi	mah	Marshallese
mai	Maithili	mak	Makasar
mal	Malayalam	man	Mandingo
mao (mri)	Maori	map	Austronesian (Other)
mar	Marathi	mas	Masai
may (msa)	Malay	mdf	Moksha
mdr	Mandar	men	Mende
mga	Irish, Middle (900-1200)	mic	Mi'kmaq; Micmac
min	Minangkabau	mis	Miscellaneous languages
mkd (mac)	Macedonian	mkh	Mon-Khmer (Other)
mlg	Malagasy	mlt	Maltese
mnc	Manchu	mni	Manipuri
mno	Manobo languages	moh	Mohawk
mol	Moldavian	mon	Mongolian
mos	Mossi	mri (mao)	Maori
msa (may)	Malay	mul	Multiple languages
mun	Munda languages	mus	Creek
mwl	Mirandese	mwr	Marwari
mya (bur)	Burmese	myn	Mayan languages
myv	Erzya		
Code (n)	Language	Code (n)	Language
nah	Nahuatl	nai	North American Indian
nap	Neapolitan	nau	Nauru
nav	Navajo; Navaho	nbl	Ndebele, South; South Ndebele
nde	Ndebele, North; North Ndebele	ndo	Ndonga
nds	Low German; Low Saxon; German, Low; Saxon, Low	nep	Nepali
new	Newari; Nepal Bhasa	nia	Nias
nic	Niger-Kordofanian (Other)	niu	Niuean
nld (dut)	Dutch; Flemish	nno	Norwegian Nynorsk; Nynorsk, Norwegian
nob	Norwegian Bokmal; Bokmal, Norwegian	nog	Nogai
non	Norse, Old	nor	Norwegian
nqo	N'ko	nso	Northern Sotho, Pedi; Sepedi
nub	Nubian languages	nwc	Classical Newari; Old Newari; Classical Nepal Bhasa

nya	Chichewa; Chewa; Nyanja	nym	Nyamwezi
nyn	Nyankole	nyo	Nyoro
nzi	Nzima		
Code (o)	Language	Code (o)	Language
oci	Occitan (post 1500); Provencal	oji	Ojibwa
ori	Oriya	orm	Oromo
osa	Osage	oss	Ossetian; Ossetic
ota	Turkish, Ottoman (1500-1928)	oto	Otomian languages
Code (p)	Language	Code (p)	Language
paa	Papuan (Other)	pag	Pangasinan
pal	Pahlavi	pam	Pampanga
pan	Panjabi; Punjabi	pap	Papiamento
pau	Palauan	peo	Persian, Old (ca.600-400 B.C.)
per (fas)	Persian	phi	Philippine (Other)
phn	Phoenician	pli	Pali
pol	Polish	pon	Pohnpeian
por	Portuguese	pra	Prakrit languages
pro	Provencal, Old (to 1500)	pus	Pushto
Code (q)	Language	Code (q)	Language
que	Quechua		
Code (r)	Language	Code (r)	Language
raj	Rajasthani	rap	Rapanui
rar	Rarotongan	roa	Romance (Other)
roh	Raeto-Romance	rom	Romany
ron (rum)	Romanian	rum (ron)	Romanian
run	Rundi	rup	Aromanian; Arumanian; Macedo-Romanian
rus	Russian		
Code (s)	Language	Code (s)	Language
sad	Sandawe	sag	Sango
sah	Yakut	sai	South American Indian (Other)
sal	Salishan languages	sam	Samaritan Aramaic
san	Sanskrit	sas	Sasak
sat	Santali	scc (srp)	Serbian
scn	Sicilian	sco	Scots
scr (hrv)	Croatian	sel	Selkup
sem	Semitic (Other)	sga	Irish, Old (to 900)
sgn	Sign Languages	shn	Shan
sid	Sidamo	sin	Sinhala; Sinhalese
sio	Siouan languages	sit	Sino-Tibetan (Other)
sla	Slavic (Other)	slk (slo)	Slovak
slo (slk)	Slovak	slv	Slovenian
sma	Southern Sami	sme	Northern Sami
smi	Sami languages (Other)	smj	Lule Sami
smn	Inari Sami	smo	Samoan

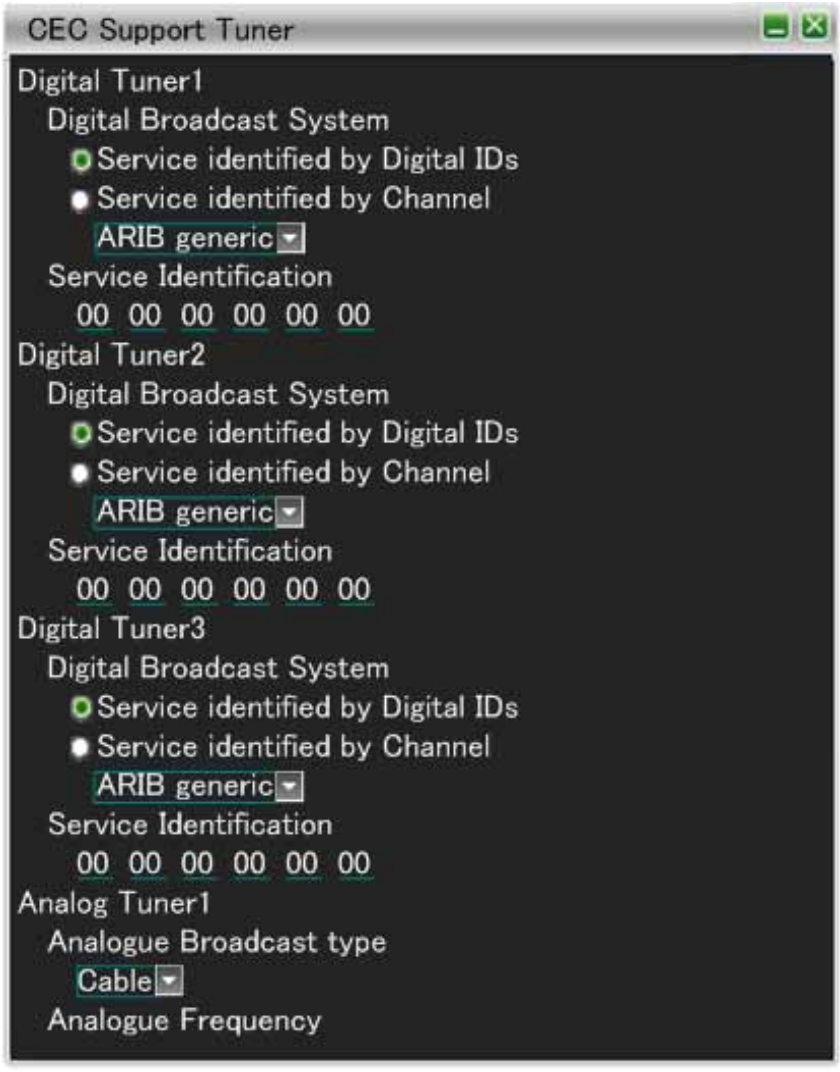
sms	Skolt Sami	sna	Shona
snd	Sindhi	snk	Soninke
sog	Sogdian	som	Somali
son	Songhai	sot	Sotho, Southern
spa	Spanish; Castilian	sqi (alb)	Albanian
srd	Sardinian	srn	Sranan Togo
srp (scc)	Serbian	srr	Serer
ssa	Nilo-Saharan (Other)	ssw	Swati
suk	Sukuma	sun	Sundanese
sus	Susu	sux	Sumerian
swa	Swahili	swe	Swedish
syr	Syriac		
Code (t)	Language	Code (t)	Language
tah	Tahitian	tai	Tai (Other)
tam	Tamil	tat	Tatar
tel	Telugu	tem	Timne
ter	Tereno	tet	Tetum
tgk	Tajik	tgl	Tagalog
tha	Thai	tib (bod)	Tibetan
tig	Tigre	tir	Tigrinya
tiv	Tiv	tkl	Tokelau
tlh	Klingon; tlhIngan-Hol	tli	Tlingit
tmh	Tamashek	tog	Tonga (Nyasa)
ton	Tonga (Tonga Islands)	tpi	Tok Pisin
tsi	Tsimshian	tsn	Tswana
tso	Tsonga	tuk	Turkmen
tum	Tumbuka	tup	Tupi languages
tur	Turkish	tut	Altaic (Other)
tvl	Tuvalu	twi	Twi
tyv	Tuvinian		
Code (u)	Language	Code (u)	Language
udm	Udmurt	uga	Ugaritic
uig	Uighur; Uyghur	ukr	Ukrainian
umb	Umbundu	und	Undetermined
urd	Urdu	uzb	Uzbek
Code (v)	Language	Code (v)	Language
vai	Vai	ven	Venda
vie	Vietnamese	vol	Volapuk
vot	Votic		
Code (w)	Language	Code (w)	Language
wak	Wakashan languages	wal	Walamo
war	Waray	was	Washo
wel (cym)	Welsh	wen	Sorbian languages
wln	Walloon	wol	Wolof
Code (x)	Language	Code (x)	Language

xal	Kalmyk; Oirat	xho	Xhosa
Code (y)	Language	Code (y)	Language
yao	Yao	yap	Yapese
yid	Yiddish	yor	Yoruba
ypk	Yupik languages		
Code (z)	Language	Code (z)	Language
zap	Zapotec	zen	Zenaga
zha	Zhuang; Chuang	zho (chi)	Chinese
znd	Zande	zul	Zulu
zun	Zuni		

4.2.10 Support Tuner

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Support Tuner	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Support Tuner.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Digital Service 1	Digital Broadcast System1
	Service Identification1
Digital Service 2	Digital Broadcast System2
	Service Identification2
Digital Service 3	Digital Broadcast System3
	Service Identification3

Digital Broadcast System
Service identified by Channel / Service identified by Digital IDs
ARIB generic / ATSC generic / DVB generic / ARIB-BS / ARIB-CS / ARIB-T / Cable / Satellite / Terrestrial / DVB-C / DVB-S /DVB S2 / DVB-T
Service Identification
6Byte DATA

Analogue Service 1	Analogue Broadcast Type1
	Analogue Frequency1
	Broadcast System1

Analogue Broadcast Type
Cable / Satellite / Terrestrial
Analogue Frequency

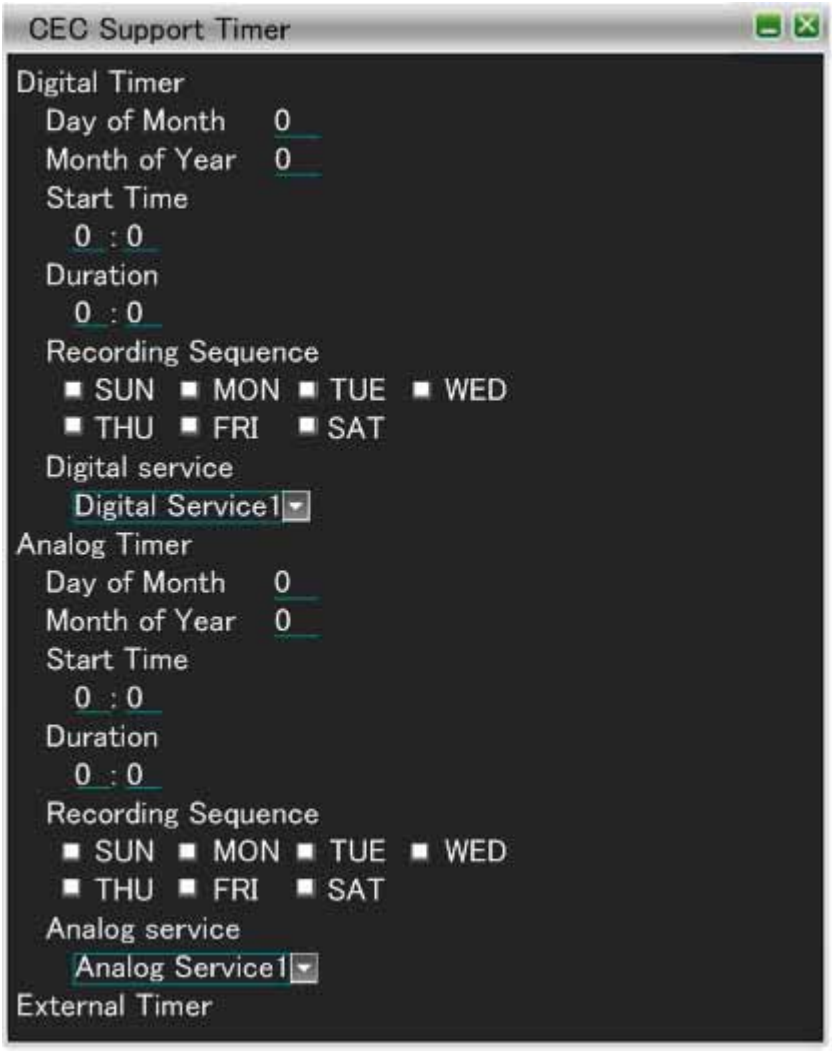
Analogue Service 2	Analogue Broadcast Type2
	Analogue Frequency2
	Broadcast System2
Analogue Service 3	Analogue Broadcast Type3
	Analogue Frequency3
	Broadcast System3

2Byte DATA
Broadcast System
PAL B/G / SECAM L / PAL M / NTSC M / PAL I / SECAM DK / SECAM B/G / SECAM L / PAL DK

4.2.11 Support Timer

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Support Timer	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Support Timer.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

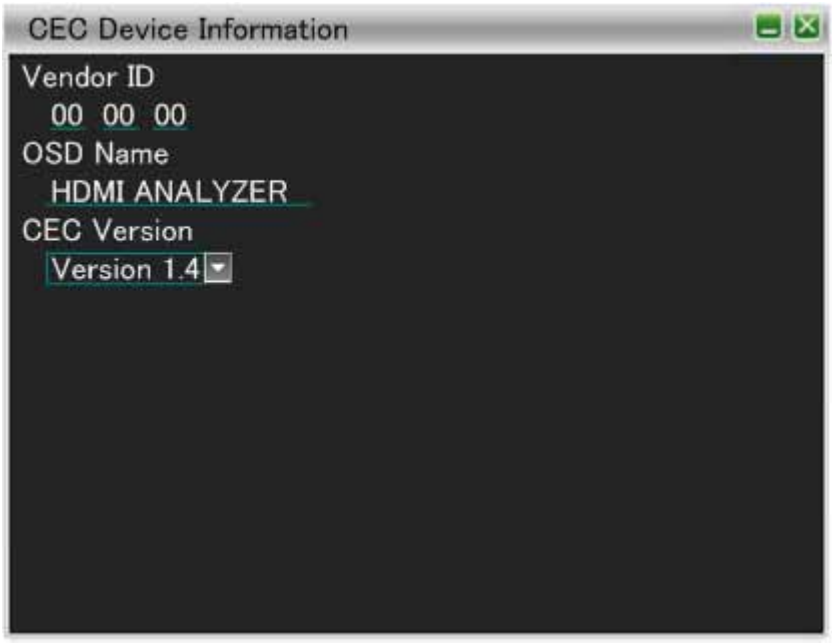


Analogue Timer Setting	The Analogue Timer setting is selected here.
Digital Timer Setting	The Digital Timer setting is selected here.
External Timer Setting	The External Timer setting is selected here.

4.2.12 Device Information

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Device Information	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Device Information.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



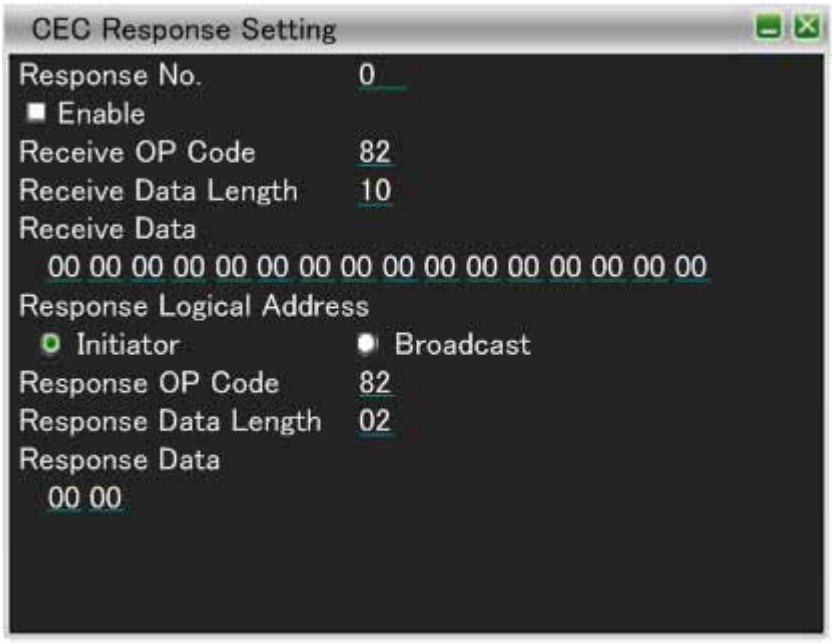
Vendor ID	3Byte DATA
OSD NAME	Max. ASCII 14 bytes
CEC Version	1.3a/1.4

4.2.13 Response Setting

The items on this screen are used to set the response to the data received. If it is not set, the response specified in the CEC standard is returned instead. Responses which are exceptions to what is set here can be returned or no response can be initiated.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Response Setting	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Response Setting.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



The table below lists the settings which can be selected.

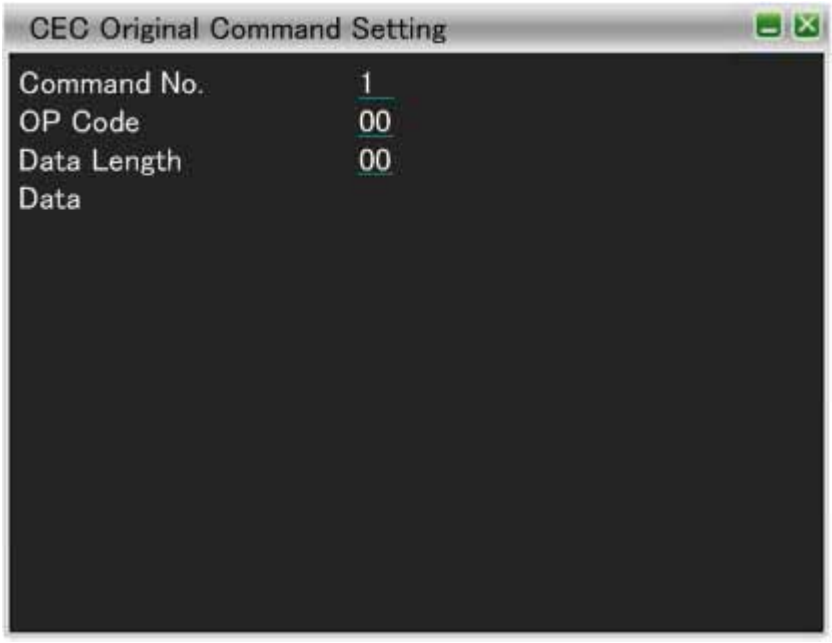
Item	Description
Enable	Selects whether to initiate a response. Also specifies the Destination when a response is initiated.
Receive OP CODE	OP CODE for which the setting takes effect
Receive Data Length	Volume of data for which the setting takes effect
Receive Data	Data for which the setting takes effect Note) display the number that is set in Receive Data Length.
Response Logical Address	Selects the address to which the response is to be initiated.
Response OP CODE	OP CODE to be returned
Response Data Length	Volume of data to be returned
Response Data	Data to be returned Note) display the number that is set in Response Data Length.

4.2.14 Original Command Setting

On this screen, it is possible for independent CEC commands to be created and for these commands to be sent by CEC Send.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Original Command Setting	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Original Command Setting.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

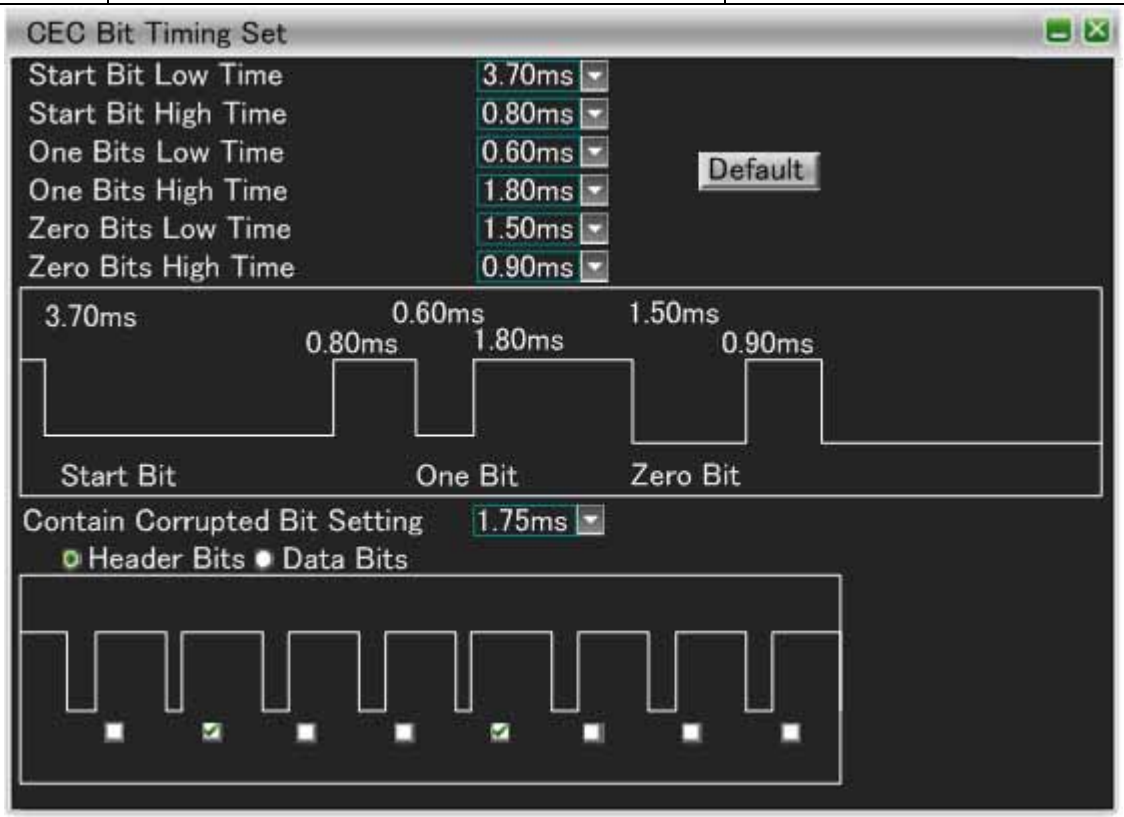


Item	Description
OP CODE	OP CODE to be sent.
Data Length	DATA amount to be sent.
Data	DATA to be sent. Note) display the number that is set in the Data Length.

4.2.15 Bit Timing Setting

On this screen, it is possible for independent CEC Data Bit Timing to be created.

Mouse operations	Right-click → left-click ANALYZE → left-click Bit Timing Setting	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Bit Timing Setting.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

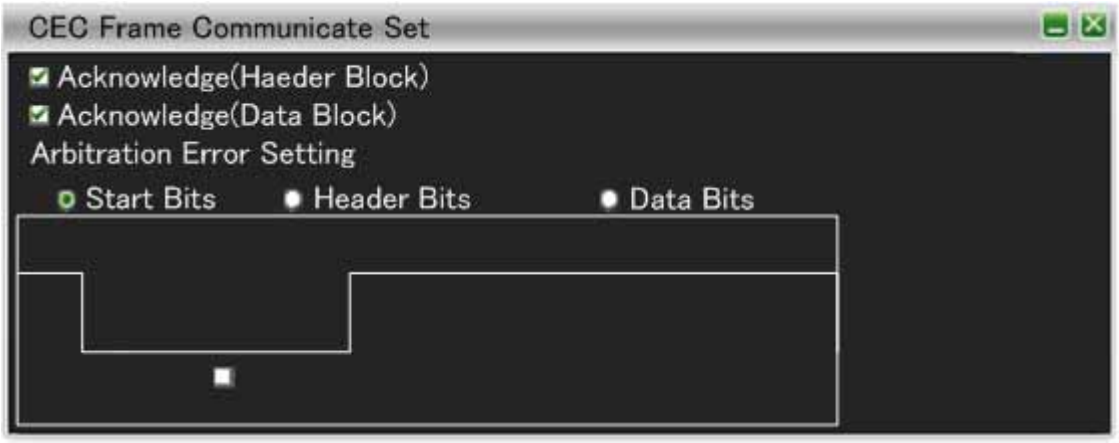


Item	Description
Start Bit Low Time	Set a period of “Low” in the Start Bit
Start Bit High Low Time	Set a period of “High” in the Start Bit.
One Bits Low Time	Set a period of “Low” in the One Bits.
One Bits High Low Time	Set a period of “Height” in the One Bits.
Zero Bits Low Time	Set a period of “Low” in the Zero Bits.
Zero Bits High Low Time	Set a period of “High” in the Zero Bits.
Contain Corrupted Bit Setting	The Bit Timing that is marked “☑” can be set as shorter period than the standard. It can select Header Bits or Data Bits.

4.2.16 Frame Communication Setting

It is possible to occur Arbitration Error under the waveform that is marked☑.

Mouse operations	Right-click → left-click ANALYZE → left-click Frame Communication Setting	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Frame Communication Setting.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	

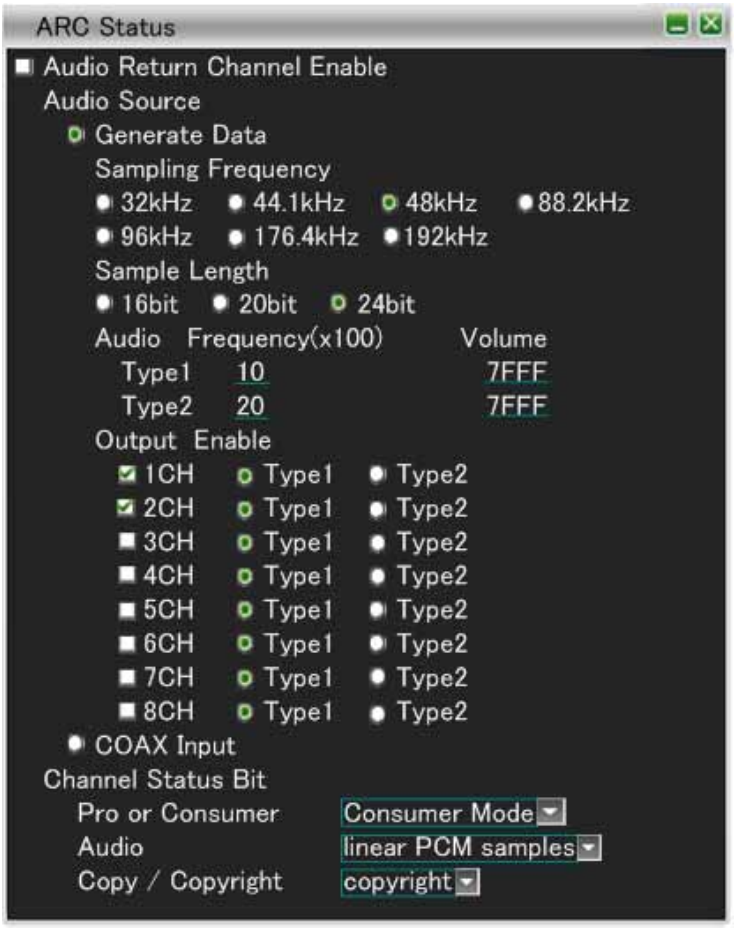


4.3 ARC Status

The items displayed on this screen are used to change the Audio Return Channel status.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click ARC Status	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on ARC Status.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Item	What is displayed	
Audio Return Channel Enable	When ☑ is checked, the Audio Return Channel can be used.	
Generate Data	When ◉ is checked, the setting data can be sent.	
Sampling Frequency	The frequency checked by ◉ in the 32 KHz to 192 KHz range is sent.	
Sample Length	The sample length checked by ◉ in the 16 bits to 24 bits range is sent.	
Audio Frequency	Type1	XX (x100)
	Type2	XX (x100)
Audio Volume	Type1	XXXX H
	Type2	XXXX H
Output Enable	The Audio Frequency and Audio Volume, which have been checked by ◉ for	

	either Type1 or Type2 in what has been checked by ☑ among channels 1 to 8, are sent	
COAX Input	ARC is sent on the basis of the information from the coaxial audio.	
Channel Status Bit	Pro or Consumer	Consumer Mode
		Professional Mode
	Audio	Liner PCM sample
		Other than liner PCM sample
	Copy / Copyright	Copyright
		no copyright
	Emphasis	Without pre-emphasis
		With 50/15 us pre emphasis
		Reservrd-2channel audio
		Reservrd-4channel audio
		Default State
		Reserved
	Channel Status Mode	Mode 00
		Reserved
	Category Code	General. Used temporarily
		Laser optical (Compact disc)
		Laser optical (Laser optical digital audio system)
		Laser optical (Mini disc system)
		Laser optical (Digital versatile disc)
		Laser optical (Reserved)
		Digital/digtal conv.&signal (PCM encoder/decoder)
		Digital/digtal conv.&signal (Digital signal mixer)
		Digital/digital conv.&signal (Sampling rate converter)
		Digital/digital conv.&signal (Digital sound sampler)
		Digital/digital conv.&signal (Digital sound processor)
		Digital/digital conv.&signal (Reserved)
		Digital compact cassette
		Magnetic tape or disc (DAT)
		Magnetic tape or disc (Video tape recorder)
		Magnetic tape or disc (Digital compact recorder)
		Magnetic tape or disc (Reserved)
		Broadcast reception (Japan)
		Broadcast reception (Europe)
		Broadcast reception (USA)
		Broadcast reception (Electronic software delivery)
		Broadcast reception (Reserved)
		Without copyright information(Synthesizer)
		Without copyright information(Microphone)
		Without copyright information(Reserved)
		Category code without copyright(A/D converter)
		Category code without copyright(Reserved)
		Category code with copyright(A/D converter)
		Category code with copyright(Reserved)
		Category code groups for solid state memory (Reserved)
		Experiment products not for commercial sale

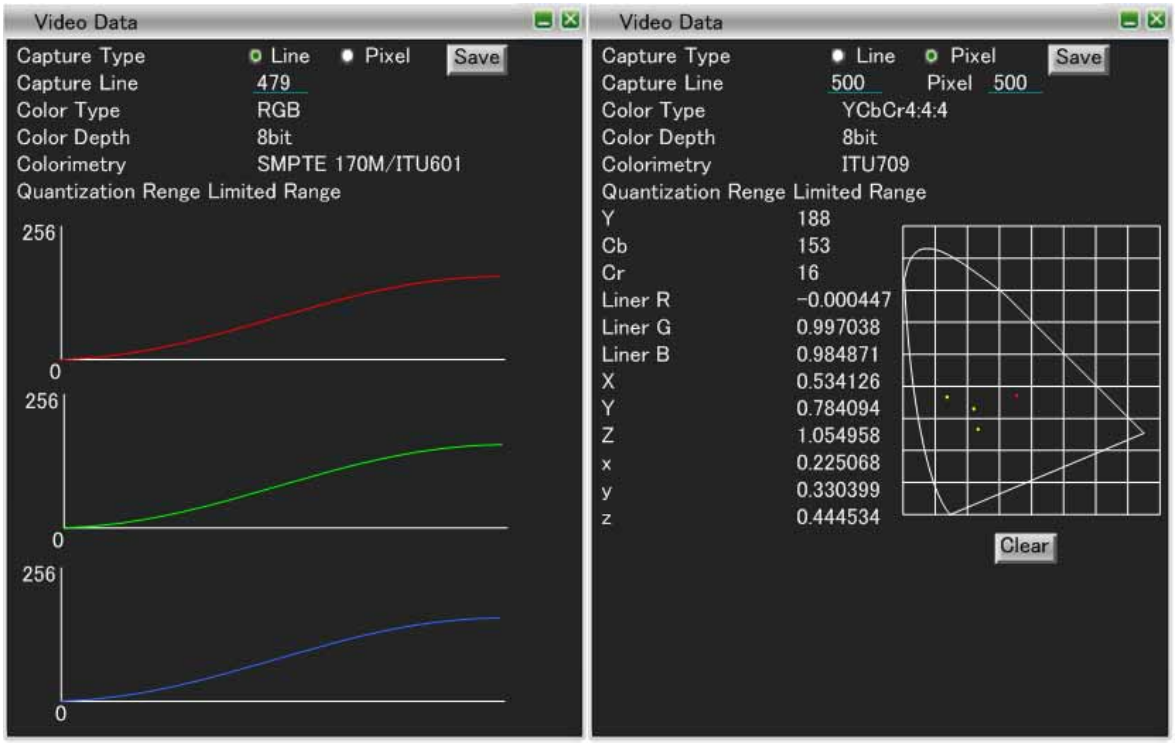
		Not define. Reserved
		Not define. Reserved、expect 000 0000 and 000 0001 L
	Source Number	Do not take into account.
		1 - 15 CH
	Channel Number	Do not take into account.
		A - O (0x1:A; 0x2:B; …… 0xF:O)
	Sampling frequency	44.1kHz
		no indicate
		48kHz
		32kHz
		88.2kHz (- HDMI Original)
		96kHz (- HDMI Original)
		176.4kHz (- HDMI Original)
		192kHz (- HDMI Original)
		768kHz (- HDMI Original)
	Clock accuracy	Level 2, ±1000ppm (default)
		Level 1, ±50ppm - high accuracy
		Level 3, variable pitch
		Reserved
	Max sample length	20bit
		24bit
	Sample word length	Maximum audio sample word length = 20 bit
		Word length not indicated (default)
		16bits
		18bits
		19bits
		20bits
		17bits
		Reserved
		Maximum audio sample word length = 24 bit
		Word length not indicated (default)
		20bits
		22bits
		23bits
		24bits
		21bits
		Reserved
Initiate Request Mode	Request Short Audio & ARC Initiation	Send “Request Short Audio Descriptor” and “Request ARC Initiation”.
	Request ARC Initiation	Send only “Request ARC Initiation”.
	No Reques	CEC communication is not performed.

4.4 Video Data

The items displayed on this screen are used to acquire the video data.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Video Data	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Video Data.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Item		What is displayed
Capture Type	Line	The video data of one line is acquired.
	Pixel	The video data of one pixel is acquired.
Capture	Line	XXX
	Pixel	XXX
Save	Line	The RGB data and YCbCr data of the line set by Capture Line are saved as text data in the USB flash memory.
	Pixel	The xyz data of the pixel set by Capture Pixel is saved as text data in the USB flash memory.
Color Type		RGB
		YCbCr4:2:2
		YCbCr4:4:4
		Future
Color Depth		8 bits
		10 bits
		12 bits
Colorimetry		No Data

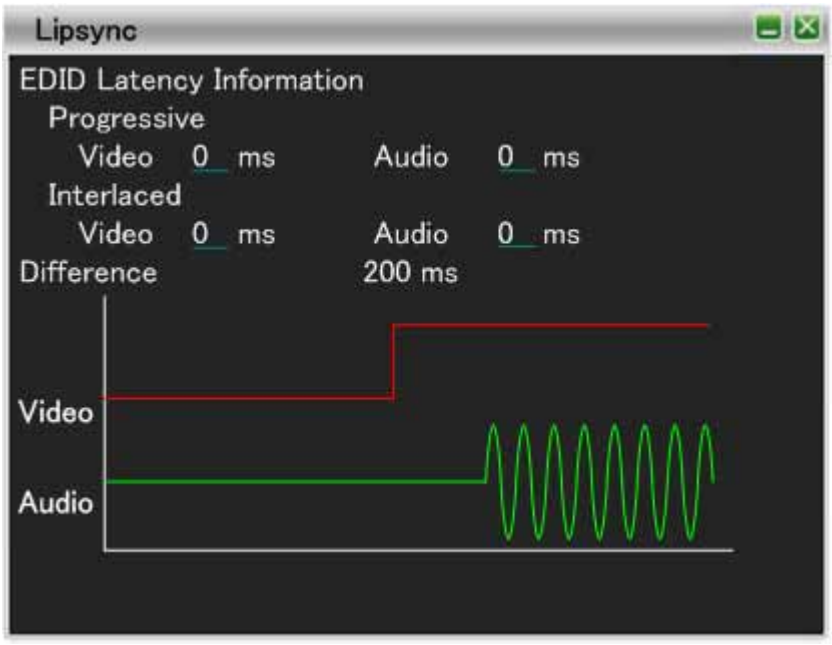
	SMPTE 170M/ITU601	
	ITU709	
	EXT Colorimetry Valid	
		xvYCC601
		xvYCC709
		sYCC601
		Adobe YCC601
		Adobe RGB
Quantization Range	Color Type = YCbCr4:4:4 or YCbCr4:2:2	
		Limited Range
		Full Range
		Reserved
		Reserved
	Color Type = RGB	
		Default
		Limited Range
		Full Range
		Reserved
Clear	The video data of the acquired pixel is cleared.	

4.5 Lipsync

On this screen, the HDMI input audio and video are analyzed, and the results are displayed.

The display method used is shown below.

Mouse operations	Right-click → left-click ANALYZE → left-click Lipsync	
Main unit operations	Press the [ANALYZE] key.	→ Press [L CLICK] on Lipsync.
	Press [R CLICK] → press [L CLICK] on ANALYZE.	



Display item			What is displayed
EDID Latency Information			
	Progressive	Video	The Video Latency of the EDID set in the VA-1831 is displayed and changed.
		Audio	The Audio Latency of the EDID set in the VA-1831 is displayed and changed.
	Interlaced	Video	The Interlaced Video Latency of the EDID set in the VA-1831 is displayed and changed.
		Audio	The Interlaced Audio Latency of the EDID set in the VA-1831 is displayed and changed.
Difference			The delay times of Audio and Video analyzed by the VA-1831 are displayed.

* If Latency_Fields_Present and I_Latency_Fields_Present of the EDID set by the VA-1832 are 0, the Lipsync delay amount cannot be set.

The video trigger level is the higher bit of a color (one of the RGB colors).

The audio trigger level is detected by LCH (channel 1). The specifications for the level are given in the table below.

Audio level	Required level
16 bits	801H or more
20 bits	8001H or more
24 bits	80001H or more

5 Signal Generate

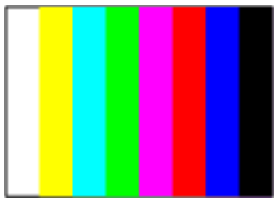
The video signals as well as other signals are generated on this screen. The items of the analysis result display area are shown in the figure below.

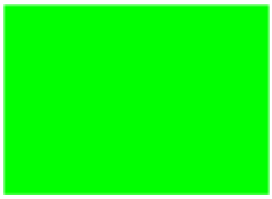
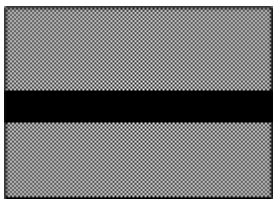
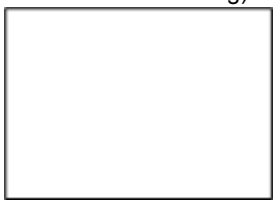
5.1 General Setting

The menu items on this screen are used to set the video signals and audio signals as well as HDCP ON/OFF and to set the packets and patterns used to generate them.

Mouse operations	Right-click → left-click GENERATE → left-click Generate Setting	
Main unit operations	Press the [GENERATE] key. Press [R CLICK] → press [L CLICK] on GENERATE.	→ Press [L CLICK] on Generate Setting.

Item	Description		
Generate Video	Whether to set the video signals ON or OFF is selected here.		
Generate Audio	Whether to set the audio signals ON or OFF is selected here.		
HDCP	Whether to set the HDCP ON or OFF is selected here.		
AV MUTE	Whether to set the Set AV MUTE / Clear AVMUTE ON or OFF is selectable here.		
Lipsync	When ☑ is checked, the Lipsync function is activated.		
	Auto Correction (EDID)	The EDID of the send destination is read, and the video signals and audio signals are sent in line with the EDID.	
	Mannual Correction	Video First	The video signals are sent first for the period of time which has been set.
		Audio First	The audio signals are sent first for the period of time which has been set.
		* The time to be set can be changed to any value between 0 and 1000 ms.	
Packet	The packets selected by ☑ are sent. * Up to six packets listed below can be selected.		
	AVI InfoFrame		
	SPD InfoFrame		

	Audio InfoFrame		
	MPEG InfoFrame		
	Vendor Specific InfoFrame		
	Gamut InfoFrame		
	ACP InfoFrame		
	ISRC InfoFrame		
	Other InfoFrame		
Pattern	The pattern selected by is sent.		
	Registered patterns	Color Bar	
		H Ramp	
		V Ramp	
		Frame	
		W Raster	

		R Raster	
		G Raster	
		B Raster	
		Random Color Bar	
		3D Checker	 (When Frame Packing has been selected for Generate Timing)  (When 2D has been selected for Generate Timing)

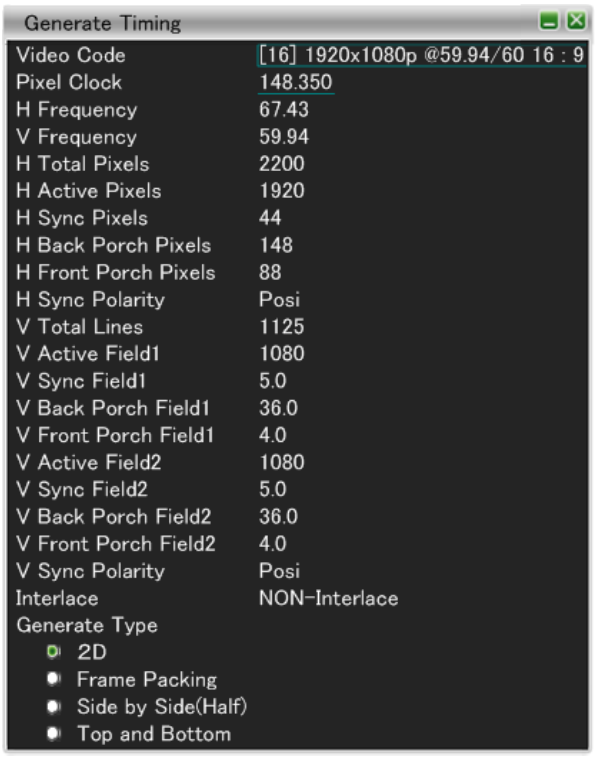
5.2 Detail

5.2.1 GenerateTiming

The video timing data is set on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Generate Timing	
Main unit operations	Press the GENERATE key.	→ Press L CLICK on Generate Timing.
	R CLICK → press L CLICK on GENERATE.	



Setting item	Description of setting
Video Code	The setting for the video timing * to be output is selected here. For details on the video timing, refer to “10.2 Video codes.”
Pixel Clock	This is the pixel frequency * for the video timing selected by Video Code. (25 to 165 MHz)
H Frequency	This is the HSYNC frequency for the video timing selected by Video Code.
V Frequency	This is the VSYNC frequency for the video timing selected by Video Code.
H Total Pixels	This is the HTOTAL width of the video timing selected by Video Code.
H Active Pixels	This is the HDISP width of the video timing selected by Video Code.
H Sync Pixels	This is the HSYNC width of the video timing selected by Video Code.
H Back Porch Pixels	This is the HSYNC Back Porch width of the video timing selected by Video Code.
H Front Porch Pixels	This is the HSYNC Front Porch width of the video timing selected by Video Code.

H Sync Polarity		This is the HSYNC polarity of the video timing selected by Video Code.
V Total Lines		This is the VTOTAL width of the video timing selected by Video Code. (in 1-frame increments)
V Active TOTAL		This is the VDISP width of the video timing selected by Video Code. (in 1-frame increments)
V Active Field1		This is the VDISP width of the video timing selected by Video Code.
V Sync Field1		This is the VSYNC width of the video timing selected by Video Code.
V Back Porch Field1		This is the VSYNC Back Porch width of the video timing selected by Video Code.
V Front Porch Field1		This is the VSYNC Front Porch width of the video timing selected by Video Code.
HV Sync OffSet1		This is the phase difference between H and V of the video timing selected by Video Code.
V Active Field2		This is the VDISP width of the 2nd field during interlacing at the video timing selected by Video Code.
V Sync Field2		This is the VSYNC width of the 2nd field during interlacing at the video timing selected by Video Code.
V Back Porch Field2		This is the VSYNC Back Porch width of the 2nd field during interlacing at the video timing selected by Video Code.
V Front Porch Field2		This is the VSYNC Front Porch width of the 2nd field during interlacing at the video timing selected by Video Code.
HV Sync OffSet2		This is the phase difference between H and V of the 2nd field during interlacing at the video timing selected by Video Code.
V Sync Polarity		This is the VSYNC polarity of the video timing selected by Video Code.
Interlace		Either Interface or Non-Interlace for the video timing selected by Video Code is selected here.
Generate Type *	2D	The output is in the form of 2D images.
	Frame Packing	The output is in the form of Frame Packing images.
	Side by Side (Half)	The output is in the form of Side by Side (Half) images.
	Top and Bottom	The output is in the form of Top and Bottom images.

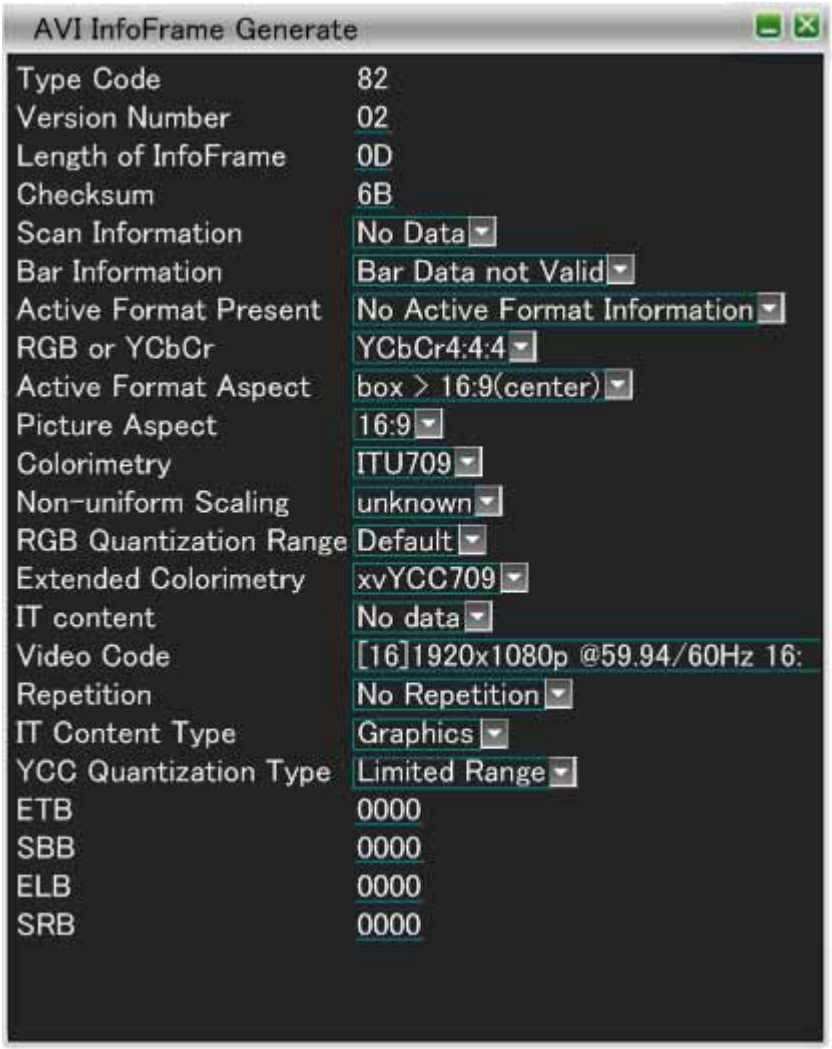
* Video Code, Pixel Clock and Generate Type are the items which can be set.

5.2.2 AVI Infoframe

The AVI InfoFrame settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click AVI InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on AVI InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Setting item	Description of setting
InfoFrame Type Code	82 H
InfoFrame Version Number	XX H
Length of AVI InfoFrame	XX H
Checksum	XX H
Scan Information	No Data
	Overscanned
	Underscanned
	Future
Bar Information	Bar Data not valid
	Vert.Bar Info valid
	Horiz. Bar Info valid

	Vert. and Horiz. Bar Info valid
Active Format Information Present	No Active Format Information valid
	Active Format Information valid
RGB or YCbCr	RGB
	YCbCr4:2:2
	YCbCr4:4:4
	Future
Active Format Aspect	Same as picture aspect ratio
	4:3 (center)
	16:9 (center)
	14:9 (center)
	box 16:9 (top)
	box 14:9 (top)
	box > 16:9 (center)
	4:3 (H Just)
	16:9 (14:9 V Just)
	16:9 (4:3 V Just)
	Reserved (0H ,1H ,5H ,6H ,7H ,CH)
Picture Aspect	No Data
	4:3
	16:9
	Future
Colorimetry	No Data
	SMPTE 170M / ITU601
	ITU709
	Extended Colorimetry Valid
Non-uniform Picture Scaling	Unknown
	Scaled H
	Scaled V
	Scaled H&V
RGB Quantization Range	Default
	Lited Range
	Full Range
	Reserved
Extended Colorimetry	xvYCC601
	xvYCC709
	SYCC601
	AdobeYCC601
	AdobeRGB
	Reserved
IT content	No data
	IT content
Video Code	[X] XXX x XXX@XXX / XXX Hz X : X
	Reserved
	No Video Code Available

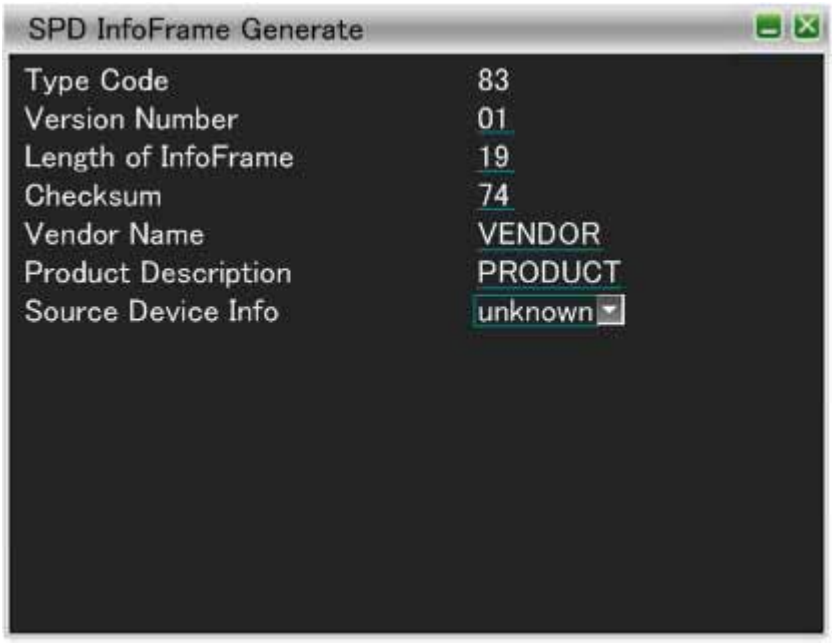
Repetition	No Repetition
	pixel sent X times
	Reserved
IT Content Type	Graphics
	Photo
	Cinema
	Game
YCC Quantization Range	Limited Range
	Full Range
	Reserved
	Reserved
Line Number of End of Top Bar (ETB)	0 to FFFF
Line Number of Start of Bottom Bar (SBB)	0 to FFFF
Pixel Number of End of Top Bar (ELB)	0 to FFFF
Pixel Number of Start of Bottom Bar (SRB)	0 to FFFF

5.2.3 SPD Infoframe

The SPD InfoFrame settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click SPD InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on SPD InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



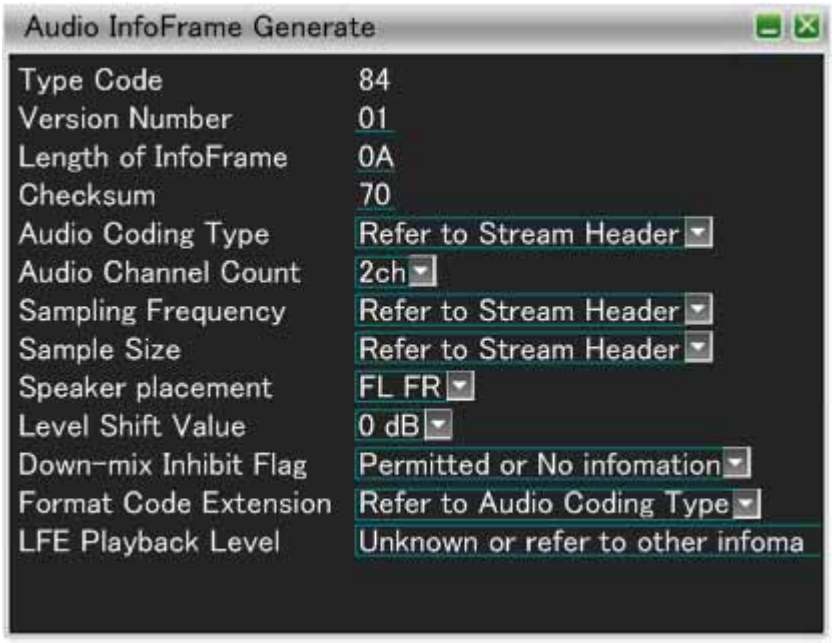
Setting item	Description of setting
InfoFrame Type Code	83 H
InfoFrame Version Number	XX H
Length of SPD InfoFrame	XX H
Checksum	XX H
Vendor Name Charanalyze_acter	(8 characters)
Product Description Charanalyze_acter	(16 characters)
Source Device Information	unknown
	Digital STB
	DVD
	D-VHS
	HDD Video
	DVC
	DSC
	Video CD
	GAME
	PC general
	Blu-Ray Disc
	Super Audio CD
	HD DVD
	PMP
	Reserved

5.2.4 Audio Infoframe

The Audio InfoFrame settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Audio InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on Audio InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Display item	What is displayed
InfoFrame Type Code	84 H
InfoFrame Version Number	XX H
Length of Audio InfoFrame	XX H
Checksum	XX H
Audio Coding Type	Refer to Stream Header
	IEC60958 PCM
	AC-3
	MPEG1 (Layers 1 & 2)
	MP3 (MPEG1 Layer 3)
	MPEG2 (multichannel)
	AAC
	DTS
	ATRAC
	One Bit Audio
	Dolby Digital+
	DTS-HD
	MLP
	DST
	WMA Pro
	Reserved
Audio Channel Count	Refer to Stream Header
	2 - 8ch

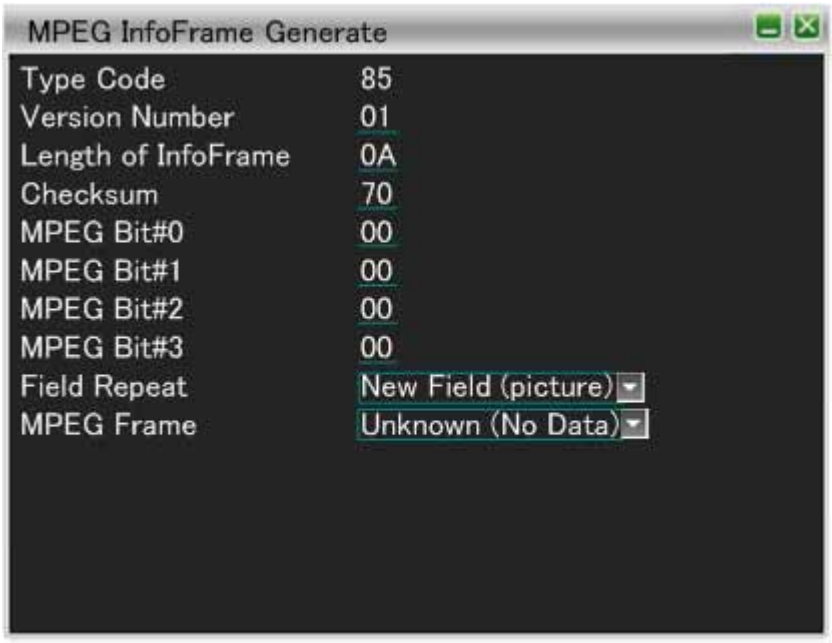
Sampling Frequency	Refer to Stream Header
	32 KHz
	44.1 KHz
	48 KHz
	88.2 KHz
	96 KHz
	176.4 KHz
	192 KHz
Sample Size	Refer to Stream header
	16 bits
	20 bits
	24 bits
Speaker Placement	TC FCH FLH FRH FLW FRW FRC FLC RR RL FC LFE FR FL (refer to written standards)
	Reserved
Level Shift Value	0 - 15dB
Down-mix Inhibit Flag	Permitted or No information
	Prohibited
Format Code Extension	Refer to Audio Coding Type
	HE-AAC
	HE-AACv2
	MPEG Surround
	Reserved
LFE Playback Level	Unknown or refer to other information
	0 dB playback
	+10 dB playback
	Reserved

5.2.5 MPEG Infoframe

The MPEG InfoFrame settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click MPEG InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on MPEG InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



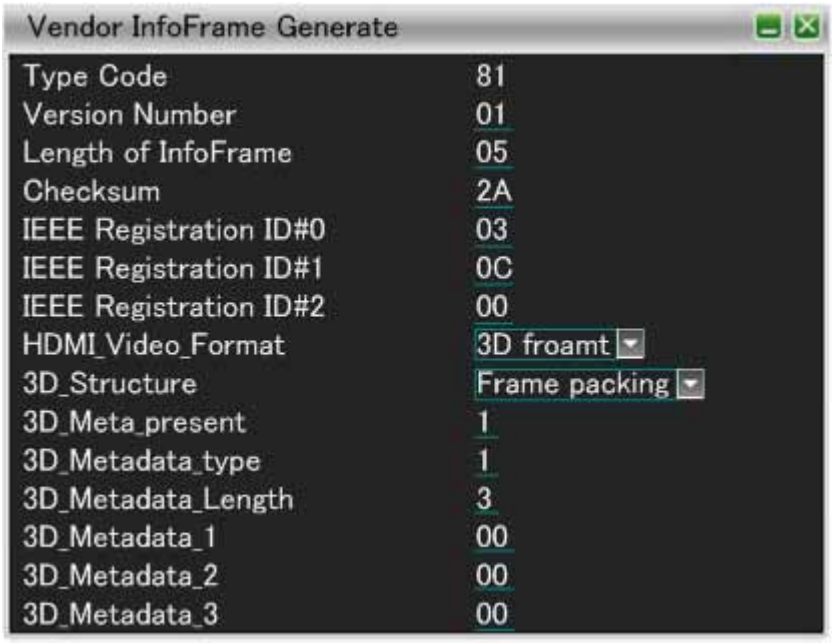
Display item	What is displayed
InfoFrame Type Code	85 H
InfoFrame Version Number	XX H
Length of MPEG InfoFrame	XX H
Checksum	XX H
MPEG Bit #0	XX H
MPEG Bit #1	XX H
MPEG Bit #2	XX H
MPEG Bit #3	XX H
Field Repeat	New Field (picture)
	Repeated Field
MPEG Frame	Unknown (No Data)
	I Picture
	B Picture
	P Picture

5.2.6 Vendor Specific Infoframe

The Vender Specific InfoFrame settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Vendor Specific InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on Vendor Specific InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Display item		What is displayed
InfoFrame Type Code		81 H
InfoFrame Version Number		XX H
Length of Vendor InfoFrame		XX H
Checksum		XX H
24-bit IEEE Resistance Id#0		XX H (03 H)
24-bit IEEE Resistance Id#1		XX H (0C H)
24-bit IEEE Resistance Id#2		XX H (00 H)
HDMI Video Format		no video format
		4Kx2K
		3D format
HDMI Video Format = Extended resolution format		
	HDMI VIC	4Kx2K 29.97/30 Hz
		4Kx2K 25 Hz
		4Kx2K 23.98/24 Hz
		4Kx2K 24 Hz (SMPTE)
		Reserved
HDMI Video Format = 3D format		
	Structure	Frame Packing
		Field alternative
		Line alternative
		Side-by-Side (Full)

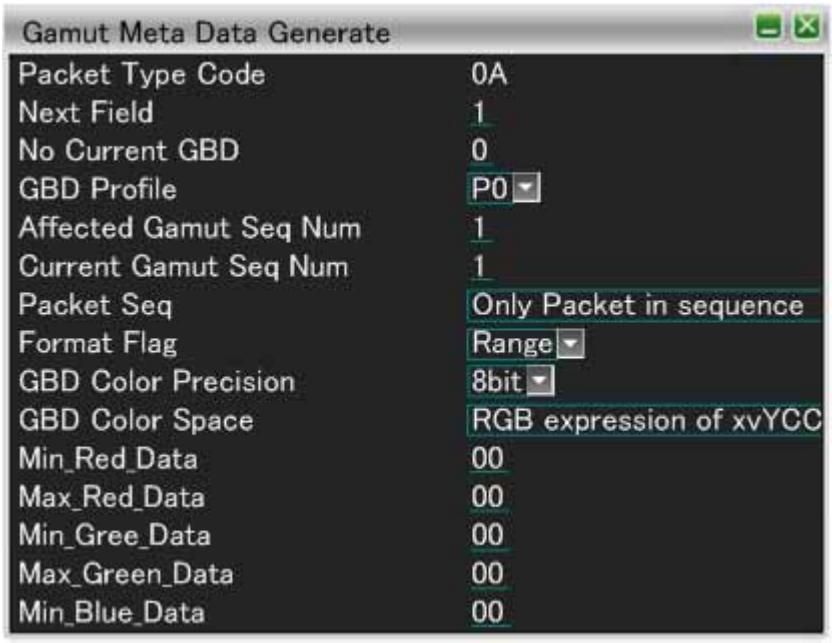
		L + depth
		L + depth + graphics + graphics-depth
		Top-and-Bottom
		Reserved
		Side-by-Side (Half)
	Meta_present	0H or 1H
	Structure = side-by-side (half)	
	Ext_Data	Horizontal Odd/Left Odd/Right
		Horizontal Odd/Left Even/Right
		Horizontal Even/Left Odd/Right
		Horizontal Even/Left Even/Right
		Quincunx Odd/Left Odd/Right
		Quincunx Odd/Left Even/Right
		Quincunx Even/Left Odd/Right
		Quincunx Even/Left Even/Right
		Reserved
	Meta_present = 1H	
	Metadata_type	XX H
	Metadata_length	XX H
	Metadata_1 to 20	XX H

5.2.7 Gamut Meta Data Packet

The Gamut MetaData Packet settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Gamut MetaData Packet	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on Gamut MetaData Packet.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Setting item		Description of setting
Packet Type Code		0A H
Next Field		XX H
No Current GBD		XX H
GBD Profile		P0
		P1
		P2
		P3
		Reserved
Affected Gamut Seq Num		XX H
Current Gamut Seq Num		XX H
Packet Seq		Intermediate packet in sequence
		First packet in sequence
		Last packet in sequence
		Only packet in sequence
GBD profile = P1 and Packet Seq = First packet in sequence		
	GBD Length H	XX H
	GBD Length L	XX H
	Checksum	XX H
Format Flag		Vertices/Facets
		Range
GBD Color Precision		8 bits
		10 bits

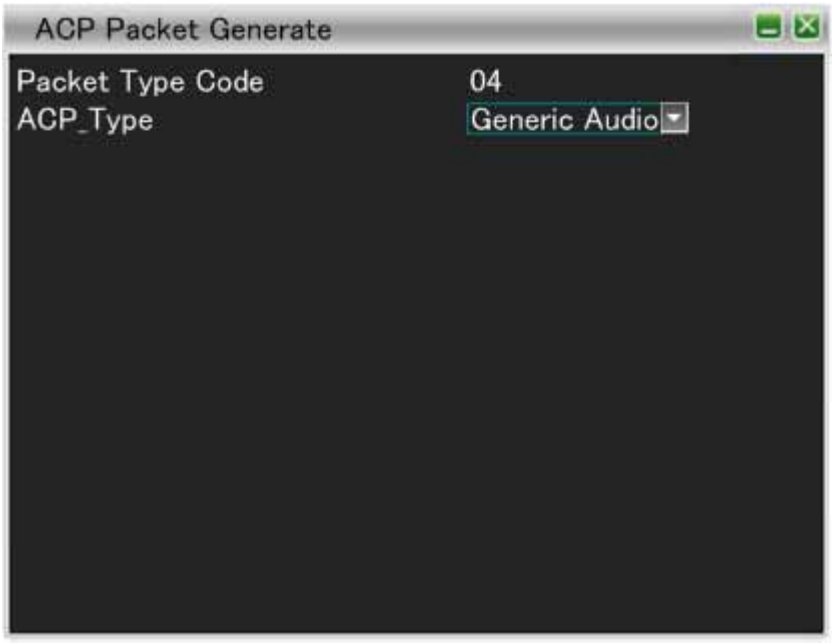
		12 bits
Format Flag = Vertices/Facets		
	GBD Color Space	ITU-R BT.709 (using RGB)
		xvYCC601 (IEC 61966-2-4-SD) (using YCbCr)
		xvYCC709 (IEC 61966-2-4-HD) (using YCbCr)
		XYZ
Format Flag = Range		
	GBD Color Space	Reserved
		RGB expression of xvYCC601
		RGB expression of xvYCC709
		Reserved
Format Flag = Vertices/Facets		
	Facet Mode	0 or 1
	Number Vertces H	XX H
	Number Vertices L	XX H
	Packed GBD Vertices Data	±X.XX
Format Flag = Range		
	Packed Range Data	±X.XX
Gamut Rsv pb0		XX H

5.2.8 ACP Packet

The ACP Packet settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click ACP Packet	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on ACP Packet.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Display item		What is displayed
Packet Type Code		04 H
ACP_Type		Generic Audio
		IEC60958-Identified Audio
		DVD Audio *1
		Super Audio CD *2
		Reserved
*1	DVD-Audio_Type_dependent _Generation	XX H
	Copy_Permission	Copy Freely
		reserved
		audio_copy_number
		Can't copy
	Copy_Number	Number of permitted copies is '1'
		Number of permitted copies is '2'
		Number of permitted copies is '4'
		Number of permitted copies is '6'
		Number of permitted copies is '8'
		Number of permitted copies is '10'
		Number of permitted copies is '3'
		Number of permitted copy is not restricted. (Copy One Generation)
	Quality	CH < 2, fs < 48 KHz, Q < 16 bits

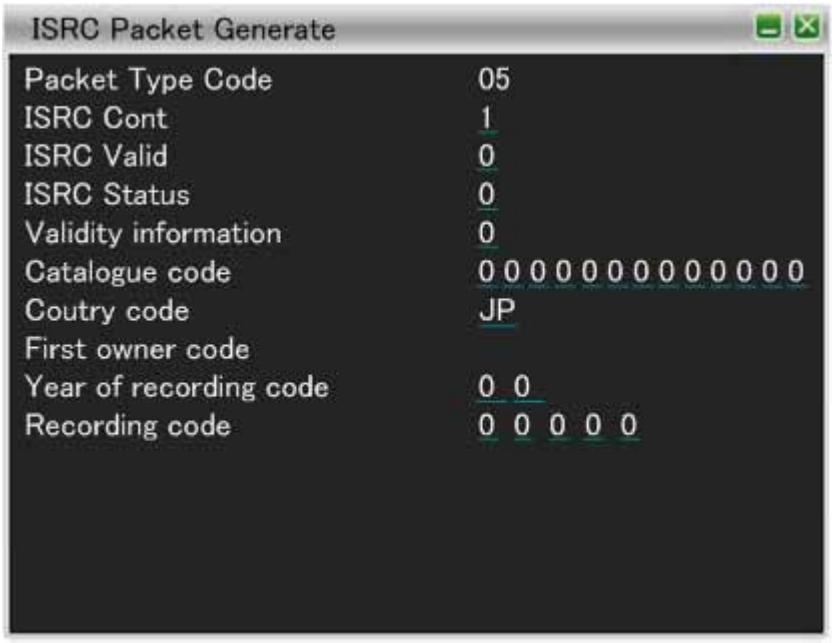
		CH < 2, fs&Q is not restricted
		CH&fs&Q is not restricted
		CH is not restricted, fs < 48 KHz, Q < 16 bits
	Transaction	not present
		reserved
*2	Count_A	XX times
	Count_S	XX times
	Count_U	XX times
	CCI_Flags Q_A	CD Quality
		unlimited DSD quality
	CCI_Flags Q_S	CD Quality
		unlimited DSD quality
	CCI_Flags Q_U	CD Quality
		unlimited DSD quality
	CCI_Flags Move_A	not allowed for the content
		allowed for the content
	CCI_Flags Move_S	not allowed for the content
		allowed for the content
	CCI_Flags Move_U	not allowed for the content
		allowed for the content

5.2.9 ISRC Packet

The ISRC Packet settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click ISRC Packet	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on ISRC Packet.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



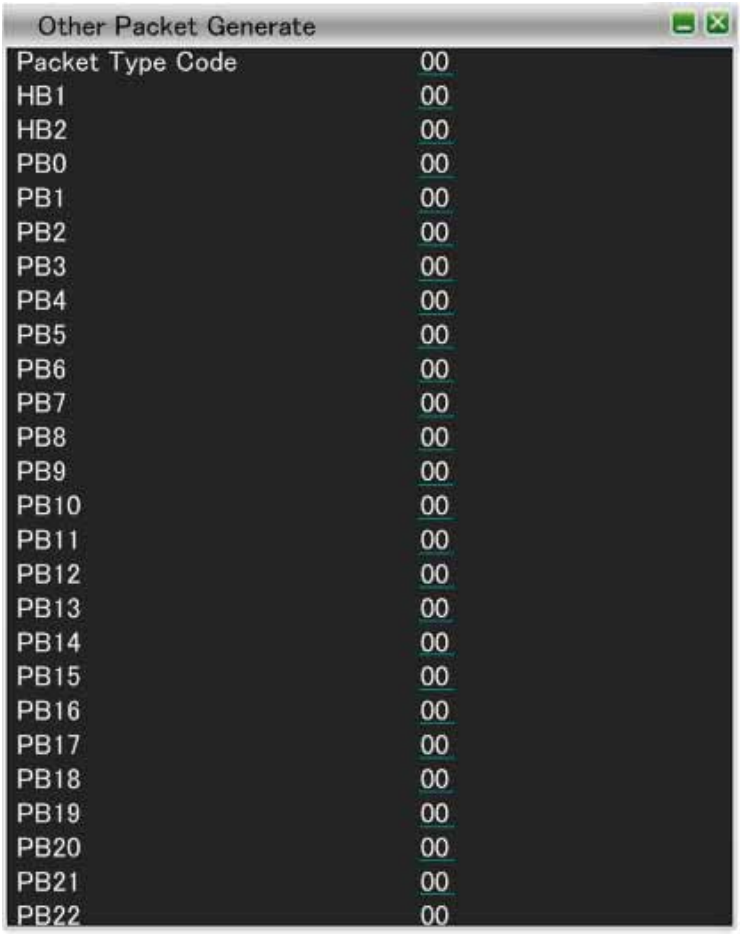
Display item	What is displayed
Packet Type Code	05H
ISRC_Cont	XX H
ISRC_Valid	XX H
ISRC_Status	XX H
Validity information	0H UPC/EAN and ISRC are invalid
	4H UPC/EAN is invalid and ISRC is valid
	8H UPC/EAN is valid and ISRC is invalid
	CH UPC/EAN and ISRC are valid
Catalogue code (UPC/EAN #1- #13)	XXXXXXXXXXXXX H
Country code (ISRC #1 - #2)	XX
First owner code (ISRC #3 - #5)	XXX
Year of recording code (ISRC #6 - #7)	XX H
Recording code (Recording-item code)	XXXXXH

5.2.10 Other InfoFrame

The InfoFrame and Packet settings can be selected independently on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Other InfoFrame	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on Other InfoFrame.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



The table below lists the packets which **cannot be set** by Other InfoFrame.

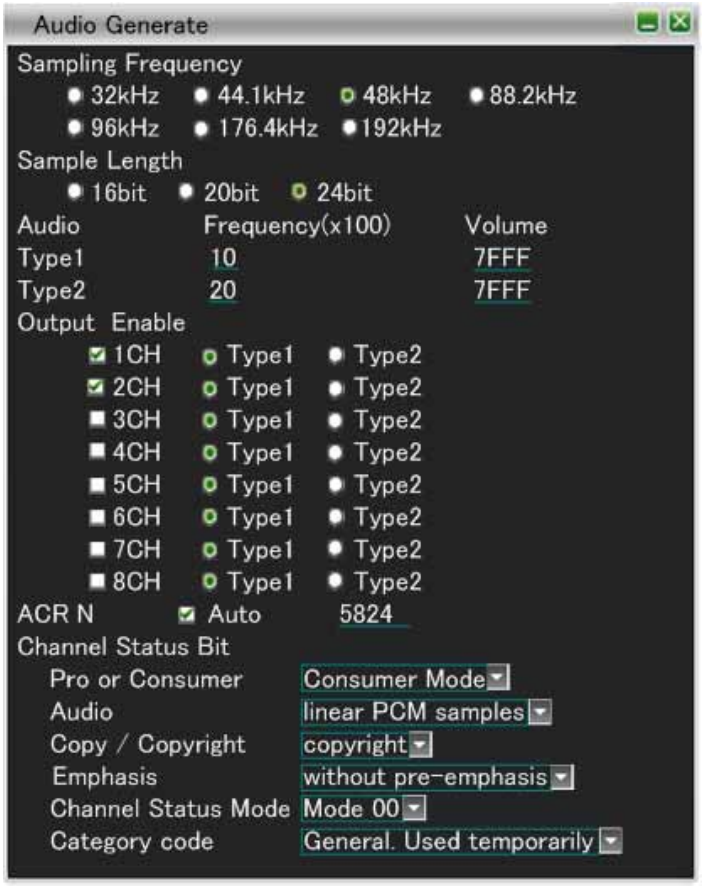
Item
Audio Clock Regeneration (0x01)
Audio Sample (0x02)
General Control Packet (0x03)
ACP Packet (0x04)
ISRC1 Packet (0x05)
One Bit Audio Sample Packet (0x07)
DST Audio Packet (0x08)
HBR Audio Stream Packet (0x09)
Gamut Metadata Packet (0x0A)
Vendor Specific InfoFrame (0x81)
AVI InfoFrame (0x82)
SPD InfoFrame (0x83)
Audio InfoFrame (0x84)
MPEG InfoFrame (0x85)

5.2.11 Audio

The Audio settings are selected on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click Audio	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on Audio.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Item	What is displayed	
Sampling Freqency	The frequency which in the range of 32 KHz to 192 KHz checked by ◉ is sent.	
Sample Length	The sample length which in the range of 16 bits to 24 bits checked by ◉ is sent.	
Audio Frequency	Type1	XX (x100)
	Type2	XX (x100)
Audio Volume	Type1	XXXX H
	Type2	XXXX H
Output Enable	The Audio Frequency and Audio Volume, which have been checked by ◉ for either Type1 or Type2 among what has been checked by ☑ among channels 1 to 8, are sent.	
ACR N	The N parameter is set here. When ☑ is checked for Auto, the N parameter is acquired automatically.	
Channel Status Bit	Pro or Consumer	Consumer Mode
		Professional Mode
	Audio	Liner PCM sample

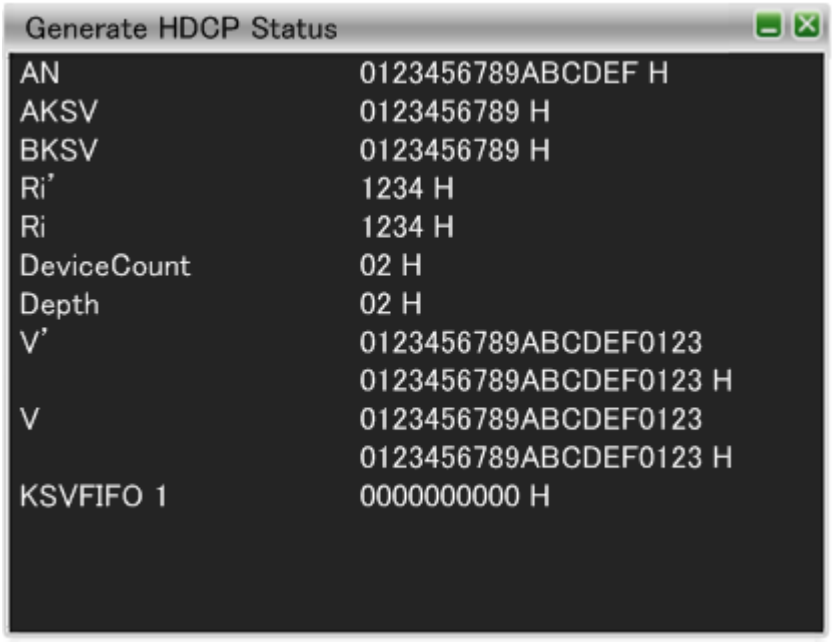
	Other than liner PCM sample
Copy / Copyright	Copyright
	no copyrightt
Emphasis	Without pre-emphasis
	With 50/15 us pre emphasis
	Reservrd-2channel audio
	Reservrd-4channel audio
	Default State
	Reserved
Channel Status Mode	Mode 00
	Reserved
Category Code	General. Used temporarily
	Laser optical (Compact disc)
	Laser optical (Laser optical digital audio system)
	Laser optical (Mini disc system)
	Laser optical (Digital versatile disc)
	Laser optical (Reserved)
	Digital/digital conv.&signal (PCM encoder/decoder)
	Digital/digtal conv.&signal (Digital signal mixer)
	Digital/digital conv.&signal (Sampling rate converter)
	Digital/digital conv.&signal (Digital sound sampler)
	Digital/digital conv.&signal (Digital sound processor)
	Digital/digital conv.&signal (Reserved)
	Digital compact cassette
	Magnetic tape or disc (DAT)
	Magnetic tape or disc (Video tape recorder)
	Magnetic tape or disc (Digital compact recorder)
	Magnetic tape or disc (Reserved)
	Broadcast reception (Japan)
	Broadcast reception (Europe)
	Broadcast reception (USA)
	Broadcast reception (Electronic software delivery)
	Broadcast reception (Reserved)
	Without copyright information (Synthesizer)
	Without copyright information (Microphone)
	Without copyright information (Reserved)
	Category code without copyright (A/D converter)
	Category code without copyright (Reserved)
	Category code with copyright (A/D converter)
	Category code with copyright (Reserved)
	Category code groups for solid state memory (Reserved)
	Experiment products not for commercial sale
	Not define. Reserved

		Not define. Reserved, except 000 0000 and 000 0001 L
	Source Number	Do not take into account.
		1 - 15 CH
	Channel Number	Do not take into account.
		A - O (0x1: A; 0x2: B; …… 0xF: O)
	Sampling frequency	44.1 KHz
		no indicate
		32 KHz
		48 KHz
		88.2 KHz (- HDMI Original)
		96 KHz (- HDMI Original)
		176.4 KHz (- HDMI Original)
		192 KHz (- HDMI Original)
		768 KHz
	Clock accuracy	Level 2, ±1000 ppm (default)
		Level 1, ±50 ppm - high accuracy
		Level 3, variable pitch
		Reserved
	Max sample length	20 bits
		24 bits
	Sample word length	Maximum audio sample word length = 20 bit
		Word length not indicated (default)
		16bits
		18bits
		19bits
		20bits
		17bits
		Reserved
		Maximum audio sample word length = 24 bit
		Word length not indicated (default)
		20bits
		22bits
		23bits
		24bits
		21bits
		Reserved

5.2.12 Generate HDCP Status

This sets the parameter of HDMI source that is used in HDCP certification.

Mouse operations	Right click → Click GENERATE → Click HDCP Status	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on HDCP Status.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



The HDCP display of GUI is shown as below.

Item	Description
AN	The pseudo random value that is used in HDCP certification that is sent from VA-1831 to the receiver or the repeater.
AKSV	Key Selection Vector of VA-1831.
BKSV	Key Selection Vector of the receiver and the Repeater.
Ri'	Certification value that is calculated by the receiver or the repeater.
Ri	Certification value calculated by VA-1831.
DeviceCount	Total number of the device that is connected in the Downstream. *
Depth	The number of depth that is connected in the Downstream. *
V'	The value to judge whether KSV list that is made by theRepeater is appropriate or not. *
V'	The value to judge whether KSV list that is made by the VA-1831 is appropriate or not. *
KSVFIFO	The KSV value of the device that is connected in the Downstream of VA-1831. *

* These items are displayed only when the receiver is the Repeater.

5.2.13 HDCP Config

This sets HDCP function of the HDMI source.

Mouse operations	Right click → Click GENERATE → Click HDCP Config	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on HDCP Config.
	Press [R CLICK] → press [L CLICK] on GENERATE.	

The setting item of the HDCP Config is shown as below.

Item	Description
Bcaps Read	Read Bcaps.
Ainfo Write	Write Ainfo.
Bstatus Read (Error Break)	Read Bstatus *1
Bstatus Read (Error Not Break)	Read Bstatus *1
Bksv Read (Error Break)	Read Bksv *2
Bksv Read (Error Not Break)	Read Bksv *2
Aksv Write	Write Aksv.
Invalid Aksv Write	Write invalid Aksv.
An Write	Write An.

Invalid An Write	Write invalid An.
Ri Read (Error Break)	Read Ri *3
Ri Read (Error Not Break)	Read Ri *3
Enc ON Set	Start Encryption.
Enc OFF Set	Encryption ends.
V' Read (Error Break)	Read V' *4
V' Read (Error Not Break)	Read V' *4
FIFO Read	Read KSV FIFO.
RDY Wait	Wait until FIFO RDY Bit becomes 1.
Wait 10ms	Wait for 10ms.
Wait 100ms	Wait for 100ms.
Wait 500ms	Wait for 500ms.
Wait 1000ms	Wait for 1000ms.

*1 The process stops if HDMI_MODE does not match, orMAX_DEVS_EXCEEDED,MAX_CASCADE_EXECEEDED becomes 1. In case of (Error Not Break), the process continues.

*2 In case of incorrect Bksv appears, the process stops. In case of (Error Not Break), the process continues.

*3 If Ri and RI' does not match, the process stops. In case of (Error Not Break), the process continues.

*4 If V and V' does not match, the process stops. In case of (Error Not Break), the process continues.

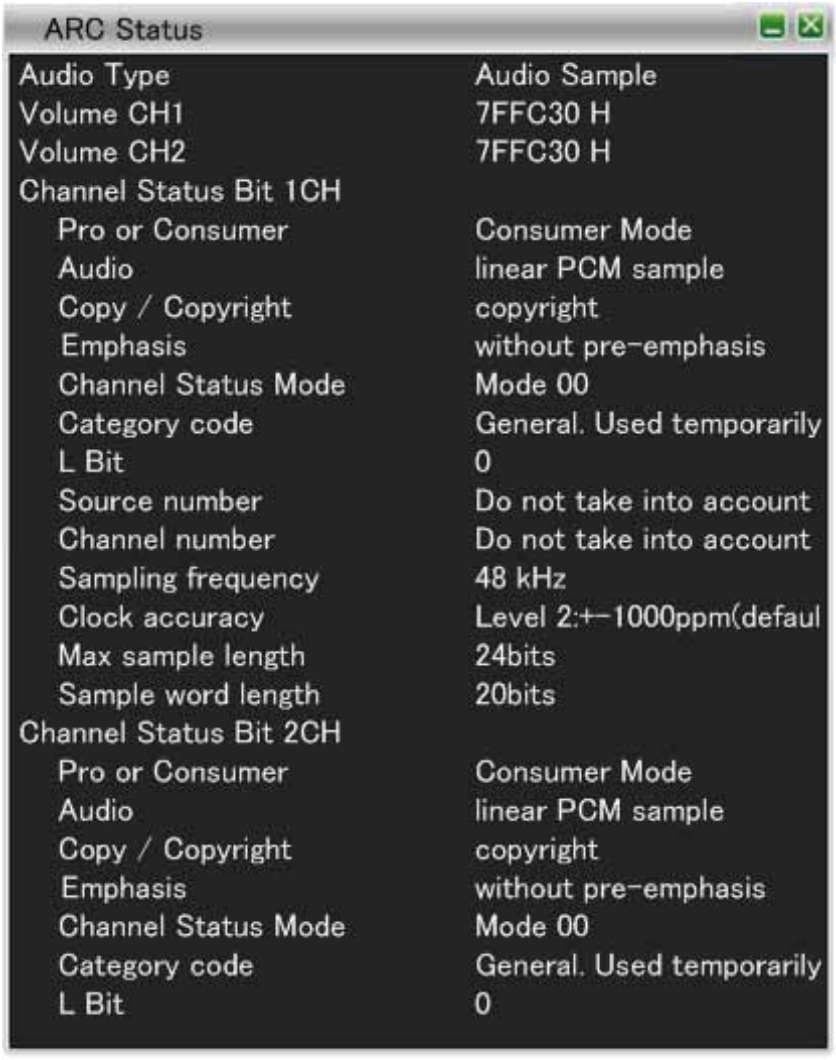
Note) if you change the sequence, HDCP may nor work properly.

5.2.14 ARC Status

ARC Status analysis is carried out on this screen.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click ARC Status	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on ARC Status.
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Item	What is displayed	
Audio Type	01-02	
Audio Volume	Ch1	XXXX H
	Ch2	XXXX H
Channel Status Bit 1CH (2CH)		
Channel Status Bit	Pro or Consumer	Consumer Mode
		Professional Mode
	Audio	Liner PCM sample
		Other than liner PCM sample
	Copy / Copyright	Copyright
		no copyrightt

Emphasis	Without pre-emphasis
	With 50/15 us pre emphasis
	Reservrd-2channel audio
	Reservrd-4channel audio
	Default State
	Reserved
Channel Status Mode	Mode 00
	Reserved
Category Code	General. Used temporarily
	Laser optical (Compact disc)
	Laser optical (Laser optical digital audio system)
	Laser optical (Mini disc system)
	Laser optical (Digital versatile disc)
	Laser optical (Reserved)
	Digital/digital conv.&signal (PCM encoder/decoder)
	Digital/digtal conv.&signal (Digital signal mixer)
	Digital/digital conv.&signal (Sampling rate converter)
	Digital/digital conv.&signal (Digital sound sampler)
	Digital/digital conv.&signal (Digital sound processor)
	Digital/digital conv.&signal (Reserved)
	Digital compact cassette
	Magnetic tape or disc (DAT)
	Magnetic tape or disc (Video tape recorder)
	Magnetic tape or disc (Digital compact recorder)
	Magnetic tape or disc (Reserved)
	Broadcast reception (Japan)
	Broadcast reception (Europe)
	Broadcast reception (USA)
	Broadcast reception (Electronic software delivery)
	Broadcast reception (Reserved)
	Without copyright information (Synthesizer)
	Without copyright information (Microphone)
	Without copyright information (Reserved)
	Category code without copyright (A/D converter)
	Category code without copyright (Reserved)
	Category code with copyright (A/D converter)
	Category code with copyright (Reserved)
	Category code groups for solid state memory (Reserved)
	Experiment products not for commercial sale
	Not define. Reserved
	Not define. Reserved, except 000 0000 and 000 0001 L
L Bit	0-1

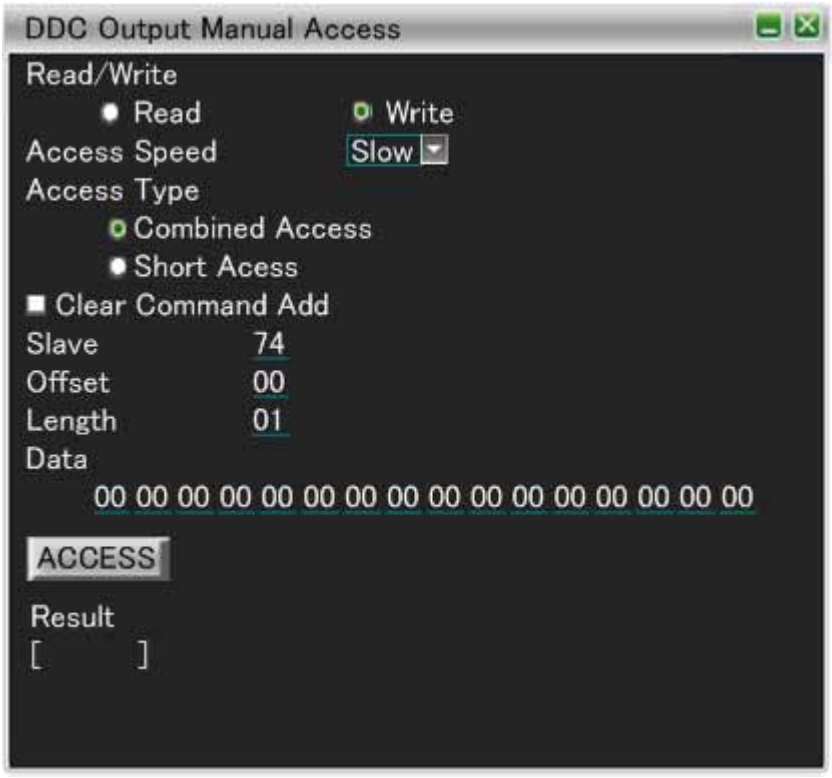
	Source Number	Do not take into account.
		1 - 15 CH
	Channel Number	Do not take into account.
		A - O (0x1: A; 0x2: B; …… 0xF: O)
	Sampling frequency	44.1 KHz
		no indicate
		32 KHz
		48 KHz
		88.2 KHz (- HDMI Original)
		96 KHz (- HDMI Original)
		176.4 KHz (- HDMI Original)
		192 KHz (- HDMI Original)
		768 KHz
		Reserved
	Clock accuracy	Level 2, ±1000 ppm (default)
		Level 1, ±50 ppm - high accuracy
		Level 3, variable pitch
		Reserved
	Max sample length	20 bits
		24 bits
	Sample word length	Maximum audio sample word length =20 bit
		Word length not indicated (default)
		16bits
		18bits
		19bits
		20bits
		17bits
		Reserved
		Maximum audio sample word length =24 bit
		Word length not indicated (default)
		20bits
		22bits
		23bits
		24bits
		21bits
		Reserved

5.2.15 DDC Output

This function performs I2C access of the HDMI source.

The display method used is shown below.

Mouse operations	Right-click → left-click GENERATE → left-click DDC Output	
Main unit operations	Press the [GENERATE] key.	→ Press [L CLICK] on DDC Output
	Press [R CLICK] → press [L CLICK] on GENERATE.	



Item	What is displayed
Read/Write	Select Read of Write of I2C.
Access Speed	Select Access Speed of I2C. Select either Slow, Normal or Fast.
Access Type	Select I2C Access Type. Select either Combined Access or Short Access. Note) Short Access is available only during Ri Read.
Clear Command	Add Clear Command.
Slave	Set Slave Address.
Offset	Set Offset Address.
Length	Set the Length.
Data	Set the Data part of the above address.
ACCESS/Result	If ACCESS is clicked, the result of the setting address is displayed by the setting Length.

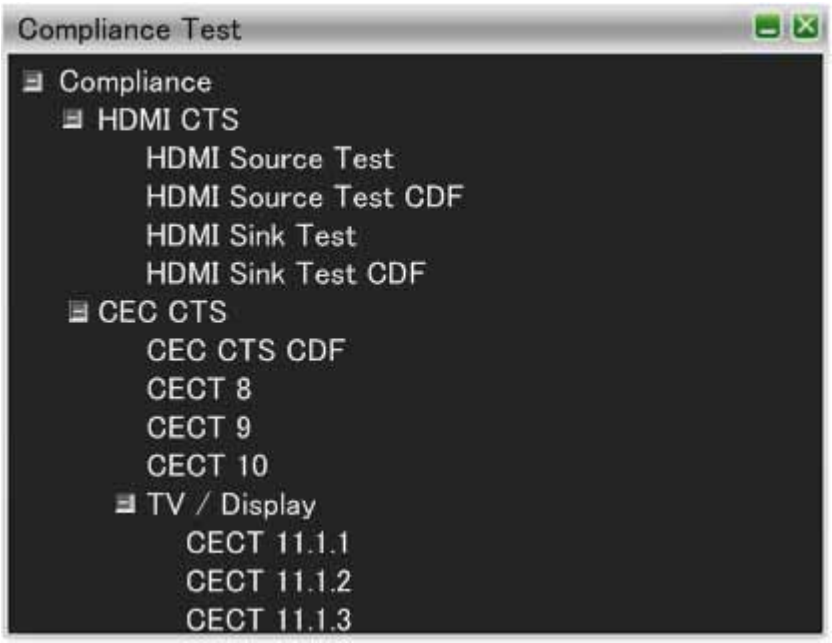
6 Compliance Test

Under the HDMI standard, it is mandatory to carry out compliance tests in order to prevent trouble in connectivity and other aspects.

The VA-1831 carries out some of the compliance tests mainly at the source end, and displays the results on an item by item basis.

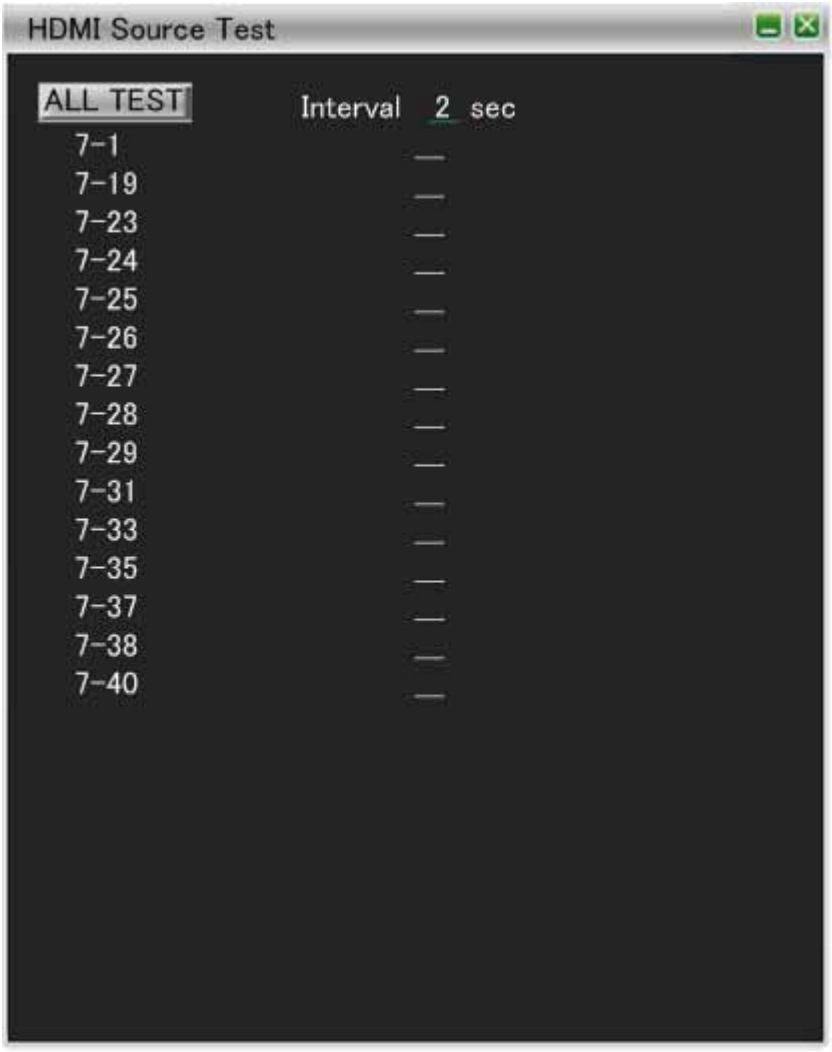
6.1 HDMI CTS

This opens the items that relate to HDMI CTS.



6.1.1 HDMI Source Test

When “ALL TEST” is selected, the tests for the Test IDs are started. When a Test ID number is clicked using the mouse, only the selected test is started. While testing is underway, the EDIDs required for the tests are set automatically. Shown below are the test table, test result table and table of items which are not tested.



Test table

TEST ID	Name of test	Description
7-1	EDID - Related Behavior	This checks whether the source device connected to the VA-1831 has read the EDIDs using DDC.
7-19	Packet Types *	This checks whether the device connected to the VA-1831 is sending the ACP Packets, ISRC1 Packets, ISRC2 Packets and Audio Packets correctly.
7-23	Pixel Encoding - RGB to RGB - only Sink *	This checks that the source device connected to the VA-1831 is not outputting the YCbCr signals to a device which can receive only RGB signals.
7-24	:Pixel Encoding YCbCr to YCbCr Sink *	This checks whether the source device connected to the VA-1831 is outputting the YCbCr signals to a device which can receive YCbCr signals.
7-25	Video Format Timing *	This checks whether the signals are output in the correct format from the source device connected to the VA-1831.
7-26	Pixel Repetition	This checks whether Pixel Repetition of the signals output from the source device connected to the VA-1831 are reflected correctly in AVI InfoFrame.

7-27	AVI Infoframe *	This checks the contents of AVI InfoFrame sent from the source device connected to the VA-1831.
7-28	IEC 60958/IEC 61937 *	This checks whether the audio signals sent from the source device connected to the VA-1831 are in compliance with the applicable standards.
7-29	ACR *	This checks the ACR Packets sent from the source device connected to the VA-1831.
7-31	Audio Infoframe *	This checks the Audio InfoFrame sent from the source device connected to the VA-1831.
7-33	Interoperability With DVI *	This checks that HDMI signals are not output to a DVI-only device by the source device connected to the VA-1831.
7-35	Gamut Metadata Transmission	This checks the Gamut Metadata sent from the source device connected to the VA-1831.
7-37	One Bit Audio *	This checks the One Bit Audio sent from the source device connected to the VA-1831.
7-38	3D Video Format Timing *	This checks whether signals are output in the correct 3D format from the source device connected to the VA-1831.
7-40	Extended Colorimetry Transmission (Without xvYCC)	This checks whether InfoFrame is output correctly when sYCC601, AdobeYCC601 or AdobeRGB have been received from the source device connected to the VA-1831.

Tests marked with * may contain some items which are not tested. For details, refer to the list of items which are not tested.

Test result table

TEST ID	Display	Description
ALL	PASS	No problems encountered.
	Running Test	Now testing.
7-1	2Block Not Read	EDIDs of two blocks have not been read.
	4Block Not Read	EDIDs of four blocks have not been read.
7-19	ACP Packet is not transmitted	ACP is not sent.
	ACP_type does not equal Generic Audio or IEC 60958 conformant	0x00 (Generic Audio) or 0x01 (IEC 60958 conformant) is not sent by ACP_type.
	ACP_type does not equal DVD Audio	0x02 (DVD Audio) is not sent by ACP_type.
	ACP_type does not equal Super Audio CD	0x03 (Super Audio CD) is not sent by ACP_type.
	ACP Reserved field is not zero	ACP Reserved field is not 0.
	ACP PB0 value is not 0x01	PB0 is not 0x01 when ACP_type is 0x02 (DVD Audio).
	ISRC1 Packet is not transmitted	ISRC1 Packet is not sent.
	ISRC1 reserved field is not zero	ISRC1 reserved field is not 0.

	ISRC2 Packet is not transmitted	ISRC2 Packet is not sent.
	ISRC2 Packet is transmitted	The ISRC2 Packet is sent.
	ISRC2 reserved field is not zero	ISRC2 reserved field is not 0.
	ACP,ISRC1,ISRC2 Packet is transmitted	The ACP, ISRC1 and ISRC2 Packets are sent.
7-23	AVI InfoFrame is not transmitted	AVI InfoFrame is not sent.
	Y1 and Y0 does not indicate RGB	The Y1 and Y0 values are not (0, 0).
	RGB Quantization is not Default or FULL	When RGB is sent at the VGA resolution, the Q1 and Q0 values are not (0, 0) or (1, 0).
	YCC Quantization is not Limited or FULL	The YQ1 and YQ0 values are not (0, 0) or (0, 1).
	RGB Quantization is not Default or Limited	When RGB are sent at a resolution other than VGA, the Q1 and Q0 values are not (0, 0) or (0, 1).
	Image appears to be transmitted with a non-RGB pixel encoding	Non-RGB Pixel Encoding has been found from the images.
7-24	AVI InfoFrame is not transmitted	AVI InfoFrame is not sent.
	Y1 and Y0 does not indicate YCbCr	RGB have been sent by AVI InfoFrame pixel encoding.
	RGB Quantization is not Default or Limited	The Q1 and Q0 values are not (0, 0) or (0, 1).
	YCC Quantization is not Limited	The YQ1 and YQ0 values are not (0, 0).
	AVI do not indicate same pixel encoding as is used in transmitted video	Pixel Encoding which is not AVI Infoframe Pixel Encoding has been found from the images.
7-25	AVI InfoFrame does not transmit	AVI InfoFrame is not sent.
	Pixel Clock is outside of allowable range	When the Video Code of AVI InfoFrame is a at timing of 60, 30, 24, 120 or 240 Hz, this frequency is not within +0.5%/-0.6% of the value specified in the format designated for the Video Code (59.94, 60, etc.). When the Video Code of AVI InfoFrame is at a timing of 25, 50, 100 or 200 Hz, this frequency is not within ±0.5% of the value specified in the format designated for the Video Code.
	H Total Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
	H Active Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
	H Sync Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
	H Back Porch Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
	H Front Porch Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.

	H Sync Polarity does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the polarity is at variance from the value specified in the format designated for the Video Code.
	V Total Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Active Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Sync Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Back Lines Porch do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Front Porch Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Sync Polarity does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the polarity is at variance from the value specified in the format designated for the Video Code.
	Interlace does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the system is at variance from the value specified in the format designated for the Video Code.
7-26	Video Timing does not correspond to format	The Video Timing is at variance from the value specified in the format designated for the Video Code.
	No AVI Value contains illegal	When AVI Infoframe is not sent, there is a variance from the value specified in the format designated for the No AVI Value.
	Video pixels are different than repetition value	The Repetition value is at variance from the value specified in the format designated for the Video Code.
	PR Value is different to standard	The PR value of AVI Infoframe is at variance from the value specified in the format designated for the Video Code.
	Repetition value does not equal for No AVI Value or Legal PR Value	Repetition value becomes No AVI Value or different from Legal PR Vale.
7-27	CDF field is set incorrectly	CDF is not correct.
	AVI InfoFrame does not transmit	AVI InfoFrame is not sent.
	AVI InfoFrame version is not 2	The setting is not 0x02.
	Reserve bit is not 0	Reserved bit is not 0.
	VIC does not correspond to video format timing	The Video Code of AVI Infoframe is at variance from the value specified in the format designated for the Video Code.
	Aspect ratio does not match aspect rate corresponding to VIC	The Aspect Ratio of AVI Infoframe is at variance from the value specified in the format designated for the Video Code.
	VIC is not zero when transmitting non-CEA format	When Source_Non-CEA_Formats of CDF is Yes and Timing which is not the CEA timing is sent, the Video Code of AVI Infoframe is not 0.
	Content type is not No Data	The Source_CN_Photo, Cinema and Game of CDF are Yes, ITC and CN1, 0 of AVI InfoFrame are not 0.
7-28	Frame Rate is not indicated value	Frame Rate is not correct.
	Frame Rate is > 192 KHz	Frame Rate has exceeded 192 KHz.
	Frame Rate is ≤ 192 KHz	Frame Rate has not reached 192 KHz.
	Audio FIFO Error	Audio FIFO Error
	PLL Lock Error	Audio PLL is not locked.
	High-Bitrate Audio Stream is not transmitted	High-Bitrate Audio is not sent.
7-29	Frame Rate is not indicated value	Frame Rate is not correct.
	128*Fs/1500 > N or 128*Fs/300 < N	N is not within the 128*FS / 1500 Hz ≤ N ≤ 128*FS / 300 Hz range.

	CTS is not without (TMDS_Clock*N) / (128*Fs) +-50ppm	CTS is not within 50 ppm of the value calculated by (F_TMDS_clock*N) / (128*FS). (The 50 ppm value is determined by the Clock Accuracy of the Channel Status Bit.)
	CTS is not without (TMDS_Clock*N) / (128*Fs) +-100ppm	CTS is not within 100 ppm of the value calculated by (F_TMDS_clock*N) / (128*FS). (The 100 ppm value is determined by the Clock Accuracy of the Channel Status Bit.)
	Audio FIFO Error	Audio FIFO Error
	PLL Lock Error	Audio PLL is not locked.
7-31	InfoFrame Type is not 0x84	The setting is not 0x84.
	InfoFrame Version is not 1	The setting is not 0x01.
	InfoFrame Length is not 0x0A	The setting is not 0x0A.
	Audio Coding (CT) Type is not 0	The Audio Coding type (CT) value of Audio InfoFrame is not 0.
	Sampling Frequency (SF) is not 0	The Sampling Frequency (SF) value of Audio InfoFrame is not 0.
	Sample Size (SS) is not 0	The Audio InfoFrame Sampling Size (SS) value of Audio InfoFrame is not 0.
	Reserve bit is not 0	Reserved bit is not 0.
	Channel Allocation (CA) ≥ 0x20	The Channel Allocation (CA) value of Audio InfoFrame has exceeded 0x20.
	Channel Allocation (CA) != 0x00	The Channel Allocation (CA) value of Audio InfoFrame is not 0x00.
	Channel Count (CC) != 0x00 and Channel Count (CC) != 0x01	The Channel Count (CC) value of Audio InfoFrame is neither 0x00 nor 0x01.
	Channel Allocation (CA) does not match Channel Count (CC)	The Allocation (CA) and Channel Count (CC) of Audio InfoFrame are at variance.
	Level Shift Value (LSV) != 0 and Channel Allocation (CA) != 0	The Channel Allocation (CA) value of Audio InfoFrame is not 0, and Level Shift Value (LSV) is not 0.
	DM_INH == 1 and Channel Allocation (CA) == 0	DHM_INH of Audio InfoFrame is 1, and Channel Allocation (CA) is 0.
	sum != 0x00	The lower 8 bits of the value calculated by Type Code of Audio InfoFrame + Audio InfoFrame Version Number + Length of Audio InfoFrame + CheckSum are not 0.
	LFEPBL1 == 1 and LFEPBL0 == 1	LFEPBL1 of Audio InfoFrame is 1, and LFEPBL0 is 1.
7-33	Not DVI	The signals are not DVI signals.
	Not HDMI	The signals are not HDMI signals.
	No Sync	No input signal
7-35	no AVI indication of xxvYCC occurs but Gamut Metadata packet does occur	Extended Colorimety of Audio InfoFrame is not displayed.
	Extended Colorimetry (EC) does not equal (0 or 1)	The Extended Colorimety (EC) value of Audio InfoFrame is neither 0 nor 1.
	no Gamut Metadata packet	Gamut Metadata Packet is not sent.
	GBD_profile != 0	The GBD_profile value of Gamut Metadata Packet is not 0.
	Packet_Seq != 3	The Packet_Seq value of Gamut Metadata Packet is not 3.

	Affected_Gamut_seq_Num - Current_Gamut_Seq_Num != (0 or 1 or -15)	Affected_Gamut_seq_Num and Current_Gamut_Seq_Num values of Gamut Metadata Packet are neither 0 nor 1 to 15.
7-37	Packet type is Audio Sample Packet	Audio Sample Packet (0x02) is sent.
	Packet type is DST,HBRA,GMP	DST (0x08), HBR (0x09) or GMP (0x0A) are sent.
	Packet type is not One Bit Audio Sample Packet	One Bit Audio Sample Packet (0x07) is not sent.
	InfoFrame Type is not 0x84	The setting is not 0x84.
	InfoFrame Version is not 1	The setting is not 0x01.
	InfoFrame Length is not 0x0A	The setting is not 0x0A.
	Audio Coding (CT) Type is not 0	The Audio Coding type (CT) value of Audio InfoFrame is not 0.
	Sampling Frequency (SF) is not 0b010	The Sampling Frequency (SF) value of Audio InfoFrame is not 0b010.
	Sample Size (SS) is not 0	The Audio InfoFrame Sampling Size (SS) value of Audio InfoFrame is not 0.
	Reserve bit is not 0	Reserved bit is not 0.
	Channel Allocation (CA) ≥ 0x20	The Channel Allocation (CA) value of Audio InfoFrame has exceeded 0x20.
	Channel Allocation (CA) != 0x00	The Channel Allocation (CA) value of Audio InfoFrame is not 0x00.
	Channel Count (CC) != 0x00 and Channel Count (CC) != 0x01	The Channel Count (CC) value of Audio InfoFrame is neither 0x00 nor 0x01.
	Channel Allocation (CA) does not match Channel Count (CC)	The Allocation (CA) and Channel Count (CC) of Audio InfoFrame are at variance.
	Level Shift Value (LSV) != 0 and Channel Allocation (CA) != 0	The Channel Allocation (CA) value of Audio InfoFrame is not 0, and Level Shift Value (LSV) is not 0.
	DM_INH == 1 and Channel Allocation (CA) == 0	DHM_INH of Audio InfoFrame is 1, and Channel Allocation (CA) is 0.
	sum != 0x00	The lower 8 bits of the value calculated by Type Code of Audio InfoFrame + Audio InfoFrame Version Number + Length of Audio InfoFrame + CheckSum are not 0.
7-38	Source_Mandatory_3D_Video_Formats is not contain any of the mandatory format	Source_Mandatory_3D_Video_Formats of CDF does not include the Mandatory Timing of 3D.
	Vendor Specific InfoFrame is not transmitted	Vendor Specific InfoFrame is not sent.
	AVI InfoFrame is not transmitted	AVI InfoFrame is not sent.
	VSI Length is less than 0x05	When PB5 of Vendor Specific InfoFrame is either 0x0000X000 or 0x0110X000, the Length value of Vendor Specific InfoFrame is less than 0x05.
	VSI Length is less than 0x06	When PB5 of Vendor Specific InfoFrame is 0x1000X000, the Length value of Vendor Specific InfoFrame is less than 0x06.

HDMI_Video_Format does not equal 0x02	The HDMI_Video_Format of Vendor Specific InfoFrame is not 0x02.
VSI Reserve bit is not 0	Reserved bit is not 0.
PB5 does not equal 0b0000X000	When 3D Structure of Vendor Specific InfoFrame is Frame Packing, PB5 is not 0b0000X000.
PB6 through InfoFrame_Length do not equal 0x00	When 3D Structure of Vendor Specific InfoFrame is Frame Packing and the PB5 value of Vendor Specific InfoFrame is 0x00, the Length from PB6 is not 0x00.
PB7+3D_Metadata_Length through InfoFrame_Length do not equal 0x00	When 3D Structure of Vendor Specific InfoFrame is Frame Packing and the PB5 value of Vendor Specific InfoFrame is 0x08, the Length from PB7 is not 0x00.
PB5 does not equal 0b1000X000	When 3D Structure of Vendor Specific InfoFrame is Side-by-Side (Half), PB5 is not 0b1000X000.
PB6 does not equal 0x00, 0x10, 0x20 or 0x30	When 3D Structure of Vendor Specific InfoFrame is Side-by-Side (Half), thePB6 value of Vendor Specific InfoFrame is not 0x00, 0x10, 0x20 or 0x30.
PB7 through InfoFrame_Length do not equal 0x00	When 3D Structure of Vendor Specific InfoFrame is Side-by-Side (Half) and the PB5 value of Vendor Specific InfoFrame is 0x80, the Length from PB7 is not 0x00.
PB8+3D_Metadata_Length through InfoFrame_Length do not equal 0x00	When 3D Structure of Vendor Specific InfoFrame is Side-by-Side (Half) and the PB5 value of Vendor Specific InfoFrame is 0x88, the Length from PB8 is not 0x00.
PB5 does not equal 0b0110X000	When 3D Structure of Vendor Specific InfoFrame is Top-of-Bottom, PB5 is not 0b0110X000.
sum != 0x00	The lower 8 bits of the CheckSum value of Vendor Specific InfoFrame are not 0.
AVI InfoFrame version is not 2	The setting is not 0x02.
Aspect ratio is not permitted for video format timing	M1 and M0 of AVI Infoframe are at variance from the values specified in the format designated for VideoFormat Timing.
Aspect ratio do not match aspect rate corresponding to VIC	M1 and M0 of AVI Infoframe are at variance from the values specified in the format designated for Video Code.
AVI Reserve bit is not 0	Reserved bit is not 0.
Pixel Clock is outside of allowable range	When the Video Code of AVI InfoFrame is at a timing of 60, 30, 24, 120 or 240 Hz, this frequency is not within +0.5%/-0.6% of the value specified in the format designated for the Video Code (59.94, 60, etc.). When the Video Code of AVI InfoFrame is at a timing of 25, 50, 100 or 200 Hz, this frequency is not within ±0.5% of the value specified in the format designated for the Video Code.
H Total Pixels not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
H Active Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
H Sync Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
H Back Porch Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.

	H Front Porch Pixels do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of pixels is at variance from the value specified in the format designated for the Video Code.
	H Sync Polarity does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the polarity is at variance from the value specified in the format designated for the Video Code.
	V Total Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Active Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Sync Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Back Porch Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Front Porch Lines do not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the number of lines is at variance from the value specified in the format designated for the Video Code.
	V Sync Polarity does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the polarity is at variance from the value specified in the format designated for the Video Code.
	Interlace does not equal values for video format	When the Video Code of AVI InfoFrame is (1-64), the system is at variance from the value specified in the format designated for the Video Code.
	VSI Length is less than 0x04	When Vendor Specific InfoFrame is (HB0, HB1, PB1, PB2, PB3=0x81, x01, 0x03, 0x0C), the Length value of Vendor Specific InfoFrame is less than 0x04.
	PB5 through InfoFrame_Length do not equal 0x00	When Vendor Specific InfoFrame is (HB0, HB1, PB1, PB2, PB3=0x81, x01, 0x03, 0x0C), the lower 8 bits of the total Infoframe_Length value from PB5 are not 0.
	PB4 does not equal 0x00	PB4 is not 0.
	VIC do not match indicated VIC	VIC value is different from from the value specified in the Video Code format.
	Pixel value differs from the first pixel value in Active space	In case of Frame Packing, there are pixels in the Active Space that is different from the initial pixel.
7-40	Colorimetry indicating Extended Colorimetry	When Source_sYCC601, Source_AdobeYC601 or Source_AdobeRGB of CDF is Yes, Extended Colorimetry (C1, C0) of Audio Infoframe is (1, 1).

List of items not tested

TEST ID	Description
7-19	If no Data Island is detected at least once per two video fields then FAIL.
	Test relating to “if packet type is equal to 0x00 (Null Packet)”
	Test relating to “If packet type is equal to 0x01 (ACR Packet)”
	Test relating to “If packet type is equal to 0x02 (Audio Sample Packet)”
	Test relating to “If packet type is equal to 0x03 (General Control Packet)”
	If the ACP packet is not transmitted at least once per 300 ms for “if ACP_type is equal to 0x02 (DVD Audio)” or “if ACP_type is equal to 0x03 (Super Audio CD),” then FAIL.
7-23	If any two video fields occur with no AVI Infoframe then FAIL.
7-24	If any two video fields occur with no AVI Infoframe then FAIL.
7-25	If any two video fields occur with no AVI Infoframe then FAIL.
7-27	If any two video fields occur with no AVI Infoframe then FAIL.
7-28	If repetition period of B bit is not 192 “Frames” then FAIL.
7-29	If CTSinterval is not within the range of (N / (128*Fs)) ± 2000 ppm then FAIL.)
	The Sampling Frequency value of CSB is used for Fs_actual.
	“Average the CTS values (CTS average)” average value is not used.
	“Measure the TMDS clock (fTMDS_clock) with an accuracy of 1 ppm” is not complied with.
7-31	If Audio Infoframe Packet is detected at least once per two video fields then FAIL.
7-33	If any Guard Bands transmitted then FAIL.
	If any Data Islands transmitted then FAIL.
	If any Video Data Period has no Guard Bands then FAIL.
	If any Video Field has no Data Islands then FAIL.
7-37	For each packet type equal to 0x07. If these reserved fields are not zero then FAIL.
	If Audio Infoframe Packet is detected at least once per two video fields then FAIL.
	If One Bit Audio Sample subpacket jitter, relative to actual One Bit Audio Sample subpacket rate, ever exceeds one video horizontal line period plus a single subpacket period then FAIL.
7-38	If any two video fields occur with no HDMI Vendor Specific Infoframe then FAIL.
	If any two video fields occur with no AVI Infoframe then FAIL.
	If any pixels value differs from the first pixel value in “Active space” then FAIL.
	If any two video fields occur with no HDMI Vendor Specific Infoframe then FAIL.

6.1.2 HDMI Source Test CDF

The items to be tested can be selected by setting ahead of time the specifications of the device under test (DUT) on the CDF (Capabilities Declaration Form) for executing HDMI CTS.

By clicking SAVE, CDF data is saved.

By clicking LOAD, CDF data is read.

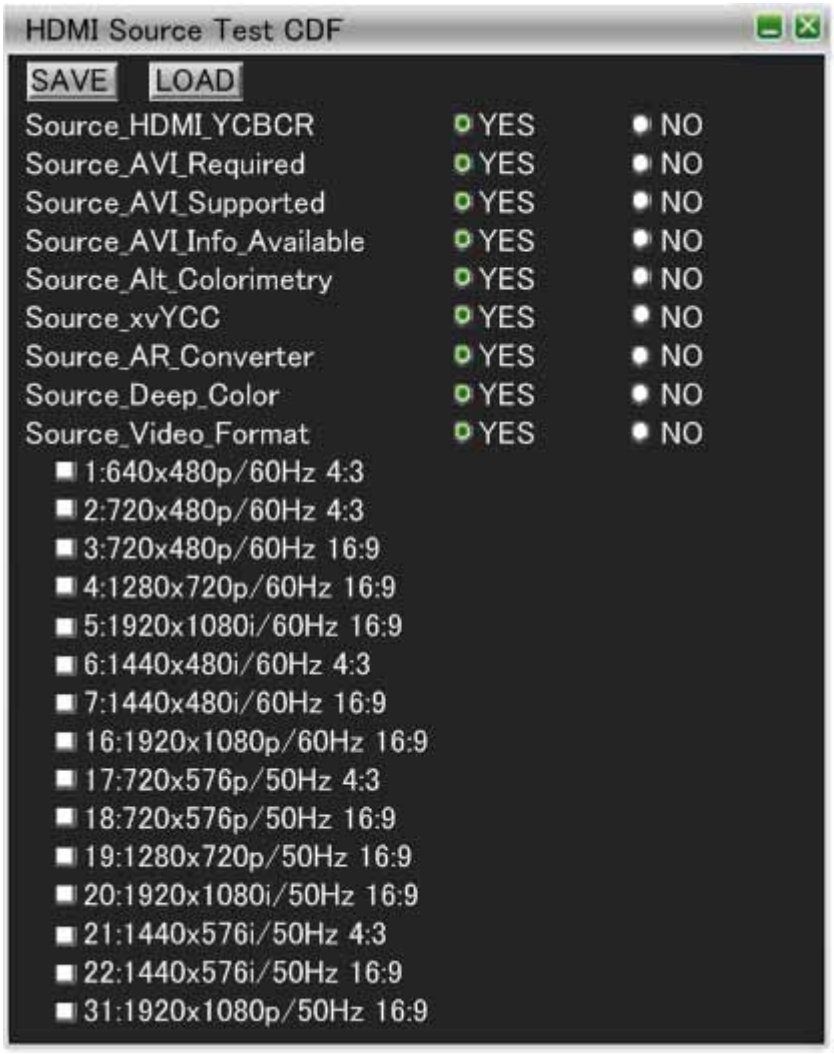


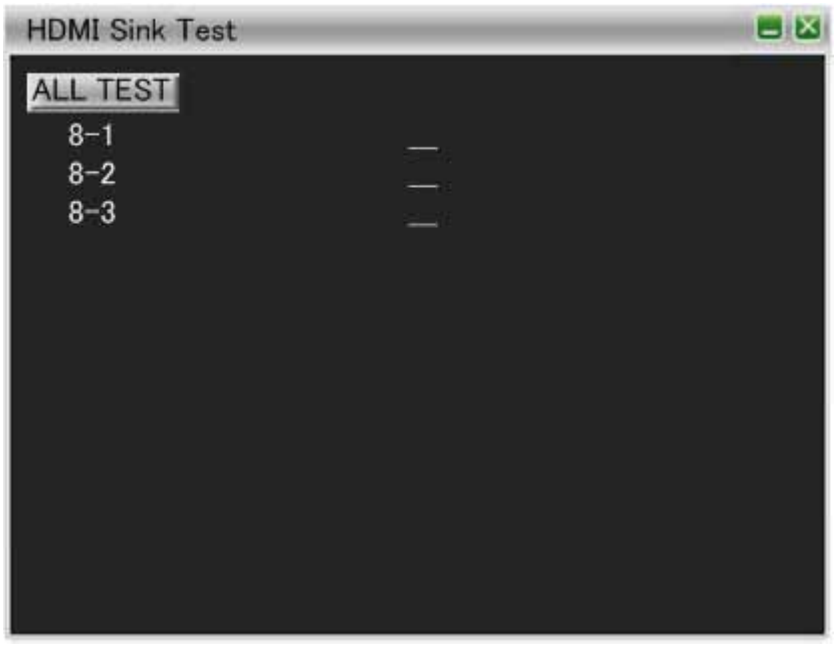
Table of HDMI Source CDF items

Display	Targeted tests
Source_HDMI_YCBCR	TEST ID7-24, TEST ID7-27
Source_AVI_Required	TEST ID7-25, TEST ID7-27
Source_AVI_Supported	TEST ID7-23, TEST ID7-24, TEST ID7-27
Source_AVI_Info_Available	TEST ID7-27
Source_Alt_Colorimetry	TEST ID7-27
Source_xvYCC	TEST ID7-35
Source_AR_Converter	TEST ID7-27
Source_Deep_Color	TEST ID7-29
Source_Video_Format	TEST ID7-23, TEST ID7-24, TEST ID7-25, TEST ID7-26, TEST ID7-27, TEST ID7-38
Source_Additional_Format	TEST ID7-27
Source_Non_CEA_Formats	TEST ID7-27
Source_3D	TEST ID7-38

Source_Mandatory_3D_Video_Formats	TEST ID7-38
Source_Other_Primary_3D_Video_Formats	TEST ID7-38
Source_Q_FullRange	TEST ID7-23
Source_YQ_FullRange	TEST ID7-24
Source_CN_Photo	TEST ID7-27
Source_CN_Cinema	TEST ID7-27
Source_CN_Game	TEST ID7-27
Source_sYCC601	TEST ID7-40
Source_AdobeYCC601	TEST ID7-40
Source_AdobeRGB	TEST ID7-40
Source_Basic_Audio	TEST ID7-28, TEST ID7-29, TEST ID7-31
Source_HBRA	TEST ID7-28
Source_One_Bit_Audio	TEST ID7-37

6.1.3 HDMI Sink Test

When “ALL TEST” is selected, the tests for the Test IDs are started. If the Test ID number is clicked using the mouse, only the selected test is started. Given below are the test table and test result table.



Test table

TEST ID	Name of test	Description
8-1	EDID Readable	The EDID of the sink device connected to the VA-1831 is loaded, and its structure is checked. If the sink device is not connected, “----” is displayed.
8-2	EDID VESA Structure	The EDID of the sink device connected to the VA-1831 is loaded, and whether it has the structure defined by VESA is checked. If the sink device is not connected, “----” is displayed.
8-3	CEA Timing Extension Structure	The EDID of the sink device connected to the VA-1831 is loaded, and whether it has the structure defined by CEA is checked. If the sink device is not connected, “----” is displayed.

Test result table

TEST ID	Display	Description
ALL	PASS	No problems encountered.
	Running Test	Now testing.
8-1	EXTENSION_COUNT == 0x00	The extension flag is 0x00.
	Any read NACKs inappropriately	NACK is inappropriate.
	EDID image read error	Read error.
	EDID image do not match	EDID does not match when the power is turned off or on.
8-2	Incorrect Block 0 header	The header of block 0 is incorrect.
	Incorrect EDID version	The EDID version is incorrect.
	Incorrect Video Information Byte	The Video Information Byte is incorrect.
	Incorrect Preferred Timing bit	The Preferred Timing bit is incorrect.

	Missing Preferred Timing descriptor	There is no Preferred Timing descriptor.
	Missing Monitor Range Limits	There is no Monitor Range Limits.
	Missing Monitor Name	There is no Monitor Name.
	Monitor name termination byte != 0x0A	The monitor name termination byte is not 0x0A.
	Monitor name length is less than 13 byte and padding byte != 0x20	The monitor name length is less than 13 bytes, and the padding byte is not 0x20.
	DTD follows Monitor Descriptor	DTD follows Monitor Descriptor
	Missing CEA Extension in block 1	When the extension flag is 0x01, byte 0 of block 1 is not 0x02.
	Missing Block Map in block 1	When the extension flag is greater than 0x02, byte 0 of block 1 is not 0xF0.
	Missing CEA Extension in block 2	When the extension flag is greater than 0x02, byte 0 of block 2 is not 0x02.
	Block Map/Extension miss match	Block Map and Extension do not match.
	Block Map byte incorrect	The Block Map byte is incorrect.
	Incorrect checksum	The Checksum is incorrect.
8-3	Incorrect CEA Extension version	The CEA Extension version is incorrect.
	Basic Audio claimed in CDF but not indicated in EDID	The values of bits 3 and 6 of the CEA Timing Extension byte are 0, and Sink_Basic_Audio of CDF is Yes.
	No Basic Audio claimed in CDF but is indicated in EDID	The values of bits 3 and 6 of the CEA Timing Extension byte are 1, and Sink_Basic_Audio of CDF is No.
	Illegal data Block Type	Data Block Tag Code is set to 0 to 6.
	No Basic Audio but Audio Data Block found	When Tag Code is 1, the values of bits 3 and 6 of CEA Timing Extension byte are 0.
	Illegal Audio Block length	When Tag Code is 1, Data Block Length is not a multiple of 3.
	Short Audio Descry. Raved bits set	When Tag Code is 1, Raved bit of Short Audio Descr. has been set.
	PCM descriptor missing Basic Audio frequencies	When Tag Code is 1 and Audio Format Code is 0001 (PCM), the Basic Audio frequencies are missing.
	No Speaker Allocation Data Block is present	When Tag Code is 1 and Audio Format Code is 0001 (PCM), the Speaker Allocation Data Block are missing.
	Illegal Speaker Alloc Block length	When Tag Code is 4, the Speaker Alloc Block length is incorrect.
	Speaker Alloc..rsvd bits set	When Tag Code is 4, Rsvd bit of Speaker Alloc. Descr. has been set.
	Speaker Alloc. rsvd bytes set	When Tag Code is 4, Rsvd byte of Speaker Alloc. has been set.
	More than one Speaker Alloc Block	When Tag Code is 4, one or more Speaker Alloc Blocks exist.
	Video Capability Data Block indicates no CE format supported	When Tag Code is 7 and Extended Tag Code is 0, Video Capability Data Block does not support the CE format.
	Video Capability Data Block indicates no VGA or other IT format supported	When Tag Code is 7 and Extended Tag Code is 0, Video Capability Data Block does not support VGA or any other IT format.
	Metadata P0 required if xvYCC supported	When Tag Code is 7 and Extended Tag Code is 5, Metadata P0 is not required if xvYCC is supported.

Illegal gamut metadata indication	When Tag Code is 7 and Extended Tag Code is 5, the gamut metadata is incorrect.
Illegal extended colorimetry indicated	When Tag Code is 7 and Extended Tag Code is 5, the extended colorimetry is incorrect.
d points into Data Block	When Tag Code is 7, the next Data Block is larger than d points.
Missing HDMI VSDB	There is no HDMI VSDB.
HDMI VSDB too short	HDMI VSDB Length is less than 5.
output count = 0 and CEC root device = N	HDMI_output_count of CDF is 0, and CEC_root_device is set to No.
Bad Physical Address	Physical Address is not correct.
Incorrect Supports_AI field	When Sink_Supports_AI of CDF is Yes, HDMI VSDB byte0 is less than 0x65 or Supports_AI is set to 0. When Sink_Supports_AI of CDF is No, HDMI VSDB byte0 is more than 0x65 and Supports_AI is set to 1.
Incorrect additional video format capabilities	When Sink_3D or Sink_4K2K of CDF is Yes, HDMI VSDB byte0 is less than 0x69 or HDMI_Video_present is set to 0.
VSDB rsvd bits set (byte 6)	When VSDB_Length is more than 6, the Rsvd bit is set.
DC_Y444 set but no Deep Color depth indicated	When VSDB_Length is more than 6, DC_Y444 is set, and Deep Color depth is not defined.
30 or 48 bits supported without default 36 bits supported	When VSDB_Length is more than 6, 30 or48 bits are supported, and 36 bits are not supported.
Max_TMDS_Clock field not present despite Deep Color support indicated	When VSDB_Length is 6, Max_TMDS_Clock field does not define Deep Color.
Max_TMDS_Clock field not present despite DVI_Dual support indicated	When VSDB_Length is 6, Max_TMDS_Clock field does not define DVI_Dual.
Max_TMDS_Clock field zero despite Deep Color support indicated	When VSDB_Length is more than 7 and byte7 is 0, Deep Color is defined.
Max_TMDS_Clock field zero despite DVI_Dual support indicated	When VSDB_Length is more than 7 and byte7 is 0, DVI_Dual is defined.
VSDB rsvd bits set (byte 8)	When VSDB_Length is more than 8, the Rsvd bit is set.
HDMI_Video_Present is set but VSDB is too short	When VSDB_Length is more than 8 and bit7-5 of byte8 is 0, 0, 1, VSDB_Length is less than 10.
3D/4Kx2K video formats support indicated despite 3D/4Kx2K video formats not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, Sink_3D and Sink_4K2K of CDF are set to No. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 1, 1, Sink_3D and Sink_4K2K of CDF are set to No. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 0, 1, Sink_3D and Sink_4K2K of CDF are set to No. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_3D and Sink_4K2K of CDF are set to No.

3D video formats support not indicated despite 3D video formats applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 are 0, 0, 1, Sink_3D of CDF is Yes, and bit7 of byte 9 is 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_3D of CDF is Yes, and bit7 of byte 11 is 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_3D of CDF is Yes, and bit7 of byte 13 is 0.
3D video formats support indicated despite 3D video formats not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, Sink_3D of CDF is set to No and a setting other than 0 is established for bit 7 of byte9. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_3D of CDF is set to No and a setting other than 0 is established for bit 7 of byte11. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, Sink_3D of CDF is set to No and a setting other than 0 is established for bit 7 of byte13.
additional 3D capability indicated despite additional 3D video formats support not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 are 0, 0, 1, Sink_3D _Additional of CDF is set to No and bit6-5 of byte9 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_3D _Additional of CDF is set to No and bit6-5 of byte11 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_3D _Additional of CDF is set to No and bit6-5 of byte13 are not 0.
image size correctness indicated despite not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, Sink_Image_Size of CDF is set to No and bit4 of byte9 is set to 1. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_Image_Size of CDF is set to No and bit4 of byte11 is set to 1. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, Sink_Image_Size of CDF is set to No and bit4 of byte13 is set to 1.
image size correctness not indicated despite applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 are 0, 0, 1, Sink_Image_Size of CDF is set to Yes and bit4 of byte9 is set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_Image_Size of CDF is set to Yes and bit4 of byte11 is set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_Image_Size of CDF is set to Yes and bit4 of byte13 is set to 0.

the size of 3D image are not correctly described	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, 3D image size is not accurate. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 0, 1, 3D image size is not accurate. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, 3D image size is not accurate.
additional 3D video formats support not indicated despite additional 3D video format applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, Sink_3D_Additional of CDF are set to Yes and bit4-0 of byte10 are set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 0, 1, Sink_3D_Additional of CDF are set to Yes and bit4-0 of byte12 are set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, Sink_3D_Additional of CDF are set to Yes and bit4-0 of byte14 are set to 0.
additional 3D video formats support indicated despite additional 3D video format not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 are 0, 0, 1, Sink_3D_Additional of CDF is set to No and bit4-0 of byte10 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_3D_Additional of CDF is set to No and bit4-0 of byte12 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_3D_Additional of CDF is set to No and bit4-0 of byte14 are not 0.
4Kx2K video formats support not indicated despite 4Kx2K video formats support applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, Sink_4K2K of CDF is set to Yes and bit7-5 of byte10 are set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 0, 1, Sink_4K2K of CDF is set to Yes and bit7-5 of byte12 are set to 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, Sink_4K2K of CDF is set to Yes and bit7-5 of byte14 are set to 0.
Not Valid HDMI_VIC	• When VSDB_Length is more than 8, and bit7-5 of byte8 is 0, 0, 1, HDMI_VIC is not valid. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 0, 1, HDMI_VIC is not valid. • When VSDB_Length is more than 8, and bit7-5 of byte8 is 1, 1, 1, HDMI_VIC is not valid.
4Kx2K video formats support indicated despite 4Kx2K video formats support not applied	• When VSDB_Length is more than 8, and bit7-5 of byte8 are 0, 0, 1, Sink_4K2K of CDF is set to No and bit7-5 of byte10 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 1, Sink_4K2K of CDF is set to No and bit7-5 of byte13 are not 0. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 1, Sink_4K2K of CDF is set to No and bit7-5 of byte14 are not 0.
I_Latency_Fields_Present cannot be set unless Latency_Fields_Present is set	• When VSDB_Length is more than 8, and bit7-6 of byte8 are set to 0, 1.

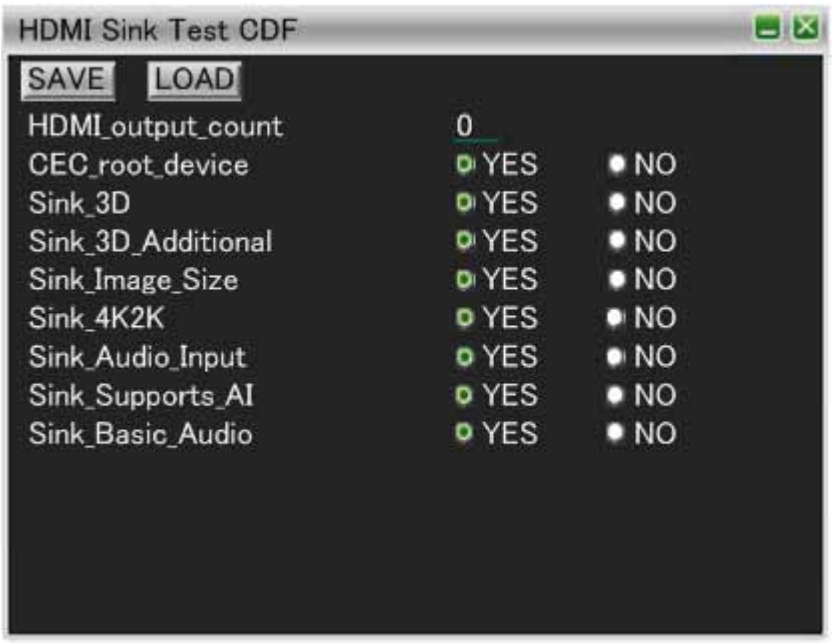
	3D/4Kx2K video formats support not indicated despite 3D/4Kx2K video formats support applied	• When VSDB_Length is more than 8, and bit5 of byte8 is 0, 0, 0, Sink_3D of CDF is set to Yes or Sink_4K2K is set to Yes. • When VSDB_Length is more than 8, and bit5 of byte8 is 0, 1, 0, Sink_3D of CDF is set to Yes or Sink_4K2K is set to Yes. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 0, 0, Sink_3D of CDF is set to Yes or Sink_4K2K is set to Yes. • When VSDB_Length is more than 8, and bit7-5 of byte8 are 1, 1, 0, Sink_3D of CDF is set to Yes or Sink_4K2K is set to Yes.
	Latency_Field_Present is set but VSDB is too short	• When VSDB_Length is more than 8, and bit7-5 of byte8 is set to 1, 0, 0, HDMI VSDB Length is less than 10.
	Latency_Field_Present are HDMI_Video_present is set but VSDB is too short	• When VSDB_Length is more than 8, and bit7-5 of byte8 is set to 1, 0, 1, HDMI VSDB Length is less than 12.
	Latency_Field_Present and I_Latency_Fields_Present is set but VSDB is too short	• When VSDB_Length is more than 8, and bit7-5 of byte8 is set to 1, 1, 0, HDMI VSDB Length is less than 12. • When VSDB_Length is more than 8, and bit7-5 of byte8 is set to 1, 1, 1, HDMI VSDB Length is less than 14.
	Non-zero Reserved Extension Fields	• When VSDB_Length is more than 9, Reserved Extension Fields is not 0.
	Extra HDMI VSDB	The 2nd Data Block values are 0b011xxxxx, 0x03, 0x0c or 0x00.
	Unmatched byte 3 in CEA Extension	Byte 3 of CEA Extension does not match.
	Native DTD count larger than number of DTDs	The Native DTD count is larger than the number of DTDs.

6.1.4 HDMI Sink Test CDF

The items to be tested can be selected by setting ahead of time the specifications of the device under test (DUT) on the CDF (Capabilities Declaration Form) for executing HDMI CTS.

By clicking SAVE, CDF data is saved.

By clicking LOAD, CDF data is read.

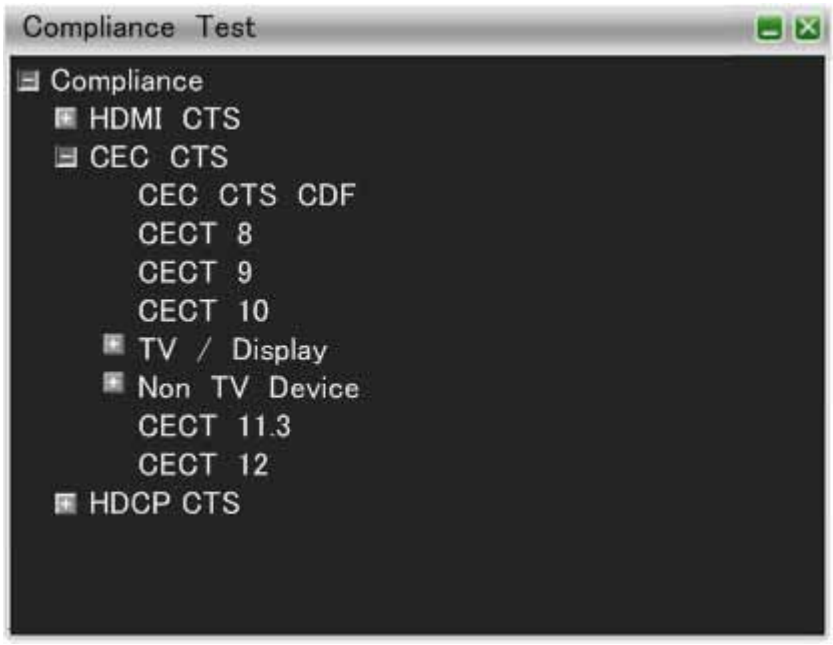


List of HDMI Sink CDF items

Display	Targeted tests
HDMI_output_count	Test ID8-3
CEC_root_device	Test ID8-3
Sink_3D	Test ID8-3
Sink_3D_Additional	Test ID8-3
Sink_Image_Size	Test ID8-3
Sink_Image_4K2K	Test ID8-3
Sink_Audio_Input	Test ID8-3
Sink_Supports_AI	Test ID8-3
Sink_Basic_Audio	Test ID8-3

6.2 **CEC CTS**

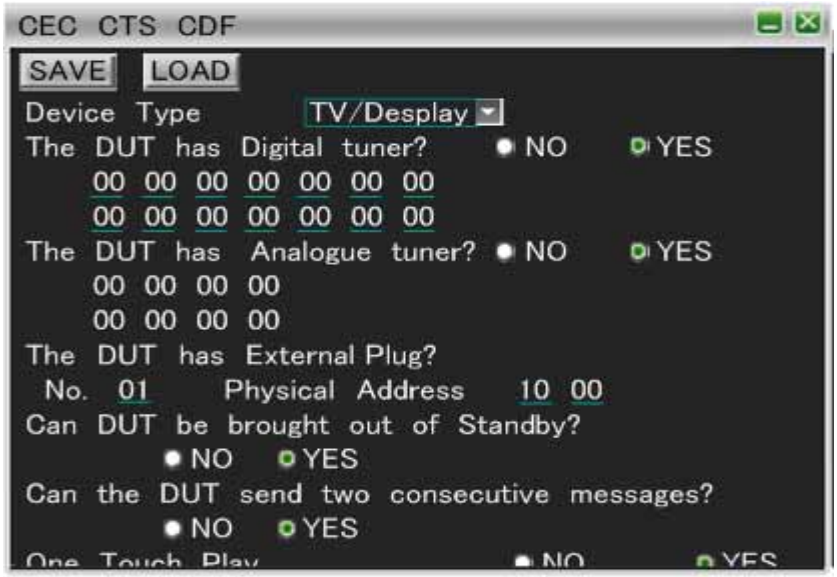
Display concerning CEC CTS.



6.2.1 HDMI Sink Test CDF CEC CTS CDF

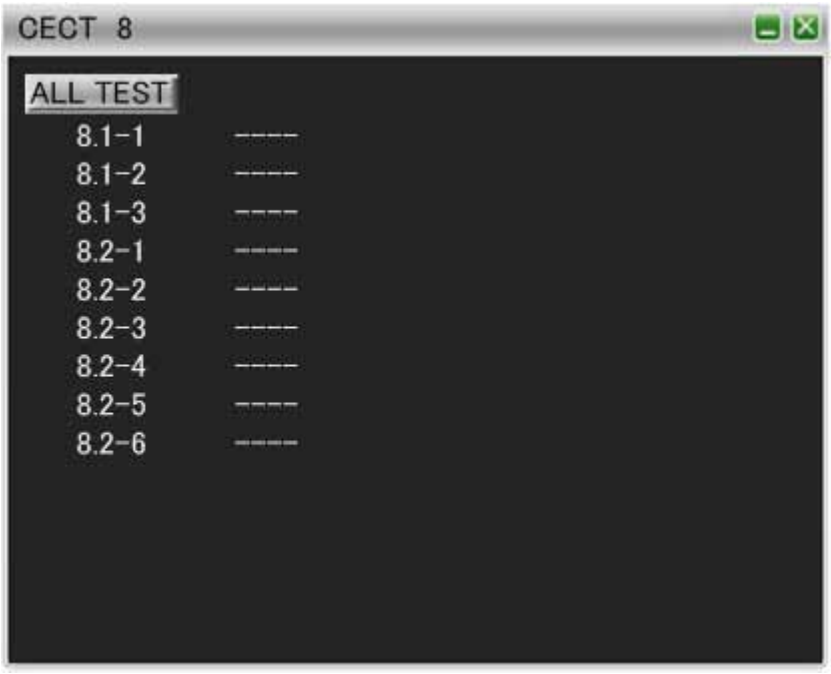
If you set CDF (Capabilities Declaration Form) to meet the specification of DUT (Device Under Test), it helps to select the test item to be performed.
By clicking SAVE, CDF data is saved.

By clicking LOAD, CDF data is read.



6.2.2 CECT 8

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

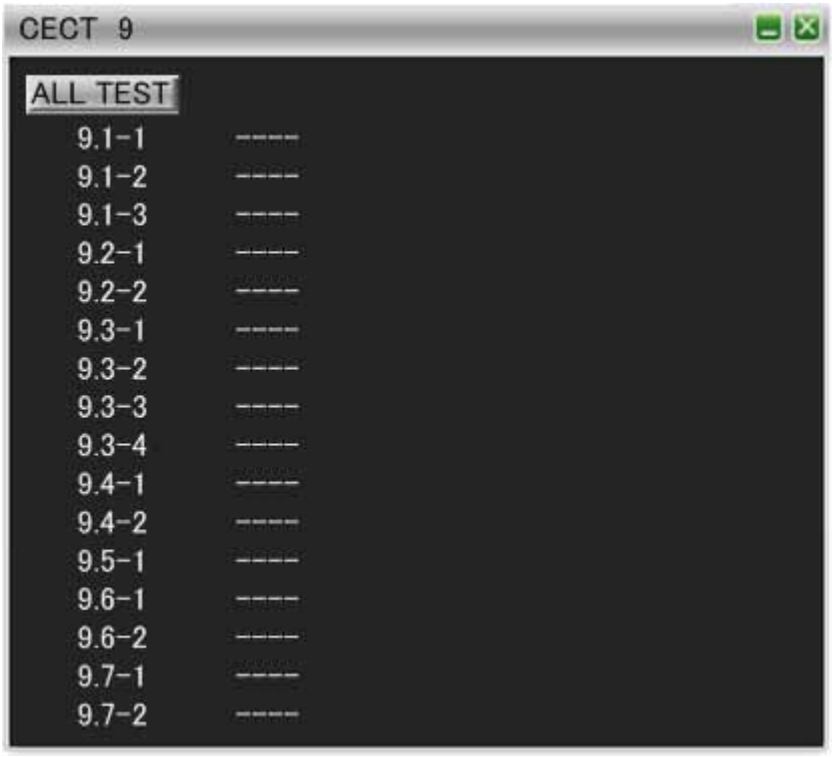


Item	Required Test Method	PASS criteria
Signaling and Bit Timings		
If DUT is a TV set, connect the HDMI output of DUT to the output of TE. If DUT is any other device, connect the HDMI output of DUT to the input of TE. Then conduct the following tests.		
8.1-1	[Except CEC Switch] Send <Abort> message to the DUT. The DUT respond with <Feature Abort> massage. [CEC Switch] The DUT broadcast a Routing Information[1.0.0.0]. Measure the timing of a ‘Start’ bit.	The start bit low time period is from 3.5ms to 3.9ms. The start bit total time period is from 4.3ms to 4.7ms.
8.1-2	[Except CEC Switch] Send <Abort> message to the DUT. The DUT respond with <Feature Abort> massage. [CEC Switch] The DUT broadcast a Routing Information[1.0.0.0]. Measure the timing of a logical 1 data bit.	The logical 1 data bit low time period is from 04ms to 0.8ms. The logical 1 data bits total time period is from 2.05ms to 2.75ms.

	8.1-3	[Except CEC Switch] Send <Abort> message to the DUT. The DUT respond with <Feature Abort> massage. [CEC Switch] The DUT broadcast a Routing Information[1.0.0.0]. Measure the timing of a logical 0 data bit.	The logical 0 data bit low time period is from 1.3ms to 1.7ms. The logical 0 data bits total time period is from 2.05ms to 2.75ms.
	8.2-1	Set the low interval time of the start bit to 3.5ms, 3.7ms, 3.9ms, and set the total start bit time to 4.5ms. Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the low interval time range 3.5≤low period ≤3.9.
	8.2-2	Set the low interval time of the start bit to 3.7ms, and set the high interval time of the start bit to 0.6, 1.0ms (total 4.7ms). Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the total bit time range 4.3≤total time≤4.7.
	8.2-3	Set the low interval time of the logical 1 bit to 0.4, 0.6, 0.8ms, and set the total logical 1 bit time to 2.4ms. Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the low interval time range 0.4≤low period≤0.8.
	8.2-4	Set the low interval time of the logical 1 bit to 0.6ms, and set the high interval time of the logical 1 bit to 1.45, 2.15ms(total2.75ms)ms. Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the total bit time range 2.05≤total time≤2.75.
	8.2-5	Set the low interval time of the logical 0 bit to 1.3, 1.5, 1.7ms, and set the total logical 0 bit time to 2.4ms. Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the low interval time range 1.3≤low period≤1.7.
	8.2-6	Set the low interval time of the logical 0 bit to 1.5ms, and set the high interval time of the logical 0 bit to 0.55, 1.25ms (total 2.75ms). Send the DUT the <Abort> message.	The DUT must acknowledge and send <Feature Abort>. All messages within the total bit time range 2.05≤total time≤2.75.

6.2.3 CECT 9

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

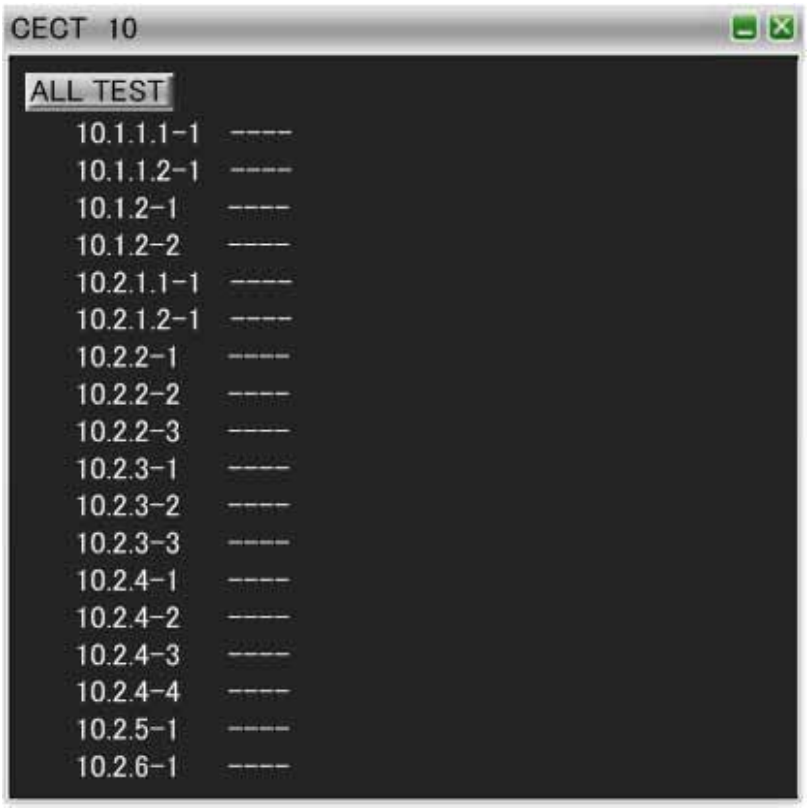


Item		Required Test Method	PASS criteria
Frame Communication			
	If DUT is a TV set, connect the HDMI output of DUT to the output of TE. If DUT is any other device, connect the HDMI output of DUT to the input of TE. Then conduct the following tests.		
	9.1-1	Send the DUT <Abort> message.	DUT sends ACK.
	9.1-2	Send the <Abort> message to a device other than DUT.	DUT does not send ACK.
	9.1-3	Broadcast <Abort> message.	DUT sends ACK.
	9.2-1	Send the DUT <Abort> message.	DUT sends <Feature Abort>.
	9.2-2	[Except CEC Switch] Send the DUT <Give Physical Address>. [CEC Switch] Broadcast the DUT <Routing Information>.	[Except CEC Switch] DUT broadcasts <Report Physical Address> [CEC Switch] DUT broadcasts <Routing Information>.
	9.3-1	Send the DUT <Abort> message. Do not acknowledge the header to the <Feature Abort>.	DUT sends <Feature Abort> with an interval of at least 3 nominal data bits between them.
	9.3-2	Send the DUT <Abort> message. Do not acknowledge a data block of <Feature Abort>.	DUT sends <Feature Abort> with an interval of at least 3 nominal data bits between them.

	9.3-3	[Except CEC Switch] Send the DUT <Give Physical Address >. [CEC Switch] Broadcast the DUT <Routing Information>[1.0.0.0]. Do not acknowledge the header block within the message that the DUT broadcasts. Do not acknowledge the header block within all retransmission attempts.	[Except CEC Switch] The DUT broadcasts <Report Physical Address> and tries to resend. [CEC Switch] The DUT broadcasts <Routing Information> and tries to resend.
	9.3-4	[Except CEC Switch] Send the DUT <Abort > message. [CEC Switch] Broadcast the DUT <Routing Information>[1.0.0.0]. While the DUT is transmitting high impedance, modify the bus to low impedance.	[Except CEC Switch] The DUT broadcasts <Feature Abort> and tries to resend. [CEC Switch] The DUT broadcasts <Routing Information> and tries to resend.
	9.4-1	Send the DUT<Active Source> without parameter.	The DUT ignores the message.
	9.4-2	[Except CEC Switch] Send the DUT an <Abort> message with an additional Data Block. [CEC Switch] Send the DUT <Routing Information> with an additional Data Block.	The DUT ignores data in the additional data block and answers the message normally.
	9.5-1	Send the <Abort> message with a corrupting information bit 3. Send the <Abort> message with a corrupting information bit 0. Send the <Abort> message with a corrupting information bit 5. Send the <Abort> message with a corrupting information bit 6. Send the <Abort> message with a corrupting information bit 7.	The DUT does not send <FeatureAbort>.
	9.6-1	Send the DUT <Abort > message. Forcibly set to low the CEC line in the 0.8 ms period 3.5 ms after starting the transmission in response to the returned Feature Abort.	The DUT sends <FeatureAbort>. When DUT detects low, arbitration must be lost and the transmission of the current message must stop. The DUT waits for a period of at least 5 nominal data bits and resends the message.
	9.6-2	Send the DUT <Abort > message. While the DUT transmitting a “1” in the source address bits, transmit a “0” in the bus.	The DUT sends <FeatureAbort>. The DUT detects the bus is low, stops transmitting its current message. The DUT waits for a period of at least 5 nominal data bits and resends the message.
	9.7-1	Send the DUT <Abort > message.	The DUT sends <FeatureAbort>. Before the DUT sends the message, wait for a period at least 5 nominal data bits.
	9.7-2	Execute One Touch Play (Remote Control Pass Through) by the DUT.	After sending the first message, DUT waits 7 nominal data bit period before sending the next message.

6.2.4 CECT10

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



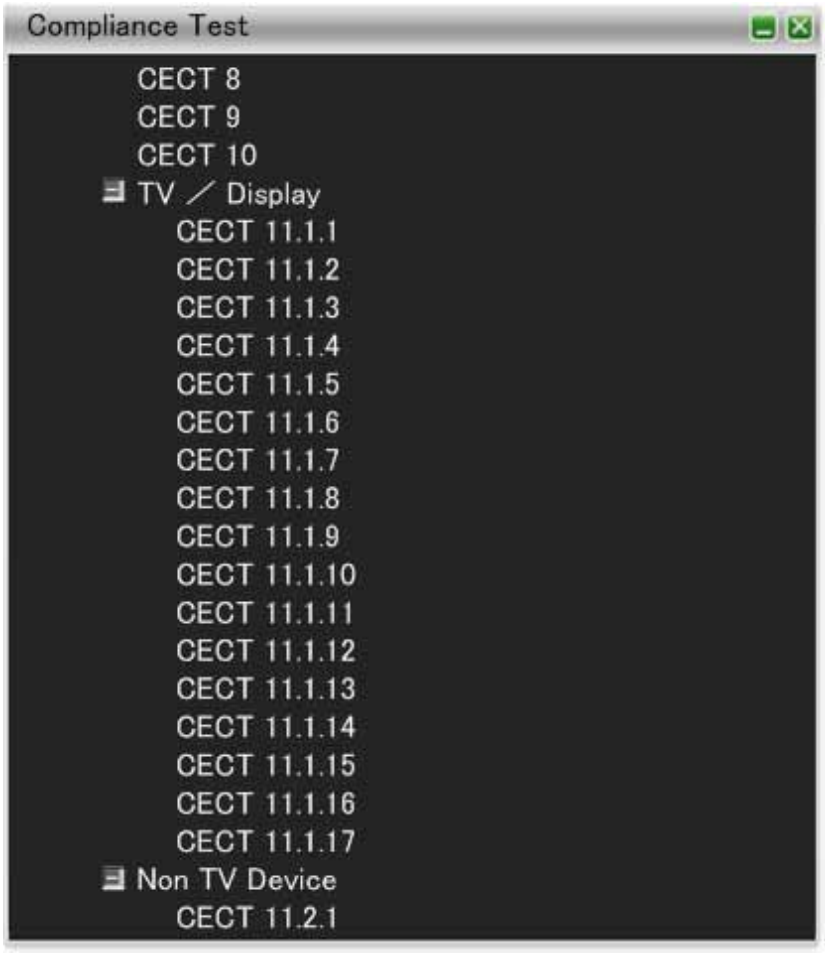
Item		Required Test Method	PASS criteria
Device Installation and Addressing			
	If DUT is a TV set, connect the HDMI output of DUT to the output of TE. If DUT is any other device, connect the HDMI output of DUT to the input of TE. Then conduct the following tests.		
	10.1.1.1-1	Send a <Give Physical Address> message to the DUT at Logical Address 0.	The DUT broadcasts <Report Physical Address>[0.0.0.0][0].
	10.1.1.2-1	Allocate a Physical Address of [2.0.0.0] to the DUT. Allocate a Physical Address of [1.0.0.0] to the DUT.	The DUT broadcasts <Report Physical Address> [1.0.0.0].
	10.1.2-1	Allocate a Physical Address of [2.0.0.0] to the DUT. Allocate a Physical Address of [1.0.0.0] to the DUT.	The DUT broadcasts <Report Physical Address> [1.0.0.0].
	10.1.2-2	Allocate a Physical Address of [2.0.0.0] to the DUT. Allocate a Physical Address of [2.3.4.5] to the DUT.	The DUT broadcasts <Report Physical Address> [2.3.4.5].
	10.2.1.1-1	Send a <PollingMessage> to Logical Address 0.	The DUT ACKs.
	10.2.1.2-1	Connect HDMI Output of the DUT with the input of VA-1831. Allocate a Physical Address of [2.0.0.0] to the DUT. Allocate a Physical Address of [1.0.0.0] to the DUT.	The broad casts a <Report Physical Address>[1.0.0.0][0x0E] from the Logical Address 14.
	10.2.2-1	Checks the device that is connected to the VA-1831. HPD is asserted.	The DUT sends a <Polling Message> to a Recording Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Recording Device” as the [Device Type] by the Logical Address of the “Recording Device”.

	10.2.2-2	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Recording Device Logical Address. The DUT sends a second <Polling Message> to the next Recording Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Recording Device” as the [Device Type] by the Logical Address of the second “Recording Device”.
	10.2.2-3	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the first <Polling Message> sent by the DUT. Acknowledge the second <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Recording Device Logical Address. The DUT sends a <Polling Message> to the second Recording Device Logical Address. The DUT sends a <Polling Message> to the third Recording Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Recording Device” as the [Device Type] by the Logical Address of the third “Recording Device”.
	10.2.3-1	Checks the device that is connected to the VA-1831. HPD is asserted.	The DUT sends a <Polling Message> to a Playback Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Playback Device” as the [Device Type] by the Logical Address of the “Playback Device”.
	10.2.3-2	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Playback Device Logical Address. The DUT sends a second <Polling Message> to the next Playback Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Playback Device” as the [Device Type] by the Logical Address of the second “Playback Device”.
	10.2.3-3	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the first <Polling Message> sent by the DUT. Acknowledge the second <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Playback Device Logical Address. The DUT sends a <Polling Message> to the second Playback Device Logical Address. The DUT sends a <Polling Message> to the third Playback Device Logical Address. The DUT broadcasts a <Report Physical Address> with “Playback Device” as the [Device Type] by the Logical Address of the third “Playback Device”.

	10.2.4-1	Checks the device that is connected to the VA-1831. HPD is asserted.	The DUT sends a <Polling Message> to a Tuner Logical Address. The DUT broadcasts a <Report Physical Address> with “Tuner” as the [Device Type] by the Logical Address of the “Tuner”.
	10.2.4-2	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Tuner Logical Address. The DUT sends a second <Polling Message> to the next Tuner Logical Address. The DUT broadcasts a <Report Physical Address> with “Tuner” as the [Device Type] by the Logical Address of the second “Tuner”.
	10.2.4-3	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the first <Polling Message> sent by the DUT. Acknowledge the second <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Tuner Logical Address. The DUT sends a <Polling Message> to the second Tuner Logical Address. The DUT sends a <Polling Message> to the third Tuner Logical Address. The DUT broadcasts a <Report Physical Address> with “Tuner” as the [Device Type] by the Logical Address of the third “Tuner”.
	10.2.4-4	Checks the device that is connected to the VA-1831. HPD is asserted. Acknowledge the first <Polling Message> sent by the DUT. Acknowledge the second <Polling Message> sent by the DUT. Acknowledge the third <Polling Message> sent by the DUT.	The DUT sends a <Polling Message> to a Tuner Logical Address. The DUT sends a <Polling Message> to the second Tuner Logical Address. The DUT sends a <Polling Message> to the third Tuner Logical Address. The DUT sends a <Polling Message> to the forth Tuner Logical Address. The DUT broadcasts a <Report Physical Address> with “Tuner” as the [Device Type] by the Logical Address of the forth “Tuner”.
	10.2.5-1	Checks the device that is connected to the VA-1831. HPD is asserted.	The DUT sends a <Polling Message> to an Audio System Logical Address 5. The DUT broadcasts a <Report Physical Address> with “Audio System” as the [Device Type] by the Logical Address 5 of the “Audio System”.
	10.2.6-1	Checks the device that is connected to the VA-1831. HPD is asserted.	The DUT sends a <Polling Message> to a Video Processor Logical Address 14. The DUT broadcasts a <Report Physical Address> with “Video Processor” as the [Device Type] by the Logical Address 5 of the “Video Processor”.

6.2.5 CECT11.1 TV / Display

The test item shown below can be selected.

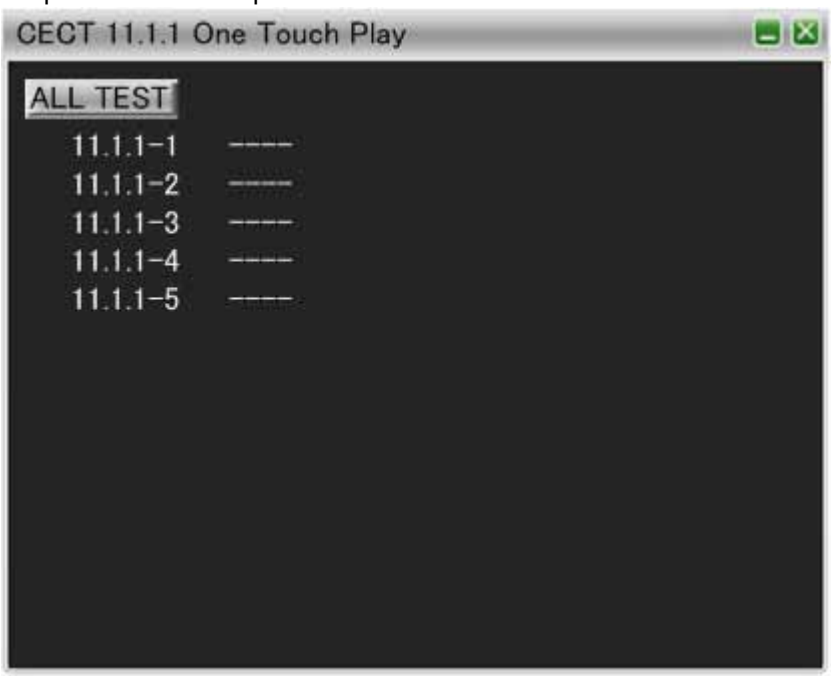


Test ID	Function
11.1.1	One Touch Play
11.1.2	Routing Control
11.1.3	System Standby
11.1.4	One Touch Record
11.1.5	Timer Programming
11.1.6	System Information
11.1.7	Deck Control
11.1.8	Tuner Control
11.1.9	Vendor Specific Commands
11.1.10	OSD Display
11.1.11	Device ODS Name Transfer
11.1.12	Device Menu Control
11.1.13	Remote Control Pass Through

11.1.14	Give Device Power Status
11.1.15	System Audio Control
11.1.16	Audio Rate Control
11.1.17	Audio Return Channel Control

6.2.7 CECT 11.1.1 One Touch Play

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item	Required Test Method	PASS criteria
One Touch Play		
Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
11.1.1-1	Ensure the DUT is displaying an internal tuner or some other external source. Send the DUT an<Image View On>. After more than 200msec, broadcast an <Active Source>. (These procedures are repeated by changing Logical Address to 1, 3 and 4.)	The DUT displays the new source.
11.1.1-2	Ensure the DUT is displaying an internal tuner or some other external source. Send the DUT an<Text View On>. After more than 200msec, broadcast an <Active Source>. (These procedures are repeated by changing Logical Address to 1, 3 and 4.)	The DUT displays the new source.
11.1.1-3	Ensure the DUT is in standby. Send the DUT an <Image View On>.	The DUT powers up.
11.1.1-4	Ensure the DUT is in standby. Send the DUT an <Text View On>.	The DUT powers up.
11.1.1-5	Broadcast an <Active Source>[1.0.0.0] to display external source. Set the DUT to display an internal source (e.g.an internal tuner).	DUT broadcasts an <Active Source>. (Physical Address 0.0.0.0)

6.2.7 CECT 11.1.2 Routing Control

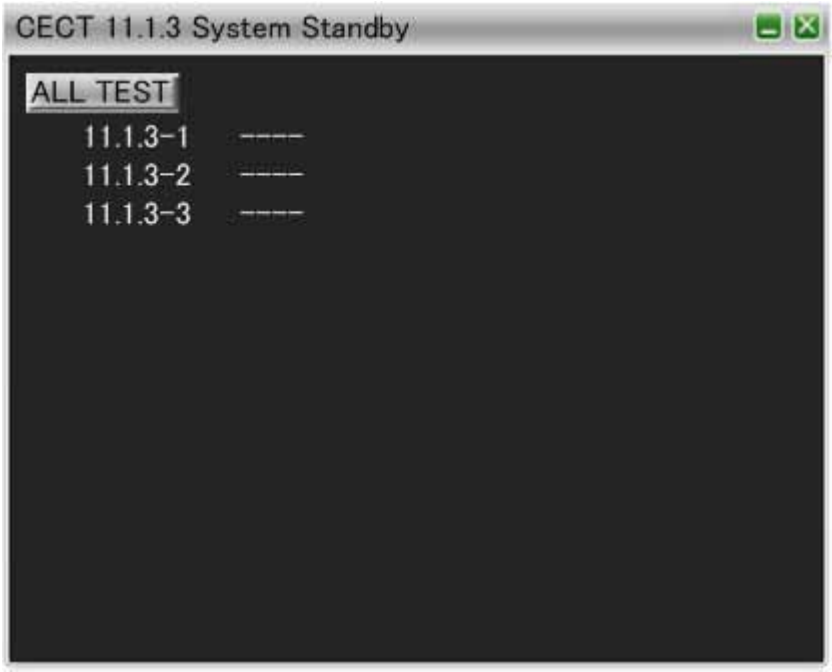
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item	Required Test Method	PASS criteria
Routing Control		
Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
11.1.2-1	Broadcast a <Report Physical Address>[1.1.0.0] from Logical Address 3. Broadcast a <Report Physical Address>[1.2.0.0] from Logical Address 4. If possible, use the DUT menu to select one of the above registered devices.	The DUT sends a <Set Stream Path> to the appropriate Logical Address.
11.1.2-2	Ensure the DUT is displaying an internal source. Broadcast an <Active Source>, indicating that another device is the active source. Broadcast a <Request Active Source>.	The DUT does not respond to the <Request Active Source>.
11.1.2-3	Ensure the DUT is displaying an internal source. Broadcast a <Request Active Source>.	The DUT responds to the <Request Active Source> by broadcasting <Active Source>.
11.1.2-4	Broadcast an <Active Source>[1.0.0.0]. Send the DUT <Inactive Source>[1.0.0.0].	The DUT does not send a <Feature Abort>.

	11.1.2-5	Ensure the DUT is currently switched to HDMI Input Port 1. Switch the DUT manually to HDMI Input Port 2.	The DUT broadcasts は<Routing Change> [1.0.0.0][2.0.0.0].

6.2.8 CECT 11.1.3 System Standby

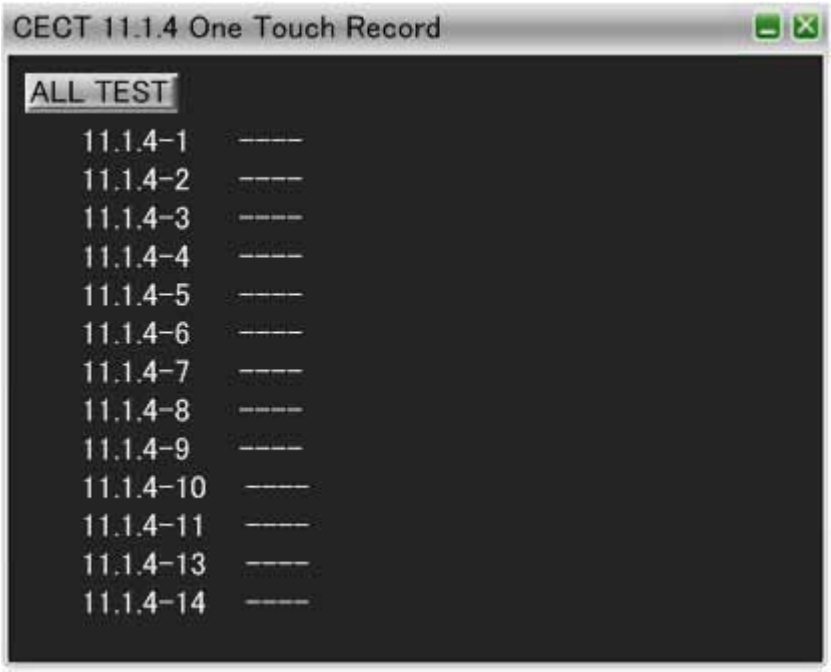
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Standby			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.3-1	Invoke the System Standby feature on the DUT.	The DUT broad casts a <Standby>, and switching into standby itself.
	11.1.3-2	Ensure that the DUT is in a state where going into standby is permitted. Broadcast a <Standby>. This procedure is repeated by changing the Logical Address to 1,3,4,5,13,14 and 15.	The DUT switches to standby.
	11.1.3-3	Ensure that the DUT is in a state where going into standby is permitted. Send a <Standby> to the DUT. This procedure is repeated by changing the Logical Address to 1,3,4,5,13,14 and 15.	The DUT switches to standby.

6.2.9 CECT 11.1.4 One Touch Record

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



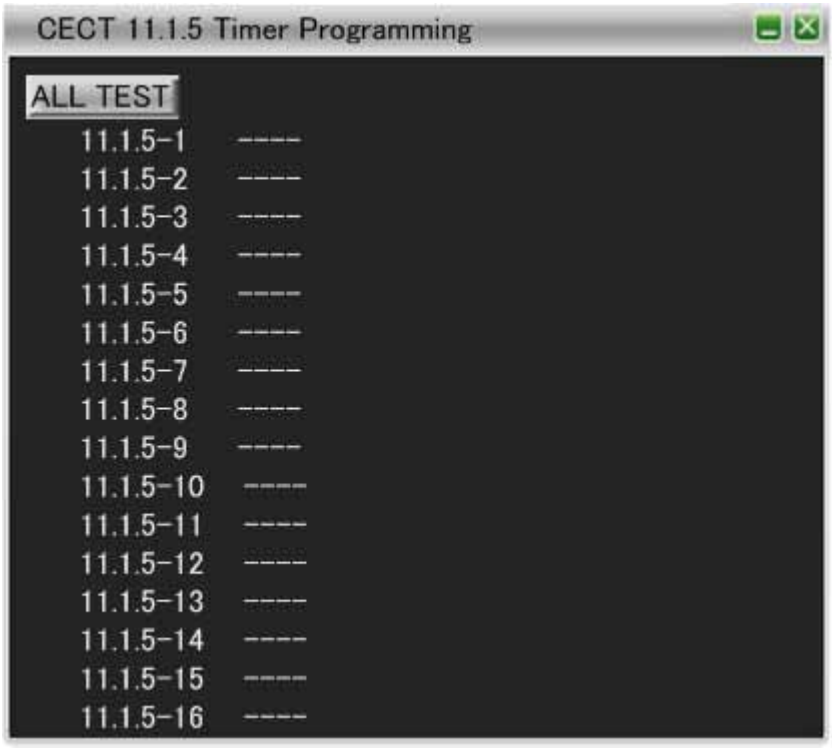
Item	Required Test Method	PASS criteria
One Touch Record		
Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
11.1.4-1	Broadcast a <Report Physical Address> from a Recording Device. Ensure that the DUT is displaying an internal digital tuner. Activate the DUT’s One Touch Record. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["Digital Service"] [Digital Service Identification] that has the parameter in the Digital Tuner 1 in the CDF.
11.1.4-2	Broadcast a <Report Physical Address> from a Recording Device. Ensure that the DUT is displaying an internal analog tuner. Activate the DUT’s One Touch Record. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>[″Analogue Service″][Analogue Broadcast Type][Analogue Frequency][Broadcast System] that has the parameter in the Analog Tuner 1 in the CDF.

	11.1.4-3	Broadcast a <Report Physical Address> from a Recording Device. Ensure that the DUT is displaying an External Plug. Activate the DUT's One Touch Record. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["External plug"][External Plug] that has the parameter in the External Plug in the CDF.
	11.1.4-4	Broadcast a <Report Physical Address> from a Recording Device. Ensure that the DUT is displaying an External Plug. Activate the DUT's One Touch Record. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["External Physical Address"][External Physical Address] that has the parameter in the External Plug in the CDF.
	11.1.4-5	Send a <Image View On> to the DUT. Broadcast an <Active Source>. Activate the DUT's One Touch Record. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>[″Own Source″].
	11.1.4-6	Set the VA-1831to the Logical Address 1. Select another external source. Activate the DUT's One Touch Record.	The DUT does not send a<Record On>.
	11.1.4-7	Send a <Image View On> to the DUT. Broadcast an <Active Source>. Activate the DUT's One Touch Record. Send a <Record Status>["Recording currently selected source"] to the DUT. Stop the recording via the DUT's UI / Remote Control.	The DUT sends a <Record Off> after selecting to stop the recording.
	11.1.4-8	Broadcast a <Report Physical Address> from a Logical Address of the Recording Device. Ensure that the DUT is displaying an internal digital tuner. Send the DUT <Record TV Screen>. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["Digital Service"][Digital Service Identification] that has the parameter in the Digital Tuner 1 in the CDF.
	11.1.4-9	Broadcast a <Report Physical Address> from a Logical Address of the Recording Device. Send the DUT <Image View On>. Broadcast an <Active Source>. Send <Record TV Screen> to the DUT. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["Own Source"].

	11.1.4-10	Broadcast a <Report Physical Address> from a Logical Address of the Recording Device. Ensure that the DUT is displaying an internal analog tuner. Send the DUT <Record TV Screen>. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["Analogue Service"][Analogue Broadcast Type][Analogue Frequency][Broadcast System] that has the parameter in the Analog Tuner 1 in the CDF.
	11.1.4-11	Send a < Image View On> from a Logical Address 4 to the DUT. Broadcast a < Active Source > from a Logical Address 4. Send the DUT <Record TV Screen>. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a <Record On>["External Plug"] or a <Record On>["External Physical Address"] with the appropriate parameters.
	11.1.4-13	Broadcast a <Report Physical Address> from a Logical Address of the Recording Device. Send the DUT < Image View On > from Logical Address 4. Broadcast a < Active Source > from a Logical Address 4. Send the DUT <Record TV Screen>. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	DUT sends the Recording Device a <Feature Abort>["Cannot Provide Source"].
	11.1.4-14	Set the VA-1831 at Logical Address 1. Ensure that the DUT is in a state ready to initiate the One Touch Record Feature. Activate the DUT’s One Touch Record Feature. Send the DUT <Record Status>. Stop the recording via the DUT’s UI / Remote Control.	DUT sends a <Record Off>.

6.2.10 CECT 11.1.5 Timer Programming

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Timer Programming			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.5-1	Set a digital timer recording via the EPG. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a correctly formatted <Set Digital Timer> with all parameters corresponding to the program that was selected.
	11.1.5-2	Set an analog timer recording via the EPG. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a correctly formatted <Set Analogue Timer> with all parameters corresponding to the program that was selected.

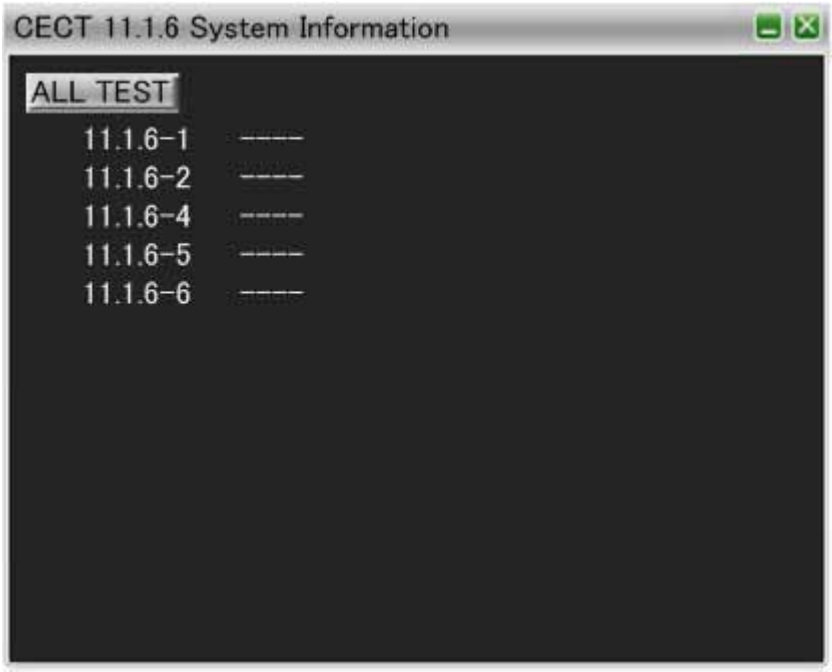
	11.1.5−3	Set a digital timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a correctly formatted <Set Digital Timer> with all parameters corresponding to the program that was selected.
	11.1.5−4	Set an analog timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a correctly formatted <Set Analogue Timer> with all parameters corresponding to the program that was selected.
	11.1.5-5	Set an external timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. (This procedure is repeated by changing Logical Address to 1, 2 and 9.)	The DUT sends a correctly formatted <Set External Timer> with all parameters corresponding to the program that was selected.
	11.1.5-6	Invoke the DUT to send a <Set Digital Timer>. Reply to the DUT with a <Timer Status> indicating that the device was not programmed.	The DUT does not add the record block to the local list.
	11.1.5-7	Invoke the DUT to send a <Set Analogue Timer>. Reply to the DUT with a <Timer Status> indicating that the device was not programmed.	The DUT does not add the record block to the local list.
	11.1.5-8	Invoke the DUT to send a <Set External Timer>. Reply to the DUT with a <Timer Status> indicating that the device was not programmed.	The DUT does not add the record block to the local list.
	11.1.5-9	Set a digital timer recording via the EPG. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the EPG. Send the DUT a <Timer Cleared Status> indicating that the timer has been successfully cleared.	The DUT sends a correctly formatted <Clear Digital Timer> with all parameters corresponding to the program that was cleared. The DUT removes the timer program from its display.

	11.1.5-10	Set an analog timer recording via the EPG. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the EPG. Send the DUT a <Timer Cleared Status> indicating that the timer has been successfully cleared.	The DUT sends a correctly formatted <Clear Analogue Timer> with all parameters corresponding to the program that was cleared. The DUT removes the timer program from its display.
	11.1.5-11	Set a digital timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer has been successfully cleared.	The DUT sends a correctly formatted <Clear Digital Timer> with all parameters corresponding to the program that was cleared. The DUT removes the timer program from its display.
	11.1.5-12	Set an analog timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer has been successfully cleared.	The DUT sends a correctly formatted <Clear Analog Timer> with all parameters corresponding to the program that was cleared. The DUT removes the timer program from its display.
	11.1.5−13	Set an external timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer has been successfully cleared.	The DUT sends a correctly formatted <Clear External Timer> with all parameters corresponding to the program that was cleared. The DUT removes the timer program from its display.
	11.1.5-14	Set a timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer could not be cleared from the device as there is not matching entry.	The DUT sends a correctly formatted <Clear Digital Timer> with all parameters corresponding to the timer that was not cleared. The DUT removes the timer program from its display.

	11.1.5-15	Set a timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer could not be cleared from the device as there is not matching entry.	The DUT sends a correctly formatted <Clear Analogue Timer> with all parameters corresponding to the timer that was not cleared. The DUT removes the timer program from its display.
	11.1.5-16	Set a timer recording via the menu. Send the DUT a <Timer Status> indicating that the recording has been programmed and that enough media is available. Clear the timer recording via the menu. Send the DUT a <Timer Cleared Status> indicating that the timer could not be cleared from the device as there is not matching entry.	The DUT sends a correctly formatted <Clear External Timer> with all parameters corresponding to the timer that was not cleared. The DUT removes the timer program from its display.

6.2.11 CECT 11.1.6 System Information

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Information			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.6-1	Send the DUT a <Polling Message>.	The DUT acknowledges it.
	11.1.6-2	Send the DUT a <Give Physical Address>. (This procedure is repeated by changing Logical Address to 1, 3, 4, 5, 13, 14 and 15.)	The DUT responds by broadcasting a <Report Physical Address> indicating that the correct Physical Address of the device.
	11.1.6-4	Set the DUT to another one of its supported menu languages.	The DUT broadcasts a <Set Menu Language> with the correct Bibliographic code.
	11.1.6-5	Send the DUT <Get Menu Language>. (This procedure is repeated by changing Logical Address to 1, 3, 4, 5, 13, 14 and 15.)	The DUT broadcasts a <Set Menu Language> with the correct Bibliographic code.
	11.1.6-6	Send the DUT <Get CEC Version>.	The DUT broadcasts a <CEC Version> with the correct [CEC Version].

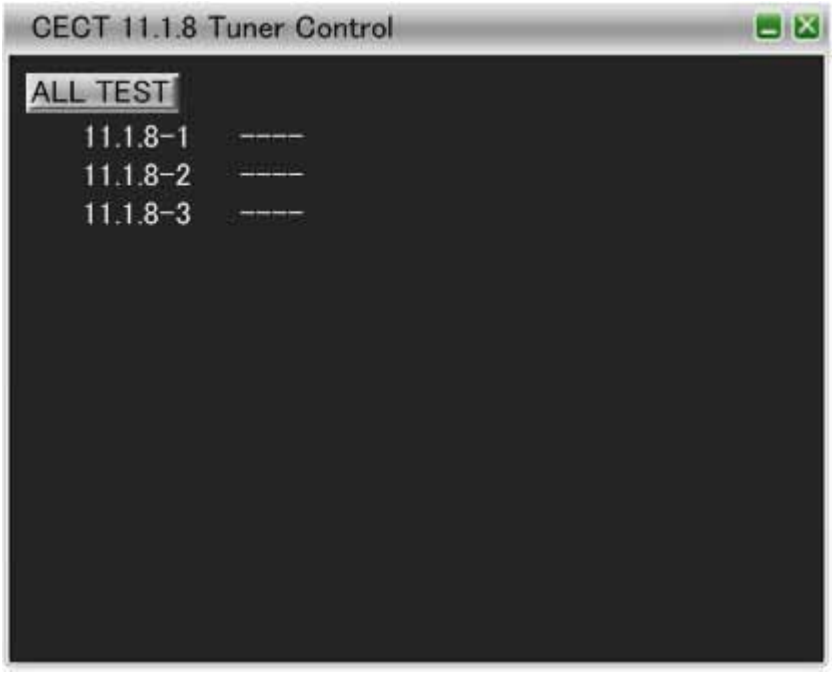
6.2.12 CECT 11.1.7 Deck Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Deck Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.7-1	Invoke the DUT to send every possible <Deck Control> and <Play> that is registered in CDF. Send the DUT an appropriate <Deck Status> after each request, to indicate that the request succeeded. (This procedure is repeated by changing Logical Address to 1, 4.)	The DUT sends the appropriate <Deck Control> or <Play> for the option that was selected.
	11.1.7-2	Invoke the DUT to send a <Play> ["PlayForward"]. Send the DUT a <DeckStatus>["Play"].	The DUT accepts the <Deck Status>.
	11.1.7-3	Invoke the DUT to send a <Play> ["PlayForward"]. Send the DUT a <DeckStatus>["Stop"] indicating that the deck is stopped.	The DUT accepts <DeckStatus>.

6.2.13 CECT 11.1.8 Tuner Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Tuner Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.8-1	Invoke the tuner control feature on the DUT. If the DUT sends a <Give Tuner Device Status>, respond with a <Tuner Device Status> that has [Digital Service Identification] written in the Digital Tuner 1 of the CDF. Increment the channel that is being shown on the external device via the DUT. (This procedure is repeated by changing Logical Address to 1, 3.)	The DUT sends a <Tuner Step Increment>.

	11.1.8-2	Invoke the tuner control feature on the DUT. If the DUT sends a <Give Tuner Device Status>, respond with a <Tuner Device Status> that has [Digital Service Identification] written in the Digital Tuner 1 of the CDF. Decrement the channel that is being shown on the external device via the DUT. (This procedure is repeated by changing Logical Address to 1, 3.)	The DUT sends a <Tuner Step Decrement>.
	11.1.8-3	Send a <Tuner Device Status> that has [Digital Service Identification] written in the Digital tuner 1 in the CDF.	The DUT should not respond with a <FeatureAbort>.

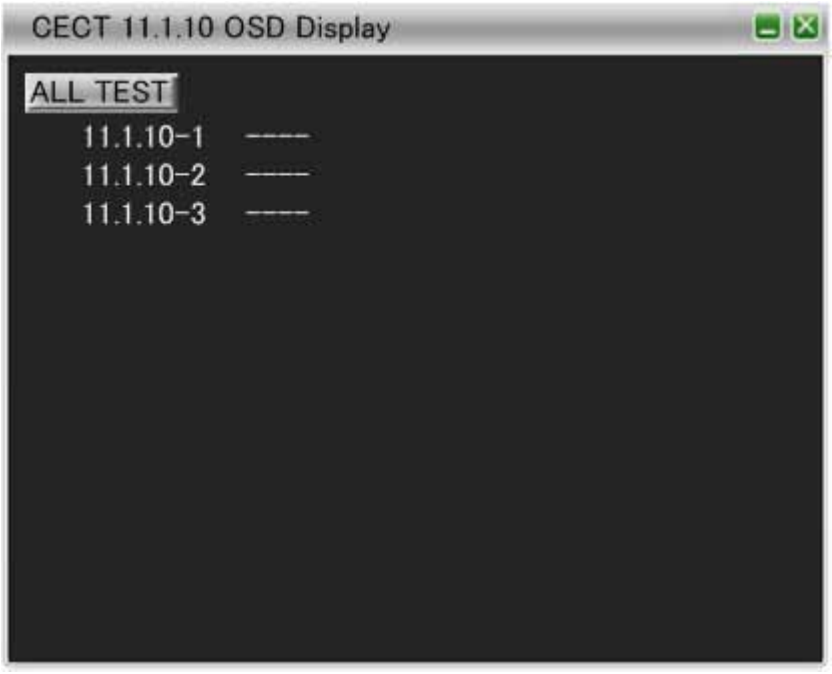
6.2.14 CECT 11.1.9 Vendor Specific Commands

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Vendor Specific Commands			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.9-1	Send a <Give Device Vendor ID> to the DUT. (This procedure is repeated by changing Logical Address to 1, 3, 4, 5, 13, 14,15.)	The DUT responds by broadcasting a <Device Vendor ID> with the correct Vendor ID.
	11.1.9-2	Broadcast a <Report Physical Address> from the TE. Broadcast a <Device Vendor ID> from the TE. Invoke the DUT to send a <Vendor Command>.	The DUT does not send any <Vendor Command>.

6.2.15 CECT 11.1.10 OSD Display

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
OSD Display			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.10-1	Ensure the DUT is in a state where displaying OSD Strings is allowed. Send the DUT a <Set OSD String> ["Display For Default Time "]['Test String']. (This procedure is repeated by changing Logical Address to 1, 3, 4, 5, 13, 14,15.)	The DUT displays the message for a default time period and then clears ‘Test String’. (a typical value is 5 seconds.)
	11.1.10-2	Ensure the DUT is in a state where displaying OSD Strings is allowed. Send the DUT a <Set OSD String> ["Display Until Cleared"]['Test String']. After about 20 seconds, send a <Set OSD String> ["Clear Previous Message"].	The DUT displays ‘Test String’ on receipt of the first message. The DUT clears the Test String on receipt of the second message.

	11.1.10-3	Ensure the DUT is in a state where displaying OSD Strings is allowed. Set the VA-1831 at Logical Address 1. Send the DUT a <Set OSD String> ["Display Until Cleared"]['Test String']. Set the VA-1831 at Logical Address 2. Send a <Set OSD String> ["Display For Default Time"]['Second String'].	The DUT displays 'Test String' on receipt of the first message. The DUT removes the previous 'Test String' and displays the 'Second String' on receipt of the second message.

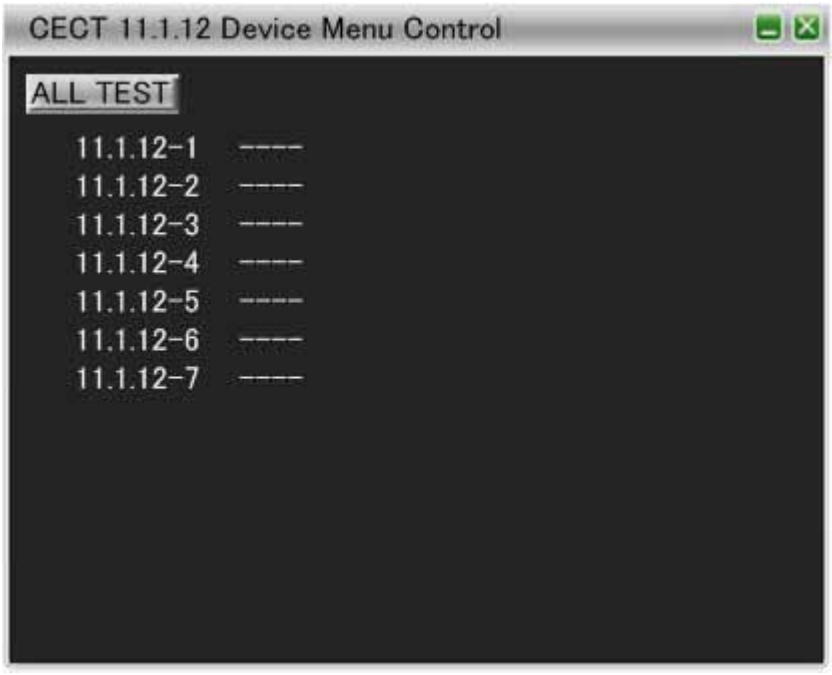
6.2.16 CECT 11.1.11 Device OSD Name Transfer

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Device OSD Name Transfer			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.11-1	Broadcast a <Report Physical Address>. After the DUT sends a <Give OSD Name>, send a <Set OSD Name>[‘Test Device’] to the DUT. Go to the menu where this OSD name is displayed. (This procedure is repeated by changing Logical Address to 1, 3, 4, 5, 13, 14.)	The DUT sends a <Give OSD Name> to the appropriate address. The DUT displays the OSD name by menu that is received by a <Set OSD Name>.
	11.1.11-2	Set the Logical Address of 15. Broadcast a <Report Physical Address>.	The DUT does not send a <Give OSD Name>.

6.2.17 CECT 11.1.12 Device Menu Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



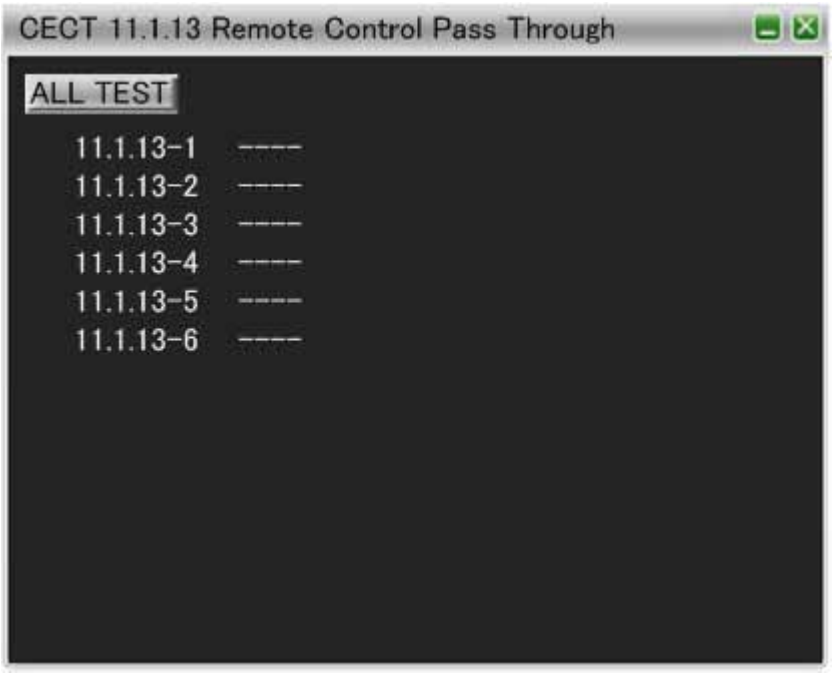
Item		Required Test Method	PASS criteria
Device Menu Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.12-1	Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send an <Image View On> to the DUT. Broadcast an <Active Source>. Send a <Menu Status>["Activated"] to the DUT. Press a remote control key that the DUT supports. Repeat the procedure for several other remote control keys that the DUT supports. (This procedure is repeated by the Logical Address that the DUT allows.)	The DUT sends a <User Control Pressed> when the remote control key is pressed. The DUT does not handle the remote control key press locally.

	11.1.12-2	Set a Logical Address 15. Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send a <Image View On> to the DUT. Broadcast an <Active Source>. Send a <Menu Status>["Activated"] to the DUT. Press the 'UP' key on the DUT's remote control.	DUT ignores the <Menu Status>. The DUT handles the remote control press locally. No <User Control Pressed> is sent.
	11.1.12-3	Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send a <Image View On> to the DUT. Broadcast an <Active Source>. Send a <Menu Status>["Activated"] to the DUT. Send a <Menu Status> ["Deactivated"] to the DUT. Press the 'UP' key on the DUT's remote control.	The DUT handles the remote control press locally. No <User Control Pressed> is sent.
	11.1.12-4	Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send a <Image View On> to the DUT. Broadcast an <Active Source>. Invoke the Device Menu Control Feature on the DUT.	The DUT sends a <Menu Request>["Activate"] to the current active source device.
	11.1.12-5	Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send a <Image View On> to the DUT. Broadcast an <Active Source>. Send a <Menu Status>["Activated"] to the DUT. Deactivate the Device Menu Control Feature on the DUT.	The DUT sends a <Menu Request> ["Deactivate"] to the current source device.
	11.1.12-6	Ensure that the DUT is displaying its internal tuner or a non-CEC external source and is in a state where forwarding the remote control key press is allowed. Send a <Menu Status>["Activated"] to the DUT. Press the 'UP' key on the DUT's remote control.	The DUT ignores the message. The DUT handles the remote control press locally. No <User Control Pressed> is sent.

	11.1.12-7	Ensure that the DUT is in a state where forwarding the remote control key press is allowed. Send an <Image View On> to the DUT from Logical Address 1. Send an < Active Source > to the DUT from Logical Address 1. Send a <Menu Status>["Activated"] from Logical Address 2. Press the ‘UP’ key on the DUT’s remote control.	The DUT ignores the <MenuStatus>. The DUT handles the remote control press locally. No <User Control Pressed> is sent.

6.2.18 CECT 11.1.13 Remote Control Pass Through

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Remote Control Pass Through			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.13-1	Set the TE as Logical Address 1. Ensure the DUT’s remote control is sent to the “Recording Device” setting. Press a remote control key that the DUT will forward to the Recording Device. Repeat the procedure for several other remote control keys that the DUT will forward to the Recording Device.	The DUT sends a <User Control Pressed> with the correct key code for the button pressed. The DUT sends <User Contorol Released> when the button is released.
	11.1.13-2	Set the TE as Logical Address 4. Ensure the DUT’s remote control is sent to the “Playback Device” setting. Press a remote control key that the DUT will forward to the Playback Device. Repeat the procedure for several other remote control keys that the DUT will forward to the Playback Device.	The DUT sends a <User Control Pressed> with the correct key code for the button pressed. The DUT sends <User Control Released> when the button is released.

	11.1.13-3	Set the TE as Logical Address 3. Ensure the DUT's remote control is sent to the "Tuner" setting. Press a remote control key that the DUT will forward to the Tuner. Repeat the procedure for several other remote control keys that the DUT will forward to the Tuner.	The DUT sends a <User Control Pressed> with the correct key code for the button pressed. The DUT sends <User Control Released> when the button is released.
	11.1.13-4	Set the TE as Logical Address 5. Ensure the DUT's remote control is sent to the "Audio System" setting. Press a remote control key that the DUT will forward to the Audio System. Repeat the procedure for several other remote control keys that the DUT will forward to the Audio System.	The DUT sends a <User Control Pressed> with the correct key code for the button pressed. The DUT sends <User Control Released> whenthe button is released.
	11.1.13-5	Broadcast a <Report Physical Address>[1.1.0.0] from Logical Address 1. Broadcast a <Report Physical Address>[1.2.0.0] from a Logical Address 2. Ensure the TV's remote control is set to the "Recording Device" setting. Press a remote control key that the DUT will forward to the Recording Device. Repeat the procedure for several other remote control keys that the DUT will forward to the Recording Device.	The DUT should select a single device to forward the remote control command to. The DUT should not send multiple messages to multiple recording devices.
	11.1.13-6	Set the Logical Addresses that the DUT supports for Remote Control Pass Through. Ensure that the remote control of DUT is correctly set. Press and hold a key on the DUT's remote or local controller that will result in <User Control Pressed> being sent to the TE for several seconds.	The time between <User Control Pressed> messages is between 200ms and 500ms. The DUT sends a <User Control Released> after the last <User Control Pressed>.

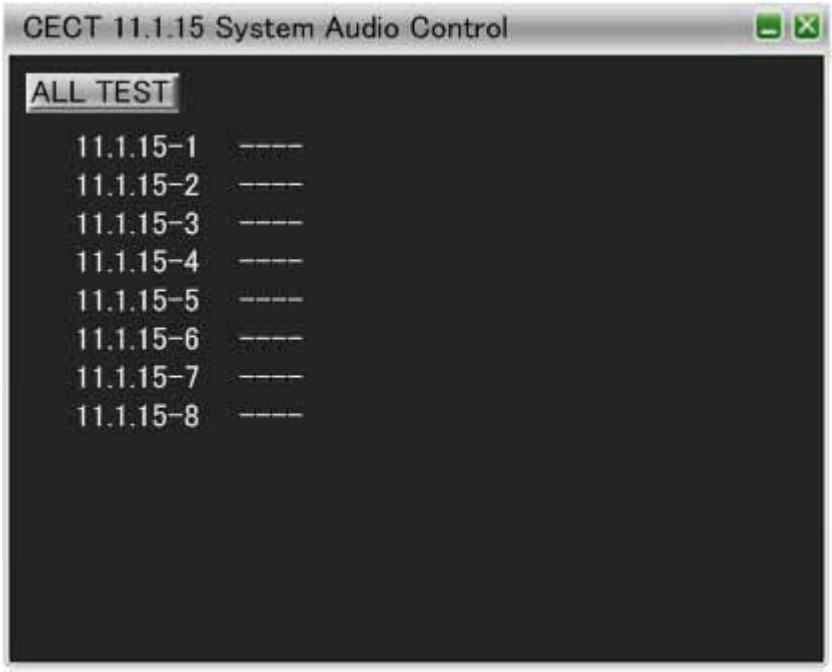
6.2.19 CECT 11.1.14 Give Device Power Status

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Give Device Power Status			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.14-1	Ensure the DUT is power on. Send the DUT a <Give Device Power Status>.	The DUT responds by <Report Power Status> ["On"].
	11.1.14-2	Ensure the DUT is standby. Send the DUT a <Give Device Power Status>.	The DUT responds by <Report Power Status> ["Standby"].

6.2.20 CECT 11.1.15 System Audio Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Audio Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.15-1	Set the TE Logical Address 5 and 1. Broadcast a <Report Physical Address>[1.0.0.0] from Logical Address 5. Broadcast a <Report Physical Address>[1.1.0.0] from Logical Address 1 Broadcast an <Image View On> and an <Active Source>[1.1.0.0] from Logical Address 1. Invoke the DUT to the System Audio Mode to become On.	The DUT sends a <System Audio Mode Request>[1.1.0.0] to the device at Logical Address5
	11.1.15-2	Send a <Set System Audio Mode> ["On"] to the DUT from Logical Address 5. Invoke the DUT to change volume control by the DUT’s local or remote control.	The DUT issues a <User Control Pressed> ["Volume Up" | "Volume Down"]. The DUT does not change its volume.
	11.1.15-3	Send a <Set System Audio Mode> ["On"] to the DUT from Logical Address 5 Invoke the DUT to change volume control to mute or unmute by the DUT’s local or remote control.	The DUT issues a <User Control Pressed> ["Mute"]. The DUT does not change its volume.

	11.1.15-4	Set the TE Logical Address 5. Broadcast a <Report Physical Address>. Ensure the DUT is standby. Power on the DUT.	The DUT issues a <Give System Audio Mode Status> to the amplifier.
	11.1.15-5	Broadcast a <Set System Audio Mode>["On"] from Logical Address 5 Invoke the DUT to turn off the System Audio Control.	The DUT sends a <System Audio Mode Request> with no operands to the amplifier.
	11.1.15-6	Set the TE Logical Address 5. Broadcast a <Report Physical Address>. Invoke the DUT to send <Request Short Audio Descriptor>. Confirm if the Audio Format Code of <Request Short Audio Descriptor> that is issued by the DUT is correct.	The DUT sends one or more correctly formatted <Request Short Audio Descriptor> that includes [Audio Format ID] and [Audio Format Code].
	11.1.15-7	Set the TE Logical Address 5. Ensure the System Audio Mode is off. Broadcast a <Set System Audio Mode> ["On"].	The DUT mutes its volume.
	11.1.15-8	Set the TE Logical Address 5. Ensure the System Audio Mode is off. Broadcast a <Set System Audio Mode> ["Off"].	The DUT unmutes its volume.

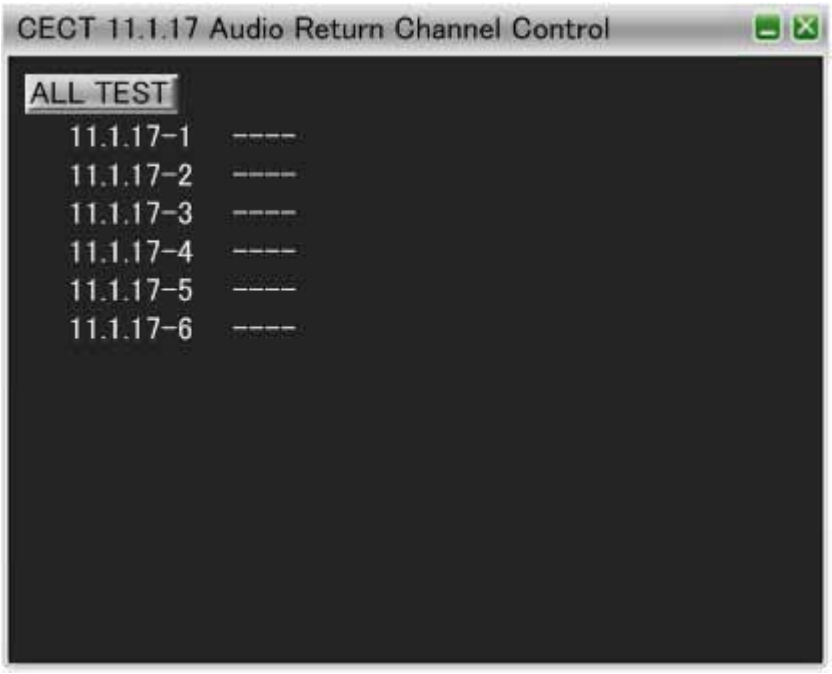
6.2.21 CECT 11.1.16 Audio Rate Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Audio Rate Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.16-1	Invoke the DUT to activate Audio Rate Control. Measure time span between the messages of <SetAudioRate>.	The DUT sends directly addressed <Set Audio Rate> at least once every 2 seconds. The parameter [AudioRate] shall be “0”, “1”,”2”, “3”, “4”, “5” or “6”.

6.2.22 CECT 11.1.17 Audio Return Channel Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Audio Return Channel Control			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.1.17-1	Broadcast a <Report Physical Address>. Invoke the DUT to send a <Request ARC Initiation>.	The DUT sends a <Request ARC Initiation> with no operand.
	11.1.17-2	Ensure that the DUT is ready to initiate ARC. Broadcast a <Report Physical Address>. Send the DUT <Initiate ARC>.	The DUT sends a <Report ARC Initiated> with no operand.
	11.1.17-3	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Invoke the DUT to send a <Request ARC Termination>.	The DUT sends a < Request ARC Termination> with no operand.
	11.1.17-4	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Send the DUT <Terminate ARC>.	The DUT sends a < Report ARC Terminated> with no operand.

	11.1.17-5	Ensure that the DUT takes Physical Address 0.0.0.0. Broadcast a <Report Physical Address> with Physical Address 1.1.0.0. Send the DUT <Initiate ARC>.	The DUT does not send a <Report ARC Initiated>.
	11.1.17-6	Connect TE to the HDMI input of the DUT that does not support Audio Return Channel. Broadcast a <Report Physical Address>. Send the DUT <Initiate ARC>. (If there is other HDMI input that does not support Audio Return Channel, repeat this procedure.)	The DUT does not send a < Report ARC Initiated>.

6.2.23 CECT 11.2.1 One Touch Play

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
One Touch Play			
	Connect the HDMI input of DUT(TV) to the HDMI Output of VA-1831.		
	11.2.1-1	Initiate the One Touch Play on the DUT.	The DUT sends an <Image View On> or <Text View On> and then broadcasts an <Active Source>.

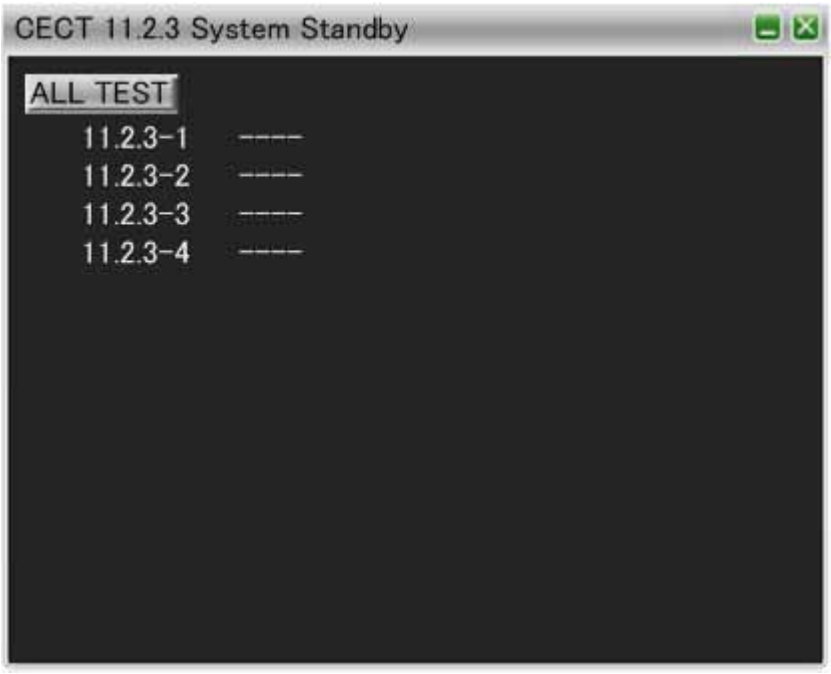
6.2.24 CECT 11.2.2 Routing Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Routing Control			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.2-1	Broadcast an <Active Source>[2.0.0.0]. Broadcast a <Set Stream Path>[1.0.0.0].	The DUT broadcasts an <Active Source>[1.0.0.0].
	11.2.2-2	Ensure the DUT is now the active source. Broadcast a <Request Active Source>.	The DUT broadcasts an <Active Source>.
	11.2.2-3	Ensure the DUT is now the active source. Change the logical address of TE to 1,3,4,5 and 15, then broadcast a <Request Active Source>.	The DUT broadcasts an <Active Source>.
	11.2.2-4	Broadcast a <Set Stream Path>[1.0.0.0]. Invoke the DUT to send an <Inactive Source>.	The DUT sends an <Inactive Source>[1.0.0.0] to the TV.

6.2.25 CECT 11.2.3 System Standby

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Standby			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.3-1	Initiate System Standby of the DUT.	The DUT broadcasts a <Standby>.
	11.2.3-2	Ensure that the DUT is in a state where going into Standby is permitted. Change the logical address of TE to 1,3,4,5 and 15, then broadcast a <Standby>.	The DUT switches to Standby.
	11.2.3-3	Ensure that the DUT is in a state where going into Standby is permitted. Change the logical address of TE to 1,3,4,5 and 15, then send a <Standby> to the DUT.	The DUT switches to Standby.
	11.2.3-4	Put the DUT into the Standby Mode.	The DUT does not broadcast <Standby>.

6.2.26 CECT 11.2.4 One Touch Record

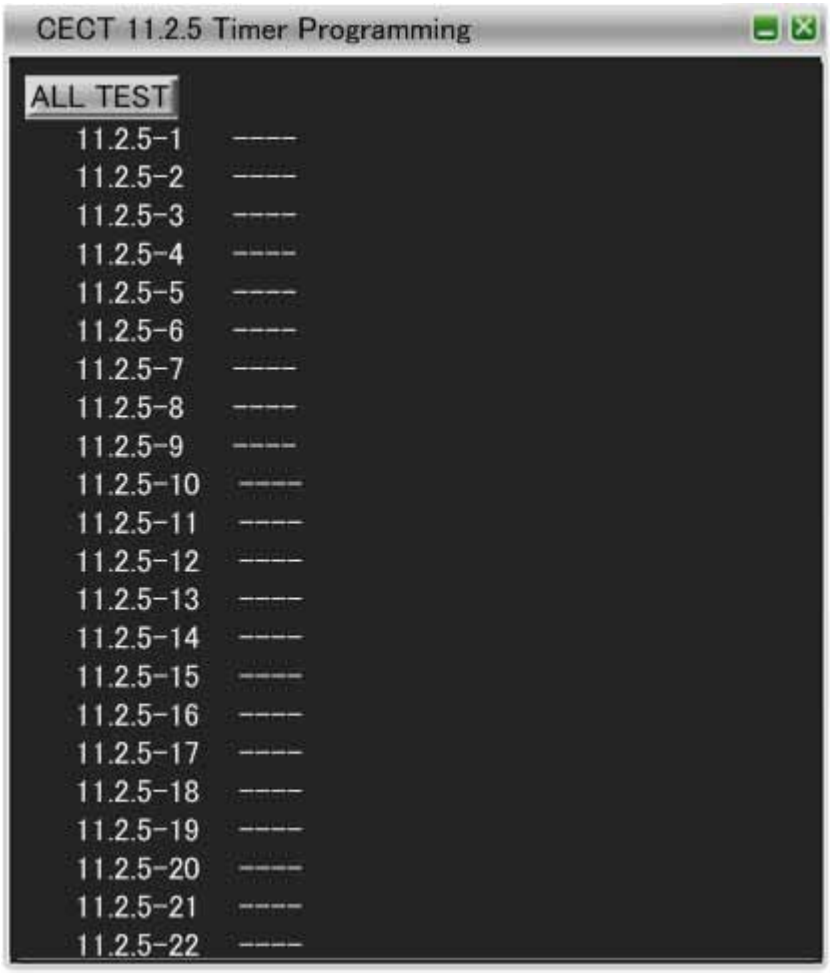
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
System Standby			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.4-1	Ensure that the DUT is ready to record. Invoke the One Touch Record on the DUT. After the DUT sends a <Record TV Screen>, send the DUT a <Feature Abort>.	The DUT does not begin recording.
	11.2.4-2	Ensure that the DUT selects a valid digital service ID. (See CDF Digital tuner1) Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording Digital Service].
	11.2.4-3	Ensure that the DUT selects a valid analog service. (See CDF Analogue tuner1) Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording Analogue Service].
	11.2.4-4	Ensure that the DUT selects an external plug. (See CDF External Plug) Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording External Input].

	11.2.4-5	Ensure that the DUT selects an external plug. (See CDF External Physical Address) Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording External Input].
	11.2.4-6	Ensure that the DUT selects an internal tuner. Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording currently selected source].
	11.2.4-7	Ensure that the DUT is displaying some external source. Ensure that the DUT is ready to record. Send a <Record On>.	The DUT sends a <Record Status>[Recording currently selected source].
	11.2.4-8	Ensure that the DUT is displaying an internal tuner. Ensure that the DUT is ready to record. Send a <Record On>. Send a <Record Off>.	The DUT stops recording.
	11.2.4-9	Change the logical address of TE to 1, 3, 4 and 5, and perform the following procedure. Ensure that the DUT is displaying an internal tuner. Ensure that the DUT is ready to record. Send a <Record On>. Send a <Record Off>.	The DUT stops recording.
	11.2.4-10	Change the logical address of TE to 15 and perform the following procedure. Ensure that the DUT is displaying an internal tuner. Ensure that the DUT is ready to record. Send a <Record On>.	The DUT does not send <Record Status>.

6.2.27 CECT 11.2.5 Timer Programming

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



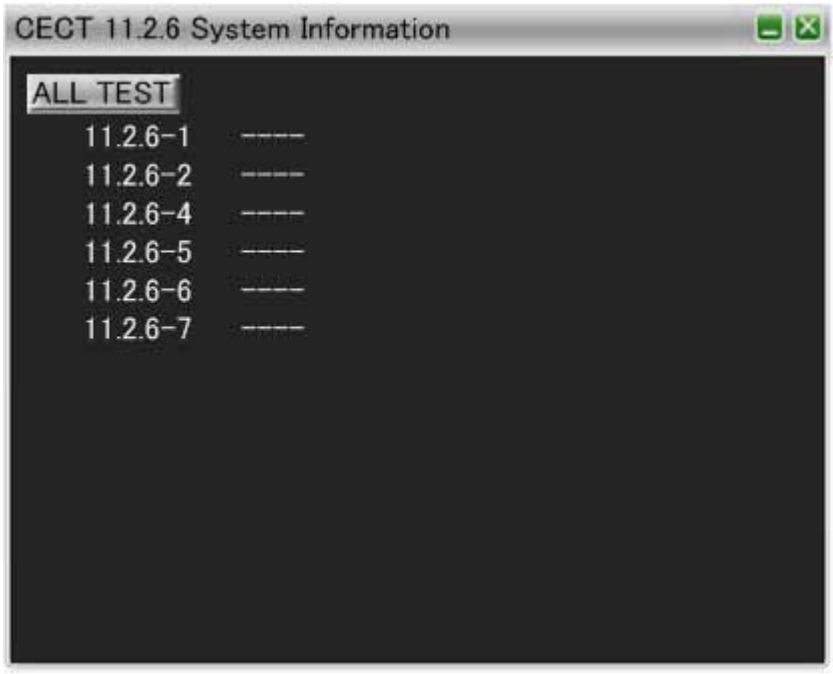
Item		Required Test Method	PASS criteria
Timer Programming			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.5-1	Change the logical address of TE to 1, 2 and 9, then send a <Report Physical Address>. Set a timer recording via the EPG.	The DUT sends a <Set Digital Timer>.
	11.2.5-2	Change the logical address of TE to 1, 2 and 9, then send a <Report Physical Address>. Set a timer recording via the EPG.	The DUT sends a <Set Analogue Timer>.
	11.2.5-3	Change the logical address of TE to 1, 2 and 9, then send a <Report Physical Address>. Set a timer recording via the EPG.	The DUT sends a <Set Digital Timer>.

	11.2.5-4	Change the logical address of TE to 1, 2 and 9, then send a <Report Physical Address>. Set a timer recording via the menu.	The DUT sends a <Set Analogue Timer>.
	11.2.5-5	Change the logical address of TE to 1, 2 and 9, then send a <Report Physical Address>. Set a timer recording via the menu.	The DUT sends a <Set External Timer>.
	11.2.5-6	Invoke a DUT to send a <Set Digital Timer>. Reply to the DUT with a <Timer Status>[Not programmed].	The DUT does not add the record list.
	11.2.5-7	Invoke a DUT to send a <Set Analogue Timer>. Reply to the DUT with a <Timer Status>[Not programmed].	The DUT does not add the record list.
	11.2.5-8	Invoke a DUT to send a <Set External Timer>. Reply to the DUT with a <Timer Status>[Not programmed].	The DUT does not add the record list.
	11.2.5-9	Set a timer recording via the EPG. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the EPG.	The DUT sends a <Clear Digital Timer>.
	11.2.5-10	Set a timer recording via the EPG. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the EPG.	The DUT sends a <Clear Analogue Timer>.
	11.2.5-11	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu.	The DUT sends a <Clear Digital Timer>.
	11.2.5-12	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu.	The DUT sends a <Clear Analogue Timer>.
	11.2.5-13	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu.	The DUT sends a <Clear External Timer>.
	11.2.5-14	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu. <Timer Cleared Status>[Timer not cleared]	The DUT sends a <Clear Digital Timer>. The DUT removes the timer program from its menu.
	11.2.5-15	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu. <Timer Cleared Status>[Timer not cleared]	The DUT sends a <Clear Analogue Timer>. The DUT removes the timer program from its menu.
	11.2.5-16	Set a timer recording via the menu. Reply to the DUT with a <Timer Status>[Programmed]. Clear the timer recording via the menu. <Timer Cleared Status>[Timer not cleared]	The DUT sends a <Clear External Timer>. The DUT removes the timer program from its menu.

	11.2.5-17	Ensure that the DUT is ready to record. Send a <Set Analogue Timer> to the DUT.	The DUT sends a <Timer Status>.
	11.2.5-18	Ensure that the DUT is ready to record. Send a <Set Digital Timer> to the DUT.	The DUT sends a <Timer Status>.
	11.2.5-19	Ensure that the DUT is ready to record. Send a <Set External Timer> to the DUT.	The DUT sends a <Timer Status>.
	11.2.5-20	Ensure that the DUT is ready to record. Send a <Set Analogue Timer> to the DUT. Send a <Clear Analogue Timer> to the DUT.	The DUT sends a <Timer Status>. The DUT sends a <Timer Cleared Status>.
	11.2.5-21	Ensure that the DUT is ready to record. Send a <Set Digital Timer> to the DUT. Send a <Clear Digital Timer> to the DUT.	The DUT sends a <Timer Status>. The DUT sends a <Timer Cleared Status>.
	11.2.5-22	Ensure that the DUT is ready to record. Send a <Set External Timer> to the DUT. Send a <Clear External Timer> to the DUT.	The DUT sends a <Timer Status>. The DUT sends a <Timer Cleared Status>.

6.2.28 CECT 11.2.6 System Information

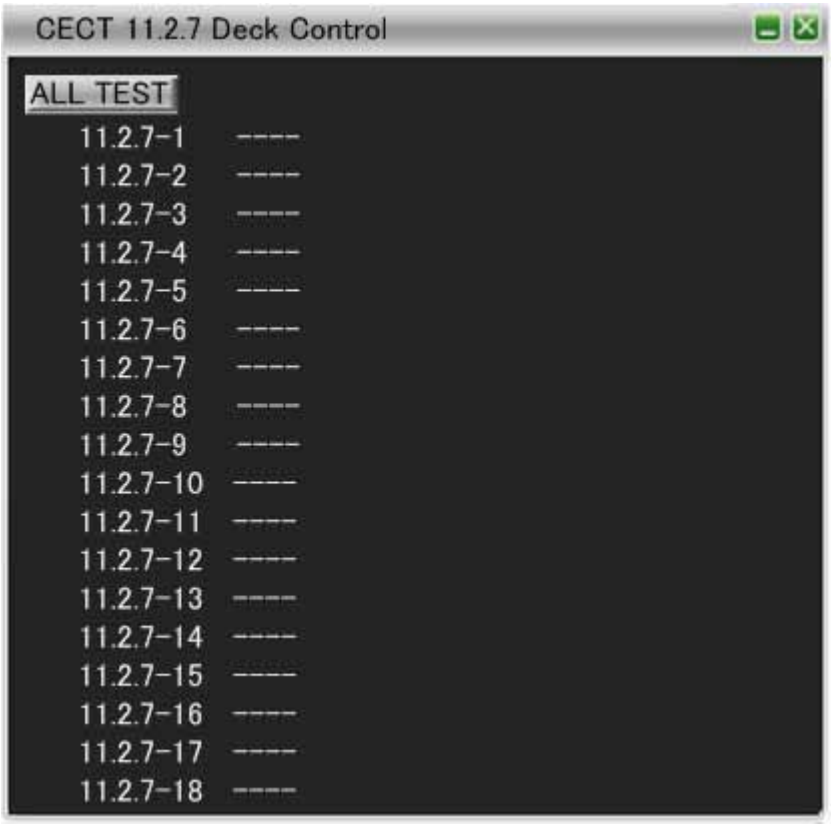
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Information			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.6-1	Send the DUT a <Polling Message>.	The DUT Acks the message.
	11.2.6-2	Change the logical address of TE to 0,1,3,4,5 and 15. Then, send the DUT a <Give Physical Address>.	The DUT broadcast a <Report Physical Address>.
	11.2.6-3	Broadcast a <Set Menu Language> with a different language to the currently set value and which is supported by the DUT.	The DUT updates its menu language.
	11.2.6-4	Broadcast a <Set Menu Language> with a different language to the currently set value and which is not supported by the DUT.	The DUT menu language is not modified.
	11.2.6-5	Change the logical address of TE to 1,3,4,5 and 15. Broadcast a <Set Menu Language> with a different language to the currently set value	The DUT menu language is not modified.
	11.2.6-6	Send a <Get CEC Version> to the DUT.	The DUT sends a <CEC Version>.
	11.2.6-7	Send a <Get Menu Language> from the TE’s logical address 0.	The DUT does not send a <Set Menu Language>.

6.2.29 CECT 11.2.7 Deck Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



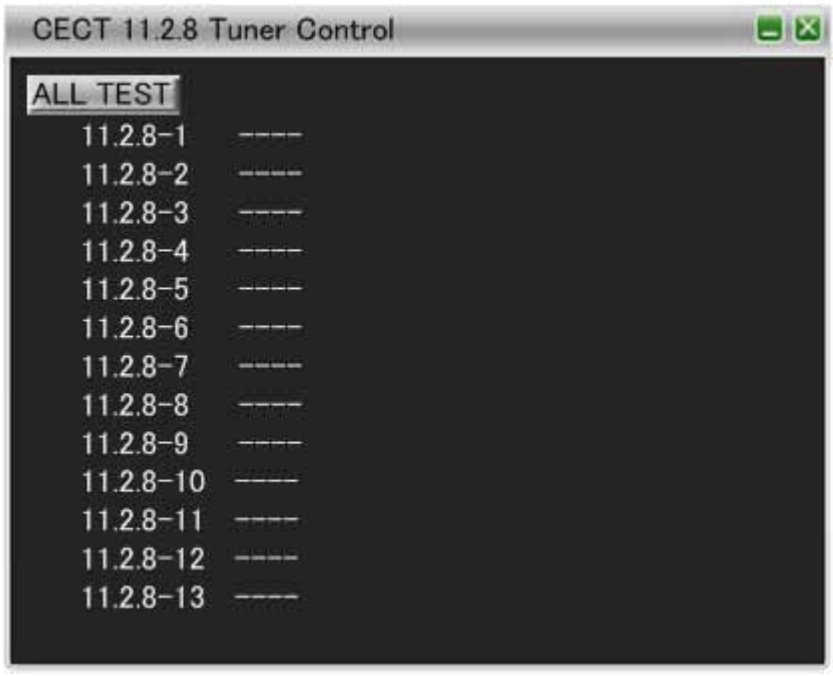
Item		Required Test Method	PASS criteria
Deck Control			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.7-1	Ensure that the DUT is playing media. Send a <Deck Control>[Skip Forward/Wind] to the DUT.	The DUT skips/winds forward.
	11.2.7-2	Ensure that the DUT is playing media. Send a <Deck Control>[Skip Reverse/Rewind] to the DUT.	The DUT skips backwards / rewinds.
	11.2.7-3	Ensure that the DUT is playing media. Send a <Deck Control>[Stop] to the DUT.	The DUT stops playing.
	11.2.7-4	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT is playing media. Send a <Deck Control>[Stop] to the DUT.	The DUT stops playing.

	11.2.7-5	Ensure that the DUT is playing media. Send a <Deck Control>[Stop] from TE's Logical Address 15.	The DUT ignores the message.
	11.2.7-6	Ensure that the DUT has media available and idle. Send a <Play>[Play Forward] to the DUT.	The DUT begins playing its media.
	11.2.7-7	Ensure that the DUT has media available and idle. Send a <Play>[Play Reverse] to the DUT.	If capable, the DUT starts playing in reverse.
	11.2.7-8	Ensure that the DUT has media available and idle. Send a <Play>[Play Still] to the DUT.	The DUT switches from playing forwards to still mode (paused.)
	11.2.7-9	Ensure that the DUT has media available and idle. Send a <Play>[Play Still] to the DUT.	The DUT enters still mode or sends a <Feature Abort>.
	11.2.7-10	Ensure that the DUT has media available and idle. Send the following messages to the DUT. <Play>[Fast Forward Min Speed] <Play>[Fast Forward Medium Speed] <Play>[Fast Forward Max Speed] <Play>[Fast Reverse Min Speed] <Play>[Fast Reverse Medium Speed] <Play>[Fast Reverse Max Speed] <Play>[Slow Forward Min Speed] <Play>[Slow Forward Medium Speed] <Play>[Slow Forward Max Speed] <Play>[Slow Reverse Min Speed] <Play>[Slow Reverse Medium Speed] <Play>[Slow Reverse Max Speed]	The DUT sends a <Image View On> or a <Text View On>. Or, the DUT sends a <Feature Abort>.
	11.2.7-11	Ensure that the DUT is playing media. Send the following messages to the DUT. <Play>[Fast Forward Min Speed] <Play>[Fast Forward Medium Speed] <Play>[Fast Forward Max Speed] <Play>[Fast Reverse Min Speed] <Play>[Fast Reverse Medium Speed] <Play>[Fast Reverse Max Speed] <Play>[Slow Forward Min Speed] <Play>[Slow Forward Medium Speed] <Play>[Slow Forward Max Speed] <Play>[Slow Reverse Min Speed] <Play>[Slow Reverse Medium Speed] <Play>[Slow Reverse Max Speed]	The DUT switches to playing in the selected mode and speed.
	11.2.7-12	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT has media available and idle. Send a <Play>[Play Forward] to the DUT.	The DUT begins playing its media.
	11.2.7-13	Ensure that the DUT has media available and idle. Send a <Play>[Play Forward] from the TE's Logical Address 15.	The DUT ignores the message.

	11.2.7-14	Ensure that the DUT is in the following status. playing forwards playing Reverse Paused Still Slow Forwards Slow Reverse Fast Forwards Fast Reverse Stopped (Idle) media present No media present Skip Forward or Winding(if applicable) Skip Reverse or Rewinding(if applicable) Recording(if applicable) Index Search Forward(if applicable) Index Search Reverse(if applicable)" <Give Deck Status>[Once]を送信します。	The DUT responds with the appropriate <Deck Status>.
	11.2.7-15	Ensure the DUT is idle. Send a <Give Deck Status>[On] to the DUT. Press play on the DUT. Press stop on the DUT. Send a <Give Deck Status>[Off] to the DUT. Press play on the DUT.	 The DUT sends a <Deck Status>[Stop]. The DUT sends a <Deck Status>[Play]. The DUT sends a <Deck Status>[Stop]. The DUT does not send a <Deck Status>.
	11.2.7-16	Change the logical address of TE to 1,3,4 and 5, and perform the following procedures. Ensure that the DUT is playing media. Send a <Give Deck Status>[Once] to the DUT.	The DUT responds with a <Deck Status>[Play].
	11.2.7-17	Ensure that the DUT is playing media. Send a <Give Deck Status>[Once] from Logical Address 15 of TE.	The DUT ignores the message.
	11.2.7-18	Ensure that the DUT is media loaded. Send a <Deck Control>[Eject] to the DUT.	The DUT ejects the media.

6.2.30 CECT 11.2.8 Tuner Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

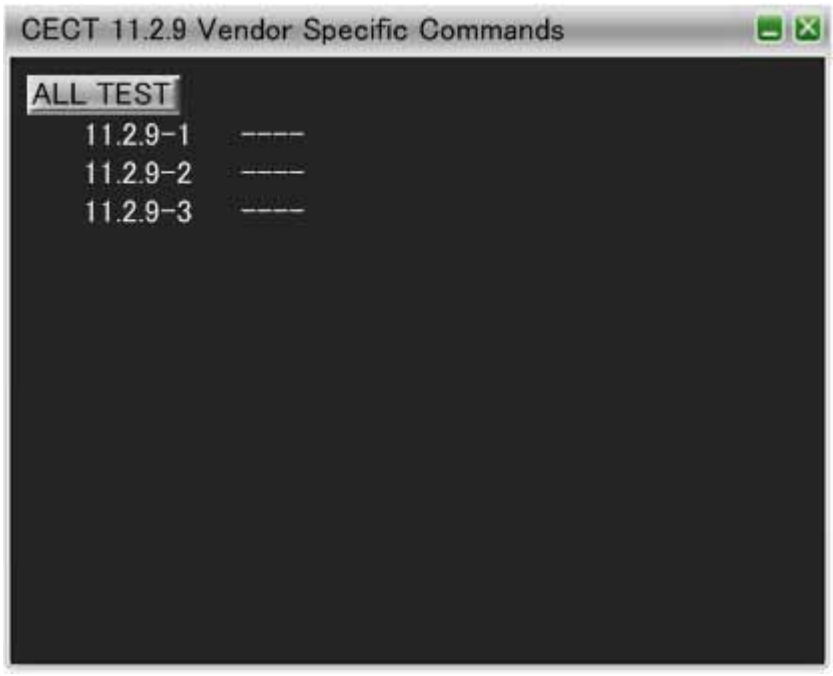


Item		Required Test Method	PASS criteria
Tuner Control			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.8-1	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT is powered on, selects Digital Service 1 that is written in the CDF. Send the DUT a <Select Digital Service>[Digital Service2].	The DUT’s tuner changed to Service2.
	11.2.8-2	Ensure that the DUT is powered on, selects Digital Service 1 that is written in the CDF. Send the DUT a <Select Digital Service>[Digital Service2] from Logical Address 15 of TE.	The DUT ignores the message.
	11.2.8-3	Ensure that the DUT is powered on, selects Digital Service 1 that is written in the CDF. Send the DUT a <Select Digital Service>[Digital Service1].	The DUT ignores the message.
	11.2.8-4	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT is powered on, selects Analogue Service 1 that is written in the CDF. Send the DUT a <Select Analogue Service> [Analogue Service2].	The DUT’s tuner changed to Service2.

	11.2.8-5	Ensure that the DUT is powered on, selects Analogue Service 1 that is written in the CDF. Send the DUT a <Select Analogue Service>[Analogue Service2] from Logical Address 15 of TE.	The DUT ignores the message.
	11.2.8-6	Ensure that the DUT is powered on, selects Analogue Service 1 that is written in the CDF. Send the DUT a <Select Analogue Service>[Analogue Service1].	The DUT ignores the message.
	11.2.8-7	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT is powered on. Send the DUT a <Tuner Step Increment>.	The DUT goes to preset number, or wraps around to the beginning of the preset list.
	11.2.8-8	Ensure that the DUT is powered on. Send a <Tuner Step Increment> from Logical Address 15 of TE.	The DUT ignores the message.
	11.2.8-9	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the DUT is powered on. Send a <Tuner Step Decrement>.	The DUT goes to preset number, or wraps around to the beginning of the preset list.
	11.2.8-10	Ensure that the DUT is powered on. Send a <Tuner Step Decrement > from Logical Address15 of TE.	The DUT ignores the message.
	11.2.8-11	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedures. Ensure that the tuner is displaying its tuner. Send the DUT a <Give Tuner Device Status>[Once].	The DUT sends a <Tuner device Status>.
	11.2.8-12	Ensure that the tuner is displaying its tuner. Send a <Give Tuner Device Status>[Once] from Logical Address 15 of TE.	The DUT ignores the message.
	11.2.8-13	Ensure that the tuner is displaying its tuner. Send the DUT a <Give Tuner Device Status>[On]. Change the Service. Send the DUT a <Give Tuner Device Status>[Off]. Change the Service.	The DUT sends a <Tuner device Status>. The DUT sends a <Tuner device Status> indicating the new service. The DUT does not send a <Tuner device Status>.

6.2.31 CECT 11.2.9 Vendor Specific Commands

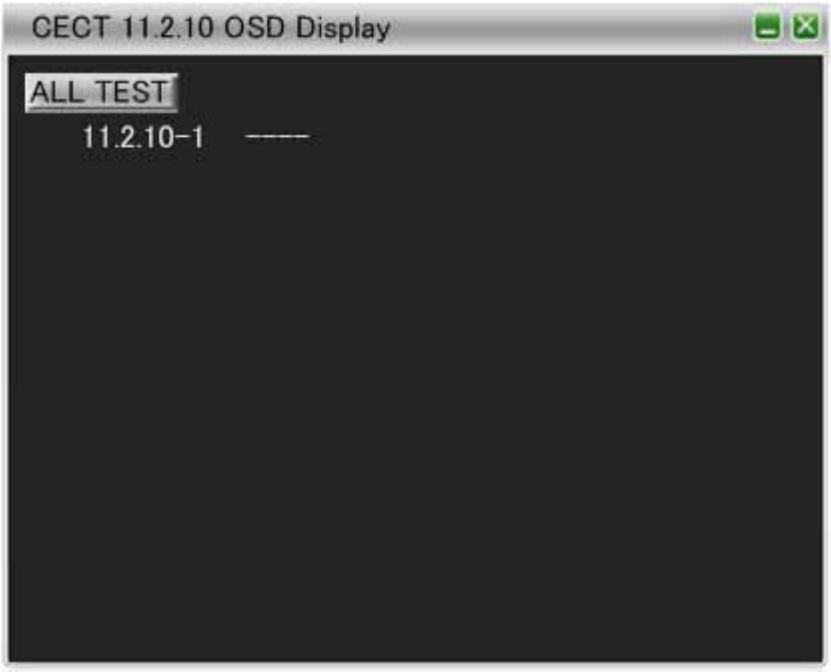
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Vendor Specific Commands			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.9-1	Change the logical address of TE to 0,1,3,4 and 5. Send a <Give Device Vendor ID> to the DUT.	The DUT broadcasts a <Device Vendor ID>.
	11.2.9-2	Set the TE to allocate a Physical Address of 1.0.0.0 to the DUT. Asserts the HPD.	The DUT broadcasts a <Device Vendor ID>.
	11.2.9-3	Broadcast a <Report Physical Address> from VA-1831. Broadcast a <Device Vendor ID>[unacceptable id] fromVA-1831. Invoke the DUT to send a <Vendor Command>.	The DUT does not send a <Vendor Command>.

6.2.32 CECT 11.2.10 OSD Display

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
OSD Display			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.10-1	Set the DUT into a mode that utilizes the TV’s OSD feature and change the current OSD message to other one.	The DUT sends a <Set OSD String> with the correct parameter.

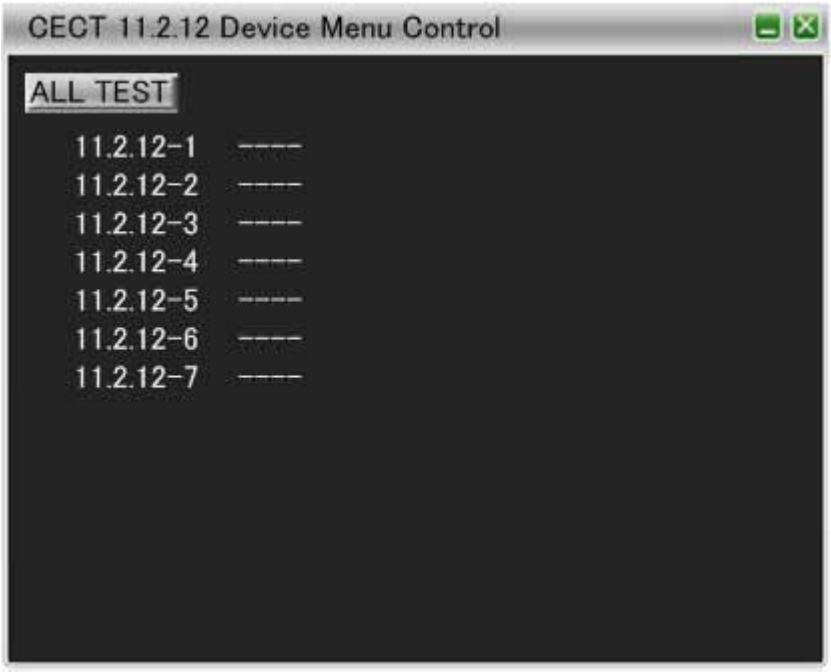
6.2.33 CECT 11.2.11 Device OSD Name Transfer

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Device OSD Name Transfer			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.11-1	Change the logical address of TE to 0,1,3,4 and 5. Send the DUT a <Give OSD Name>.	The DUT sends a <Set OSD Name>.
	11.2.11-2	Send the DUT a <Give OSD Name> from Logical Address15 of TE.	The DUT ignores the message.

6.2.34 CECT 11.2.12 Device Menu Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

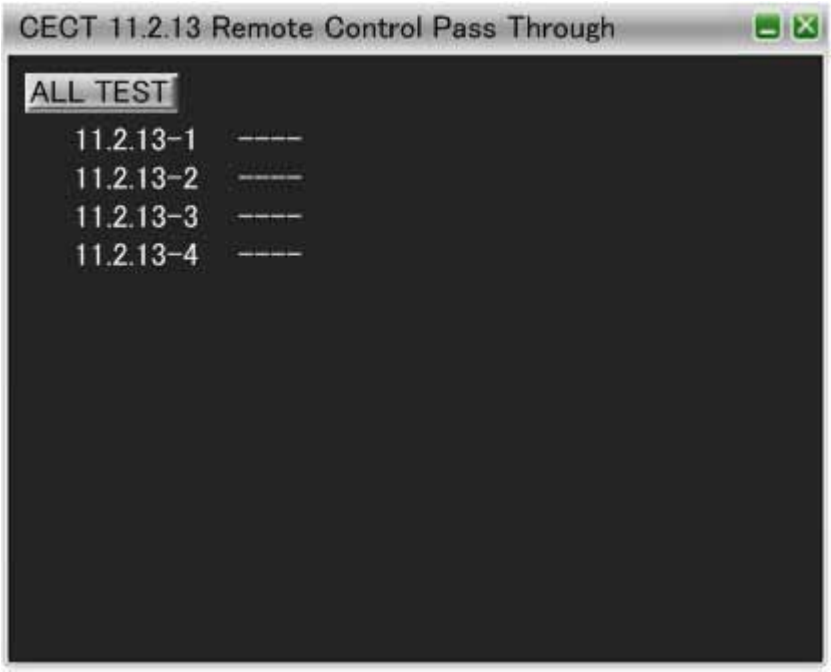


Item		Required Test Method	PASS criteria
Device Menu Control			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.12-1	Ensure that the DUT’s menu is not activated. Ensure that the DUT is now the active source. Activate the device menu.	The DUT sends a <Menu Status>[Activated].
	11.2.12-2	Ensure that the DUT’s menu is activated. Ensure that the DUT is now the active source. Deactivate the device menu.	The DUT sends a <Menu Status>[Deactivated]
	11.2.12-3	Ensure that the DUT is now the active source. Send a <Menu Request>[Activate] to the DUT.	The DUT sends a <Menu Status>[Activated] or <Menu Status>[Deactivated].
	11.2.12-4	Ensure that the DUT is now the active source. Send a <Menu Request>[Deactivate] to the DUT.	The DUT sends a <Menu Status>[Activated] or a <Menu Status>[Deactivated].
	11.2.12-5	Change the logical address of TE to 0,1,3,4 and 5, and perform the following procedure. Ensure that the DUT is now the active source. Send a <Menu Request>[Query] to the DUT.	The DUT sends a <Menu Status>[Activated] or a <Menu Status>[Deactivated].
	11.2.12-6	Change the logical address of TE to 15, and perform the following procedure. Ensure that the DUT is now the active source. Send a <Menu Request>[Query] to the DUT.	The DUT ignores the message.

	11.2.12-7	Ensure that the DUT is now the active source. Send the following messages to the DUT. <Menu Request>[Activate] <User Control Pressed>[Select] <User Control Released> <User Control Pressed>[Up] <User Control Released> <User Control Pressed>[Down] <User Control Released> <User Control Pressed>[Left] <User Control Released> <User Control Pressed>[Right] <User Control Released>	The DUT's menu reacts sensibly to the incoming messages.

6.2.35 CECT 11.2.13 Remote Control Pass Through

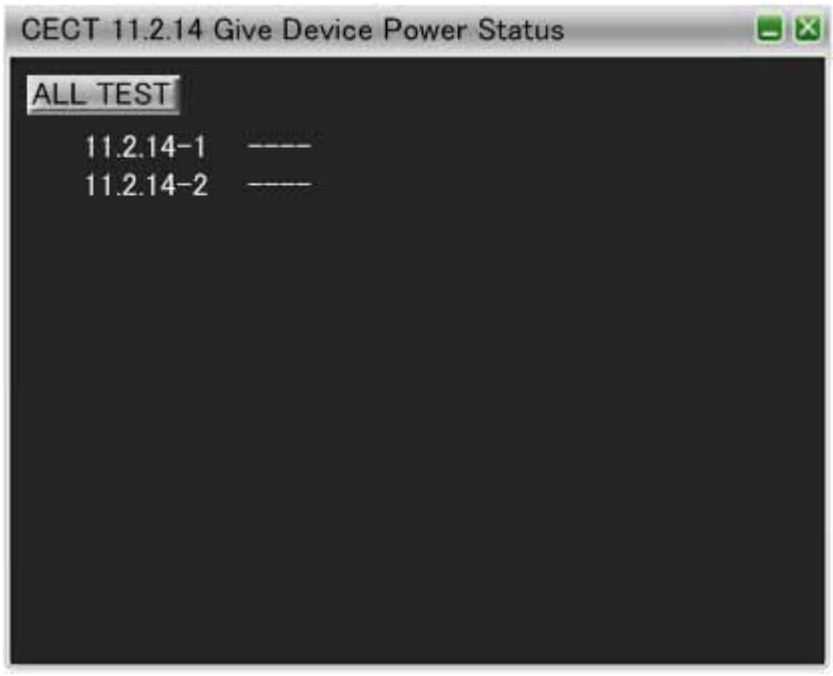
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Remote Control Pass Through			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.13-1	Send the DUT a <User Control Pressed>. Send the DUT a <User Control Released>. * Perform the test to the 4 keys that are supported.	The DUT reacts as if the remote control key was pressed locally.
	11.2.13-2	Ensure that the DUT is in the mode where Press and Hold Operation can be observed. Send repeated <User Control Pressed> for 10 seconds every 450ms. Send the DUT a <User Control Released>.	The DUT starts Press and Hold behavior and stops after 10 seconds.
	11.2.13-3	Ensure that the DUT is in the mode where Press and Hold Operation can be observed. Send repeated <User Control Pressed> for 10 seconds every 450ms. The TE stops to send the<User Control Released> at end.	The DUT starts Press and Hold behavior and stops after 10 seconds.
	11.2.13-4	Ensure that the DUT is in the mode where Press and Hold Operation can be observed. Send repeated <User Control Pressed> for 10 seconds every 450ms. Send a <User Control Pressed> with a [UI Command] after the last [UI Command] that is sent out.	The DUT starts Press and Hold behavior and stops after 10 seconds.

6.2.36 CECT 11.2.14 Give Device Power Status

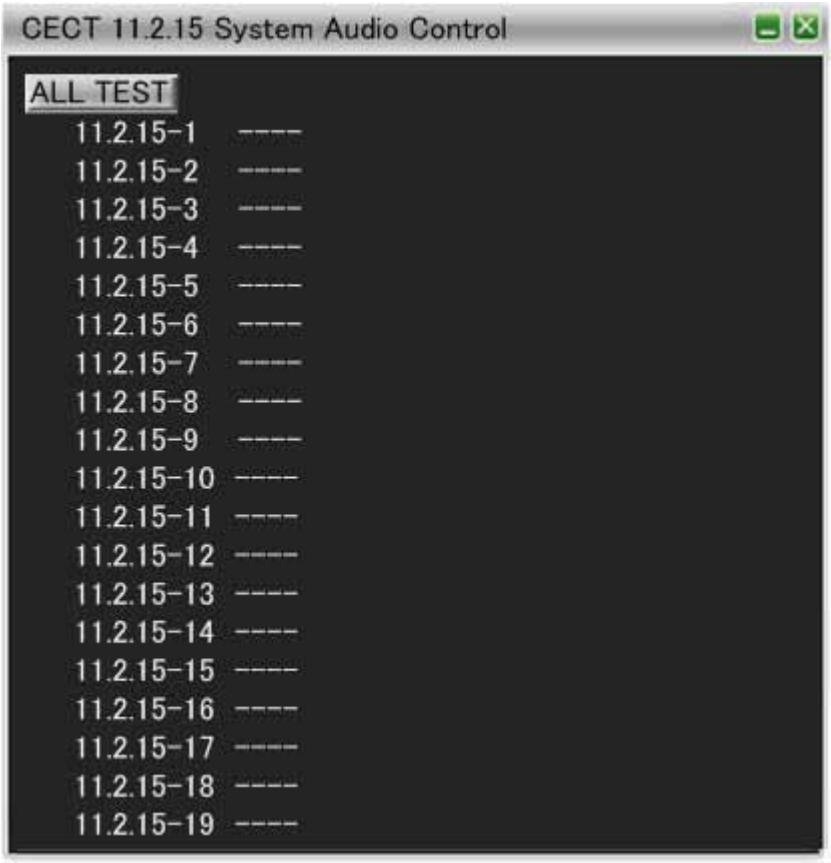
If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Give Device Power Status			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.14-1	Ensure the DUT is power on. Send the DUT a <Give Device Power Status>.	The DUT sends a <Report Power Status>[On].
	11.2.14-2	Ensure the DUT is standby. Send the DUT a <Give Device Power Status>.	The DUT sends a <Report Power Status>[Standby].

6.2.37 CECT 11.2.15 System Audio Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
System Audio Control			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.15-1	Change the Logical Address of TE to 0, 3. Send a <System Audio Mode Request>[0.0.0.0] to the DUT.	DUT broadcasts a <Set System Audio Mode>[On].
	11.2.15-2	Invoke the DUT to initiate the System Audio Mode to On.	The DUT sends a <Set System Audio Mode>[On] to Logical Address 0. The DUT broadcasts a <Set System Audio Mode>[On].
	11.2.15-3	Invoke the DUT to initiate the System Audio Mode to On. The TE responds with <Feature Abort> to the <Set System Audio Mode>[On] that is sent to Logical Address 0.	The DUT sends a <Set System Audio Mode>[On] to Logical Address 0. The DUT does not broadcast a <Set System Audio Mode>[On].
	11.2.15-4	Send a <System Audio Mode Request>[0.0.0.0] to the DUT. Send a <Give System Audio Status> to the DUT.	The DUT broadcasts a <Set System Audio Mode>[On]. The DUT responds with a <Set System Audio Mode>[On] to a <Give System Audio Status>.

	11.2.15-5	Send a <System Audio Mode Request>[0.0.0.0] to the DUT. Send a <System Audio Mode Request> with no operands.	The DUT broadcasts a <Set System Audio Mode>[Off].
	11.2.15-6	Send a <System Audio Mode Request>[0.0.0.0] to the DUT. Invoke the DUT to go into standby.	The DUT broadcasts a <Set System Audio Mode>[Off].
	11.2.15-7	Ensure that the System Audio is Off. Sends a <Give System Audio Status> to the DUT.	The DUT responds with a <Set System Audio Mode>[Off].
	11.2.15-8	Send a <System Audio Mode Request>[0.0.0.0] to the DUT. Send a <User Control Pressed>[Mute] and a <User Control Released>.	The DUT mutes its volume.
	11.2.15-9	Send a <System Audio Mode Request>[0.0.0.0] to the DUT. Sends a <Give Audio Status> to the DUT.	The DUT responds with a <Report Audio Status>[Audio Status].
	11.2.15-10	Broadcast a <Report Physical Address>. The DUT becomes standby. Invoke the DUT to turn on.	The DUT sends a <Give System Audio Mode Status> at Logical Address 5.
	11.2.15-11	Sends a <Set System Audio Mode>[On] to the DUT. Press the volume up/down key on the DUT's local or remote control.	The DUT sends a <User Control Pressed>[Volume Up | Volume Down], and does not change its volume level.
	11.2.15-12	Send a <Set System Audio Mode>[On] to the DUT. Press the volume mute on the DUT's local or remote control.	The DUT sends a <User Control Pressed>[Mute], and does not change its volume level.
	11.2.15-13	Send a <Request Short Audio Descriptor> including one pair of format that the DUT support and one pair of format that the DUT does not support.	The DUT replies with a supported format <Report Short Audio Descriptor>.
	11.2.15-14	Sends a <Request Short Audio Descriptor> with one pair of format that the DUT does not support.	The DUT replies a <Feature Abort>[Invalid Operand].
	11.2.15-15	Connect the DUT to the output of VA-1831. Broadcast a <Report Physical Address> from VA-1831. Invoke the DUT to send a <Request Short Audio Descriptor>.	The DUT sends <Request Short Audio Descriptor> with the parameter of the format written in the CDF.
	11.2.15-16	Sends a <System Audio Mode Request> without parameter. Ensure that the System Audio Mode is Off. Sends a <System Audio Mode Request>[0.00.0] to the DUT.	The DUT unmute its volume.
	11.2.15-17	Sends a <System Audio Mode Request>[0.00.0]. Ensure that the System Audio Mode is On. Sends a <System Audio Mode Request> without parameter.	The DUT mutes its volume.
	11.2.15-18	Invoke the DUT to initiate System Audio Mode to On. The VA-1831 responds with <Feature Abort> after about 896ms to the <Set System Audio Mode>[On].	The DUT sends a <Set System Audio Mode>[On]. The DUT does not broadcast a <Set System Audio Mode>[On].
	11.2.15-19	Send a <System Audio Mode Request>[0.0.0.0] from Logical Address 3 or VA. The TE responds with <Feature Abort> after about 896ms to the <Set System Audio Mode>[On].	The DUT sends a <Set System Audio Mode>[On] at Logical Address 0. The DUT does not broadcast a <Set System Audio Mode>[On].

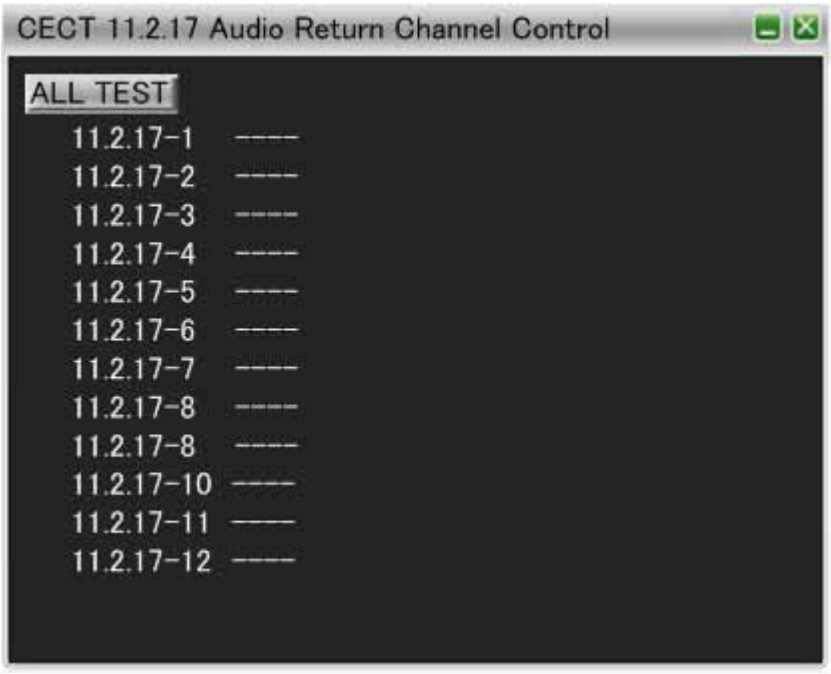
6.2.38 CECT 11.2.16 Audio Rate Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Give Device Power Status			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.16-1	Ensure that the DUT playing an audio media such as CD,Super Audio CD or DVD-AUDIO. Sends a <Set Audio Rate> by changing its parameter to1,2,3,0,4,5,6 and 0.	The DUT Acks all message.
	11.2.16-2	Ensure that the DUT activates Audio Rate Control.	The DUT sends a <Set Audio Rate> with a parameter of either 1,2,3,4,5,6 or 0.

6.2.39 CECT 11.2.17 Audio Return Channel Control

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

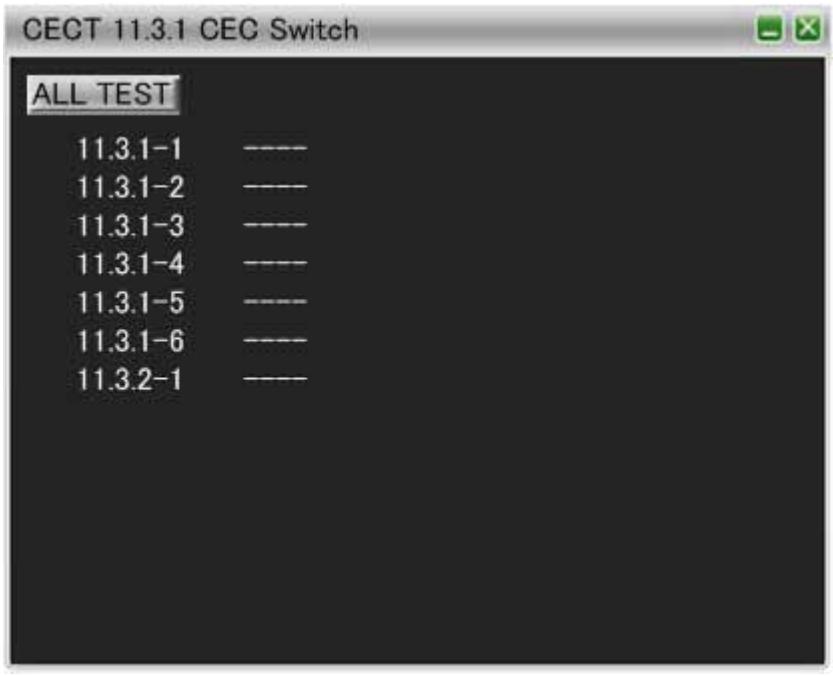


Item		Required Test Method	PASS criteria
Give Device Power Status			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.2.17-1	Broadcast a <Report Physical Address>. Invoke the DUT to send a <Initiate ARC>.	The DUT sends a <Initiate ARC>.
	11.2.17-2	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Invoke the DUT send a <Terminate ARC>.	The DUT sends a <Terminate ARC>.
	11.2.17-3	Ensure that the DUT is ready to initiate ARC. Broadcast a <Report Physical Address>. Send a <Request ARC Initiation> to the DUT.	The DUT sends a <Initiate ARC>.
	11.2.17-4	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Sends a <Request ARC Termination> to the DUT.	The DUT sends a <Terminate ARC>.
	11.2.17-5	Set Physical Address of the DUT to 1.1.0.0, and asserts the HPD. Ensure that the DUT is ready to initiate ARC. Broadcast a <Report Physical Address>. Sends a <Request ARC Initiation> to the DUT.	The DUT does not send a <Initiate ARC>.

	11.2.17-6	Ensure that the VA-1831 connects to the output of the DUT that is not supported ARC. Ensure that the DUT is ready to initiate ARC. Broadcast a <Report Physical Address>. Send a <Request ARC Initiation> to the DUT.	The DUT does not send a <Initiate ARC>.
	11.2.17-7	Broadcast a <Report Physical Address>. Invoke the DUT to send a <Request ARC Initiation>.	The DUT sends a <Request ARC Initiation>.
	11.2.17-8	Ensure that the DUT is ready to initiate ARC. Broadcast a <Report Physical Address>. Send a <Initiate ARC> to the DUT.	The DUT sends a <Report ARC Initiated>.
	11.2.17-9	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Invoke the DUT to send a <Request ARC Termination>.	The DUT sends a <Request ARC Termination >.
	11.2.17-10	Ensure that ARC has been initiated. Ensure that the DUT is ready to terminate ARC. Broadcast a <Report Physical Address>. Sends a <Terminate ARC> to the DUT.	The DUT sends a <Report ARC Terminated>.
	11.2.17-11	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Broadcast a <Report Physical Address>. Sends a <Initiate ARC> to the DUT.	The DUT does not send a <Report ARC Initiated>.
	11.2.17-12	Ensure that the VA-1831 connects to the input of DUT that is not supported ARC. Broadcast a <Report Physical Address>. Sends a <Initiate ARC> to the DUT.	The DUT does not send a <Report ARC Initiated>.

6.2.40 CECT 11.3 CEC Switch

If you select “ALL TEST”, each Test ID starts.　If you click Test ID number, only the selected test starts.　Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
Give Device Power Status			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	11.3.1-1	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast an <Active Source>[1.1.0.0].	The DUT does not switch.
	11.3.1-2	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast an <Active Source>[1.2.0.0].	The DUT switches to Position 2.
	11.3.1-3	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast a <Set Stream Path>[1.1.0.0].	The DUT does not switch.
	11.3.1-4	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast a <Set Stream Path >[1.2.0.0].	The DUT switches to Position 2.

	11.3.1-5	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast a <Routing Change>[0.0.0.0][1.0.0.0].	The DUT broadcasts a <Routing Information>[1.1.0.0].
	11.3.1-6	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Broadcast a <Routing Information> [1.0.0.0].	The DUT broadcasts a <Routing Information>[1.1.0.0].
	11.3.2-1	Connect the output of DUT to the input of VA-1831. Connect the input of the DUT to the output of the VA-1831. Ensure the output of the DUT is at Position 1. Set the DUT to position 2.	The DUT broadcasts a <Routing Change>[1.1.0.0][1.2.0.0].

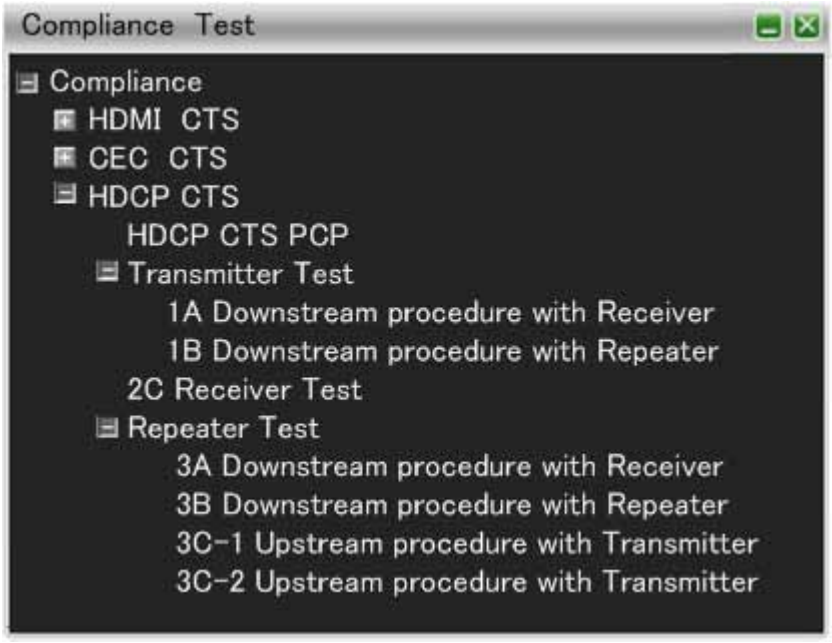
6.2.41 CECT 12 Invalid Message Tests

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.

Item		Required Test Method	PASS criteria
Invalid Message Tests			
	Connect the HDMI output of DUT to the HDMI input of VA-1831.		
	12-1	The VA-1831 sends the command with a direct address to the DUT while it is supposed to be broadcast.	The DUT ignores the message.
	12-2	The VA-1831 broadcast a message while it is supposed to be sent with direct address to the DUT.	The DUT ignores the message.
	12-3	The VA-1831 send unsupported message to the DUT.	The DUT ignores the message.

6.3 HDCP CTS

Display HDCP CTS items.

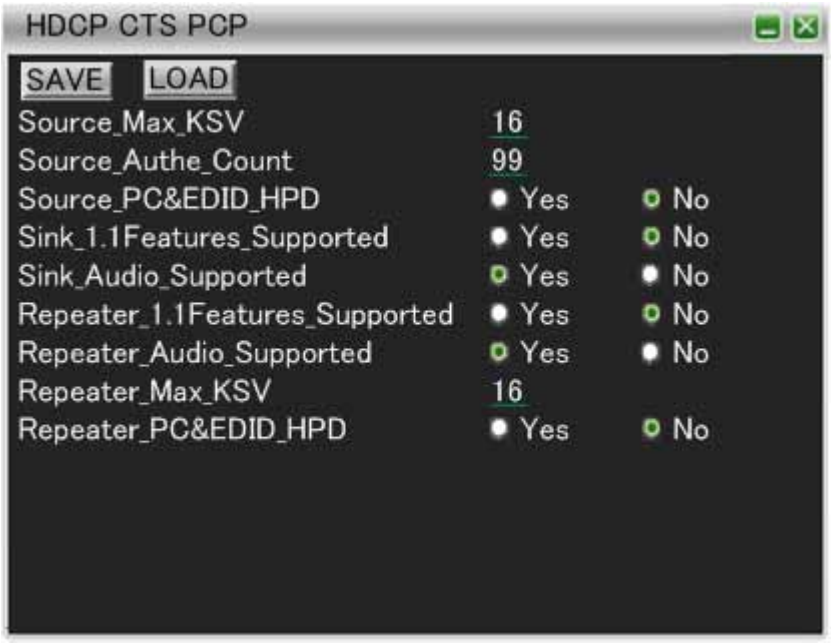


6.3.1 HDCP CTS PCP

Set the spec of the DUT in the PCP (Product Capability Parameter) for performing HDCP CTS.

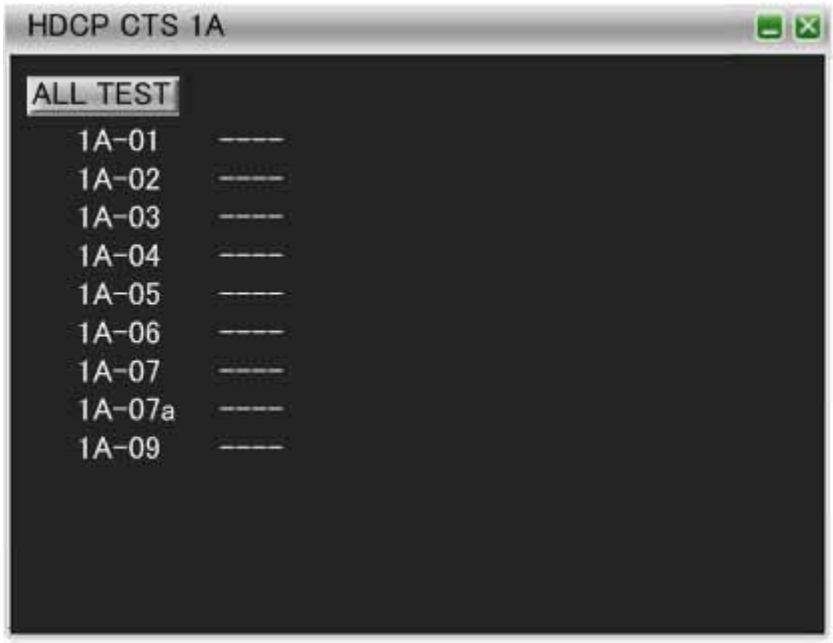
By pressing SAVE, the CDF data is saved.

By pressing LOAD, the CDF data can be read.



6.3.2 1A Downstream procedure with Receiver

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
1A –01 Regular procedure : With HDMI-capable Receiver			
	Connect the DUT output to VA-1831.		
	TP01	TE asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that the 1st Part Authentication is started.	The 1st Part Authentication must be started.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0’ are read before HDCP Encryption is applied.	Two bytes of R0’ must be read before HDCP Encryption is applied.
	T301	Check that Ri’ is read within 3.5 seconds.	Ri’ must be read within 3.5 seconds.
	T301	Check that 2 bytes of Ri’ are read.	Two bytes of Ri’ must be read.
	TT02	Check that the images are displayed properly on the VA-1831.	The YES button must be pressed after checking that the images are displayed properly on the VA-1831.

* TT01 is not supported. * TT02: Audio-related tests are not supported.

Item		Required Test Method	PASS criteria
1A –02 Regular procedure : HPD after writing Aksv			
	Connect the DUT output to VA-1831.		
	TP01	TE asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check the An and Aksv are written.	An and Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
		Check that Aksv is written.	Aksv is written.
		VA-1831 de-asserts HPD.	
		VA-1831 asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	The DUT must disable the HDCP Encryption.
		Check that the DUT proceeds with re-authentication.	

Item		Required Test Method	PASS criteria
1A –03 Regular procedure : HPD after starting third part of authentication			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that the 1st Part Authentication is started.	The 1st Part Authentication must be started.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0’ are read before HDCP Encryption is applied.	Two bytes of R0’ must be read before HDCP Encryption is applied.
	T301	Check that Ri’ is read within 3.5 seconds.	Ri’ is read within 3.5 seconds.
	T301	Check that 2byteRead is performed to Ri’.	Ri’ is performed by 2byteRead.
		VA-1831 de-asserts HPD.	
		VA-1831 asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	The DUT must disable the HDCP Encryption.
		Check that the DUT proceeds with re-authentication.	DUT starts re-recognition.

Item		Required Test Method	PASS criteria
1A –04 Irregular procedure : HDCP port access			
	Connect the DUT output to VA-1831.		
		In the VA-1831, set so that EDID can be read, and set the HDCP port to the access disabled status.	
		VA-1831 asserts HPD.	
		Check that the video signal is sent.	Video signal is sent out.
		Check that the DUT tries to access the VA-1831 after asserting HPD.	The DUT must try to access the VA-1831 after asserting HPD.
		Check that access is tried 4 seconds after the previous access.	Access must be tried 4 seconds after the previous access.

Item		Required Test Method	PASS criteria
1A –05 Irregular procedure : Verify Bksv			
	Connect the DUT output to VA-1831.		
		Set an illegal Bksv in VA-1831 (all 0's).	
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bksv are read and that An and Aksv are written.	Bksv are read and that An and Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
		Check that the DUT reads Bksv a multiple number of times.	DUT reads Bksv a multiple number of times.
		Check that the DUT does not read R0' after reading the illegal Bksv.	The DUT must not read R0' after reading the illegal Bksv.
		Check that HDCP Encryption is not initiated after the DUT has read the illegal Bksv.	HDCP Encryption must not be initiated after the DUT has read the illegal Bksv.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
1A –06 Irregular procedure : Verify R0'			
	Connect the DUT output to VA-1831.		
		Set an illegal R0' in VA-1831 (all 0's).	
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
		Check that 2byteRead is performed to Ri'.	2byteRead is performed to Ri'.
		Check that R0' is read 100 ms after Aksv has been written.	R0' is read 100 ms after Aksv has been written.
		Check that HDCP Encryption is not initiated after the DUT has read the illegal R0'.	HDCP Encryption must not be initiated after the DUT has read the illegal R0'.

		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

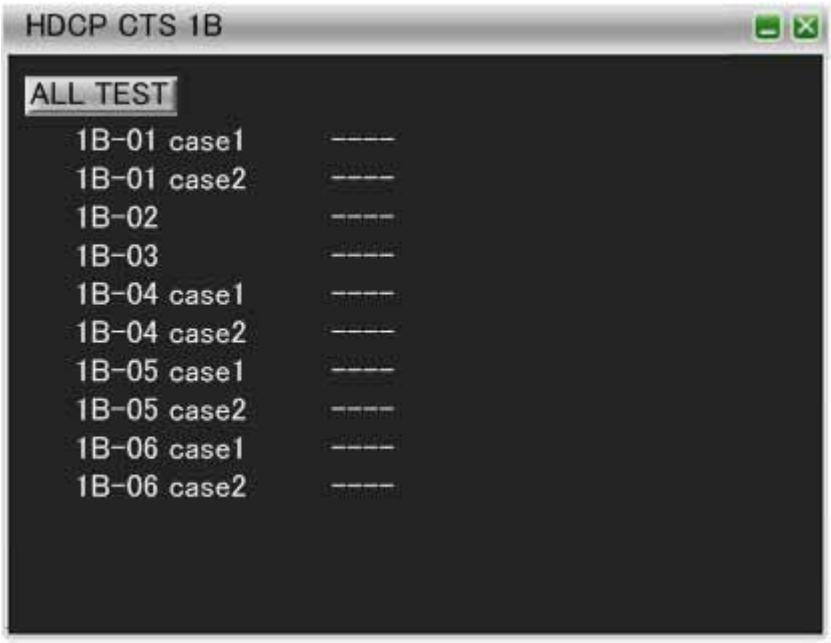
Item		Required Test Method	PASS criteria
1A -07 Irregular procedure : Verify Ri'			
	Connect the DUT output to VA-1831.		
		Set an illegal Ri' in VA-1831 (all 0's).	
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0' is read 100 ms after Aksv has been written.	R0' is read 100 ms after Aksv has been written.
	T104	Check that 2byteRead is performed to R0' before starting HDCP Encryption.	2byteRead is performed to R0' before starting HDCP Encryption.
		Check that 2byteRead is performed to Ri'.	2byteRead is performed to Ri'.
		Check that HDCP Encryption is set disable after the DUT has read the illegal Ri'.	HDCP Encryption is set disable after the DUT has read the illegal Ri'.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
1A –07a Irregular procedure : Verify Ri’			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ is read 100 ms after Aksv has been written.
	T104	Check that 2byteRead is performed to R0’ before starting HDCP Encryption.	2byteRead is performed to R0’ before starting HDCP Encryption.
		Check that 2byteRead is performed to Ri’.	2byteRead is performed to Ri’.
		Set HDCP Port of VA-1831 as not to be accessed.	
		Check that HDCP Encryption is set disable after the DUT can not read Ri’.	HDCP Encryption is set disable after the DUT can not read Ri’.
		Check that DUT tries to access after DUT can not read Ri’,	DUT tries to access after DUT can not read Ri’,
		Check that DUT is trying to access after 4 seconds of the previous access.	DUT is trying to access after 4 seconds of the previous access.

Item		Required Test Method	PASS criteria
1A –09 Regular procedure : With DVI Receiver			
	Connect the DUT output to VA-1831.		
		Set EDID of VA-1831 to DVI.	
	TP01	VA-1831 asserts HPD.	
	TP02	Check that video signal is sent out from the DUT.	Video signal is sent out from the DUT.
		Check that the DUT initiates the HDCP Encryption.	The DUT must initiate the HDCP Encryption.
	TT02	Check that the images are displayed properly on the VA-1831.	The OK button must be pressed after checking that the images are displayed properly on the VA-1831.

6.3.3 1B Downstream procedure with Repeater

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item	Required Test Method	PASS criteria
1B –01 Regular procedure : With Repeater		
Connect the DUT output to VA-1831.		
TP01	VA-1831 asserts HPD.	
TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
TP03	Change to the HDMI mode after receiving Data Island.	
TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
T102	Check that Aksv is written after An.	Aksv must be written after An.
T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ is read 100 ms after Aksv has been written.
T104	Check that 2byteRead is performed to R0’ before starting HDCP Encryption.	2byteRead is performed to R0’ before starting HDCP Encryption.
T202	Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
Case1 DEVICE_COUNT is a non-zero value		
T203	Check that KSV FIFO in the count corresponding to the Device Count value is read.	KSV FIFO in the count corresponding to the Device Count value must be read.
T204	Check that all V’ are read.	All V’ must be read.
Case2 DEVICE_COUNT is zero		
CaseA DUT does not read V’ or DUT reads only part of V’		

				Check that the Authentication is not completed.	Authentication is not completed.
				Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
		CaseB DUT reads all bytes of V'			
				Check that all V' are read.	All V' must be read.
	After passing Case1or Case2-B, go on to the following tests.				
			T301	Check that Ri' is read within 3.5 seconds.	Ri' is read within 3.5 seconds.
			T301	Check that 2byteRead is performed to Ri'.	2byteRead is performed to Ri'.
			TT02	Check that the images are displayed properly on the VA-1831.	The YES button must be pressed after checking that the images are displayed properly on the VA-1831.

Item		Required Test Method	PASS criteria
1B –02 Regular procedure : HPD after reading R0'			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0 is Read.	R0 is Read.
		VA-1831 De-asserts HPD.	
		VA-1831 asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	DUT does not perform HDCP Encryption.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
1B –03 Irregular procedure : Timeout of KSV list READY			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0’ are read before HDCP Encryption is applied.	Two bytes of R0’ must be read before HDCP Encryption is applied.
		Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
		After checking that the READY Bit is not asserted for 5 seconds, check that Encryption is set to Disable.	After checking that the READY Bit is not asserted for 5 seconds, Encryption must be set to Disable.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

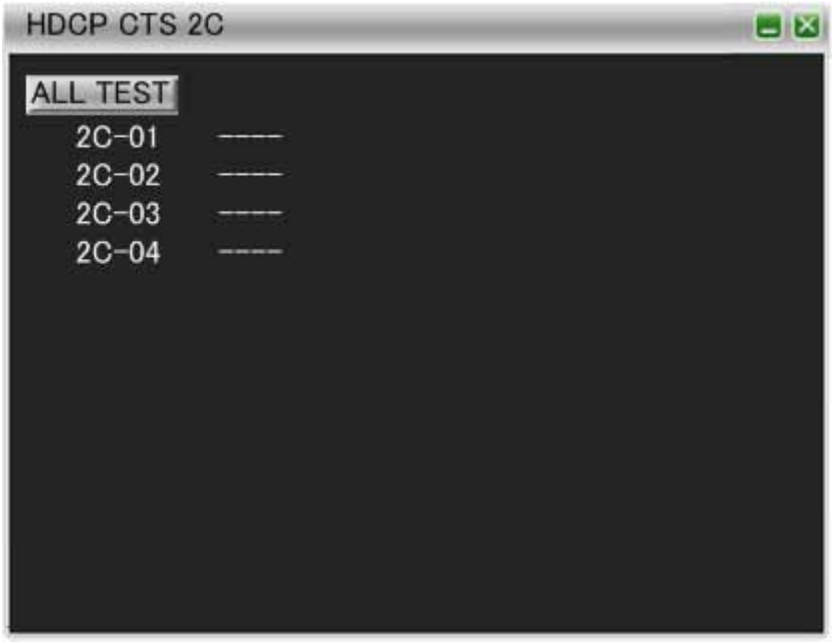
Item		Required Test Method	PASS criteria
1B –04 Irregular procedure : Verify V’			
	Connect the DUT output to VA-1831.		
		Set illegal V’ to the VA-1831.	
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0’ are read before HDCP Encryption is applied.	Two bytes of R0’ must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
	Case1 DEVICE_COUNT is a non-zero value		
	T203	Check that KSV FIFO in the count corresponding to the Device Count value is read.	KSV FIFO in the count corresponding to the Device Count value must be read.
	T204	Check that all V’ (illegal) are read.	All V’(illegal) must be read.
		Check that HDCP Encryption is set to Disable after reading the illegal V’.	HDCP Encryption must be set to Disable after reading the illegal V’.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
	Case2 DEVICE_COUNT is zero		
		Check that KSV FIFO is not Read.	KSV FIFO is not Read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
1B –05 Irregular procedure : MAX_DEVS_EXCEEDED			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that 1st Part Authentication starts.	1st Part Authentication starts.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Aksv is not facsimile Aksv.	Aksv must not be facsimile Aksv.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0' is read 100 ms after Aksv has been written.	R0' must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0' are read before HDCP Encryption is applied.	Two bytes of R0' must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0' has been read.	Bcaps must be read within 5 seconds after R0' has been read.
	Case1 Bstatus : MAX_DEVS_EXCEEDED bit to one and asserts Bcaps : Ready bit at the configured period after Aksv is written		
		Check that HDCP Encryption is set to Disable after Bstatus (MAX_DEVS_EXCEEDED) has been read.	HDCP Encryption must be set to Disable after Bstatus has been read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
	Case2 Bstatus : MAX_DEVS_EXCEEDED bit to one and does not asserts Bcaps : Ready bit		
		Check that HDCP Encryption is set to Disable after confirming READY Bit is not asserted for 5 seconds.	HDCP Encryption is set to Disable after confirming READY Bit is not asserted for 5 seconds.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
1B –06 Irregular procedure : MAX_CASCADE_EXCEEDED			
	Connect the DUT output to VA-1831.		
	TP01	VA-1831 asserts HPD.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps, Bksv are read and that An, Aksv are written.	Bcaps, Bksv are read and that An, Aksv are written.
	T102	Check that 1st Part Authentication starts.	1st Part Authentication starts.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Aksv is not facsimile Aksv.	Aksv must not be facsimile Aksv.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0' is read 100 ms after Aksv has been written.	R0' must be read 100 ms after Aksv has been written.
	T104	Check that 2 bytes of R0' are read before HDCP Encryption is applied.	Two bytes of R0' must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0' has been read.	Bcaps must be read within 5 seconds after R0' has been read.
	Case1 Bstatus : MAX_CASCADE _EXCEEDED bit to one and asserts Bcaps : Ready bit at the configured period after Aksv is written		
		Check that HDCP Encryption is set to Disable after Bstatus (MAX_DEVS_EXCEEDED) has been read.	HDCP Encryption must be set to Disable after Bstatus has been read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
	Case2 Bstatus : MAX_ CASCADE _EXCEEDED bit to one and does not asserts Bcaps : Ready bit		
		Check that HDCP Encryption is set to Disable after confirming READY Bit is not asserted for 5 seconds.	HDCP Encryption is set to Disable after confirming READY Bit is not asserted for 5 seconds.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

6.3.4 2C Receiver Test

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
2C –01 Regular procedure : With HDMI-capable Transmitter			
	Connect the output of VA-1831 to the input of DUT. (It is not necessary to input signal to the input of VA-1831.)		
	SP01	VA-1831 asserts HPD.	VA-1831 asserts HPD.
	SP02	Check that HDMI_Mode of Bstatus is 0.	HDMI_Mode of Bstatus is 0.
	SP03	VA-1831 outputs video signal.	
	SP03	Confirm the response from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP05	Read 5 bytes of KSV FIFO, and check that KSV FIFO is 0.	KSV FIFO must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv has been written.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0 is equal to R0’ after 100ms from Aksv Write.	R0 must be equal to R0’.
		Set HDCP Encryption to Enable.	
	S301	Check that Ri’ can be read by Short Read Format Access.	It must be possible to read Ri’ by Short Read Format Access.

	S301	Check that Ri is equal to Ri'.	Ri must be equal to Ri'.

* S302 is not supported.

Item		Required Test Method	PASS criteria
2C –02 Irregular procedure : (First part of authentication)New Authentication			
	Connect the output of VA-1831 to the input of DUT. (It is not necessary to input signal to the input of VA-1831.)		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP05	Read 5 bytes of KSV FIFO, and check that KSV FIFO is 0.	KSV FIFO must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		Read Bcaps and Bksv, and write An and Aksv.	
	S102	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0=R0' after 100 ms after 2nd Aksv has been written.	It must be R0 = R0'
		Set HDCP Encryption to Enable.	
	S301	Check that Ri' can be read by Short Read Format Access.	Ri' can be read by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri is equal to Ri'.

* S302 is not supported.

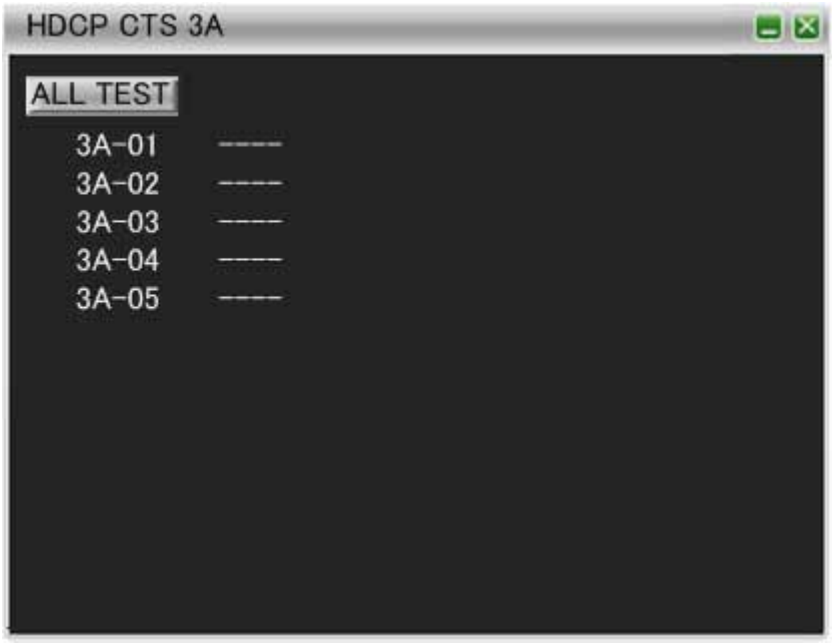
Item		Required Test Method	PASS criteria
2C –03 Irregular procedure : (Third part of authentication)New Authentication			
	Connect the output of VA-1831 to the input of DUT. (It is not necessary to input signal to the input of VA-1831.)		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP05	Read 5 bytes of KSV FIFO, and check that KSV FIFO is 0.	KSV FIFO must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv has been written.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0=R0' after 100 ms after Aksv has been written.	It must be R0 = R0'
		Set HDCP Encryption to Enable.	
	S301	Check that Ri' can be read by Short Read Format Access.	It must be possible to read Ri' by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri must be equal to Ri'.
		Set HDCP Encryption to Disable.	
		Read Bcaps and Bksv, and write An and Aksv.	
	S102	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0 is equal to R0', 100ms after the second Aksv Write.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S301	Check that Ri' can be read by Short Read Format Access.	It must be possible to read Ri' by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri must be equal to Ri'.

* S302 is not supported.

Item		Required Test Method	PASS criteria
2C –04 Regular procedure : With DVI Transmitter			
	Connect the output of VA-1831 to the input of DUT. (It is not necessary to input signal to the input of VA-1831.)		
		Check that the images are displayed properly on the DUT.	The YES button must be pressed after checking that the images are displayed properly on the DUT.

6.3.5 3A Downstream procedure with Receiver

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
3A –01 Regular procedure : With HDMI-capable Receiver			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that the 1st Part Authentication is started.	The 1st Part Authentication must be started.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0’ is read before HDCP Encryption is applied.	2byteR0’ must be read before HDCP Encryption is applied.
	T301	Check that Ri’ is read within 3.5 seconds.	Ri’ must be read within 3.5 seconds.
	T301	Check that Ri’ is 2byteRead.	Ri’ is 2byteRead.

	TT02	Check that the images are displayed properly on the DUT.	The YES button must be pressed after checking that the images are displayed properly on the DUT.

* TT01 is not supported.

Item		Required Test Method	PASS criteria
3A –02 Irregular procedure : HDCP port access			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
		In the TE, set so that EDID can be read, and set the HDCP port to the access disabled status.	
		VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
		Check that the DUT sends video signal.	The DUT sends video signal.
		Check that DUT tries to access after asserting HPD.	The DUT tries to access after asserting HPD.
		Check that the DUT tries to access 4 seconds after the previous access.	the DUT tries to access 4 seconds after the previous access.

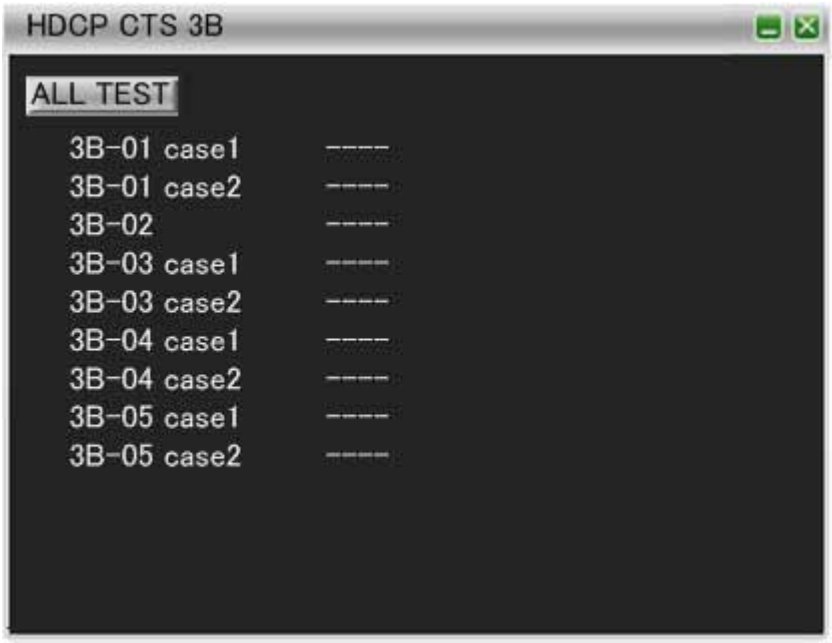
Item		Required Test Method	PASS criteria
3A –03 Irregular procedure : Verify Bksv			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
		Set an illegal Bksv in TE (all 0's).	
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bksv are read and that An and Aksv are written.	Bksv must be read, and An and Aksv must be written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
		Check that the DUT reads Bksv a multiple number of times.	The DUT must read Bksv a multiple number of times.
		Check that the DUT does not read R0' after reading the illegal Bksv.	The DUT must not read R0' after reading the illegal Bksv.
		Check that HDCP Encryption is not initiated after the DUT has read the illegal Bksv.	HDCP Encryption must not be initiated after the DUT has read the illegal Bksv.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
3A –04 Irregular procedure : Verify R0’			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
		Set an illegal R0’ in VA-1831. (all 0’s).	
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
		Check that Ri’ is 2byteRead.	Ri’ is 2byteRead.
		Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
		Check that HDCP Encryption is not initiated after the DUT has read the illegal R0’.	HDCP Encryption must not be initiated after the DUT has read the illegal R0’.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
3A –05 Regular procedure : With DVI Receiver			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
		Set VA-1831 to DVI.	
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that video signal is sent out.	Video signal is sent out.
		Check that the DUT initiates the HDCP Encryption.	The DUT must initiate the HDCP Encryption.
	TT02	Check that the images are displayed properly on the DUT.	The YES button must be pressed after checking that the images are displayed properly on the DUT.

6.3.6 3B Downstream procedure with Repeater

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
3B –01 Regular procedure : With Repeater			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0’ is read before HDCP Encryption is applied.	2byteR0’ must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
	Case1 DEVICE_COUNT is a non-zero value		
	T203	Check that KSV FIFO in the count corresponding to the Device Count value is read.	KSV FIFO in the count corresponding to the Device Count value must be read.
	T204	Check that all V’ are read.	All V’ must be read.

	Case2 DEVICE_COUNT is zero				
		CaseA DUT does not read V' or DUT reads only part of V'			
				Check that the Authentication is not completed.	Authentication is not completed.
				Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
		CaseB DUT reads all bytes of V'			
				Check that all V's are read.	All V's are read.
	When Case1 or Case2-B passes, go on to the following tests.				
			T301	Check that Ri' is read within 3.5 seconds.	Ri' is read within 3.5 seconds.
			T301	Check that Ri' is 2byteRead.	Ri' is 2byteRead.
			TT02	Check that the images are displayed properly on the DUT.	The YES button must be pressed after checking that the images are displayed properly on the DUT.

Item		Required Test Method	PASS criteria
3B –02 Irregular procedure : Timeout of KSV list READY			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0’ is read before HDCP Encryption is applied.	2byteR0’ must be read before HDCP Encryption is applied.
		Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
		After checking that the READY Bit is not asserted for 5 seconds, check that Encryption is set to Disable.	After checking that the READY Bit is not asserted for 5 seconds, Encryption must be set to Disable.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

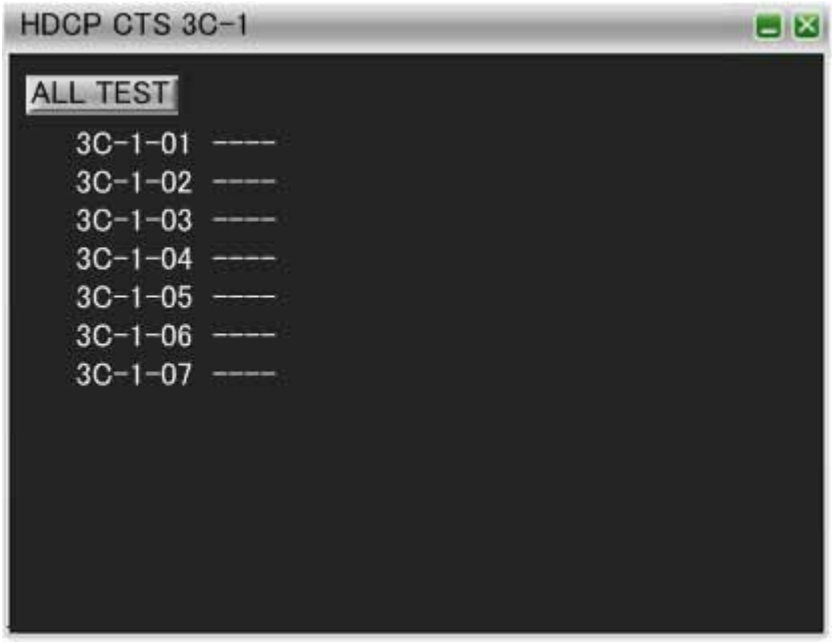
Item		Required Test Method	PASS criteria
3B –03 Irregular procedure : Verify V’			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
		Set an illegal V’ in VA-1831.	
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0’ is read before HDCP Encryption is applied.	2byteR0’ must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
	Case1 DEVICE_COUNT is a non-zero value		
	T203	Check that KSV FIFO in the count corresponding to the Device Count value is read.	KSV FIFO in the count corresponding to the Device Count value must be read.
	T204	Check that all V’ (illegal) are read.	All V’ (illegal) must be read.
		Check that HDCP Encryption is not initiated after the DUT has read the illegal V’.	HDCP Encryption must not be initiated after the DUT has read the illegal V’.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
	Case2 DEVICE_COUNT is zero		
		Check that KSV FIFO is not read.	KSV FIFO is not read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
3B –04 Irregular procedure : MAX_DEVS_EXCEEDED			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that 1st Part Authentication starts.	1st Part Authentication starts.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Aksv is not a facsimile Aksv.	Aksv is not a facsimile Aksv.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0’ is read 100 ms after Aksv has been written.	R0’ must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0’ is read before HDCP Encryption is applied.	2byteR0’ must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0’ has been read.	Bcaps must be read within 5 seconds after R0’ has been read.
	Case1 Bstatus : MAX_DEVS_EXCEEDED bit to one and asserts Bcaps : Ready bit at the configured period after Aksv is written		
		Check that the Bstatus is read.	The Bstatus must be read.
		Check that HDCP Encryption is set to Disable after Bstatus (MAX_DEVS_EXCEEDED) has been read.	HDCP Encryption must be set to Disable after Bstatus has been read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Required Test Method	PASS criteria
3B –05 Irregular procedure : MAX_CASCADE_EXCEEDED			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	TP01	VA-1831 asserts HPD.	
		The images and authentication are started from the VA-1831.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	TP03	Change to the HDMI mode after receiving Data Island.	
	TP04	After changing the VA-1831 to the HDMI mode, check that Authentication starts.	After VA-1831 changes to HDMI Mode, the Authentication starts.
	T101	Check that Bcaps and Bksv are read and that An and Aksv are written.	Bcaps and Bksv must be read, and An and Aksv must be written.
	T102	Check that 1st Part Authentication starts.	1st Part Authentication starts.
	T102	Check that Aksv is written after An.	Aksv must be written after An.
	T102	Check that Aksv is not a facsimile Aksv.	Aksv is not a facsimile Aksv.
	T102	Check that Ainfo is not written ahead of Aksv.	Ainfo must not be written ahead of Aksv.
	T103	Check that R0' is read 100 ms after Aksv has been written.	R0' must be read 100 ms after Aksv has been written.
	T104	Check that 2 byteR0' is read before HDCP Encryption is applied.	2byteR0' must be read before HDCP Encryption is applied.
	T202	Check that Bcaps is read within 5 seconds after R0' has been read.	Bcaps must be read within 5 seconds after R0' has been read.
	Case1 Bstatus : MAX_CASCADE _EXCEEDED bit to one and asserts Bcaps : Ready bit at the configured period after Aksv is written		
		Check that HDCP Encryption is set to Disable after Bstatus (MAX_CASCADE_EXCEEDED) has been read.	HDCP Encryption must be set to Disable after Bstatus has been read.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.
	Case2 Bstatus : MAX_ CASCADE _EXCEEDED bit to one and does not asserts Bcaps : Ready bit		
		Check that HDCP Encryption is set to Disable after checking READY Bit is not asserted for 5 seconds.	HDCP Encryption is set to Disable after checking READY Bit is not asserted for 5 seconds.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

6.3.7 3C Upstream procedure with Transmitter

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
3C-1–01 Regular procedure: Transmitter – DUT - Receiver			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv has been written.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0=R0’ after 100 ms after Aksv has been written.	It must be R0 = R0’
	S104	Set HDCP Encryption to enable.	
	S201S	Check that the READY bit becomes 1 within 600 ms after Aksv has been written.	The READY bit must become 1 within 600 ms after Aksv has been written.

	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri' and Ri match.	Ri' and Ri must match.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-1–02 Regular procedure: HDCP_HPD signal caused by user operation			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv has been written.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0=R0' after 100 ms after Aksv has been written.	It must be R0 = R0'
	S104	Set HDCP Encryption to enable.	
	S201S	Check that the READY bit becomes 1 within 600 ms after Aksv has been written.	The READY bit must become 1 within 600 ms after Aksv has been written.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri' and Ri match.	Ri' and Ri must match.
		VA-1831 asserts HPD.	
		Check that the DUT De-Asserts HPD.	The DUT De-Asserts HPD.
		Check that the DUT is De-asserting HPD for more than 100ms.	the DUT is De-asserting HPD for more than 100ms.
		Check that the DUT asserts HPD.	DUT asserts HPD.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-1–03 Irregular procedure: (First part of authentication) New Authentication			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		Read Bcaps and Bksv, and write An and Aksv. Different An should be used from the previously written one.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201S	Check that the Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri' and Ri match.	Ri' and Ri must match.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-1–04 Irregular procedure: (Second part of authentication) New Authentication			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
	S201S	Check that the Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.
		Set HDCP Encryption to disable.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201S	Check that the Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.

	S301	Check that Ri' and Ri match.	Ri' and Ri must match.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-1–05 Irregular procedure: (Third part of authentication) New Authentication			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
	S201S	Check that the Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri' and Ri match.	Ri' and Ri must match.
		Set HDCP Encryption to disable.	
		Read Bcaps and Bksv, and write An and Aksv. Different An should be used from the previously written one.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.

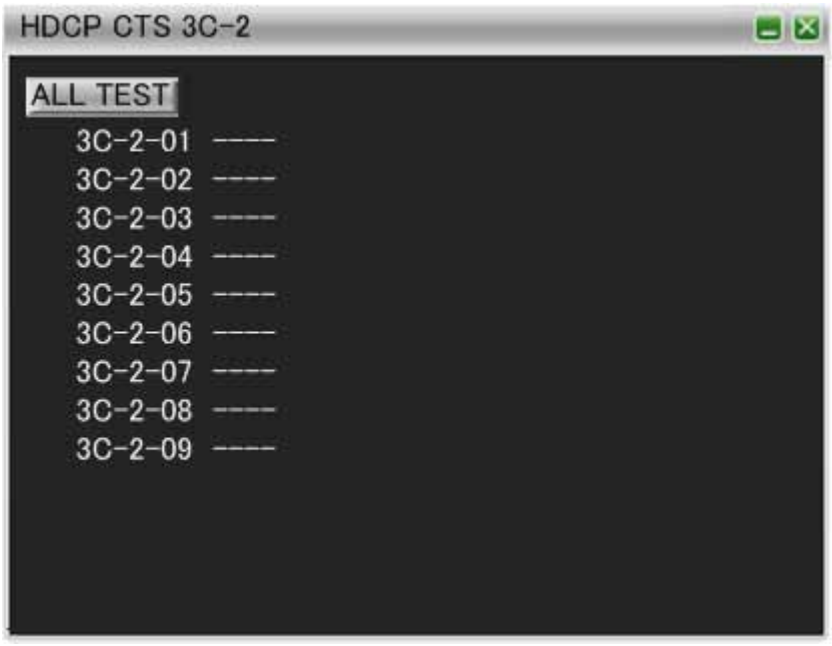
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		Check that R0 is equal to R0'.	R0' is equal to R0.
		Set HDCP Encryption to Enable.	
	S201S	Check that the Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 600 ms after Aksv Write.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202S	Check that DEPTH of Bstatus is 1.	DEPTH of Bstatus must be 1.
	S202S	Check that DEVICE_COUNT of Bstatus is 1.	DEVICE_COUNT Bstatus must be 1.
	S203S	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204S	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri' is equal to Ri.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-1–06 Irregular procedure: (Second part of authentication) Verify Bksv			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
		Set illegal Bksv (all 0) to VA-1831.	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds, and this is not asserted by the DUT.	DUT does not assert Bcaps:READY Bit.

Item		Required Test Method	PASS criteria
3C-1–07 Irregular procedure: (Second part of authentication) Verify R0’			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0 is equal to R0’ 100ms after Aksv Write.	R0 must be equal to R0’.
	S104	Set HDCP Encryption to Enable.	
		Set illegal Ri’ (all 0) to VA-1831.	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds, and this is not asserted by the DUT.	DUT does not assert Bcaps:READY Bit.

If you select “ALL TEST”, each Test ID starts. If you click Test ID number, only the selected test starts. Here explains the test sequence of VA-1831.



Item		Required Test Method	PASS criteria
3C-2–01 Regular procedure: Transmitter - DUT - Repeater+Receiver			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0 is equal to R0’ 100ms after Aksv Write.	R0 must be equal to R0’.
	S104	Set HDCP Encryption to Enable.	
	S201R	Check that the Bcaps:READY bit becomes 1 within 1200 ms after Aksv Write.	The Bcaps:READY bit becomes 1 within 1200 ms after Aksv Write.
	S202R	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.

	S202R	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202R	Check that DEPTH of Bstatus is not 2.	DEPTH of Bstatus must not be 2.
	S202R	Check that DEVICE_COUNT of Bstatus is not 2.	DEVICE_COUNT Bstatus must not be 2.
	S203R	Check that KSV FIFO of the DUT matches BKSV of VA-1831.	KSV FIFO of the DUT must match BKSV of VA-1831.
	S204R	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' is read by Short Read Format Access.	Ri' is read by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri' is equal to Ri.

* S302 is not supported.

Item		Required Test Method	PASS criteria
3C-2–02 Regular procedure: HDCP_HPD after writing Aksv			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
		VA-1831 de-asserts HOTPLUF for 100 ms after Aksv has been written.	
		Check that the DUT de-asserts HOTPLUG.	The DUT must de-assert HOTPLUG.
		Check that the DUT de-asserts HOTPLUG for 100 ms or more.	The DUT must de-assert HOTPLUG for 100 ms or more.
		Check that the DUT asserts HOTPLUG.	The DUT must assert HOTPLUG.

Item		Required Test Method	PASS criteria
3C-2–03 Regular procedure: HDCP_HPD after reading R0’			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0 is equal to R0’ 100ms after Aksv Write.	R0 must be equal to R0’.
	S104	Set HDCP Encryption to Enable.	
		VA-1831 de-asserts HOTPLUF for 100 ms after R0’ has been read.	
		Check that the DUT de-asserts HOTPLUG.	The DUT must de-assert HOTPLUG.
		Check that the DUT de-asserts HOTPLUG for 100 ms or more.	The DUT must de-assert HOTPLUG for 100 ms or more.
		Check that the DUT asserts HOTPLUG.	The DUT must assert HOTPLUG.

Item		Required Test Method	PASS criteria
3C-2–04 Regular procedure: HDCP_HPD after starting third part of authentication			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
	S201PR	Check that Bcaps:READY Bit becomes 1 within +600ms in addition to the period that Bcaps:READY Bit is asserted after Aksv is written that is set in VA-1831.	Bcaps:READY Bit becomes 1 within +600ms in addition to the period that Bcaps:READY Bit is asserted after Aksv is written that is set in VA-1831.
	S202PR	Check that MAX_DEVS_EXCEEDED of Bstatus is not 1.	MAX_DEVS_EXCEEDED of Bstatus is not 1.
	S202PR	Check that MAX_CASCADE_EXCEEDED of Bstatus is not 1.	MAX_CASCADE_EXCEEDED of Bstatus is not 1.
	S202PR	Check that DEPTH of Bstatus is +1 to the number that is set in the VA-1831.	DEPTH of Bstatus is +1 to the number that is set in the VA-1831.
	S202PR	Check that DEVICE_COUNT of Bstatus is +1 to the number that is set in the VA-1831.	DEVICE_COUNT of Bstatus is +1 to the number that is set in the VA-1831.
	S204R	Check that V' that is read by DUT and V of its own match.	V' that is read by DUT and V of its own match.
	S301	Check that Ri' can be read by Short Read Format .	It must be possible to read Ri' by Short Read Format Access.
	S301	Check that Ri is equal to Ri'.	Ri' is equal to Ri.
		VA-1831 de-asserts HOTPLUF for 100 ms after Ri' has been read.	
		Check that the DUT de-asserts HOTPLUG.	The DUT must de-assert HOTPLUG.
		Check that the DUT de-asserts HOTPLUG for 100 ms or more.	The DUT must de-assert HOTPLUG for 100 ms or more.
		Check that the DUT asserts HOTPLUG.	The DUT must assert HOTPLUG.

Item		Required Test Method	PASS criteria
3C-2–05 Irregular procedure: (Second part of authentication) Verify V’			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S103	Check that R0’ can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0’ by Short Read Format Access.
	S103	Check that R0 is equal to R0’ 100ms after Aksv Write.	R0 must be equal to R0’.
	S104	Set HDCP Encryption to Enable.	
		Set illegal V’ to VA-1831.	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds after confirmation of R0’ of DUT, and this is not asserted by the DUT.	DUT does not assert Bcaps:READY Bit.

Item		Required Test Method	PASS criteria
3C-2–06 Irregular procedure: (Second part of authentication) DEVICE_COUNT			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test. Set Repeater_Max_KSV in the HDCP PCP.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
		VA-1831 sets Bstatus as below. Bstatus: DEVICE_COUNT = Repeater_Max_KSV	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds after confirmation of R0' of the DUT.	
		Check that MAX_DEVS_EXCEEDED of Bstatus is 1.	MAX_DEVS_EXCEEDED of Bstatus is 1.

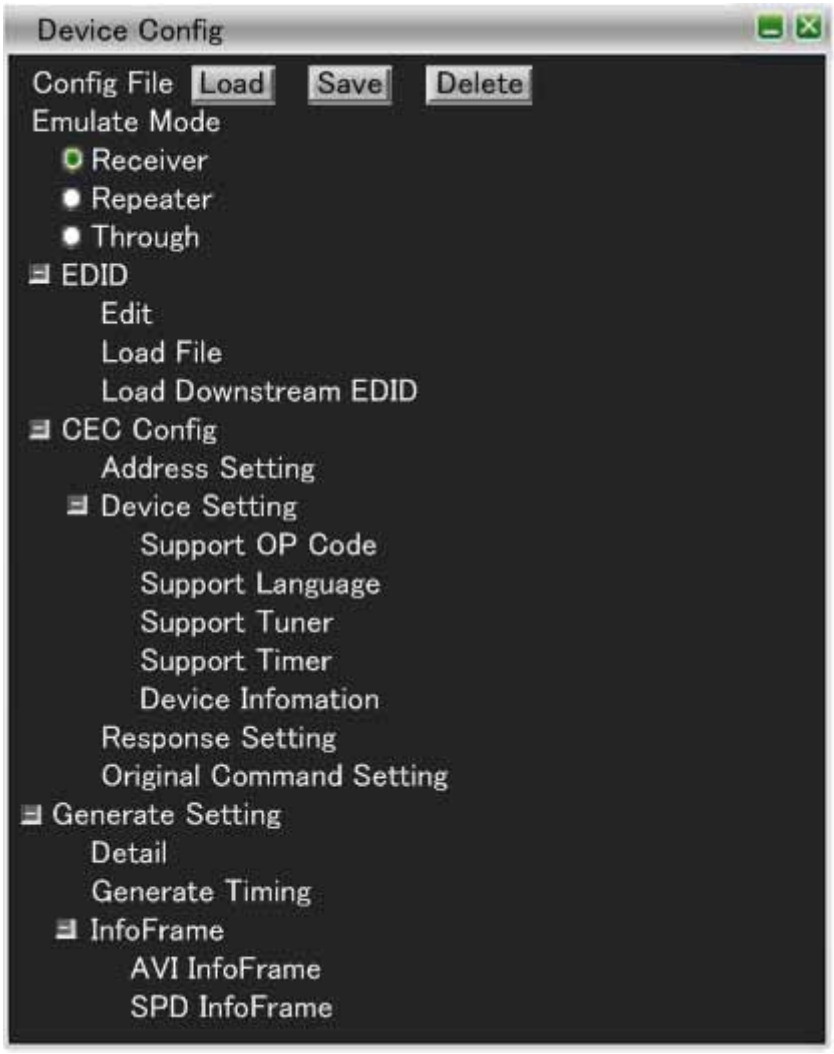
Item		Required Test Method	PASS criteria
3C-2–07 Irregular procedure: (Second part of authentication) DEPTH			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
		VA-1831 sets Bstatus as below. Bstatus: DEPTH = 7 Bstatus: DEVICE_COUNT = 7	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds after confirmation of R0' of the DUT.	
		Check that MAX_DEVS_EXCEEDED of Bstatus is 1.	MAX_DEVS_EXCEEDED of Bstatus is 1.

Item		Required Test Method	PASS criteria
3C-2–08 Irregular procedure: (Second part of authentication) MAX_DEVS_EXCEEDED			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
		VA-1831 sets Bstatus as below. Bstatus: MAX_DEVS_EXCEEDED bit = 1	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds after confirmation of R0' of the DUT.	
		Check that MAX_DEVS_EXCEEDED of Bstatus is 1.	MAX_DEVS_EXCEEDED of Bstatus is 1.

Item		Required Test Method	PASS criteria
3C-2–09 Irregular procedure: (Second part of authentication) MAX_CASCADE_EXCEEDED			
	Connect the DUT output to the VA-1831 input and the VA-1831 output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
	SP03	The VA-1831 outputs the video signals.	
	SP03	Confirm the reply from Read Bksv.	There is response from Read Bksv.
	SP04	Check that the Reserve area is 0.	The Reserve area must be 0.
	SP06	Check that HDMI_MODE of Bstatus is 1.	HDMI_MODE of Bstatus must be 1.
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is 1.	Bcaps: REPEATER Bit must be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bcaps:READY Bit is not 1.	Bcaps:READY Bit is not 1.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S103	Check that R0' can be read by Short Read Format Access 100 ms after Aksv Write.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0' 100ms after Aksv Write.	R0 must be equal to R0'.
	S104	Set HDCP Encryption to Enable.	
		VA-1831 sets Bstatus as below. Bstatus: MAX_CASCADE_EXCEEDED bit = 1 Bstatus: DEPTH = 7 Bstatus: DEVICE_COUNT = 7	
		Check that the VA-1831 reads Bcaps:READY Bit from DUT once in 100ms within 5 seconds after confirmation of R0' of the DUT.	
		Check that MAX_DEVS_EXCEEDED of Bstatus is 1.	MAX_DEVS_EXCEEDED of Bstatus is 1.

7 Device Config

The data which has been set can be stored in the VA-1831 or USB flash memory by selecting settings using Device Config. The stored setting data can then be read out.



7.1 Config File

Save, Load or Delete for Config File can be opened.

7.1.1 Save

When Save is selected, the window shown below opens, and the Config data which was set using Device Config can be stored.

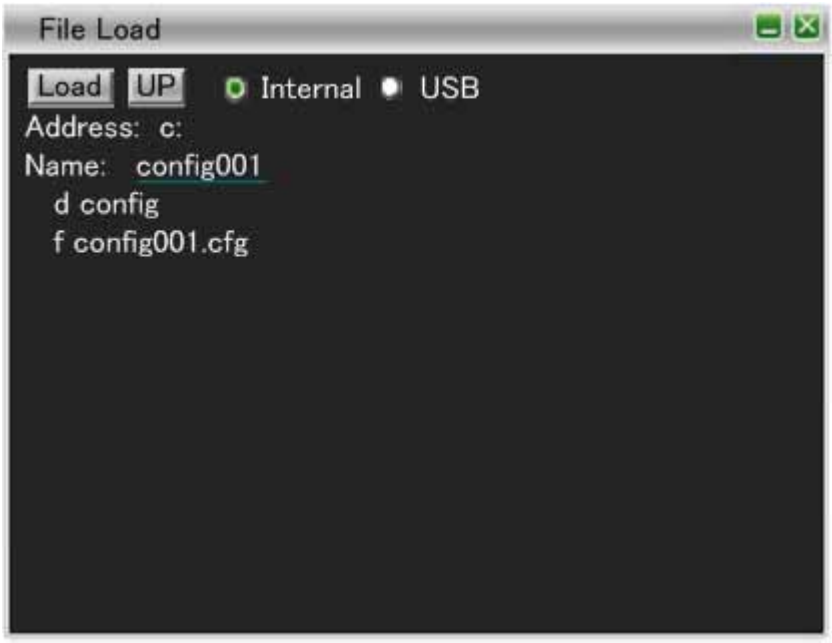
Item	Description
Save	This is used to store the Config data in the .cfg file whose name was set using Name.
Make Folder	This is used to create the folder set by Name.
UP	This is used to move to the next folder up.
Internal	When the check is placed in Internal, the Config data is saved or a folder is created in VA-1831.
USB	When the check is placed in USB, the Config data is saved or a folder is created in the USB flash memory.
Address	The address for storing the setting data or creating the folder is displayed here.
Name	The name of the address for storing the setting data or creating the folder is set here.

7.1.2 Load

When Load is selected, the window shown below opens, and the stored Config data can be loaded.

Config data is contained as samples in d Config inside Internal.

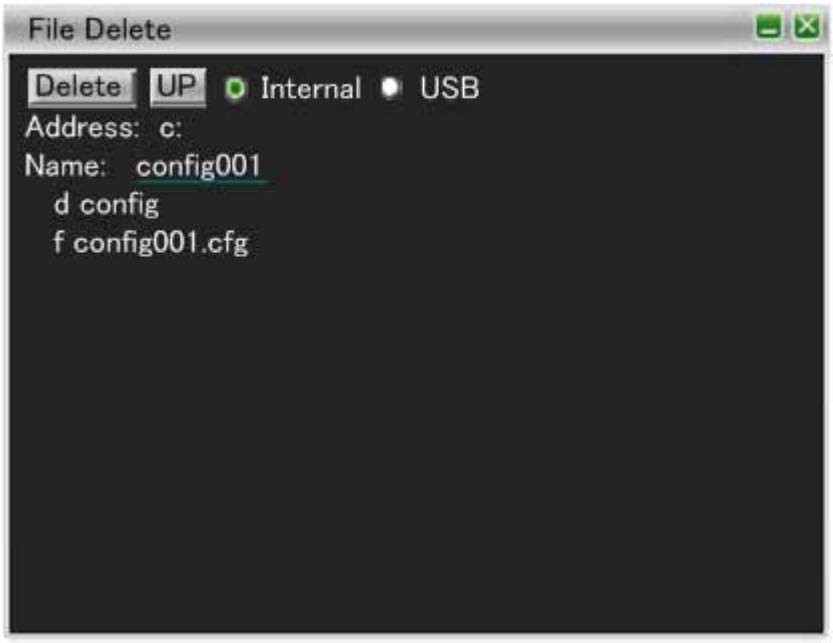
For details on the internal data, refer to page 162.



Item	Description
Load	This is used to load the .cfg file whose name was set using Name.
UP	This is used to move to the next folder up.
Internal	When the check is placed for Internal, the data in the VA-1831 is loaded.
USB	When the check is placed for USB, the data in the USB flash memory is loaded.
Address	The address whose setting data is to be loaded is displayed here.
Name	The name of the address whose setting data is to be loaded is set here.

7.1.3 Delete

When Delete is selected, the window shown below opens, and the stored Config data can be deleted.



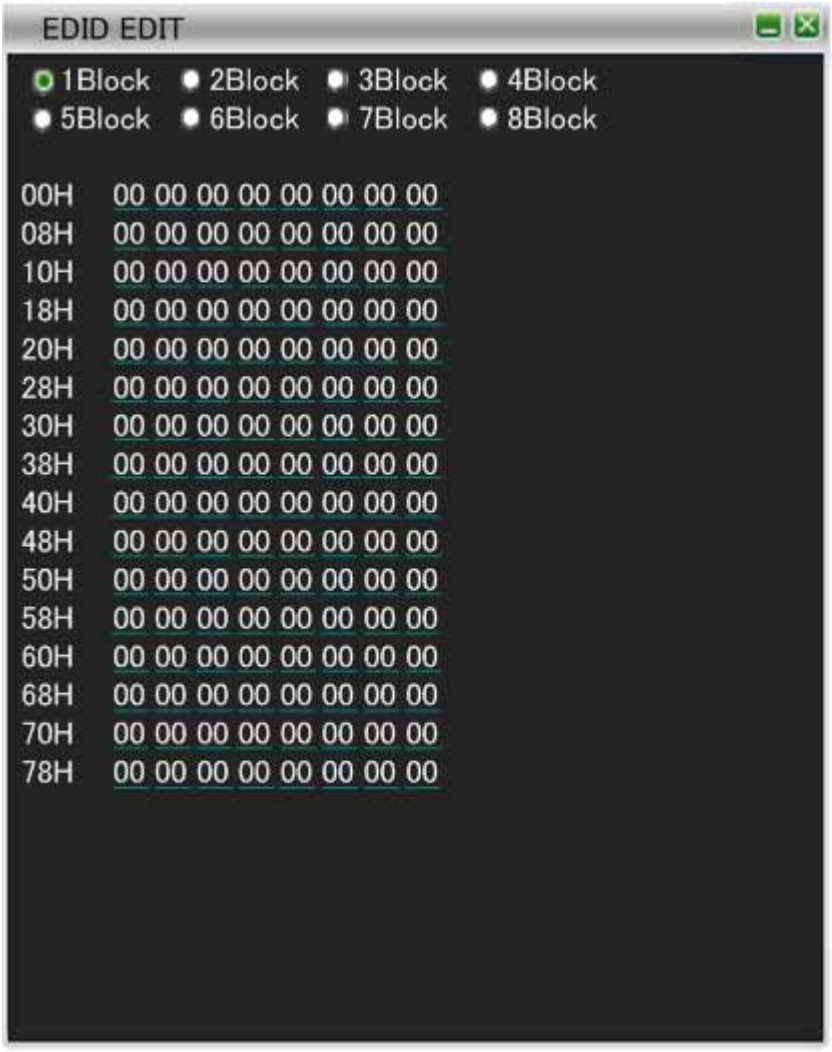
Item	Description
Delete	This is used to delete the .cfg file or folder whose name was set using Name.
UP	This is used to move to the next folder up.
Internal	When the ◉ check is placed for Internal, the data or folder in the VA-1831 is deleted.
USB	When the ◉ check is placed for USB, the data or folder in the USB flash memory is deleted.
Address	The address whose setting data is to be deleted is displayed here.
Name	The name of the address or folder to be deleted is set here.

7.2 Emulate Mode

Item	Description
Receiver	This is used to set the Config data to be stored as the Receiver Mode.
Repeater	This is used to set the Config data to be stored as the Repeater Mode.
Through	This is used to set the Config data to be stored as the Through Mode.

7.3 EDID (Edit)

The EDIDs are displayed and changed on this screen.



Item	Description
X Block	The EDID of block X can be displayed or changed.

7.4 EDID (Load File)

Open the window shown in section “7.1.2 Load,” and use this to load only the EDIDs of the stored Config data.

* If the VA-1809 is available, its DDC files or EDI files can also be loaded.
In other cases, the data is loaded using the binary format.

7.5 Load Downstream EDID

Use this to load the downstream EDIDs.

7.6 CEC Config

7.6.1 Address Setting

Use this to acquire the Logical Addresses.
For the setting items and further details, refer to section “4.2.7 Address Setting.”

7.6.2 Support OP Code

Use this to select the Support OP Codes.
For the setting items and further details, refer to section “4.2.8 Support OP Cod.”

7.6.3 Support Language

Use this to select the Support Language.
For the setting items and further details, refer to section “4.2.9 Support Language.”

7.6.4 Support Tuner

Use this to select the Support Tuner.
For the setting items and further details, refer to section “4.2.10 Support Tuner.”

7.6.5 Support Timer

Use this to set the Support Timer.
For the setting items and further details, refer to section “4.2.11 Support Timer.”

7.6.6 Response Setting

Use this to set the response to the data that has been received.
For the setting items and further details, refer to section “4.2.13 Response Setting.”

7.6.7 Original Command Setting

Use this to set the independent CEC commands.
For the setting items and further details, refer to section “4.2.14 Original Command Setting.”

7.7 Generate Setting

7.7.1 Detail

Use this to set the video signals, audio signals and HDCP to ON or OFF, and to set the packets and patterns for generating the signals.
For the setting items and further details, refer to section “5.1 General Setting.”

7.7.2 Generate Timing

Use this to set the video timing data.
For the setting items and further details, refer to section “5.2.1 GenerateTiming.”

7.7.3 AVI InfoFrame

Use this to set the AVI InfoFrame.
For the setting items and further details, refer to section “5.2.2 AVI Infoframe.”

7.7.4 SPD InfoFrame

Use this to set the SPD InfoFrame.
For the setting items and further details, refer to section “5.2.3 SPD Infoframe.”

7.7.5 Audio InfoFrame

Use this to set the Audio InfoFrame.
For the setting items and further details, refer to section “5.2.4 Audio Infoframe.”

7.7.6 MPEG InfoFrame

Use this to set the MPEG InfoFrame.
For the setting items and further details, refer to section “5.2.5 MPEG Infoframe.”

7.7.7 Vendor Specific InfoFrame

Use this to set the Vendor Specific InfoFrame.
For the setting items and further details, refer to section “5.2.6 Vendor Specific Infoframe.”

7.7.8 Gamut MetaData Packet

Use this to set the Gamut MetaData Packet.
For the setting items and further details, refer to section “5.2.7 Gamut Meta Data Packet.”

7.7.9 ACP Packet

Use this to set the ACP Packet.
For the setting items and further details, refer to section “5.2.8 ACP Packet.”

7.7.10 ISRC Packet

Use this to set the ISRC Packet.
For the setting items and further details, refer to section “5.2.9 ISRC Packet.”

7.7.11 Other InfoFrame

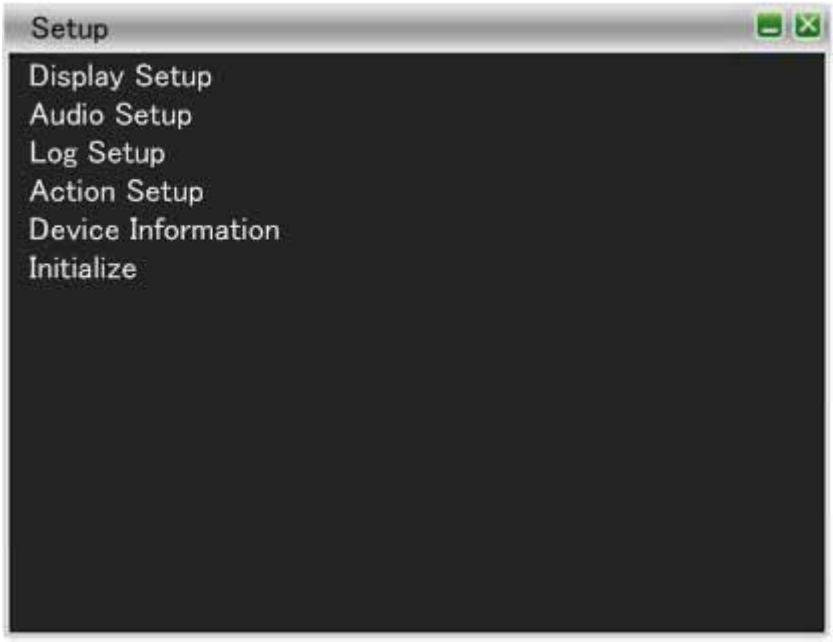
Use this to set the independent packets.
For the setting items and further details, refer to section “5.2.10 Other.”

7.7.12 Audio

Use this to set the audio.
For the setting items and further details, refer to section “5.2.11 Audio.”

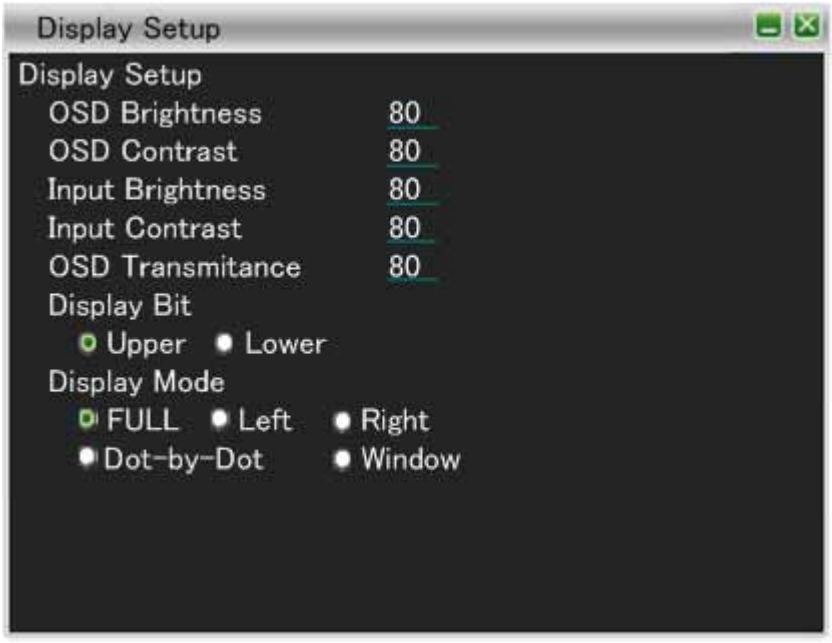
8 Setup

The items shown in the figure below are set on the Setup screen.



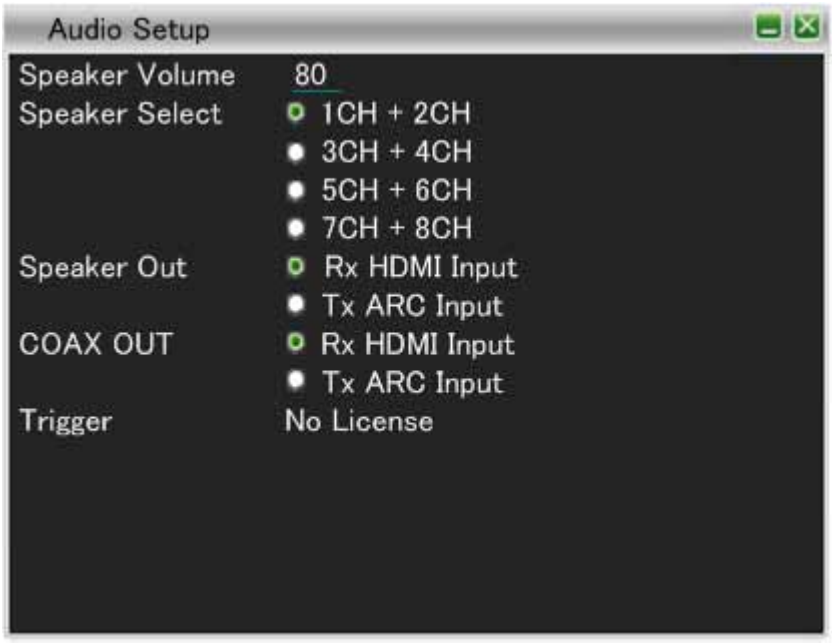
8.1 Display Setup

The LCD settings are selected on the Display Setup screen.



Item	Description	
OSD Brightness	The brightness of the OSD areas is set here. The setting can be changed to any value from 0 to 100.	
OSD Contrast	The contrast of the OSD areas is set here. The setting can be changed to any value from 0 to 100.	
Input Brightness	The brightness of the LCD (areas other than the OSD areas) is set here. The setting can be changed to any value from 0 to 100.	
Input Contrast	The contrast of the LCD (areas other than the OSD areas) is set here. The setting can be changed to any value from 0 to 100.	
OSD Transmittance	The transparency of the OSD displays is set here. The setting can be changed to any value from 0 to 100.	
Display Bit	The area of the color gradations to be displayed (YCbCr->RGB) after the color spaces on the LCD is set here.	
Display Mode	FULL	Input image is displayed in by the whole display.
	Left	Left image of 3D is displayed.
	Right	Right image of 3D is displayed.
	Dot-by-Dot	1-dot of LCD display the 1-dot of input image.
	Window	Input image is displayed in the Window.

8.2 Audio Setup



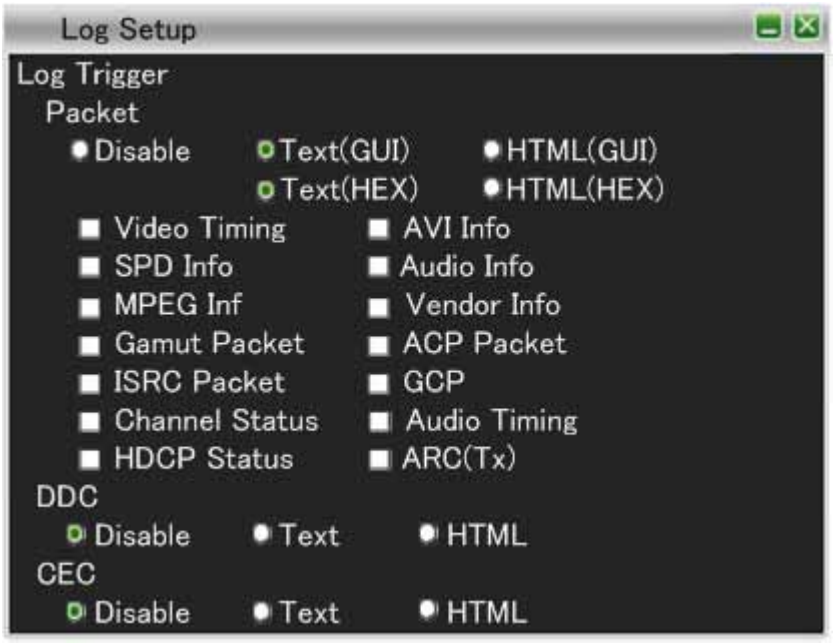
Item	Description
Speaker Volume	The speaker volume level is set here. The setting can be changed to any value from 1 to 100. ***2**
Speaker Select	The speaker channels for outputting the sound are set here.
Speaker Out	When Rx HDMI Input has been selected, the sound from HDMI is output to the speakers.
	When Tx ARC Input has been selected, the sound from ARC is output to the speakers.
COAX Out	When Rx HDMI Input has been selected, the sound from HDMI is output to the Coaxial connector.
	When Tx ARC Input has been selected, the sound from ARC is output to the Coaxial connector.
Trigger	Either Trigger output or I2S output is selected here. ***1**

***1: This function is optional. For details, consult an ASTRODESIGN sales representative.**
***2: When DSD signals are input, the Speaker Volume level will change but the setting itself remains the same.**

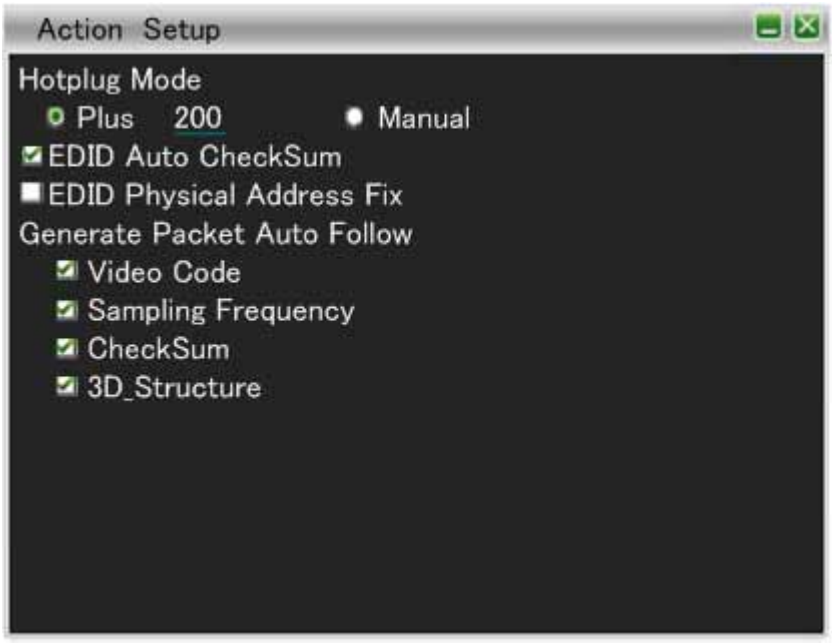
8.3 Log Setup

On the Log Setup screen, the logs of the items corresponding to the Packet ☑ check as well as the DDC and CEC logs are acquired

The logs can be acquired as Text or HTML files. No logs are acquired when Disable is selected.



8.4 Action Setup



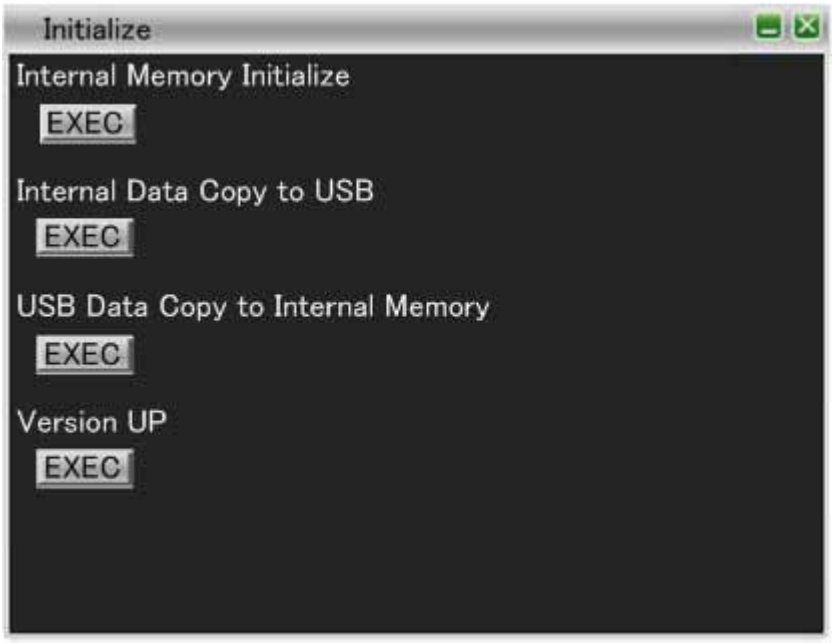
Item		Description
Hotplug Mode	Plus	During the period which has been set, the Hotplug output is set Low. The setting can be changed to any value from 1 to 200.
	Manual	When the HPD key is clicked, the Hotplug is set Low, and when it is clicked again, it is set High.
EDID Auto CheckSum		This is selected to set the EDID CheckSum automatically.
EDID Physical Address Fix		The Physical Address that is set in VA-1831 is fixed.
Generate Packet Auto Follow		When the Generate Timing setting is changed, the items among Video Code, Sampling Frequency and CheckSum with the ☑ checks are automatically changed to the values aligned with the Generate Timing setting.

8.5 Device Information

Item	Description
Firm Ware Version	The firmware version is displayed here.
CPU FPGA Version	The CPU FPGA version is displayed here.
HDMI FPGA Version	The HDMI FPGA version is displayed here.
Serial No.	The serial number of the VA-1831 is displayed here.
Mouse Speed	The mouse speed is set from 0-5 step.
IP Address	The IP Address can be set here.
Sub Net Mask	The sub net mask can be set here.
Gateway	The gateway can be set here.
Mac Address	The mac address of the VA-1831 is displayed here.
Calibration Value	The calibration value of the VA-1831 is displayed here.
Internal Timer	The time/date can be set here.
License	Whether there is a license is displayed here.

* The VA-1831 must be rebooted after the Ethernet and other settings have been changed.

8.6 Initialize



Item	Description
Internal Memory initialize	This is used to initialize the Config data stored in the VA-1831.
Internal Data Copy to USB	This is used to copy all the Config data stored in the VA-1831 into the USB flash memory here.
USB Data Copy to Internal Memory	This is used to copy all the Config data stored in the USB flash memory into the VA-1831 here.
Version UP	This is used to update the version.

⚠ CAUTION

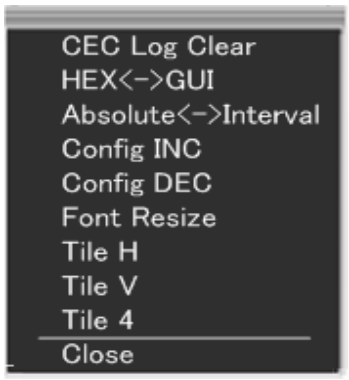
While  is displayed, do NOT turn off the power. Doing so will cause malfunctioning.

9 Sub Window

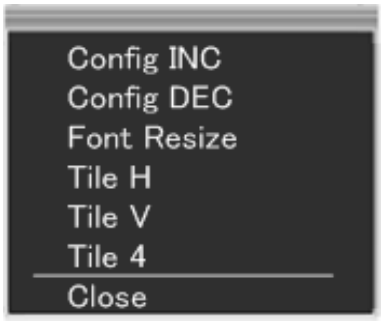
When the window is right-clicked, the sub windows shown below are opened.

(1) InfoFrame items of Source ANALYSIS (excluding General Control Packet) and Channel Status bit sub-window

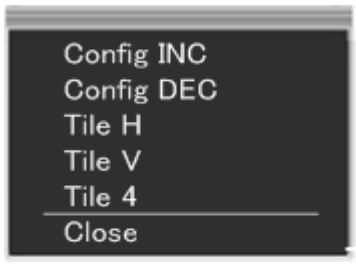
(2) DDC Monitor sub window



(3) CEC Monitor sub window



(4) Video Timing, General Control Packet, Audio Timing and HDCP Status sub window



(5) Sub window except (1)-(4), Audio, Timing and Compliance.

(6) Compliance sub window

(7) Sub Window of Audio Timing Monitor

Item	Function supported	Description
Config INC	(1)(2)(3)(4)(5)	This increments the program number of Config set in the VA-1831.
Config DEC	(1)(2)(3)(4)(5)	This decrements the program number of Config set in the VA-1831.
Tile H	(1)(2)(3)(4)(5)(6)	This displays two windows vertically.
Tile V	(1)(2)(3)(4)(5)(6)	This displays two windows horizontally.
Tile 4	(1)(2)(3)(4)(5)(6)	This displays four windows.
Font Resize	(1)(2)(3)(4)	This resizes the font.
HEX<->GUI	(1)(3)	This switches between the GUI display and HEX display.
DDC Log Clear	(2)	This clears the DDC Monitor logs.
CEC Log Clear	(3)	This clears the CEC Monitor logs.
Absolute<->Interval	(3)	This switches the display between the absolute time and interval time.
dB<->Value	(7)	This switches display between dB display and Value display.
Close	(1) (2) (3) (4) (5) (6) (7)	Close the Window.

10 Internal Data

10.1 EDID

The VA-1831 comes with sample data in the form of internal data.

The internal data is contained in d config inside Config File of Device Config.

The default settings are listed below.

- **SAMPLE1 (2D monitor capable of receiving a multiple number of formats)**
- SAMPLE2 (monitor using 1920X1080p as the Native Format)
- SAMPLE3 (monitor using 720X576p as Native Format)
- SAMPLE4 (monitor capable of receiving regular TV programs)
- SAMPLE5 (monitor capable of receiving a multiple number of audio signals)
- SAMPLE6 (monitor capable of receiving 3D mandatory signals)
- SAMPLE7 (monitor capable of receiving a multiple number of 3D formats)
- SAMPLE8 (HDMI1.0 monitor)
- SAMPLE9 (DVI monitor)
- SAMPLE10 (4-block monitor)
- CTS7-1_1 (EDID tests)
- CTS7-1_2 (EDID tests)
- CTS7-19_1 (Packet tests)
- CTS7-19_2 (Packet tests)
- CTS7-23 (RGB monitor)
- CTS7-24 (YCbCr monitor)
- CTS7-31 (Audio InfoFrame tests)
- CTS7-33_1 (DVI tests)
- CTS7-33_2 (DVI tests)
- CTS7-34 (Deep Color tests)
- CTS7-35 (xvYCC tests)
- CTS7-36 (High-Bit Rate Audio tests)
- CTS7-37 (One Bit Audio tests)
- CTS7-38_1 (3D mandatory tests)
- CTS7-38_2 (3D mandatory tests)
- CTS7-40 (Adobe RGB tests)

Video Format (SAMPLE1 to 10)

●: Native Format; ○: Format supported; −: Not supported

Internal program	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
[01]640x480p@59.94/60Hz	○	○	○	○	○	-	-	○	-	○
[02]720x480p@59.94/60Hz	●	○	○	●	-	○	○	●	-	●
[03]720x480p-w@59.94/60Hz	○	○	○	○	○	-	-	-	-	○
[04]1280x720p@59.94/60Hz	○	○	○	○	○	(1), (3)	(1), (3)	○	-	○
[05]1920x1080i@59.94/60Hz	○	○	○	○	●	(1), (2)	(2), (4)	○	-	○
[16]1920x1080p@59.94/60Hz	○	●	○	○	-	(3)	○	○	-	○
[17]720x576p@50Hz	○	○	●	○	-	-	-	○	-	○
[18]720x576p-w@50Hz	○	○	○	○	○	-	-	-	-	○
[19]1280x720p@50Hz	○	○	○	○	○	(1), (3)	(1), (3), (5)	○	-	○
[20]1920x1080i@50Hz	○	○	○	○	○	(1), (2)	(2), (4)	○	-	○
[31]1920x1080p@50Hz	○	○	○	○	-	(3)	○	○	-	○
[06]1440x480i@59.94/60Hz	○	○	○	○	○	-	-	-	-	○
[07]1440x480i-w@59.94/60Hz	○	○	○	○	○	-	-	-	-	○
[14]1440x480p@59.94/60Hz	-	-	-	-	○	-	-	-	-	○
[15]1440x480p-w@59.94/60Hz	-	-	-	-	○	-	-	-	-	-
[08]1440x240p@59.94/60Hz	-	-	-	-	-	-	-	-	-	○
[21]1440x576i@50Hz	○	○	○	○	○	-	-	-	-	○
[22]1440x576i-w@50Hz	○	○	○	○	○	-	-	-	-	○
[29]1440x576p@50Hz	-	-	-	-	○	-	-	-	-	○
[30]1440x576p-w@50Hz	-	-	-	-	○	-	-	-	-	-
[23]1440x288p@50Hz	-	-	-	-	-	-	-	-	-	○
[10]2880x480i@59.94/60Hz	-	-	-	-	○	-	-	-	-	○
[11]2880x480i-w@59.94/60Hz	-	-	-	-	○	-	-	-	-	-
[12]2880x240p@59.94/60Hz	-	-	-	-	-	-	-	-	-	○
[25]2880x576i@50Hz	-	-	-	-	○	-	-	-	-	○
[26]2880x576i-w@50Hz	-	-	-	-	○	-	-	-	-	-
[27]2880x288p@50Hz	-	-	-	-	-	-	-	-	-	○
[32]1920x1080p@23.97/24Hz	-	-	-	-	-	● (1), (2), (3)	● (1), (3), (5), (6), (7), (8)	-	-	○
[33]1920x1080p@25Hz	-	-	-	-	-	-	-	-	-	○
[34]1920x1080p@29.97/30Hz	-	-	-	-	-	(1), (3)	○	-	-	○
[46]1920x1080i@119.98/120Hz	-	-	-	-	-	-	-	-	-	○
[47]1280x720p@119.98/120Hz	-	-	-	-	-	-	-	-	-	○
[60]1280x720p@23.97/24Hz	-	-	-	-	-	(1)	○	-	-	-
[62]1280x720p@29.97/30Hz	-	-	-	-	-	(1)	○	-	-	-

(1) Also supports 3D FramePacking.
(2) Also supports 3D Side-by-Side (Half).
(3) Also supports 3D Top-and-Bottom.
(4) Also supports 3D Field Alternative.
(5) Also supports 3D Line Alternative.
(6) Also supports 3D Side-by-Side (Full).
(7) Also supports 3D L+Depth.
(8) Also supports 3D L+Depth+Graphics+Graphics-depth.

Video Format (Compliance EDID)

●: Native Format; ○: Format supported; -: Not supported

Internal program	CTS 7-1_1	CTS 7-1_2	CTS 7-19_1	CTS 7-19_2	CTS 7-23	CTS 7-24	CTS 7-27	CTS 7-31
[01] 640x480p@59.94/60Hz	○	○	○	○	○	○	○	○
[02] 720x480p@59.94/60Hz	●	●	●	●	●	●	●	●
[03] 720x480p-w@59.94/60Hz	○	○	○	○	○	○	○	○
[04] 1280x720p@59.94/60Hz	○	○	○	○	○	○	○	○
[05] 1920x1080i@59.94/60Hz	○	○	○	○	○	○	○	○
[16] 1920x1080p@59.94/60Hz	○	○	○	○	○	○	○	○
[17] 720x576p@50Hz	○	○	○	○	○	○	○	○
[18] 720x576p-w@50Hz	○	○	○	○	○	○	○	○
[19] 1280x720p@50Hz	○	○	○	○	○	○	○	○
[20] 1920x1080i@50Hz	○	○	○	○	○	○	○	○
[31] 1920x1080p@50Hz	○	○	○	○	○	○	○	○
[06] 1440x480i@59.94/60Hz	○	○	○	○	○	○	○	○
[07] 1440x480i-w@59.94/60Hz	○	○	○	○	○	○	○	○
[14] 1440x480p@59.94/60Hz	-	○	-	-	-	-	-	-
[15] 1440x480p-w@59.94/60Hz	-	-	-	-	-	-	-	-
[08] 1440x240p@59.94/60Hz	-	○	-	-	-	-	-	-
[21] 1440x576i@50Hz	○	○	○	○	○	○	○	○
[22] 1440x576i-w@50Hz	○	○	○	○	○	○	○	○
[29] 1440x576p@50Hz	-	○	-	-	-	-	-	-
[30] 1440x576p-w@50Hz	-	-	-	-	-	-	-	-
[23] 1440x288p@50Hz	-	○	-	-	-	-	-	-
[35] 2880x480p@59.94/60Hz	-	○	-	-	-	-	-	-
[36] 2880x480p-w@59.94/60Hz	-	-	-	-	-	-	-	-
[12] 2880x240p@59.94/60Hz	-	○	-	-	-	-	-	-
[37] 2880x576p@50Hz	-	○	-	-	-	-	-	-
[38] 2880x576p-w@50Hz	-	-	-	-	-	-	-	-
[27] 2880x288p@50Hz	-	○	-	-	-	-	-	-
[32] 1920x1080p@23.97/24Hz	-	○	-	-	-	-	-	-
[33] 1920x1080p@25Hz	-	○	-	-	-	-	-	-
[34] 1920x1080p@29.97/30Hz	-	○	-	-	-	-	-	-
[46] 1920x1080i@119.98/120Hz	-	○	-	-	-	-	-	-
[47] 1280x720p@119.98/120Hz	-	○	-	-	-	-	-	-
[60] 1280x720p@23.97/24Hz	-	-	-	-	-	-	-	-
[62] 1280x720p@29.97/30Hz	-	-	-	-	-	-	-	-

Internal program	CTS 7-33_1	CTS 7-33_2	CTS 7-34	CTS 7-35	CTS 7-36	CTS 7-37	CTS 7-38_1	CTS 7-38_2	CTS 7-38-3	CTS 7-40
[01] 640x480p@59.94/60Hz	-	○	○	○	-	-	○	○	○	○
[02] 720x480p@59.94/60Hz	-	●	●	●	●	●	●	●	●	●
[03] 720x480p-w@59.94/60Hz	-	○	○	○	○	○	○	○	○	○
[04] 1280x720p@59.94/60Hz	-	○	○	○	-	-	(1)(3)	(2)	○	○
[05] 1920x1080i@59.94/60Hz	-	○	○	○	○	○	(2)	(1)	○	○
[16] 1920x1080p@59.94/60Hz	-	○	○	○	○	○	○	(3)	○	○
[17] 720x576p@50Hz	-	○	○	○	○	○	○	○	○	○
[18] 720x576p-w@50Hz	-	○	○	○	○	○	○	○	○	○
[19] 1280x720p@50Hz	-	○	○	○	-	-	(1)(3)	(2)	○	○
[20] 1920x1080i@50Hz	-	○	○	○	○	○	(2)	(1)	○	○
[31] 1920x1080p@50Hz	-	○	○	○	○	○	○	(3)	○	○
[06] 1440x480i@59.94/60Hz	-	○	○	○	-	-	-	-	-	○
[07] 1440x480i-w@59.94/60Hz	-	○	○	○	-	-	-	-	-	○
[14] 1440x480p@59.94/60Hz	-	-	-	-	○	○	-	-	-	-
[15] 1440x480p-w@59.94/60Hz	-	-	-	-	○	○	-	-	-	-
[08] 1440x240p@59.94/60Hz	-	-	-	-	-	-	-	-	-	-
[21] 1440x576i@50Hz	-	○	○	○	-	-	-	-	-	○
[22] 1440x576i-w@50Hz	-	○	○	○	-	-	-	-	-	○
[29] 1440x576p@50Hz	-	-	-	-	○	○	-	-	-	-
[30] 1440x576p-w@50Hz	-	-	-	-	○	○	-	-	-	-
[23] 1440x288p@50Hz	-	-	-	-	-	-	-	-	-	-
[35] 2880x480p@59.94/60Hz	-	-	-	-	○	○	-	-	-	-
[36] 2880x480p-w@59.94/60Hz	-	-	-	-	○	○	-	-	-	-
[12] 2880x240p@59.94/60Hz	-	-	-	-	-	-	-	-	-	-
[37] 2880x576p@50Hz	-	-	-	-	○	○	-	-	-	-
[38] 2880x576p-w@50Hz	-	-	-	-	○	○	-	-	-	-
[27] 2880x288p@50Hz	-	-	-	-	-	-	-	-	-	-
[32] 1920x1080p@23.97/24Hz	-	-	-	-	-	-	(1)(3)	(2)	○	-
[33] 1920x1080p@25Hz	-	-	-	-	-	-	-	-	-	-
[34] 1920x1080p@29.97/30Hz	-	-	-	-	-	-	○	(1)(3)	○	-
[46] 1920x1080i@119.98/120Hz	-	-	-	-	-	-	-	-	-	-
[47] 1280x720p@119.98/120Hz	-	-	-	-	-	-	-	-	-	-
[60] 1280x720p@23.97/24Hz	-	-	-	-	-	-	○	(1)	○	-
[62] 1280x720p@29.97/30Hz	-	-	-	-	-	-	○	(1)	○	-

(1) Also supports 3D FramePacking.
(2) Also supports 3D Side-by-Side (Half).
(3) Also supports 3D Top-and-Bottom.

Audio Format (SAMPLE1 to 10)

Internal program	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10
Linear PCM 8ch	○	○	○	-	○	○	○	○	-	○
Linear PCM 2ch	-	-	-	○	○	-	-	○	-	-
AC-3	○	○	○	○	○	○	○	-	-	○
MPEG1	-	-	-	-	-	-	-	-	-	-
MP3	-	-	-	-	-	-	-	-	-	-
MPEG2	-	-	-	-	-	-	-	-	-	-
AAC	○	○	○	○	○	○	○	-	-	○
DTS	○	○	○	-	○	○	○	-	-	○
ATRAC	-	-	-	-	-	-	-	-	-	-
One Bit Audio	○	○	○	-	○	○	○	-	-	○
DolbyDigital+	○	○	○	-	○	○	○	-	-	○
DTS-HD	○	○	○	-	○	○	○	-	-	○
MAT (MLP)	○	○	○	-	○	○	○	-	-	○
DST	-	-	-	-	-	-	-	-	-	-
WMA Pro	-	-	-	-	○	-	-	-	-	-

Audio Format (Compliance EDID)

Internal program	CTS 7-1_1	CTS 7-1_2	CTS 7-19_1	CTS 7-19_2	CTS 7-23	CTS 7-24	CTS 7-24	CTS 7-31	CTS 7-33_1
Linear PCM 8ch	○	○	○	○	○	○	○	○	-
Linear PCM 2ch	-	-	-	-	-	-	-	-	-
AC-3	○	○	-	-	○	○	○	-	-
MPEG1	-	-	-	-	-	-	-	-	-
MP3	-	-	-	-	-	-	-	-	-
MPEG2	-	-	-	-	-	-	-	-	-
AAC	○	○	-	-	○	○	○	-	-
DTS	○	○	-	-	○	○	○	-	-
ATRAC	-	-	-	-	-	-	-	-	-
One Bit Audio	○	○	-	-	○	○	○	-	
DolbyDigital+	○	○	-	-	○	○	○	-	-
DTS-HD	○	○	-	-	○	○	○	-	-
MAT (MLP)	○	○	-	-	○	○	○	-	-
DST	-	-	-	-	-	-	-	-	-
WMA Pro	-	-	-	-	-	-	-	-	-

Internal program	CTS 7-33_2	CTS 7-34	CTS 7-35	CTS 7-36	CTS 7-37	CTS 7-38_1	CTS 7-38_2	CTS 7-38-3	CTS 7-40
Linear PCM 8ch	○	○	○	○	○	○	○	○	○
Linear PCM 2ch	-	-	-	-	-	-	-	-	-
AC-3	○	○	○	○	○	○	○	○	○
MPEG1	-	-	-	-	-	-	-	-	-
MP3	-	-	-	-	-	-	-	-	-
MPEG2	-	-	-	-	-	-	-	-	-
AAC	○	○	○	○	○	○	○	○	○
DTS	○	○	○	○	○	○	○	○	○
ATRAC	-	-	-	-	-	-	-	-	-
One Bit Audio	○	○	○	○	○	○	○	○	○
DolbyDigital+	○	○	○	○	○	○	○	○	○
DTS-HD	○	○	○	○	○	○	○	○	○
MAT (MLP)	○	○	○	○	○	○	○	○	○
DST	-	-	-	-	-	-	-	-	-
WMA Pro	-	-	-	-	-	-	-	-	-

10.1.1 SAMPLE1 (2D monitor capable of receiving a multiple number of formats)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
C0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18
D0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
E0	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C
F0	00	00	00	1E	00	00	00	00	00	00	00	00	00	00	00	3A

byte	Item	Setting
07-00	Header	0x00FFFFFFFFFFFF00
09-08	ID Manufacturer Name	0x8F06 = ATO
0B-0A	ID Product Code	0xB012h
0F-0C	ID Serial Number	0x00000001
10	Week of Manufacture	0x0C = 12
11	Year of Manufacture	0x14 = Year 2010
12	EDID Version	0x01 = ver.1
13	EDID Revision	0x03 = Rev.3
14	Video Input Definition Analog or Digital DFP1.X	0x80 0b1 = Digital 0b0 = not support
15	Max. Horizontal Image Size	0x1C = 28cm
16	Max. Vertical Image Size	0x15 = 21cm
17	Display Transfer Characteristic (Gamma)	0x78= 2.20
18	[Feature Support] Standby (DPMS) Suspend (DPMS) Active Off/Very Low Power Display Type Standard Default Color Space sRGB Preferred Timing Mode is indicated in the first detailed timing block Default GTF supported	0x0A 0b0 = not support 0b0 = not support 0b0 = not support 0b1 = RGB color display 0b0 = not support 0b1 = support 0b0 = not support
22-19	[Color Characteristics] Red-x Red-y	0x57522928855659981EAC 0x280 = 0.594 0x15C = 0.349

	Green-x	0x11F = 0.339
	Green-y	0x262 = 0.521
	Blue-x	0x09F = 0.158
	Blue-y	0x048 = 0.162
	White-x	0x122 = 0x323
	White-y	0x131 = 0.340
23	[Established Timings 1]	0x20
	720x400@70Hz	0b0 = not support
	720x400@88Hz	0b0 = not support
	640x480@60Hz	0b1 = support
	640x480@67Hz	0b0 = not support
	640x480@72Hz	0b0 = not support
	640x480@75Hz	0b0 = not support
	800x600@56Hz	0b0 = not support
	800x600@60Hz	0b0 = not support
24	[Established Timings 2]	0x00
	800x600@72Hz	0b0 = not support
	800x600@75Hz	0b0 = not support
	832x624@75Hz	0b0 = not support
	1024x768@87Hz (Interlace)	0b0 = not support
	1024x768@60Hz	0b0 = not support
	1024x768@70Hz	0b0 = not support
	1024x768@75Hz	0b0 = not support
	1280x1024@75Hz	0b0 = not support
25	[Manufacturer's Reserved Timings]	0x00
	1152x870@75Hz	0b0 = not support
27-26	Standard Timing Identification #1	0x0101 = Unused field in this section
29-28	Standard Timing Identification #2	0x0101 = Unused field in this section
2B-2A	Standard Timing Identification #3	0x0101 = Unused field in this section
2D-2C	Standard Timing Identification #4	0x0101 = Unused field in this section
2F-2E	Standard Timing Identification #5	0x0101 = Unused field in this section
31-30	Standard Timing Identification #6	0x0101 = Unused field in this section
33-32	Standard Timing Identification #7	0x0101 = Unused field in this section
35-34	Standard Timing Identification #8	0x0101 = Unused field in this section
47-36	[Detailed Timing Descriptions #1]	
37-36	Pixel Clock	0x0A8C = 27.00 MHz
3A-38	Horizontal Active Pixels	0x2D0 = 720 dots
	Horizontal Blanking Pixels	0x8A = 138 dots
3D-3B	Vertical Active Lines	0x1E0 = 480H
	Vertical Blanking Lines	0x2D = 45H
41-3E	Horizontal sync offset	0x10 = 16 dots
	Horizontal sync pulse width	0x3E = 62 dots
	Vert sync offset	0x09 = 9H
	Vert sync pulse width	0x06 = 6H
44-42	Horizontal Image Size	0xFA = 250mm
	Vertical Image Size	0xBE = 190cm
45	Horizontal Border	0x00 = 0 dot
46	Vertical Border	0x00 = 0H
47	Interlace	0b0 = non-Interlace
	Stereo Mode	0b0 = Normal display, no stereo

	sync signal description1	0x3 = Digital Separate
	sync signal description2	0b0 = Vertical Polarity negative
	sync signal description3	0b0 = Horizontal Polarity negative
59-48	[Detailed Timing Descriptions #2]	
49-48	Pixel Clock	0x09D5 = 25.17 MHz
4C-4A	Horizontal Active Pixels	0x280 = 640 dots
	Horizontal Blanking Pixels	0xA0 = 160 dots
4F-4D	Vertical Active Lines	0x1E0 = 480H
	Vertical Blanking Lines	0x2D = 45H
53-50	Horizontal sync offset	0x10 = 16 dots
	Horizontal sync pulse width	0x60 = 96 dots
	Vert sync offset	0x02 = 2H
	Vert sync pulse width	0x05 = 5H
56-54	Horizontal Image Size	0xFA = 250mm
	Vertical Image Size	0xBE = 190cm
57	Horizontal Border	0x00 = 0 dot
58	Vertical Border	0x00 = 0H
59	Interlace	0b0 = non-Interlace
	Stereo Mode	0b0 = Normal display, no stereo
	sync signal description1	0x3 = Digital Separate
	sync signal description2	0b0 = Vertical Polarity negative
	sync signal description3	0b0 = Horizontal Polarity negative
6B-5A	[Monitor Descriptor Description #1]	
5B-5A	FLAG	0x0000 = Monitor Descriptor
5C	Reserved	0x00
5D	Data Type Tag	0xFC = Monitor name, stored as ASCII
5E	Reserved	0x00
66-5F	Monitor Name	0x56412D313833310A = VA-1831
6B-67		0x2020202020
7D-6C	[Monitor Descriptor Description #2]	
6D-6C	FLAG	0x0000 = Monitor Descriptor
6E	Reserved	0x00
6F	Data Type Tag	0xFD = Monitor range limits, binary coded
70	Reserved	0x00
71	Min. Vertical rate	0x17 = 23Hz
72	Max. Vertical rate	0x3D = 61Hz
73	Min. Horizontal	0x0D = 13 KHz
74	Max. Horizontal	0x2E = 46 KHz
75	Max. Supported Pixel Clock	0x11 = 170 MHz
76	Secondary timing formula support	0x00 = No secondary timing formula supported
77		0x0A
7D-78		0x202020202020
7E	Extension FLAG	0x01 = 1
7F	Check Sum	0xFA
80	Extended Block Type	0x02 = CEA861B
81	Revision Number	0x03 = ver.3
82	Detailed Timing Blocks start at Byte	0x42
83	[DTV Monitor Support]	0x71
	under scan	0b0 = not support
	Basic Audio	0b1 = support

	YCbCr4:4:4 YCbCr4:2:2 total number of native formats	0b1 = support 0b1 = support 0b1 = 1 format
84 85 86 87 88 89 8A 8B 8C 8D 8E 8F 90 91 92 93	[Video Short Description] Tag Code Length Video Code/Native Format	0x4F 0x02 = Video Short Description 0x0F 0x82 = [2] = 720x480p / Native Format 0x01 = [1] = 640x480p 0x03 = [3] = 720x480pW 0x04 = [4] = 1280x720p 0x05 = [5] = 1920x1080i 0x10 = [16] = 1920x1080p 0x11 = [17] = 720x576p 0x12 = [18] = 720x576pW 0x13 = [19] = 1280x720p 0x14 = [20] = 1920x1080i 0x1F = [31] = 1920x1080p 0x06 = [6] = 1440x480i 0x07 = [7] = 720x480iW 0x15 = [21] = 1440x567i 0x16 = [22] = 720x576iW
94 95 96 97 98 99 9A 9B 9C 9D 9E 9F A0 A1 A2 A3 A4 A5 A6 A7	[Audio Short Block Description1] Tag Code Length Audio Format Code#1 Max Number of Audio#1 Supported Sampling Frequency#1 Supported Bit Size#1 Audio Format Code#2 Max Number of Audio#2 Supported Sampling Max Bit Rate#2 Audio Format Code#3 Max Number of Audio#3 Supported Sampling Frequency#3 Max Bit Rate#3 Audio Format Code#4 Max Number of Audio#4 Supported Sampling Frequency#4 Max Bit Rate#4 Audio Format Code#5 Max Number of Audio#5 Supported Sampling Frequency#5 User Define #5 Audio Format Code#6 Max Number of Audio#6 Supported Sampling Frequency#6 User Define #6 Audio Format Code#7	0x38 0x01 = Audio Short Block Description 0x18 0x01 = Linier PCM 0x07 = 8ch 0x7F = 32,44.1,48,88.2,96,176,192 KHz 0x07 = 16,20,24 bits 0x02 = AC-3 0x05 = 6ch 0x07 = 32,44.1,48 KHz 0x50 = 640 KHz 0x06 = AAC 0x05 = 6ch 0x06 =44.1,48 KHz 0x3C = 480 KHz 0x07 = DTS 0x06 = 7ch 0x1E = 44.1,48,88.2,96 KHz 0xC0 = 1536 KHz 0x09 = OneBitAudio 0x05 = 6ch 0x02 = 44.1 KHz 0x00 = 0 0x0A = DolbyDigital+ 0x07 = 8ch 0x06 = 44.1,48 KHz 0x00 = 0 0x0B = DTS-HD

	Max Number of Audio#7	0x07 = 8ch
A8	Supported Sampling Frequency#7	0x7E = 44.1,48,88.2,96,176,192 KHz
A9	User Define #7	0x01 = 1
AA	Audio Format Code#8	0x0C = MAT (MLP)
	Max Number of Audio#8	0x07 = 8ch
AB	Supported Sampling Frequency#8	0x7E = 44.1,48,88.2,96,176,192 KHz
AC	Audio Codec Vendor#8	0x00= 0
AD	[Speaker Allocation Data Block]	0x83
	Tag Code	0x04 = Speaker Allocation Data Block
	Length	0x03
AE	Speaker	0x4F = = RLC/RRC,RL/RR,FC,LFE,FL/FR
B0-AF	Reserved	0x0000
B1	[Vendor Specific Data Block]	0x68
	Tag Code	0x03 = Vendor Specific Data Block
	Length	0x0C
B4-B2	24-bit IEEE Registration Identifier	0x000C03
B6-B5	Physical Address	0x1000 = 1.0.0.0
B7	Support_AI	0b1= Support
	DC_48bit	0b0 = Not Support
	DC_36bit	0b1 = Support
	DC_30bit	0b1 = Support
	DC_Y444bit	0b1 = Support
	DVI_Dual	0b0 = Not Support
B8	Max TMDS Clock	0x2D = 225 MHz
B9	Latency Fields Present	0b0 = Not Support
	I Latency Fields Present	0b0 = Not Support
	HDMI Video Present	0b0 = Not Support
	Reserved	0b0 = Not Support
	CNC3 (Game)	0b1 = Support
	CNC2 (Cinema)	0b1 = Support
	CNC1 (Photo)	0b1 = Support
	CNC0 (Graphics)	0b1 = Support
BA		
BB		
BC		
BD		
BA	[Use Extended Tag]	0xE3
	Tag Code	0x07 = Use Extended Tag
	Length	0x03
BB	Extended Tag Code	0x05 = Colorimetry Data Block
BC	xvYCC709/xvYCC601/sYCC601 Adobe YCC601/AdobeRGB	0x1F = support
BD	MD	0x01 = MD0=support
	[Detailed Timing Description 1]	
BE-BF	Pixel Clock	0x0A8C = 27.00 MHz
C0-C1	Horizontal Active Pixels	0x2D0 = 720 dots
	Horizontal Blanking Pixels	0x8A = 138 dots
C4-C2	Vertical Active Lines	0x1E0 = 480H

	Vertical Blanking Lines	0x2D = 45H
C8-C5	Horizontal sync offset	0x10 = 16 dots
	Horizontal sync pulse width	0x3E = 62 dots
	Vert sync offset	0x9 = 9H
	Vert sync pulse width	0x6 = 6H
CB-C9	Horizontal Image Size	0xFA = 250mm
	Vertical Image Size	0x8C = 140mm
CC	Horizontal Border	0x00 = 0 dot
CD	Vertical Border	0x00 = 0H
CE	Interlace	0x00 = non-Interlace
	Stereo Mode	0x0 = Normal display, no stereo
	sync signal description1	0x3 = Digital Separate
	sync signal description2	0x0 = Vertical Polarity negative
	sync signal description3	0x00 = Horizontal Polarity negative
	[Detailed Timing Description 2]	
D1-D0	Pixel Clock	0x1D01 = 74.25 MHz
D4-D2	Horizontal Active Pixels	0x500 = 1280 dots
	Horizontal Blanking Pixels	0x172 = 370 dots
D7-D5	Vertical Active Lines	0x2D0 = 720H
	Vertical Blanking Lines	0x1E = 30H
DB-D8	Horizontal sync offset	0x6E = 110 dots
	Horizontal sync pulse width	0x28 = 40 dots
	Vert sync offset	0x5 = 5H
	Vert sync pulse width	0x5 = 5H
DE-DD	Horizontal Image Size	0xBE = 250mm
	Vertical Image Size	0x8C = 140mm
DF	Horizontal Border	0x00 = 0 dot
E0	Vertical Border	0x00 = 0H
E1	Interlace	0x0 = non-Interlace
	Stereo Mode	0x0 = Normal display, no stereo
	sync signal description1	0x3 = Digital Separate
	sync signal description2	0x0= Vertical Polarity positive
	sync signal description3	0x0 = Horizontal Polarity positive
	Reserved	0x00
	[Detailed Timing Description 3]	
E4-E3	Pixel Clock	0x1D01 = 74.25 MHz
E7-E5	Horizontal Active Pixels	0x780 = 1920 dots
	Horizontal Blanking Pixels	0x118 = 280 dots
EA-E8	Vertical Active Lines	0x438 = 1080H
	Vertical Blanking Lines	0x16 = 22H
EE-EB	Horizontal sync offset	0x58 = 88 dots
	Horizontal sync pulse width	0x2C = 44 dots
	Vert sync offset	0x2 = 2H
	Vert sync pulse width	0x5 = 5H
F0-EF	Horizontal Image Size	0xBE = 250mm
	Vertical Image Size	0x8C = 140mm
F1	Horizontal Border	0x00 = 0 dot
F2	Vertical Border	0x00 = 0H
F3	Interlace	0x0 = non-Interlace
	Stereo Mode	0x0 = Normal display, no stereo

	sync signal description1 sync signal description2 sync signal description3	0x3 = Digital Separate 0x0= Vertical Polarity positive 0x0 = Horizontal Polarity positive
FE-F4	Reserved	0x00
FF	Check sum	0x3A

10.1.2 SAMPLE2 (monitor using 1920X1080p as the Native Format)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	FA	8C	00	00	00	1E	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	84
80	02	03	3E	71	4F	90	01	02	03	04	05	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
C0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	BE	00	00	00	18
D0	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00
E0	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C
F0	00	00	00	1E	00	00	00	00	00	00	00	00	00	00	00	1F

10.1.3 SAMPLE3 (monitor using 720X576p as the Native Format)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	90	20	40	31	20	0C	40
40	55	00	FA	BE	00	00	00	18	8C	0A	D0	90	20	40	31	20
50	0C	40	55	00	FA	8C	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3E	71	4F	91	12	13	14	1F	01	02	03	04	05	10
90	15	16	06	07	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	01	1D
C0	00	BC	52	D0	1E	20	B8	28	55	40	FA	8C	00	00	00	1E
D0	01	1D	80	D0	72	1C	16	20	10	2C	25	80	FA	8C	00	00
E0	00	9E	02	3A	80	D0	72	38	2D	40	10	2C	45	80	FA	8C
F0	00	00	00	1E	00	00	00	00	00	00	00	00	00	00	00	5B

10.1.4 SAMPLE4 (monitor capable of receiving regular TV programs)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	2F	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	29	09	7F	07	11	07	50	35	06	2A	83	01
A0	00	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C
B0	0A	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00
C0	18	8C	0A	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00
D0	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA
E0	8C	00	00	00	9E	02	3A	80	18	71	38	2D	40	58	2C	45
F0	00	FA	8C	00	00	00	1E	00	00	00	00	00	00	00	00	FE

10.1.5 SAMPLE5 (monitor capable of receiving a multiple number of audio signals)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	01	1D	80	18	71	1C	16	20	58	2C
40	25	00	FA	8C	00	00	00	9E	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	95
80	02	03	4C	72	53	85	01	03	04	12	13	14	06	07	0E	0F
90	15	16	1D	1E	0A	0B	19	1A	3E	09	7F	07	0F	7F	07	15
A0	07	50	35	06	3C	3E	1E	C0	4D	02	00	57	06	00	5F	7E
B0	01	67	7E	00	77	1F	03	83	4F	00	00	6C	03	0C	00	10
C0	00	B8	2D	CF	00	00	00	00	E3	05	1F	01	8C	0A	D0	8A
D0	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18	01	1D
E0	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	1E
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	9D

10.1.6 SAMPLE6 (monitor capable of receiving 3D mandatory signals)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	01	1D	80	3E	73	38	2D	40	7E	2C
40	45	80	FA	8C	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	10
80	02	03	50	72	4B	A0	04	05	10	13	14	1F	22	3C	3E	02
90	38	0F	7F	07	15	07	50	35	06	3C	3E	1E	C0	4D	02	00
A0	57	06	00	5F	7E	01	67	7E	00	83	4F	00	00	7E	03	0C
B0	00	10	00	B8	2D	2F	80	14	00	10	40	28	00	58	00	06
C0	16	46	73	05	80	90	A0	08	00	36	66	A6	E3	05	1F	01
D0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
E0	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C
F0	00	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	8F

10.1.7 SAMPLE7 (monitor capable of receiving a multiple number of 3D formats)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	01	1D	80	3E	73	38	2D	40	7E	2C
40	45	80	FA	8C	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	10
80	02	03	4D	72	4B	A0	02	04	05	10	13	14	1F	22	3C	3E
90	38	0F	7F	07	15	07	50	35	06	3C	3E	1E	C0	4D	02	00
A0	57	06	00	5F	7E	01	67	7E	00	83	4F	00	00	7B	03	0C
B0	00	10	00	B8	2D	2F	80	11	00	20	50	38	00	68	00	06
C0	26	56	31	61	02	52	03	04	05	E3	05	1F	01	01	1D	00
D0	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	1E	01
E0	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C	00	00	00
F0	9E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	B8

10.1.8 SAMPLE8 (HDMI1.0 monitor)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	1F	71	49	82	01	04	05	10	11	13	14	1F	26	0F
90	1F	07	09	7F	07	83	2F	00	00	65	03	0C	00	10	00	01
A0	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00
B0	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C	00
C0	00	00	9E	02	3A	80	18	71	38	2D	40	58	2C	45	00	FA
D0	8C	00	00	00	1E	8C	0A	D0	90	20	40	31	20	0C	40	55
E0	00	FA	BE	00	00	00	18	8C	0A	D0	90	20	40	31	20	0C
F0	40	55	00	FA	8C	00	00	00	18	00	00	00	00	00	00	F6

10.1.9 SAMPLE9 (DVI monitor)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	3F	CF	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	81	60	00	00	00	18	01	1D	80	18	71	1C	16	20
50	58	2C	25	00	81	49	00	00	00	9E	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	00	77

10.1.10 SAMPLE10 (4-block monitor)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	03	F8
80	F0	02	02	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	0C
100	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
110	06	07	0E	08	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
120	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
130	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
140	D0	8A	20	E0	2D	10	0C	3E	96	00	FA	8C	00	00	00	00
150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	AF
180	02	03	12	71	4D	15	16	1D	17	0A	0C	19	1B	20	21	22
190	2E	2F	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C
1A0	00	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00
1B0	FA	8C	00	00	00	9E	00	00	00	00	00	00	00	00	00	00
1C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	FE

10.1.11 CTS7-1_1 (EDID tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	65	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
C0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18
D0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
E0	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C
F0	00	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	BC

10.1.12 CTS7-1_2 (EDID tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	03	F8
80	F0	02	02	00	00	00	00	00	00	00	00	00	00	00	00	00
90	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
A0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
B0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	0C
100	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
110	06	07	0E	08	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
120	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
130	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
140	D0	8A	20	E0	2D	10	0C	3E	96	00	FA	8C	00	00	00	00
150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
160	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
170	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	AF
180	02	03	12	71	4D	15	16	1D	17	23	0C	25	1B	20	21	22
190	2E	2F	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C
1A0	00	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00
1B0	FA	8C	00	00	00	9E	00	00	00	00	00	00	00	00	00	00
1C0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1D0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
1F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	D9

10.1.13 CTS7-19_1 (Packet tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	23	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	23	0F	7F	07	83	4F	00	00	66	03	0C	00
A0	10	00	80	8C	0A	D0	8A	20	E0	2D	10	0C	3E	96	00	FA
B0	8C	00	00	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55
C0	00	FA	8C	00	00	00	1E	01	1D	80	18	71	1C	16	20	58
D0	2C	25	00	FA	8C	00	00	00	9E	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	DA

10.1.14 CTS7-19_2 (Packet tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	22	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	23	0F	7F	07	83	4F	00	00	65	03	0C	00
A0	10	00	8C	0A	D0	8A	20	E0	2D	10	0C	3E	96	00	FA	8C
B0	00	00	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55	00
C0	FA	8C	00	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C
D0	25	00	FA	8C	00	00	00	9E	00	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	5C

10.1.15 CTS7-23 (RGB monitor)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	02	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	02
80	02	03	3D	41	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E2	00	0F	8C	0A	D0
C0	8A	20	E0	2D	10	10	3E	25	00	FA	8C	00	00	00	18	01
D0	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00
E0	1E	01	1D	80	18	71	1C	16	20	58	2C	55	00	FA	8C	00
F0	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	00	43

10.1.16 CTS7-24 (YCbCr monitor)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3C	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	67	03	0C	00	10	00	B8	2D	E2	00	0F	8C	0A	D0	8A
C0	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18	01	1D
D0	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	9E
E0	01	1D	80	18	71	38	16	40	58	2C	25	00	FA	8C	00	00
F0	00	9E	00	00	00	00	00	00	00	00	00	00	00	00	00	27

10.1.17 CTS7-27 (AVI InfoFrame tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3D	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	01	E2	00	0F	8C	0A	D0
C0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18	01
D0	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00
E0	9E	01	1D	80	18	71	38	16	40	58	2C	25	00	FA	8C	00
F0	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	00	24

10.1.18 CTS7-31 (Audio InfoFrame tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	23	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	23	0F	7F	07	83	7F	00	00	66	03	0C	00
A0	10	00	80	8C	0A	D0	8A	20	E0	2D	10	0C	3E	96	00	FA
B0	8C	00	00	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55
C0	00	FA	8C	00	00	00	1E	01	1D	80	18	71	1C	16	20	58
D0	2C	25	00	FA	8C	00	00	00	9E	00	00	00	00	00	00	00
E0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	AA

10.1.19 CTS7-33_1 (DVI tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	3F	CF	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	81	60	00	00	00	18	01	1D	80	18	71	1C	16	20
50	58	2C	25	00	81	49	00	00	00	9E	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	00	77

10.1.20 CTS7-33_2 (DVI tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	35	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	63	DE	02	00	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
C0	00	FA	8C	00	00	00	18	01	1D	00	72	51	D0	1E	20	6E
D0	28	55	00	FA	8C	00	00	00	1E	01	1D	80	18	71	1C	16
E0	20	58	2C	25	00	FA	8C	00	00	00	9E	00	00	00	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	03

10.1.21 CTS7-34 (Deep Color tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	39	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	67	03	0C	00	10	00	B8	2D	8C	0A	D0	8A	20	E0	2D
C0	10	10	3E	96	00	FA	8C	00	00	00	18	01	1D	00	72	51
D0	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	9E	01	1D	80
E0	18	71	38	16	40	58	2C	25	00	FA	8C	00	00	00	9E	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	1B

10.1.22 CTS7-35 (xvYCC tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
C0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18
D0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
E0	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C
F0	00	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	BA

10.2.23 CTS7-36 (High-Bit Rate Audio tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	8C	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	68
80	02	03	3A	71	50	82	03	05	10	11	12	14	1F	0E	0F	1D
90	1E	23	24	25	26	38	0F	7F	07	15	07	50	35	06	3C	3E
A0	1E	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F
B0	00	00	67	03	0C	00	10	00	B8	33	01	1D	80	18	71	1C
C0	16	20	58	2C	25	00	FA	8C	00	00	00	9E	02	3A	80	18
D0	71	38	2D	40	58	2C	45	00	FA	8C	00	00	00	1E	8C	0A
E0	D0	90	20	40	31	20	0C	40	55	00	FA	BE	00	00	00	18
F0	18	00	00	00	00	00	00	00	00	00	00	00	00	00	00	DB

10.1.24 CTS7-37 (One Bit Audio tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	8C	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	68
80	02	03	3A	71	50	82	03	05	10	11	12	14	1F	0E	0F	1D
90	1E	23	24	25	26	38	0F	7F	07	15	07	50	35	06	3C	3E
A0	1E	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	7F
B0	00	00	67	03	0C	00	10	00	B8	33	01	1D	80	18	71	1C
C0	16	20	58	2C	25	00	FA	8C	00	00	00	18	02	3A	80	18
D0	71	38	2D	40	58	2C	45	00	FA	8C	00	00	00	98	8C	0A
E0	D0	90	20	40	31	20	0C	40	55	00	FA	BE	00	00	00	1E
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	C9

10.1.25 CTS7-38_1 (3D mandatory tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	D5	09	80	A0	20	E0	2D	10	10	60
40	A2	00	FA	BE	00	00	00	18	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	4A	71	4F	81	02	03	04	05	10	11	12	13	14	1F
90	20	22	3C	3E	38	0F	7F	77	95	87	50	35	86	3C	BE	1E
A0	C0	4D	02	00	57	06	00	5F	FE	01	67	7E	00	83	4F	00
B0	00	74	03	0C	00	10	00	B8	2D	2F	80	0A	30	80	B0	48
C0	00	98	00	36	86	B6	E3	05	1F	01	8C	0A	D0	8A	20	E0
D0	2D	10	10	3E	96	00	FA	8C	00	00	00	18	01	1D	00	72
E0	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	1E	00	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	18

10.1.26 CTS7-38_2 (3D mandatry tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	D5	09	80	A0	20	E0	2D	10	10	60
40	A2	00	FA	BE	00	00	00	18	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	4E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	20	22	3C	3E	38	0F	7F	77	95	87	50	35	86	3C	BE	1E
A0	C0	4D	02	00	57	06	00	5F	FE	01	67	7E	00	83	4F	00
B0	00	78	03	0C	00	10	00	B8	2D	2F	80	0E	40	902	C0	D0
C0	E0	38	00	88	00	B8	00	56	A6	C6	E3	05	1F	01	8C	0A
D0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18
E0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
F0	00	1E	1E	00	00	00	00	00	00	00	00	00	00	00	00	26

10.1.27 CTS7-38_3 (3D mandatory tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	D5	09	80	A0	20	E0	2D	10	10	60
40	A2	00	FA	BE	00	00	00	18	8C	0A	D0	8A	20	E0	2D	10
50	10	3E	96	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3B	71	4F	81	02	03	04	05	10	11	12	13	14	1F
90	20	22	3C	3E	38	0F	7F	77	95	87	50	35	86	3C	BE	1E
A0	C0	4D	02	00	57	06	00	5F	FE	01	67	7E	00	83	4F	00
B0	00	65	03	0C	00	10	00	E3	05	1F	01	8C	0A	D0	8A	20
C0	E0	2D	10	10	60	96	00	FA	8C	00	00	00	18	01	1D	00
D0	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00	00	1E	01
E0	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C	00	00	00
F0	9E	00	00	00	00	00	00	00	00	00	00	00	00	00	00	1E

10.1.28 CTS 7-40 (Adobe RGB tests)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	06	8F	12	B0	01	00	00	00
10	0C	14	01	03	80	1C	15	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	20	00	00	01	01	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	8C	0A	D0	8A	20	E0	2D	10	10	3E
40	96	00	FA	BE	00	00	00	18	D5	09	80	A0	20	E0	2D	10
50	10	60	A2	00	FA	BE	00	00	00	18	00	00	00	FC	00	56
60	41	2D	31	38	33	31	0A	20	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	FA
80	02	03	3E	71	4F	82	01	03	04	05	10	11	12	13	14	1F
90	06	07	15	16	38	0F	7F	07	15	07	50	35	06	3C	3E	1E
A0	C0	4D	02	00	57	06	00	5F	7E	01	67	7E	00	83	4F	00
B0	00	68	03	0C	00	10	00	B8	2D	0F	E3	05	1F	01	8C	0A
C0	D0	8A	20	E0	2D	10	10	3E	96	00	FA	8C	00	00	00	18
D0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	FA	8C	00	00
E0	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	FA	8C
F0	00	00	00	9E	00	00	00	00	00	00	00	00	00	00	00	BA

10.2 Video Code

Listed below are the video timing specifications set in the Video Codes of Generate Timing.

[1] 640x480p @59.94 / 60Hz 4 : 3
[2] 720x480p @59.94 / 60Hz 4 : 3
[3] 720x480p @59.94 / 60Hz 16 : 9
[4] 1280x720p @59.94 / 60Hz 16 : 9
[5] 1920x1080i @59.94 / 60Hz 16 : 9
[6] 720 (1440)x480i @59.94 / 60Hz 4 : 3
[7] 720 (1440)x480i @59.94 / 60Hz 16 : 9
[8] 720 (1440)x240p @59.94 / 60Hz 4 : 3
[9] 720 (1440)x240p @59.94 / 60Hz 16 : 9
[10] 1440 (2880)x480i @59.94 / 60Hz 4 : 3
[11] 1440 (2880)x480i @59.94 / 60Hz 16 : 9
[12] 1440 (2880)x240p @59.94 / 60Hz 4 : 3
[13] 1440 (2880)x240p @59.94 / 60Hz 16 : 9
[14] 1440x480p @59.94 / 60Hz 4 : 3
[15] 1440x480p @59.94 / 60Hz 16 : 9
[16] 1920x1080p @59.94 / 60Hz 16 : 9
[17] 720x576p @50Hz 4 : 3
[18] 720x576p @50Hz 16 : 9
[19] 1280x720p @50Hz 16 : 9
[20] 1920x1080i @50Hz 16 : 9
[21] 720 (1440)x576i @50Hz 4 : 3
[22] 720 (1440)x576i @50Hz 16 : 9
[23] 720 (1440)x288p @50Hz 4 : 3
[24] 720 (1440)x288p @50Hz 16 : 9
[25] 1440 (2880)x576i @50Hz 4 : 3
[26] 1440 (2880)x576i @50Hz 16 : 9
[27] 1440 (2880)x288p @50Hz 4 : 3
[28] 1440 (2880)x288p @50Hz 16 : 9
[29] 1440x576p @50Hz 4 : 3
[30] 1440x576p @50Hz 16 : 9
[31] 1920x1080p @50Hz 16 : 9
[32] 1920x1080p @23.97 / 24Hz 16 : 9
[33] 1920x1080p @25Hz 16 : 9
[34] 1920x1080p @29.97 / 30Hz 16 : 9
[35] 2880x480p @59.94 / 60Hz 4 : 3
[36] 2880x480p @59.94 / 60Hz 16 : 9
[37] 2880x576p @50Hz 4 : 3
[38] 2880x576p @50Hz 16 : 9
[39] 1920x1080i @50Hz 16 : 9
[40] 1920x1080i @100Hz 16 : 9
[41] 1280x720p @100Hz 16 : 9
[42] 720x576p @100Hz 4 : 3
[43] 720x576p @100Hz 16 : 9
[44] 720 (1440)x576i @100Hz 4 : 3
[45] 720 (1440)x576i @100Hz 16 : 9
[46] 1920x1080i @119.88 / 120Hz 16 : 9
[47] 1280x720p @119.88 / 120Hz 16 : 9
[48] 720x480p @119.88 / 120Hz 4 : 3
[49] 720x480p @119.88 / 120Hz 16 : 9
[50] 720 (1440)x480i @119.88 / 120Hz 4 : 3
[51] 720 (1440)x480i @119.88 / 120Hz 16 : 9
[52] 720x576p @200Hz 4 : 3
[53] 720x576p @200Hz 16 : 9
[54] 720 (1440)x576i @200Hz 4 : 3
[55] 720 (1440)x576i @200Hz 16 : 9
[56] 720x480p @239.76 / 240Hz 4 : 3
[57] 720x480p @239.76 / 240Hz 16 : 9
[58] 720 (1440)x480i @239.76 / 240Hz 4 : 3
[59] 720 (1440)x480i @239.76 / 240Hz 16 : 9
[60] 1280x720p @23.97 / 24Hz 16 : 9
[61] 1280x720p @25Hz 16 : 9
[62] 1280x720p @29.97 / 30Hz 16 : 9

11 Error Tables

11.1 List of analyze errors (indicated in red)

11.1.1 Video Timing

Item	Description
Pixel Clock	When the Video Code of AVI Infoframe is (1-64), the Pixel Clock frequency is not within ±0.5% of the value specified in the format designated in Video Code.
H Frequency	When the Video Code of AVI Infoframe is (1-64), the Pixel Clock frequency is not within ±0.5% of the value specified in the format designated in Video Code.
V Frequency	When the Video Code of AVI Infoframe is (1-64), the Pixel Clock frequency is not within ±0.5% of the value specified in the format designated in Video Code.
H Total Pixels	When the Video Code of AVI Infoframe is (1-64), the H Total Pixel number is at variance from the value specified in the format designated in Video Code.
H Active Pixels	When the Video Code of AVI Infoframe is (1-64), the H Total Pixel number is at variance from the value specified in the format designated in Video Code.
H Sync Pixels	When the Video Code of AVI Infoframe is (1-64), the H Total Pixel number is at variance from the value specified in the format designated in Video Code.
H Back Porch Pixels	When the Video Code of AVI Infoframe is (1-64), the H Total Pixel number is at variance from the value specified in the format designated in Video Code.
H Front Porch Pixels	When the Video Code of AVI Infoframe is (1-64), the H Total Pixel number is at variance from the value specified in the format designated in Video Code.
H Sync Polarity	When the Video Code of AVI Infoframe is (1-64), the H Sync Polarity is at variance from the value specified in the format designated in Video Code.
V Total Lines	When the Video Code of AVI Infoframe is (1-64), the V Total Line number is at variance from the value specified in the format designated in Video Code.
V Active TOTAL	When the Video Code of AVI Infoframe is (1-64), the V Total Line number is at variance from the value specified in the format designated in Video Code.
V Sync Field1	When the Video Code of AVI Infoframe is (1-64), the V Total Line number is at variance from the value specified in the format designated in Video Code.
V Back Porch Field1	When the Video Code of AVI Infoframe is (1-64), the V Total Line number is at variance from the value specified in the format designated in Video Code.
V Front Porch Field1	When the Video Code of AVI Infoframe is (1-64), the V Total Line number is at variance from the value specified in the format designated in Video Code.
V Sync Polarity	When the Video Code of AVI Infoframe is (1-64), the H Sync Polarity is at variance from the value specified in the format designated in Video Code.
Interlace	When the Video Code of AVI Infoframe is (1-64), the Interlace system is at variance from the value specified in the format designated in Video Code.

11.1.2 AVI InfoFrame

Item	Description
InfoFrame Version Number	The setting is not 0x02.
Length of AVI InfoFrame	The setting is not 0x0D.
Checksum	The lower 8 bits of the value calculated by AVI InfoFrame Type Code + AVI InfoFrame Version Number + Length of AVI InfoFrame + CheckSum is not 0.
RGB or YCbCr	Y1, Y0 of AVI InfoFrame are not in conformity with the color system (RGB, YCbCr422 or YCbC444) supported by EDID of the program.
Active Format Aspect	AVI InfoFrame Active Format Aspect (R) is not 0x08 to 0x0b.
Picture Aspect	AVI InfoFrame Picture Aspect (M) is 0x02. Alternatively, when the Video Code of AVI Infoframe is (1-64), the Picture Aspect value is at variance from the value specified in the format designated in Video Code.
Colorimetry	Colorimetry is set to 0x03 (Extended Colorimetry), and Extended Colorimetry is set to Reserve.
RGB Quantization Range	RGB or YCbCr is set to YCbCr, and RGB Quantization Range is set to Full Range or Reserve. When RGB or YCbCr is set to RGB and VGA is being sent, RGB Quantization Range is not set to Full Range or Default. When RGB or YCbCr is set to RGB and a resolution other than VGA is being sent, RGB Quantization Range is not set to Limited Range or Default.
Extended Colorimetry	Extended Colorimetry is set to Reserve.
Video Code	When this value is (1-64), an error occurs in Input Video Timing.
Repetition	When the Video Code of AVI Infoframe is (1-64), the Repetition value is at variance from the value specified in the format designated in Video Code.
YCbCr Quantization Range	When RGB or YCbCr is set to YCbCr for transmission, YCbCr Quantization Range is not set to Limited Range.
Rsv of Data Byte1	None of the values of the Reserve Bits of Data Byte 1 are 0.
Rsv of Data Byte4	None of the values of the Reserve Bits of Data Byte 4 are 0.

11.1.3 SPD InfoFrame

Item	Description
Checksum	The lower 8 bits of the value calculated by SPD InfoFrame Type Code + SPD InfoFrame Version Number + Length of SPD InfoFrame + CheckSum are not 0.

11.1.4 Audio InfoFrame

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>InfoFrame Version Number</td><td>The setting is not 0x01.</td></tr>
<tr><td>Length of Audio InfoFrame</td><td>The setting is not 0x0A.</td></tr>
<tr><td>Checksum</td><td>The lower 8 bits of the value calculated by Audio InfoFrame Type Code + Audio InfoFrame Version Number + Length of Audio InfoFrame + CheckSum are not 0.</td></tr>
<tr><td>Audio Coding Type</td><td>The Audio InfoFrame Audio Coding type (CT) value is not 0.</td></tr>
<tr><td>Audio Channel Count</td><td>The Audio InfoFrame Audio Channel Count (CC) and Speaker Placement (CA) settings are not combined correctly. (See below for further details.)
<table>
<tr><th>Audio Channel Count (CC)</th><th>Speaker Placement (CA)</th></tr>
<tr><td>0x00</td><td>This setting is higher than 0x1F.</td></tr>
<tr><td>0x01</td><td>This setting is not 0x00.</td></tr>
<tr><td>0x02</td><td>This setting is not 0x01, 0x02 or 0x04.</td></tr>
<tr><td>0x03</td><td>This setting is not 0x03, 0x05, 0x06, 0x08 or 0x14.</td></tr>
<tr><td>0x04</td><td>This setting is not 0x07, 0x09, 0x0A, 0x0C, 0x15, 0x16 or 0x18.</td></tr>
<tr><td>0x05</td><td>This setting is not 0x0B, 0x0D, 0x0E, 0x10, 0x17, 0x19, 0x1A or 0x1C.</td></tr>
<tr><td>0x06</td><td>This setting is not 0x0F, 0x11, 0x12, 0x1B, 0x1D or 0x1E.</td></tr>
<tr><td>0x07</td><td>This setting is not 0x13 or 0x1F.</td></tr>
</table></td></tr>
<tr><td>Sampling Frequency</td><td>Audio Type is other than DSD, and the value of Sampling Frequency (SF) of Audio InfoFrame Audio Channel Count Audio InfoFrame is not 0.
Audio Type is One Bit Audio, and the value of Sampling Frequency (SF) of Audio InfoFrame Audio Channel Count Audio InfoFrame is 0.</td></tr>
<tr><td>Sample Size</td><td>The Audio InfoFrame Audio InfoFrame Sampling Size (SS) value is not 0.</td></tr>
<tr><td>Speaker Placement</td><td>Audio InfoFrame Speaker Placement (CA) is higher than 0x1F.</td></tr>
<tr><td>Level Shift Value</td><td>Audio InfoFrame Speaker Placement (CA) is 0, and Level Shift Value (LSV) is not 0.</td></tr>
<tr><td>Down-mix Inhibit Flag</td><td>Audio InfoFrame Speaker Placement (CA) is 0, and Down-mix Inhibit Flag (DM_INH) is 0x01 (Prohibited).</td></tr>
<tr><td>Rsv of Data Byte1</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 1 are 0.</td></tr>
<tr><td>Rsv of Data Byte2</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 2 are 0.</td></tr>
<tr><td>Rsv of Data Byte6</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 6 are 0.</td></tr>
<tr><td>Rsv of Data Byte7</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 7 are 0.</td></tr>
<tr><td>Rsv of Data Byte8</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 8 are 0.</td></tr>
<tr><td>Rsv of Data Byte9</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 9 are 0.</td></tr>
<tr><td>Rsv of Data Byte10</td><td>None of the values of the Reserve Bits of Audio InfoFrame Data Byte 10 are 0.</td></tr>
<tr><td>No Audio InfoFrame</td><td>There is no Audio InfoFrame when there is Audio input.</td></tr>
</table>

11.1.5 MPEG InfoFrame

Item	Description
Checksum	The lower 8 bits of the value calculated by Mpeg InfoFrame Type Code + Mpeg InfoFrame Version Number + Length of Mpeg InfoFrame + CheckSum are not 0.
Rsv of Data Byte6	None of the values of the Reserve Bits of Mpeg InfoFrame Data Byte 6 are 0.
Rsv of Data Byte7	None of the values of the Reserve Bits of Mpeg InfoFrame Data Byte 7 are 0.
Rsv of Data Byte8	None of the values of the Reserve Bits of Mpeg InfoFrame Data Byte 8 are 0.
Rsv of Data Byte9	None of the values of the Reserve Bits of Mpeg InfoFrame Data Byte 9 are 0.
Rsv of Data Byte10	None of the values of the Reserve Bits of Mpeg InfoFrame Data Byte 10 are 0.

11.1.6 ACP Packet

Item	Description
ACP_TYPE	This is higher than 2. Alternatively, ACP_TYPE is 2, and ISRC1 is not sent.
DVD-Audio_Type_ Dependent_Generation	ACP_Type is 0x02 (DVD), and DATDG is not 0x01. Alternatively, ACP_Type is other than 0x02 (DVD), and DATDG is not 0x00.
Copy_Permission	ACP_Type is not 0x02 (DVD), and Copy_Permission is not 0.
Copy_Number	ACP_Type is not 0x02 (DVD), and Copy_number is not 0. Alternatively, ACP_Type is 0x02 (DVD), Copy_permission is not 0x02, and Copy_number is not 0.
Quality	ACP_Type is not 0x02 (DVD), and Quality is not 0. Alternatively, ACP_Type is 0x02 (DVD), Copy_permission is not 0x02, and Quality is not 0.
Transaction	ACP_Type is not 0x02 (DVD), and Transaction is not 0.
Rsv of Header Byte2	None of the values of the Reserve Bits of Header Byte 2 are 0.
Rsv of Data Byte2-27	None of the values of the Reserve Bits of Data Byte 16-27 are 0.

11.1.7 ISRC1 Packet

Item	Description
Rsv of Header Byte1	None of the values of the Reserve Bits of ISRC1 Packet Header Byte 1 are 0.
Rsv of Header Byte2	None of the values of the Reserve Bits of ISRC1 Packet Header Byte 2 are 0.
Rsv of Data Byte16-27	None of the values of all the Reserve Bits of ISRC1 Packet Data Byte 16-27 are 0.
NO ISRC1 Packet	ACP Packet ACP Type is 0x02 (DVD), and ISRC1 is not sent.

11.1.8 ISRC2 Packet

Item	Description
Rsv of Header Byte1	None of the values of the Reserve Bits of ISRC2 Packet Header Byte 1 are 0.
Rsv of Header Byte2	None of the values of the Reserve Bits of ISRC2 Packet Header Byte 2 are 0.
Rsv of Data Byte16-27	None of the values of the Reserve Bits of ISRC2 Packet Data Byte 16-27 are 0.
NO ISRC2 Packet	When ISRC1_Cont of ISRC1 Packet is 1, ISRC2 Packet is not sent.

11.1.9 Channel Status Bit

Item	Description
Professional or Consumer	The Pro or Consumer setting of Channel Status Block is not 0 (Consumer).
Sampling frequency	Sampling frequency (SF) is not one of the following: 0x00, 0x02, 0x03, 0x08, 0x0A, 0x0C, 0x0E
CSB Repetition Period	The period of B Bit of Channel Status Block is not every 192 samples. *
Audio FIFO ERROR	There is an error in the FIFO access rate.
Audio PLL Lock ERROR	ACR PLL cannot be locked.

* When Sampling Frequency is higher than 96 KHz, this cannot be measured.

11.1.10 Audio Timing

Item	Description
N	N is not within the 128*FS / 1500 Hz ≤ N ≤ 128*FS / 300 Hz range.
CTS	CTS is not within 50 ppm or 100 ppm of the value calculated by (F_TMDS_clock*N) / (128*FS). (Whether 50 ppm or 100 ppm is to be used is determined by the Clock Accuracy of Channel Status Bit.)
No Audio	There is no Audio input, but Audio InfoFrame is present.

* N and CTS errors occur also when SF of Channel Status Bit is abnormal.

11.1.11 Vendor Specific InfoFrame

Item	Description
HDMI Video Format	HDMI Video Format is set to No additional or Reserve.
HDMI VIC	HDMI VIC is set to Reserve.
Structure	Structure is set to Reserve.
EXT_Data	EXT Data is set to Reserve.

11.1.12 HDCP

Item	Description
AKSV	AKSV is not made up of twenty 1's and twenty 0's.
BKSV	BKSV is not made up of twenty 1's and twenty 0's.
Ri, Ri'	The Ri と Ri' values differ.
Device Count	The DEVICE_CNT value has exceeded the maximum count (127).
Depth	The DEPTH value has exceeded the maximum depth (7).

11.2 List of exceeded analyze limits (indicated in orange)

Video Timing

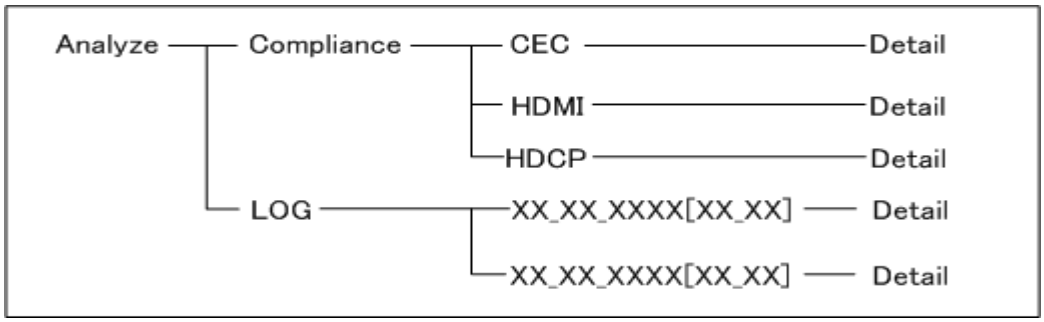
Item	Description
Pixel Clock	When Video Code of AVI Infoframe is not (1-64), the Pixel Clock frequency is not within the 25.000 MHz to 165.000 MHz range.
H Total Pixels	(1) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Total Pixels is not a multiple of 2. (2) When Video code of AVI Infoframe is not (1-64), the pixel count for H Total Pixels is not within the 200 to 2500 range. (3) When Video Code of AVI Infoframe is not (1-64) and H Period is greater than 2144 pixels, then the following is not true: Hsync + H Back Porch ≥ H period - 2048.
H Active Pixels	(1) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Active Pixels is not a multiple of 2. (2) When Video code of AVI Infoframe is not (1-64), the pixel count for H Active Pixels is not within the 128 to 200 range.
H Sync Pixels	(1) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Sync Pixels is not a multiple of 2. (2) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Sync Pixels is less than 2. (3) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Blanking (H Sync Pixels + H Back Porch Pixels + H Front Porch Pixels) is less than 138.
H Back Porch Pixels	(1) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Back Porch Pixels is not a multiple of 2. (2) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Back Porch Pixels is less than 2. (3) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Blanking (H Sync Pixels + H Back Porch Pixels + H Front Porch Pixels) is less than 138.
H Front Porch Pixels	(1) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Front Porch Pixels is not a multiple of 2. (2) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Front Porch Pixels is less than 2. (3) When Video Code of AVI Infoframe is not (1-64), the pixel count for H Blanking (H Sync Pixels + H Back Porch Pixels + H Front Porch Pixels) is less than 138.
V Total Lines	When Video Code of AVI Infoframe is not (1-64), the line count for V Total Lines is not within the 200 to 2000 range.
V Active TOTAL	When Video Code of AVI Infoframe is not (1-64), the line count for V Active TOTAL is not within the 128 to 1320 range.
V Sync Field1	When Video Code of AVI Infoframe is not (1-64), the line count for V Sync Field1 is not within the 4 to 500 range.
V Back Porch Field1	When Video Code of AVI Infoframe is not (1-64), the line count for V Back Porch Field1 is not within the 1 to (1/2 × V Total Lines) range.
V Front Porch Field1	When Video Code of AVI Infoframe is not (1-64), the line count for V Front Porch Field1 is not within the 1 to (1/2 × V Total Lines) range.

12 VA-1831 Specifications

12.1 Log data structure

12.1.1 LOG Data

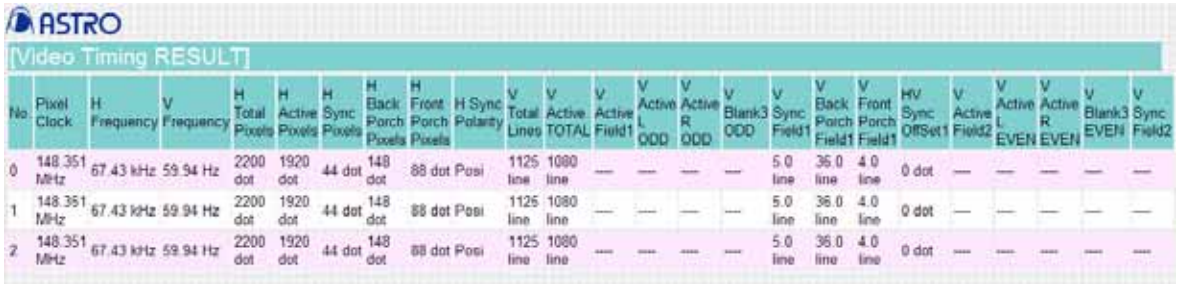
VA-1831 can get LOG data and save it in USB Flash Memory.
The following folder is created in the USB Flash Memory.



* The folder in the LOG folder is created by the element of month_day_year[time]

12.1.2 Analyze Data

When the ANALYZE DATA logs are acquired by the VA-1831, HTML files describing the detailed data below are stored in the USB flash memory.



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[Video Timing RESULT]

No	Pixel Clock	H Frequency	V Frequency	H Total Pixels	H Active Pixels	H Sync Pixels	H Back Porch Pixels	H Front Porch Pixels	H Sync Polarity	V Total Lines	V Active TOTAL	V Active Field1	V Active L ODD	V Active R ODD	V Blank3 ODD	V Sync Field1	V Back Porch Field1	V Front Porch Field1	HV Sync OffSet1	V Active Field2	V Active L EVEN	V Active R EVEN	V Blank3 EVEN	V Sync Field2
0	148.351 MHz	67.43 kHz	59.94 Hz	2200 dot	1920 dot	44 dot	148 dot	88 dot	Posi	1125 line	1080 line	---	---	---	---	5.0 line	36.0 line	4.0 line	0 dot	---	---	---	---	---
1	148.351 MHz	67.43 kHz	59.94 Hz	2200 dot	1920 dot	44 dot	148 dot	88 dot	Posi	1125 line	1080 line	---	---	---	---	5.0 line	36.0 line	4.0 line	0 dot	---	---	---	---	---
2	148.351 MHz	67.43 kHz	59.94 Hz	2200 dot	1920 dot	44 dot	148 dot	88 dot	Posi	1125 line	1080 line	---	---	---	---	5.0 line	36.0 line	4.0 line	0 dot	---	---	---	---	---

The following logs can be acquired by ANALYZE DATA.

Video Timing	Same data as ANALYSIS item data (refer to section “4.1.1 Video Timing”)
AVI InfoFrame	Same data as ANALYSIS item data (refer to section “4.1.2 AVI InfoFrame”)
SPD InfoFrame	Same data as ANALYSIS item data (refer to section “4.1.3 SPD InfoFrame”)
Audio InfoFrame	Same data as ANALYSIS item data (refer to section “4.1.4 Audio InfoFrame”)
MPEG InfoFrame	Same data as ANALYSIS item data (refer to section “4.1.5 MPEG InfoFrame”)
Vendor Specific InfoFrame	Same data as ANALYSIS item data (refer to section “4.1.6 Vendor Specific InfoFrame”)
Gamut MetaData Packet	Same data as ANALYSIS item data (refer to section “4.1.7 Gamut MetaData Packet”)
ACP Packet	Same data as ANALYSIS item data (refer to section “4.1.8 ACP Packet”)
ISRC1 Packet	Same data as ANALYSIS item data (refer to section “4.1.9 ISRC1 Packet”)
General Control Packet	Same data as ANALYSIS item data (refer to section “4.1.11 General Control Packet”)
Channel Status Bit	Same data as ANALYSIS item data (refer to section “4.1.12 Channel Status Bit”)
Audio Timing	Same data as ANALYSIS item data (refer to section “4.1.13 Audio Timing”)
HDCP Status	Same data as ANALYSIS item data (refer to section “4.1.14 HDCP Status”)
Audio Return Channel	Same data as ANALYSIS item data (refer to section “5.2.12 ARC Status”)

12.1.3 DDC DATA

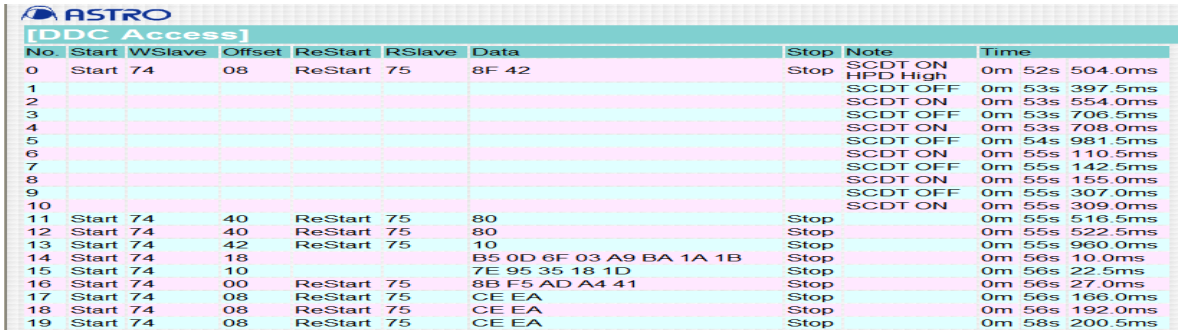
When DDC DATA logs are acquired, the data acquired in text files for DDC text logs and in HTML files for DDC HTML logs is stored in the USB flash memory.

■ **DDC Text Log**

```
0498: SCDT OFF (3m:58s:126.5ms)
0499: SCDT ON (3m:58s:126.5ms)
0500: Start (3m:58s:696.0ms)
        74
        40
     ReStart
        75
        80
       Stop
```

Display item	What is displayed
Start	Start Condition
Restart	Restart Condition
Stop	Stop Condition
SCDT	Detect change
HPD	Hotplugchange
(XXm XXs XXX.Xms)	Acquisition time

■ **DDC HTML Log**



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[DDC Access]

No.	Start	WSlave	Offset	ReStart	RSlave	Data	Stop	Note	Time
0	Start	74	08	ReStart	75	8F 42	Stop	SCDT ON HPD High	0m 52s 504.0ms
1								SCDT OFF	0m 53s 397.5ms
2								SCDT ON	0m 53s 554.0ms
3								SCDT OFF	0m 53s 706.5ms
4								SCDT ON	0m 53s 708.0ms
5								SCDT OFF	0m 54s 981.5ms
6								SCDT ON	0m 55s 110.5ms
7								SCDT OFF	0m 55s 142.5ms
8								SCDT ON	0m 55s 155.0ms
9								SCDT OFF	0m 55s 307.0ms
10								SCDT ON	0m 55s 309.0ms
11	Start	74	40	ReStart	75	80	Stop		0m 55s 516.5ms
12	Start	74	40	ReStart	75	80	Stop		0m 55s 522.5ms
13	Start	74	42	ReStart	75	10	Stop		0m 55s 960.0ms
14	Start	74	18			B5 0D 6F 03 A9 BA 1A 1B	Stop		0m 56s 10.0ms
15	Start	74	10			7E 95 35 18 1D	Stop		0m 56s 22.5ms
16	Start	74	00	ReStart	75	8B F5 AD A4 41	Stop		0m 56s 27.0ms
17	Start	74	08	ReStart	75	CE EA	Stop		0m 56s 166.0ms
18	Start	74	08	ReStart	75	CE EA	Stop		0m 56s 192.0ms
19	Start	74	08	ReStart	75	CE EA	Stop		0m 58s 200.5ms

Display item	What is displayed
No.	The running number for DDC access executed during the test period is shown in this column.
Start	Start Condition
WSlave	The Write Slave addresses are shown in this column.
Offset	The Offset addresses are shown in this column.
ReStart	Restart Condition
RSlave	The Read Slave addresses are shown in this column.
Data	The accessed data is shown in this column.
Stop	Stop Condition
Note	Information appears here when status changes have occurred.
Time	The time elapsed since the log acquisition is shown in this column.

12.1.4 CEC DATA

When CEC DATA logs are acquired, the data acquired in text files for CEC Text logs and in HTML files for CEC HTML logs is stored in the USB flash memory.

■ **CECText Log**

```
0027: Rec2->TV (23m:7s:303.5ms)
        [OP Code] Give Tuner Device Status
        [PA] Off
0028: Rec2->TV (23m:8s:803.5ms)
        [OP Code] Give Tuner Device Status
        [PA] On
0029: Rec2->TV (23m:16s:602.5ms)
        [OP Code] Set Audio Rate
        [PA] Rate Control Off
```

Display item	What is displayed
OP Code	OP Code
PA	Parameter
(XXm XXs XXX.Xms)	Acquisition time

■ **CECHTML Log**

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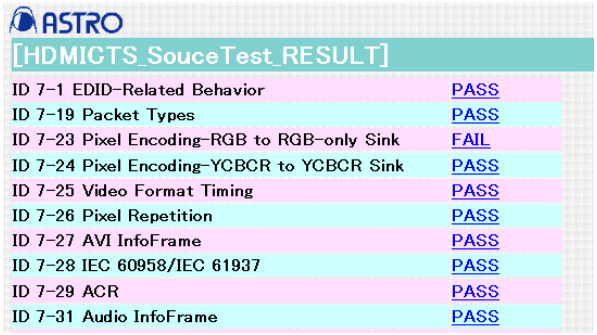
[CEC Access]

No.	Initiator	Destination	OP Code	Data	Note	Time
0	TV	Tuner1			No Ack	5m 52s 521.0ms
1	Audio	Audio			No Ack	5m 52s 555.0ms
2	Audio	Audio			No Ack	5m 52s 595.0ms
3	Audio	BroadC	Report Physical Address	0x1000 TV		5m 52s 631.0ms
4	TV	Tuner1			No Ack	5m 52s 767.0ms
5	TV	Tuner1			No Ack	5m 52s 802.0ms
6	TV	PlayD1			No Ack	5m 52s 846.5ms
7	TV	PlayD1			No Ack	5m 52s 881.5ms
8	TV	PlayD1			No Ack	5m 52s 916.5ms
9	TV	Audio	Give Physical Address			5m 52s 961.0ms
10	Audio	BroadC	Report Physical Address	0x1000 Audio System		5m 53s 17.5ms
11	TV	Tuner2			No Ack	5m 53s 153.5ms
12	TV	Tuner2			No Ack	5m 53s 188.5ms

Display item	What is displayed
No.	The numbers from the log acquisition times are shown in this column.
Initiator	The Initiators are shown in this column.
Destination	The Destination are shown in this column.
OP Code	The OP Code are shown in this column.
Data	The Data are shown in this column.
Time	The time elapsed from the log acquisition is shown in this column.

12.1.5 HDMI Compliance Data

In the HDMI CTS (Refer to 6.1) LOG data, Compliance Test Result is saved as HTML file in the folder of Analyze/Compliance/HDMI in the USB Flash Memory. The result of HDMI Source Test is saved as HDMI_CTS_Sourcetest_result.html and the result of HDMI Sink Test is saved as HDMI_CTS_Sinktest_result.html.



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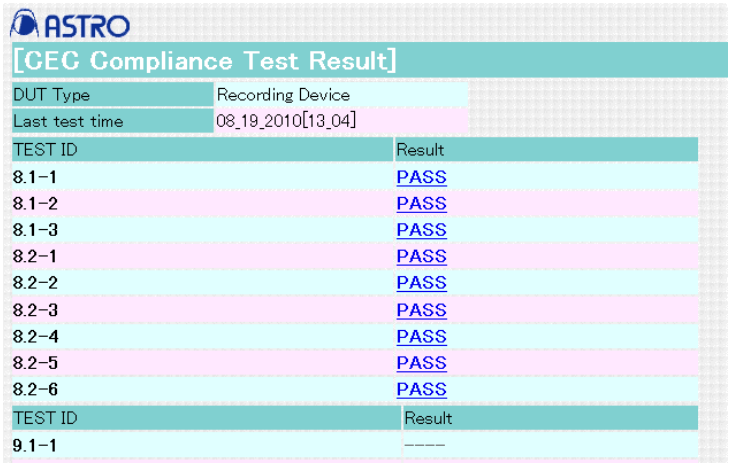
[HDMICTS_SouceTest_RESULT]

ID 7-1 EDID-Related Behavior	PASS
ID 7-19 Packet Types	PASS
ID 7-23 Pixel Encoding-RGB to RGB-only Sink	FAIL
ID 7-24 Pixel Encoding-YCBCR to YCBCR Sink	PASS
ID 7-25 Video Format Timing	PASS
ID 7-26 Pixel Repetition	PASS
ID 7-27 AVI InfoFrame	PASS
ID 7-28 IEC 60958/IEC 61937	PASS
ID 7-29 ACR	PASS
ID 7-31 Audio InfoFrame	PASS

The details of Details folder can be seen from the link of the result of PASS and FAIL.
(Please refer to 6.1 HDMI CTS for details.)

12.1.6 CEC Compliance Data

In the CEC CTS (Refer to 6.2) LOG data, Compliance Test Result is saved as HTML file in the folder of Analyze/Compliance/HDMI in the USB Flash Memory. It is saved as CEC_COMPLIANCE.html.



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[CEC Compliance Test Result]

DUT Type	Recording Device
Last test time	08_19_2010[13_04]

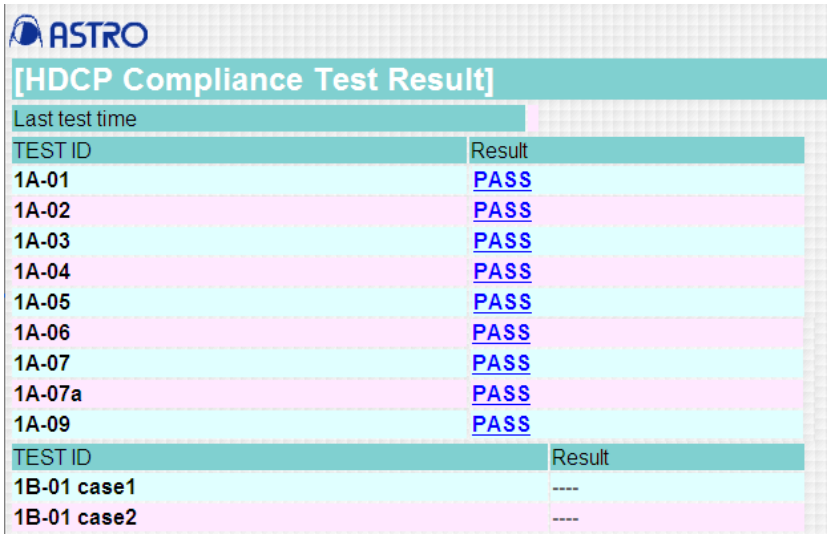
TEST ID	Result
8.1-1	PASS
8.1-2	PASS
8.1-3	PASS
8.2-1	PASS
8.2-2	PASS
8.2-3	PASS
8.2-4	PASS
8.2-5	PASS
8.2-6	PASS
TEST ID	Result
9.1-1	----

Item	Description
TEST ID	CEC CTS ID is displayed.
Result	The result of Compliance Test is displayed.

The flow of CEC DATA of each test item in the Details folder can be seen from the link of the Result of PASS and FAIL. (the display item is same as CEC DATA.)

12.1.6 HDCP Compliance Data

In the HDCP CTS (Refer to 6.3) LOG data, Compliance Test Result is saved as HTML file in the folder of Analyze/Compliance/HDMI in the USB Flash Memory. It is saved as HDCP_COMPLIANCE.html.



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[HDCP Compliance Test Result]

Last test time

TEST ID	Result
1A-01	PASS
1A-02	PASS
1A-03	PASS
1A-04	PASS
1A-05	PASS
1A-06	PASS
1A-07	PASS
1A-07a	PASS
1A-09	PASS

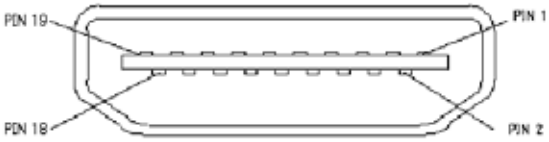
TEST ID	Result
1B-01 case1	----
1B-01 case2	----

Item	Description
TEST ID	CEC CTS ID is displayed.
Result	The result of Compliance Test is displayed.

The flow of DDC DATA of each test item in the Details folder can be seen from the link of the Result of PASS and FAIL.

12.2 Connector Pinouts

12.2.1 HDMI connector



Pinout

Pin assignment

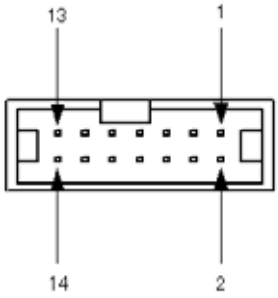
Connector pin no.	Input/output signal
1	TMDS DATA2+
2	TMDS DATA2 SHIELD
3	TMDS DATA2-
4	TMDS DATA1+
5	TMDS DATA1 SHIELD
6	TMDS DATA1-
7	TMDS DATA0+
8	TMDS DATA0 SHIELD
9	TMDS DATA0-
10	TMDS CLK+
11	TMDS CLK SHIELD
12	TMDS CLK-
13	CEC
14	UTILITY
15	DDC CLK
16	DDC DATA
17	GROUND (for +5 V)
18	+5 V POWER
19	HOT PLUG DETECT
Shell	FG

12.2.2 TRIGGER connector

Connector: 7614-5002PL made by 3M

Level: 3.3 V TTL level (equivalent to SN74LVC04)

*** This function is optional. For details, consult with an ASTRODESIGN sales representative.**

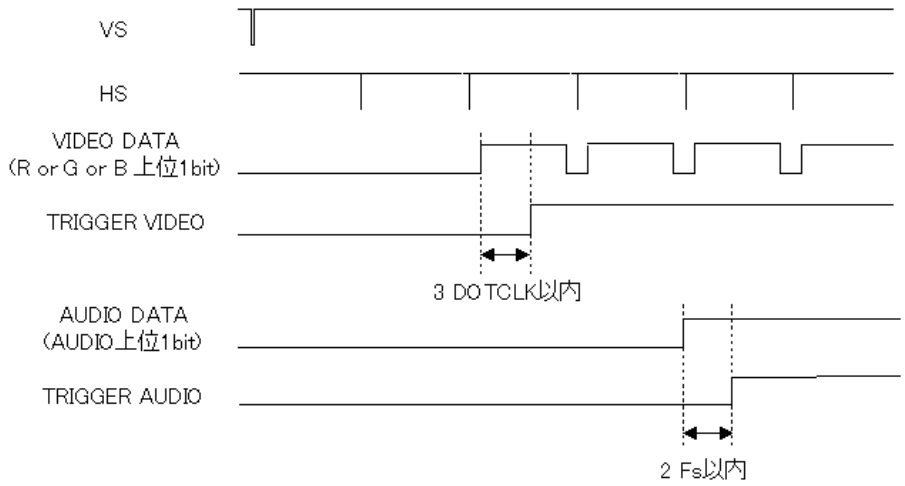


Pin assignment

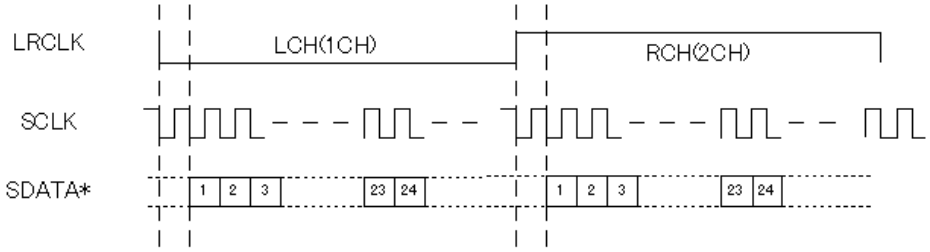
Pin no.	TRIGGER	I2S	Pin no.	TRIGGER	I2S
1	TRIGGER VIDEO	MCLK	8	GND	GND
2	GND	GND	9	VIDEO (YgMSB) *	SD1
3	TRIGGER AUDIO	SCLK	10	GND	GND
4	GND	GND	11	AUDIO (SD0) *	SD2
5	HS	LRCLK	12	GND	GND
6	GND	GND	13	NC	SD3
7	VS	SD0	14	NC	NC

* With VIDEO (YgMSB) Y (or G) is bit 7 with 8 bits and bit 11 with 12 bits.
* AUDIO (SD0) corresponds to bit 0 of I2S. When non-compressed sound is provided, the serial data of channels 1 and 2 is output.

TRIGGER output: The triggers are output at the timing shown below.



I2S output: The I2S are output at the timing shown below.



12.3 VA-1831 specifications

12.3.1 General specifications

■ General specifications

Item	Specification
Supply voltage	AC100 to 240 V
Power line frequency	50 Hz / 60 Hz
Power consumption	50 W
Dimensions	265 (H) × 340 (W) × 150 (D) mm (excluding protrusions)
Weight	Approx. 4.0 kg
Ambient operating temperature	+5 to 40°C
Storage temperature	-10 to 60°C
Humidity	30 to 85% RH (no condensation)

(Panel specifications

Item	Specification
Display area	12.1 inches
No. of pixels	XGA (1024 × 768)
View angle	Horizontal: -80 to 80°, vertical : -80 to 60°
Brightness	320 (cd/m^2)
Contrast	550:1
LCD brightness life	50,000 hours (when LCD backlight brightness is halved) (*)

* The LCD brightness life is an estimate only, and it is not a guarantee.

12.3.2 Ratings

■ HDMI input/output signals

Item			Rating
Input/output signal			TMDS
Video timing restrictions	Pixel Clock		25 to 165 MHz (TMDS CLK: 225 MHz)
	Measurement pixel increment		In 1-pixel increments
	Color space		RGB / YCbCr 444, 422
	LCD output Restrictions	H Total Pixels	300 to 5000 pixels
		H Active Pixels	128 to 4000 pixels
		H Blanking Pixels	138 pixels or more
		V period	60 ms or less
		V Total Lines	300 to 3000 lines
		V Active Lines	128 to 2500 lines
		VBlanking	5 to (1/2 × V Total Lines) lines
	HDMI input/output restrictions	TMDS CLOCK	25 to 225 MHz
		H Total Pixels	300 to 8191 pixels
		H Active Pixels	128 to 4095 pixels
		H Blanking Pixels	138 pixels or more
		V period	60 ms or less
		V Total Lines	300 to 4095 lines
		V Active Lines	128 to 2047 ;ines
		V Sync Lines	4 to 2047 lines
		V Back Porch Lines	1 to (1/2 × V Total Lines) lines
Audio	HDMI input/output restrictions	Sampling frequency	32 K to 192 KHz (L-PCM 8CH), 768 KHz (HBR) * Restrictions apply with some timings.
		Audio format	IEC 60958, 61937
		No. of bits	16, 20 or 24 bits
HDCP			Sending and receiving enabled
Generate function			Available
Repeater function			Available (up to 16 units)
Through function			Available (up to TMDS CLK165 MHz)
DDC			DDC2B supported
E-EDID			Ver. 1.4
CEA EDID Timing Extension			Ver. 3
EDID ROM size	When power is OFF		256 bytes (not rewritable)
	When power is ON		2 Kbytes

■ USB

Item	Rating
HOST×2	Connected with USB mouse for use Connected with USB flash memory for use (*)
DEVICE	Connected with PC, Utility software used

* Use the USB flash memory provided as a standard accessory.

■ LAN

Item	Rating
	Connected with PC, Utility software used

■ COAX input/output signals

Item		Rating
COAX IN/OUT	Audio format	SPDIF, IEC60958 or 61937
	Sampling frequency	32k to 192 KHz (L-PCM 8CH)
	No. of bits	16, 20 or 24 bits

■ TRIGGER

Item	Rating
TRIGGER	TRIGGER or I2S

* For details on the specifications, refer to section "11.2.2 TRIGGER connector."
* **This function is optional. For details, consult with an ASTRODESIGN sales representative.**

12.3.3 Restrictions

- While operating with the VA-1831 sink data set to receiver (monitor), no signals will be output from the HDMI and COAX output connectors.
- While operating with the VA-1831 sink data set to DVI, no sound can be input or output.
- Even when the VA-183 sink data is set to repeater, it will be executed by the receiver if a device is not connected to the HDMI output connector. (Only with HDCP)
- When the VA-1831 sink data is set to repeater and a device which does not support HDCP is connected to the HDMI output connector, HDCP will not be executed properly. (An ACK error in the DDC line at the HDMI output side results, making it impossible for the sequence to move ahead).
- When a monitor with no Physical Address has been connected to the output, the Physical Address of the VA unit remains unchanged.
- The maximum number of units which can be connected when the VA-1831 sink data has been set to repeater is 16.
- When headphones are connected to the headphone jack, no sound will be output from the speakers.
- Up to five windows including ENABLE can be displayed.
- The maximum number of packets which can be selected by Generate General Setting is 6.
- It is not possible to display the video timing sub window to be displayed by the HDMI icon and the clock window at the same time.
- Use an HDMI cable with a length up to 2 meters.
- Use the mouse and USB flash memory which come with the VA-1831.
- Generate can be used only in the Receiver Mode.
- When using Lipsync at the Manual setting with Generate Timing, the video and audio ON/OFF times are output at 128 V. Select a setting that ensures that the Manual Correction (Delay time) setting will not exceed V period x 128.
- Only Load, Save or Delete for Config File can be opened at one time
- In the Through Mode, support is provided up to TMDS CLK 165 MHz.
- With Other Packet for Signal Generate, the following packets cannot be set.

Audio Clock Regeneration (0x01)
Audio Sample (0x02)
General Control Packet (0x03)
ACP Packet (0x04)
ISRC1 Packet (0x05)
One Bit Audio Sample Packet (0x07)
DST Audio Packet (0x08)
HBR Audio Stream Packet (0x09)
Gamut Metadata Packet (0x0A)
Vendor Specific InfofFrame (0x81)
AVI InfoFrame (0x82)
SPD InfoFrame (0x83)
Audio InfoFrame (0x84)
MPEG InfoFrame (0x85)

VA-1831 Instruction Manual

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