ASTRO

HDMI protocol Analyzer

VA-1809A

Instruction Manual

Ver.1.06

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2008.7

Ver.1.06

ASTRODESIGN,Inc

Contents

Foreword

Thank you very much for purchasing this model VA-1809A HDMI protocol analyzer. This manual contains details on the operation procedures to be followed when the VA-1809A is used, the checkpoints and precautions to be observed, and other useful information. Refer to its instructions when using the analyzer.
Ensure that the manual is kept in a safe place where it can be referred to at any time.

Safety precautions

Concerning this unit

- Do not subject the analyzer to strong shocks or throw it around. Doing so may cause the liquid crystal to leak and/or the analyzer to malfunction, rupture, generate heat and cause a fire.
- Do not use the analyzer wherever there is a risk of ignition or explosions.
- Do not place the analyzer inside a microwave oven or other heating or cooking appliance or pressure vessel. Doing so may cause heat or smoke to be generated in the analyzer, combustion and/or damage to the circuit components.
- Inside the analyzer are some high-voltage parts: since exposure to these parts may result in electric shocks or burns and tampering with them may cause malfunctioning, refrain from disassembling, repairing or remodeling the analyzer.
- If a thunderstorm should occur while the analyzer is being used outdoors, immediately turn off its power, disconnect the power cable from the main unit, and move the analyzer to a safe place.

Concerning the power cord

- Always take hold of the molded part of the plug when disconnecting the power cable.
- Do not bend the power cords with excessive force or bundle them. Doing so may cause fire.
- Do not place heavy objects on top of the power cable. This may damage the cord, causing a fire or electrical shock.

Concerning foreign matter

- Do not spill liquids inside the analyzer or drop inflammable objects or metal parts into it. Operating the analyzer under these conditions may cause a fire, electric shocks and/or malfunctioning.

Concerning the power supply

- Use an AC supply voltage within the range of AC 100 - 120 V or AC 200 - 240 V for the analyzer
- Do not turn the power back on immediately after having turned it off. Doing so can cause malfunctioning.
- To make the power supplies of the devices to be connected to the VA-1809A common, connect such devices with FG cables.

Concerning the LCD display

- Due to the nature of liquid crystal, some picture elements may be missing (bright spots, dark spots, etc.) at times.
- Do not touch any liquid crystal which has leaked from the liquid crystal panel.
  If the liquid crystal panel has been damaged by mistake and the liquid (liquid crystal) inside has leaked out, keep the liquid away from your mouth and skin and do not inhale its odors.
- In the event that liquid crystal has made contact with your eyes or mouth, use water to rinse it off immediately. If it has come into contact with your skin or clothing, wipe it off immediately with alcohol, and then rinse it off with soap. Leaving it in place may damage your skin or clothing.
- Exercise care with the glass of a broken liquid crystal panel. If the panel has broken, take care not to cut your hands on the glass shards. If you should touch an area where the glass has broken off, you may injure yourself.
- The LCD panel is a high-precision component and, as such, the following care must be taken in its handling.
  - Wiping the panel's surface with benzine, paint thinners, etc. will cause a deterioration in its quality.

- If water (salty 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 analyzer due to condensation, etc. may cause unevenness in the colors.
- Directly tapping the surface or bumping it into objects may crack the panel, etc.
- Do not attempt to disassemble the panel since leaking liquid crystal may make contact with your skin, which is hazardous.

- Handle the liquid crystal protective panel carefully.
  Gently wipe off any fingerprints or dirt on the liquid crystal protective panel with a cleaning agent used to clean office automation equipment. Rubbing the panel with too much force may mark or damage the panel.
- Leaving an image on the screen for too long may result in the image being burned onto the screen.
- The user will be charged for repairs or replacement of parts to correct any trouble occurring in the LCD panel whether or not the trouble has occurred during the warranty period.

Concerning impact

- This is a precision instrument and, as such, subjecting it to impact may cause malfunctioning. Take special care when moving the analyzer.
- Do not drop the analyzer.

Concerning the installation and operation locations

- Installing the analyzer in the following kinds of locations may cause malfunctioning and/or accidents.
  - Locations with an ambient temperature outside the range of 5 to 40°C (see Note 1)
  - Locations with an ambient humidity outside the range of 30 to 80% RH
  - Locations in the vicinity of an air conditioner or subject to rapid temperature changes or the formation of condensation
  - Locations exposed to direct sunlight (see Note 2)
  - Locations exposed to corrosive gases or high concentrations of dust
  - Locations where strong magnetic fields are generated
  - Locations where the analyzer may be splashed with water, oil, chemicals, etc.
  - Locations to which vibrations are transmitted from the floor
  - Unstable locations
- Take care to meet the following conditions in order to ensure that the analyzer will be used properly.
  - Do not place heavy objects such as a monitor directly on top of the analyzer.
  - Avoid placing any objects around the analyzer.

Note 1: When the surface temperature of the LCD panel exceeds 60°C, the LCD panel may cease to indicate the proper displays and deteriorate.

Note 2: 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.

Concerning what is packed with the unit

The following items have been provided with this analyzer. Be absolutely sure to use only the items supplied for these parts since use of any other items may give rise to trouble.

Standard items

- VA-1809A
- VA-1809A instruction manual (what you are reading): 1 copy
- Compact Flash (CF) card (64 MB): 1 pc
- Power cable: 1 pc (for use with VA-1809A only)
- FG cable (1.5 meters): 1 pc (for use with VA-1809A only)
- VA-1809A utility software installation CD (Windows compatible): 1 disc

1 Concerning the VA-1809A

1.1 Introduction

The VA-1809A HDMI (High-Definition Multimedia Interface) protocol analyzer (henceforth referred to in this manual as the VA-1809A) allows the protocols required in the development of HDMI transmitters to be checked. Its LCD screen and internal speaker on the front panel enables HDMI images and sound to be easily monitored.

Since the performance information (EDID, SINK) of the VA-1809A can be rewritten, the analyzer allows various kinds of receivers (monitors) to be simulated. It comes with output HDMI connectors so that it can be used as a repeater as well. It can also be used in the development of DVD players and set-top boxes which are equipped with HDMI connectors.

* For the purposes of this manual, the term “receiver” (or “monitor”) is used to denote any unit equipped with an HDMI input connector but not with an HDMI output connector such as a monitor or TV, and the term “repeater” is used to denote any unit which is equipped with both HDMI input and HDMI output connectors and which outputs signals on the basis of the input signals.

1.2 Features and main functions

■ ANALYZE (measurement) functions

The analyzer measures the HDMI and DVI video timing data.

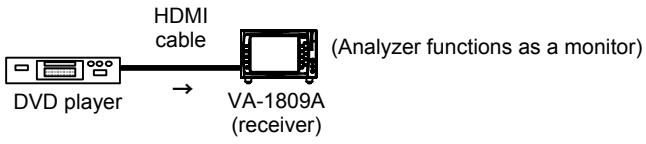
It also measures the contents of the HDMI packets.

It checks for differences from the HDMI ratings.

■ Receiver (monitor) functions

HDMI input signals can be received.

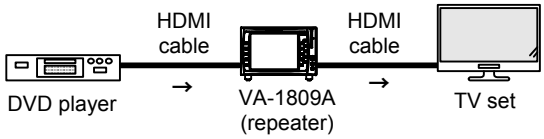
Connections



■ Repeater functions

The analyzer can also be made to function as a repeater by supplying signals through its HDMI output connector.

Connections



■ Emulation functions

The performance information (such as for a TV that supports HDTV or NTSC) of the VA-1809A main unit can be changed to the performance of many other types of monitors.

■ Built-in LCD monitor and speaker

This LCD monitor at the front makes easy work of monitoring 8-bit, 10-bit and 12-bit HDMI images. Similarly, the internal speaker makes easy work of monitoring the linear PCM sound.

■ Program functions

The data used to simulate monitors can be managed using programs. It can be changed to the performance of many different kinds of monitors simply by calling the corresponding programs. A group function is also available for selecting ahead of time only those programs used among a pool of many programs.

■ Registration of data onto CompactFlash cards

The ANALYZE (measurement) data, programs, equipment settings and other data can be stored on CompactFlash cards.

■ Hot plug function

This function resets the transmitter without having to connect or disconnect the cables between the transmitter and VA-1809A.

■ Log trigger function

This function allows the trigger to be set for capturing the ANALYZE data.

■ DDC line monitor function

This function will enable commands to be sent and received over the DDC line.

■ HDMI Ver.1.3a supported

HDMI 1.3a timing data and InfoFrame are supported.

■ Compliance function

This function enables simplified HDCP CTS1.1, HDMI CTS1.3b and CEC CTS1.3b tests to be performed.

1.3 Concerning the programs

The information on the performance of the HDMI receivers is stored in the EDID and HDCP registers, and it is relayed when it is read by the HDMI transmitter.

By rewriting this performance information, the VA-1809A enables various HDMI receivers to be simulated.The information can be stored in a single program.

Programs consist of the following data:

- Program data : The program name data is stored.
- EDID date : The EDID data is stored.
- SINK data : The performance information of the DVI or HDMI receiver (monitor) or repeater is stored.

Ten programs are provided inside the EPROM in the VA-1809A main unit as sample programs. (For details, refer to “8.1 Internal data” on page 280.) This data can be used for output or as the original data to be copied onto CF cards.

1.4 Concerning Compact Flash (CF) cards

1.4.1 Introduction

The results of the analyses performed by the VA-1809A can be saved onto CompactFlash (CF) cards.

CF cards enable programs, EDID data, SINK data, ANALYSIS data and CONFIG data to be registered and edited.

1.4.2 Types

Use the CF card packed with the VA-1809A. Trouble in operation caused by the use of any other CF card is not covered by the warranty.

CAUTION

CF cards come with many and varied specifications. As such, if a card whose operation in the VA-1809A has not been verified is used, the read/write operations may be unstable or the card may not function at all.

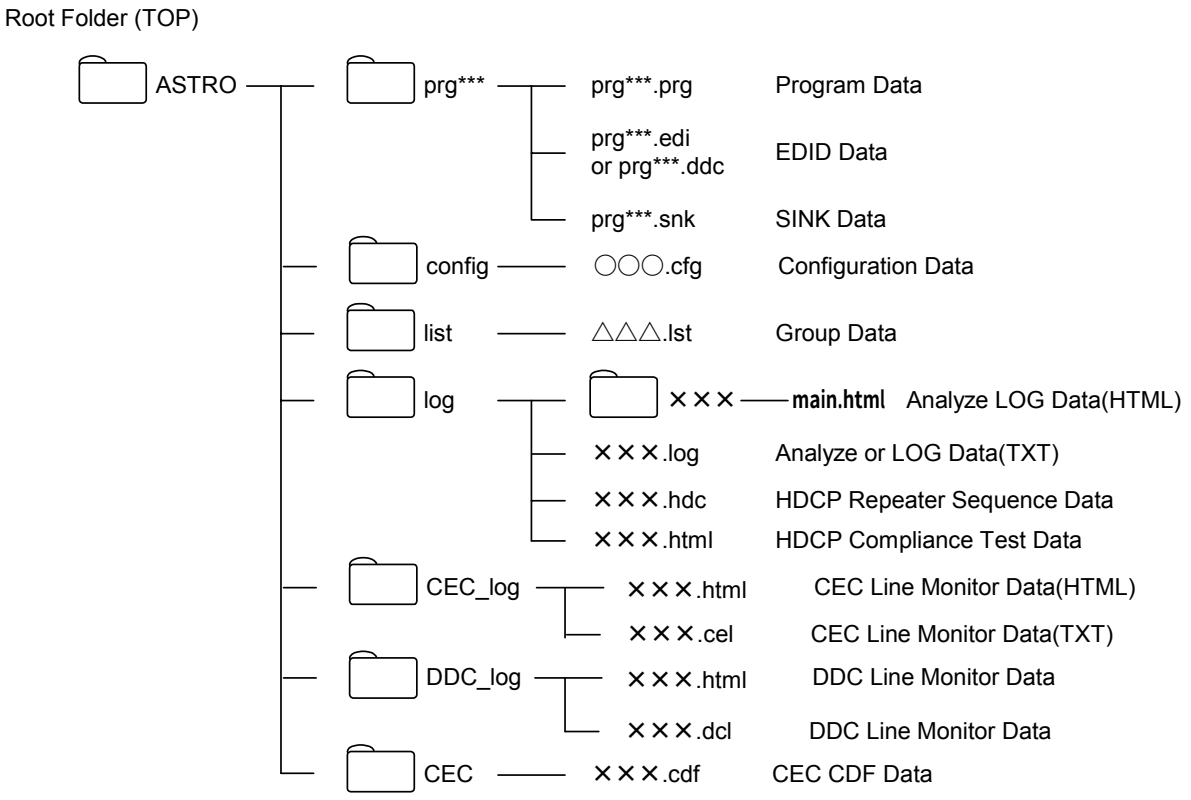
1.4.3 Amount of data that can be registered

Shown below is the amount of data that can be registered on a CF card.

	Amount of data that can be registered
Programs (PROGRAM, EDID, SINK)	100
LOG, ANALYSIS data	These can be saved insofar as the CF card has enough free memory to accommodate them.
GROUP data	
CONFIG data	

1.4.4 Storage locations of registered data

When data is registered in a CF card, it is registered in the locations shown below.



1.4.5 How to insert the CF card

Point the CF card in the direction of the arrow shown on the top of the card, and insert. Insert it all the way in. Check that the VA-1809A's card icon is displayed in white, and card recognition is completed.

1.4.6 How to eject the CF cards

Verify that the card icon has disappeared by holding down the ENTER button, and then remove the card.

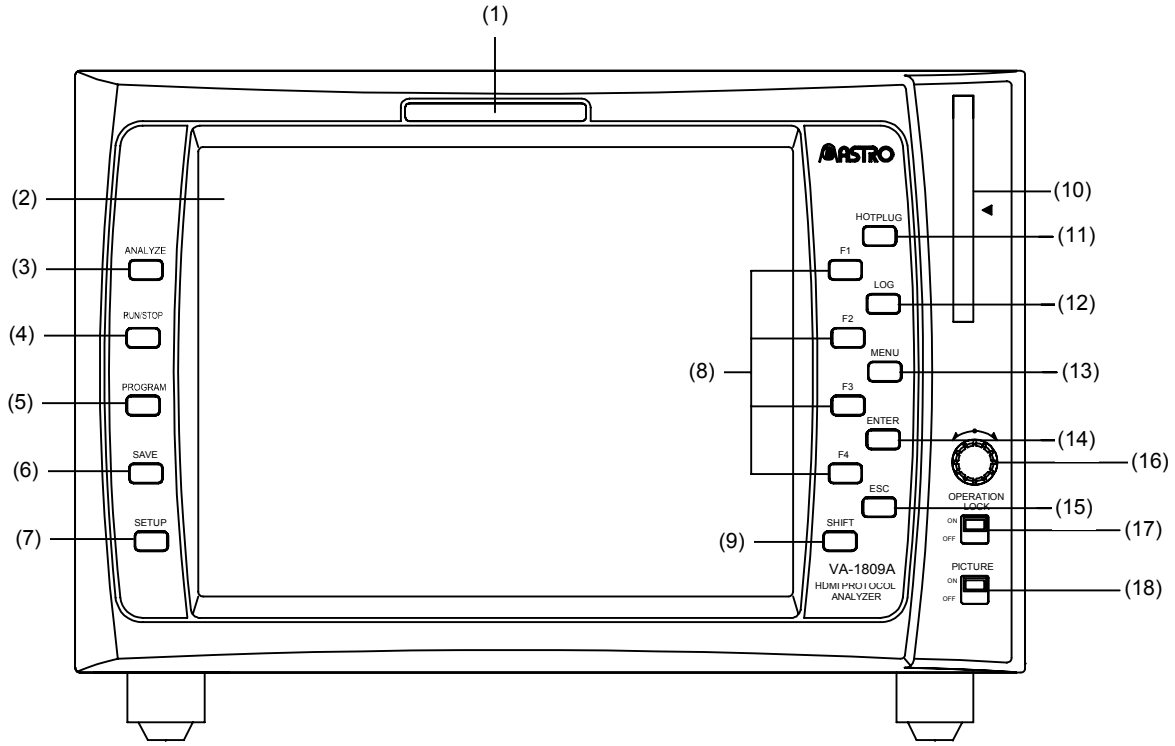
CAUTION

Be absolutely sure to adhere to the above sequence of steps when inserting or ejecting the CF card. Action taken in any other sequence may destroy the CF card data. In addition, the CF card will no longer be recognized even when it is re-inserted.

1.5 Parts and their functions

The button functions differ depending on the unit's function and its mode.
For details, refer to the descriptions of the operations outlined in each section.

1.5.1 VA-1809A front panel



No.	Button	Description of function
(1)	Operation LED	This lights when images are input or operations are performed.
(2)	LCD screen	The HDMI input images, analysis results, etc. are displayed on this screen.
(3)	ANALYZE button	HDMI output data analysis is initiated by pressing this button.
(4)	RUN/STOP button	This is used to run or stop the analysis. It works only while analysis results are displayed.
(5)	PROGRAM button	The contents of programs can be edited by pressing this button.
(6)	SAVE button	The settings or analysis results can be saved by pressing this button.
(7)	SETUP button	Various settings can be performed by pressing this button.
(8)	F1, F2, F3, F4 buttons	Settings or programs can be selected by pressing these buttons.
(9)	SHIFT button	The functions of the function buttons can be extended by pressing the buttons together with the shift button.
(10)	CF card slot	This is where the CF cards are inserted.
(11)	HOTPLUG button	The Hot Plug Detect signal can be turned ON or OFF by pressing this button. It works only while analysis results are displayed.
(12)	LOG button	This is used to start or terminate a log.
(13)	MENU button	The menus can be turned ON or OFF by pressing this button.
(14)	ENTER button	Settings can be selected and entered by pressing this button.
(15)	ESC button	Settings can be exited by pressing this button.
(16)	Rotary encoder	When this is rotated, menus or programs can be selected. When it is pressed, its ENTER function is activated. When it is held down (for 2 seconds), the sound is muted. When it is held down and rotated, the sound volume can be adjusted.
(17)	OPERATION LOCK switch	When it is set to ON, none of the panel buttons can be operated.
(18)	PICTURE switch	It enables the rear panel images to be set to ON or OFF.

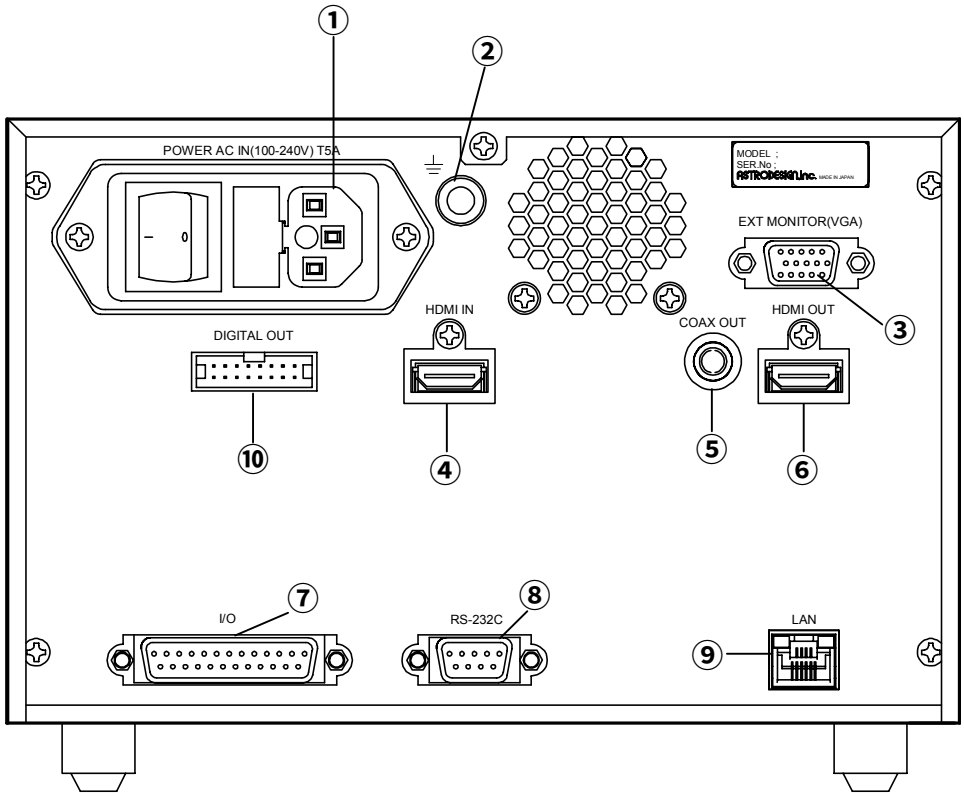
CAUTION

Always remember to insert the CF card all the way in. Verify that the card icon has disappeared by holding down the ENTER button, and then remove the card. Failing to take the steps in the prescribed sequence may cause the CF card data to be destroyed.

CAUTION

HDMI input images are displayed after their resolution has been converted.
For this reason, the images displayed on the LCD may differ from the images actually input.

1.5.2 VA-1809A rear panel



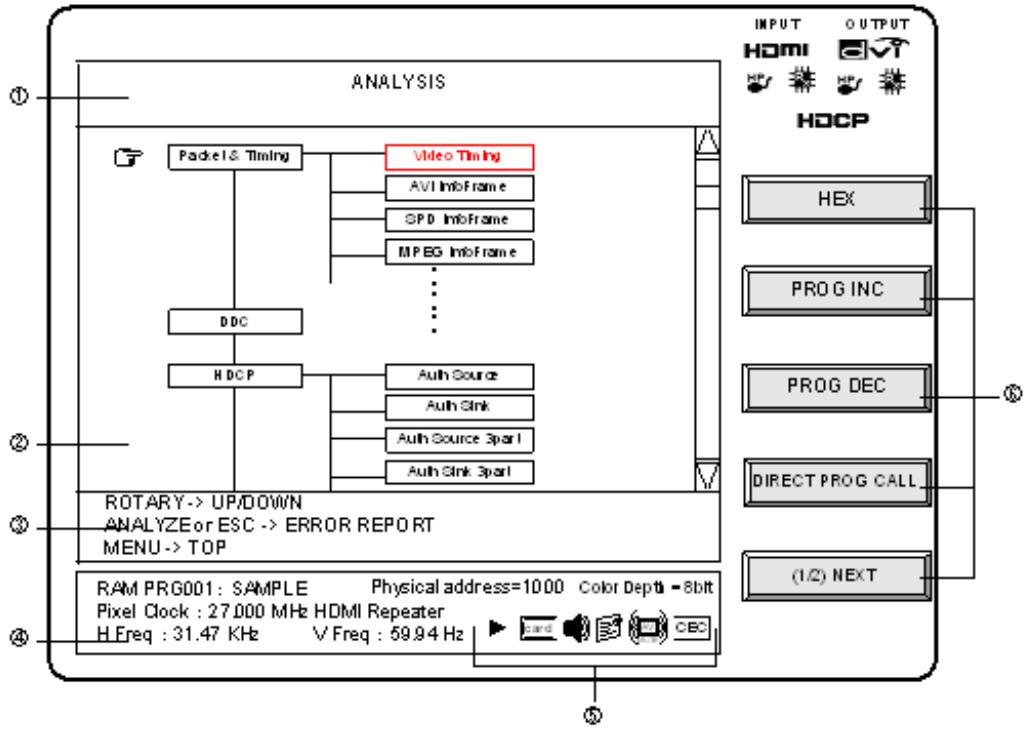
No.	Part	Description
(1)	AC input socket	Connect the power cable here. This socket supports 100-120 V and 200-240 V supply voltages.
(2)	Frame ground (FG) terminal	This is connected to the corresponding FG terminal on the unit connected to the VA-1809A.
(3)	EXT MONITOR (VGA) connector	The same output signals as the ones displayed on the LCD screen are output from this connector in analog form. Resolution is fixed at 1024 × 768 (at 60 Hz). (No signals are output with HDCP.)
(4)	HDMI IN connector	The HDMI output signals of the DVD player, set-top box, etc. are supplied to this connector.
(5)	COAX (coaxial) OUT connector	This is the digital audio output connector.
(6)	HDMI OUT connector	The HDMI signals are output from this connector to the input connector on the HDMI TV set, monitor, etc.
(7)	I/O connector(25 pins, female)	This is not used.
(8)	RS-232C connector (9 pins, male)	This connector is used to connect a personal computer using an RS-232C cable.
(9)	Ethernet port (10/100BASE-TX)	This port is used to connect to a LAN using an Ethernet cable.
(10)	DIGITAL OUT (Option)	This port outputs TRIGGER or I2S. (Option)

* The function of (10) is an option. Please ask ASTRODESIGN for details.

CAUTION

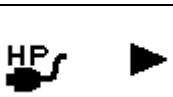
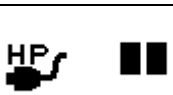
Be absolutely sure to use the power switch to turn the power on and off. Turning the power on or off by connecting or disconnecting the power cable may destroy the data on the CF card.

1.5.3 VA-1809A on-screen display



No.	Part	Description
(1)	TITLE window	This is where the titles of the on-screen display contents are displayed.
(2)	MAIN window	This is where details of the analysis results, etc. are displayed.
(3)	HELP window	Advice on the button operations is available here.
(4)	STATUS window	The input timing data information appears here.
(5)	STATUS icons	The types, statuses, etc. of the input and output signals are displayed here using icons.
(6)	FUNC (function) icons	The meanings of the function buttons are indicated here. They correspond to the F1 to F4 and SHIFT buttons from the top.

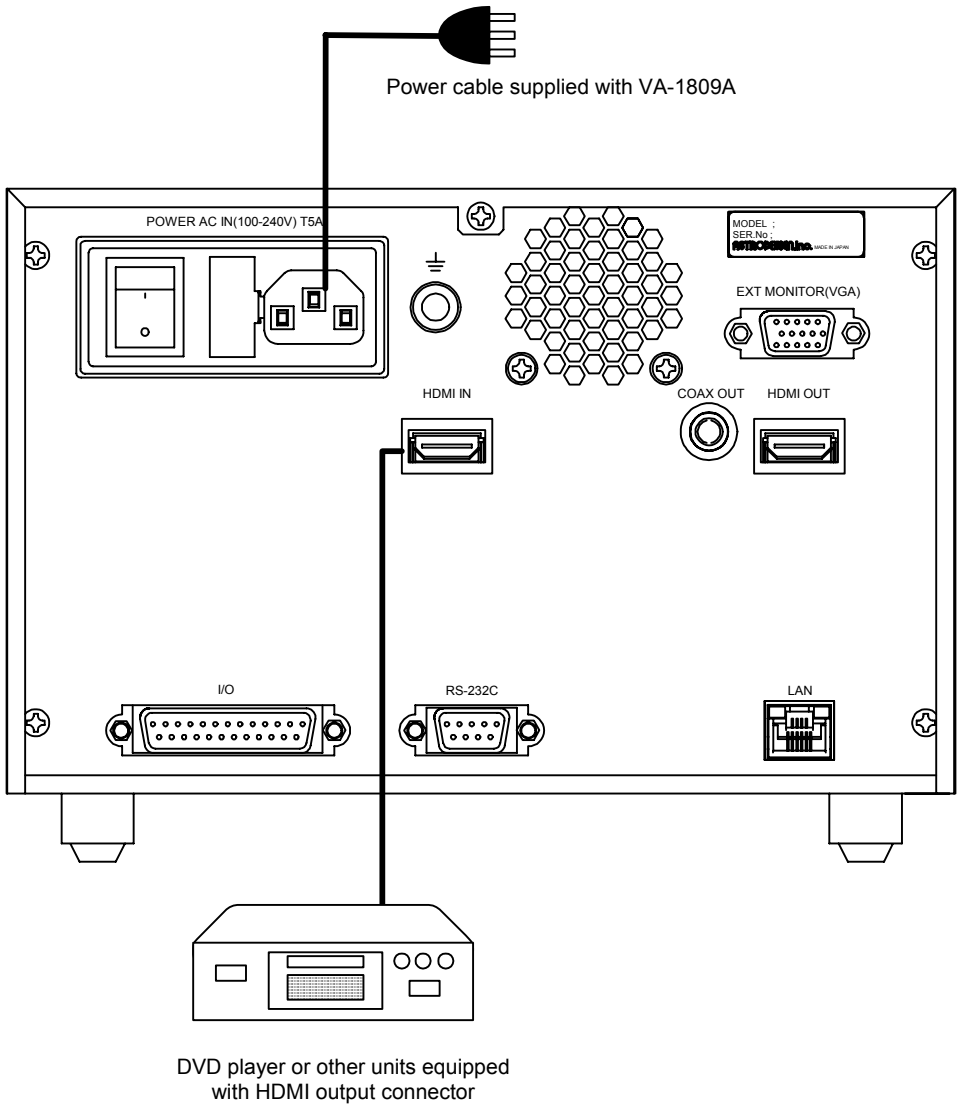
1.5.4 Icons

Icon	Name	Description
	Card icon	This indicates the CF card status. If it appears in red, data is being written on the CF card, so do not turn off the power or attempt to eject the card.
	Input/output signal format icons	This appears in white when the signal format of the input or output images is HDMI (High-Definition Multimedia Interface).
		This icon appears in white when the signal format of the input or output images is DVI (Digital Visual Interface).
	HDCP icon	This appears in white when HDCP (High-bandwidth Digital Content Protection) has been applied to the input or output image signals. It appears in orange when the first recognition is done.
	Hot plug icons	This appears when the AUTO MODE is selected in CONFIG SETUP for the hot plug status on the HDMI input side. In this mode, the hot plug signals are set to low only for the set time (10 to 200 ms) when the HOTPLUG button is pressed.
		This appears in light blue when the hot plug status at the HDMI input side or output side is at Low (not Detect). The hot plug at the input side can be controlled using the HOTPLUG button.
		This appears when the hot plug status at the HDMI input is selected as CONTINUOUS MODE by CONFIG SETUP, and in addition, HOTPLUG is being changed regularly. Regular change of HOTPLUG can be controlled using the HOTPLUG button.
		This appears when the hot plug status at the HDMI input is selected as CONTINUOUS MODE by CONFIG SETUP, and in addition, HOTPLUG is NOT being changed regularly. Regular change of HOTPLUG can be controlled using the HOTPLUG button.
	Log icon	This appears in white while log data is being output.
	Update/no update icons	This appears in green when RUN (updating) has been selected with the RUN/STOP button.
		This appears in red when STOP (no updating) has been selected with the RUN/STOP button.
	Speaker icon	This appears in yellow when the sound from the internal speaker is output. It appears in gray when it is muted.
	AV MUTE icon	This appears in blue when AV mute is on, and in gray when off.
	CEC icon	This icon appears in yellow when CEC commands are being transmitted or received. It appears in gray when commands are not being transmitted or received.

2 Connections with peripherals

2.1 Example of connections when using the VA-1809A as a receiver (monitor)

In this example, the VA-1809A is used as the receiver (monitor) for analyzing the HDMI protocols of the HDMI output device. Timings can be measured even when the DVI output device is not equipped with an HDMI function.

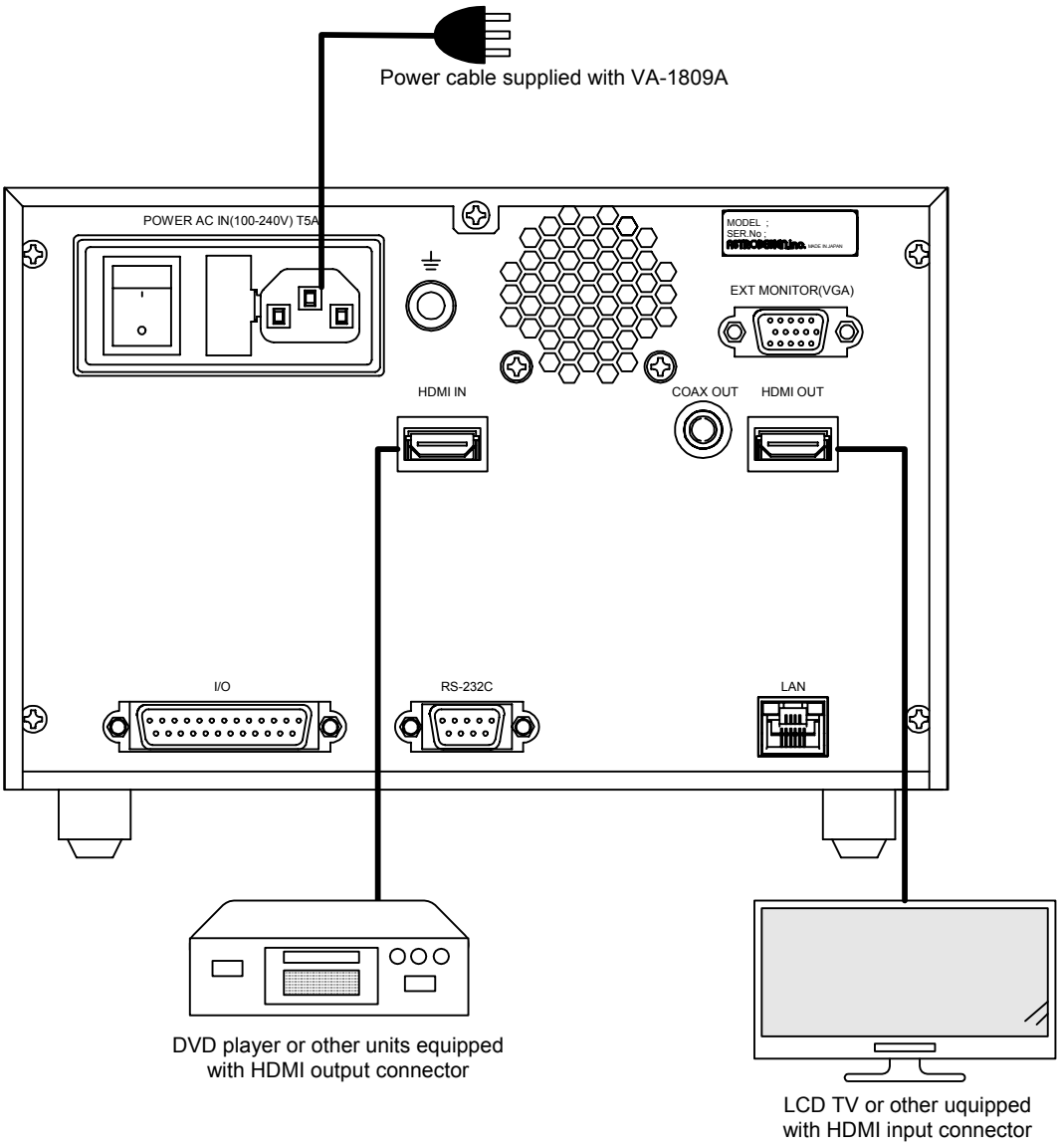


CAUTION

When using the VA-1809A as a receiver (monitor), use one for which the SINK rx mode is registered as the receiver. For the setup, refer to “Simple setup” on page 220.

2.2 Example of connections when using the VA-1809A as a repeater

In this example, the VA-1809A is used as the repeater for analyzing the HDMI protocols of the HDMI output device. By connecting a monitor that supports HDMI to the HDMI output connector of the VA-1809A, it is checked that the output device functions properly to support the repeater.



CAUTION

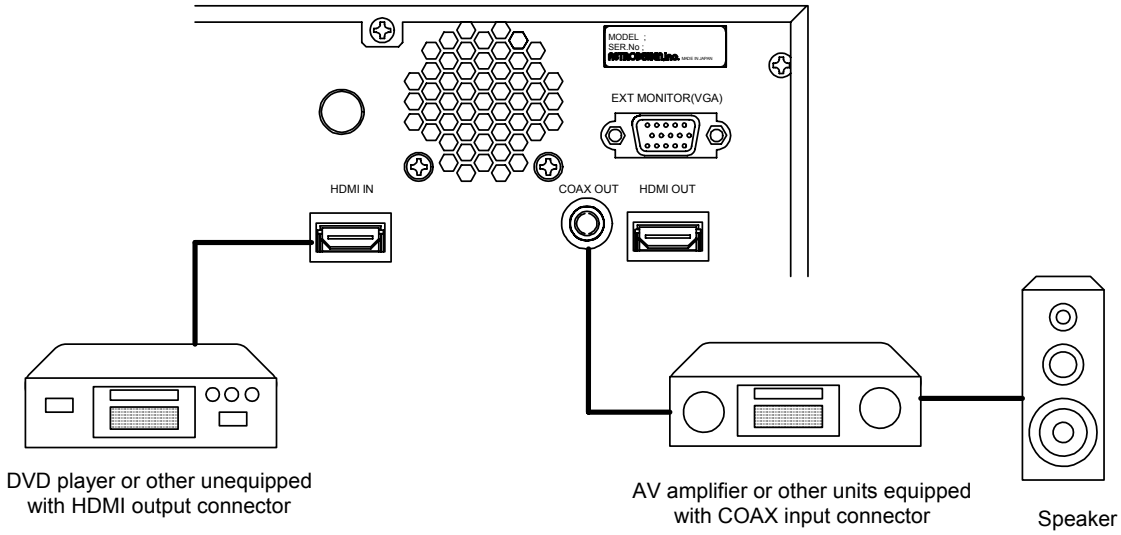
When using the VA-1809A as a repeater, use one for which the SINK rx mode is registered as the repeater. For the setup, refer to “Simple setup” on page 220.

If a receiver or repeater is not connected to HDMI output, the VA-1809A will operate as a receiver even if SINK rx mode is set to repeater.

2.3 Connections for isolating the HDMI input sound for output

In this example, the audio output is checked by connecting an AV amplifier or other unit to the COAXIAL output connector of the VA-1809A.

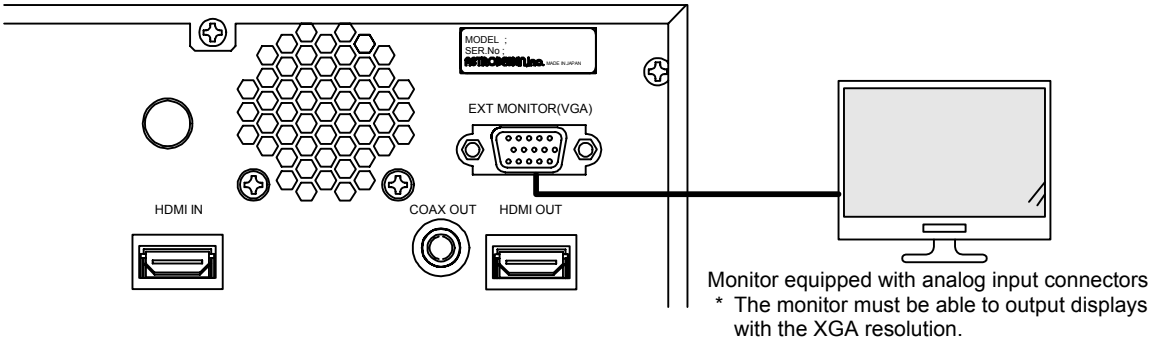
* Audio output cannot be performed during HDCP execution.



2.4 Example of connections when outputting LCD displays to an analog monitor

In this example, the same displays as on the LCD screen of the VA-1809A are output to an external monitor

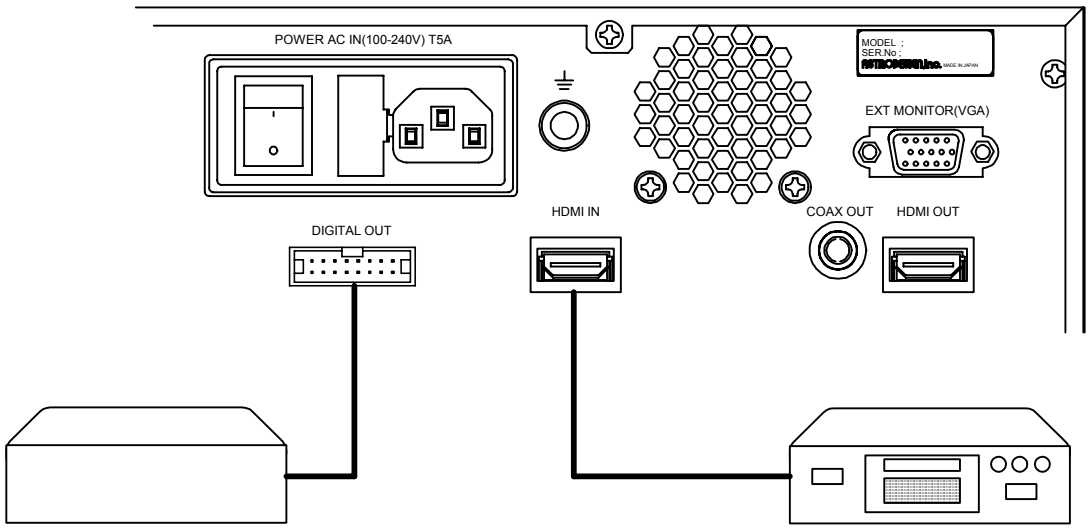
* Displays with the XGA screen resolution are output regardless of the performance (EDID) of the monitor connected to the analog D-SUB output connector. Provide a monitor capable of displaying the XGA resolution.
* The background image cannot be output during HDCP execution. If the background image is turned off with the PICTURE switch, only the overlaid output result can be output.



2.5 Example of connections when outputting signal from DIGITALOUT

TRIGGER signal or I2S signal is output from DIGITAL OUT connector.

* This is an optional function. Please ask ASTRODESIGN for detail.
* User has to prepare Testing Adapter.

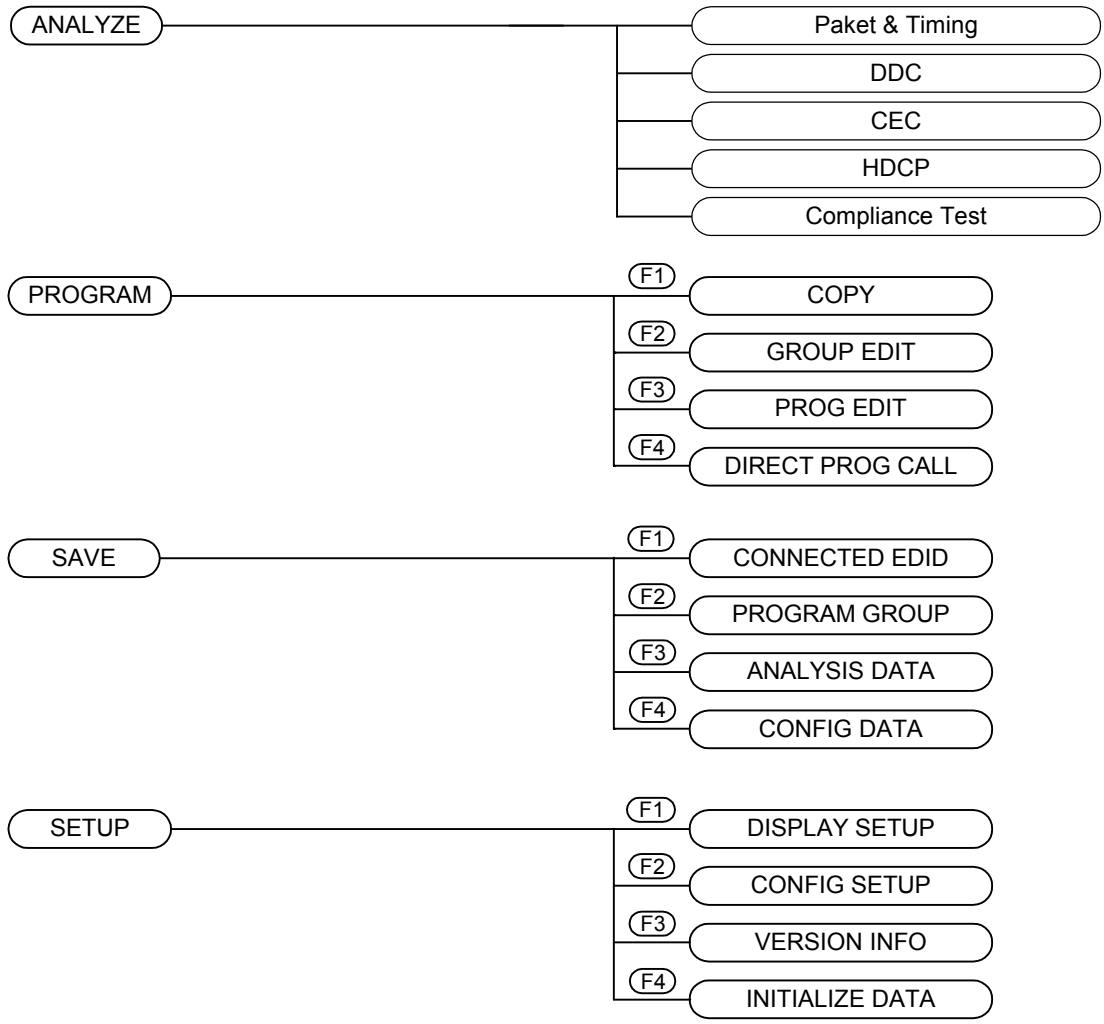


Testing Adapter

The device that has HDMI input, such as LCD TV.

3 Menu tree

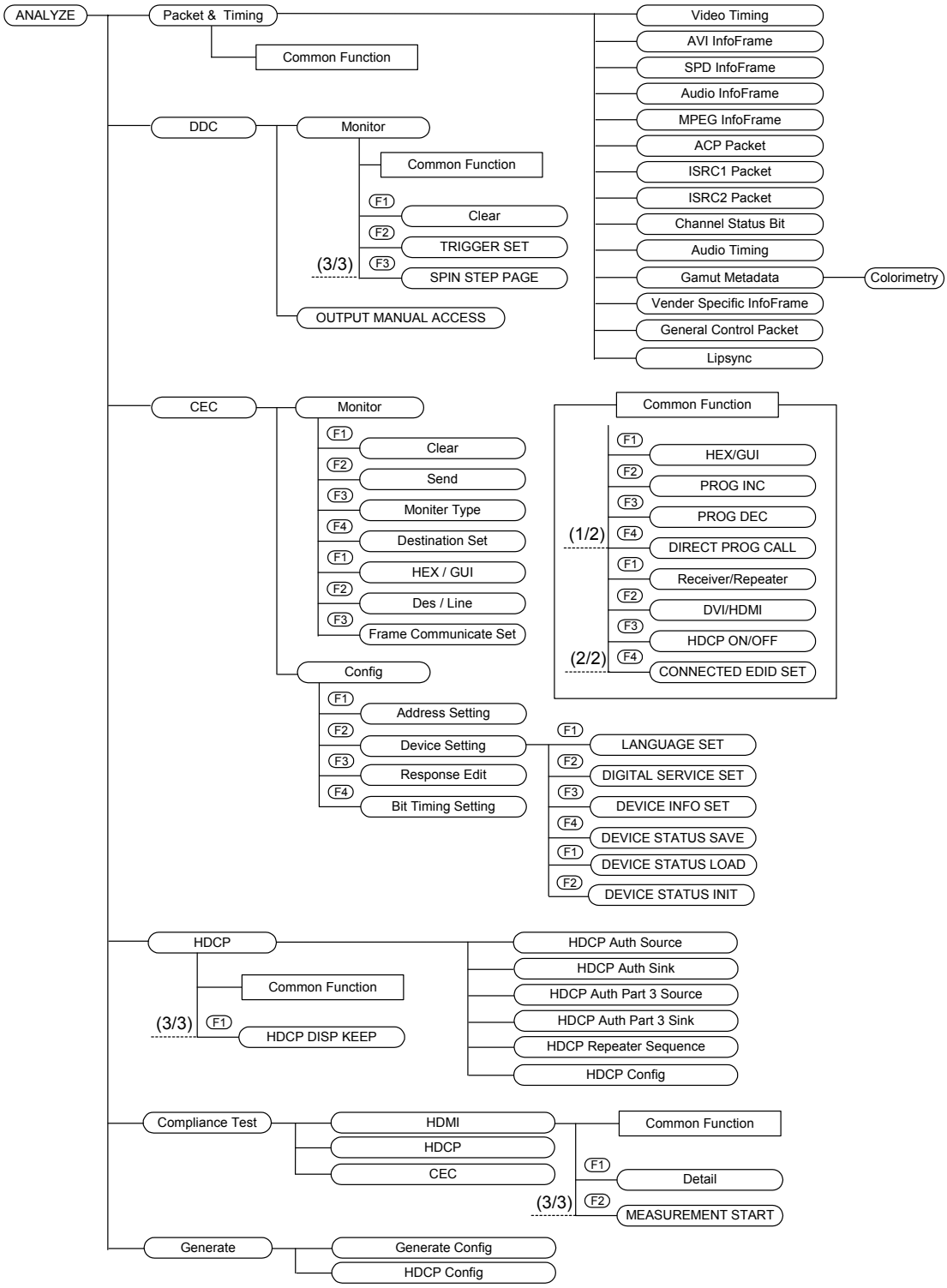
An outline of the menu structure is as shown in the figure below. Press each menu button while the on-screen display is blank.



3.1 ANALYZE menu

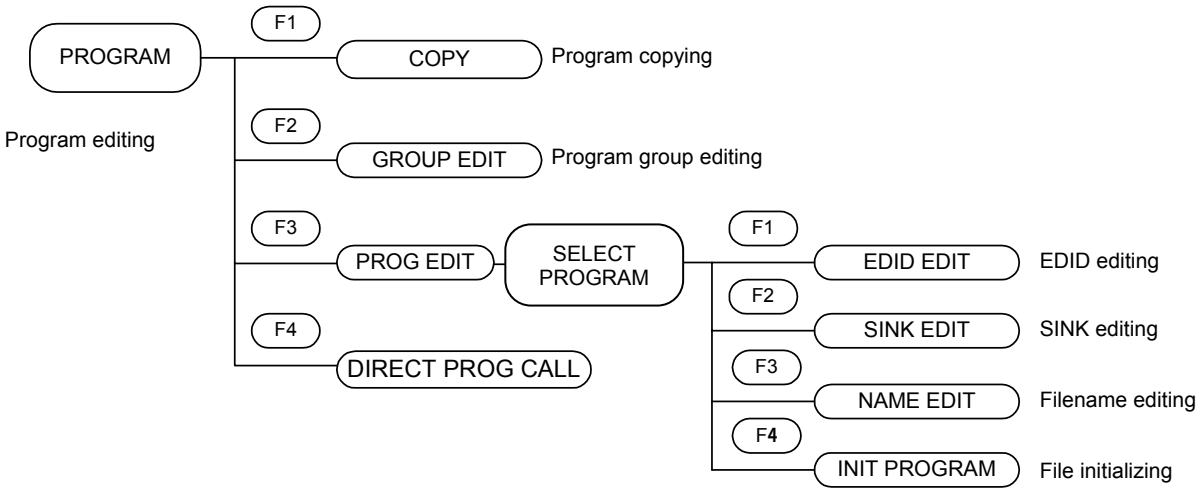
The ANALYZE menu is used when measuring the input HDMI statuses.

The menu is configured as shown below when the ANALYZE button is pressed while the on-screen display is blank.



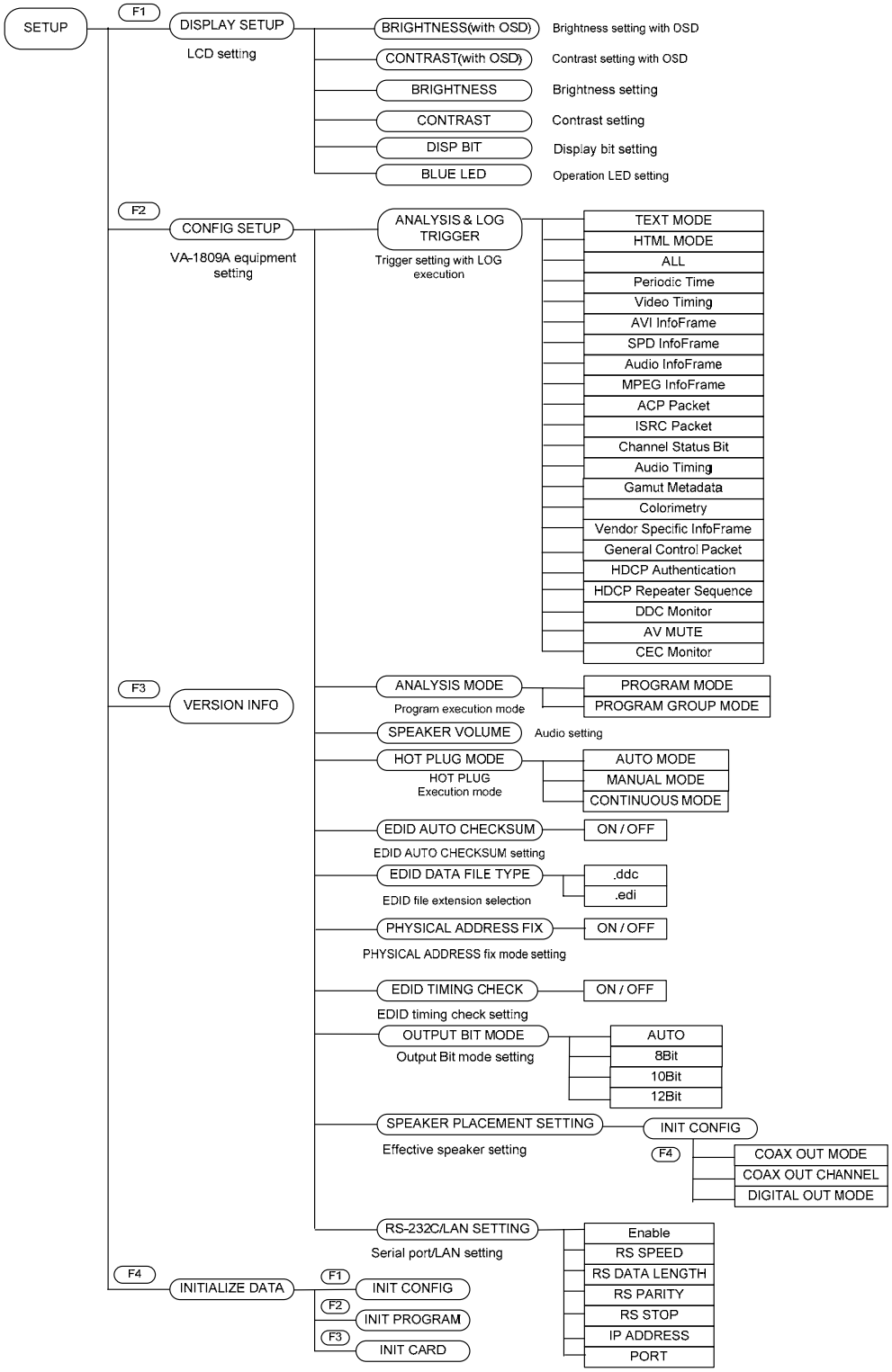
3.2 PROGRAM menu

The PROGRAM menu is used when copying or editing program data and when editing program groups in the group execution mode.
The menu is configured as shown below when the PROGRAM button is pressed while the on-screen display is blank.



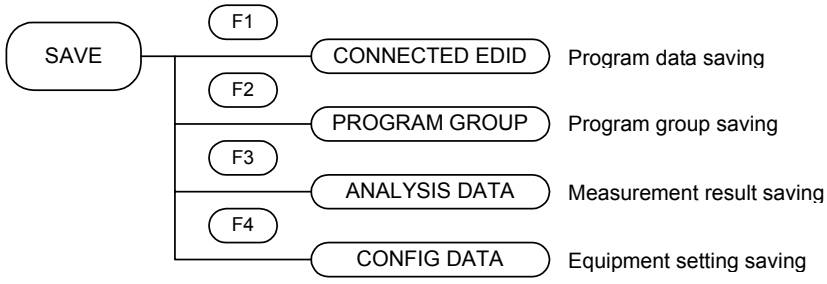
3.3 SETUP menu

The SETUP menu is used when setting the LCD screen of the VA-1809A or performing the equipment settings. The menu is configured as shown below when the SETUP button is pressed.



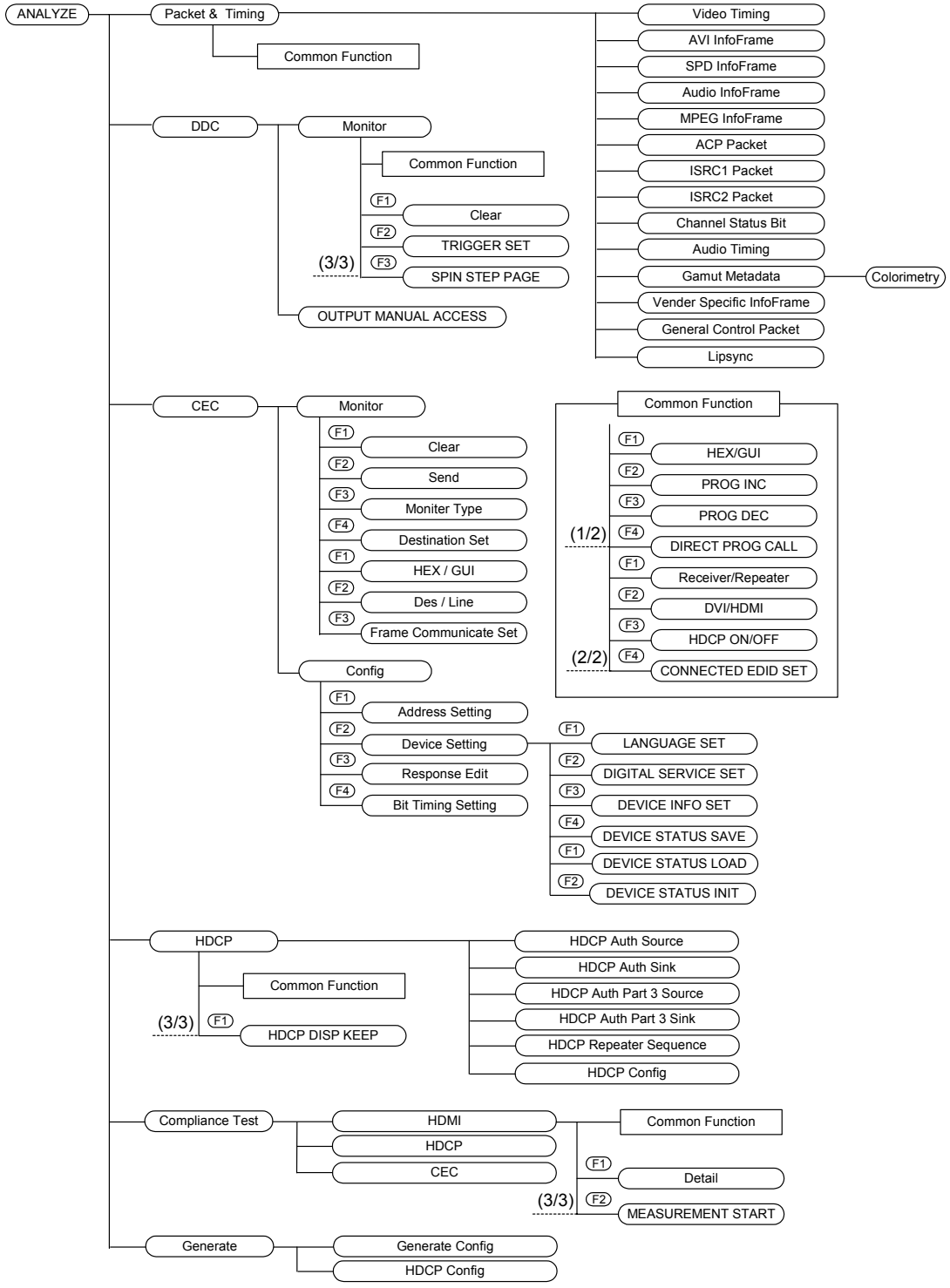
3.4 SAVE menu

The SAVE menu is used when the current statuses are to be stored.
The menu is configured as shown below when the [SAVE] button is pressed.



4 ANALYZE (measurement result display methods)

When the ANALYZE button is pressed, the HDMI signal timing data can be measured, and InfoFrame and other contents can be decoded and displayed. The menu tree in the measurement result display area is configured as shown below.



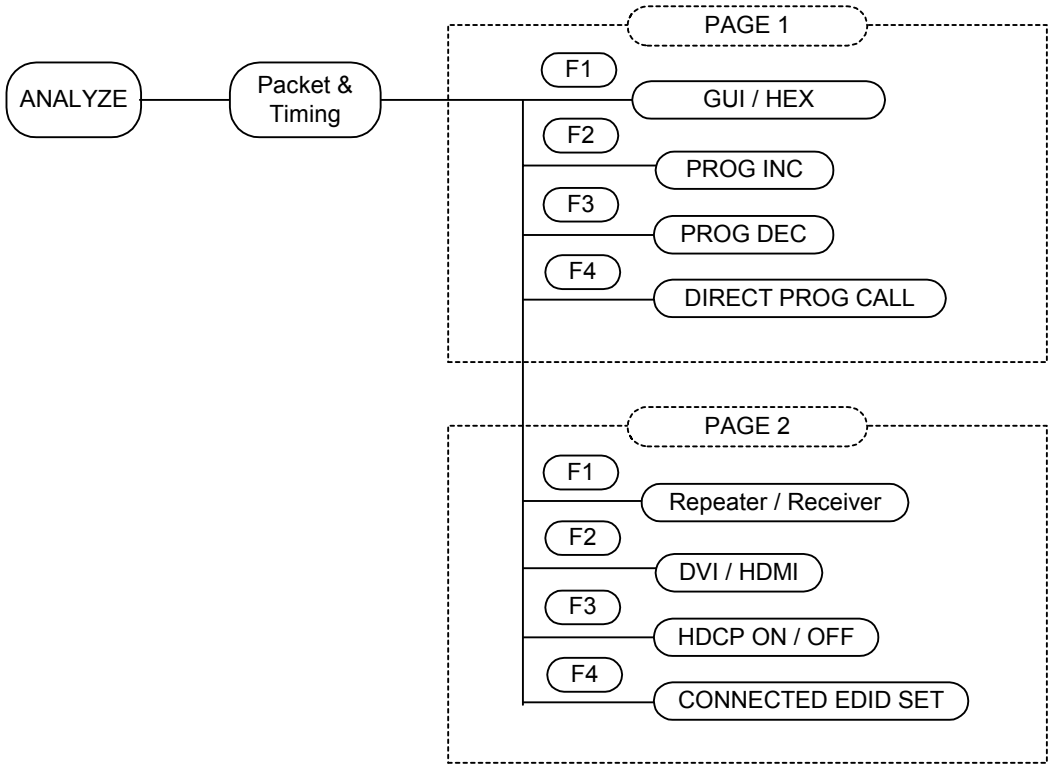
To display the measurement result of each item, perform the following procedure;

OSD hidden state → [ANALYZE] Display ERROR REPORT
→ [Rotary Key] Select and execute each item.

For more information, see the description of each item.

4.1 Packet & Timing Common Function Keys

The common function keys of the Packet & Timing menu are as shown below.



The function keys common to the ANALYZE menu are as follows.

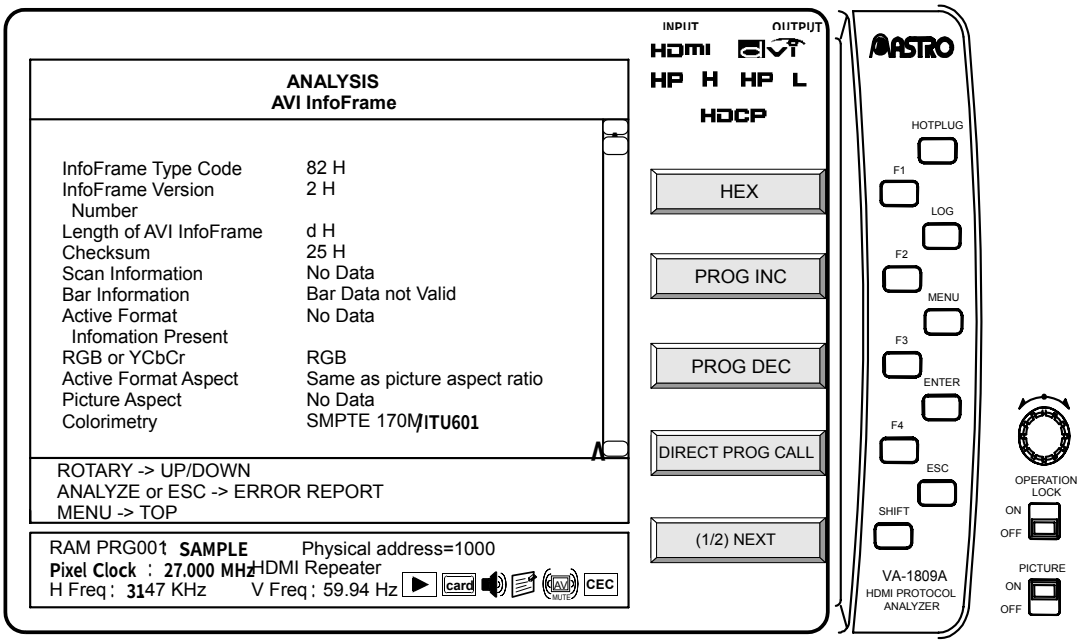
KEY	Description
GUI/HEX	Toggles between GUI display and HEX display.
PROG INC	Increments the program number.
PROG DEC	Decrements the program number.
DIRECT PROG CALL	Directly select a program number, and then execute the corresponding program.
Repeater/Receiver	Toggles the operation mode between Repeater and Receiver.
DVI/HDMI	Toggles the signal format between DVI and HDMI.
HDCP ON/OFF	Turns ON/OFF HDCP.
CONNECTED EDID SET	Reads the EDID of the device at the output destination of the VA-1809A, and sets it as the EDID of the VA-1809A main unit.

4.1.1 GUI/HEX

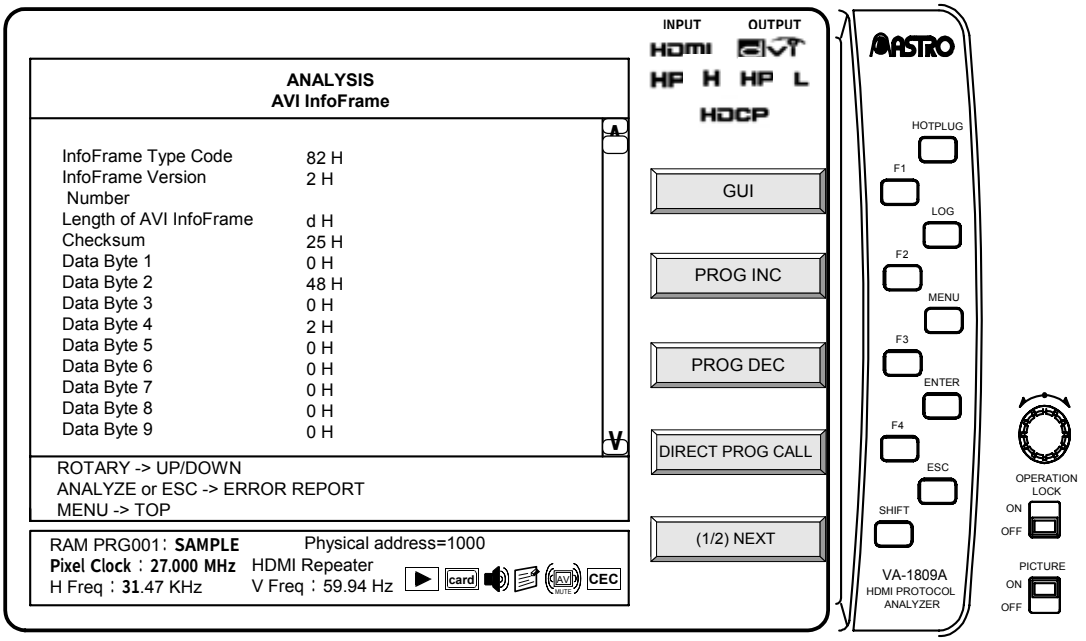
The measurement screen is switched between the GUI display and hexadecimal display on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS. → [F1] GUI/HEX.

GUI display



HEX display



4.1.2 PROG INC/PROG DEC/DIRECT PROG CALL

The VA-1809A has device performance information as programs. By toggling between them, it uses a virtual HDMI device. By using the PROG INC, PROG DEC and DIRECT PROG CALL functions keys, the performance of each device can be changed by changing the program number set in the VA-1809A.

For more information about program switching, see page 234, “6.1.2 Executing programs (LOAD).”

4.1.3 Repeater/Receiver

This function key toggles the operation mode between Repeater and Receiver.

This operation toggles bit 6 of the HDCP register “Bcaps.”

* It is not reflected in the SINK data.

4.1.4 DVI/HDMI

This function key toggles the receivable signal format between DVI and HDMI.

This operation toggles bit 7 of the HDCP register “Bcaps.”

* It is not reflected in the SINK data.

4.1.5 HDCP ON/OFF

This function key toggles HDCP between receive enabled and receive disabled.

This operation enables or disables the HDCP register (device address 0x74).

* It is not reflected in the SINK data.

4.1.6 CONNECTED EDID SET

This function key sets the EDID data to be identical to that of the device connected to the output destination of the VA-1809A.

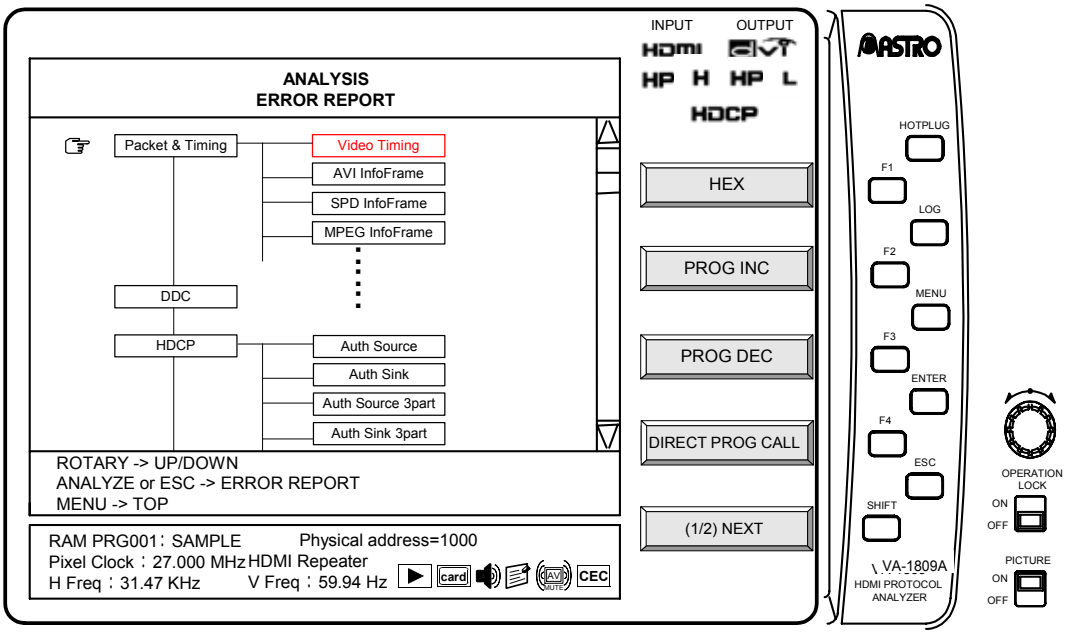
It does not change if no device is connected to the output destination of the VA-1809A.

* It is not reflected in the EDID data.

4.2 Error reports

A tree structure is used to indicate whether there are errors in any of the measurement items. Items with no errors are displayed in white, items with errors in red, and items not sent in gray.

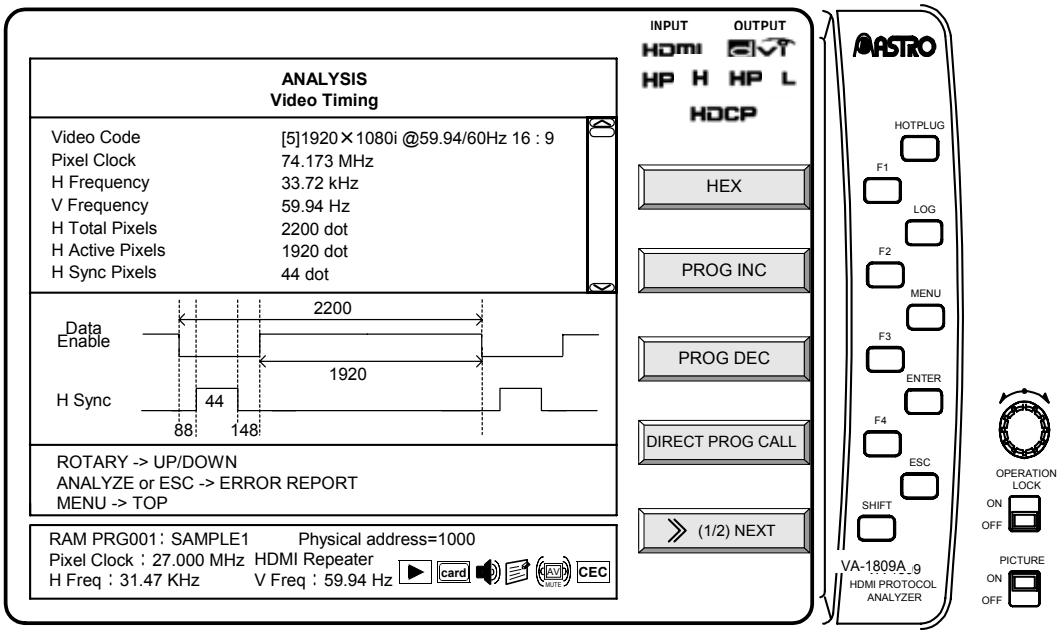
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.



4.3 Video Timing

The input timing data is measured.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Video Timing.



The video timing chart for the GUI display is shown.

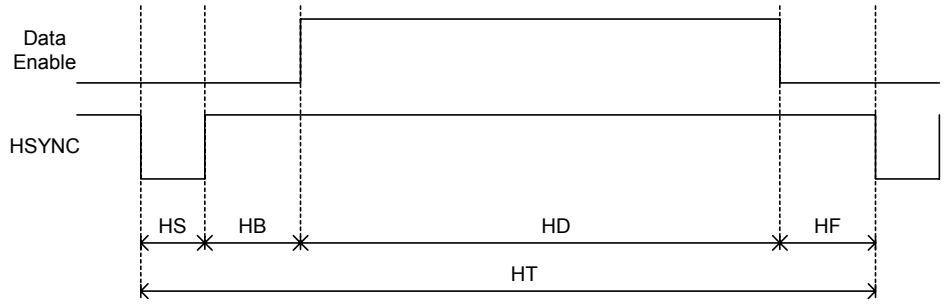
The video timing items displayed are listed below.

Item	Figure	Details	
Video Code		Refer to “7.4 AVI InfoFrame Video Code tables” on page 268.	
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 (1-frame increments)	
V Active TOTAL	VD(VD1+VD2)	VDISP width (1-frame increments)	
V Active Field1	VD(1)	VDISP width	1-frame increments for non-interlacing; value of first field for interlacing.
V Sync Field1	VS(1)	VSYNC width	
V Back Porch Field1	VB(1)	VSYNC back porch width	

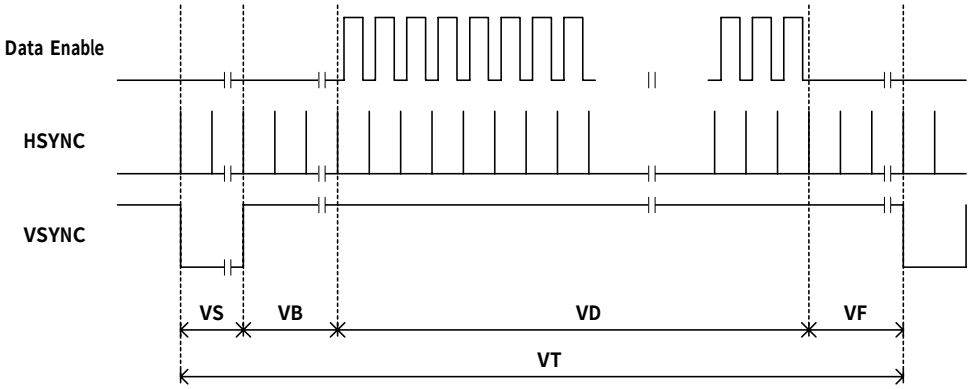
Item	Figure	Details	
V Front Porch Field1	VF(1)	VSYNC front porch width	1-frame increments for non-interlacing; value of first field for interlacing.
HV Sync OffSet1		Difference between horizontal and vertical phases	
V Active Field2	VD2	VDISP width of 2nd field during interlacing	
V Sync Field2	VS2	VSYNC width of 2nd field during interlacing	
V Back Porch Field2	VB2	Back porch width of VSYNC of 2nd field during interlacing	
V Front Porch Field2	VF2	Front porch width of VSYNC of 2nd field during interlacing	
HV Sync OffSet2		Difference between horizontal and vertical phases of 2nd field during interlacing	
V Sync Polarity		VSYNC polarity	
Interlace		Interlace or non-interlace	
VESA CODE		VESA standard timing name *1	
EIA CODE		EIA standard timing name *1	
EDID SUPPORT		Supported/Not supported *2	

* For details on the Video Timing errors, refer to “7.1.1 Video Timing” on page 256.
* It is not possible to perform measurements correctly if the HDMI signals have been input with a timing that exceeds the limits of the specifications. (Refer to “7.2 ANALYSIS OVER LIMIT (yellow display) table” on page 266.)

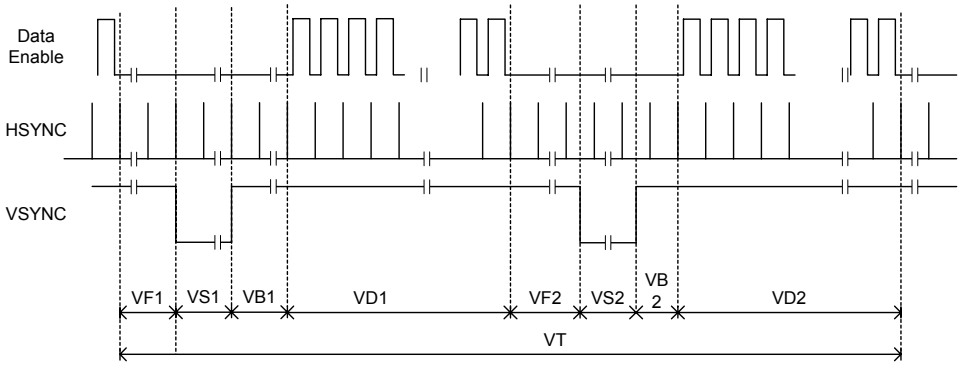
*1 “VESA CODE” and “EIA CODE” display the timing code assumed from the input video data.
*2 “EDID Support” displays whether the input timing is supported by the EDID set in the VA-1809A. (It is determined by DTD of Base Block as well as DTD and SVD of Extension Block.)



Horizontal sync signal



Vertical sync signal (non-interlace)

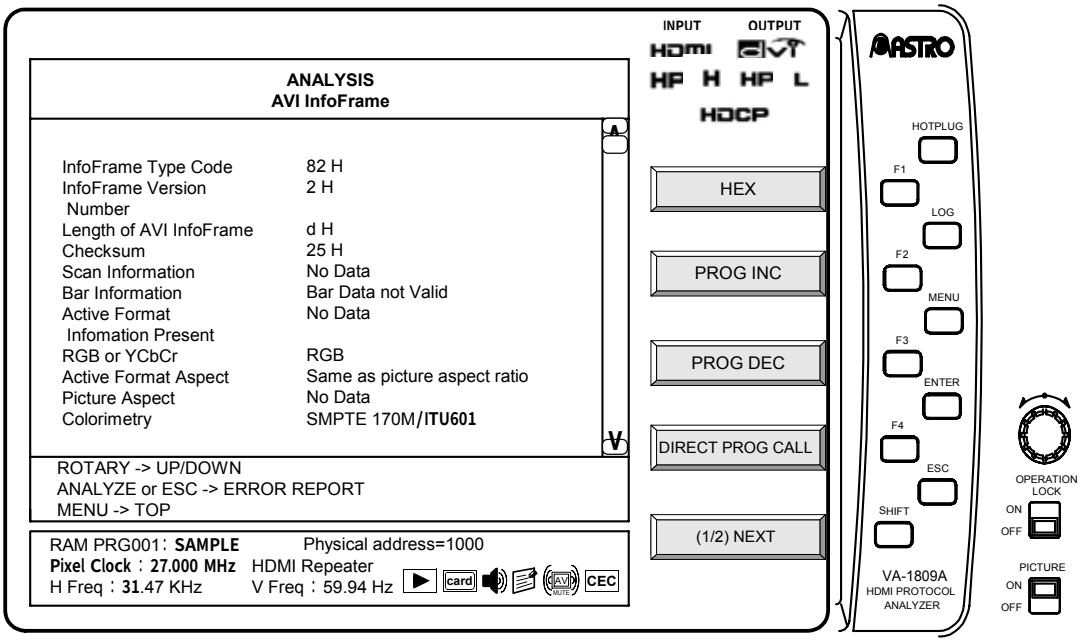


Vertical sync signal (interlace)

4.4 AVI InfoFrame

The AVI (= Auxiliary Video Information) InfoFrame data of HDMI inputs is decoded and displayed on this screen. The information on the images output by the transmitter is input as AVI InfoFrame.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select AVI InfoFrame.



Display details of AVI InfoFrame with the GUI display are listed below.

Display item	Details
InfoFrame Type Code	82 H
InfoFrame Version Number	XX H
Length of AVI InfoFrame	XX H
Scan Information	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 Data
	Active Format Information valid
RGB or YCbCr	RGB
	YCbCr 4:2:2
	YCbCr 4:4:4
	Future

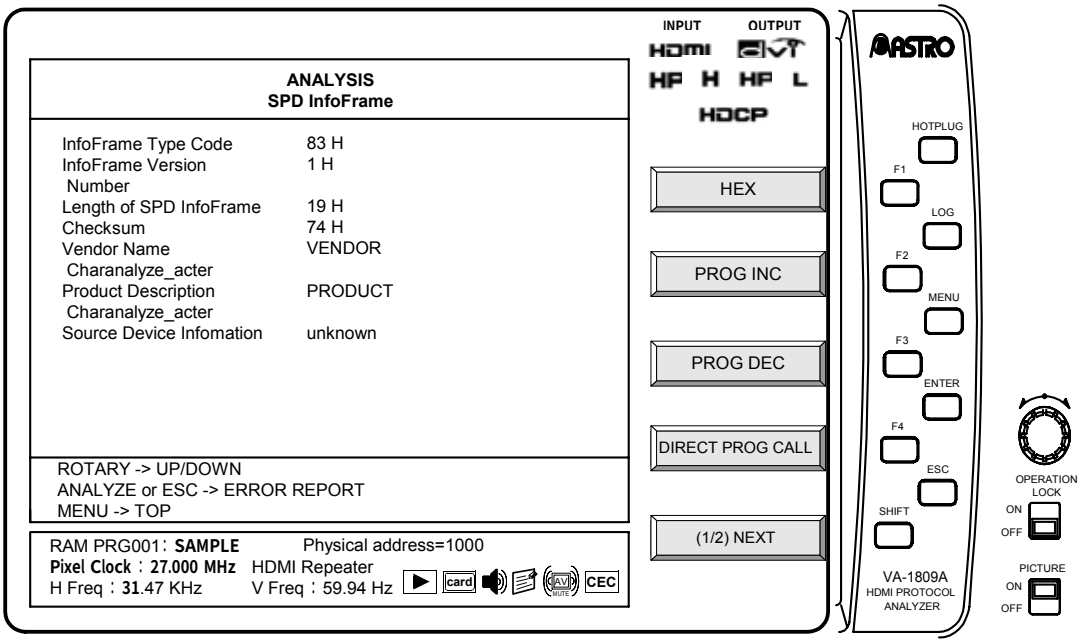
Active Format Aspect	Reserved
	box 16:9 (top)
	box 14:9 (top)
	box > 16:9 (center)
	Same as picture aspect ratio
	4:3 (center)
	16:9 (center)
	14:9 (center)
	4:3 (with shoot & protect 14:9 center)
	16:9 (with shoot & protect 14:9 center)
	16:9 (with shoot & protect 4:3 center)
Picture Aspect	No Data
	4:3
	16:9
	Future
Colorimetry	No Data
	SMPTE 170M / ITU601
	ITU709
	Extended Colorimetry Valid
Non-uniform Picture Scaling	No Known non-uniform Scaling
	Picture has been scaled horizontally
	Picture has been scaled vertically
	Picture has been scaled horizontally and vertically
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 × XXX @ XXX / XXX Hz X : X
	Reserved
	No Video Code Available
	Refer to “7.4 AVI InfoFrame Video Code tables” on page 268.
Repetition	No Repetition
	pixel sent X times
	Reserved
Line Number of End of Top Bar	0 to 65535
Line Number of Start of Bottom Bar	0 to 65535
Pixel Number of End of Top Bar	0 to 65535
Pixel Number of Start of Bottom Bar	0 to 65535

* For details on the AVI InfoFrame errors, refer to “7.1.2 AVI InfoFrame” on page 257.

4.5 SPD InfoFrame

The SPD (= Source Product Description) InfoFrame data of HDMI inputs is decoded and displayed on this screen. The information of the transmitter is input as SPD InfoFrame.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select SPD InfoFrame.



Display details of SPD InfoFrame with the GUI display are listed below.

Display item	Details
InfoFrame Type Code	83 H
InfoFrame Version Number	XX H
Length of SPD InfoFrame	XX H
Checksum	
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

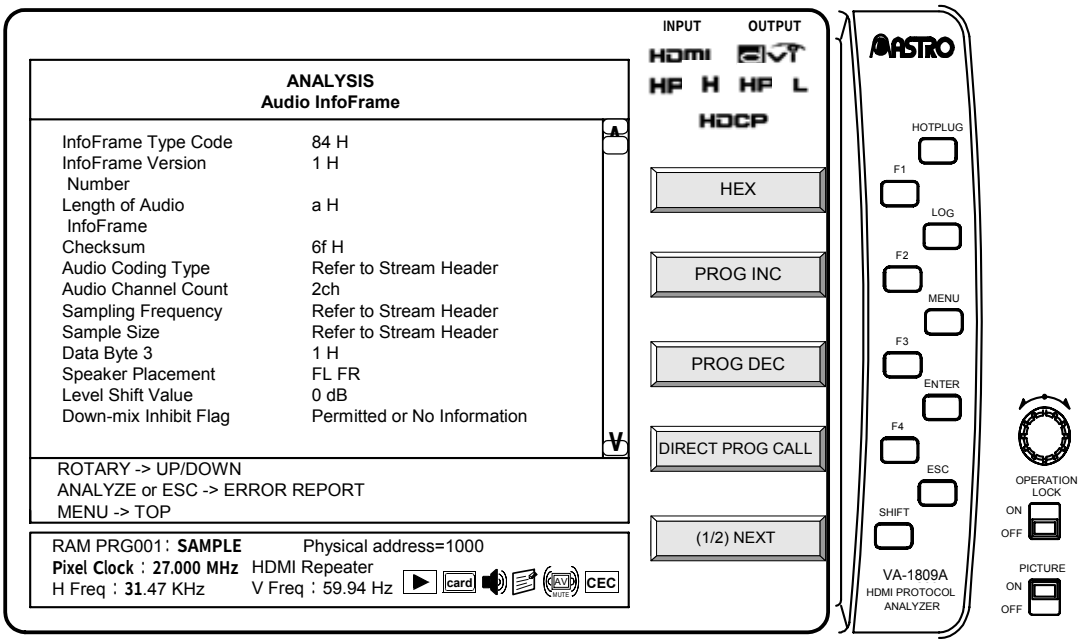
	HD DVD
	PMP
	Reserved

* For details on the SPD InfoFrame errors, refer to “7.1.3 SPD InfoFrame” on page 257.

4.6 Audio InfoFrame

The Audio InfoFrame data of HDMI inputs is decoded and displayed on this screen. The information on the sound output by the transmitter is input as Audio InfoFrame.
The input Audio InfoFrame is decoded and displayed.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Audio InfoFrame.



Display details of Audio InfoFrame with the GUI display are listed below.

Display item	Details
InfoFrame Type Code	84 H
InfoFrame Version Number	XX H
Length of Audio InfoFrame	XX H
Checksum	
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 bit
	20 bit
	24 bit
Data Byte 3	XX H
Speaker Placement	TC FCH FLH FRH FLW FRW FRC FLC RR RL FC LFE FR FL (Refer to the Standards)
	Reserved
Level Shift Value	0 - 15 dB
Down-mix Inhibit Flag	Permitted or No information
	Prohibited

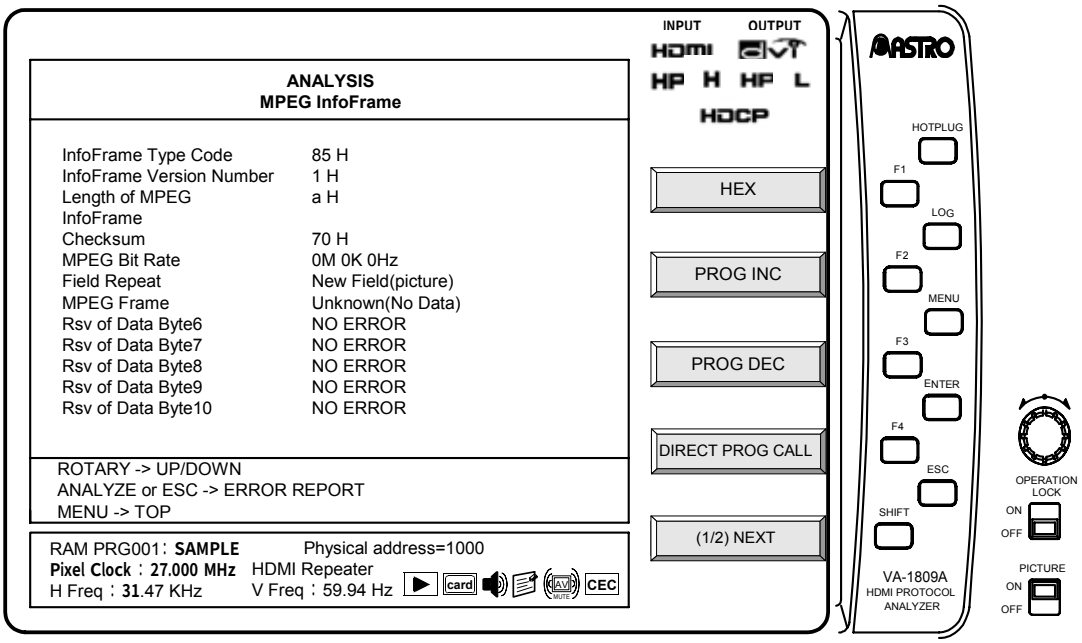
* “Stream Header” refers to the Channel Status Bit. For details on the Channel Status Bit measurement result display, refer to “4.11 Channel Status Bit” on page 42.

* For details on the Audio InfoFrame errors, refer to “7.1.4 Audio InfoFrame” on page 258.

4.7 MPEG InfoFrame

The MPEG InfoFrame data of HDMI inputs is decoded and displayed on this screen. If the images sent by the transmitter have been obtained by converting them from compressed images, the information on the compressed images is input as MPEG InfoFrame.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select MPEG InfoFrame.



Display details of MPEG InfoFrame with the GUI display are listed below.

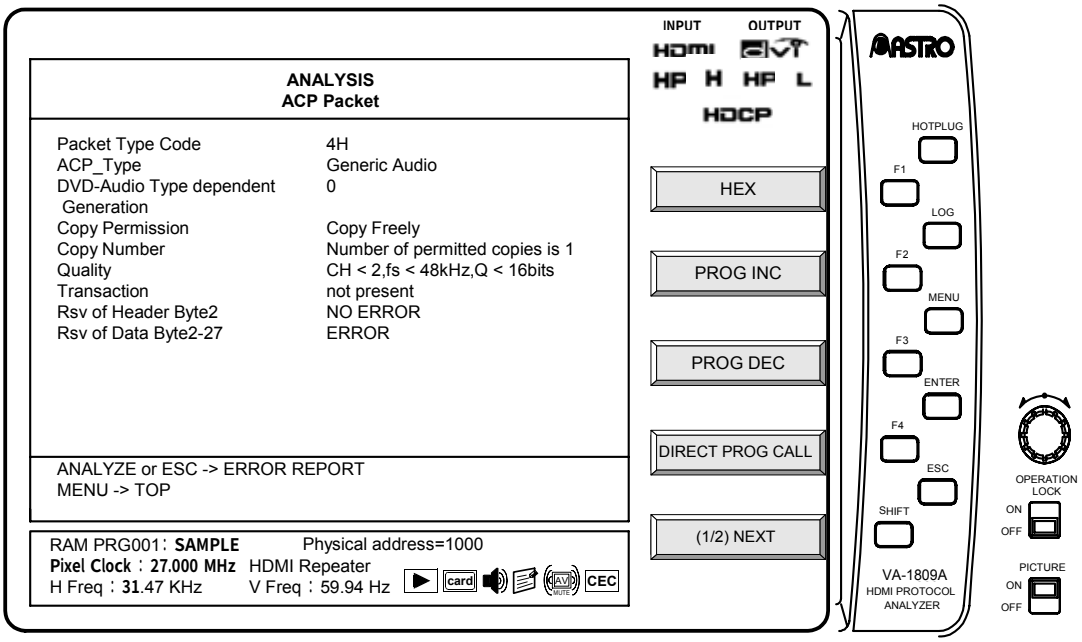
Display item	Details
InfoFrame Type Code	85 H
InfoFrame Version Number	XX H
Length of MPEG InfoFrame	XX H
MPEG Bit Rate	X M XXX k XXXX Hz
Field Repeat	Ner Field (picture)
	Repeated Field
MPEG Frame	Unkown (No Data)
	I Picture
	B Picture
	P Picture

* For details on the MPEG InfoFrame errors, refer to “7.1.5 MPEG InfoFrame” on page 259.

4.8 ACP Packet

The ACP (= Audio Content Protection) Packet data of HDMI inputs is decoded and displayed on this screen. Information for protecting the copyrights of the sound sent by the transmitter is input as the ACP packet.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select ACP Packet.



Display details of ACP Packet with the GUI display are listed below.
*2 is displayed when Super Audio CD is selected as the ACP Type setting; *1 is displayed when any other setting is selected for ACP Type.

Display item		Details
Packet Type Code		04 H
ACP_Type		Generic Audio *1
		IEC60958-Identified Audio *1
		DVD Audio *1
		Super Audio CD *2
		Reserved *1
*1	DVD-Audio_Type_dependent _Generation	XX H
	Copy_Permission	Copying is permitted without restriction (Copy Freely)
		reserved for copyright management system use
		Copying is permitted per “audio_copy_number” as specified below
		No more copies are permitted unless exceptional conditions are provided by a copyright management system

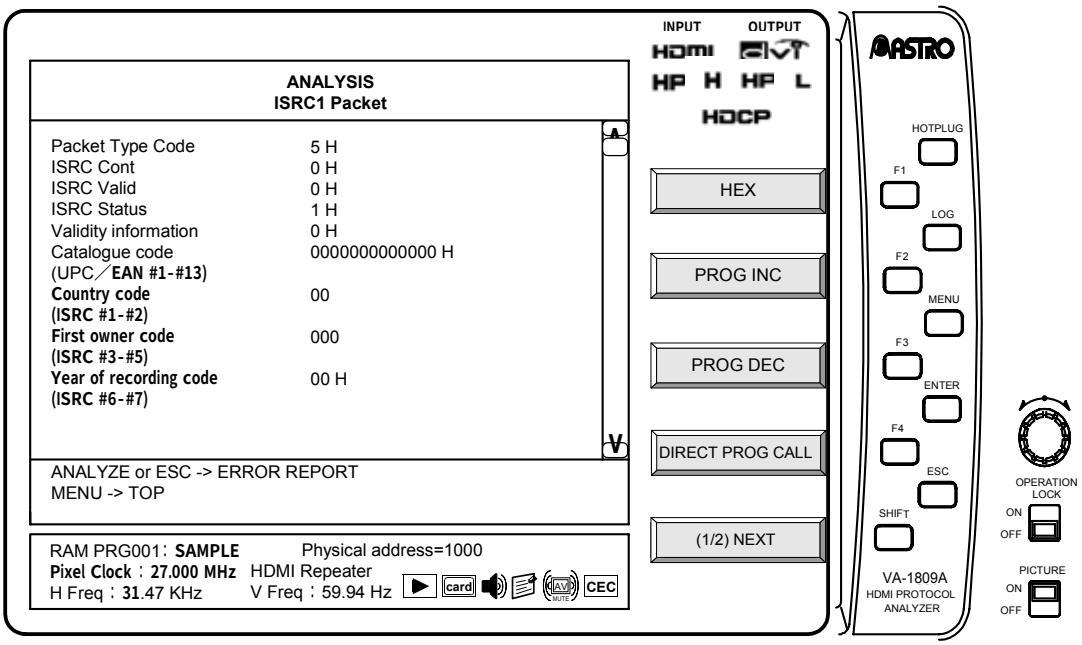
	Copy_Number	Number of permitted copies is ‘1’
		Number of permitted copies is ‘2’
		Number of permitted copies is ‘4’
		Number of permitted copies is ‘6’
		Number of permitted copies is ‘8’
		Number of permitted copies is ‘10’
		Number of permitted copies is ‘3’
		Number of permitted copy is not restricted. (Copy One Generation)
	Quality	CH < 2, fs < 48 kHz, Q < 16 bits
		CH < 2, fs & Q = not restricted
		CH & fs & Q = not restricted
		CH = not restricted, fs < 48 kHz, Q < 16 bits
	Transaction	not present
		reserved for copyright management system use
*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 Byte 5 - 16	NO ERROR
		ERROR
	Rsv of Data Byte 17 - 27	NO ERROR
		ERROR

* For details on the ACP Packet errors, refer to “7.1.6 ACP Packet” on page 259.

4.9 ISRC1 Packet

The ISRC1 (= International Standard Recording Code) Packet data of HDMI inputs is decoded and displayed on this screen. If the sound sent by the transmitter is DVD Audio, the sound source identification code is input. For ISRC1, a UPC EAN ISC number from 0 to 15 as defined under the DVD Audio standard is used in addition to the value defined by the HDMI standard.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select ISRC1 Packet.



Display details of ISRC1 Packet with the GUI display are listed below.

Display item	Details
Packet Type Code	05 H
ISRC_Cont	XX H
ISRC_Valid	XX H
ISRC_Status	XX H
Validity information	0 H UPC/EAN and ISRC are invalid
	4 H UPC/EAN is invalid and ISRC is valid
	8 H UPC/EAN is valid and ISRC is invalid
	C H 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)	XXXXX H
Rsv of Header Byte 1	

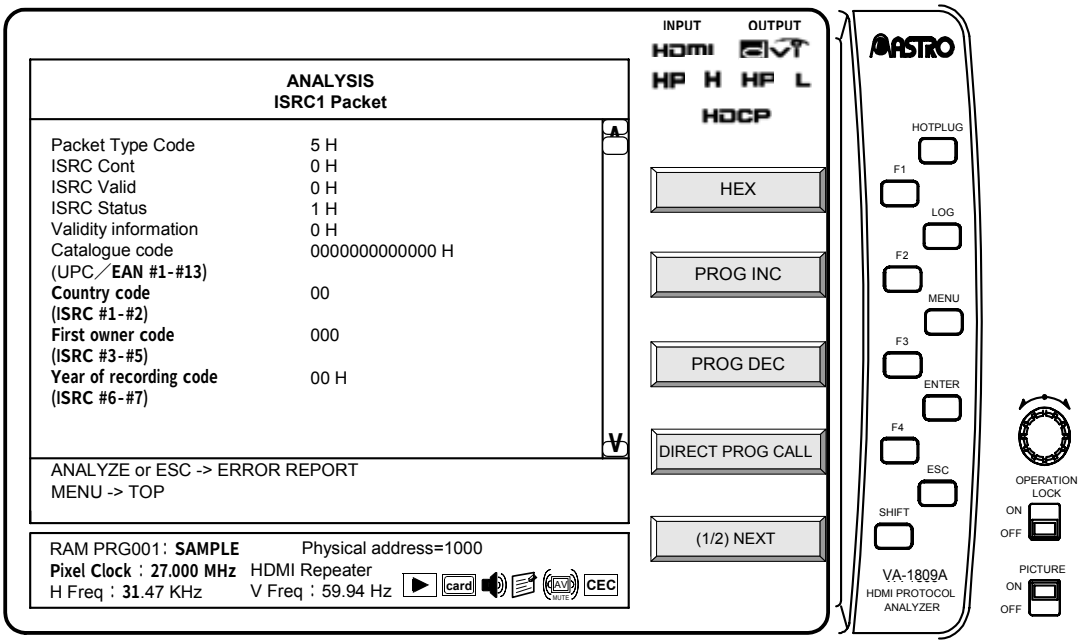
Rsv of Header Byte 2	
Rsv of Data Byte 16 - 27	
NO ISRC1 Packet	

* For details on the ISRC1 Packet errors, refer to “7.1.7 ISRC1 Packet” on page 259.

4.10 ISRC2 Packet

The ISRC2 Packet data of HDMI inputs is decoded and displayed on this screen. For ISRC2, a UPC EAN ISC number from 16 to 31 as defined under the DVD Audio standard is used. (Currently, “Reserve” is the status of this number under the DVD Audio standard.)

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select ISRC2 Packet.



Display details of ISRC2 Packet with the GUI display are listed below.

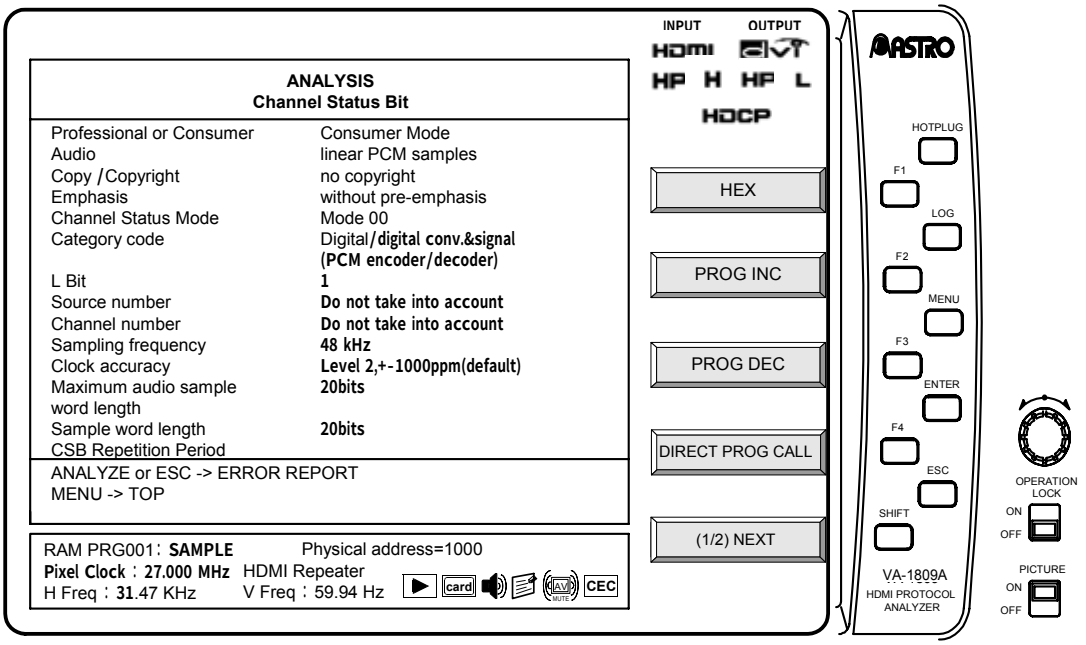
Display item	Details
Header Byte 0	06 H
Header Byte 1 - 2	XX H for each byte
Data Byte 1 - 16	XX H for each byte

* For details on the ISRC2 Packet errors, refer to “7.1.8 ISRC2 Packet” on page 260.

4.11 Channel Status Bit

The Channel Status Bit (a subcode enabling the transmitting device, sampling frequency and other specifications to be ascertained) in the audio streams of HDMI inputs is decoded and displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Channel Status Bit.



Display details of Channel Status Bit with the GUI display are listed below.

Display item	Details
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 - 2 channel audio
	Reserved - 4 channel audio
	Audio = other than Linear PCM samples
	Default state
	Reserved
Channel Status Mode	Mode 00
	Reserved
Category code	General. Used temporarily

	Compact disc digital audio signal compatible with IEC 60958
	Laser optical digital audio systems for which no other category code is defined
	Mini disc system
	Digital versatile disc
	PCM encoder/decoder
	Digital signal mixer
	Sampling rate converter
	Digital sound sampler
	Digital sound processor
	DAT
	Video tape recorder with digital sound
	Digital compact cassette
	Digital audio broadcast signal with or without a video signal (Japan)
	Digital audio broadcast signal with or without a video signal (Europe)
	Digital audio broadcast signal with or without a video signal (USA)
	Electronic software delivery
	Synthesizer
	Microphone
	A/D converter
	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	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)
	768kHz
	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 bit
	Word length not indicated (default)

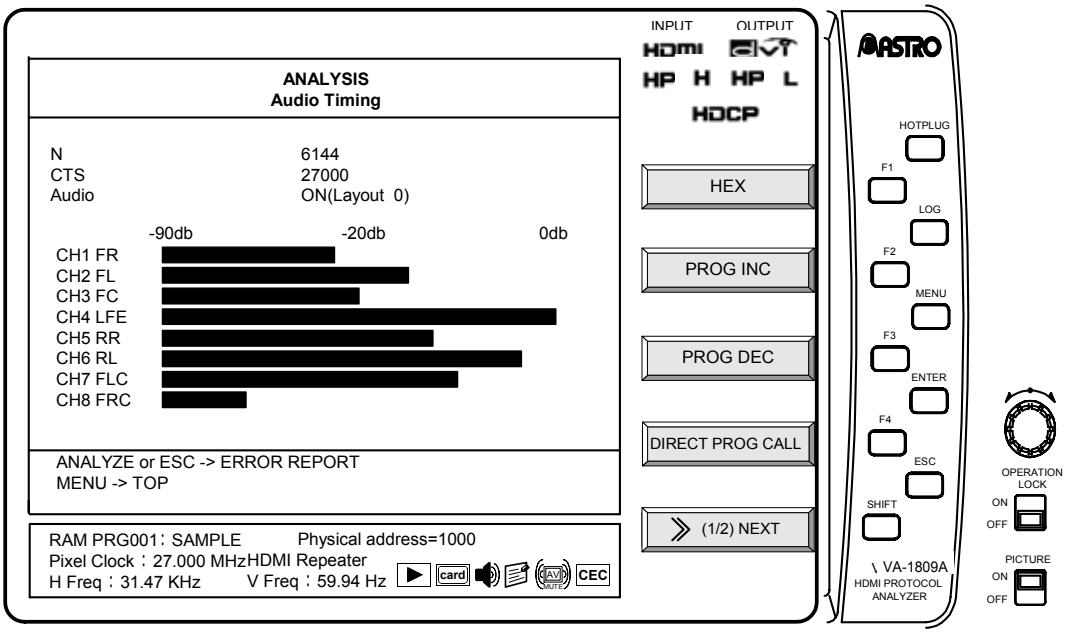
	20 bits
	22 bits
	23 bits
	24 bits
	21 bits
	Reserved
	Maximum audio sample word length = 24 bit
	Word length not indicated (default)
	16 bits
	18 bits
	19 bits
	20 bits
	17 bits
	Reserved

* For details on the Channel Status Bit errors, refer to “7.1.9 Channel Status Bit” on page 260.

4.12 Audio Timing

The constants (N, CTS), which are used for playing the audio clock of HDMI inputs from the video pixel clock, and the HDMI audio volume are displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Audio Timing.



Display details of Audio Timing with the GUI display are listed below.

Display item	Details
N	Display of register values (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 of each channel	
CH2		
CH3		
CH4		
CH5		
CH6		
CH7		
CH8		

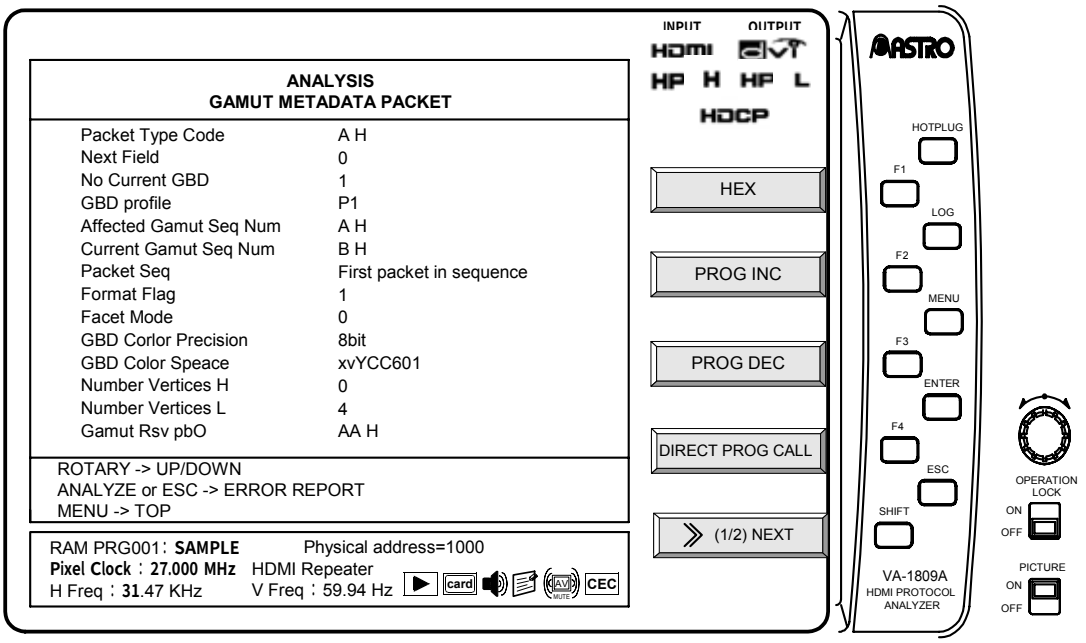
* For details on the Audio Timing errors, refer to “7.1.10 Audio Timing” on page 260.

* In Compression Audio, Audio Type and Length are displayed judged by Pc value.

4.13 GAMUT METADATA PACKET

The Gamut Metadata Packets of the HDMI input are decoded and displayed on this screen. The gamut boundary descriptions (GBD) and other related metadata information are input to these packets.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select GAMUT METADATA.



Display details of GAMUT METADATA PACKET with the GUI display are listed below.

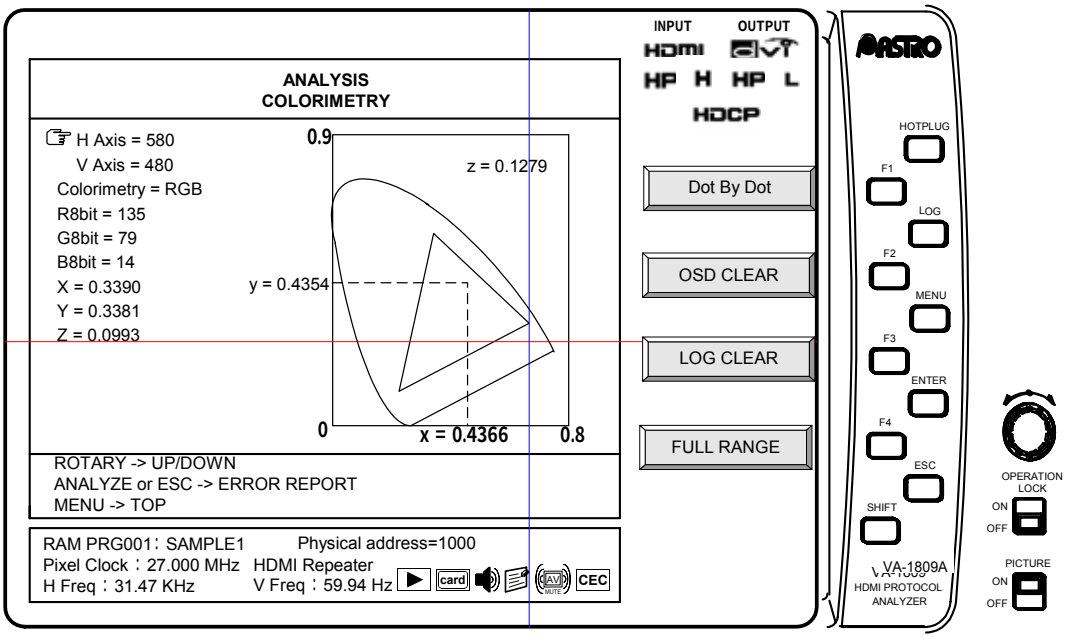
Display item	Details
Packet Type Code	0A H
Next Field	XX H
No Current GBD	XX H
GBD Profile	P0
	P1
	P2
	P3
	Reserved
Affected Gamut Seq Num	XX H
Current Gamut Seq Num	XX H
Packet Seq	Intermediate packet in sequence
	First packet in sequence
	Last packet in sequence
	Only packet in sequence

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		0 or 1
GBD Color Precision		8 bit
		10 bit
		12 bit
Format Flag = 0		
	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 = 1		
	GBD Color Space	Reserved
		RGB expression of xvYCC601
		RGB expression of xvYCC709
		Reserved
Format Flag = 0		
	Facet Mode	0 or 1
	Number Vertces H	XX H
	Number Vertices L	XX H
	Packed GBD Vertices Data	±X.XX
Format Flag = 1		
	Packed Range Data	±X.XX
Gamut Rsv pbO		XX H

4.14 COLORIMETRY

The color information at the position designated by the cursor on the image input from HDMI is displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Colorimetry.



The display contents of COLORIMETRY are as follows.

Display item		Details
H Axis		Horizontal coordinate designated
V Axis		Vertical coordinate designated
Colorimetry		RGB
		YCbCr 4:2:2
		YCbCr 4:4:4
Colorimetry = RGB		
	R X bit	Color information (X bit)
	G X bit	Color information (X bit)
	B X bit	Color information (X bit)
Colorimetry = YCbCr4:2:2 or YCbCr4:4:4		
	Y X bit (ITU xxx)	Color information (X bit)
	Cb X bit (ITU xxx)	Color information (X bit)
	Cr X bit (ITU xxx)	Color information (X bit)
	Liner R	Value obtained by normalizing R in the color difference information to 1
	Liner G	Value obtained by normalizing G in the color difference information to 1
	Liner B	Value obtained by normalizing B in the color difference information to 1

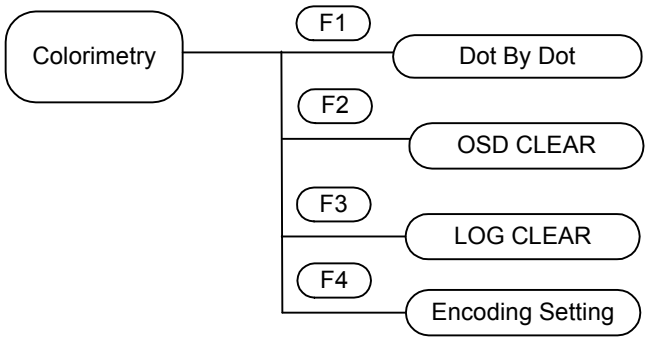
X	**XYZ foreground color system X**
Y	**XYZ foreground color system Y**
Z	**XYZ foreground color system Z**
x	**CIE 1931 XYZ X**
y	**CIE 1931 XYZ Y**
z	**CIE 1931 XYZ Z**

* The sRGB triangle is displayed as a general guideline for the coordinates of the xyz foreground color system.

■ Specifying the coordinates

The coordinates to be acquired must be specified by the cursor in order for the color information of the images to be acquired. To move the cursor, select H Axis and V Axis using the rotary key, and after the H Axis and V Axis coordinates have been displayed in the solid white characters, they can be changed by turning the rotary key.

■ Description of function keys used exclusively for COLORIMETRY



Dot By Dot F1

When Dot By Dot is executed, the image displayed on the monitor is displayed without scaling.

OSD CLEAR F2

This key is used to clear the OSD. It makes it possible to monitor the screen on which to set the cursor.

LOG CLEAR F3

This key is used to clear the xyz diagram history. To leave the history in place, it is necessary to select SETUP and then ANALYZE LOG TRIGGER Colorimetry on CONFIG SETUP.

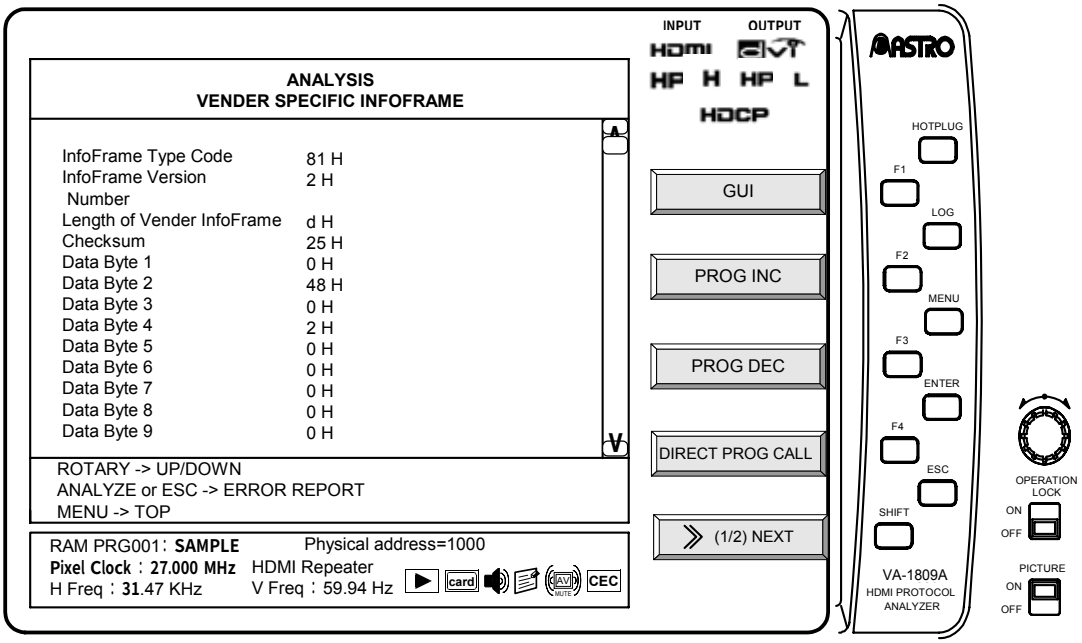
Encoding Setting F4

This is used to set whether the video signals are to be handled as full range data or as limited range data and whether gamma has been applied, and change from the YCbCr to RGB conversion system.

4.15 Vendor Specific InfoFrame

The Vendor Specific InfoFrame of the HDMI input is decoded and displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Vendor Specific InfoFrame.



The Vendor Specific InfoFrame is always displayed in the hexadecimal format.

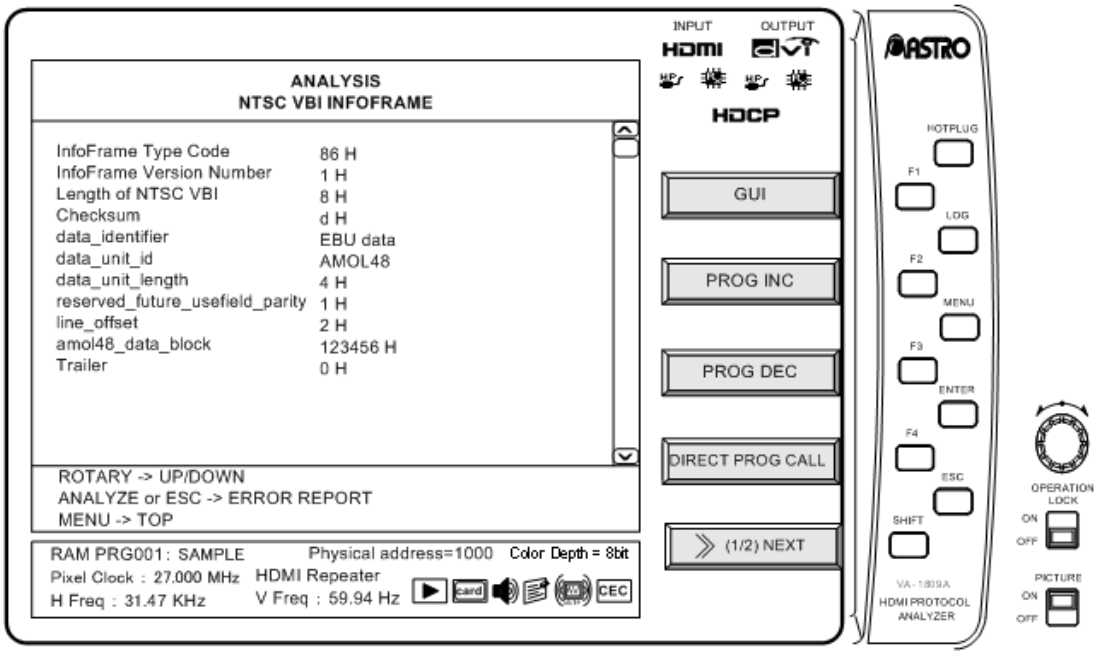
Display item	Details
InfoFrame Type Code	81 H
InfoFrame Version Number	XX H
Length of Vender InfoFrame	XX H
Checksum	XX H
Data Byte X	XX H

4.16 NTSC VBI InfoFrame

The NTSC VBI InfoFrame of the HDMI input is decoded and displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.

→ Use the [Rotary key] to select NTSC VBI InfoFrame.



NTSC VBI InfoFrame is always displayed in HEX mode.

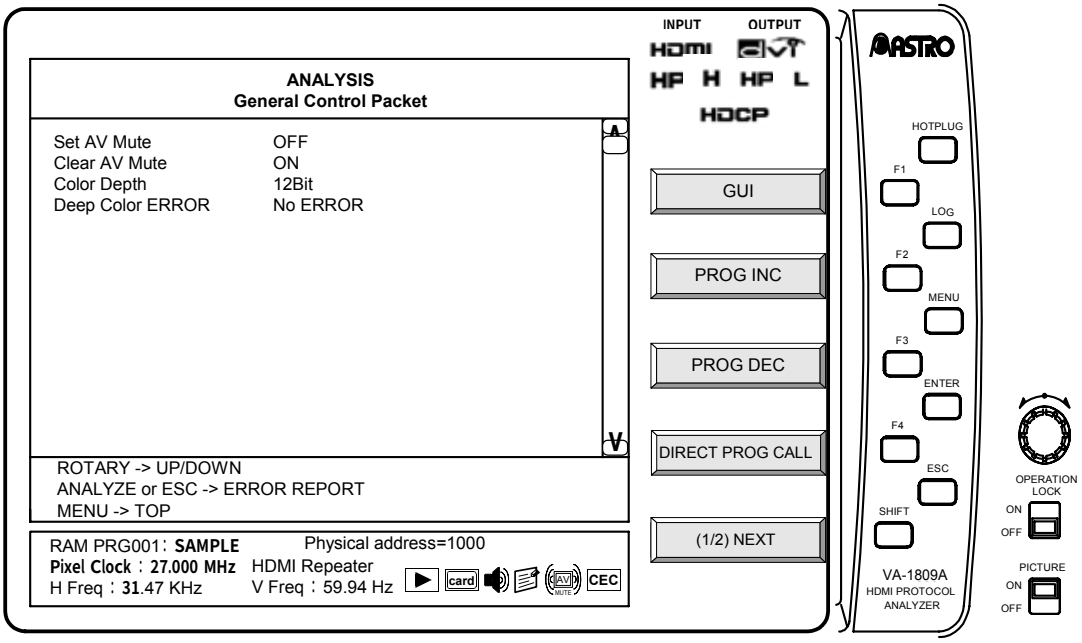
Display Item	Display contents
InfoFrame Type Code	86 H
InfoFrame Version Number	XX H
Length of NTSC VBI	XX H
Checksum	XX H
data_identifier	Refer to SCTE 127
data_unit_id	Refer to SCTE 127
data_unit_length	Refer to SCTE 127
reserved_future_use	Refer to SCTE 127
field_parity	Refer to SCTE 127
line_offset	Refer to SCTE 127
amol48_data_block	Refer to SCTE 127
Trailer	Refer to SCTE 127
amol96_data_block	Refer to SCTE 127
framing_code	Refer to SCTE 127
nabts_data_block	Refer to SCTE 127
TVG2X_data_block	Refer to SCTE 127
vitc_data_block	Refer to SCTE 127
cp_data_block	Refer to SCTE 127

reserved	Refer to SCTE 127
stuffing_byte	Refer to SCTE 127

4.17 General Control Packet

The General Control Packet of the HDMI input is decoded and displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select General Control Packet.

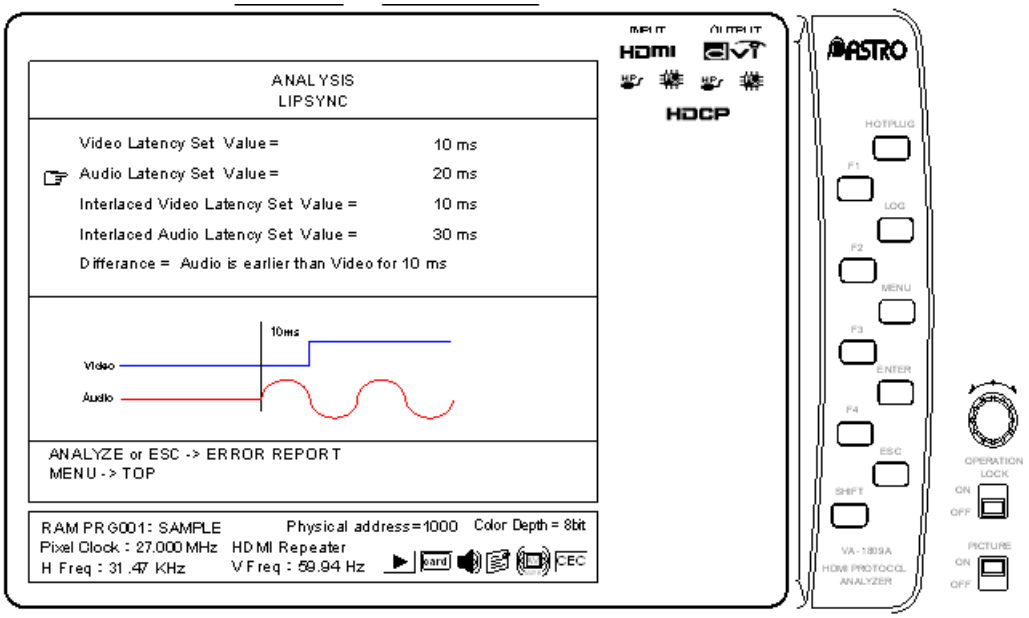


Display details of General Control Packet with the GUI display are listed below.

Display item	Details
Set AV Mute	ON
	OFF
Clear AV Mute	ON
	OFF
Color Depth	8 bit
	10 bit
	12 bit
Deep Color ERROR	NO ERROR
	ERROR

4.18 Lipsync

Delay time of HDMI input audio and video are measured and displayed in this screen.
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Lipsync



Display details of Lipsync are listesd below.

VA-1809A

Display item	Details
Video Latency Set Value	This item displays and changes Video Latency of EDID that is set in VA-1809A.
Audio Latency Set Value	This item displays and changes Audio Latency of EDID that is set in VA-1809A.
Interlaced Video Latency Set Value	This item displays and changes Interlaced Video Latency of EDID that is set in VA-1809A.
Interlaced Audio Latency Set Value	This item displays and changes Interlaced Audio Latency of EDID that is set in VA-1809A.
Differance	This item displays delay time of Audio and Video that is measured by VA-1809A.

* If VSDB of EDID that is set in VA-1809A is 8bytes or less, Lipsync delay time can not be measured.

Trigger level of video is higher 1bit of each color (one color among RGB).
Trigger level of audio is detected LCH (1CH). Level spec is listed below.

Audio level	Necessary level
16bit	801H or more
20bit	8001H or more
24bit	80001H or more

* Confirmation of audio level is shown below.

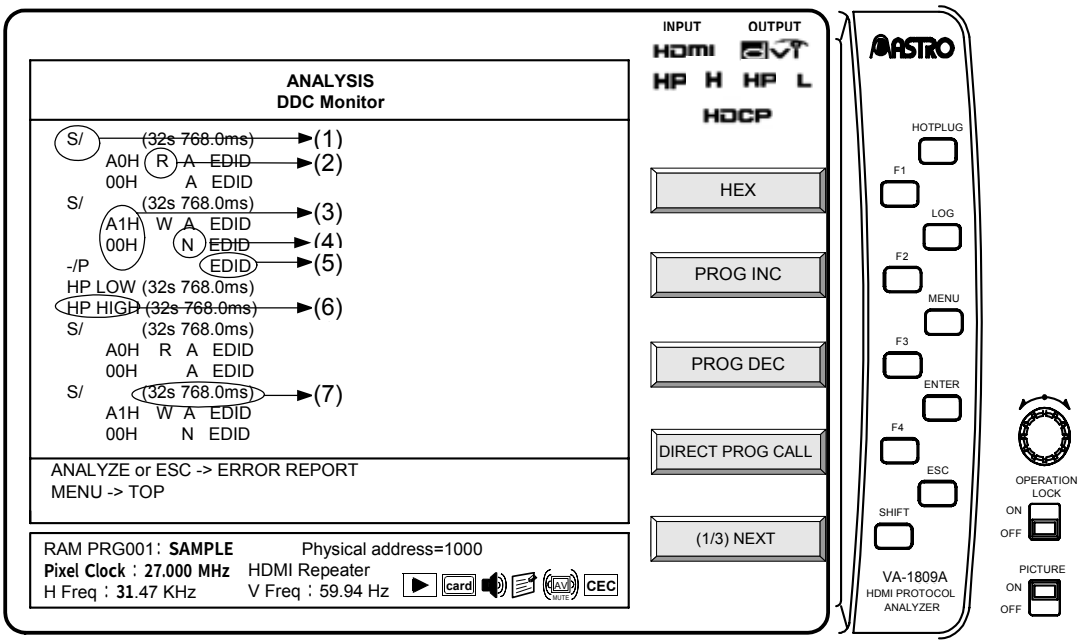
While the on-screen display is blank: Select [ANALYZE] ANALYSIS →
Use the [Rotary Key] to select Audio Timing → Select [HEX] and execute it.

4.19 DDC Monitor

DDC is the abbreviation for Display Data Channel; it is the standard for sending the information of the monitor specified by VESA to the source. It is also used to transmit/receive HDCP data in HDMI. Data is transmitted/received via the DDC line using the I2C bus method.

The VA-1809A can display the data flowing through the DDC line between the input side of the VA-1809A and the HDMI source device on the LCD located on the front of the main unit. By using this function, whether the HDMI source device is correctly transmitting/receiving the DDC command can be checked. Also, by triggering arbitrary data, only the necessary data can be displayed.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select DDC Monitor.



The display contents of DDC Monitor are as follows.

Display item	Figure
S/ = Start Condition, -/P = Stop Condition	(1)
R = Read, W = Write	(2)
Slave Address, Sub Address or Data	(3)
A = Acknowledge, N = Not acknowledge	(4)
Data type *	(5)
Changes in hot plug of VA-1809A	(6)
Acquisition time	(7)

* The data type is classified as follows according to Slave Address.

Slave Address	Data type display	Description
A0 H	EDID	Read command of EDID
60 H	Segment Pointor	Segment Pointer Switch command of EDID
74 H	Receiver	HDCP related commands
Other than above	?	Commands other than EDID and HDCP

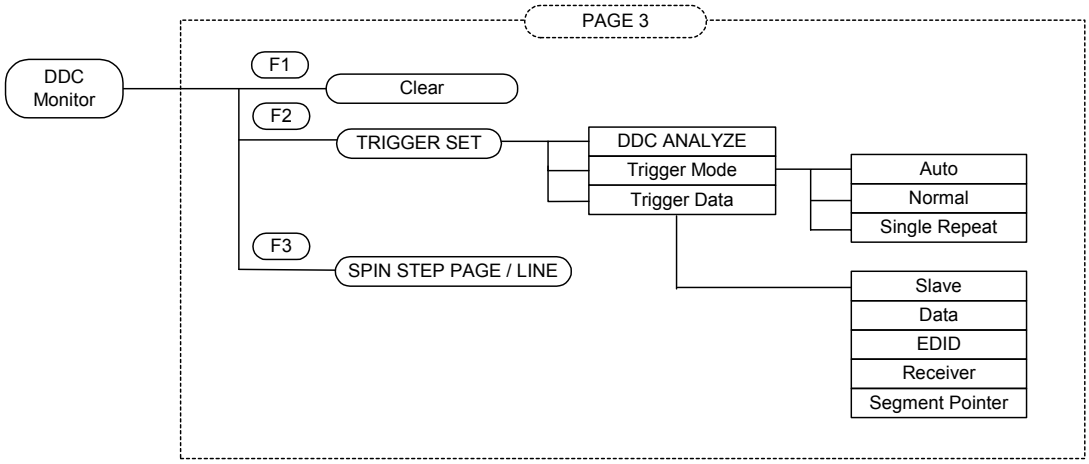
* If abnormal commands are continuously sent (for example, start bits are sent continuously), it may not be possible to capture data. If data cannot be captured, error display is performed.

* A maximum of 4096 lines can be displayed at a time.

■ Description of the function keys dedicated to DDC Monitor

Page 3 contains the function keys dedicated to DDC Monitor.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select DDC Monitor.→ Press [SHIFT] twice. Page 3



Clear [F1]

When Clear is executed, all data displayed on the Monitor will be cleared.

Trigger Set [F2]

This function key sets the trigger mode and data for executing DDC Monitor. Change the setting using the rotary key.

DDC ANALYZE

Item	Description
ON	Starts DDC ANALYZE.

Trigger Mode

Item	Description
Auto	Displays all data regardless of Trigger Data.
Normal	Selects and displays only the command of the data selected by Trigger Data.
Single Repeat	Triggers the command of the data selected by Trigger Data, and starts acquiring.

* From the start bit immediately before triggered data to the stop bit immediately after are treated as one command.
* If there is no stop bit, it is not treated as a command.

Trigger Data

Item	Description
SLAVE	Can trigger the specified SLAVE Address.
DATA	Can trigger the specified data. (It will be data other than the SLAVE address.)
EDID	Triggers a command whose SLAVE Address is EDID (0xA0).
Receiver	Triggers a command whose SLAVE Address is Receiver (0x74).
Segment Pointer	Triggers a command whose SLAVE Address is Segment Pointer (0x60).

* A trigger can be applied again by pressing the RUN button to change from STOP to RUN.

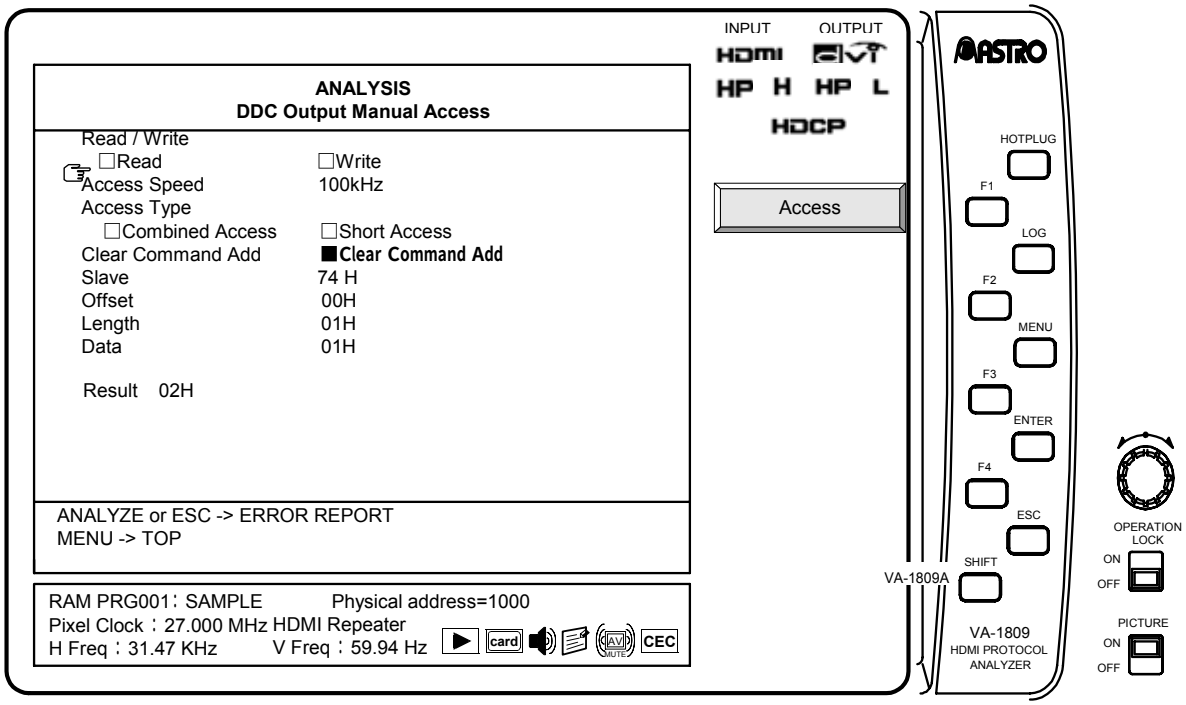
SPIN STEP PAGE/LINE F3

This function key sets whether to scroll the monitor result screen display in units of lines or pages when the rotary key is rotated.

4.20 DDC Output Manual Access

The VA-1809A analyzer can manually access the DDC line between its output side and HDMI sink device. By using this function, it is possible to check whether the HDMI sink device has received the DDC command correctly.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select DDC Output Manual Access.



The display contents of DDC Output Manual Access are as follows.

The settings can be changed by pressing the [Rotary key] or ESC key.

Item	Description
Read / Write	Used to set to read data from or write data into the sink device.
Access Speed	Used to set the I2C access speed.
Access Type	Used to set whether to perform combined access or short access.
Clear Command Add	Add Clear Command to the Commands
Slave	Used to set the slave address.
Offset	Used to set the offset address.
Length	Used to set the number of bytes to be accessed.
Data	Used the set the data to be written.
Result	Used to display the access results. (Results are displayed only when the access has been initiated.)

■ DDC Output Access

The commands set on the screen can be accessed by pressing Access F1. The access results are displayed in Result at the bottom of the screen.

Item		Description
Read	TimeOut Error	In case ACK(Acknowledge) is not returned, this message is displayed.
	Read value	Access result is displayed in HEX mode.
Write	TimeOut Error	In case ACK(Acknowledge) is not returned, this message is displayed.
	OK	In case “Write” is succeeded, this message is displayed.

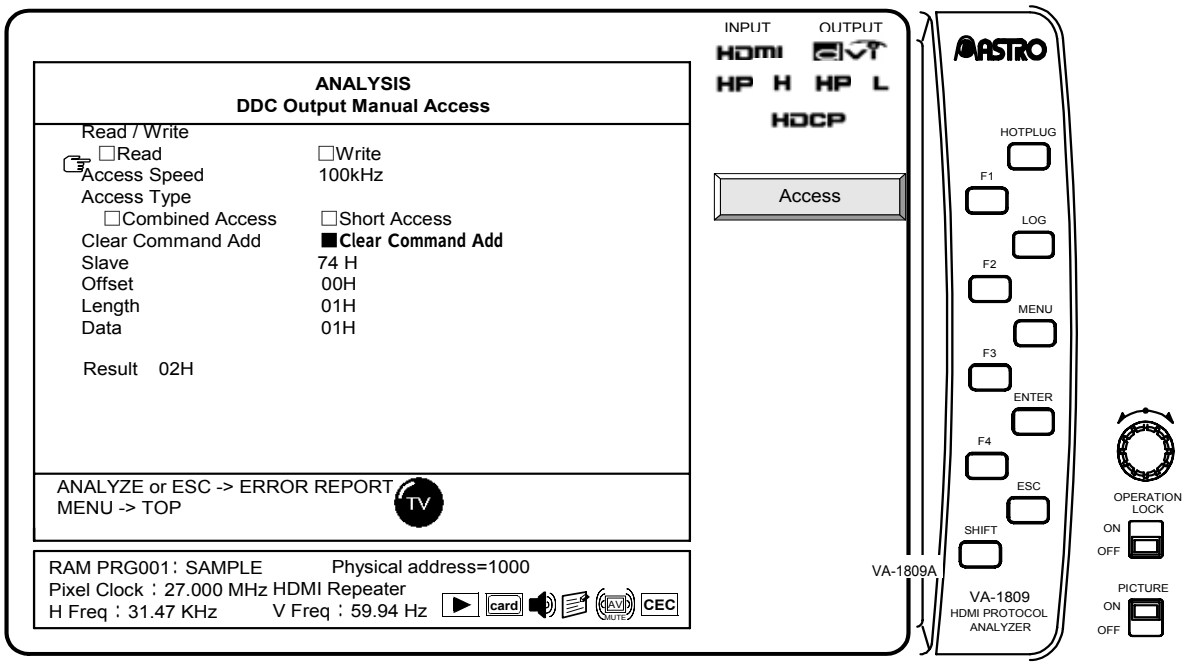
4.21 CEC Monitor

CEC is the abbreviation for Consumer Electronics Control; it is the function for mutually controlling among devices connected using HDMI. For example, it can play a DVD player from a TV, and turn ON/OFF the power to a TV or DVD player from an AV amplifier (AV center). CEC is implemented by exchanging messages among devices via the CEC line of HDMI.

The VA-1809A can monitor the CEC line and transmit/receive commands.

* This function is optional. For more information, please contact our Sales Department.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select CEC Monitor.

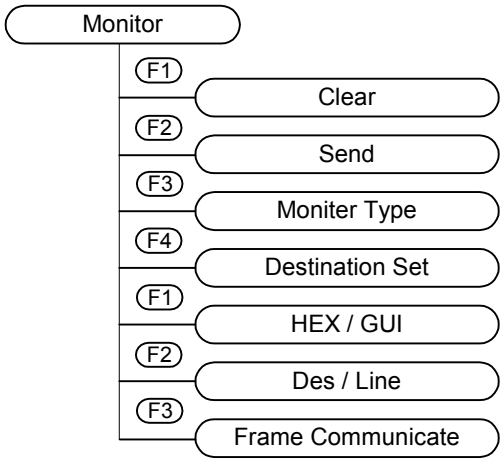


Icon	Name	Descriptions
	TV Emulate Icon	This icon lights when VA-1809A emulates as TV. It becomes pink when Active Source is TV. It becomes light blue when Active source is other than TV.
	Recording Device Emulate Icon	This icon lights when VA-1809A emulates as Recording Device. It becomes pink when Active Source is TV. It becomes light blue when Active source is other than TV.
	Playback Device Emulate Icon	This icon lights when VA-1809A emulates as Playback Device. It becomes pink when Active Source is TV. It becomes light blue when Active source is other than TV.
	Tuner Emulate Icon	This icon lights when VA-1809A emulates as Tuner. It becomes pink when Active Source is TV. It becomes light blue when Active source is other than TV.
	Audio System Emulate Icon	This icon lights when VA-1809A emulates as Audio System. It becomes pink when Active Source is TV. It becomes light blue when Active source is other than TV.

■ Description of the Function Keys Dedicated to CEC Analyzer

The function keys used exclusively for the CEC analyzer take effect on PAGE 3 and the subsequent pages.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select CEC Analyzer.



CAUTION

When VA-1809A emulates TV and Active Source is TV, input video is not displayed, and input audio is not output as well. This is to express displaying Internal Source.

>> PAGE 1 ----------

Clear F1 : PAGE 1

When the Clear function is executed, all the data shown on the monitor display is cleared.

Send / Send Again F2 : PAGE 1

When the Send function is executed, this function sends the data which was set in the Detail Mode.

* The function sends the transmission data which was set in the Detail Mode also while the Feature Mode is selected.

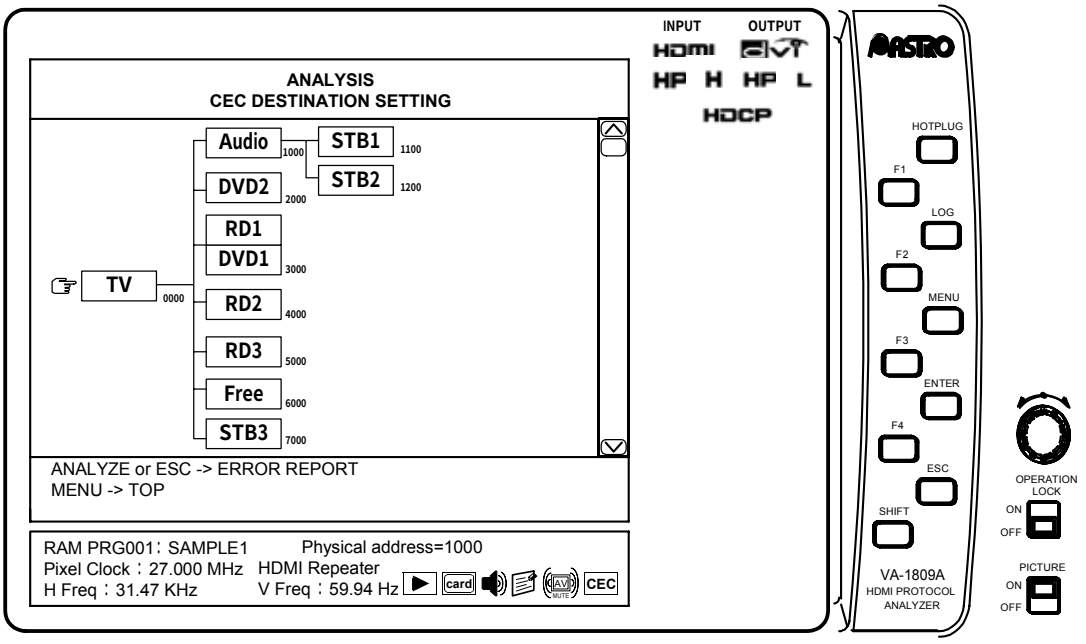
Normal Mode / Detail Send Mode / Feature Send Mode / Status Mode F3 : PAGE 1

The display mode of the CEC line monitor is changed.

1. Normal Monitor..... The CEC line monitoring results are displayed. (P.65)
2. Feature Send Monitor ..... The screen on which to set the transmission data for each function is displayed at the bottom of the CEC line monitor. (P.68)
3. Detail Send Monitor..... The screen on which to set the detailed transmission data is displayed at the bottom of the CEC line monitor. (P.68)
4. Status Monitor ..... The current status of the VA-1809A is shown at the bottom of the CEC line monitor. (P.83)

Destination Set F4 : PAGE 1

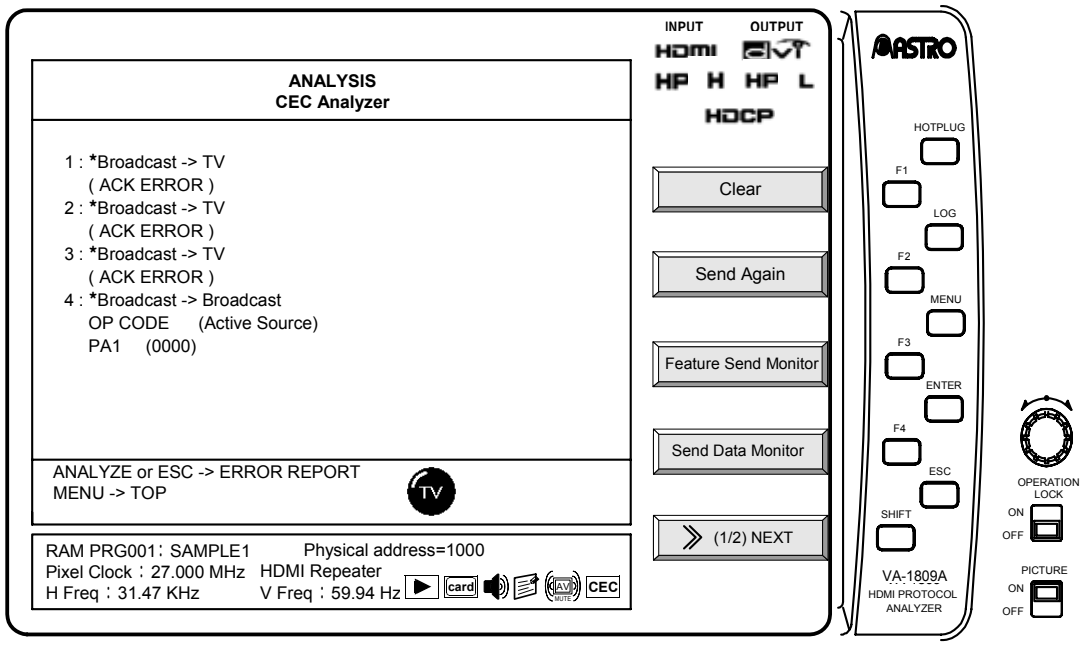
The devices currently connected on the CEC line are organized into a tree using logical addresses from their physical addresses, and displayed. (Devices emulated by the VA-1809A appear in green; all other devices appear in pink.) The devices selected are established as the destination by pressing the Rotary key or ENTER.



1. Normal Monitor

The CEC line monitoring results are displayed on this screen. Switching between GUI display and HEX display is possible.

GUI display



Display item	Description	Figure
Data number	Running number of the data	(1)
Address	Initiator at left, destination at right ("*" is displayed for data which has been sent from the VA-1809A).	(2)
OP CODE	Operand Code Blocks	(3)
PA	Parameter	(4)

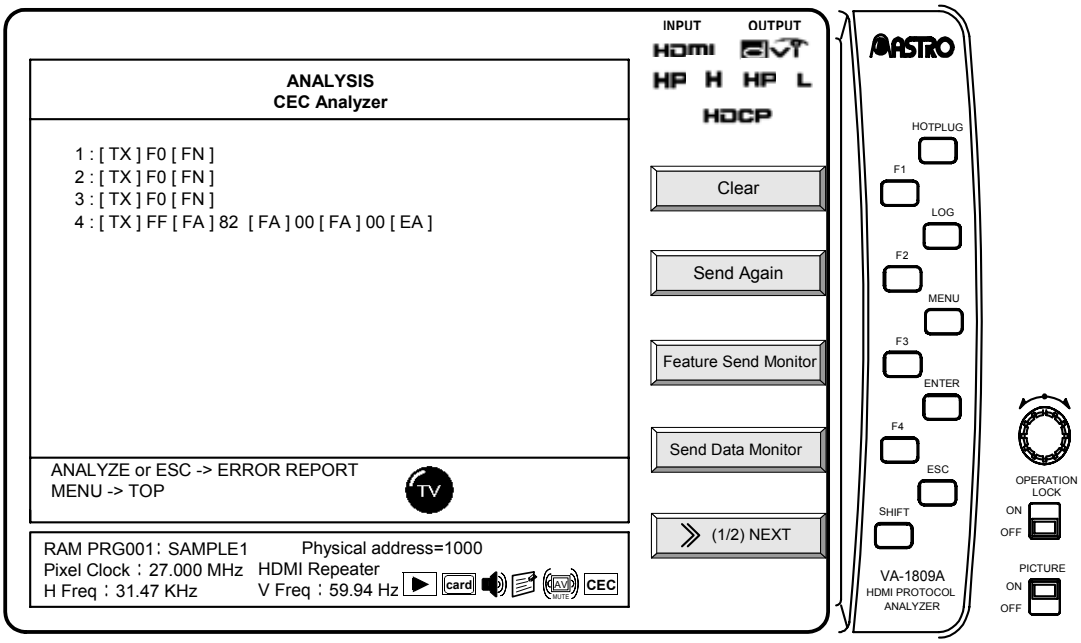
* The HEX system is used to display the operand codes or parameters which are not mandatory when they have been received or transmitted.

* When using the ASCII system to display OSD names, OSD strings, etc., a period (".") is used to indicate the setting of values which cannot be displayed.

CAUTION

The intervals between successive commands must be at least 3 bits (7.2 ms). If this distance is not provided between them, it may not be possible for the data to be displayed properly.

HEX display



Display item	Description	Figure
Data number	Running number of the data	(1)
Data type	RX: reception data; TX: transmission data	(2)
Data	From the left: header block, data block 1 ... data block n	(3)
EOM	Left EOM (end of message); E: available; F: not available	(4)
ACK	Right ACK (acknowledge); A: available; N: not available	(5)

* Up to 64 CEC commands can be displayed at one time.

CAUTION

The intervals between successive commands must be at least 3 bits (7.2 ms). If this distance is not provided between them, it may not be possible for the data to be displayed properly.

Listed below are the errors which may be output by the CEC analyzer monitor.

* The errors are indicated within quotation marks on the monitor.

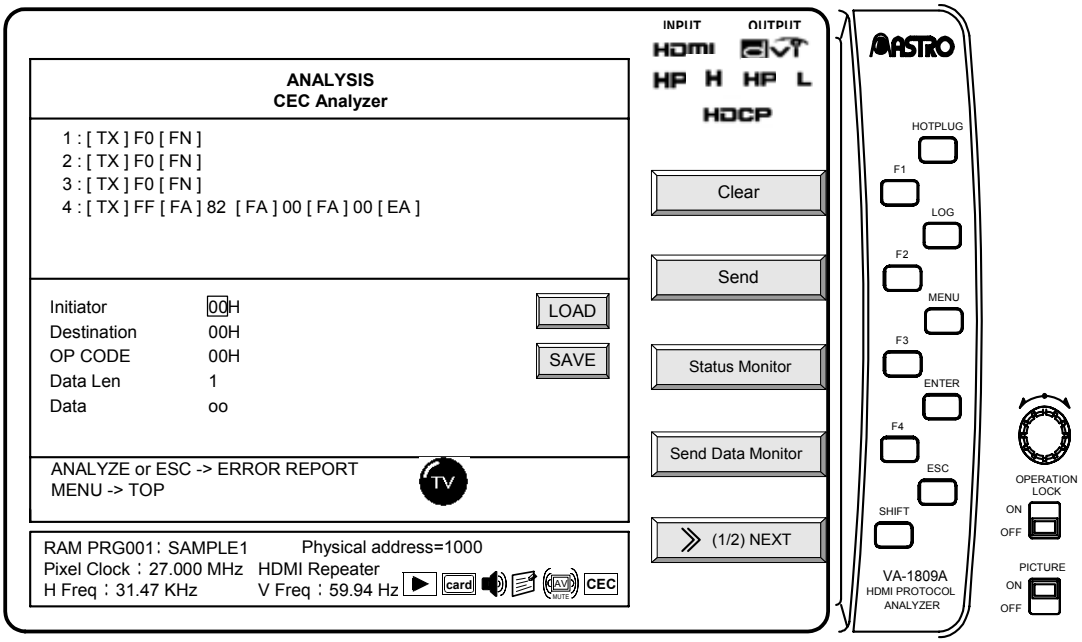
Item	Details
Error Handling	The follower has detected an error indicating that the bit period is less than the rating, and in order to notify the initiator that this error has occurred in the CEC bus, it sends a low level to the bus at a length which is approximately 1.5 times the length of the bit period. (Error Handling) The VA-1809A displays this message when it has detected this operation. (If the low level period exceeds 3.30 to 3.35 ms, the VA-1809A recognizes this as “Error Handling.”)
Error Handling Act	This message is displayed when the VA-1809A has executed Error Handling.
Bit Priod Short Error	This message is displayed when the bit period of a CEC command is less than the rating. (This error results when the bit period is less than 2.00 to 2.05 ms.)
Bit Priod Long Error	This message is displayed when the bit period of a CEC command is more than the rating. (This error results when the bit period is more than 2.80 to 2.85 ms.)
Bus Free Error	This message is displayed when the re-send time is shorter than the one prescribed in the area of the items which are to be checked up to the re-send time of the CEC Compliance Test Item Check command by the VA-1809A.
ACK Error	This message is displayed when the ACK is not contained in the CEC command.
Send Bus Busy Error	This message is displayed if the bus remains busy (low level) when an attempt has been made to send a command from the VA-1809A.
Send Error Handling	This message is displayed when a command has been sent from the VA-1809A if the 1-bit period is shorter than the rating for some reason and this fact has been posted by the Follower. (If the low level period exceeds 3.30 to 3.35 ms, the VA-1809A recognizes this as “Error Handling.”)
Send Aribitration Error	This message is displayed when a command has been sent from the VA-1809A if it is deemed that there is an Initiator other than the VA-1809A as well.
Send Ack Error	This message is displayed when a command has been sent from the VA-1809A and ACK was not detected.
Send Impedance Error	This message is displayed when a command has been sent from the VA-1809A if another device has been set to the low level for some reason at a place other than where the bus should be set to the low level.
Send the other Error	This message is displayed when the an error is deemed to have occurred from some reason.
Corrupted bit Error	This message is displayed when an unintended low level has been output to the bus.

2. Send Data Monitor

This function displays the transmission data setting screen.
The setting and selection screen display system (Detail Mode, Feature Mode or Status Mode) is switched using F3.

- Detail Mode

  In this mode, the transmission data can be set with numerical values (HEX).
  It is also possible to load or save the set data.
  The items to be changed are selected, edited and executed by Rotary Key.



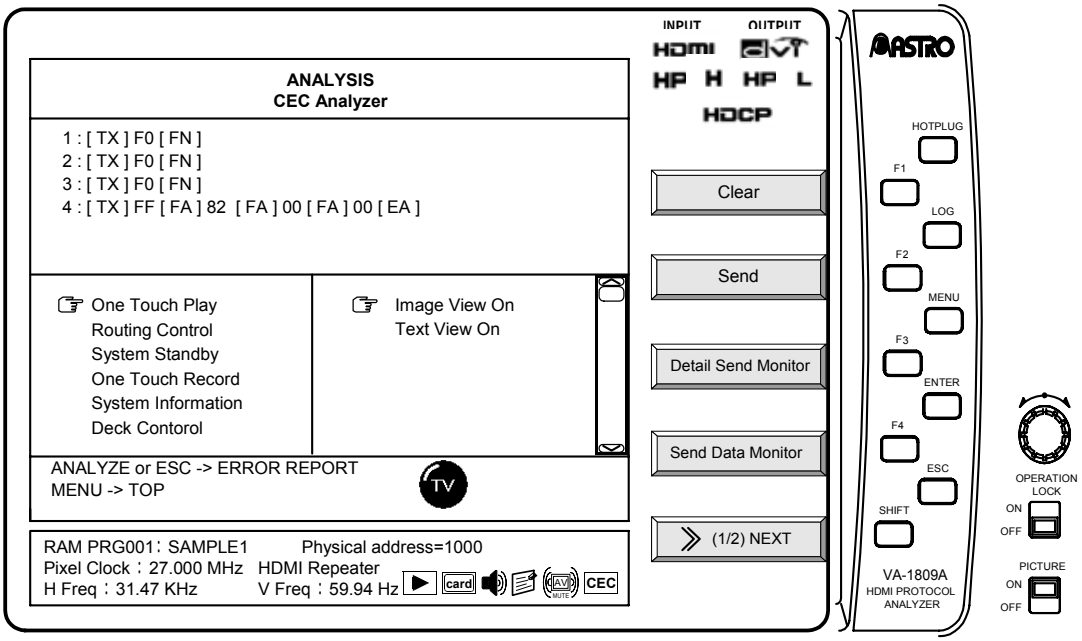
A description of each item is given below.

Item	Description
Destination	The logical address of the transmission destination is specified here.
OP CODE	The operand code is specified here.
Data Len	The parameter data volume is specified here.
Data	The operand block data is specified here.

- Feature Mode

  In this mode, the transmission data can be set with command names (GUI).
  Select the transmission data using [Rotary Key] or by pressing [ENTER].

  * The transmission destinations of those transmission commands whose destination can be determined from a multiple number of such destinations can be set using Destination in the Detail Mode or the “Destination Set” function key ([F4], see PAGE 1) used exclusively by the CEC Analyzer.



Listed below is the data which can be transmitted.

* Functions which support VA-1809A HDMI1.3a are transmitted.

Function item	Transmission data	Description
One Touch Play	Image View On	When the VA-1809A is not emulating a TV set, the Image View On data is sent to the TV set, and the Active Source data is broadcast approximately 200 ms later.
	Text View On	When the VA-1809A is not emulating a TV set, the Text View On data is sent to the TV set, and the Active Source data is broadcast approximately 200 ms later.
Routing Control	Active Source	The Active Source data is broadcast.
	Request Active Source	The Request Active Source data is broadcast.
	Routing Change	When the VA-1809A is emulating two or more devices, the least significant bit of the currently posted Physical Address data is changed, and the Routing Change data is broadcast.
	Set Stream Path	When the VA-1809A is emulating a TV set, the Give Physical Address data is transmitted, and the Set Stream Path data is broadcast to the returned Physical Address.

Function item	Transmission data	Description
System Standby		System Standby is transmitted.
One Touch Record	Record OFF	When the VA-1809A is emulating a TV set, the Record OFF data is transmitted.
	Record ON	When the VA-1809A is emulating a TV set, the Record ON data is transmitted. When it is emulating a device other than a TV set, the Record TV Screen data is transmitted.
Timer Programming	Clear Analogue Timer	Clear Analogue Timer is transmitted.
	Clear Digital Timer	Clear Digital Timer is transmitted.
	Clear External Timer	Clear External Timer is transmitted.
	Set Analogue Timer	Set Analogue Timer is transmitted.
	Set Digital Timer	Set Digital Timer is transmitted.
	Set External Timer	Set External Timer is transmitted.
	Set Timer Program Title	Set Timer Program Title [TEST TITLE STR] is transmitted.
System Information	Get Menu Language	When the VA-1809A is not emulating a TV set, the Get Menu Language data is transmitted to the TV set.
	Set Menu Language	When the VA-1809A is emulating a TV set, the Set Menu Language data is transmitted.
	Give Physical Address	The Give Physical Address data is transmitted.
	Report Physical Address	The Report Physical Address data is broadcast.
Deck Control	Give Deck Status ON	The Give Deck Status [ON] data is transmitted.
	Give Deck Status OFF	The Give Deck Status [OFF] data is transmitted.
	Give Deck Status ONCE	The Give Deck Status [ONCE] data is transmitted.
	Skip Forward / Wind Forward	The Deck Control [Skip Forward/Wind Forward] data is transmitted.
	Skip Backwoard / Rewind	The Deck Control [Skip Backward/Rewind] data is transmitted.
	Stop	The Deck Control [Stop] data is transmitted.
	Eject	The Deck Control [Eject] data is transmitted.
	Play Forward	The Play [Play Forward] data is transmitted.
	Play Reverse	The Play [Play Reverse] data is transmitted.
	Play Still	The Play [Play Still] data is transmitted.
	Fast Forward Min Speed	The Play [Fast Forward Min Speed] data is transmitted.
	Fast Forward Medium Speed	The Play [Fast Forward Medium Speed] data is transmitted.
	Fast Forward Max Speed	The Play [Fast Forward Max Speed] data is transmitted.
	Fast Reverse Min Speed	The Play [Fast Reverse Min Speed] data is transmitted.
	Fast Reverse Medium Speed	The Play [Fast Reverse Medium Speed] data is transmitted.
	Fast Reverse Max Speed	The Play [Fast Reverse Max Speed] data is transmitted.
	Slow Forward Min Speed	The Play [Slow Forward Min Speed] data is transmitted.
	Slow Forward Medium Speed	The Play [Slow Forward Medium Speed] data is transmitted.
	Slow Forward Max Speed	The Play [Slow Forward Max Speed] data is transmitted.
	Slow Reverse Min Speed	The Play [Slow Reverse Min Speed] data is transmitted.
	Slow Reverse Medium Speed	The Play [Slow Reverse Medium Speed] data is transmitted.
	Slow Reverse Max Speed	The Play [Slow Reverse Max Speed] data is transmitted.

Function item	Transmission data	Description
Tuner Control	Give Tuner Device Status ON	The Give Tuner Device Status [ON] data is transmitted.
	Give Tuner Device Status OFF	The Give Tuner Device Status [OFF] data is transmitted.
	Give Tuner Device Status Once	The Give Tuner Device Status [ONCE] data is transmitted.
	Select Digital Service 1	The Select Digital Service data is transmitted using Digital Service 1 set by Device Setting as the parameter.
	Select Digital Service 2	The Select Digital Service data is transmitted using Digital Service 2 set by Device Setting as the parameter.
	Select Digital Service 3	The Select Digital Service data is transmitted using Digital Service 3 set by Device Setting as the parameter.
	Select Analog Service 1	The Select Analog Service data is transmitted using Analog Service 1 set by Device Setting as the parameter.
	Select Analog Service 2	The Select Analog Service data is transmitted using Analog Service 2 set by Device Setting as the parameter.
	Select Analog Service 3	The Select Analog Service data is transmitted using Analog Service 3 set by Device Setting as the parameter.
	Tuner Step Decrement	The Tuner Step Decrement data is transmitted.
	Tuner Step Increment	The Tuner Step Increment data is transmitted.
Vendor Specific Commands	Device Vendor ID	The Device Vendor ID data is transmitted using the Vendor ID set by Device Setting as the parameter.
	Give Device Vendor ID	The Give Device Vendor ID is transmitted.
OSD Status Display	Display for default time	The Set OSD String [Display for default time] data is transmitted.
	Display until cleard	The Set OSD String [Display until cleared] data is transmitted.
	Clear previous message	The Set OSD String [Clear previous message] data is transmitted.
	Reserved for future use	The Set OSD String [Reserved for future use] data is transmitted.
Device OSD Name Transfer		The Give OSD Name data is transmitted.
Device Menu Control	Activate	The Menu Request [Activate] data is transmitted.
	Deactivate	The Menu Request [Deactivate] data is transmitted.
	Query	The Menu Request [Query] data is transmitted.

Function item	Transmission data		Description
Device Menu Control	Select	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Select] data for P and the User Control Released data for R.
	Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Up] data for P and the User Control Released data for R.
	Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Down] data for P and the User Control Released data for R.
	Left	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Left] data for P and the User Control Released data for R.
	Right	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Right] data for P and the User Control Released data for R.
	Right-Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Right-Up] data for P and the User Control Released data for R.
	Right-Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Right-Down] data for P and the User Control Released data for R.
	Left-Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Left-Up] data for P and the User Control Released data for R.
	Left-Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Left-Down] data for P and the User Control Released data for R.
	Root Menu	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Root Menu] data for P and the User Control Released data for R.
	Setup Menu	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Setup Menu] data for P and the User Control Released data for R.
	Contents Menu	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Contents Menu] data for P and the User Control Released data for R.
	Favorite Menu	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Favorite Menu] data for P and the User Control Released data for R.
	Exit	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Exit] data for P and the User Control Released data for R.
	Reserved (0x0E) : Reserved (0x1F)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Numbers 0 : Numbers 9	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Numbers X] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Device Menu Control	Dot	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Dot] data for P and the User Control Released data for R.
	Enter	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Enter] data for P and the User Control Released data for R.
	Clear	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Clear] data for P and the User Control Released data for R.
	Reserved (0x2D)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Reserved (0x2E)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Next Favorite	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Next Favorite] data for P and the User Control Released data for R.
	Channel Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Channel Up] data for P and the User Control Released data for R.
	Channel Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Channel Down] data for P and the User Control Released data for R.
	Previous Channel	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Previous Channel] data for P and the User Control Released data for R.
	Sound Select	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Sound Select] data for P and the User Control Released data for R.
	Input Select	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Input Select] data for P and the User Control Released data for R.
	Display Information	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Display Information] data for P and the User Control Released data for R.
	Help	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Help] data for P and the User Control Released data for R.
	Page Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Page Up] data for P and the User Control Released data for R.
	Page Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Page Down] data for P and the User Control Released data for R.
	Reserved (0x39) : Reserved (0x3F)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Device Menu Control	Power	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Power] data for P and the User Control Released data for R.
	Volume Up	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Volume Up] data for P and the User Control Released data for R.
	Volume Down	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Volume Down] data for P and the User Control Released data for R.
	Mute	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Mute] data for P and the User Control Released data for R.
	Play	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Play] data for P and the User Control Released data for R.
	Stop	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Stop] data for P and the User Control Released data for R.
	Pause	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Pause] data for P and the User Control Released data for R.
	Record	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Record] data for P and the User Control Released data for R.
	Rewind	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Rewind] data for P and the User Control Released data for R.
	Fast forward	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Fast Forward] data for P and the User Control Released data for R.
	Eject	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Eject] data for P and the User Control Released data for R.
	Forward	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Forward] data for P and the User Control Released data for R.
	Backward	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Backward] data for P and the User Control Released data for R.
	Stop-Record	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Stop-Record] data for P and the User Control Released data for R.
	Pause-Record	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Pause-Record] data for P and the User Control Released data for R.
	Reserved (0x4F)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Device Menu Control	Angle	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Angle] data for P and the User Control Released data for R.
	Sub picture	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Sub picture] data for P and the User Control Released data for R.
	Video on Demand	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Video on Demand] data for P and the User Control Released data for R.
	Electronic Program Guide	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Electronic Program Guide] data for P and the User Control Released data for R.
	Timer Programming	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Timer Programming] data for P and the User Control Released data for R.
	Intial Configuration	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Initial Configuration] data for P and the User Control Released data for R.
	Reserved (0x56) : Reserved (0x5F)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Play Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Play Function] data for P and the User Control Released data for R.
	Pause-Play Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Pause-Play Function] data for P and the User Control Released data for R.
	Record Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Record Function] data for P and the User Control Released data for R.
	Pause-Record Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Pause-Record Function] data for P and the User Control Released data for R.
	Stop Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Stop Function] data for P and the User Control Released data for R.
	Mute Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Mute Function] data for P and the User Control Released data for R.
	Restore Volume Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Restore Volume Function] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Device Menu Control	Tune Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Tune Function] data for P and the User Control Released data for R.
	Select Disk Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Select Disk Function] data for P and the User Control Released data for R.
	Select A/V Input Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Select A/V Input Function] data for P and the User Control Released data for R.
	Select Audio Input Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Select Audio Input Function] data for P and the User Control Released data for R.
	Power Toggle Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Power Toggle Function] data for P and the User Control Released data for R.
	Power Off Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Power Off Function] data for P and the User Control Released data for R.
	Power On Function	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Power On Function] data for P and the User Control Released data for R.
	Reserved(0x6B) : Reserved (0x70)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved]] data for P and the User Control Released data for R.
	F1 (Blue)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [F1 (Blue)] data for P and the User Control Released data for R.
	F2 (Red)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [F2 (Red)] data for P and the User Control Released data for R.
	F3 (Green)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [F3 (Green)] data for P and the User Control Released data for R.
	F4 (Yellow)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [F4 (Yellow)] data for P and the User Control Released data for R.
	F5	P&R / P / R	Transmitted to Active Source is the User Control Pressed [F5] data for P and the User Control Released data for R.
	Data	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Data] data for P and the User Control Released data for R.
	Reserved (0x77) : Reserved (0x7F)	P&R / P / R	Transmitted to Active Source is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Remote Control Pass Through	Select	P&R / P / R	Transmitted is the User Control Pressed [Select] data for P and the User Control Released data for R.
	Up	P&R / P / R	Transmitted is the User Control Pressed [Up] data for P and the User Control Released data for R.
	Down	P&R / P / R	Transmitted is the User Control Pressed [Down] data for P and the User Control Released data for R.
	Left	P&R / P / R	Transmitted is the User Control Pressed [Left] data for P and the User Control Released data for R.
	Right	P&R / P / R	Transmitted is the User Control Pressed [Right] data for P and the User Control Released data for R.
	Right-Up	P&R / P / R	Transmitted is the User Control Pressed [Right-Up] data for P and the User Control Released data for R.
	Right-Down	P&R / P / R	Transmitted is the User Control Pressed [Right-Down] data for P and the User Control Released data for R.
	Left-Up	P&R / P / R	Transmitted is the User Control Pressed [Left-Up] data for P and the User Control Released data for R.
	Left-Down	P&R / P / R	Transmitted is the User Control Pressed [Left-Down] data for P and the User Control Released data for R.
	Root Menu	P&R / P / R	Transmitted is the User Control Pressed [Root Menu] data for P and the User Control Released data for R.
	Setup Menu	P&R / P / R	Transmitted is the User Control Pressed [Setup Menu] data for P and the User Control Released data for R.
	Contents Menu	P&R / P / R	Transmitted is the User Control Pressed [Contents Menu] data for P and the User Control Released data for R.
	Favorite Menu	P&R / P / R	Transmitted is the User Control Pressed [Favorite Menu] data for P and the User Control Released data for R.
	Exit	P&R / P / R	Transmitted is the User Control Pressed [Exit] data for P and the User Control Released data for R.
	Reserved (0x0E) : Reserved (0x1F)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Numbers 0 : Numbers 9	P&R / P / R	Transmitted is the User Control Pressed [Numbers X] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Remote Control Pass Through	Dot	P&R / P / R	Transmitted is the User Control Pressed [Dot] data for P and the User Control Released data for R.
	Enter	P&R / P / R	Transmitted is the User Control Pressed [Enter] data for P and the User Control Released data for R.
	Clear	P&R / P / R	Transmitted is the User Control Pressed [Clear] data for P and the User Control Released data for R.
	Reserved (0x2D)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Reserved (0x2E)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Next Favorite	P&R / P / R	Transmitted is the User Control Pressed [Next Favorite] data for P and the User Control Released data for R.
	Channel Up	P&R / P / R	Transmitted is the User Control Pressed [Channel Up] data for P and the User Control Released data for R.
	Channel Down	P&R / P / R	Transmitted is the User Control Pressed [Channel Down] data for P and the User Control Released data for R.
	Previous Channel	P&R / P / R	Transmitted is the User Control Pressed [Previous Channel] data for P and the User Control Released data for R.
	Sound Select	P&R / P / R	Transmitted is the User Control Pressed [Sound Select] data for P and the User Control Released data for R.
	Input Select	P&R / P / R	Transmitted is the User Control Pressed [Input Select] data for P and the User Control Released data for R.
	Display Information	P&R / P / R	Transmitted is the User Control Pressed [Display Information] data for P and the User Control Released data for R.
	Help	P&R / P / R	Transmitted is the User Control Pressed [Help] data for P and the User Control Released data for R.
	Page Up	P&R / P / R	Transmitted is the User Control Pressed [Page Up] data for P and the User Control Released data for R.
	Page Down	P&R / P / R	Transmitted is the User Control Pressed [Page Down] data for P and the User Control Released data for R.
	Reserved (0x39) : Reserved (0x3F)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Remote Control Pass Through	Power	P&R / P / R	Transmitted is the User Control Pressed [Power] data for P and the User Control Released data for R.
	Volume Up	P&R / P / R	Transmitted is the User Control Pressed [Volume Up] data for P and the User Control Released data for R.
	Volume Down	P&R / P / R	Transmitted is the User Control Pressed [Volume Down] data for P and the User Control Released data for R.
	Mute	P&R / P / R	Transmitted is the User Control Pressed [Mute] data for P and the User Control Released data for R.
	Play	P&R / P / R	Transmitted is the User Control Pressed [Play] data for P and the User Control Released data for R.
	Stop	P&R / P / R	Transmitted is the User Control Pressed [Stop] data for P and the User Control Released data for R.
	Pause	P&R / P / R	Transmitted is the User Control Pressed [Pause] data for P and the User Control Released data for R.
	Record	P&R / P / R	Transmitted is the User Control Pressed [Record] data for P and the User Control Released data for R.
	Rewind	P&R / P / R	Transmitted is the User Control Pressed [Rewind] data for P and the User Control Released data for R.
	Fast forward	P&R / P / R	Transmitted is the User Control Pressed [Fast Forward] data for P and the User Control Released data for R.
	Eject	P&R / P / R	Transmitted is the User Control Pressed [Eject] data for P and the User Control Released data for R.
	Forward	P&R / P / R	Transmitted is the User Control Pressed [Forward] data for P and the User Control Released data for R.
	Backward	P&R / P / R	Transmitted is the User Control Pressed [Backward] data for P and the User Control Released data for R.
	Stop-Record	P&R / P / R	Transmitted is the User Control Pressed [Stop-Record] data for P and the User Control Released data for R.
	Pause-Record	P&R / P / R	Transmitted is the User Control Pressed [Pause-Record] data for P and the User Control Released data for R.
	Reserved (0x4F)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

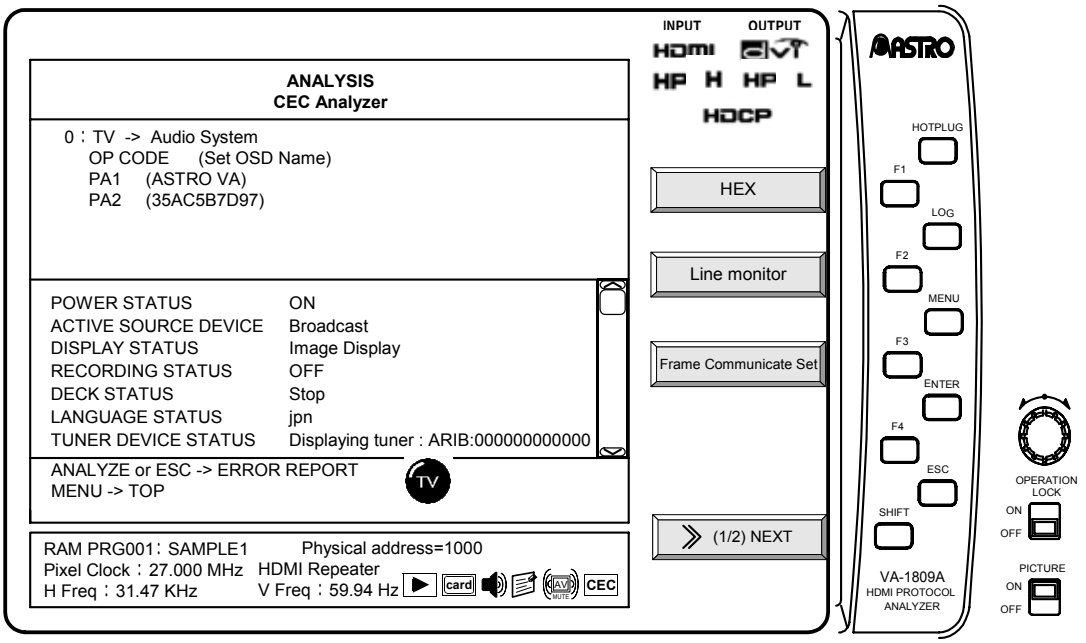
Function item	Transmission data		Description
Remote Control Pass Through	Angle	P&R / P / R	Transmitted is the User Control Pressed [Angle] data for P and the User Control Released data for R.
	Sub picture	P&R / P / R	Transmitted is the User Control Pressed [Sub picture] data for P and the User Control Released data for R.
	Video on Demand	P&R / P / R	Transmitted is the User Control Pressed [Video on Demand] data for P and the User Control Released data for R.
	Electronic Program Guide	P&R / P / R	Transmitted is the User Control Pressed [Electronic Program Guide] data for P and the User Control Released data for R.
	Timer Programming	P&R / P / R	Transmitted is the User Control Pressed [Timer Programming] data for P and the User Control Released data for R.
	Intial Configuration	P&R / P / R	Transmitted is the User Control Pressed [Initial Configuration] data for P and the User Control Released data for R.
	Reserved (0x56) : Reserved (0x5F)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	Play Function	P&R / P / R	Transmitted is the User Control Pressed [Play Function] data for P and the User Control Released data for R.
	Pause-Play Function	P&R / P / R	Transmitted is the User Control Pressed [Pause-Play Function] data for P and the User Control Released data for R.
	Record Function	P&R / P / R	Transmitted is the User Control Pressed [Record Function] data for P and the User Control Released data for R.
	Pause-Record Function	P&R / P / R	Transmitted is the User Control Pressed [Pause-Record Function] data for P and the User Control Released data for R.
	Stop Function	P&R / P / R	Transmitted is the User Control Pressed [Stop Function] data for P and the User Control Released data for R.
	Mute Function	P&R / P / R	Transmitted is the User Control Pressed [Mute Function] data for P and the User Control Released data for R.
	Restore Volume Function	P&R / P / R	Transmitted is the User Control Pressed [Restore Volume Function] data for P and the User Control Released data for R.

Function item	Transmission data		Description
Remote Control Pass Through	Tune Function	P&R / P / R	Transmitted is the User Control Pressed [Tune Function] data for P and the User Control Released data for R.
	Select Disk Function	P&R / P / R	Transmitted is the User Control Pressed [Select Disk Function] data for P and the User Control Released data for R.
	Select A/V Input Function	P&R / P / R	Transmitted is the User Control Pressed [Select A/V Input Function] data for P and the User Control Released data for R.
	Select Audio Input Function	P&R / P / R	Transmitted is the User Control Pressed [Select Audio Input Function] data for P and the User Control Released data for R.
	Power Toggle Function	P&R / P / R	Transmitted is the User Control Pressed [Power Toggle Function] data for P and the User Control Released data for R.
	Power Off Function	P&R / P / R	Transmitted is the User Control Pressed [Power Off Function] data for P and the User Control Released data for R.
	Power On Function	P&R / P / R	Transmitted is the User Control Pressed [Power On Function] data for P and the User Control Released data for R.
	Reserved (0x6B) : Reserved (0x70)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.
	F1 (Blue)	P&R / P / R	Transmitted is the User Control Pressed [F1 (Blue)] data for P and the User Control Released data for R.
	F2 (Red)	P&R / P / R	Transmitted is the User Control Pressed [F2 (Red)] data for P and the User Control Released data for R.
	F3 (Green)	P&R / P / R	Transmitted is the User Control Pressed [F3 (Green)] data for P and the User Control Released data for R.
	F4 (Yellow)	P&R / P / R	Transmitted is the User Control Pressed [F4 (Yellow)] data for P and the User Control Released data for R.
	F5	P&R / P / R	Transmitted is the User Control Pressed [F5] data for P and the User Control Released data for R.
	Data	P&R / P / R	Transmitted is the User Control Pressed [Data] data for P and the User Control Released data for R.
	Reserved (0x76) : Reserved (0x7F)	P&R / P / R	Transmitted is the User Control Pressed [Reserved] data for P and the User Control Released data for R.

Function item	Transmission data	Description
Give Device Power Status		The Give Device Power Status data is transmitted.
System Audio Control	Give Audio Status	Transmits Give Audio Status.
	Give System Audio Mode Status	Transmits Give System Audio Mode Status.
	Set System Audio Mode ON	Transmits Set System Audio Mode [ON].
	Set System Audio Mode OFF	Transmits Set System Audio Mode [OFF].
	System Audio Mode Request	Transmits System Audio Mode Request.
Audio Rate Control	Standard Rate (Wide Range Control)	Transmits Audio Rate Control[Standard Rate (Wide Range Control)].
	Fast Rate (Wide Range Control)	Transmits Audio Rate Control[Fast Rate (Wide Range Control).
	Slow Rate (Wide Range Control)	Transmits Audio Rate Control[Slow Rate (Wide Range Control)].
	Standard Rate (Narrow Range Control)	Transmits Audio Rate Control[Standard Rate (Narrow Range Control)].
	Fast Rate (Narrow Range Control)	Transmits Audio Rate Control[Fast Rate (Narrow Range Control)].
	Slow Rate (Narrow Range Control)	Transmits Audio Rate Control[Slow Rate (Narrow Range Control)].

3. Status Monitor

The current statuses of the VA-1809A are shown on this monitor.
The statuses may be changed by CEC commands from an external source or changed from the VA-1809A main unit. To change them from the main unit, use [Rotary Key] and [ENTER].



Item	Description
POWER STATUS	The currently emulated power status is displayed here.
ACTIVE SOURCE DEVICE	The current active source device is displayed here. * The only change which can be made using [Rotary Key] is to change the device emulated by the VA-1809A to Active Source. * The status in which the internal tuner or external source is displayed at Display is established when “TV” is displayed.
DISPLAY STATUS	The currently emulated display status is displayed here. * This takes effect only when the VA-1809A is emulating a TV set.
RECORDING STATUS	The currently emulated recording status is displayed here. * This takes effect only when the VA-1809A is emulating a recording device.
TIMER STATUS	The currently emulated timer status is displayed here.
DECK STATUS	The currently emulated deck status is displayed here. * This takes effect only when the VA-1809A is emulating a deck device.
LANGUAGE STATUS	The currently emulated language status is displayed here.
TUNER RECORDING FLAG	The currently emulated TUNER RECORDING FLAG status is displayed here.
TUNER DISPLAY INFO	The currently emulated TUNER kinds is displayed here.
TUNER STATUS	The currently emulated TUNER STATUS is displayed here.

DEVICE MENU STATUS	The currently emulated menu status is displayed here. * This takes effect only when the VA-1809A is emulating a TV set.
UI COMMAND STATUS	The status of the UI command transmitted is displayed here.
OSD NAME STATUS	The currently emulated device OSD name is displayed here. * The setting is performed using the OSD Name part of [Device Info Set] which is accessed by selecting [Emulate Device Setting] -> [Device Setting].
OSD STRING DISP STATUS	The OSD string transmitted is displayed here. * This takes effect only when the VA-1809A is emulating a TV set.
AUDIO STATUS	The currently emulated AUDIO status is displayed here.
AUDIO MODE STATUS	The currently emulated AUDIO MODE STATUS is displayed here.

>> PAGE 2 ----------

HEX / GUI F1 : PAGE 2

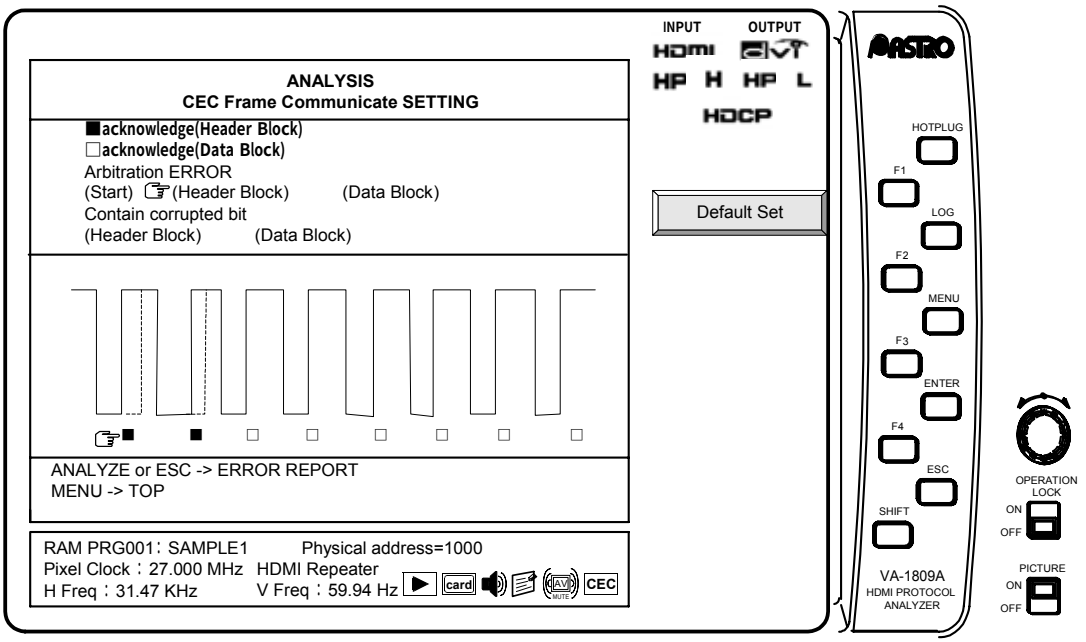
The display format of the CEC monitor is changed to HEX, GUI.

Destination Monitor / Line Monitor F2 : PAGE 2

The line monitor is switched to the destination monitor or vice versa. If the line monitor is selected, all the CEC line data is displayed; if the destination monitor is selected, only the data sent by and received by (sent to) the VA-1809A is displayed.

Frame Communicate Set F3 : PAGE 2

The detailed communication settings of the CEC frame are changed here.

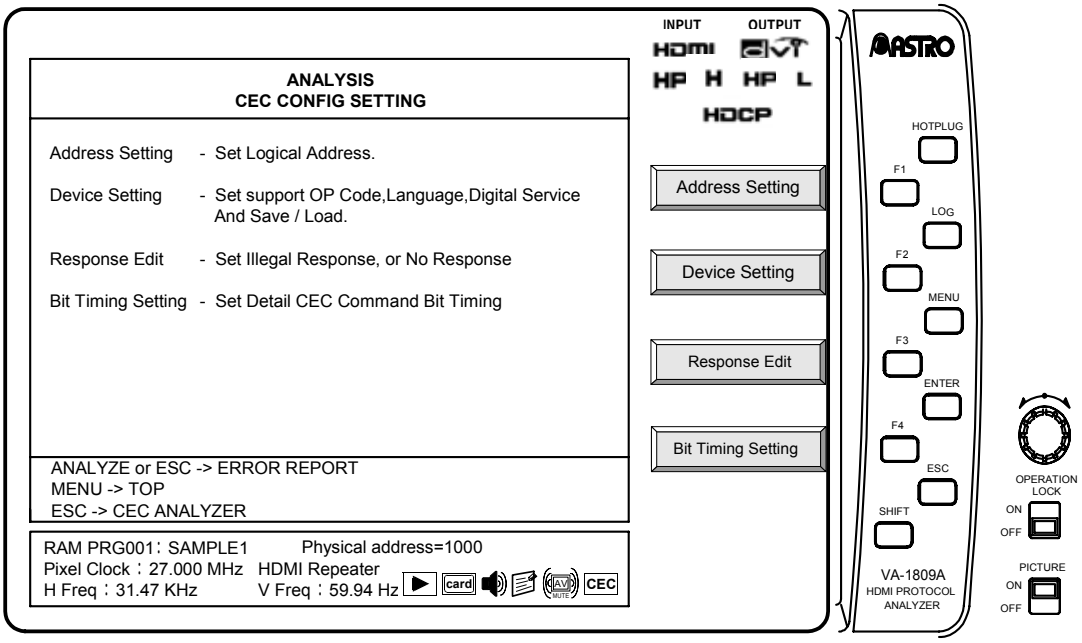


Item	Description
Acknowledge (Header Block / Data Block)	Used to select whether to use acknowledge.
Arbitration ERROR (Start / Header / Data)	Used to generate an arbitration error.
Contain corrupted Bit (Header / Data)	Used to set the line to low during a high period which has been transmitted.

4.22 CEC Config

The detailed settings for the CEC of the VA-1809A are established on this screen.

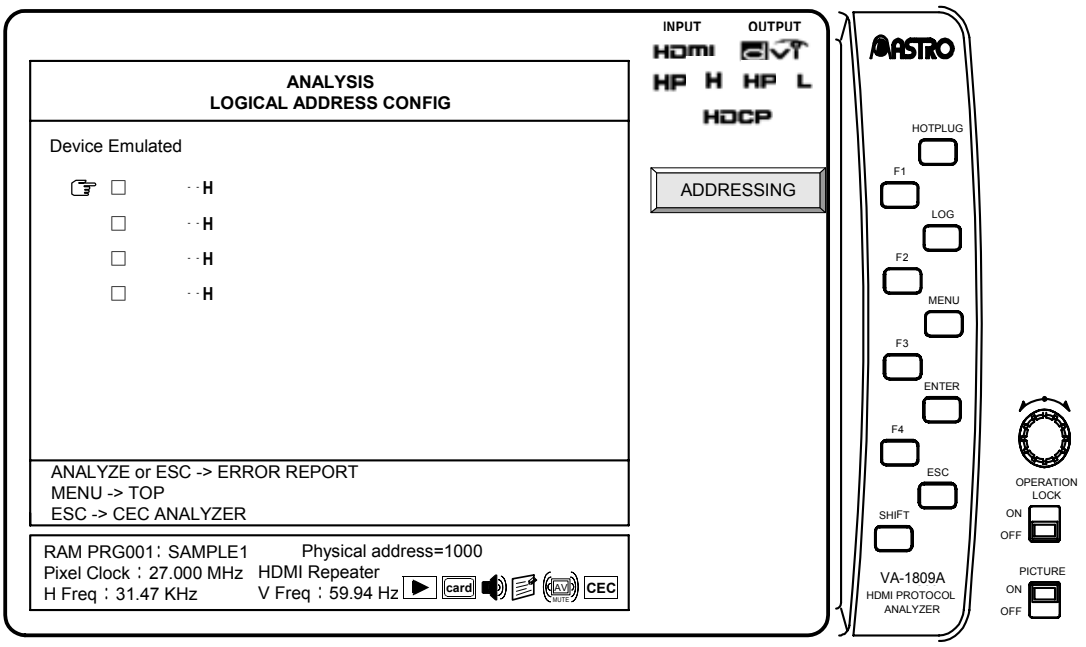
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select CEC Config.



* This function is an option. For details, contact ASTRODESIGN.

Address Setting F1 :

With CEC, the logical addresses must be acquired by the devices. The VA-1809A enables up to any four logical addresses to be acquired.



→ Press the Rotary key or ENTER, and check ON ■.
→ Press the Rotary key, move to Address. → press the Rotary key or ENTER.
→ AUTO ADDRESSING MODE/DIRECT ADDRESSING MODE appears on the right.
→ Press the Rotary key, set either the auto or direct addressing mode, and check ON ■.

→ **F1 ADDRESSING**

The address is now set.

AUTO ADDRESSING MODE

When AUTO ADDRESSING MODE is checked, the logical addresses are automatically acquired by the device categories which have been set. The logical addresses are specified as shown below depending on the device category.

Logical Address	DEVICE
00 H	TV
01 H	Recording Device 1
02 H	Recording Device 2
03H	Tuner 1
04H	Playback Device 1
05H	Audio System
06H	Tuner 2
07H	Tuner 3
08H	Playback Device 2
09H	Recording Device 3

Logical Address	DEVICE
0A H	Tuner 4
0B H	Playback Device 3
0C H	Reserved
0D H	
0E H	Free Use
0F H	Unregistered (as initiator address) Broadcast (as destination address)

DIRECT ADDRESSING MODE

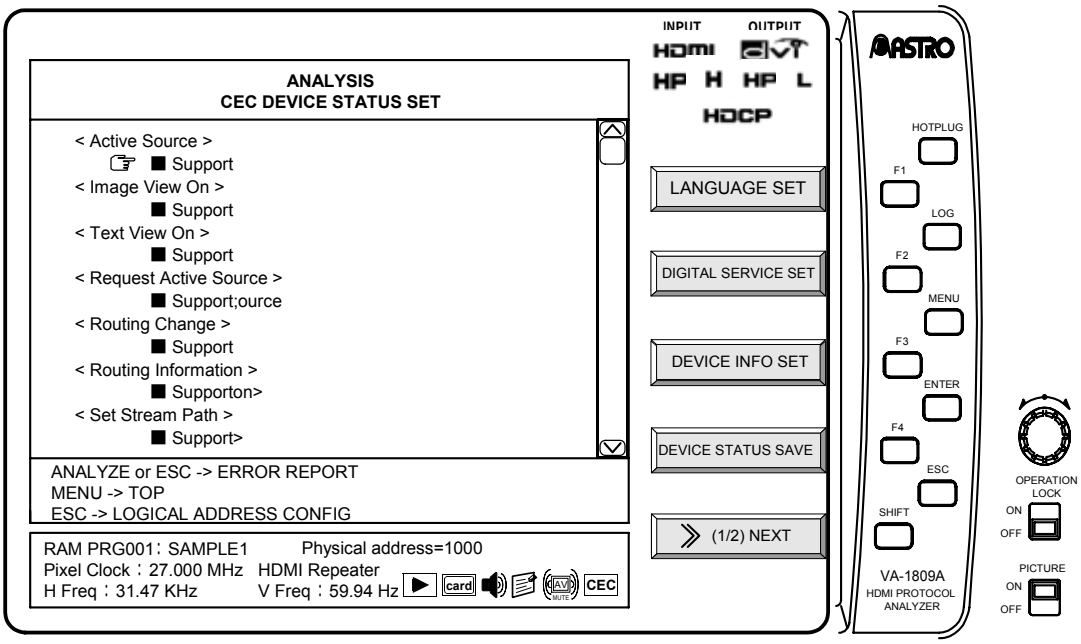
When DIRECT ADDRESSING MODE is checked, the set data is forcibly allocated to the logical addresses.

CAUTION

To have the VA-1809A emulate a TV set, set it up as a receiver, and use the HDMI input port; to have it emulate any other device, set it up as a repeater.

F2 DEVICE SETTING

The setting screen is displayed here.



The items which can be set are shown below.

1. Support OP CODE
2. LANGUAGE (→ F1) P.92
3. Tuner Service (→ F2) P.99
4 DEVICE Information (→ F3) P.99
5 Timer setting (→ F4) P.99

Data is saved or loaded by DEVICE STATUS SAVE / LOAD.

→ SHIFT NEXT → F1 DEVICE STATUS SAVE

The saved data is loaded.

→ SHIFT NEXT → F2 DEVICE STATUS LOAD

The saved data is read.

1. Support OP CODE

OP CODE	Description
Active Source	Active Source reception is supported.
Image View On	Image View On reception is supported.
Text View On	Text View On reception is supported.
Inactive Source	Inactive Source reception is supported.
Request Active Source	Request Active Source reception is supported.
Routing Change	Routing Change reception is supported.
Routing Information	Routing Information reception is supported.
Set Stream Path	Set Stream Path reception is supported.
Standby	Standby reception is supported.
Record Off	Record Off reception is supported.
Record On	Record On reception is supported.
Record Status	Record Status reception is supported.
Record TV Screen	Record TV Screen reception is supported.
Clear Analogue Timer	Clear Analogue Timer reception is supported.
Clear Digital Timer	Clear Digital Timer reception is supported.
Clear External Timer	Clear External Timer reception is supported.
Set Analogue Timer	Set Analogue Timer reception is supported.
Set Digital Timer	Set Digital Timer reception is supported.
Set External Timer	Set External Timer reception is supported.
Set Timer Program Title	Set Timer Program Title reception is supported.
Timer Cleared Status	Timer Cleared Status reception is supported.
Timer Status	Timer Status reception is supported.
CEC Version	CEC Version reception is supported.
Get CEC Version	Get CEC Version reception is supported.
Give Menu Language	Give Menu Language reception is supported.
Give Physical Address	Give Physical Address reception is supported.
Report Physical Address	Report Physical Address reception is supported.
Set Menu Language	Set Menu Language reception is supported.
Deck Control	Deck Control reception is supported.
Deck Status	Deck Status reception is supported.
Give Deck Status	Give Deck Status reception is supported.
Play	Play reception is supported.
Give Tuner Device Status	Give Tuner Device Status reception is supported.
Select Analogue Service	Select Analogue Service reception is supported.
Select Digital Service	Select Digital Service reception is supported.
Tuner Device Status	Tuner Device Status reception is supported.
Tuner Step Decrement	Tuner Step Decrement reception is supported.
Tuner Step Increment	Tuner Step Increment reception is supported.
Device Vendor ID	Device Vendor ID reception is supported.
Give Device Vendor ID	Give Device Vendor ID reception is supported.
Vendor Command	Vendor Command reception is supported.
Vendor Command With ID	Vendor Command With ID 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.
Set OSD String	Set OSD String reception is supported.
Give OSD Name	Give OSD Name reception is supported.
Set OSD Name	Set OSD Name reception is supported.

Menu Request	Menu Request reception is supported.
Menu Status	Menu Status reception is supported.
User Control Pressed	User Control Pressed reception is supported.
User Control Released	User Control Released reception is supported.
Give Device Power Status	Give Device Power Status reception is supported.
Report Device Power Status	Report Device Power Status reception is supported.
Give Audio Status	Give Audio Status reception is supported.
Give System Audio Mode Status	Give System Audio Mode Status reception is supported.
Report Audio Status	Report Audio Status reception is supported.
Set System Audio Mode	Set System Audio Mode reception is supported.
System Audio Mode Request	System Audio Mode Request reception is supported.
System Audio Mode Status	System Audio Mode Status reception is supported.
Set Audio Rate	Set Audio Rate reception is supported.

2. LANGUAGE SET F1

Code	Language	Code	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	Asturian; Bable
ath	Athapascan languages	aus	Australian languages
ava	Avaric	ave	Avestan
awa	Awadhi	aym	Aymara
aze	Azerbaijani		
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	Language	Code	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
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
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	Language	Code	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
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
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	Language	Code	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		
jav	Javanese	jbo	Lojban
jpn	Japanese	jpr	Judeo-Persian
jrb	Judeo-Arabic		
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		
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	Language	Code	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		
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		
oci	Occitan (post 1500); Provencal	oji	Ojibwa
ori	Oriya	orm	Oromo
osa	Osage	oss	Ossetian; Ossetic

Code	Language	Code	Language
ota	Turkish, Ottoman (1500 - 1928)	oto	Otomian languages
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
que	Quechua		
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		
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

Code	Language	Code	Language
suk	Sukuma	sun	Sundanese
sus	Susu	sux	Sumerian
swa	Swahili	swe	Swedish
syr	Syriac		
tah	Tahitian	tai	Tai (Other)
tam	Tamil	tat	Tatar
tel	Telugu	tem	Time
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		
udm	Udmurt	uga	Ugaritic
uig	Uighur; Uyghur	ukr	Ukrainian
umb	Umbundu	und	Undetermined
urd	Urdu	uzb	Uzbek
vai	Vai	ven	Venda
vie	Vietnamese	vol	Volapuk
vot	Votic		
wak	Wakashan languages	wal	Walamo
war	Waray	was	Washo
wel (cym)	Welsh	wen	Sorbian languages
wln	Walloon	wol	Wolof
xal	Kalmyk; Oirat	xho	Xhosa
yao	Yao	yap	Yapese
yid	Yiddish	yor	Yoruba
ypk	Yupik languages		
zap	Zapotec	zen	Zenaga
zha	Zhuang; Chuang	zho (chi)	Chinese
znd	Zande	zul	Zulu
zun	Zuni		

3. TUNER SERVICE SETTING F2

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 / IDs
ARIB / ATSC / DVB/
Service Identification
6Byte DATA

Analogue Service 1	Analogue Broadcast Type1
	Analogue Frequency1
	Broadcast System1
Analogue Service 2	Analogue Broadcast Type2
	Analogue Frequency2
	Broadcast System2
Analogue Service 3	Analogue Broadcast Type3
	Analogue Frequency3
	Broadcast System3

Analogue Broadcast Type
Cable / Satellite / Terrestria
Analogue Frequency
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. DEVICE INFO SET F3

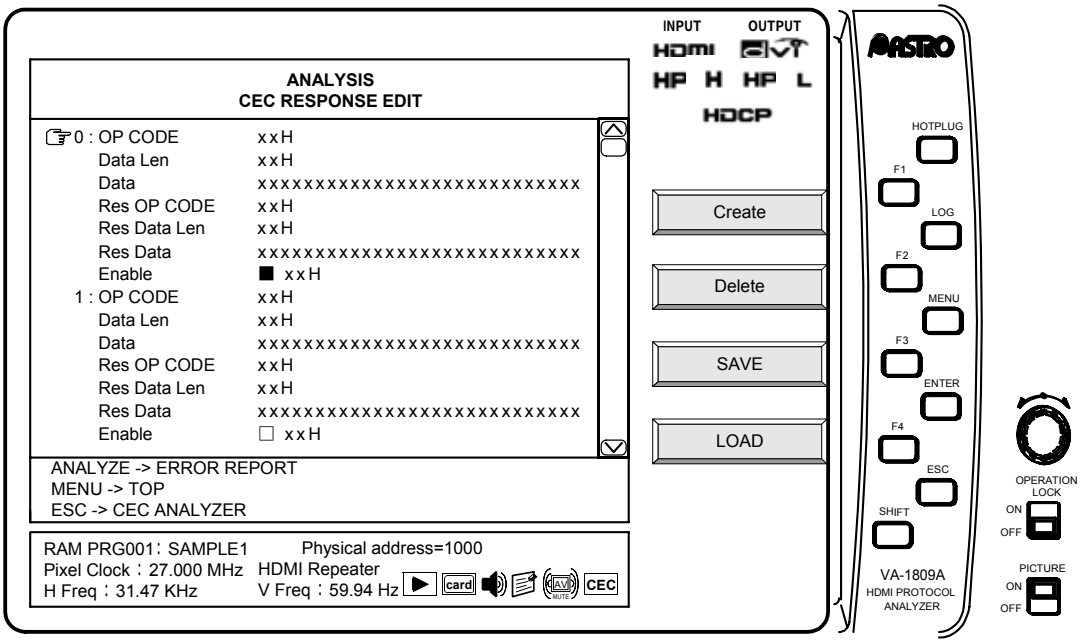
Vendor ID	3 bytes DATA
OSD NAME	ASCII max. 14 bytes
CEC Version	1.1 / 1.2 / 1.2a / 1.3 / 1.3a

5. TIMER SETTING F4

Analogue Timer Setting	Analogue Timer setting
Digital Timer Setting	Digital Timer setting
External Timer Setting	External Timer setting

Response EDIT F3

A response to the received data is set. When this setting is not performed, a response in compliance with the CEC standard is returned. By performing the settings on this screen, an exceptional response can be returned or no response can be returned.



The items which can be set are shown below.

Item	Description
OP CODE	OP CODE with which the settings take effect
Data Len	Amount of data with which the settings take effect
Data	Data with which the settings take effect
Res OP CODE	OP CODE which is returned
Res Data Len	Data amount which is returned
Res Data	Data which is returned
Enable	Whether to respond; destination to which to respond if responding

The settings take effect with OP CODE, Data Len and Data above match the data which has been received. When Enable is checked, the data as set using the above three Res items is returned.

→ F1 Create

This is used to create up to ten response setting items.

→ F2 Delete

This is used to delete the response setting items.

→ F3 SAVE

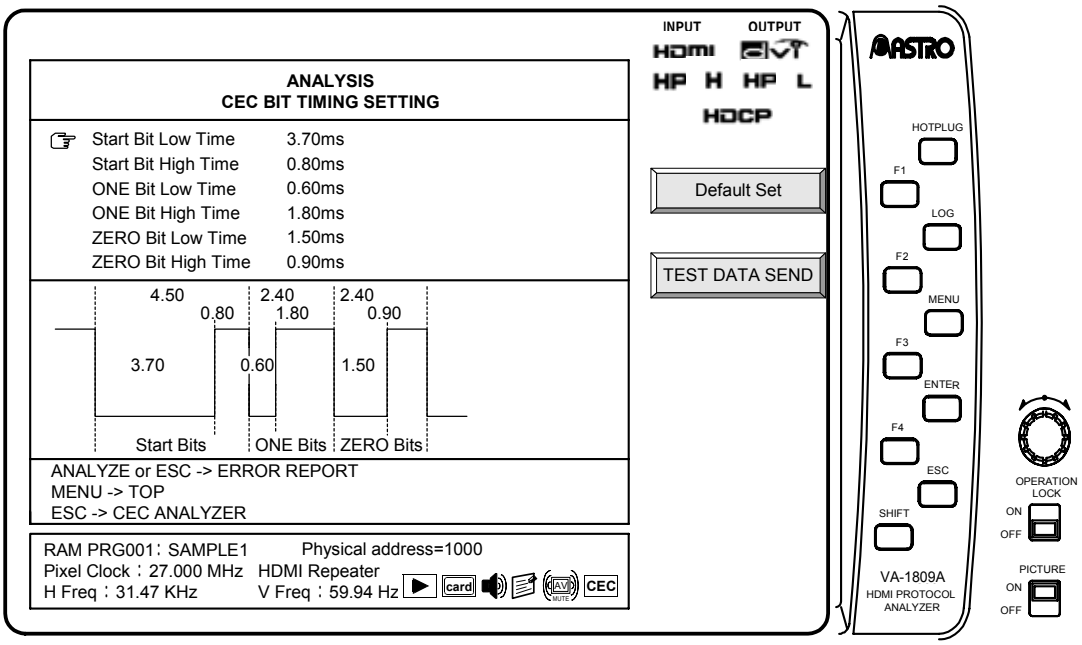
This is used to save the set data.

→ F4 LOAD

This is used to load the saved data.

Bit Timing Setting **F4** :PAGE4

The timing of each bit is set here.



The items which can be set are shown below.

Item	Description
Start Bits Low Time	Used to set the Low time of the Start Bit.
Start Bits High Time	Used to set the High time of the Start Bit.
ONE Bits Low Time	Used to set the Low time of the ONE Bits.
ONE Bits High Time	Used to set the High time of the ONE Bits.
ZERO Bits Low Time	Used to set the Low time of the ZERO Bits.
ZERO Bits High Time	Used to set the High time of the ZERO Bits.

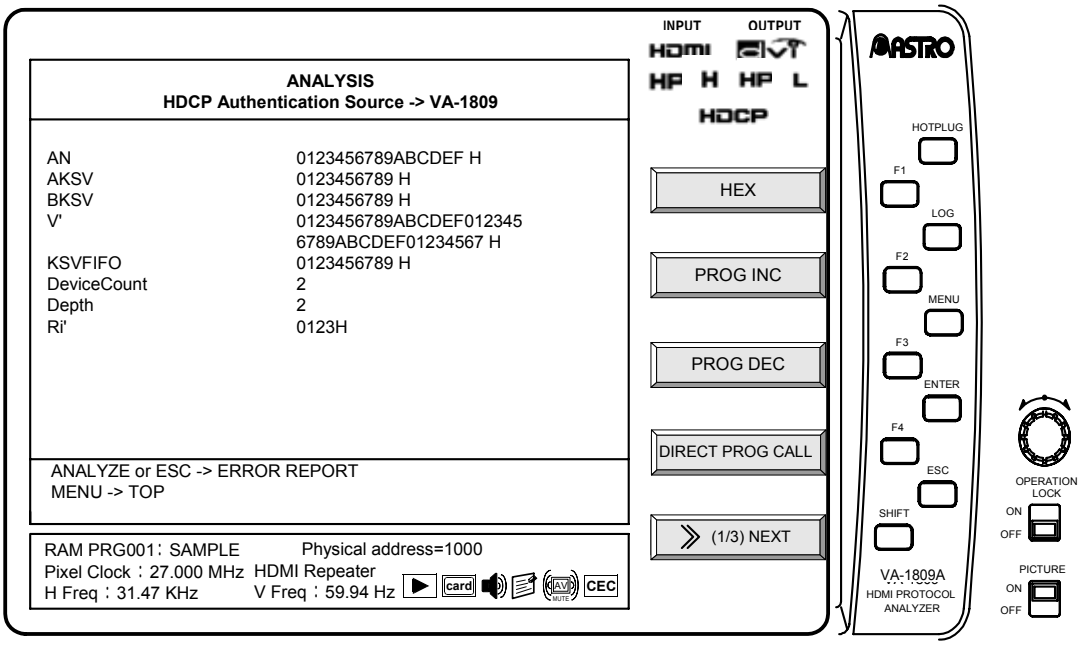
4.23 HDCP

Each constant used when authenticating HDCP on the HDMI receiving side is displayed.

4.23.1 HDCP Authentication Source -> VA-1809A

The constants which are used when HDCP is authenticated at the HDMI reception end are displayed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP.

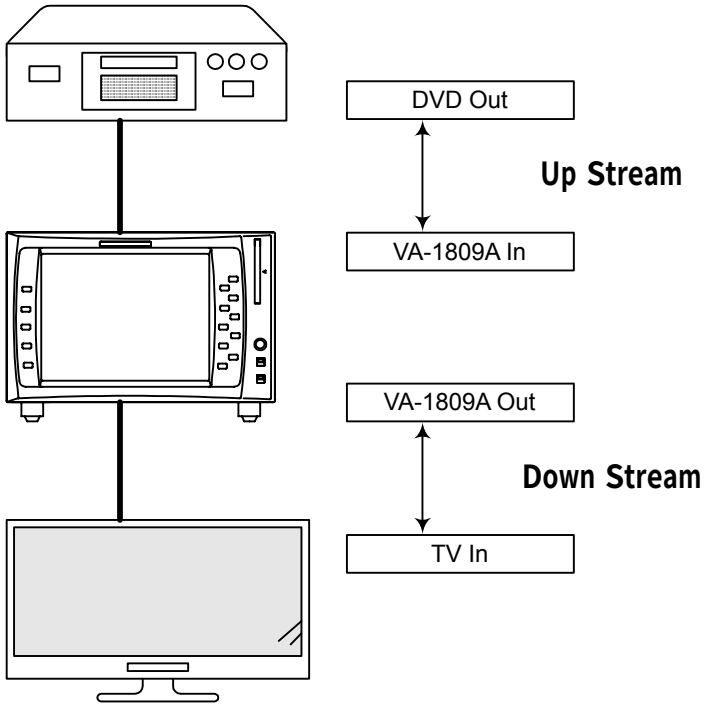


Display details of HDCP with the GUI display are listed below.

Display item	Details
AN	Pseudo random value sent from the transmitter to the VA-1809A that is used to authenticate HDCP
AKSV	Key Selection Vector on the transmitting side
BKSV	Key Selection Vector of the VA-1809A
V’	Value for determining whether the KSV list generated by the VA-1809A is valid *
KSVFIFO	Value of the KSV of the receiver/repeater connected to the downstream collected by the VA-1809A *
DeviceCount	Total number of devices connected to the downstream *
Depth	Total number of levels connected to the downstream *
Ri’	Authentication value calculated by the VA-1809A

* Displayed only for the repeater.

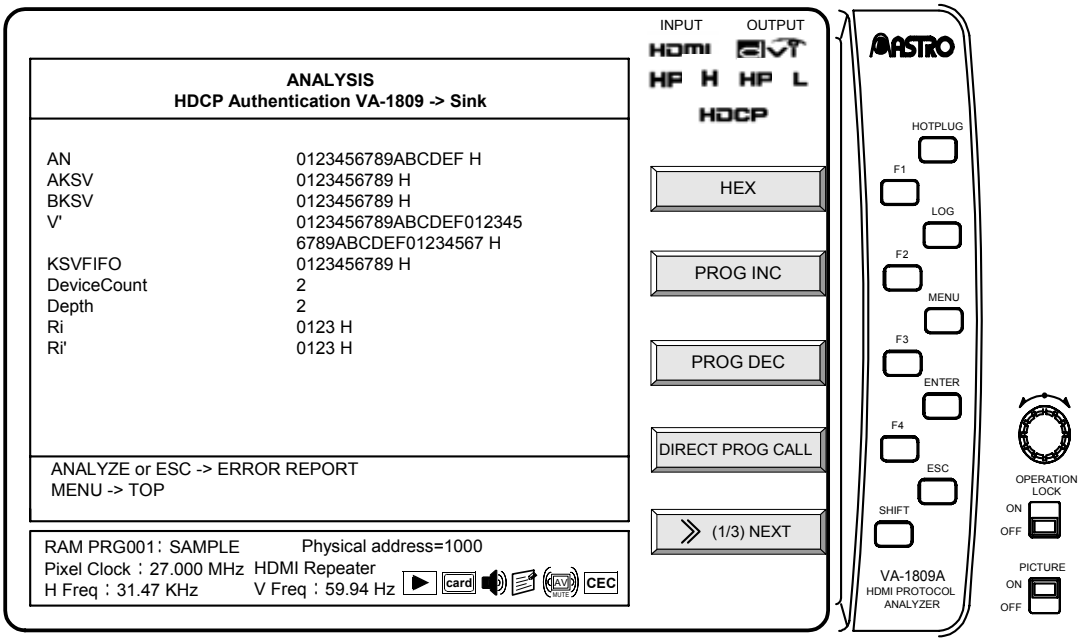
* The definitions of the upstream and downstream viewed from the VA-1809A are as follows.



4.23.2 HDCP Authentication VA-1809A -> Sink

Each constant exchanged on the downstream side can be displayed among authentications of HDCP.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Auth Sink.



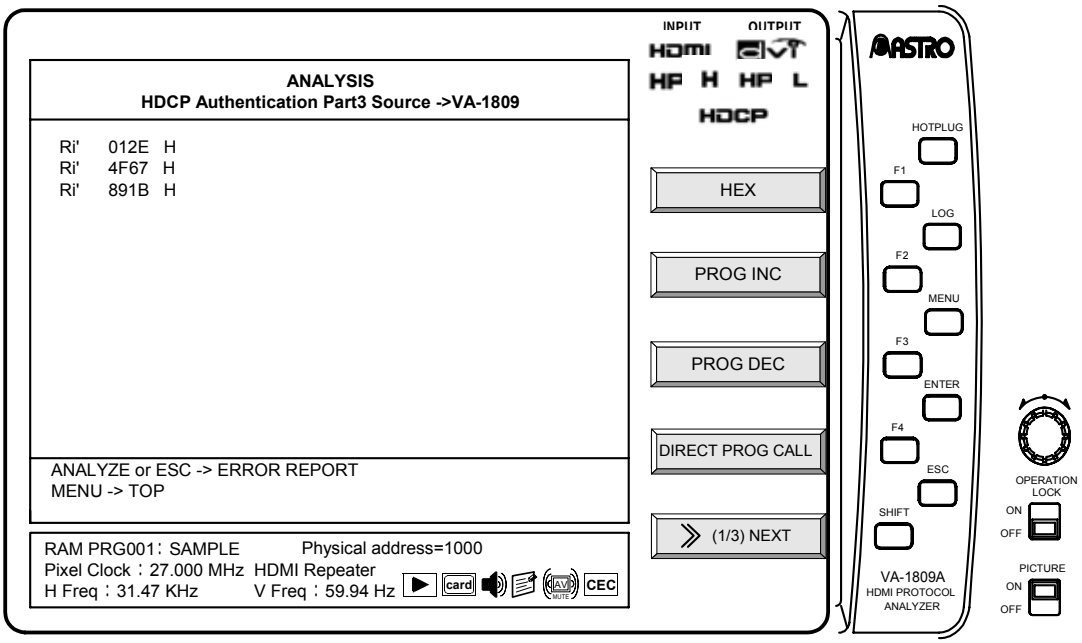
The display contents of HDCP during GUI display are as follows.

Display item	Details
AN	Pseudo random value sent from the VA-1809A to the receiver that is used to authenticate HDCP
AKSV	Key Selection Vector of the VA-1809A
BKSV	Key Selection Vector on the receiving side
V’	Value for determining whether the KSV list generated by the receiver is valid *
KSVFIFO	Value of the KSV of the receiver/repeater connected to the downstream collected by the receiver *
DeviceCount	Total number of devices connected to the downstream *
Depth	Total number of levels connected to the downstream *
Ri	Authentication value calculated by the receiver
Ri’	Authentication value calculated by the VA-1809A

4.23.3 HDCP Authentication Part 3 Source -> VA-1809A

Among authentications of HDCP, the constant (Ri') used for Part 3 (verification of whether HDCP encoding and decoding are performed correctly) is displayed consecutively on the upstream side.

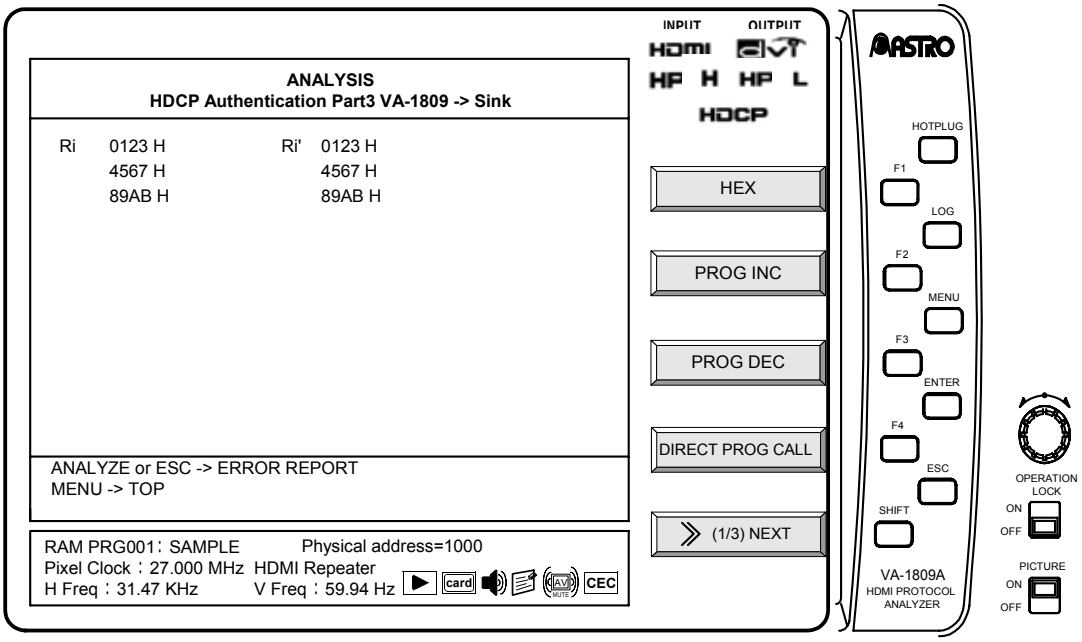
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Auth Part 3 Source.



4.23.4 HDCP Authentication Part 3 VA-1809A -> Sink

Among authentications of HDCP, the constants (Ri, Ri') used for Part 3 (verification of whether HDCP encoding and decoding are performed correctly) are displayed consecutively on the downstream side.

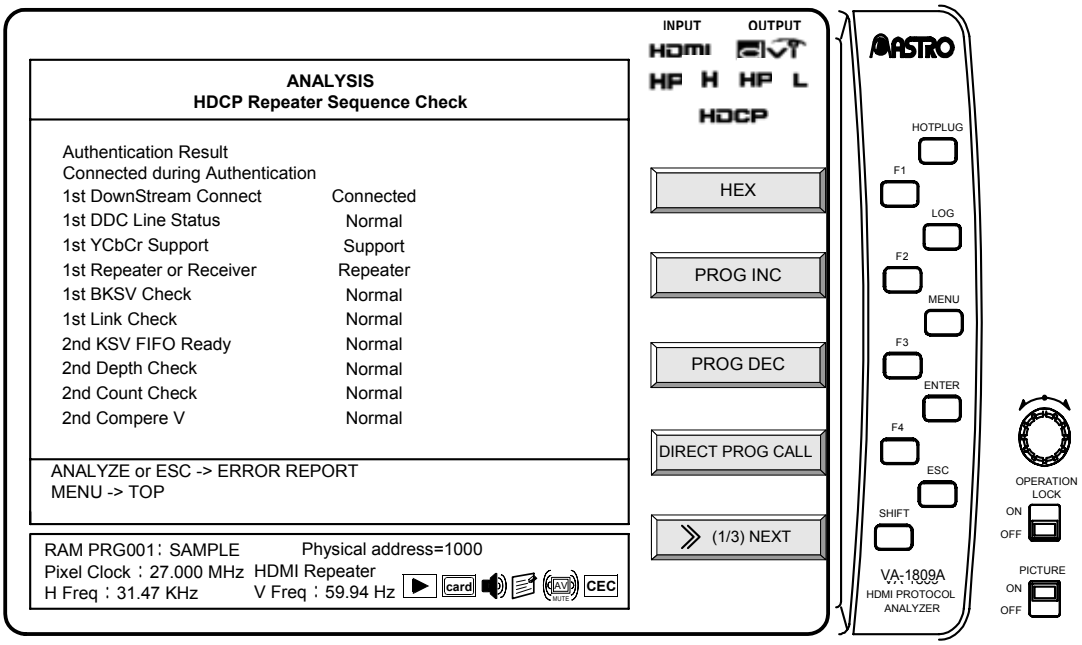
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Auth Part 3 Sink.



4.23.5 HDCP Repeater Sequence Check

The result of each authentication processing between sink devices is displayed when a repeater is set.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Repeater Sequence Check.



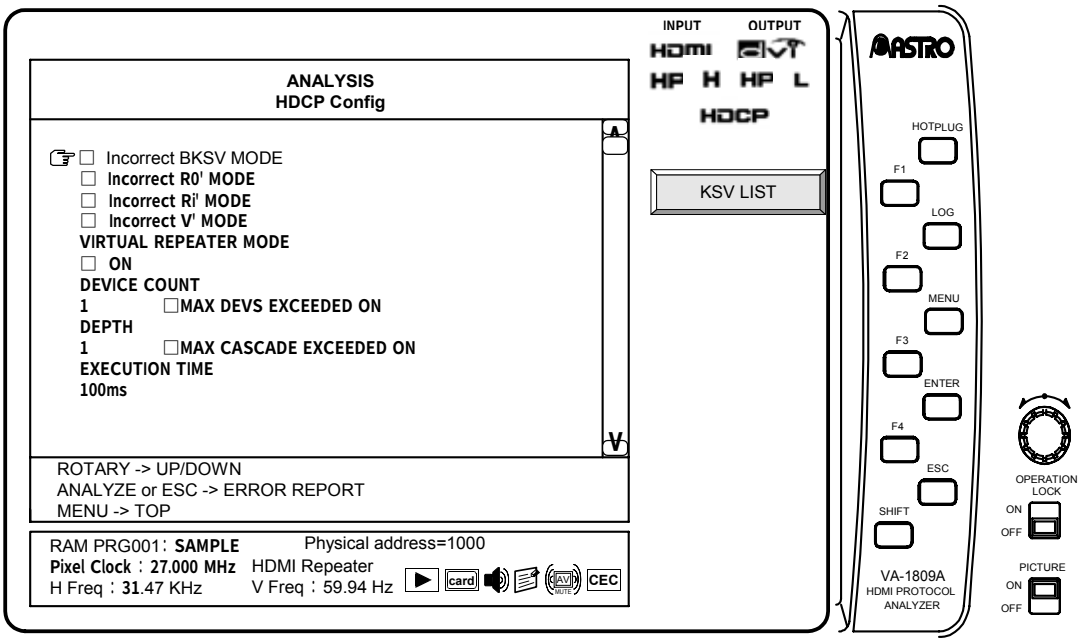
Display item	Description
1st Down Stream Connect	Check whether a sink device is connected to the VA-1809A in the 1st part of authentication processing. If connected, the message “Connected” is displayed.
1st DDC Line Status	Check the status of the DDC line with the sink device connected to the VA-1809A in the 1st part of authentication processing. If normal, the message “Normal” is displayed; if abnormal, the message “Error” is displayed.
1st YCbCr Support	Check whether the EDID of the sink device connected to the VA-1809A supports YCbCr if the signal to be input to the VA-1809A is the YCbCr signal in the 1st part of authentication processing. If supported, the message “Support” is displayed; if not supported, the message “Not Support” is displayed.
1st Repeater or Receiver	Check whether the sink device connected to the VA-1809A is a repeater or receiver in the 1st part of the authentication processing. If it is a repeater, the message “Repeater” is displayed; if it is a receiver, the message “Receiver” is displayed.
1st Link Check	Check the validity of BKSV in the 1st part of authentication processing. If normal, the message “Normal” is displayed; if abnormal, the message “Error” is displayed. (If BKSV is not comprised of twenty “1s” and twenty “0s,” it is determined abnormal.)

2nd KSV FIFO Ready	Check the KSV list load completion status of the sink device connected to the VA-1809A in the 2nd part of authentication processing. If loading is complete, the message “Normal” is displayed; if incomplete, the message “Error” is displayed.
2nd Depth Check	Check the validity of Depth loaded from the sink device connected to the VA-1809A in the 2nd part of authentication processing. If normal, the message “Normal” is displayed; if abnormal, the message “Error” is displayed. (If the Depth value exceeds MAX (7), it is determined abnormal.)
2nd Count Check	Check the validity of Count loaded from the sink device connected to the VA-1809A in the 2nd part of authentication processing. If normal, the message “Normal” is displayed; if abnormal, the message “Error” is displayed. (If the Count value exceeds MAX (127), it is determined abnormal.)
2nd Compare V	Compare V’ loaded from the sink device connected to the VA-1809A with V calculated by the VA-1809A in the 2nd part of authentication processing. If the values are the same, the message “Normal” is displayed; if different, the message “Error” is displayed.

4.23.6 HDCP Config

The HDCP-related settings are performed on this screen.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Config.



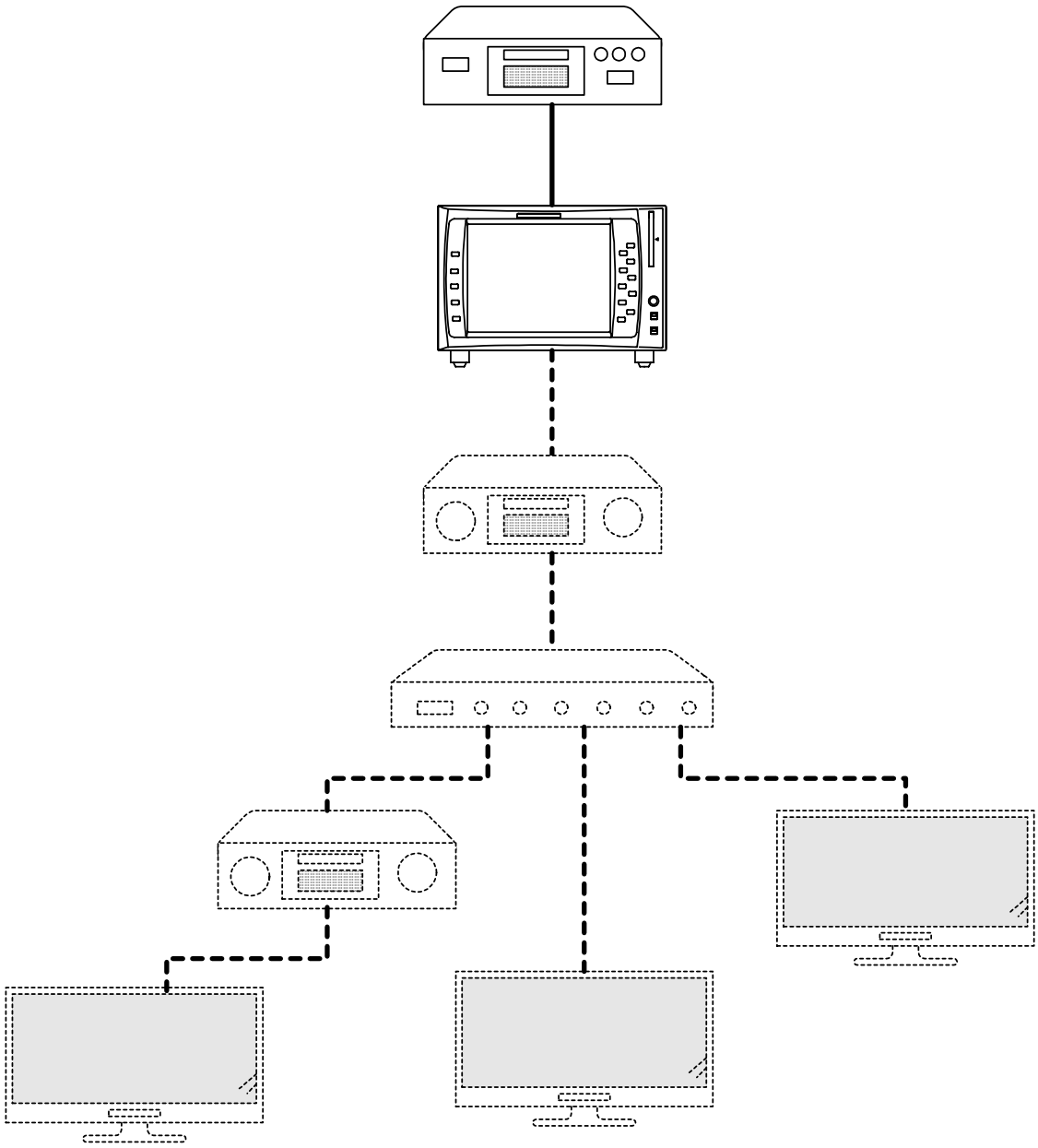
The setting items of HDCP Config are listed below.

Setting item	Description
Incorrect BKSV MODE	Set this to return that an incorrect BKSV.
Incorrect R0' MODE	Set this to return that an incorrect R0'.
Incorrect Ri' MODE	Set this to return that an incorrect Ri'.
Incorrect V' MODE	Set this to return that an incorrect V'.
Output Short Read Access On	Check R0/Ri with the output side device using Short Read Access.
VIRTUAL REPEATER MODE	When the VA-1809A operates as a repeater, the VA-1809A emulates the device which outputs signals to the VA-1809A as if the HDMI device were connected to the output side of the VA-1809A, as shown in the figure below.
DEVICE COUNT	Set the total number of devices connected to the output destination of the VA-1809A. When MAX DEVS EXCEEDED ON is set, MAX DEVS EXCEEDED is set to 1.
DEPTH	Set the number of hierarchical levels of output destination of the VA-1809A. When MAX CASCADE EXCEEDED ON is set, MAX CASCADE EXCEEDED is set to 1.
EXECUTION TIME	This is the time to be taken until KSV FIFO READY is returned after it has been recognized that HDCP started at the input side of the VA-1809A.

VIRTUAL REPEATER MODE

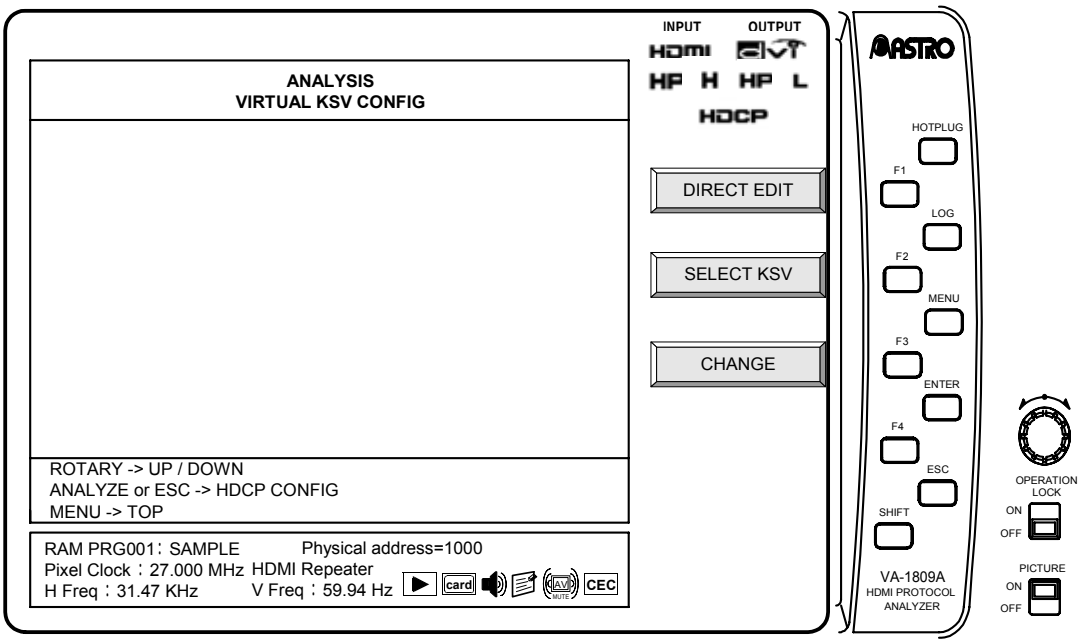
Tests using the virtual repeater mode can be performed where connection of devices to HDCP 2nd Part is simulated. In this mode, it is also possible to inspect the FIFO READY TIME OUT, MAX DEVS EXCEEDED, MAX CASCADE EXCEEDED and other non-regular connections.

VIRTUAL REPEATER MODE



KSV LIST F1

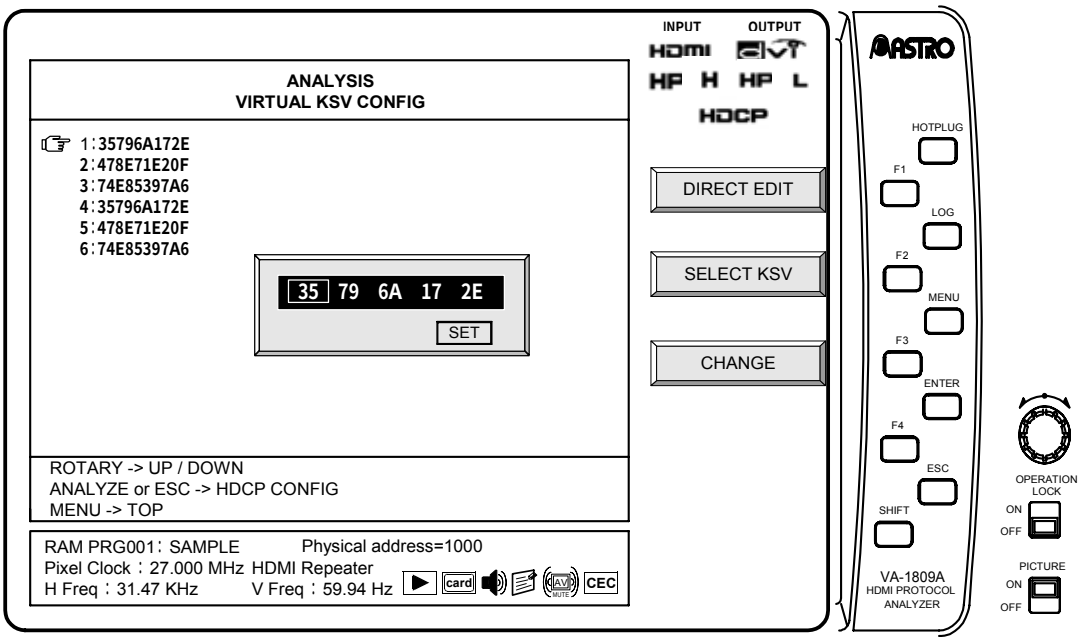
KSV of the device to be emulated can be set here for the device which outputs signals to the VA-1809A when the VA-1809A has been set to the virtual repeater mode.



DIRECT EDIT F1

This is used to edit KSV.

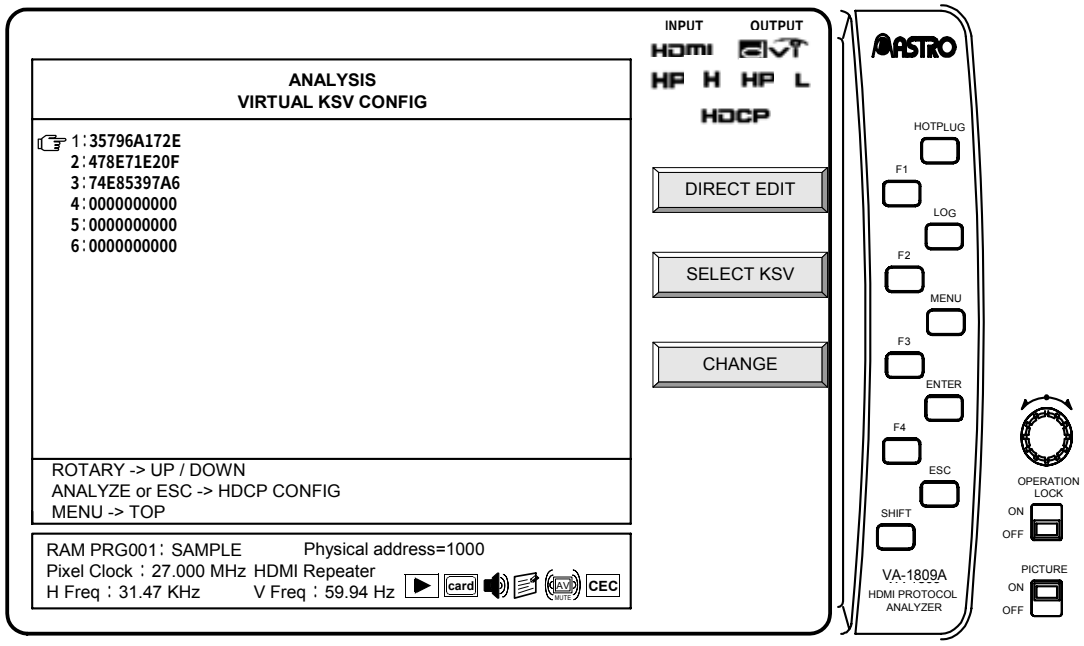
→ Press the Rotary key, and select KSV to be edited using the arrow.
→ The editing screen is displayed. →Press the Rotary key, and edit KSV.



SELECT KSV F2

This is used to switch from one KSV to another KSV which is used more frequently.

→ Press the Rotary key, and select and execute KDV to be changed using the arrow.
→ Press the Rotary key, and select the KSV from the frequently used KSV list (a list of six KSVs), and execute it.

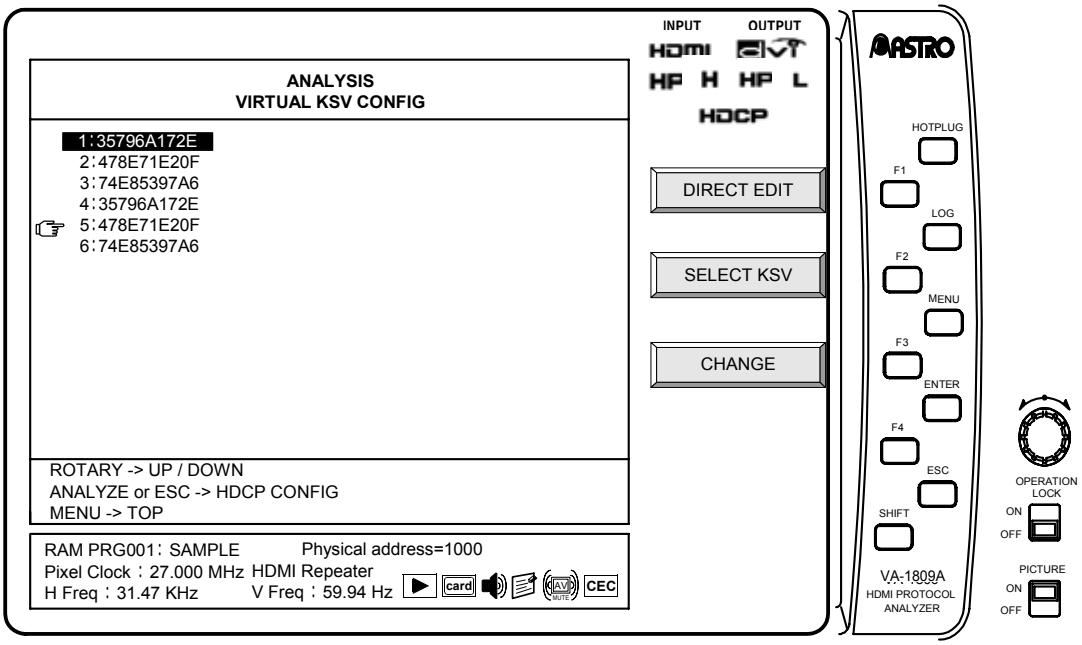


* The frequently used KSVs must be created ahead of time. They can be created using F1 EDIT in 4, 5 and 6 of SELECT KSV MODE. (Already determined values are provided in 1, 2 and 3, and these cannot be edited.)

CHANGE F3

This is used to change the KSV sequence.

→ Select F3 CHANGE.
→ Press the Rotary key, and select the KSV which is to be replaced using an arrow.
→ Press the Rotary key, and select the KSV which is to replace the current KSV using an arrow.



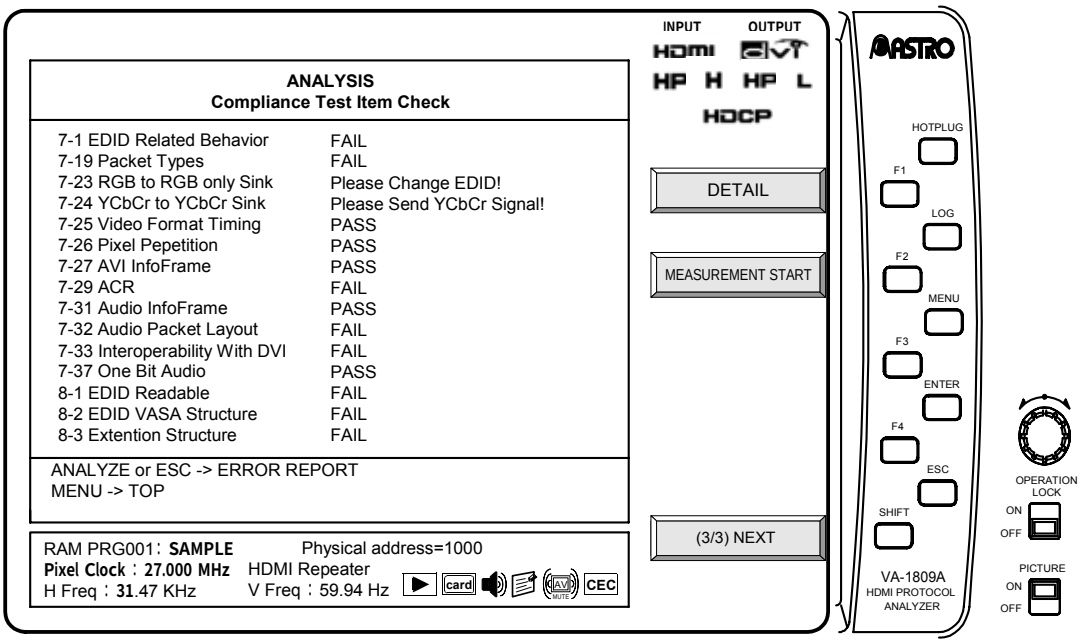
4.24 Compliance Test Item Check

The HDMI standard requires a compliance test in order to prevent troubles such as connectivity.

The VA-1809A performs part of the compliance check mainly on the source side, and can display the result for each item.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Compliance Test Item Check.
→ Execute [MEASUREMENT START] (F2 on PAGE 3) measurement.

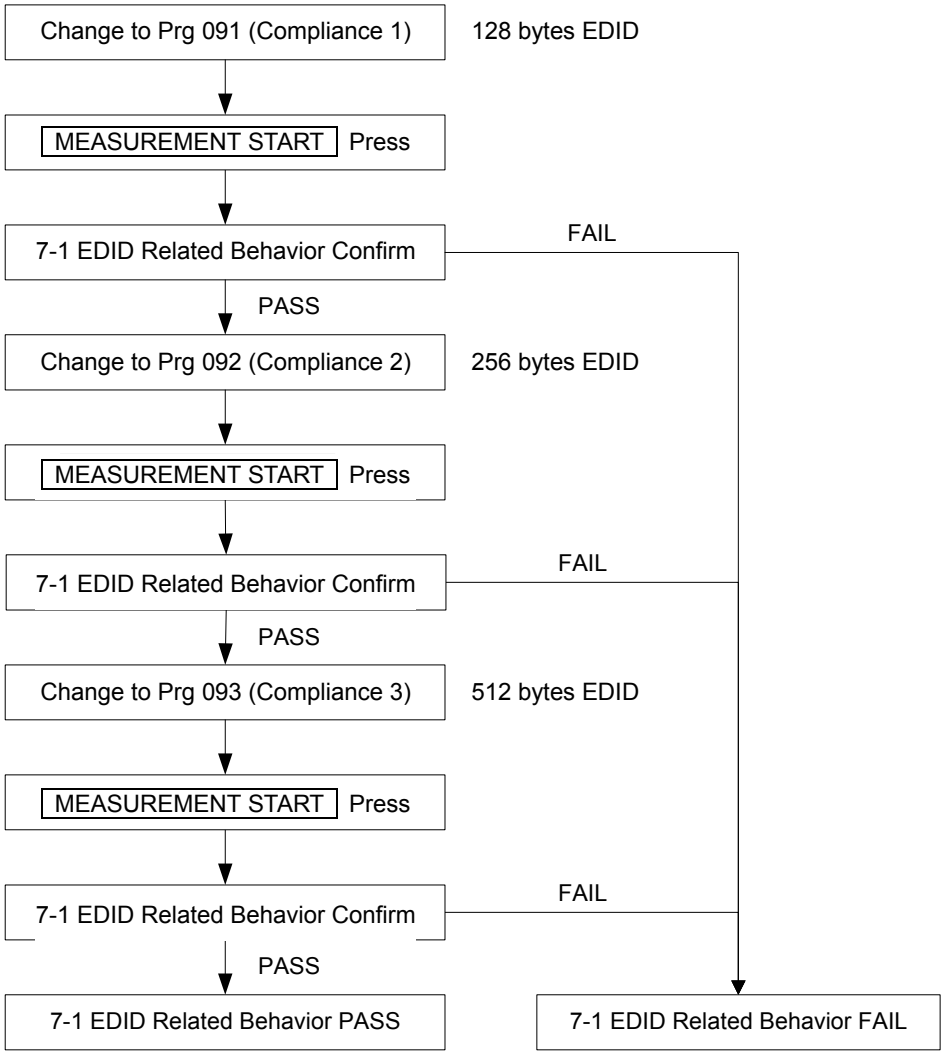
* Built-in programs 91 to 96 are compliance check programs.



All test items of Compliance Test Item Check cannot be executed simultaneously.
Compliance Test Item Check consists of the following.

■ 7-1 EDID Related Behavior

TEST ID 7-1: EDID Related Behavior is supported.
This checks whether the source device connected to the VA-1809A reads the EDID by DDC. Different sized EDID testing can be done with buit-in program PRG091, 092 and 093.
Operating procedure is shown below.

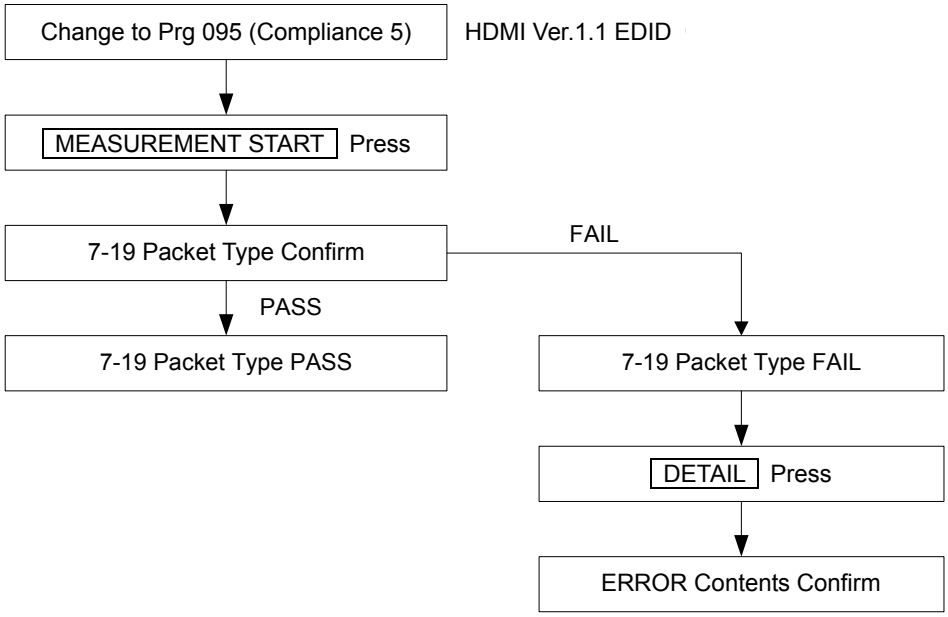


The result is shown below.

Display	Description
PASS	EDID is read correctly.
NO EDID	EDID cannot be read at all.
NO SegP	There is no Segment Pointer in the EDID whose size needs Segment pointer.
SegP SIZE OVER	Segment pointer is larger than it should be in the EDID.
Sent EDID is little	All of the EDID data can not be read.

■ 7-19 Packet Type

TEST ID 7-19: Packet Type is supported.
This checks whether the device connected to the VA-1809A correctly transmits ACP Packet, ISRC1 Packet, ISRC2 Packet, Audio Packet and Channel Status Bit.
Operating procedure is shown below.



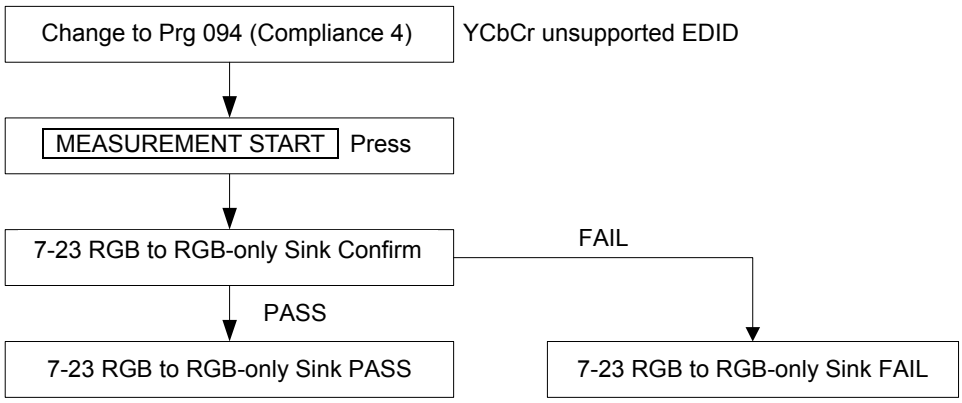
The result is shown below.

Display	Description
PASS	The contents of transmission data of ACP, ISRC1 Packet or ISRC2 Packet support the standard.
FAIL	The contents of transmission data of ACP, ISRC1 Packet or ISRC2 Packet do not support the standard.

* By pressing DETAIL, detailed information (which of ACP, ISRC1 or ISRC2 has problem) can be viewed.

■ 7-23 RGB to RGB-only Sink

TEST ID 7-23: Pixel Encoding RGB to RGB-only Sink is supported.
This checks that the source device connected to the VA-1809A does not output YCbCr signals to devices that can only receive RGB signals.
To check this item, the EDID of the program currently set in the VA-1809A must be set to “receive only RGB.”
Operating procedure is shown below.

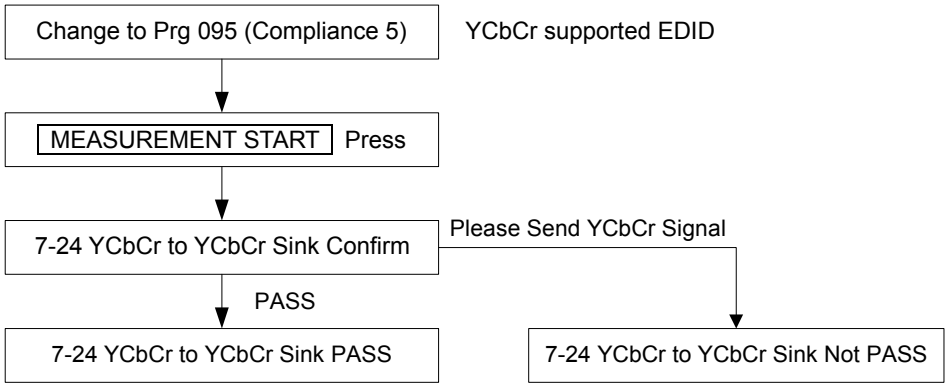


The result is shown below.

Display	Description
PASS	Video is out put in RGB color space signal.
FAIL	Video is output in YCbCr color space signal.
Please Change EDID!	Set EDID to “receive only RGB.”

■ 7-24 YCbCr to YCbCr Sink

TEST ID 7-23:Pixel Encoding YCbCr to YCbCr Sink is supported.
This checks that the source device connected to the VA-1809A outputs YCbCr signals to devices that can receive YCbCr signals.
To check this item, the EDID of the current program in the VA-1809A must be set to "receive YCbCr."
Operating procedure is shown below.

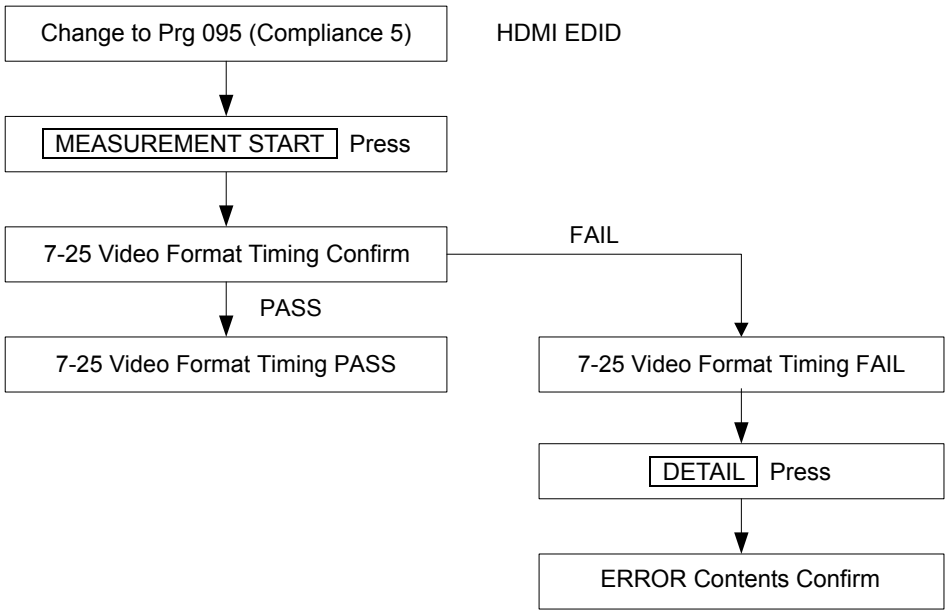


The result is shown below.

Display	Description
PASS	Video is out put in YCbCr color space signal.
Please Send YCbCr Signal!	Video is output in RGB color space signal. Change setting to output video in YCbCr color space.
Please Change EDID!	Set EDID to "receive only YCbCr."

■ 7-25 Video Format Timing

TEST ID 7-25: Video Format Timing is supported.
This checks whether signals are output from the source device connected to the VA-1809A in correct format.



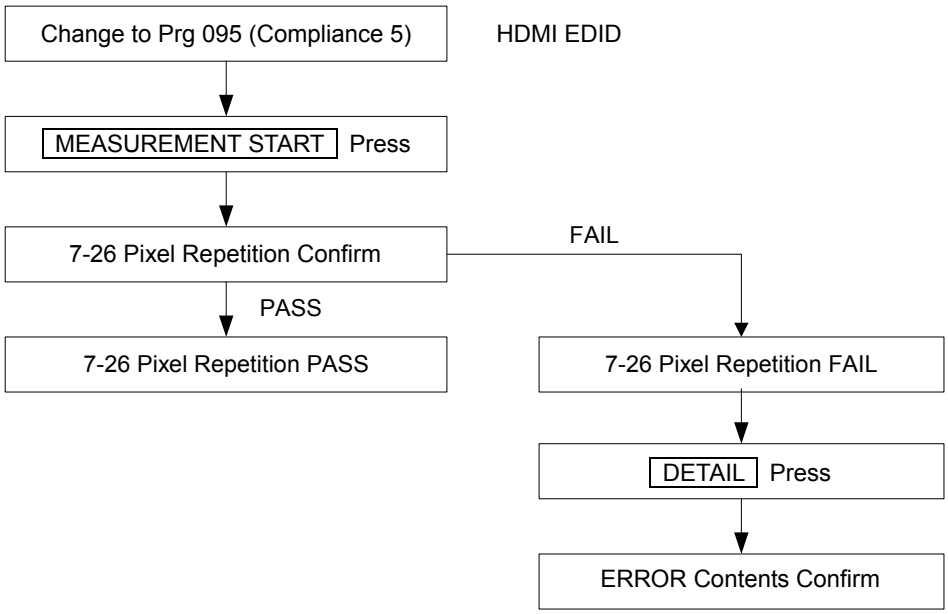
The result is shown below.

Display	Description
PASS	Video code of AVI InfoFrame and transmitting video timing are matched.
FAIL	Video code of AVI InfoFrame and transmitting video timing are not matched.

* By pressing DETAIL → Rotary Key Video Timing, detailed information can be confirmed.

■ 7-26 Pixel Repetition

TEST ID 7-26: Pixel Repetition is supported.
This checks whether the Pixel Repetition signal output from the source device connected to the VA-1809A is correctly reflected in AVI InfoFrame.



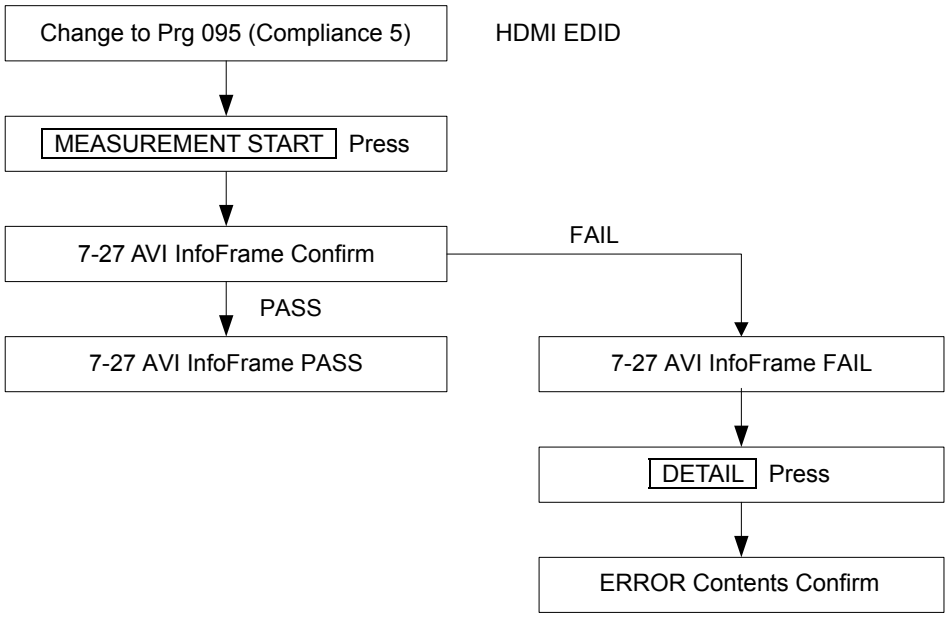
The result is shown below.

Display	Description
PASS	Repetition of AVI InfoFrame and repetition of transmitting video data are matched.
FAIL	Repetition of AVI InfoFrame and repetition of transmitting video data are not matched.

* By pressing DETAIL → Rotary Key AVI InfoFrame, detailed information can be confirmed.

■ 7-27 AVI InfoFrame

TEST ID 7-27: AVI InfoFrame is supported.
This checks the content of AVI InfoFrame sent from the source device connected to the VA-1809A.



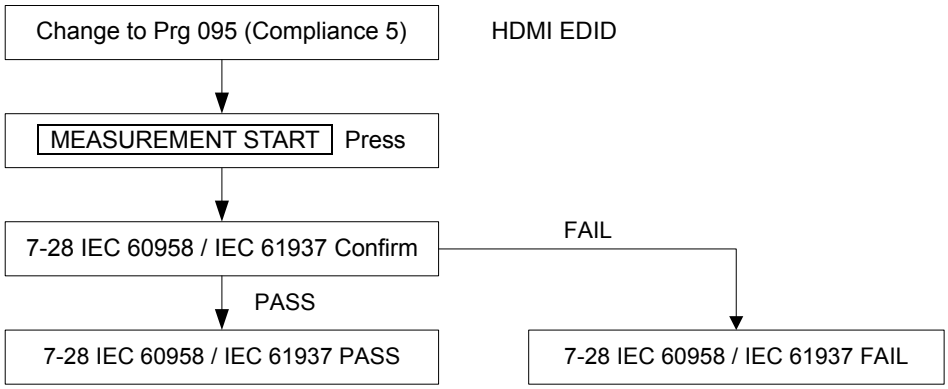
The result is shown below.

Display	Description
PASS	The contets of transmission data of AVI InfoFrame support the standard.
FAIL	The contets of transmission data of AVI InfoFrame do not support the standard.

* By pressing DETAIL → Rotary Key AVI InfoFrame, detailed information can be confirmed.

■ 7-28 IEC 60958 / IEC 61937

TEST ID 7-28:IEC 60958/IEC 61937 is supported.
This checks whether the audio data which is sent from the source device connected to the VA-1809A complies with the standard.



The result is shown below.

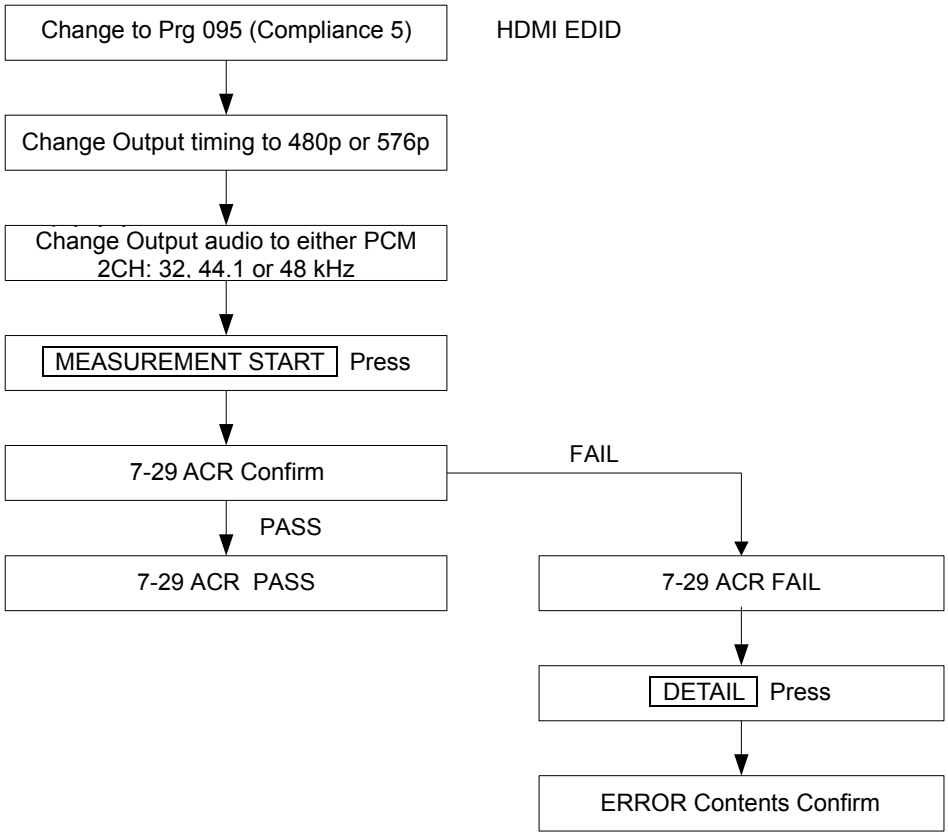
Display	Description
PASS	The audio data complies with the standard.
FAIL	The audio data does not comply with the standard.

* When conducting inspections using HBR Audio, set EDID to Prg 001 (Sample 1).

■ 7-29 ACR

TEST ID 7-29: ACR is supported.
This checks the ACR Packet sent from the source device connected to the VA-1809A. If normal, “PASS” is displayed; if abnormal, “FAIL” is displayed.

* Because it takes time to detect sound, “FAIL” is displayed for a while after image recognition.



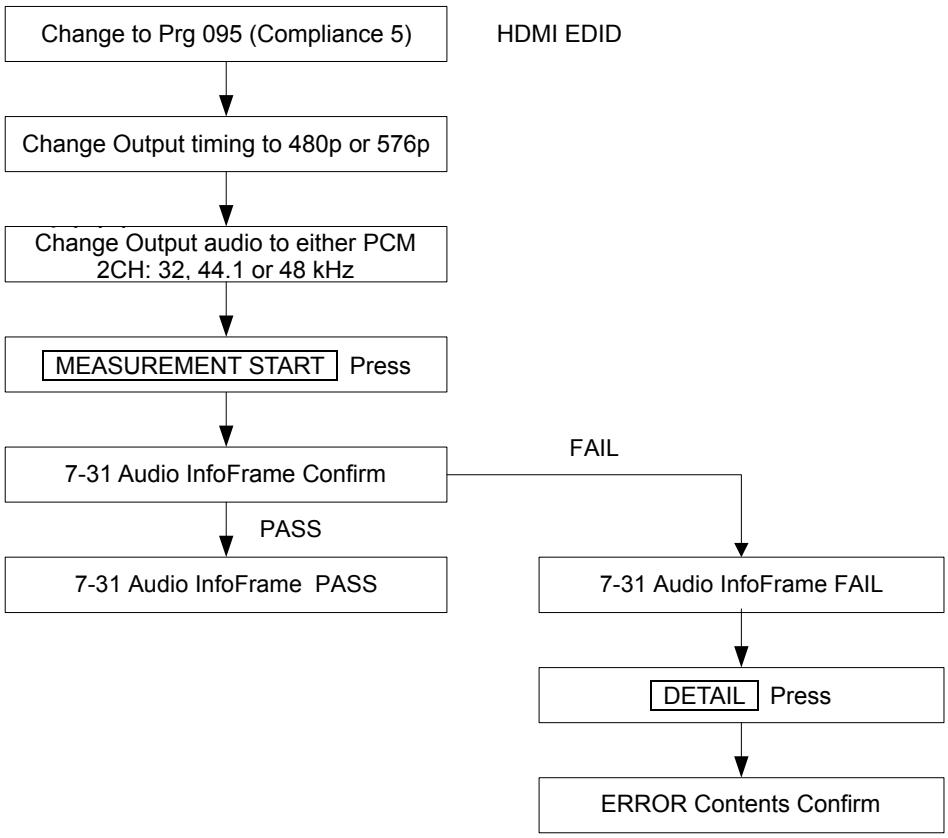
The result is shown below.

Display	Description
PASS	The value of N and CTS in ACR Packet supports the standard.
FAIL	The value of N and CTS in ACR Packet does not support the standard.
Please Change Sampling frequency!	The frequency is input other than 32, 44.1 or 48 kHz. Change input frequency to either 32, 44.1 or 48 kHz.
Please Change Video Timing!	The timing is input other than 480p or 576p. Change input timing to either 480p or 576p.
Please Change Audio Type!	Audio is not input as PCM. Change input audio to PCM.
Please Change Channel Count!	Number of channels is not set as 2CH. Change to 2CH setting.

* By pressing [DETAIL] → [Rotary Key] Audio Timing, detailed information can be confirmed.

■ 7-31 Audio InfoFrame

TEST ID 7-31: Audio InfoFrame is supported.
This checks Audio InfoFrame sent from the source device connected to the VA-1809A. If normal, “PASS” is displayed; if abnormal, “FAIL” is displayed.
(In the case of “FAIL,” detailed information can be viewed by pressing the DETAIL key.)



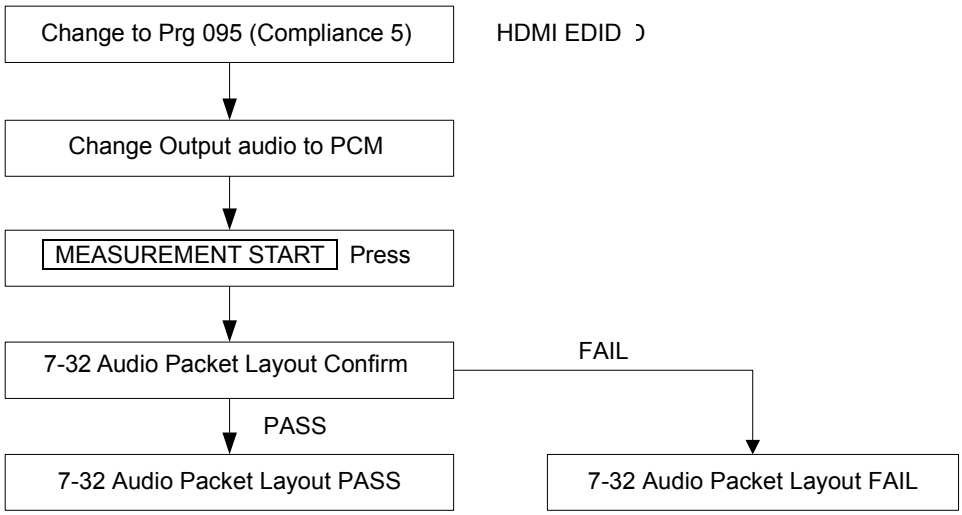
The result is shown below.

Display	Description
PASS	Contents of transmission data of Audio InfoFrame supports the standard.
FAIL	Contents of transmission data of Audio InfoFrame does not support the standard.
Please Change Sampling frequency!	The frequency is input other than 32, 44.1 or 48 kHz. Change input frequency to either 32, 44.1 or 48 kHz.
Please Change Video Timing!	The timing is input other than 480p or 576p. Change input timing to either 480p or 576p.
Please Change Audio Type!	Audio is not input as PCM. Change input audio to PCM.
Please Change Channel Count!	Number of channels is not set as 2CH. Change to 2CH setting.

* By pressing DETAIL → Rotary Key Audio Timing, detailed information can be confirmed.

■ 7-32 Audio Packet Layout

TEST ID 7-32: Audio Sample Packet Layout is supported.
This checks Audio Sample Packet Layout sent from the source device connected to the VA-1809A. If normal, “PASS” is displayed; if abnormal, “FAIL” is displayed.

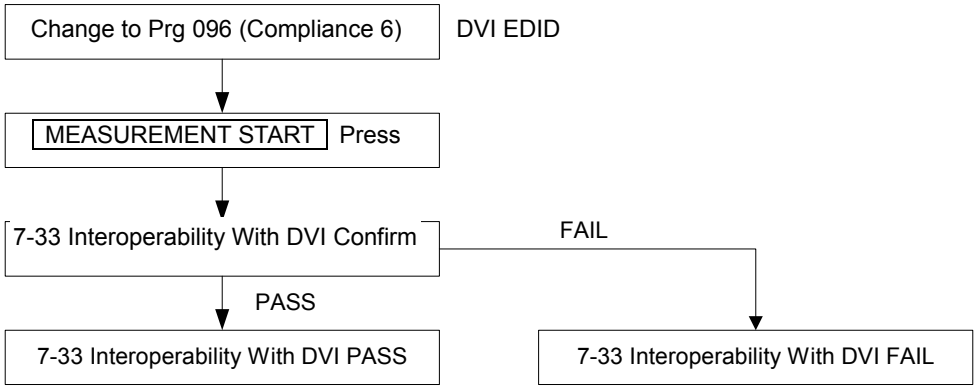


The result is shown below.

Display	Description
PASS	Audio Packet Layout bit and Channel Count & Channel Allocation of Audio InfoFrame are matched.
FAIL	Audio Packet Layout bit and Channel Count & Channel Allocation of Audio InfoFrame are not matched.
Please Change Audio Type!	Audio is not input as PCM. Change input audio to PCM.

■ 7-33 Interoperability With DVI

TEST ID 7-33: Interoperability With DVI is supported.
This checks that the source device connected to the VA-1809A does not output HDMI signals to a DVI dedicated device. To perform this check, the EDID setting of the current program in the VA-1809A must be set to “HDMI unsupported.” In the case of DVI input, “PASS” is displayed; in the case of HDMI input, “FAIL” is displayed.



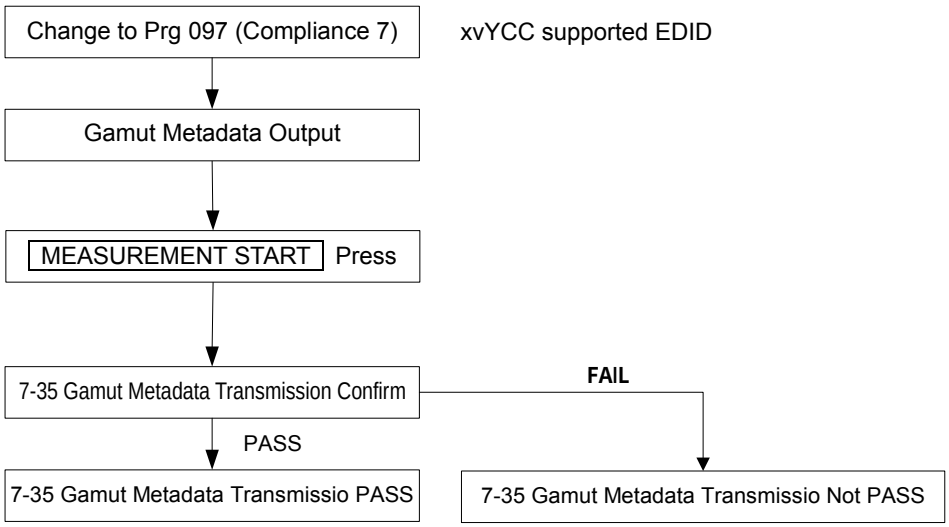
The result is shown below.

Display	Description
PASS	Outputs DVI signal to the unit whose EDID is set as DVI.
FAIL	Outputs HDMI signal to the unit whose EDID is set as DVI.

* If the EDID is set to “HDMI supported,” “PASS” is displayed.

■ 7-35 Gamut Metadata Transmission

TEST ID 7-37:Gamut Metadata Transmission is supported.
This checks the Gamut Metadata which is sent from the source device connected to the VA-1809A. If normal, “PASS” is displayed; if abnormal, “FAIL” is displayed.

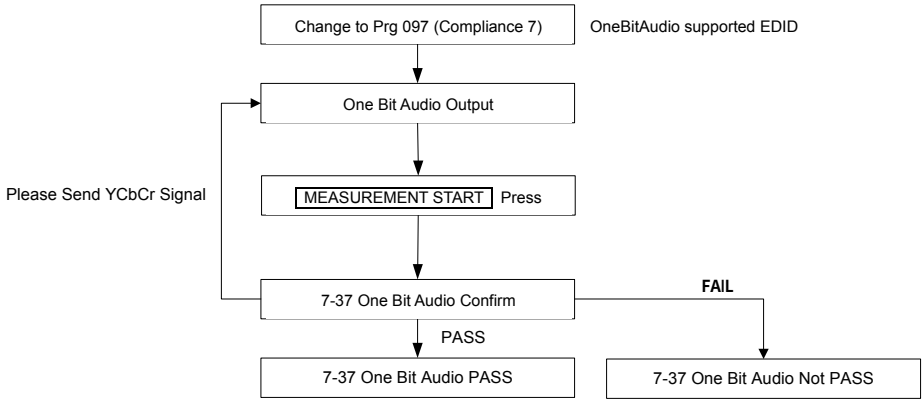


The result is shown below.

Display	Description
PASS	The Gamut Metadata and AVI InfoFrame information match.
FAIL	There is an error in the Gamut Metadata vis-a-vis the AVI InfoFrame.

■ 7-37 One Bit Audio

TEST ID 7-37:One Bit Audio is supported.
This checks the One Bit Audio which is sent from the source device connected to the VA-1809A. If normal, “PASS” is displayed; if abnormal, “FAIL” is displayed.

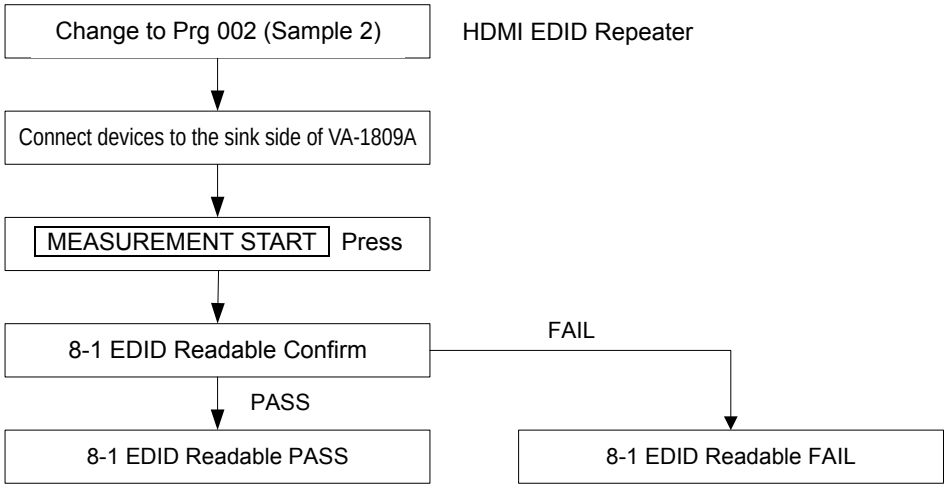


The result is shown below.

Display	Description
PASS	The Layout bit in the Audio Packet and the Channel Count and Channel Allocation in Audio InfoFrame match.
FAIL	There is an error in the audio data of One Bit Audio or the packet.
Please Change One Bit Audio	Audio data other than One Bit Audio is input. Change to One Bit Audio.

■ 8-1 EDID Readable

TEST ID 8-1: EDID Readable is supported.
This reads the EDID of the sink device connected to the VA-1809A, and checks the structure. If no sink device is connected, "----" is displayed.



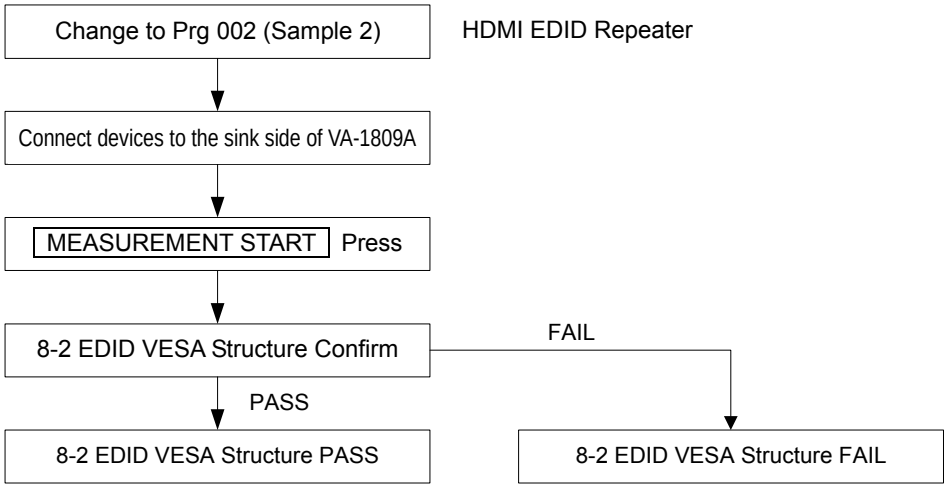
The result is shown below.

Display	Description
PASS	EDID structure of connecting device is set correctly.
FAIL	EDID structure of connecting device is not set correctly.

* Refer to "7.1.15 Compliance Test Item Check" (p.261) for details of Compliance Test.

■ 8-2 EDID VESA Structure

TEST ID 8-2: EDID VESA Structure is supported.
This reads the EDID of the sink device connected to the VA-1809A, and checks whether the structure is as defined by VESA. If no sink device is connected, "----" is displayed.



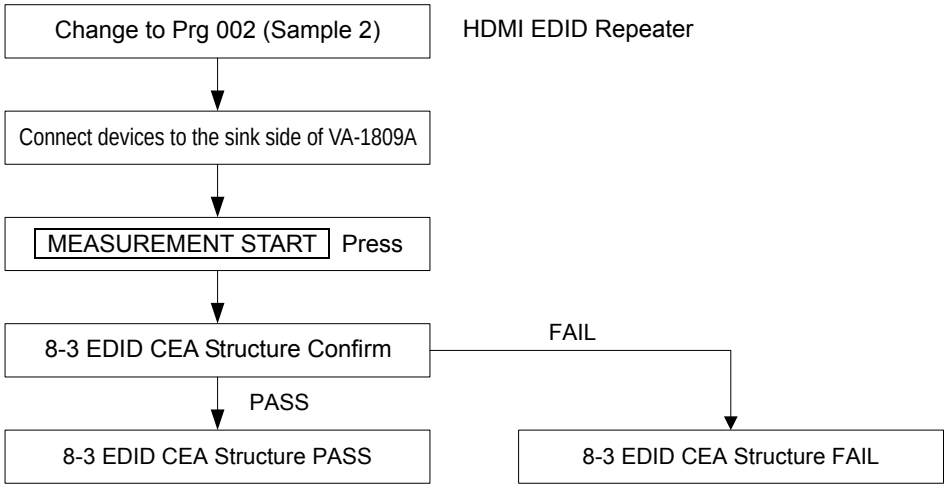
The result is shown below.

Display	Description
PASS	EDID structure of connecting device is set as VESA's standard
FAIL	EDID structure of connecting device is not set as VESA's standard

* Refer to "7.1.15 Compliance Test Item Check" (p.261) for details of Compliance Test.

■ 8-3 EDID CEA Structure

TEST ID 8-3: CEA Timing Extension Structure is supported.
This reads the EDID of the sink device connected to the VA-1809A, and checks whether the structure is as defined by CEA. If no sink device is connected, "----" is displayed.



The result is shown below.

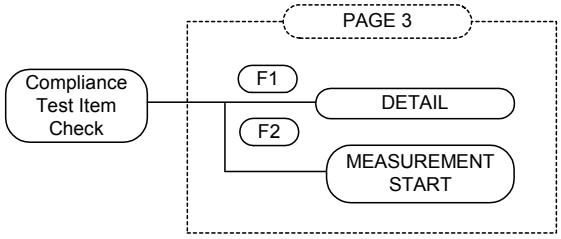
Display	Description
PASS	EDID structure of connecting device is set as CEA's standard
FAIL	EDID structure of connecting device is not set as CEA's standard

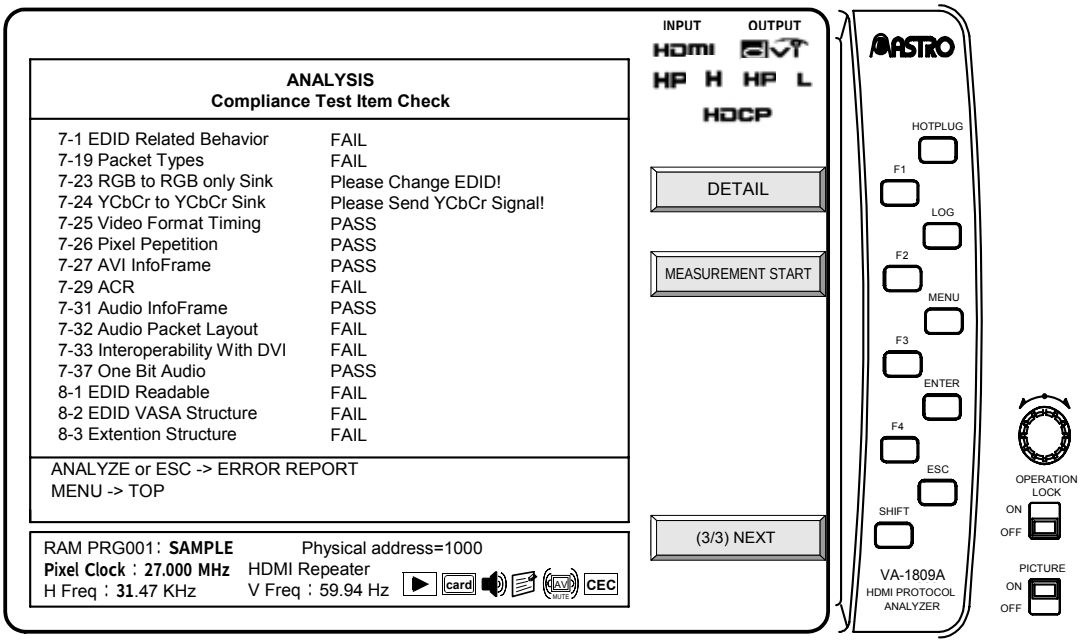
* Refer to "7.1.15 Compliance Test Item Check" (p.261) for details of Compliance Test.

■ Functions keys dedicated to Compliance Test Item Check

Page 3 contains the function keys dedicated to Compliance Test Item Check.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select Compliance Test Item Check.
→ Press [SHIFT] twice Page 3





DETAIL [F1]

This function key allows the viewing of detailed information of abnormal “FAIL” items.
By selecting and executing items for which you want to view detailed information with the [Rotary Key], you can jump to the corresponding detail screen.

The applicable items are as follows:
• 7-19 Packet Type
• 7-25 Video Format Timing
• 7-27 Audio InfoFrame
• 7-29 ACR
• 7-31 Audio InfoFrame

MEASUREMENT START [F2]

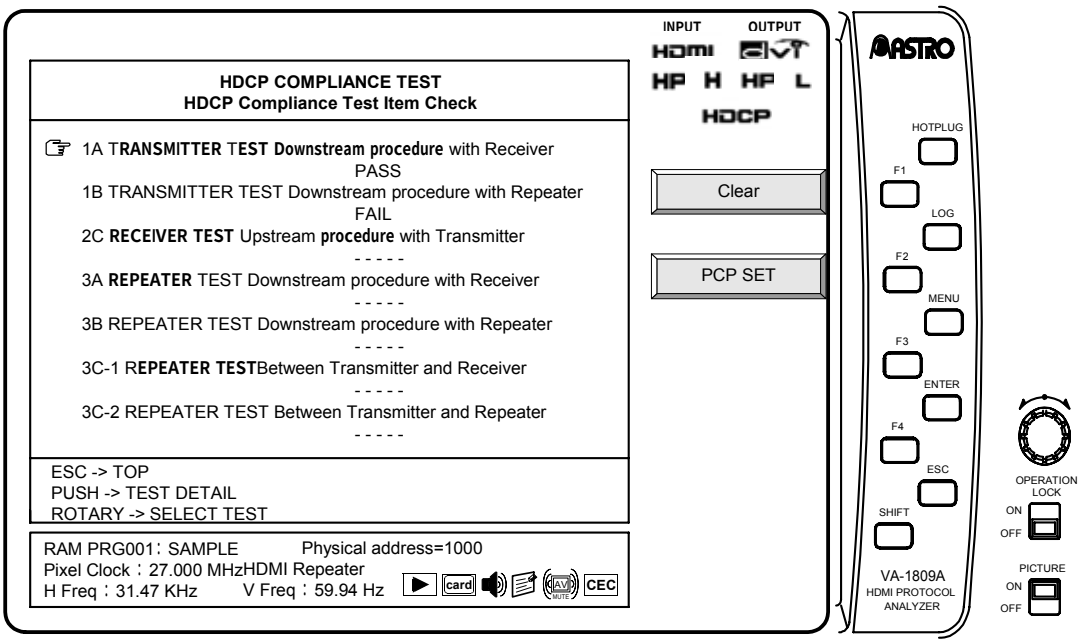
This function key starts the measurement of each check item.

4.25 HDCP Compliance Test Item Check

Under the HDMI standard, starting with Version 1.3 it is mandatory to conduct the compliance test in order to prevent connectivity trouble because of the HDCP, for example. With this item of the VA-1809A, an HDCP pre-compliance test can be conducted.

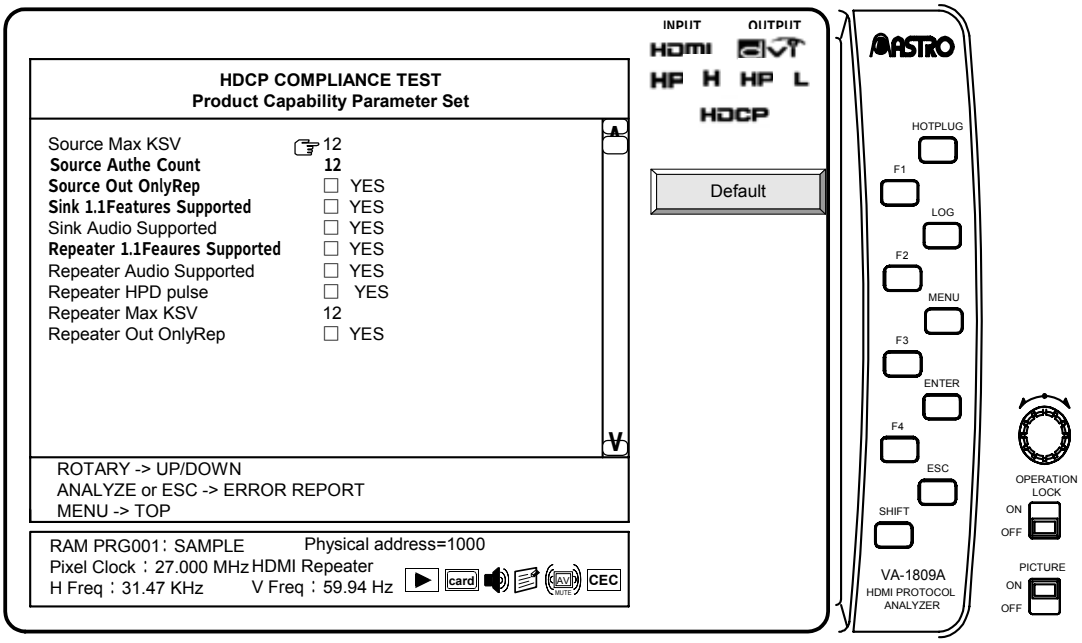
Furthermore, the items to be tested can be selected when the specifications of the device under test have been set in PCP (Product Capability Parameter) ahead of time.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select HDCP Compliance Test Item Check.



(1) PCP setting

Set the specifications of the device under test in PCP (Product Capability Parameter). The setting screen is shown below.



The setting items are listed below.

Item	Description
Source Max KSV	Used to set the maximum value of the KSV list supported by the device under test.
Source Authe Count	Used to set the number of times authentication can be attempted by the device under test.
Source Out OnlyRep	Used to set whether the device under test is to support a repeater which has nothing downstream of it.
Sink 1.1 Features Supported	Used to set whether the device under test is to support 1.1 Features.
Repeater 1.1 Feaures Supported	Used to set whether the device under test is to support 1.1 Features.
Repeater Audio Supported	Used to set whether the device under test is to support Audio.
Repeater HPD pulse	Used to set whether the device under test is capable of outputting HPD pulses manually.
Repeater Max KSV	Used to set the maximum value of the KSV list supported by the device under test.
Repeater Out OnlyRep	Used to set whether the device under test is to support a repeater which has nothing downstream of it.

(3) Test details

The HDCP Compliance Test Item Check procedure carried out by the VA-1809A is described below.

* "DUT" stands for device under test, and "TE" is the VA-1809A (analyzer).
* In the test for determining the encryption status, the status may not be determined correctly while AV MUTE is applied.
* Both warnings and errors are possible results if what is specified in the pass operation column is not satisfied.

Item		Test procedure	Pass operation
1A - 1 Regular procedure: With HDMI-capable Receiver			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
	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 DUT.	The OK button must be pressed after checking that the images are displayed properly on the DUT.

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

Item		Test procedure	Pass operation
1A - 2 Regular procedure: HPD after writing Aksv			
	Connect the DUT output to TE, and perform the test.		
	TP01	TE asserts HPD.	
		Check that Aksv is written.	Aksv must be written.
		TE de-asserts HPD.	
		Check that Authentication is not started.	Authentication must not be started.
		TE asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	The DUT must disable the HDCP Encryption within 10 seconds.
		Check that the DUT proceeds with re-authentication.	

Item		Test procedure	Pass operation
1A - 3 Regular procedure: HPD after starting third part of authentication			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
		TE de-asserts HPD.	
		Check that Authentication is not started.	Authentication must not be started.
		TE asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	The DUT must disable the HDCP Encryption within 10 seconds.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1A - 4 Irregular procedure: HDCP port access			
	Connect the DUT output to TE, and perform the test.		
		In the TE, set so that EDID can be read, and set the HDCP port to the access disabled status.	
	TP01	TE asserts HPD.	
		Check that the DUT tries to access the TE.	The DUT must try to access the TE.
		Check that access is tried 4 seconds after the first access.	Access must be tried 4 seconds after the first access.

Item		Test procedure	Pass operation
1A - 5 Irregular procedure: Verify Bksv			
	Connect the DUT output to TE, and perform the test.		
		Set an illegal Bksv in TE (all 0's).	
	TP01	TE asserts HPD.	
		Check that the DUT reads Bksv.	The DUT must read Bksv.
		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		Test procedure	Pass operation
1A - 6 Irregular procedure: Verify R0'			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
		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		Test procedure	Pass operation
1A - 7 Irregular procedure: Verify Ri’			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
	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.
		Set an illegal Ri’ in the TE.	
	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.
		Check that the DUT does not continue to keep HDCP Encryption after it has read the illegal Ri’.	The DUT must not continue to keep HDCP Encryption for at more than seconds after it has read the illegal Ri’.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1A - 9 Regular procedure: With DVI Receiver			
	Connect the DUT output to TE, and perform the test.		
		Set TE to DVI.	
	TP01	TE asserts HPD.	
		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 TE.	The OK button must be pressed after checking that the images are displayed properly on the TE.
		Check that the DUT sends signals in the DVI Mode.	The DUT must send signals in the DVI Mode.

Item		Test procedure	Pass operation
1B - 1 Regular procedure: With Repeater			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
	T203	Case 1: 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.

Item		Test procedure	Pass operation
1B - 2 Regular procedure: HPD after reading R0’			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
		TE de-asserts HPD.	
		Check that Authentication is not started.	Authentication must not be started.
		TE asserts HPD.	
		Check that the DUT does not continue to keep the HDCP Encryption.	The DUT must disable the HDCP Encryption within 10 seconds.
		Check that the DUT proceeds with re-authentication.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1B - 3 Irregular procedure: Timeout of KSV list READY			
	Connect the DUT output to TE, and perform the test.		
	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.	
	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 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.
		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 re-authentication is conducted 5 seconds after R0’ has been read.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1B - 4 Irregular procedure: Verify V’			
	Connect the DUT output to TE, and perform the test.		
	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.
	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 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.
	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 re-authentication is conducted 5 seconds after R0’ has been read.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1B - 5 Irregular procedure: MAX_DEVS_EXCEEDED			
	Connect the DUT output to TE, and perform the test.		
	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.
	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 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.
		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 re-authentication is initiated.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
1B - 6 Irregular procedure: MAX_CASCADE_EXCEEDED			
	Connect the DUT output to TE, and perform the test.		
	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.
	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 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.
		Check that the Bstatus is read.	The Bstatus must be read.
		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 re-authentication is initiated.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
2C - 1 Regular procedure: With HDMI-capable Transmitter			
	Connect the DUT output to TE, and perform the test. (There is no need to supply signals to the TE input.)		
	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 TE outputs the video signals.	
	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.
	S102	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	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'.	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		Test procedure	Pass operation
2C - 2 Irregular procedure: (First part of authentication) New Authentication			
	Connect the DUT output to TE, and perform the test. (There is no need to supply signals to the TE input.)		
	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 TE outputs the video signals.	
	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.
	S102	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
		Again 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 2nd Aksv has been written.	It must be possible to read R0' by Short Read Format Access.
	S103	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	

Item		Test procedure	Pass operation
2C - 3 Irregular procedure: (Third part of authentication) New Authentication			
	Connect the DUT output to TE, and perform the test. (There is no need to supply signals to the TE input.)		
	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 TE outputs the video signals.	
	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.
	S102	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	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'.	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'.
	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.
	S102	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	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'.	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'.

Item		Test procedure	Pass operation
2C - 4 Regular procedure: With DVI Transmitter			
	Connect the DUT output to TE, and perform the test. (There is no need to supply signals to the TE input.)		
	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.
		The TE outputs the video signals.	
	S101	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	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'.	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'.
		Check that the images are displayed properly on the DUT.	The OK button must be pressed after checking that the images are displayed properly on the DUT.

Item		Test procedure	Pass operation
3A - 1 Regular procedure: With HDMI-capable Receiver			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
	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.

* TT01 is not supported.

Item		Test procedure	Pass operation
3A - 2 Irregular procedure: HDCP port access			
	Connect the DUT output to the TE input and the TE 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.	
		The images and authentication are started from the TE.	
		Check that the DUT tries to access the TE.	The DUT must try to access the TE.
		Check that access is tried 4 seconds after the first access.	Access must be tried 4 seconds after the first access.

Item		Test procedure	Pass operation
3A - 3 Irregular procedure: Verify Bksv			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		Set an illegal Bksv in TE (all 0's).	
		The images and authentication are started from the TE.	
		Check that the DUT reads Bksv.	The DUT must read Bksv.
		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		Test procedure	Pass operation
3A - 4 Irregular procedure: Verify R0'			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
		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		Test procedure	Pass operation
3A - 5 Regular procedure: With DVI Receiver			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		Set TE to DVI.	
		The images and authentication are started from the TE.	
		Check that the DUT initiates the HDCP Encryption.	The DUT must initiate the HDCP Encryption.

Item		Test procedure	Pass operation
3B - 1 Regular procedure: With Repeater			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
	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.

Item		Test procedure	Pass operation
3B - 2 Irregular procedure: Timeout of KSV list READY			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
		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.

Item		Test procedure	Pass operation
3B - 3 Irregular procedure: Verify V’			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	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.	
	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.
	TP04	After changing the TE to the HDMI mode, check that Authentication starts.	Authentication must start after changing to the HDMI mode.
	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 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.
	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 re-authentication is conducted 5 seconds after R0’ has been read.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
3B - 4 Irregular procedure: MAX_DEVS_EXCEEDED			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	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 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.
		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 re-authentication is initiated.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
3B - 5 Irregular procedure: MAX_CASCADE_EXCEEDED			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
		The images and authentication are started from the TE.	
	TP02	Check that the video signals are sent earlier than 1st Part Authentication.	The video signals must be sent earlier than 1st Part Authentication.
	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 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.
		Check that the Bstatus is read.	The Bstatus must be read.
		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 re-authentication is initiated.	The DUT must proceed with re-authentication.

Item		Test procedure	Pass operation
3C - 1 - 1 Regular procedure: Transmitter - DUT - Receiver			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201S	Check that the READY bit is raised within 600 ms after Aksv has been written.	The READY bit must be raised within 600 ms after Aksv has been written.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	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 matches KSV of TE.	KSV FIFO must match KSV of TE.
	S204S	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.

Item		Test procedure	Pass operation
3C - 1 - 2 Regular procedure: HPD pulse output caused by user operation			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Manually generate the HPD pulses of the DUT.	
		Check that HDP is de-asserted for more than 100.	HDP must be de-asserted for more than 100.
		Check that HPD is asserted again.	HPD must be asserted again.

Item		Test procedure	Pass operation
3C - 1 - 3 Irregular procedure: (First part of authentication) New Authentication			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Repeat SP04 to S103S one more time.	
		Set HDCP Encryption to Enable.	
	S201S	Check that the READY bit is raised within 600 ms after Aksv has been written.	The READY bit must be raised within 600 ms after Aksv has been written.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	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 matches KSV of TE.	KSV FIFO must match KSV of TE.
	S204S	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.

Item		Test procedure	Pass operation
3C - 1 - 4 Irregular procedure: (Second part of authentication) New Authentication			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201S	Check that the READY bit is raised within 600 ms after Aksv has been written.	The READY bit must be raised within 600 ms after Aksv has been written.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	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.
		Set Encryption to Disable.	
		Repeat SP04 to S202S one more time.	
	S203S	Check that KSV FIFO matches KSV of TE.	KSV FIFO must match KSV of TE.
	S204S	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.

Item		Test procedure	Pass operation
3C - 1 - 5 Irregular procedure : (Third part of authentication) New Authentication			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201S	Check that the READY bit is raised within 600 ms after Aksv has been written.	The READY bit must be raised within 600 ms after Aksv has been written.
	S202S	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202S	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	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 matches KSV of TE.	KSV FIFO must match KSV of TE.
	S204S	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.
		Set Encryption to Disable.	
		Repeat SP04 to S204S one more time.	

Item		Test procedure	Pass operation
3C - 1 - 6 Irregular procedure: (Second part of authentication) Verify Bksv			
	Connect the DUT output to the TE input and the TE 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.
		Set an illegal Bksv in the TE.	
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Check that the DUT has not raised the READY bit of Bcaps within 5 seconds.	The DUT must not raise the READY bit of Bcaps within 5 seconds.

Item		Test procedure	Pass operation
3C - 1 - 7 Irregular procedure: (Second part of authentication) Verify R0’			
	Connect the DUT output to the TE input and the TE 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.
		Set an illegal R0’ in the TE.	
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0’.	R0 must be equal to R0’.
		Set HDCP Encryption to Enable.	
		Check that the DUT has not raised the READY bit of Bcaps within 5 seconds.	The DUT must not raise the READY bit of Bcaps within 5 seconds.

Item		Test procedure	Pass operation
3C - 2 - 1 Regular procedure: Transmitter = DUT - Repeater + Receiver			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201R	The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	The READY bit of Bcaps must be read within 1.2 seconds after the DUT has written Aksv.
	S202R	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202R	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	S202R	Check that DEPTH of Bstatus is 2.	DEPTH of Bstatus must be 2.
	S202R	Check that DEVICE_COUNT of Bstatus is 2.	DEVICE_COUNT of Bstatus must be 2.
	S203R	Check that it is Bksv of TE and KSV FIFO transferred to the DUT in KSV FIFO.	It must be Bksv of TE and KSV FIFO transferred to the DUT in KSV FIFO.
	S204R	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.

Item		Test procedure	Pass operation
3C - 2 - 2 Regular procedure: HPD after writing Aksv			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
		HOTPLUG is de-asserted for 100 ms after Aksv has been written from the DUT into TE.	
		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 re-asserts HOTPLUG.	The DUT must re-assert HOTPLUG.

Item		Test procedure	Pass operation
3C - 2 - 3 Regular procedure: HPD after reading R0’			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0’s and twenty 1’s.	Bksv must consist of twenty 0’s and twenty 1’s.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
		HOTPLUG is de-asserted for 100 ms after R0’ has been read by the DUT in TE.	
		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 re-asserts HOTPLUG.	The DUT must re-assert HOTPLUG.

Item		Test procedure	Pass operation
3C - 2 - 4 Regular procedure: HPD after starting third part of authentication			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
	S201R	The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	The READY bit of Bcaps must be read within 600 ms after the READY bit has been asserted.
	S202R	Check that MAX_DEVS_EXCEEDED of Bstatus is 0.	MAX_DEVS_EXCEEDED of Bstatus must be 0.
	S202R	Check that MAX_CASCADE_EXCEEDED of Bstatus is 0.	MAX_CASCADE_EXCEEDED of Bstatus must be 0.
	S202R	Check that DEPTH of Bstatus is 2.	DEPTH of Bstatus must be 2.
	S202R	Check that DEVICE_COUNT of Bstatus is 2.	DEVICE_COUNT of Bstatus must be 2.
	S203R	Check that it is Bksv of TE and KSV FIFO transferred to the DUT in KSV FIFO.	It must be Bksv of TE and KSV FIFO transferred to the DUT in KSV FIFO.
	S204R	Check that V' and V match.	V' and V must match.
		Check that Ri' and Ri match.	Ri' and Ri must match.
		De-assert HOTPLUG for 100 ms after checking three times that Ri' and Ri match.	
		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 re-asserts HOTPLUG.	The DUT must re-assert HOTPLUG.

Item		Test procedure	Pass operation
3C - 2 - 5 Regular procedure: HPD after starting third part of authentication			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set an illegal V' for Authentication from the DUT, and raise the READY bit of Bcaps.	
		Check that the DUT has not raised the READY bit of Bcaps for 5 seconds.	The DUT must not raise the READY bit of Bcaps for 5 seconds.

Item		Test procedure	Pass operation
3C - 2 - 6 Irregular procedure: (Second part of authentication) DEVICE_COUNT			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set the Repeater_Max_KSV value, which was set in PCP, in DEVICE_COUNT of the TE.	
		Regardless of the Repeater_Max_KSV value, the TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	
		Check that the DUT has raised the READY bit of Bcaps, and also check that MAX_DEVS_EXCEEDED is set to 1 when more than 5 seconds have elapsed after Aksv is written.	MAX_DEVS_EXCEEDED must be set to 1.

Item		Test procedure	Pass operation
3C - 2 – 7 Irregular procedure: (Second part of authentication) DEPTH			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set DEPTH of TE to 7 and DEVICE_COUNT to 7.	
		The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	
		Check that the DUT has raised the READY bit of Bcaps, and also check that MAX_CASCADE_EXCEEDED is set to 1 when more than 5 seconds have elapsed after Aksv is written.	MAX_CASCADE_EXCEEDED must be set to 1.

Item		Test procedure	Pass operation
3C - 2 - 7 Irregular procedure: (Second part of authentication) DEPTH			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set DEPTH of TE to 7 and DEVICE_COUNT to 7.	
		The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	
		Check that the DUT has raised the READY bit of Bcaps, and also check that MAX_CASCADE_EXCEEDED is set to 1 when more than 5 seconds have elapsed after Aksv is written.	MAX_CASCADE_EXCEEDED must be set to 1.

Item		Test procedure	Pass operation
3C - 2 - 8 Irregular procedure: (Second part of authentication) MAX_DEVS_EXCEEDED			
	Connect the DUT output to the TE input and the TE 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.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set MAX_DEVS_EXCEEDED of the TE to 1.	
		The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	
		Check that the DUT has raised the READY bit of Bcaps, and also check that MAX_DEVS_EXCEEDED is set to 1 when more than 5 seconds have elapsed after Aksv is written.	MAX_DEVS_EXCEEDED must be set to 1.

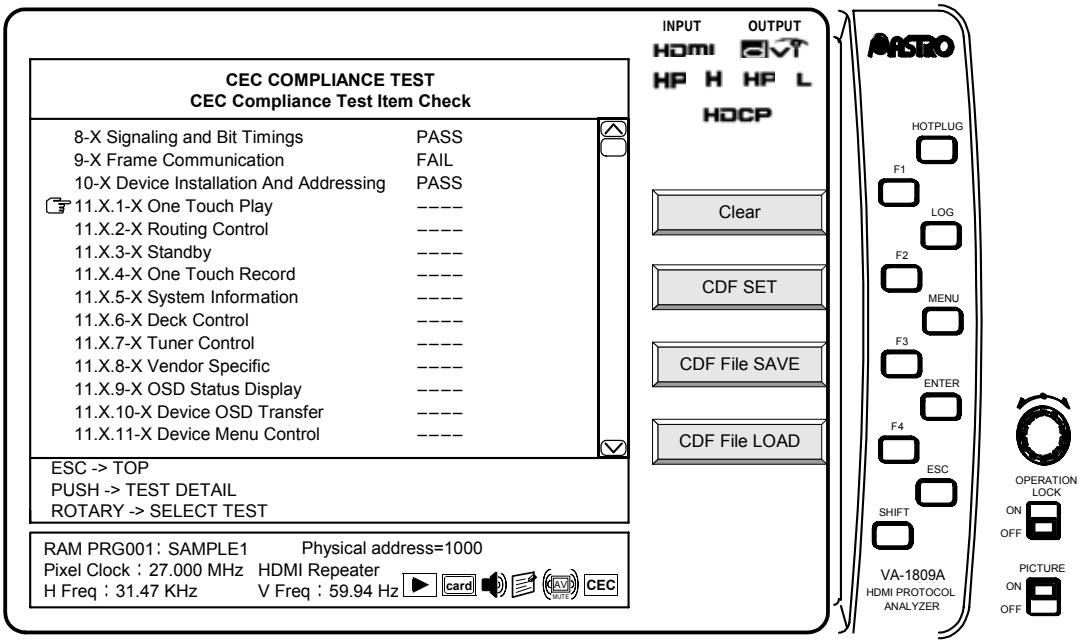
Item		Test procedure	Pass operation
3C - 2 - 9 Irregular procedure: (Second part of authentication) MAX_CASCADE_EXCEEDED			
	Connect the DUT output to the TE input and the TE output to the DUT input, and perform the test.		
	SP01	Check that HPD of the DUT has been asserted.	HPD of the DUT must be asserted.
	SP02	Check that HDMI_MODE of Bstatus is 0.	HDMI_MODE of Bstatus must be 0.
		The TE outputs the video signals.	
	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.
	S101S	Read Bcaps and Bksv, and write Ainfo, An and Aksv.	
	S102S	Check that Bcaps: REPEATER Bit is not 1.	Bcaps: REPEATER Bit must not be 1.
	S102S	Check that the Bcaps: 1.1_FEATURE bit matches PCP.	Bcaps: 1.1_FEATURE bit must match PCP.
	S102S	Check that Bksv consists of twenty 0's and twenty 1's.	Bksv must consist of twenty 0's and twenty 1's.
	S102S	Check that Bksv is not facsimile Bksv.	Bksv must not be facsimile Bksv.
	S103S	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.
	S103S	Check that R0 is equal to R0'.	R0 must be equal to R0'.
		Set HDCP Encryption to Enable.	
		Set MAX_CASCADE_EXCEEDED of the TE to 1.	
		The TE raises the READY bit of Bcaps 600 ms after Aksv has been written from the DUT.	
		Check that the DUT has raised the READY bit of Bcaps, and also check that MAX_CASCADE_EXCEEDED is set to 1 when more than 5 seconds have elapsed after Aksv is written.	MAX_CASCADE_EXCEEDED must be set to 1.

4.26 CEC Compliance Test Item Check

The HDMI standard mandates compliance testing in order to prevent connectivity problems and other trouble. Using the CEC Compliance Test Item Check function item of the VA-1809A, it is possible to perform protocol layer tests among the CEC compliance tests. If the specifications of the device under test (DUT) are first set on the CDF (Capabilities Declaration Form), it is possible to select the items to be tested.

* This is an optional function. For further details, contact a sales representative.

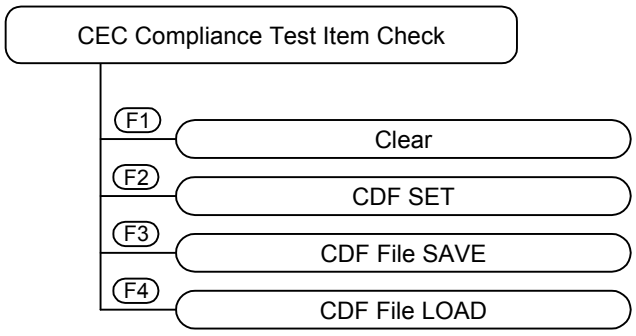
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select CEC Compliance Test Item Check.



■ Description of function keys used exclusively for the CEC compliance test item checks

* No functions keys which are used for the CEC compliance test item checks are shared with other functions: only exclusive-use function keys are used.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select CEC compliance test item checks



→ [F1] Clear

This is used to initialize the display of the tested items.

→ [F2] CDF SET

This is used to set the CDF (see page 175).

→ [F3] CDF File SAVE

This is used to save the CDF data.
To save the data on a card, press New Card Number. In a case like this, the name of the data saved will be cdfxxx.cdf (where “xxx” is a number which does not exist on the card).

→ [F4] CDF File LOAD

This is used to load the CDF data.
Use [Rotary Key] to select and execute the test items.
Display the test execution screen.

CAUTION

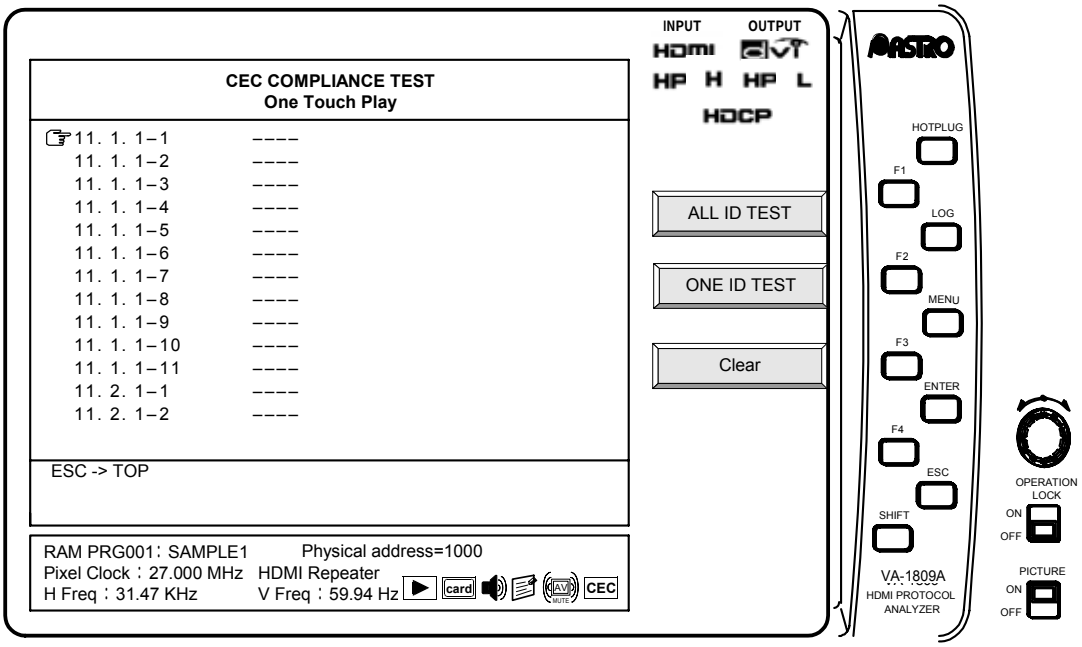
Before displaying the test execution screen, ensure that the VA-1809A and device under test (DUT) are connected. (The DUT address is captured as soon as the test execution screen appears.)

(1) Executing the tests

* Before displaying the test execution screen, ensure that the VA-1809A and device under test (DUT) are connected.

CAUTION

The intervals between successive commands must be at least 3 bits (7.2 ms). If this distance is not provided between them, the tests may not be performed properly.



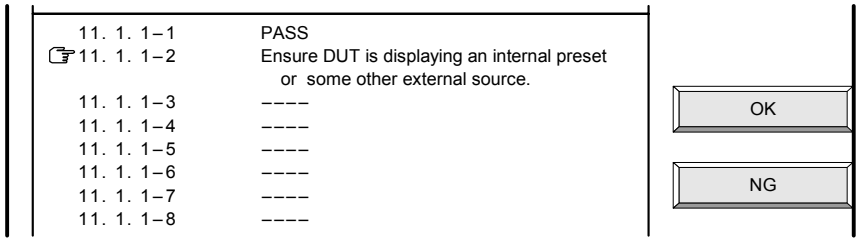
→ **F1** **ALL ID TEST**

This is used to select and perform only those tests which are supported for the DUT and which have been set by CDF.

→ **F2** **Rotary Key** **ONE ID TEST**

This is used to test only the items which have been selected.

- Display which appears during testing



The tests are not performed completely automatically. The measurements which can be conducted by the main unit (response command present/absent and time measurements) are conducted automatically. In addition, it is necessary to check the connection methods and displayed information. If checking is required, the check items will be displayed on OSD so input **OK (F1)** or **NG (F2)**, and proceed with the tests. When the tests are completed, the result (PASS or FAIL) is displayed.

* If the CDF settings (such as Device Type) have not been performed properly, the tests may not be performed.

For details on the tests, refer to “(3) Test details” (see page 184).

→ **F3 Clear**

This is used to initialize the displays of the tested items.

(2) CDF SETTING

→ **F2 CDF SET**

This is used to display the CDF setting screen.
Listed below are the items which can be set.

- Device Type / CEC Features / CECMessages Supported
- LANGUAGE (→ F1) Same as 2. LANGUAGE in DEVICE SETTING. (P.92)
- Digital Service (→ F2) Same as 3. Digital Service in DEVICE SETTING. (P.99)
- DEVICE Information (→ F3) Same as 4. DEVICE Information in DEVICE SETTING. (P.99)
- UI Command (→ F4) P.183

The set data is saved and the saved data is loaded using the CDF File SAVE and LOAD functions.

● Device Type / CEC Features / CECMessages Supported

Item	Selection options
Device Type	Standard TV / TV with an HDMI Output / Recording Device / STB / DVD / Audio System / CEC Switch
CEC Features	
CEC Message	
One Touch Play	(Mandatory Feature)
Can DUT be brought out of Standby?	Support Yes / No
-> Does DUT(TV) have an internal source?	
-> Does DUT(TV) have a text mode?	
Active Source	Send Support Yes / No Receive Support Yes / No
Image View On	
Text View On	
Routing Control	(Mandatory Feature)
Request Active Source	Send Support Yes / No Receive Support Yes / No
Routing Change	
Routing Information	
Set Stream Path	
Inactive source	
Standby	(Mandatory Feature)
Standby	Send Support Yes / No Receive Support Yes / No
One Touch Record	Support Yes / No
-> Does DUT(TV) have an internal source?	Support Yes / No
Record Off	Send Support Yes / No Receive Support Yes / No
Record On	
Record On [Own Source]	
Record On [Digital Service]	
Record On [Analogue Service]	
Record On [External Plug]	
Record On [External Physical Address]	
Record Status	
Record TV Screen	

CEC Features		Selection options
	CEC Message	
Timer Programming		Support Yes / No
	Clear Analogue Timer	Send Support Yes / No Receive Support Yes / No
	Clear Digital Timer	
	Clear External Timer	
	Set Analogue Timer	
	Set Digital Timer	
	Set External Timer	
	Set External Timer [External Plug]	
	Set External Timer [External Physical Address]	
	Set Timer Program Title	
	Timer Cleared Status	
	Timer Status	
System Information		(Mandatory Feature)
-> Language Supported (Set using Language Set F1)		(Language Set using F1)
	Give Menu language	Send Support Yes / No Receive Support Yes / No
	Give Physical Address	
	Polling Message	
	Report Physical Address	
	Set Menu Language	
	Get CEC Version	
	CEC Verssion	

CEC Features		Selection options
	CEC Message	
Deck Control		Support Yes / No
	Deck Control	Send Support Yes / No Receive Support Yes / No
	Deck Control [Skip Forward / Wind Forward]	
	Deck Control [Skip Backward / Rewind]	
	Deck Control [Stop]	
	Deck Status	
	Give Deck Status	
	Give Deck Status [Once]	
	Play	
	Play [Play Forward]	
	Play [Play Reverse]	
	Play [Play Still]	
	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]	
Tuner Control		Support Yes / No
-> Which [Digital Broadcast System] does DUT support1?		(Tuner Service Set using F2)
-> Which [Digital Broadcast System] does DUT support2?		
	Give Tuner Device Status	Send Support Yes / No Receive Support Yes / No
	Select Digital Service	
	Select Analog Service	
	Tuner Device Status	
	Tuner Step Decrement	
	Tuner Step Increment	

CEC Features		Selection options
	CEC Message	
Vendor Specific		Support Yes / No
	Device Vendor ID	Send Support Yes / No Receive Support Yes / No
	Give Device Vendor ID	
	Vendor Command	
	Vendor Remote Button Down	
	Vendor Remote Button Up	
-> Vendor ID used by the DUT		(Set using Device Info Set F3)
OSD Status Display		Support Yes / No
	Set OSD String	Send Support Yes / No Receive Support Yes / No
Device OSD Transfer		Support Yes / No
	Give OSD Name	Send Support Yes / No Receive Support Yes / No
	Set OSD Name	
-> Device OSD Name		(Set using Device Info Set F3)
Device Menu Control		Support Yes / No
	Menu Request	Send Support Yes / No Receive Support Yes / No
	Menu Status	
Remote Control Passthrough		Support Yes / No
	User Control Pressed	Send Support Yes / No Receive Support Yes / No
	User Control Released	
-> Supported Operation Ids as Initiator?		(Set using UI Command Set F4)
-> Supported Operation Ids as Follower?		
Power Status		Support Yes / No
	Give Device Power Status	Send Support Yes / No Receive Support Yes / No
	Report Device Power Status	
System Audio Control		Support Yes / No
	Give System Audio mode Status	Send Support Yes / No Receive Support Yes / No
	Report Audio Status	
	Set System Audio Mode	
	System Audio Mode Request	
	System Audio Mode Status	
Set Audio Rate		Support Yes / No

● **UI Command Set** **F4**

Sellect	Up	Down	Left
Right	Right-Up	Right-Down	Left-Up
Left-Down	Root Menu	Setup Menu	Contents Menu
Favorite Menu	Exit	Reserved (0x0E)	Reserved (0x0F)
Reserved (0x10)	Reserved (0x11)	Reserved (0x12)	Reserved (0x13)
Reserved (0x14)	Reserved (0x15)	Reserved (0x16)	Reserved (0x17)
Reserved (0x18)	Reserved (0x19)	Reserved (0x1A)	Reserved (0x1B)
Reserved (0x1C)	Reserved (0x1D)	Reserved (0x1E)	Reserved (0x1F)
Numbers 0	Numbers 1	Numbers 2	Numbers 3
Numbers 4	Numbers 5	Numbers 6	Numbers 7
Numbers 8	Numbers 9	Dot	Enter
Clear	Reserved (0x2D)	Reserved (0x2E)	Reserved (0x2F)
Channel Up	Channel Down	Previous Channel	Sound Select
Input Select	Display Information	Help	Page Up
Page Down	Reserved (0x39)	Reserved (0x3A)	Reserved (0x3B)
Reserved (0x3C)	Reserved (0x3D)	Reserved (0x3E)	Reserved (0x3F)
Power	Volume Up	Volume Down	Mute
Play	Stop	Pause	Record
Rewind	Fast forward	Eject	Forward
Backward	Reserved (0x4D)	Reserved (0x4E)	Reserved (0x4F)
Angle	Sub picture	Reserved (0x52)	Reserved (0x53)
Reserved (0x54)	Reserved (0x55)	Reserved (0x56)	Reserved (0x57)
Reserved (0x58)	Reserved (0x59)	Reserved (0x5A)	Reserved (0x5B)
Reserved (0x5C)	Reserved (0x5D)	Reserved (0x5E)	Reserved (0x5F)
Play Function	Pause-Play Function	Record Function	Pause-Record Function
Stop Function	Mute Function	Restore Volume Function	Tune Function
Select Disk Function	Select A/V Input Function	Select Audio Input Function	Reserved (0x6B)
Reserved (0x6C)	Reserved (0x6D)	Reserved (0x6E)	Reserved (0x6F)
Reserved (0x70)	F1 (Blue)	F2 (Red)	F3 (Green)
F4 (Yellow)	F5	Reserved (0x76)	Reserved (0x77)
Reserved (0x78)	Reserved (0x79)	Reserved (0x7A)	Reserved (0x7B)
Reserved (0x7C)			

(3) Test details

Listed below is the sequence in which the CEC compliance test item checks are performed by the VA-1809A.

* "DUT" denotes device under test; "TE" denotes the VA-1809A (test equipment).

Item		Required Test Method	Pass criateria
Signaling and Bit Timings			
	Connect the HDMI input of DUT to the output of TE if DUT is a TV set or connect the HDMI output of DUT to the input of TE if DUT is any other device. Then conduct the following tests.		
	8.2-1	Change the low period of the start bit to 3.5, 3.7 and 3.9 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
	8.2-2	Change the high period of the start bit to 0.6, 0.8 and 1.0 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
	8.2-3	Change the low period of one bit to 0.4, 0.6 and 0.8 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
	8.2-4	Change the high period of one bit to 1.45, 1.8 and 2.15 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
	8.2-5	Change the low period of the zero bit to 1.3, 1.5 and 1.7 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
	8.2-6	Change the high period of the start bit to 0.55, 0.9 and 1.25 ms, and send the DUT <Abort> message.	DUT sends ACK. DUT sends <Feature Abort>.
Frame Communication			
	Connect the HDMI input of DUT to the output of TE if DUT is a TV set or connect the HDMI output of DUT to the input of TE if DUT is any other device (including a CEC switch). Then conduct the following tests.		
	9.1-1	Send the DUT <Abort> message. * If DUT does not send ACK, the message is resent during the period from 7.2 to 12 ms. It will be resent for a maximum of 5 times.	DUT sends ACK'0'.
	9.1-2	Send the <Abort> message to a device other than DUT.	DUT does not send ACK '0'.
	9.1-3	Broadcast <Report Physical Address>. * If DUT does not send ACK, the message is resent during the period from 7.2 to 12 ms. It will be resent for a maximum of 5 times.	DUT sends ACK '1'.
	9.2-1	Send the DUT <Abort> message.	DUT sends <Feature Abort> from the appropriate logical address.
	9.2-2	[When DUT is a CEC switch] Broadcast a <Routing Information> [1.0.0.0].	[When DUT is a CEC switch] DUT broadcasts <Routing Information>.
		[When DUT is not a CEC switch] Send <Give Physical Address> to DUT.	[When DUT is not a CEC switch] DUT broadcasts <Report Physical Address>.
	9.3-1	Send the <Abort> message to DUT.	DUT sends <Feature Abort>.
		Do not send ACK'0' to Header Block of the returned <Feature Abort>.	DUT sends <Feature Abort> five times with an interval of at least 3 nominal data bits between them.
	9.3-2	Send the DUT <Abort> message.	DUT sends <Feature Abort>.
		Do not send ACK'0' to Data Block of the returned <Feature Abort>.	DUT sends <Feature Abort> five times with an interval of at least 3 nominal data bits between them.

Item	Required Test Method	Pass criateria
9.3-3	[When DUT is a CEC switch]	[When DUT is a CEC switch]
	Broadcast <Routing Information> [1.0.0.0].	DUT broadcasts <Routing Information>.
	Do not send ACK '1' in response to the returned <Broadcast message>.	DUT sends the Broadcast message five times with an interval of at least 3 nominal data bits between them.
	[When DUT is a not CEC switch]	[When DUT is a not CEC switch]
	Send Give Physical Address to DUT.	DUT broadcasts <Report Physical Address>.
	Do not send ACK '1' in response to the returned Broadcast message.	DUT sends the Broadcast message five times with an interval of at least 3 nominal data bits between them.
9.3-4	Send the DUT <Abort> message.	DUT sends <Feature Abort>.
	Set the bus to Low impedance while DUT is sending High impedance.	DUT leaves an interval longer than 3 nominal data bit periods and send <Feature Abort> five times between them.
	[This is applied when CEC switch and 1.3b] Routing Information [1.0.0.0] is broadcasted. Set the bus to Low impedance while DUT is sending High impedance.	DUT leaves an interval longer than 3 nominal data bit periods and send <Feature Abort> five times between them.
9.4-1	Set DUT to Active Source. Send <Active Source> with no [Physical Address]. Send Request Active Source.	DUT sends <Active Source>. (The commands of <Active Source> with no [Physical Address] must be ignored.)
9.5-1	Send the DUT <Abort> message. However, insert the destroyed bit into bit 3 of the first data block before sending the message.	DUT outputs a low bit with a length 1.4 to 1.6 times (3.4 to 3.8 ms) the nominal data bit period. DUT does not send <Feature Abort>.
9.6-1	Send the DUT <Abort> message.	DUT returns <Feature Abort>.
	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. (Send low impedance as the Start Bit.)	When DUT detects low, arbitration must be lost and the transmission of the current message must stop. DUT waits for a period of at least 5 bits and then resends the message.
9.6-2	Send the DUT <Abort> message.	DUT returns <Feature Abort>.
	DUT sends low impedance in the high impedance part while it is sending the source address.	When DUT detects low, arbitration must be lost and the transmission of the current message stops. DUT waits for a period of at least 5 bits and then resends the message.
9.7-1 (1.2a only)	Send the DUT <Abort> message.	DUT returns <Feature Abort>.
	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. (Send low impedance to the Start Bit.)	When DUT detects low, arbitration must be lost and the transmission of the current message stops. DUT waits for a period of at least 5 bits and then resends the message.
9.7-1 (in 1.2a, this is 9.7-2	Send the DUT <Abort> message.	DUT waits for a period of at least 5 nominal bit periods and then resends the <Feature Abort>.
9.7-2 (in 1.2a, this is 9.7-3)	Execute the One Touch Play feature or Remote Control Pass Through feature using DUT.	After sending the first message, DUT waits 7 nominal data bit period before sending the next message.

Item	Required Test Method	Pass criateria
Device Installation And Addressing		
Items 10.X.1.1 pertain to the testing of regular TV sets, items 10.X.1.2 pertain to the testing of TV set with HMDI outputs, and items 10.X.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed. When DUT is a regular TV set, set TE to Repeater, and connect the HDMI input of DUT to the output of TE; when DUT is a device other than a regular TV set, connect the HMDI output of DUT to the input of TE; and then perform the tests.		
10.1.1.1-1	Connect DUT to the TE output. Send a <Give Physical Address> to the DUT.	The DUT broadcasts a <Report Physical Address> [0.0.0.0].
10.1.1.2-1	Allocate Physical Address [2.0.0.0] to DUT. Disconnect DUT from TE. Allocate Physical Address [1.0.0.0] to DUT.	The DUT broadcasts a <Report Physical Address> [1.0.0.0].
10.1.2-1	Connect DUT to the input of TE. Allocate Physical Address [2.0.0.0] to DUT. Disconnect DUT from TE. Allocate Physical Address [1.0.0.0] to DUT.	The DUT broadcasts a <Report Physical Address> [1.0.0.0].
10.1.2-2	Connect DUT to the input of TE. Allocate Physical Address [1.0.0.0] to DUT. Disconnect DUT from TE. Allocate Physical Address [2.3.4.5] to DUT.	The DUT broadcasts a <Report Physical Address> [2.3.4.5].
10.2.1.1-1	Send the polling message to logical address 0.	DUT must return ACK.
10.2.1.2-1	Set Logical Address of TE to 0. Allocate physical address [2.0.0.0] to DUT. Disconnect DUT from TE. Allocate Physical Address [1.0.0.0] to DUT.	<Report Physical Address> [1.0.0.0] is broadcast.
10.2.1.2-2 (1.2a only)	Allocate Physical Address [1.0.0.0] to DUT. Return ACK in response to the polling message which was sent by DUT to logical address 14.	DUT captures the logical address with an unregistered address (15). Also, <Report Physical Address is broadcast.
10.2.2-1	Connect DUT to the input of TE. Disconnect the connection temporarily, and then re-establish the connection.	DUT sends the polling message to the recording device logical address, and captures the logical address. Also, <Report Physical Address> is broadcast.
10.2.2-2	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.2-1 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the recording device logical address, and captures the second logical address. Also, <Report Physical Address> is broadcast.
10.2.2-3	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.2-2 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the recording device logical address, and captures the third logical address. Also, <Report Physical Address> is broadcast.

Item		Required Test Method	Pass criateria
	10.2.3-1	Connect DUT to the input of TE. Disconnect the connection temporarily, and then re-establish the connection.	DUT sends the polling message to the DVD logical address, and captures the logical address. Also, <Report Physical Address> is broadcast.
	10.2.3-2	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.3-1 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the DVD logical address, and captures the second logical address. Also, <Report Physical Address> is broadcast.
	10.2.3-3 (1.3b only)	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.3-2 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the DVD logical address, and captures the third logical address. Also, <Report Physical Address> is broadcast.
	10.2.4-1	Connect DUT to the input of TE. Disconnect the connection temporarily, and then re-establish the connection.	DUT sends the polling message to the STB logical address, and captures the logical address. Also, <Report Physical Address> is broadcast.
	10.2.4-2	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.4-1 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the STB logical address, and capture the second logical address. Also, <Report Physical Address> is broadcast.
	10.2.4-3	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.4-2 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the STB logical address, and captures the third logical address. Also, <Report Physical Address> is broadcast.
	10.2.4-4 (1.3b only)	Disconnect DUT from the input of TE. Ensure that the logical address captured by DUT in 10.2.4-3 is forcibly captured by TE. Connect DUT to the input of TE.	DUT sends the polling message to the STB logical address, and captures the forth logical address. Also, <Report Physical Address> is broadcast.
	10.2.5-1	Disconnect the connection temporarily, and then re-establish the connection.	DUT sends the polling message to the audio system logical address, and captures the logical address. Also, <Report Physical Address> is broadcast.

Item	Required Test Method	Pass criateria
One Touch Play Items 11.1 pertain to the TV set tests, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.		
Items 11.1 pertain to the TV set tests. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.1-1	Change the logical addresses of TE to 1, 3, 4, 5, and repeat the following steps. Display the internal preset or some other external source on DUT. Send <Image View ON> from TE. About 200 ms later, broadcast Active Source from TE.	The DUT display switches to the HDMI input port connected on TE.
11.1.1-2	Change the logical addresses of TE to 1, 3, 4, 5, and repeat the following steps. Display the internal preset or some other external source on DUT. Send <Text View ON> from TE. About 200 ms later, broadcast Active Source from TE.	The DUT display switches to the HDMI input port connected on TE.
11.1.1-3	Set DUT to the standby status. Send <Image View ON> from TE.	The power of DUT is turned on.
11.1.1-4	Set DUT to the standby status. Send <Text View ON> from TE.	The power of DUT is turned on.
11.1.1-5 (1.2a only)	Display the internal preset or some other external source on DUT. Also display the DUT menu. Send <Image View ON> from TE.	The DUT menu remains on the screen.
11.1.1-6 (1.2a only)	Display the internal preset or some other external source on DUT. Also display the DUT menu. Send <Text View ON> from TE.	The DUT menu is cleared from the screen.
11.1.1-7 (1.2a only)	Display the internal preset or some other external source on DUT. Send <Image View ON> from TE (logical address 15).	DUT ignores the message.
11.1.1-8 (1.2a only)	Display the internal preset or some other external source on DUT. Send <Text View ON> from TE (logical address 15).	DUT ignores the message.
11.1.1-5 (in 1.2a, this is 11.1.1-9)	Send <Active Source> from TE to DUT. (Let DUT display the external source.) Next, select the settings in such a way that the internal source is displayed on DUT.	DUT sends <Active> Source [0.0.0.0].
11.1.1-6 (in 1.2a, this is 11.1.1-10	Set DUT to the Text Mode. Send <Image View On> from TE.	DUT clears the text display.
11.1.1-7 (in 1.2a, this is 11.1.1-11)	Set DUT to the Text Mode. Send <Text View On> from TE.	DUT clears the text display.

Item	Required Test Method	Pass criateria
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.1-1	Execute the One Touch Play feature from DUT to TE.	DUT sends <Active Source> after sending <Image View On> or <Text View On>.
11.2.1-2	Set DUT to the play status using <Active Source>. Broadcast <Active Source> from TE (logical address 15).	DUT ignores <Active Source> and continues to play.
Routing Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 172) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.2-1	Broadcast <Report Physical Address> [1.1.0.0] from TE (logical address 3). Broadcast <Report Physical Address> [1.2.0.0] from TE (logical address 4). Select one of the two devices above on the DUT menu.	<Set Stream Path> is sent from DUT.
11.1.2-2 (1.2a only)	Broadcast <Report Physical Address> [1.1.0.0] from TE (logical address 3). Broadcast <Report Physical Address> [1.2.0.0] from TE (logical address 4). Send <Image View On> from TE (logical address 3). About 200 ms later, broadcast <Active Source> from TE (logical address 3). Broadcast <Routing Change> [1.1.0.0] [1.2.0.0] from logical address 15.	<Set Stream Path> [1.2.0.0] is sent from DUT. Alternatively, <Active Source> is sent, and the display switched to internal tuner.
11.1.2-3 (1.2a only)	Broadcast <Report Physical Address> [1.1.0.0] from TE (logical address 3). Broadcast <Report Physical Address> [1.2.1.0] from TE (logical address 4). Send <Image View On> from TE (logical address 3). About 200 ms later, broadcast <Active Source> from TE (logical address 3). Broadcast <Routing Change> [1.1.0.0] [1.2.0.0] from TE (logical address 1). Broadcast <Routing Information> [1.2.1.0] from TE (logical address 15).	<Set Stream Path> [1.2.1.0] is sent from DUT. Alternatively, <Active Source> is sent, and the display switched to internal tuner.

Item		Required Test Method	Pass criateria
	11.1.2-4 (1.2a only)	Broadcast <Report Physical Address> [1.1.0.0] from TE (logical address 3). Broadcast <Report Physical Address> [1.2.1.9] from TE (logical address 4). Send <Image View On> from TE (logical address 3). About 200 ms later, broadcast <Active Source> from TE (logical address 3). Broadcast <Routing Change> [1.1.0.0] [1.2.0.0] from TE (logical address 15). Broadcast <Routing Information> [1.2.1.0] from TE (logical address 15). Broadcast <Routing Information> [1.2.1.9] from TE (logical address 15).	<Set Stream Path> [1.2.1.9] is sent from DUT. Alternatively, <Active Source> is sent, and the display switched to internal tuner.
	11.1.2-2 (in 1.2a, this is 11.1.2-5)	Send <Active Source> from TE. Then broadcast <Request Active Source> from TE.	The DUT does not respond to <Request Active Source>.
	11.1.2-3 (in 1.2a, this is 11.1.2-6)	Set DUT to <Active Source>. Broadcast <Request Active Source> from TE.	DUT returns <Active Source>.
	11.1.2-4 (in 1.2a, this is 11.1.2-7)	Set DUT to <Active Source>. Send <Active Source> [1.0.0.0] from TE to the logical address of DUT. Broadcast <Request Active Source> from TE.	DUT returns <Active Source>.
	11.1.2-5 (1.3b only)	Confirm DUT is Child Position 1. After confirmation, change it to Child Position 2 manually.	The DUT broadcasts Routing Change [1.0.0.0][2.0.0.0].
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.2-1	Broadcast <Active Source> from TE (logical address 0). With the DUT power ON, check that DUT does not operate as <Active Device>. Broadcast <Set Stream Path> from TE so that DUT operates as <Active Source>.	DUT returns <Active Source>.
	11.2.2-2	Set DUT to <Active Source>. Broadcast <Request Active Source> from TE.	DUT returns <Active Source>.
	11.2.2-3	Change the logical addresses of TE to 1, 3, 4, 5, 15, and repeat the following steps. Set DUT to <Active Source>. Broadcast <Request Active Source> from TE.	DUT returns <Active Source>.
	11.2.2-4 (1.3b only)	Broadcast ,Set Stream Path> to DUT with DUT's physical address. Operate DUT in order to send <Inactive Source>.	DUT sends <Inactive Source>.

Item	Required Test Method	Pass criateria
System Standby Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.3-1	Execute the system standby feature of DUT.	DUT broadcasts the standby message and switches to standby.
11.1.3-2	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, 15, and take the following steps. Set to the status in which DUT can transfer to standby. Broadcast standby from TE.	DUT switches to standby.
11.1.3-3	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, 15, and take the following steps. Set to the status in which DUT can transfer to standby. Broadcast standby from TE.	DUT switches to standby.
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.3-1	Set to the status in which DUT can transfer to standby. Execute the system standby feature of DUT.	DUT broadcasts standby.
11.2.3-2	Change the logical addresses of TE to 1, 3, 4, 5, 15, and take the following steps. Check that the status is established in which DUT can transfer to standby. Broadcast standby from TE.	DUT switches to standby.
11.2.3-3	Change the logical addresses of TE to 1, 3, 4, 5, 15, and take the following steps. Check that the status is established in which DUT can transfer to standby. Send standby from TE to DUT.	DUT switches to standby.
One Touch Record Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.4-1	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the internal Digital tuner on DUT. Execute the One Touch Record feature of DUT.	DUT sends <Record On> [Digital Service] [Digital Service Identification].
11.1.4-2 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the internal Analog tuner on DUT. Execute the One Touch Record feature of DUT.	DUT sends Record On [Analog Service Identification] [Analogu Broadcast Type][Analogue Frequency][Broadcast System].

Item		Required Test Method	Pass criateria
	11.1.4-3 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the External Plug on DUT. Execute the One Touch Record feature of DUT.	DUT sends Record On [External Plug] [External Plug].
	11.1.4-4 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the External Plug on DUT. Execute the One Touch Record feature of DUT.	DUT sends Record On [External Physical Address] [External Physical]
	11.1.2-5 (11.1.4-2 in 1.2a)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Send <Image View On> from TE to DUT. Broadcast <Active Source> from TE. Send <Record TV Screen> from TE to DUT.	DUT sends <Record On> [Own Source].
	11.1.2-6 (11.1.4-3 in 1.2a)	Connect DUT with other source except VA-1809A (e.g. Analog input terminal), and display it. Send <Record TV Screen> from TE.	DUT does not send <Record On..
	11.1.2-7 (11.1.4-3 in 1.2a)	Sends <Image View On> from TE to DUT. TE broadcasts <Active Source>. Execute <One Touch Record Feature> of DUT. Sends <Record Status [Recording own source] from TE to DUT. Stop recording by UI/Remote Control of DUT.	After stop recording, <Record Off> is sent.
	11.1.2-8 (11.1.4-4 in 1.2a)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the internal Digital tuner on DUT. Send <Record TV Screen> from TE to DUT.	DUT sends <Record On> [Digital Service] [Digital Service Identification].
	11.1.2-9 (11.1.4-6 in 1.2a)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Send <Image View On> from TE to DUT. TE broadcasts <Active Source>. Send <Record TV Screen> from TE to DUT.	DUT sends <Record On> [Own Source].

Item		Required Test Method	Pass criateria
	11.1.4-10 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Display the internal Analog tuner on DUT. Send <Record TV Screen> from TE to DUT.	DUT sends Record On [Analogue Service] [Analogue Broadcast Type][Analogue Frequency][Broadcast System].
	11.1.4-11 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Send <Image View On> from Logical Address 4 to DUT. Logical Address 4 broadcasts <Active Source>. Send <Record TV Screen> from TE to DUT.	DUT sends Record On [External Plug] or Record On [External Physical Address].
	11.1.2-12 (11.1.4-7 in 1.2a)	In the * area, change the logical addresses of TE to 3, 4, 5, 14, 15, and take the following steps. Send <Report Physical Address> from TE (logical address 1) to DUT. Send <Image View On> from TE (logical address1) to DUT. Broadcast <Active Source> from TE (logical address 1). Send <Record TV Screen> from TE (* address).	The DUT ignores TV Screen.
	11.1.2-13 (11.1.4-8 in 1.2a)	In the * area, change the logical addresses of TE to 1, 2, 9, and take the following steps. Send <Image View On> from logical address 4. Broadcast <Active Source> from logical address 4. Send <Record TV Screen> from TE (address of *).	DUT sends <Feature Abort> [Cannot Provide Source].
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.4-1	Install the media in DUT, and set to the record enable ode. Execute the One Touch Record feature of DUT.	DUT sends <Record TV Screen>.
		After DUT has sent Record TV Screen, send Feature Abort [Cannot Provide Source] from TE.	<Feature Abort> is received, and recording does not start.
	11.2.4-2	At DUT, select the ID set in Digital Service 1 of CDF. Install the media in DUT, and set to the record enable mode. Send <Record On> [Digital Service 1] from TE.	DUT returns <Record Status> [Recording Digital Service]. DUT also changes the tuner to Specified service, and starts recording.
	11.2.4-3 (1.3b only)	At DUT, select the ID set in Digital Service 1 of CDF. Install the media in DUT, and set to the record enable mode. Send <Record On> [Analog Service 1] from TE.	DUT returns <Record Status> [Recording Analog Service]. DUT also changes the tuner to Specified service, and starts recording.

Item		Required Test Method	Pass criateria
	11.2.4-4 (1.3b only)	At DUT, select ID set in External Plug No of CDF. Install the media in DUT, and set to the record enable mode. Send <Record On> [External Plug] from TE.	DUT returns <Record Status> [Recording External Input]. DUT also changes the tuner to Specified service, and starts recording.
	11.2.4-5 (1.3b only)	At DUT, select ID set in External Physical Address of CDF. Install the media in DUT, and set to the record enable mode. Send Record On[External Physical Address] from TE.	DUT returns <Record Status> [Recording External Input]. DUT also changes the tuner to Specified service, and starts recording.
	11.2.4-6 (11.2.4-3 in 1.2a)	Check that DUT displays the internal tuner. Install the media in DUT, and set to the record enable mode. Send <Record On> [Own Source] from TE.	DUT returns <Record Status> [Recording Own Source]. DUT also starts internal tuner recording.
	11.2.4-6 (1.2a only)	Display the internal tuner on DUT, install the media, and set to the record enable mode. Send <Record On> [Own Source] from TE (logical address 0).	DUT returns <Record Status> [Recording Own Source]. DUT also starts recording.
		Send <Record Off> from TE (logical address14).	The message is ignored and recording continued.
	11.2.4-7 (11.2.4-4 in 1.2a)	Check that DUT displays an external source (such as a camcorder). Install the media in DUT, and set to the record enable mode. Send <Record On> [Own Source] from TE.	DUT returns <Record Status> [Recording Own Source]. DUT also starts recording.
	11.2.4-8 (11.2.4-5 in 1.2a)	Display the internal tuner on DUT, install the media, and set to the record enable mode. Send <Record On> [Own Source].	DUT returns <Record Status> [Recording Own Source]. DUT also starts recording.
		Send <Record Off> from TE.	Recording stops.
	11.2.4-9 (11.2.4-7 on 1.2a)	Change the logical addresses of TE to 1, 3, 4, 5, and take the following steps. Send <Record On> [Own Source] from TE.	DUT returns <Record Status> [Recording Own Source]. DUT also starts recording.
		Send Record Off from TE.	Recording stops.
	11.2.4-10 (11.2.4-8 in 1.2a)	Display the internal tuner on DUT, install the media, and set to the record enable mode. Send <Record On> [Own Source] from TE (logical address 15).	DUT ignores the message.

Item	Required Test Method	Pass criateria
Timer Programming Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175 are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.5-1 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from EPG. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE.
11.1.5-2 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from EPG. Send <Timer Status > from TE to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE.
11.1.5-3 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from menu. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE.
11.1.5-4 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from menu. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE.
11.1.5-5 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from menu. Send <Timer Status> from TE to DUT.	DUT sends <Set Digital Timer> in the correct format to TE.
11.1.5-6 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set Digital Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.1.5-7 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set Analog Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.1.5-8 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set External Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.1.5-9 (1.3b only)	Set Timer from EPG. Send <Timer Status> from TE to DUT. Clear the timer from EPG. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE.

Item		Required Test Method	Pass criateria
	11.1.5-10 (1.3b only)	Set Timer from EPG. Send <Timer Status> from TE to DUT. Clear the timer from EPG. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE.
	11.1.5-11 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE.
	11.1.5-12 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE.
	11.1.5-13 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set External Timer> to TE. DUT sends correctly formatted <Clear External Timer> to TE.
	11.1.5-14 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	11.1.5-15 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	11.1.5-16 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set External Timer> to TE. DUT sends correctly formatted <Clear External Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.5-1 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from EPG. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE.
	11.2.5-2 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from EPG. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE.

Item	Required Test Method	Pass criateria
11.2.5-3 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from Menu. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE.
11.2.5-4 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from Menu. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE.
11.2.5-5 (1.3b only)	Change the logical addresses of TE to 1, 2, 9, and take the following steps. Set Timer from Menu. Send <Timer Status> from TE to DUT.	DUT sends correctly formatted <Clear External Timer> to TE.
11.2.5-6 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set Digital Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.2.5-7 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set Analog Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.2.5-8 (1.3b only)	Set Timer from menu. TE sends DUT with <Timer Status> indicating that the Timer was not programmed.	DUT sends correctly formatted <Set External Timer> to TE. Appropriate process is done when Timer is not set when receiving Timer Status.
11.2.5-9 (1.3b only)	Set Timer from EPG. Send <Timer Status> from TE to DUT. Clear the timer from EPG. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE.
11.2.5-10 (1.3b only)	Set Timer from EPG. Send <Timer Status> from TE to DUT. Clear the timer from EPG. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE.
11.2.5-11 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE.
11.2.5-12 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE.

Item		Required Test Method	Pass criateria
	11.2.5-13 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends <Timer Cleared Status> to DUT.	DUT sends correctly formatted <Set External Timer> to TE. DUT sends correctly formatted <Clear External Timer> to TE.
	11.2.5-14 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set Digital Timer> to TE. DUT sends correctly formatted <Clear Digital Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	11.2.5-15 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set Analog Timer> to TE. DUT sends correctly formatted <Clear Analog Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	11.2.5-16 (1.3b only)	Set Timer from Menu. Send <Timer Status> from TE to DUT. Clear the timer from Menu. TE sends DUT <Timer Cleared Status> indicating that the timer could not be cleared from the DUT as there is no matching engtry.	DUT sends correctly formatted <Set External Timer> to TE. DUT sends correctly formatted <Clear External Timer> to TE. DUT removes the timer program from menu after receiving <Timer Cleared Status>.
	11.2.5-17 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set Analog Timer> to DUT.	The DUT sets timer record, and sends <Timer Status> to TE.
	11.2.5-18 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set Digital Timer> to DUT.	The DUT sets timer record, and sends <Timer Status> to TE.
	11.2.5-19 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set External Timer> to DUT.	The DUT sets timer record, and sends <Timer Status> to TE.
	11.2.5-20 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set Analog Timer> to DUT. TE sends <Clear Analog Timer> with the parameter that same as previously sent to DUT.	The DUT sets timer record, and sends <Timer Status> to TE. The DUT responds <Timer Cleared Status> to a <Clear Analog Timer>.
	11.2.5-21 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set Digital Timer> to DUT. TE sends <Clear Ditital Timer> with the parameter that same as previously sent to DUT.	The DUT sets timer record, and sends <Timer Status> to TE. The DUT responds <Timer Cleared Status> to a <Clear Digital Timer>.
	11.2.5-22 (1.3b only)	Ensure that the DUT is ready to set timer-record. TE sends <Set External Timer> to DUT. TE sends <Clear External Timer> with the parameter that same as previously sent to DUT.	The DUT sets timer record, and sends <Timer Status> to TE. The DUT responds <Timer Cleared Status> to a <Clear External Timer>.

Item	Required Test Method	Pass criateria
System Information Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.6-1	Send the polling message to DUT.	ACK is returned.
11.1.6-2	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, 15, and take the following steps. Send <Give Physical Address> from TE to DUT.	DUT broadcasts <Report Physical Address>.
11.1.6-3	Broadcast <Report Physical Address> [1.0.0.0] from TE (logical address 15).	DUT ignores the message.
11.1.6-4	Change the language setting of DUT.	<Set Menu Language> is broadcast.
11.1.6-5	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, 15, and take the following steps. Send <Give Menu Language> from TE.	DUT is broadcast <Set Menu Language>.
11.1.6-6	TE sends <Get CEC Version> to DUT.	DUT sends <CEC Version> to TE.
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.6-1	Send the polling message to DUT.	ACK is returned.
11.2.6-2	Change the logical addresses of TE to 0, 1, 3, 4, 5, 15 (logical addresses other than those of DUT), and take the following steps. Send <Give Physical Address> from TE to DUT.	DUT broadcasts <Report Physical Address>.
11.2.6-3	Broadcast <Set Menu Language> [First language enabled by Language Set of CDF] from TE. If the language setting is not going to be changed, broadcast <Set Menu Language> [Second language enabled by Language Set of CDF] from TE.	The language setting is changed.
11.2.6-4	Broadcast <Set Menu Language> [Language not enabled by Language Set of CDF] from TE.	The language setting is not changed.
11.2.6-5	In the * area, change the logical addresses of TE to 1, 3, 4, 5, 15, and take the following steps. Broadcast Set Menu Language [First language enabled by Language Set of CDF] from TE (logical address 0). Broadcast <Set Menu Language> [Second language enabled by Language Set of CDF] from TE (logical address 0). Broadcast <Set Menu Language> [First language enabled by Language Set of CDF] from TE (address of *).	The language setting is not changed.
11.2.6-6	TE sends <Get CEC Version> to TE.	DUT sends <CEC Version> to TE.

Item	Required Test Method	Pass criateria
Deck Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.7-1	Change the logical addresses of TE to 1, 4, and take the following steps.	
	Send <Deck Control> or <Play message> from DUT.	DUT is able to send <Deck Control> or <Play message>.
	Send <Deck Status> from TE to DUT.	If possible, check that <Deck Status> has been updated correctly at DUT.
11.1.7-2	Send <Play> [Forward] from DUT. Return <Deck Status> [Play] from TE.	DUT is able to receive <Deck Status>. If possible, check that <Deck Status> has been updated correctly at DUT.
11.1.7-3	Send <Play> [Forward] from DUT. Return <Deck Status> [Stop] from TE.	DUT is able to receive <Deck Status>. If possible, check that <Deck Status> has been updated correctly at DUT.
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.7-1	Play the DUT media. Send <Deck Control> [Skip Forward/Wind Forward] to DUT.	DUT skips forward or wind forward.
11.2.7-2	Play the DUT media. Send <Deck Control> [Skip Backward/Rewind] to DUT.	DUT skips backward or rewind.
11.2.7-3	Play the DUT media. Send <Deck Control> [Stop] to DUT.	DUT stops the play.
11.2.7-4	Change the logical addresses of TE to 0, 1, 3, 4, 5 (logical addresses other than those of DUT), and conduct the following tests. Play the DUT media. Send <Deck Control> [Stop] to DUT.	DUT stops the play.
11.2.7-5	Play the DUT media. Send <Deck Control> [Stop] from TE (logical address 15) to DUT.	DUT ignores the message and continue play.
11.2.7-6	Install the media in DUT, and set to the idle mode. Send <Play> [Play Forward] to DUT.	DUT starts play.
11.2.7-7	Install the media in DUT, and set to the idle mode. Send <Play> [Play Reverse] to DUT.	DUT starts reverse play.
11.2.7-8	Play the DUT media. Send <Play> [Play still] to DUT.	DUT transfers from the play mode to play still mode.
11.2.7-9	Install the media in DUT, and set to the idle mode. Send <Play> [Play still] to DUT.	DUT transfers to the play still mode. Alternatively, DUT sends <Feature Abort>, and remains in the idle mode.

Item		Required Test Method	Pass criateria
	11.2.7-10	Install the media in DUT, and set to the idle mode. Send <Play> [Scan Forward Minimum] from TE (TV) to DUT. Change the parameters of the above command to the ones listed below, and conduct the tests one after the other. [Fast Forward Medium] [Fast Forward Maximum] [Fast Reverse Minimum] [Fast Reverse Medium] [Fast Reverse Maximum] [Slow Forward Minimum] [Slow Forward Medium] [Slow Forward Maximum] [Slow Reverse Minimum] [Slow Reverse Medium] [Slow Reverse Maximum]	DUT sends <Image View On> or <Text View On> to TE (TV), and starts play at the selected speed (or the closest speed if the selected speed is not supported) in the scan mode where applicable. Alternatively, DUT sends <Feature Abort>, and remains in the idle mode.
	11.2.7-11	Play the DUT media. Send <Play> [Scan Forward Minimum] from TE (TV) to DUT. Change the parameters of the above command to the ones listed below, and conduct the tests one after the other. [Fast Forward Medium] [Fast Forward Maximum] [Fast Reverse Minimum] [Fast Reverse Medium] [Fast Reverse Maximum] [Slow Forward Minimum] [Slow Forward Medium] [Slow Forward Maximum] [Slow Reverse Minimum] [Slow Reverse Medium] [Slow Reverse Maximum]	The DUT switches to playing in the selected mode and speed (or a sensible close match if that speed is not supported).
	11.2.7-12	Change the logical addresses of TE to 1, 3, 4, 5 (logical addresses other than those of DUT), and conduct the following tests. Install the media in DUT, and set to the idle mode.	Send <Play> [Play Forward] to DUT.
	11.2.7-13	Install the media in DUT, and set to the idle mode. Send <Play> [Play Forward] from TE (logical address 15).	DUT ignores the message.

Item		Required Test Method	Pass criateria
	11.2.7-14	Play the DUT media. Send <Give Deck Status> [Once] to DUT. Change the DUT mode as below, and conduct the tests one after the other. Playing Forwards Playing Reverse Paused Slow Forwards Slow Backwards Fast Forwards Fast Backwards Stopped media present No media present Winding forwards Winding backwards Recording	DUT sends the appropriate <Deck Status>. Listed below are the parameters corresponding to the modes. Playing Forwards - [Play] Playing Reverse - [Play Reverse] Paused – [Still] Slow Forwards - [Slow] Slow Backwards - [Slow Reverse] Fast Forwards - [Search Forward] Fast Backwards - [Search Reverse] Stopped media present - [Stop] No media present - [No Media] Winding forwards - [Wind] Winding backwards - [Rewind] Recording - [Record]
	11.2.7-15	Set DUT to idle, and install the media. Send <Give Deck Status> [On] to DUT.	DUT sends <Deck Status> [Stop].
		Press the play key on DUT.	DUT sends <Deck Status> [Play].
		Press the stop key on DUT.	DUT sends <Deck Status> [Stop].
		Send <Give Deck Status> [Off] to DUT. Press the play key on DUT.	DUT does not send <Deck Status>.
	11.2.7-16	Change the logical addresses of TE to 1, 3, 4, 5 (logical addresses other than those of DUT), and take the following steps. Play the DUT media. Send <Give Deck Status> [Once] to DUT.	DUT sends <Deck Status> [Play].
	11.2.7-17	Play the DUT media. Send <Give Deck Status> [Once] from TE (logical address 15).	DUT <ignores> the message.
	11.2.7-18 (1.3b only)	Ensure that the media is losded in the DUT. TE sends <Deck Control>[Eject] to DUT.	DUT ejects its media.
Tuner Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.			
	Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
	11.1.8-1	Change the logical addresses of TE to 1, 3, and conduct the following tests. Execute the tuner control feature of DUT. If <Give Tuner Device Status> has been sent, return Digital service which was set in CDF. Send <Tuner Step Increment> from DUT.	DUT sends <Tuner Step Increment>.

Item		Required Test Method	Pass criateria
	11.1.8-2	Change the logical addresses of TE to 1, 3, and conduct the following tests. Execute the tuner control feature of DUT. If <Give Tuner Device Status> has been sent, return Digital service which was set in CDF. Send <Tuner Step Decrement> from DUT.	DUT sends <Tuner Step Decrement>.
	11.1.8-3	Send <Tuner Device Status> [Not Displaying Tuner] [Digital service set in CDF] to DUT.	DUT does not respond with <Feature Abort>.
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.8-1	Change the logical addresses of TE to 0, 1, 3, 4, 5 (logical addresses other than those of DUT), and conduct the following tests. Turn on the power of DUT, and select Digital service 1 set in CDF. Send <Select Digital Service> [Digital service 2 set in CDF] to DUT.	DUT changes to Digital service 2 set in CDF.
	11.2.8-2	Turn on the power of DUT, and select Digital service 1 set in CDF. Send <Select Digital Service> [Digital service 2 set in CDF] from TE (logical address 15) to DUT.	DUT ignores the message.
	11.2.8-3	Turn on the power of DUT, and select Digital service 1 set in CDF. Send <Select Digital Service> [Digital service 1 set in CDF] to DUT.	DUT ignores the message, and Digital service 1 set in CDF remains unchanged.
	11.2.8-4 (1.3b only)	Change the logical addresses of TE to 0, 1, 3, 4, 5 (logical addresses other than those of DUT), and conduct the following tests. Turn on the power of DUT, and select Analog service 1 set in CDF. Send <Select Analog Service> [Analog service 2 set in CDF] to DUT.	DUT changes to Analog service 2 set in CDF.
	11.2.8-5 (1.3b only)	Turn on the power of DUT, and select Analog service 1 set in CDF. Send <Select Analog Service> [Digital service 2 set in CDF] from TE (logical address 15) to DUT.	DUT ignores the message.
	11.2.8-6 (1.3b only)	Turn on the power of DUT, and select Analog service 1 set in CDF. Send <Select Analog Service> [Analog service 1 set in CDF] to DUT.	DUT ignores the message, and Analog service 1 set in CDF remains unchanged.

Item		Required Test Method	Pass criateria
	11.2.8-7	Change the logical addresses of TE to 0, 1, 3, 4, 5, and conduct the following tests. Turn on the power of DUT. Send <Tuner Step Increment> to DUT.	DUT increments the Digital service number received.
	11.2.8-8	Turn on the power of DUT. Send <Tuner Step Increment> from TE (logical address 15) to DUT.	DUT ignores the message.
	11.2.8-9	Change the logical addresses of TE to 0, 1, 3, 4, 5 (logical addresses other than those of DUT), and conduct the following tests. Turn on the power of DUT. Send <Tuner Step Decrement> to DUT.	DUT decrements the Digital service number received.
	11.2.8-10	Turn on the power of DUT. Send <Tuner Step Decrement> from TE (logical address 15) to DUT.	DUT ignores the message.
	11.2.8-11	Change the logical addresses of TE to 0, 1, 3, 4, 5, and conduct the following tests. Display the tuner on DUT. Send <Give Tuner Device Status> [Once] to DUT.	DUT returns <Tuner Device Status> using the service number of the currently displayed tuner.
	11.2.8-12	Display the tuner on DUT. Send <Give Tuner Device Status> [Once] from TE (logical address 15) to DUT.	DUT ignores the message.
	11.2.8-13	Display the tuner on DUT.	
		Send <Give Tuner Device Status> [On] to DUT.	DUT returns <Tuner Device Status> using the service number of the currently displayed tuner.
		Change Digital service of DUT.	DUT returns <Tuner Device Status> using the new service number.
		Send <Give Tuner Device Status> [Off]. Change Digital service of DUT.	DUT does not send <Tuner Device Status>.
Vendor Specific Commands Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.			
	Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
	11.1.9-1	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, 15, and conduct the following tests. Send <Give Device Vendor ID> to DUT.	DUT broadcasts <Device Vendor ID> using the appropriate ID.
	11.1.9-2 (1.3b only)	TE broadcasts <Report Physical Address>. TE broadcasts < Device Vendor ID> that is different from that of DUT. Set the DUT to send <Vendor Command>.	DUT does not send <Vendor Command>.

Item	Required Test Method	Pass criateria
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.9-1	Change the logical addresses of TE to 0, 1, 3, 4, 5, 15 of TE (logical addresses other than those of DUT), and conduct the following tests. Send <Give Device Vendor ID> to DUT.	DUT broadcasts <Device Vendor ID> using the appropriate ID.
11.2.9-2 (1.3b only)	HotPlug is asserted. Set DUT, so that Physical Address of TE can beset as 1.0.0.0. HotPlug is deasserted.	DUT broadcasts <Device Vendor ID>.
11.2.9-3 (1.3b only)	TE broadcasts <Report Physical Address>. TE broadcasts < Device Vendor ID> that is different from that of DUT. Set the DUT to send <Vendor Command>.	DUT does not send <Vendor Command>.
OSD Status Display Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.10-1	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, and conduct the following tests. Set DUT to a status in which OSD String can be displayed. Send <Set OSD String> [Display For Default Time] [Test String] to DUT.	DUT displays the message during the default time period, and then clears it.
11.1.10-2	Set DUT to a status in which OSD String can be displayed.	
	Send <Set OSD String> [Display Until Cleared] [Test String] to DUT.	The “Test String” message is displayed.
	After the “Test String” message has been displayed and a period of time exceeding the default time period has elapsed, send <Set OSD String> [Clear Previous Message] to DUT.	The OSD text is cleared.
11.1.10 -3	Set DUT to a status in which OSD String can be displayed.	
	Send <Set OSD String> [Display Until Cleared] [Test String] from TE (logical address 1) to DUT.	DUT displays the “Test String” message.
	Send <Set OSD String> [Display For Default Time] [Second String] from TE (logical address 2) to DUT.	DUT clears the previous message and display the “Second String” message.
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.10-1	Send <Set OSD String> [OSD String] to logical address 0 from DUT.	DUT provides the appropriate [OSD String] parameter, and sends <Set OSD String> [OSD String].

Item	Required Test Method	Pass criateria
Device OSD Name Transfer Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.11-1	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, and conduct the following tests.	
	Broadcast <Report Physical Address> [1.0.0.0].	DUT sends <Give OSD Name> to the appropriate address.
	After DUT has sent Give OSD Name, send <Set OSD Name> to DUT.	DUT recognizes TE as Test Device on the DUT menu.
11.1.11-2	Broadcast <Report Physical Address> [1.0.0.0] from TE (logical address 15).	DUT does not send <Give OSD Name>.
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.11-1	Change the logical addresses of TE to 0, 1, 3, 4, 5 of TE (logical addresses other than those of DUT), and take the following steps. Send <Give OSD Name> to DUT.	DUT sends <Set OSD Name> to the appropriate address.
11.2.11-2	Send <Give OSD Name> from TE (logical address 15) to DUT.	DUT ignores the message.
Device Menu Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 168) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.12-1	Change the logical addresses of TE to 1, 3, 4, 5, 13, 14, and conduct the following tests. Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> to DUT. Broadcast <Active Source>. Send <Menu Status> [Activated] to DUT. Press the remote control UP key on DUT.	When the key is pressed, DUT sends <USER Control>.
11.1.2-2	Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> from TE (logical address 15) to DUT. Broadcast <Active Source>. Send <Menu Status> [Activated] to DUT. Press the remote control UP key on DUT.	DUTdoes not send USER Control.
11.1.12-3	Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> to DUT. Broadcast <Active Source>. Send <Menu Status> [Activated] to DUT. Send <Menu Status> [Deactivated] from the current source device to DUT. Press the remote control UP key on DUT.	DUT does not send USER Control.

Item		Required Test Method	Pass criateria
	11.1.12-4	Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> to DUT. Broadcast <Active Source>. Execute the Device Menu Control feature of DUT.	DUT sends Menu Request [Activate] to the current active source device.
	11.1.12-5	Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> to DUT. Broadcast <Active Source>. Send <Menu Status> [Activated] to DUT. Stop the Device Menu Control feature of DUT.	DUT sends Menu Request [Deactivate] to the current source device.
	11.1.12-6	Display internal tuner or an external source not supported by CEC on DUT. Also, set DUT to the status in which the remote control keys can be transferred. Send <Menu Status> [Activated] to DUT. Press the remote control UP key on DUT.	USER Control is not sent.
	11.1.12-7	Set DUT to the status in which the remote control keys can be transferred. Send <Image View On> from TE (logical address 1) to DUT. Broadcast <Active Source> from TE (logical address 1). Send <Menu Status> [Activated] from TE (logical address 2). Press the remote control UP key on DUT.	USER Control is not sent.
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.12-1	Check that the DUT menu is not set to Active. Check that DUT is the current Active Source. Call Device Menu of DUT.	When Menu is called, DUT sends Menu Status [Activated].
	11.2.12-2	Call the DUT menu. Set DUT as the current Active Source. Call Device Menu of DUT.	When Menu is called, DUT sends Menu Status [Deactivated].
	11.2.12-3	Set DUT as the current Active Source. Send <Menu Request> [Activate] to DUT.	DUT sends <Menu Status> [Activated] or <Menu Status> [Deactivated].
	11.2.12-4	Set DUT as the current Active Source. Send <Menu Request> [Deactivate] to DUT.	DUT must send Menu Status [Activated] or Menu Status [Deactivated].
	11.2.12-5	Change the logical addresses of TE to 0, 1, 3, 4, 5 of TE (logical addresses other than those of DUT), and conduct the following tests. Set DUT as the current Active Source. Send <Menu Request> [Query] from TE to DUT.	DUT sends <Menu Status> [Activated] or <Menu Status> [Deactivated].

Item		Required Test Method	Pass criateria
	11.2.12-6	Set DUT as the current Active Source. Send <Menu Request> [Query] from TE (logical address 15).	DUT ignores the message.
	11.2.12-7	Set DUT as the current Active Source. Send <Menu Request> [Activate] to DUT. Send <User Control Pressed> using the following user control codes: Select, Up, Down, Left, Right After sending each of the user control codes, send <User Control Released> to DUT.	The DUT menu is called. The DUT menu responds to the message sent.
Remote Control Pass Through Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.			
	Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
	11.1.13-1	Set the logical address of TE to 1. Set the remote control of DUT to point at Recording Device. Press the Remote Control Key with which DUT sends to the Recording Device.	DUT sends <User Control Pressed> and then <User Control Released>.
	11.1.13-2	Set the logical address of TE to 4. Set the remote control of DUT to point at Recording Device. Press the Remote Control Key with which DUT sends to the DVD.	DUT sends <User Control Pressed> and then <User Control Released>.
	11.1.13-3	Set the logical address of TE to 3. Set the remote control of DUT to point at STB. Press the Remote Control Key with which DUT sends to STB.	DUT sends <User Control Pressed> and then <User Control Released>.
	11.1.13-4	Set the logical address of TE to 5. Set the remote control of DUT to point at Audio System. Press the Remote Control Key with which DUT sends to Audio System.	DUT sends <User Control Pressed> and then <User Control Released>.

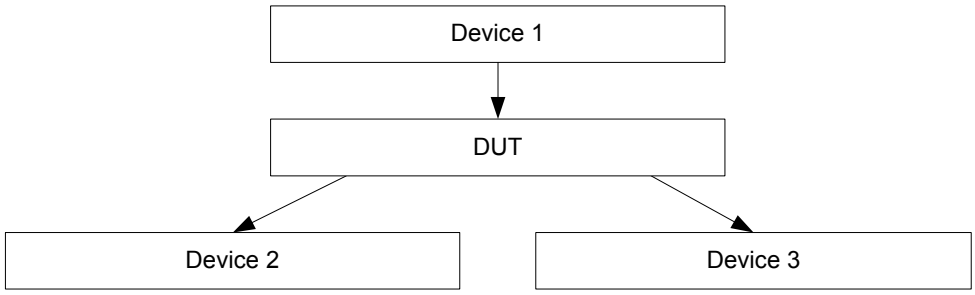
Item		Required Test Method	Pass criateria
	11.1.13-5	Select Device Type to which DUT can send Remote Control Key. <When Recording Devices are supported> Set TE to logical address 1. Broadcast <Report Physical Address> [2.0.0.0] from TE (logical address 2). Set the remote control of DUT to point at Recording Device. Press some of the Remote Control Keys with which DUT sends to Recording Device. <When DVDs are supported> Set TE to logical address 4. Broadcast <Report Physical Address> [2.0.0.0] from TE (logical address 8). Set the remote control of DUT to point at DVD. Press some of the Remote Control Keys with which DUT sends to DVD. <When STBs are supported> Set TE to logical address 3. Broadcast <Report Physical Address> [2.0.0.0] from TE (logical address 6). Set the remote control of DUT to point at STB. Press some of the Remote Control Keys with which DUT sends to STB.	User Control Pressed and then User Control Released are sent. In addition, they are not sent to a multiple number of Recording Devices, DVDs or STBs.
	11.1.13-6 (1.2a only)	Send <Image View On> to DUT. Broadcast <Active Source>. Press the Remote Control Key with which DUT transfers to Recording Device. Before releasing the key, transfer DUT to the standby mode.	DUT sends <User Control Pressed>. In addition, before transferring to the standby status, it sends <User Control Released>.
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.13-1	Send <User Control Pressed> of the key set in CDF to DUT. Send <User Control Released> to DUT. Change the key, and repeat the above steps.	DUT operates in such a way that the Remote Control Key is pressed inside (by DUT itself).
	11.2.13-2 (1.2a only)	Among the keys set in CDF, use the key set first to send <User Control Pressed> five times in succession (with no <User Control Released> in between). Finally, send <User Control Released> to DUT.	After receiving <User Control Released>, DUT stops the Remote Control Key operation.

Item	Required Test Method	Pass criateria
Give Device Power Status Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.14-1	Turn on the power of DUT. Send <Give Device Power Status> to DUT.	DUT sends <Report Power Status> [On].
11.1.14-2	Set DUT to the standby mode. Send <Give Device Power Status> to DUT.	DUT sends <Report Power Status> [Standby].
Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
11.2.14-1	Turn on the power of DUT. Send <Give Device Power Status>.	DUT sends <Report Power Status> [On].
11.2.14-2	Set DUT to the standby mode. Send <Give Device Power Status> to DUT.	DUT sends <Report Power Status> [Standby].
System Audio Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under “CDF SETTING” (see page 175) are performed.		
Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
11.1.15-1	TE(Logical address5) broadcasts< Report Physical Address> [1.0.0.0]. TE(Logical address1) broadcasts <Report Physical Address> [1.1.0.0]. TE(Logical address1) sends <Image View On> to DUT. TE(Logical address1) broadcasts <Active Source> [1.1.0.0]. Set System Audio Mode of DUT On.	DUT sends <System Audio Mode Request> [1.1.0.0] to TE(Logical address5).
11.1.15-2	TE(Logical address5) sends <Set System Audio mode> [On] to DUT. Change voleme of DUT by the DUT’s local or remote control.	DUT sends <User Control Pressed> [Volume UP/Volume Down] to TE. DUT does not change the volume level of DUT.
11.1.15-3	TE(Logical address5) sends< Set System Audio mode> [On] to DUT. Change mute status of DUT by the DUT’s local or remote control.	DUT sends <User Control Pressed> [Mute] to TE. DUT does not change the mute status of DUT.
11.1.15-4	TE(Logical address5) broadcasts <Report Physical Address>. Confirm the DUT status is standby. Power on the DUT.	DUT sends<Give System Audio Status> to TE.
11.1.15-5	TE(Logical address5) sends <Set System Audio mode>[On] to DUT. Invoke the DUTto turn off System Audio Control.	DUT sends <System Audio Mode Request> with no operands to TE.

Item		Required Test Method	Pass criateria
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.15-1	Change the logical addresses of TE to 0, 3 and conduct the following tests. TE sends <System Audio Mode Request> [0.0.0.0] to DUT.	DUT broadcasts <Set System Audio Mode> [On].
	11.2.15-2	Set the logical address of TE to 0. Invoke the DUT to initiate the System Audio modeto on.	DUT sends <Set System Audio Mode> [On] to TE. DUT broadcasts <Set System Audio Mode> [On].
	11.2.15-3	Set the logical address of TE to 0. Invoke the DUT to initiate the System Audio modeto on. TE respondss < Feature Abort > to the message <Set System Audio Mode>.	DUT sends <Set System Audio Mode> [On] to TE. DUT does not broadcast <Set System Audio Mode> [On].
	11.2.15-4	TE sends <System Audio modeRequest> [0.0.0.0] to DUT. TE sends <Give System Audio Status> to DUT.	DUT broadcasts <Set System Audio Mode> [On]. DUT sends <System Audio Mode Status> [On] to TE.
	11.2.15-5	TE sends System Audio modeRequest[0.0.0.0] to DUT. TE sends <System Audio modeRequest> with no operands to DUT.	DUT broadcasts <Set System Audio Mode> [On]. DUT broadcasts <System Audio Mode Status> [OFF].
	11.2.15-6	TE sends <System Audio modeRequest> [0.0.0.0] to DUT. Change DUT to standby status.	DUT broadcasts <Set System Audio Mode> [On]. DUT broadcasts <System Audio Mode Status> [OFF].
	11.2.15-7	Confirm the System Audio Mode of DUT is Off. TE sends <Give System Audio Status> to DUT.	DUT sends <System Audio Mode Status> [Off] to TE.
	11.2.15-8	TE sends <System Audio modeRequest> [0.0.0.0] to DUT. TE sends <User Control Pressed> [Mute] and <User Control Released> to DUT.	DUT broadcasts <Set System Audio Mode> [On]. DUT changes to mute status.
	11.2.15-9	TE sends <System Audio modeRequest> [0.0.0.0] to DUT. TE sends <Give Audio Status> to DUT.	DUT broadcasts <Set System Audio Mode> [On]. DUT sends <Report Audio Status> [Audio Status] to TE.
	11.2.15-10	Set the logical address of TE to 5. TE broadcasts <Report Physical Address>. Confirm the DUT is standby status. Power on the DUT.	DUT sends <Give System Audio ModeStatus> to TE.

Item		Required Test Method	Pass criateria
	11.2.15-11	Set the logical address of TE to 5. TE sends <Set System Audio Mode> [On] to DUT. Change voleme of DUT by the DUT's local or remote control.	DUT sends <User Control Pressed> [Volume up / down] to TE. DUT does not change the volume level of DUT.
	11.2.15-11	Set the logical address of TE to 5. TE sends <Set System Audio Mode> [On] to DUT. Change mute status of DUT by the DUT's local or remote control.	DUT sends <User Control Pressed> [Mute] to TE. DUT does not change the mute status of DUT.
Audio Rate Control Items 11.1 pertain to the testing of TV sets, and items 11.2 pertain to the testing of devices other than TV sets. Only the tests for the Device Type which was set by Device Type under "CDF SETTING" (see page 175) are performed.			
	Items 11.1 pertain to the testing of TV sets. Set TE to Repeater, and connect the HDMI input of DUT to the output of TE.		
	11.1.16-1	Set the logical address of TE to 1. Start the Audio Rate Control function of DUT.	DUT sends <Set Audio Rete> to TE at least once every 2 seconds.
	Items 11.2 pertain to the testing of devices other than TV sets. Connect the HDMI output of DUT to the input of TE.		
	11.2.16-1	Confirm DUT is playing audio media. TE sends <Set Audio Rate> [Audio Rate] to DUT in the below sequence at least once every 2 seconds. Sequence 1:[Audio Rate] = 1 →2→3→0 Sequence 2:[Audio Rate] = 4→5→6→0	DUT responds Ack to all the <Set Audio Rate> in either sequence 1 or 2.
CEC Switch Items 11.3 pertain to the testing of CEC switches. Only the tests for the Device Type which was set by Device Type under "CDF SETTING" (see page 175) are performed.			
	11.3.1-1	Connect the TE output to any slave position of DUT. (Device 2 or Device 3) Select slave position 1 as the DUT port. Broadcast <Active Source [Device 2 Physical address]>.	The DUT does not switch.
	11.3.1-2	Connect the TE output to any slave position of DUT. (Device 2 or Device 3) Select slave position 1 as the DUT port. Broadcast <Active Source [Device 3 Physical address]>.	The DUT switches to position 2.
	11.3.1-3	Connect the TE output to any slave position of DUT. (Device 2 or Device 3) Select slave position 1 as the DUT port. Broadcast <Set Stream Path [Device 2 Physical address]>.	The DUT does not switch.
	11.3.1-4	Connect the TE output to any slave position of DUT. (Device 2 or Device 3) Select slave position 1 as the DUT port. Broadcast <Set Stream Path [Device 3 Physical address]>.	The DUT does not switch.

	11.3.1-5	Connect the TE input to DUT. (Device 1) (Set the physical address of DUT to 1.0.0.0.) Select slave position 1 as the DUT port. Broadcast <Routing Change> [0.0.0.0] [1.0.0.0] (from TE). * Routing Change [0.0.0.0][1.1.0.0] applies with CTS 1.2a. However, since this has been modified to Routing Change [0.0.0.0][1.0.0.0] in CTS 1.3a, CTS 1.3a is complied with only by items 11.3.1-5.	The DUT broadcasts a <Routing Information> [1.0.0.0].
	11.3.1-6	Connect the DUT to the TE input. (Device 1) (Set the physical address of DUT to 1.0.0.0.) Select slave position 1 as the DUT port. Broadcast Routing Information [1.0.0.0].	The DUT broadcasts a <Routing Information> [1.1.0.0].
	11.3.2-1	Connect the TE input to DUT. (Device 1) (Set the physical address of DUT to 1.0.0.0.) Select slave position 1 as the DUT port. Change the DUT port to slave position 2.	Routing Change [1.1.0.0] [1.2.0.0] is broadcast.



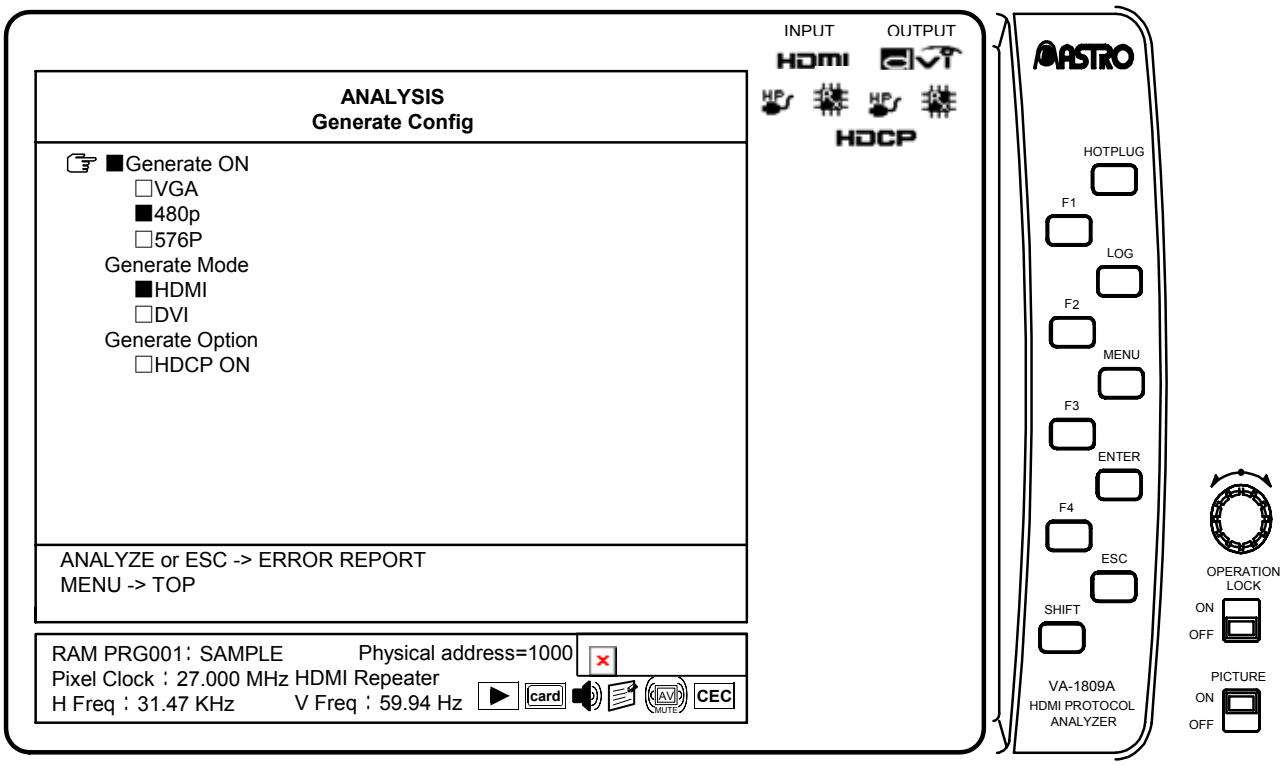
CEC switch connection diagram

Item	Required Test Method	Pass criateria
Invalid Massage When DUT is a regular TV set, set TE to Repeater, connect the HDMI input of DUT to the output of TE; when DUT is any other device, connect the HDMI output of DUT to the input of TE. Then conduct the tests.		
12-1	For the message which has been set in CDF to be broadcast, send it as a directly addressed message to the DUT.	The DUT ignores the message.
12-2	For the message which has been set in CDF and to be directly addressed, send it as a broadcast message.	The DUT ignores the message.
12-3	For every message that DUT does not support and and should only be accepted when directly addressed, send it as a broadcast message.	The DUT ignores the message.
12-4	For the message which has been set in CDF and to be directly unsupported addressed, send it as a broadcast message.	The DUT ignores the message.

4.27 Generate Config

VA-1809A outputs test signal even without input signal.

While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select General Config.



The setting item of Generate Config is listed below.

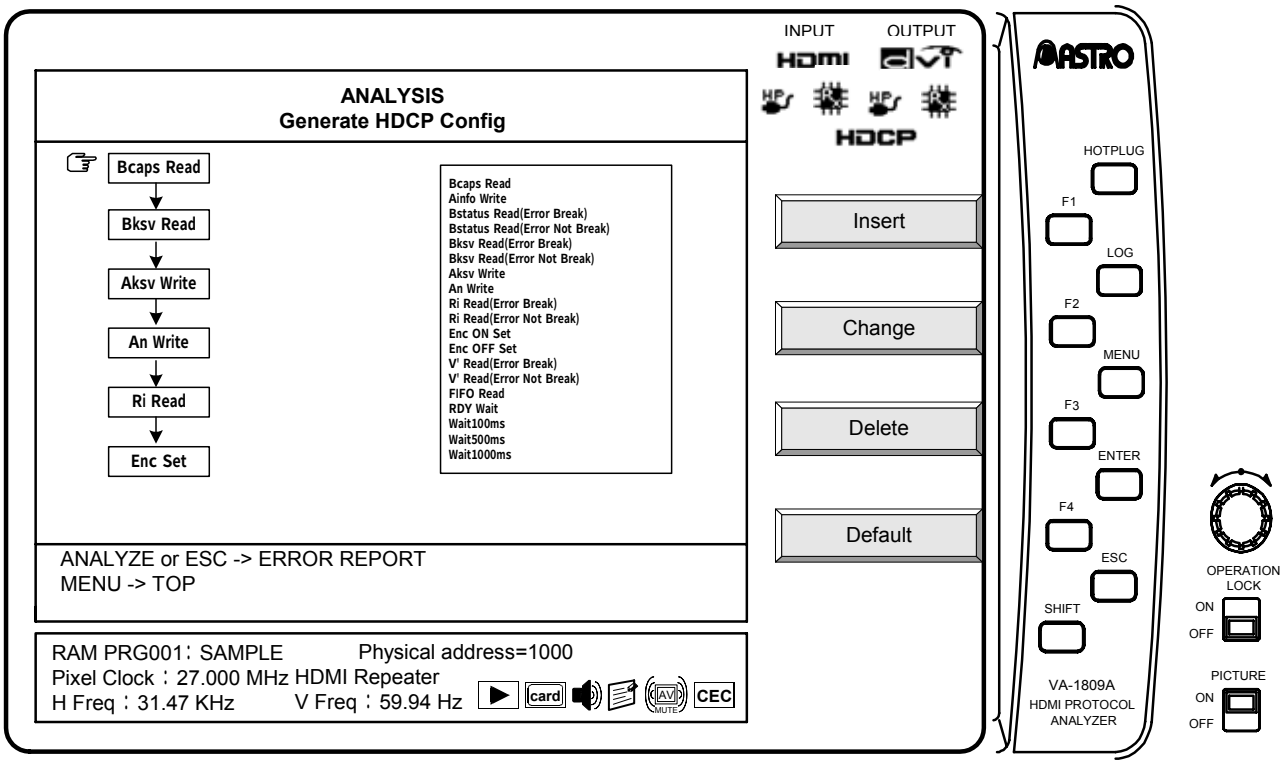
Item		Description
Generate ON		Output test signal.
	VGA	Change test signal to VGA.*1 (Default)
	480P	Change test signal to 480P. *1
	576P	Change test signal to 576P. *1
	HDMI	Change test signal to HDMI output.
	DVI	Change test signal to DVI output.
	HDCP ON	Change test signal to have HDCP (On).*2

*1: Either VGA, 480P & 576P is output from one unit.
If you would like to change output timing (from VGA to 480P & 576P or vice versa), please ask ASTRODESIGN.

*2: it is output with the sequence that is set in Generate HDCP Config.

4.28 Generate HDCP Config

Set HDCP sequence of output signal of VA-1809A.
While the on-screen display is blank: Select [ANALYZE] ANALYSIS.
→ Use the [Rotary key] to select General HDCP Config.



Setting item of HDCP sequence is listed below.

Item	Description
Bcaps Read	Bcaps is read.
Ainfo Write	When 1.1FEATURES of Read Data of Bcaps is 1, 1 is written in bit 2 in Ainfo.
Bstatus Read(Error Break)	Bstatus is read. If the value that is against the standard is read, error appears.
Bstatus Read(Error Not Break)	Bstatus is read. Even if the value that is against the standard is read, error does not appear and continue operating.
Bksv Read(Error Break)	Bksv is Read. If the value that is against the standard is read, error appears.
Bksv Read(Error Not Break)	Bksv is read. Even if the value that is against the standard is read, error does not appear and continue operating.
Aksv Write	Aksv is written.
An Write	An is written.
Ri Read(Error Break)	Ri is read. If the value that is against the standard is read, error appears.

Ri Read(Error Not Break)	Ri is read. Even if the value that is against the standard is read, error does not appear and continue operating.
Enc ON Set	Encryption is set to be ON. If minimum sequence is not performed, there is possibility that Encryption is not set to be ON.
Enc OFF Set	Encryption is set to be OFF.
V' Read(Error Break)	V' is read. If the value that is against the standard is read, error appears.
V' Read(Error Not Break)	V' is read. Even if the value that is against the standard is read, error does not appear and continue operating.
FIFO Read	KSV FIFO is read.
RDY Wait	KSV FIFO Ready Bit is repeatedly read unit it becomes “Set”. When KSV FIFO Ready Bit becomes “Set”, it goes to the next process.
Wait100ms	Wait 100ms.
Wait500ms	Wait 500ms.
Wait1000ms	Wait 1000ms,

Caution

If minimum process is not performed, HDCP may not be worked.

Insert **F1**

Insert the sequenct to the position of Arrow.

Change **F2**

Change the sequence of the position of Arrow.

Delete **F3**

Delete the sequence of the position of Arrow.

Default **F4**

Read default sequence.

There are three kinds of default sequence.

Sequence1 (HDCP Standard)	Sequence2 (HDCP 1st Authentication again)	Sequence3 (HDCP 2nd Authentication again)
Bcaps Read	Bcaps Read	Bcaps Read
Ainfo Write	Ainfo Write	Ainfo Write
An Write	An Write	An Write
Aksv Write	Aksv Write	Aksv Write
Bksv Read	Bksv Read	Bksv Read
Wait 100ms	Wait 100ms	Wait 100ms
Ri Read	Ri Read	Ri Read
Enc Set	Bcaps Read	Enc Set
RDY Wait	Ainfo Write	RDY Wait

Bstatus Read	An Write	Bstatus Read
FIFO Read	Aksv Write	FIFO Read
V' Read	Bksv Read	V' Read
	Wait 100ms	Bcaps Read
	Ri Read	Ainfo Write
	Enc Set	An Write
	RDY Wait	Aksv Write
	Bstatus Read	Bksv Read
	FIFO Read	Wait 100ms
	V' Read	Ri Read
		Enc Set
		RDY Wait
		Bstatus Read
		FIFO Read
		V' Read

4.29 Other functions

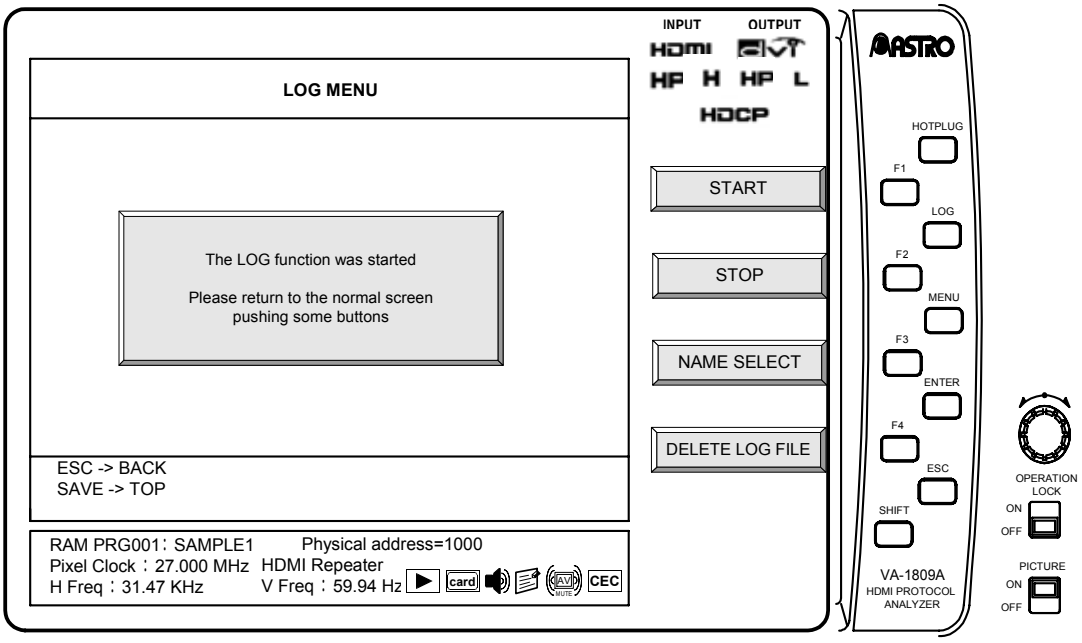
4.29.1 Hot plug function

The hot plug status can be changed by pressing the HOTPLUG button.
The hot plug function can be used when the measurement results are displayed using the ANALYZE button.
For the HOTPLUG button settings, refer to “6.3.5 HOT PLUG MODE” on page 241.

4.29.2 Log function

In the VA-1809A, this function makes it possible to apply a trigger in the HDMI input status and import the measurement results on a CF card as a log. There are four kinds of logs: logs for the DDC line monitor, logs for the CEC line monitor, logs for the HDCP Repeater Sequence, and analysis data logs. They can be captured simultaneously.
The data in each log is saved as a text file.

LOG Moves to the Log screen



* For details on the log import trigger settings, refer to “6.3.2 ANALYSIS & LOG TRIGGER” on page 241.

* For details on the log data structure, refer to “8.2 Log data structure” on page 304.

START F1

This function key starts loading a log.

STOP F2

This function key stops loading a log.

NAME SELECT F3

This function key changes the name of a log file.

* A new file name must be set before acquiring a log.
* After setting the name in NAME SELECT, press the SAVE button. If ESC is pressed, the setting is not reflected.

DETELE LOG FILE F4

This function key deletes a log file. Select the log file you want to delete with the rotary key, and then delete it.

Presented below is an outline of each type of log file.

Log file	Extension	Description
ANALYSIS DATA	.log	All data to be captured by the ANALYSIS item except for information relating to the DDC monitor and CEC can be captured in these logs. The log capture times are also noted in the logs.
HDCP Repeater Sequence	.hdc	The information to be captured by the HDCP Repeater Sequence Check area of the ANALYSIS item can be captured as these logs.
DDC line monitor	.dcl	The information to be captured by the DDC Line Monitor area of the ANALYSIS item can be captured as these logs. The log capture times are also noted in the logs.
CEC line monitor	.cel	The information to be captured by the CEC Line Monitor area of the ANALYSIS item can be captured in the HEX display status in these logs.

* Log files can be referenced from the text editor of the PC, etc.
* Before taking off the card, finish capturing LOG data. After that, press ENTER while and confirm the card icon turns off before taking off the card.
* If the card is taken off without doing the above procedure, the LOG data may not be captured correctly.

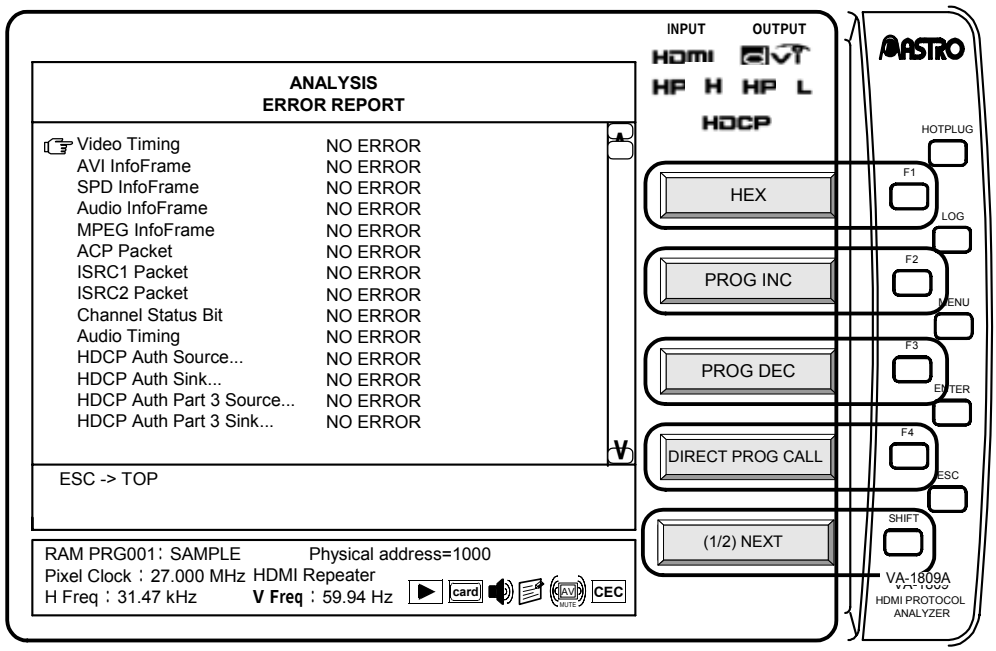
5 Simple setup

5.1 Setting the VA-1809A's HDMI equipment performance using the internal programs with the default settings

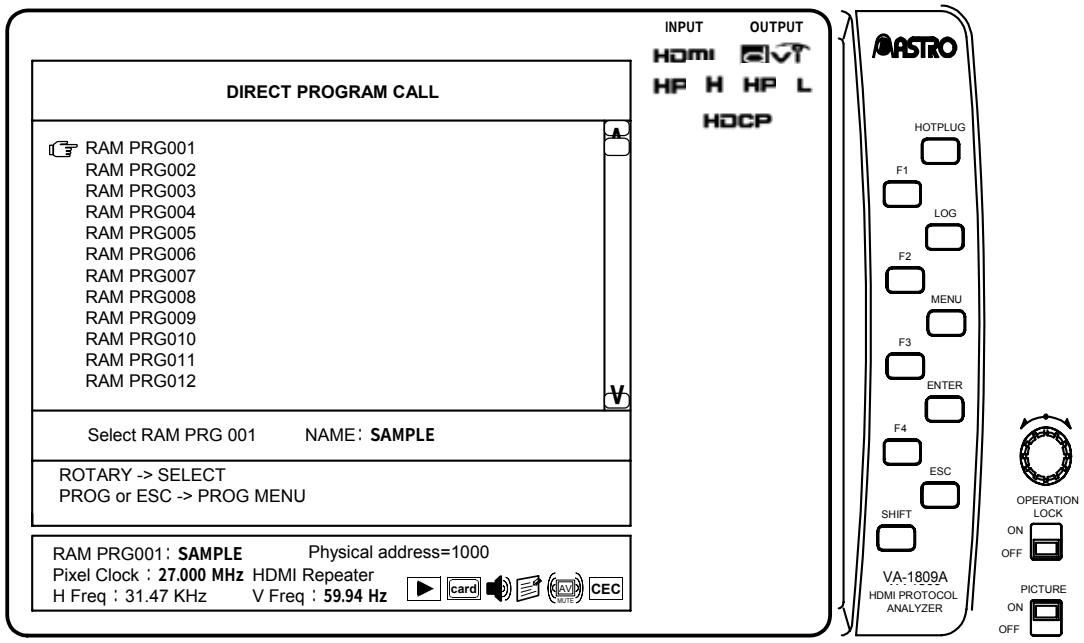
The VA-1809A can be made to switch between operating as a receiver (monitor) and as a repeater by using the internal programs with the default settings. It is also possible to set the performance (supported TV formats and sound) of the VA-1809A as a receiver using a program.
Select the number of the program to be set from the ones listed below, and load the program by following the steps below.

5.1.1 Loading the programs

(1) Press the [ANALYZE] button. The key menu appears as shown below.



(2) Press DIRECT PROGRAM CALL F4 on the key menu. The following screen appears.



(3) From the list, select the program data to be loaded.

* The cursor is moved using the Rotary key, and the selection is entered by pressing the Rotary key or ENTER.
* Select a program from the list of programs in “5.1.2 Internal programs with default settings” below.

(4) The program is now loaded.

* PRG 001 is loaded as the default setting.

5.1.2 Internal programs with default settings

The default settings in the internal programs can be used as indicated below.

■ For use as an xvYCC- or 12-bit-compatible receiver which can receive multiple numbers of formats:

→ RAM PRG 001

■ For use as an xvYCC- or 12-bit-compatible repeater which can receive multiple numbers of formats:

→ RAM PRG 002

■ For use as an xvYCC-compatible receiver

→ RAM PRG 003

■ For use as a 12-bit-compatible receiver

→ RAM PRG 004

■ Setting the audio reception performance to PCM, 2 channels

→ RAM PRG 005

■ Setting the audio reception performance of to PCM, 8 channels

→ RAM PRG 006

■ Use as a receiver (monitor) capable of receiving multiple formats

→ RAM PRG 007

■ Use as a repeater capable of receiving multiple formats

→ RAM PRG 008

■ Use as a DVI monitor

→ RAM PRG 009

■ Use as an HDMI Ver.1.0 monitor

→ RAM PRG 010

* When a program with the default settings is changed and the resulting program with these changes is saved under the same program number, the old program will be overwritten.
* The VA-1809A has a front 2-channel audio output capability. For this reason, the audio signals of two channels will be output to the speaker even if 8-channel audio signals are supplied.
* For details on EDIDs, refer to “8.1 Internal data” on page 280.

A list of the internal programs is provided below.

Video Format

Internal program	001	002	003	004	005	006	007	008	009	010
720×480p @ 59.94/60Hz	○	○	○	○	○	○	○	○	-	○
1920×1080i @ 59.94/60Hz	○	○	○	○	○	○	○	○	-	○
1280×720p @ 59.94/60Hz	○	○	○	○	○	○	○	○	-	○
640×480p @ 59.94/60Hz	○	○	○	○	○	○	○	○	-	○
1920×1080p @ 59.94/60Hz	○	○	○	○	○	○	○	○	-	○
1440×480i @ 59.94/60Hz	○	○	○	○	-	-	○	○	-	-
720×576p @ 50Hz	○	○	○	○	○	○	○	○	-	○
1920×1080i @ 50Hz	○	○	○	○	○	○	○	○	-	○
1280×720p @ 50Hz	○	○	○	○	○	○	○	○	-	○
1920×1080p @ 50Hz	○	○	○	○	○	○	○	○	-	○
1440×576i @ 50Hz	○	○	○	○	-	-	○	○	-	-
720×480p-w @ 59.94/60Hz	○	○	○	○	-	-	○	○	-	-
1440×480i-w @ 59.94/60Hz	○	○	○	○	-	-	○	○	-	-
720×576p-w @ 50Hz	○	○	○	○	-	-	○	○	-	-
1440×576i-w @ 50Hz	○	○	○	○	-	-	○	○	-	-

Audio Format

Internal program	001	002	003	004	005	006	007	008	009	010
Linear PCM 8 ch	○	○	○	○	-	○	○	○	-	○
Linear PCM 2 ch	-	-	-	-	○	-	○	○	-	○
AC-3	○	○	○	○	-	-	○	○	-	-
MPEG1 (Layers 1 & 2)	○	○	○	○	-	-	○	○	-	-
MP3 (MPEG1 Layer 3)	-	-	○	-	-	-	○	○	-	-
MPEG2 (multichannel)	○	○	○	○	-	-	○	○	-	-
AAC	○	-	-	○	-	-	○	○	-	-
DTS	○	○	○	○	-	-	○	○	-	-
ATRAC	-	○	-	-	-	-	○	○	-	-
One Bit Audio	○	○	○	○						
DolbyDigital	○	○	○	○						
DTS-HD	○	○	○	○						
MAT (MLP)										
DST										
WAM Pro										

* For details on the audio sample rate, sample size and channels, refer to the EIA/CEA-861-D standard.

5.2 Connecting the signal source, and displaying the HDMI input images on the LCD screen

After executing the steps in “5.1 Setting the VA-1809A’s HDMI equipment performance using the internal programs with the default settings” on page 220, refer to “2.1 Example of connections when using the VA-1809A as a receiver (monitor)” on page 11, and connect the DVD player or other signal source to the HDMI input connector on the VA-1809A.
The images output from the DVD player appear on the unit’s LCD screen while the sound output is delivered through its speaker.

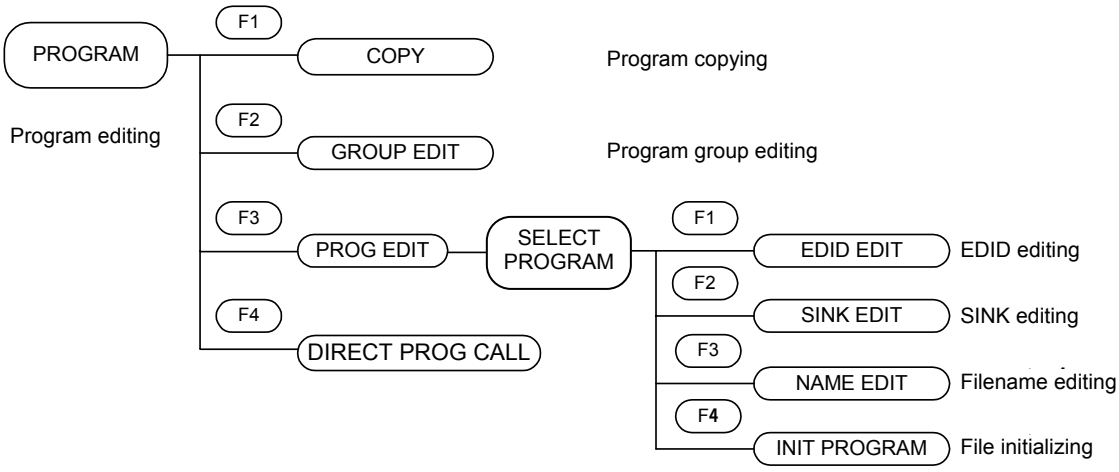
6 Detailed setup

6.1 PROGRAM (HDMI equipment performance settings)

The performance information of the HDMI receiver is stored in the EDID and HDCP registers and relayed when this information is read by the HDMI transmitter. By rewriting this performance information in the VA-1809A, various kinds of monitors can be simulated.
The data can be registered as programs and stored on a CF card.
This section describes the procedures from creating programs to executing the program data.

6.1.1 Creating programs and groups

The program data creation screen is displayed when the PROGRAM button is pressed while the on-screen display is blank.
The menu tree is as shown below.



■ Copying programs

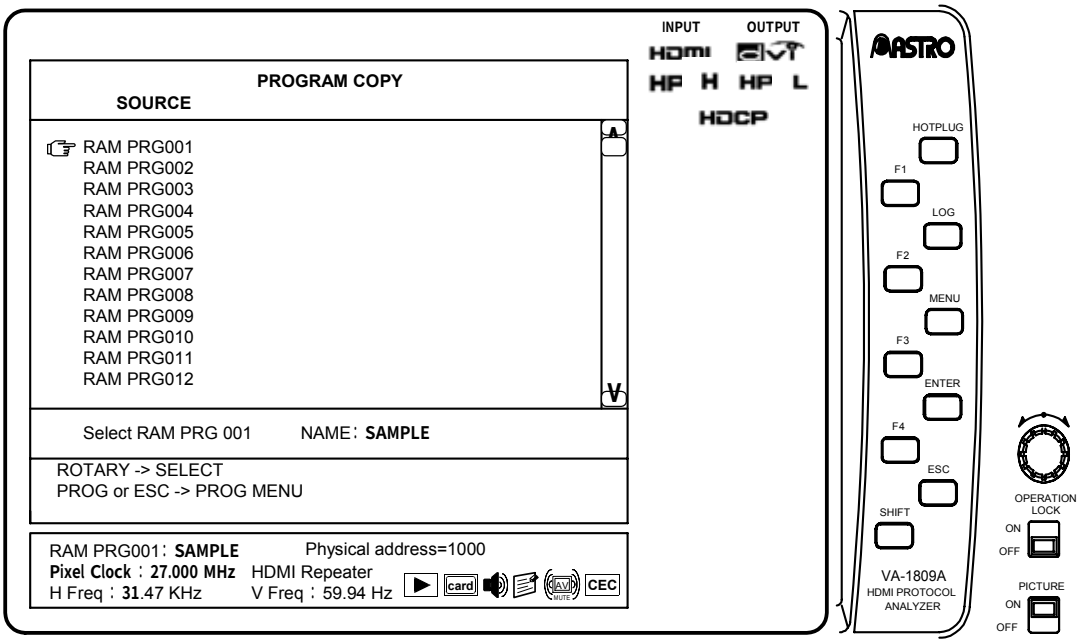
The procedure for creating a new program using an existing program or internal program is set forth below.

While the on-screen display is blank: Select [PROGRAM] PROGRAM MENU → [F1] COPY.

* First, perform these steps. All subsequent operation displays have been omitted.

(1) Selecting the editing source program

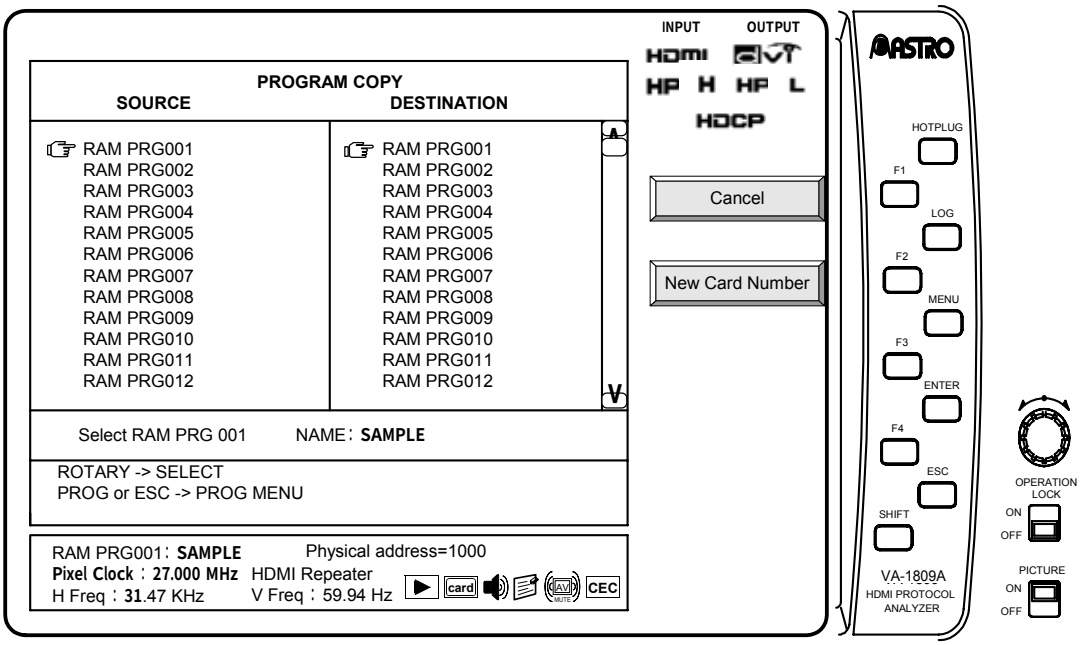
→ Use the [Rotary key] to select the editing source program.

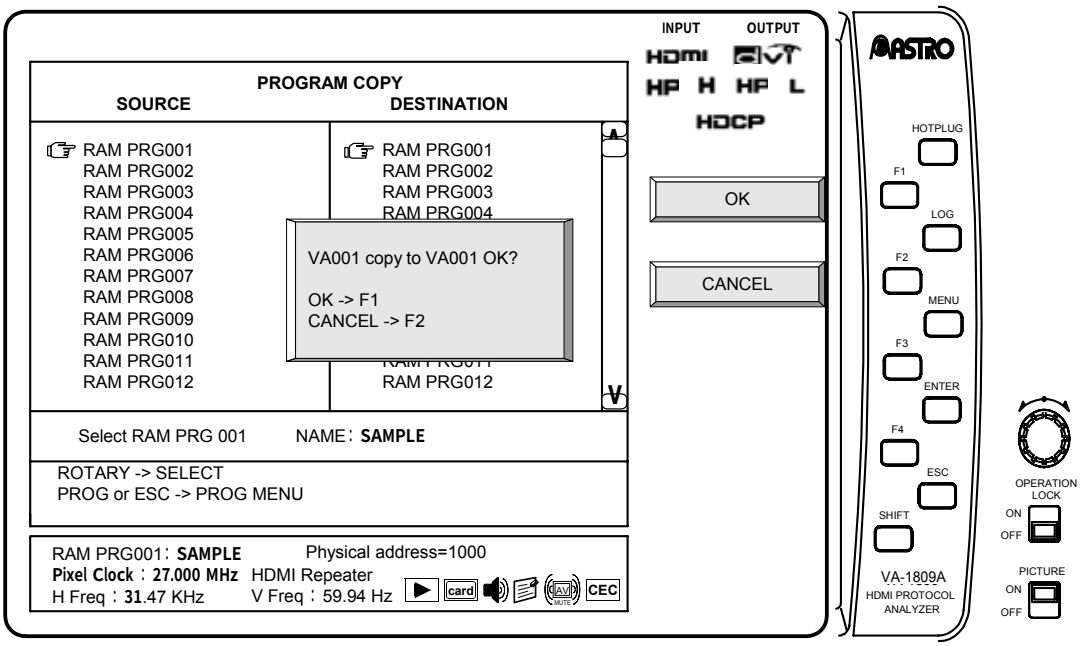


(2) Saving the copied data

1) Saving the data in an existing program

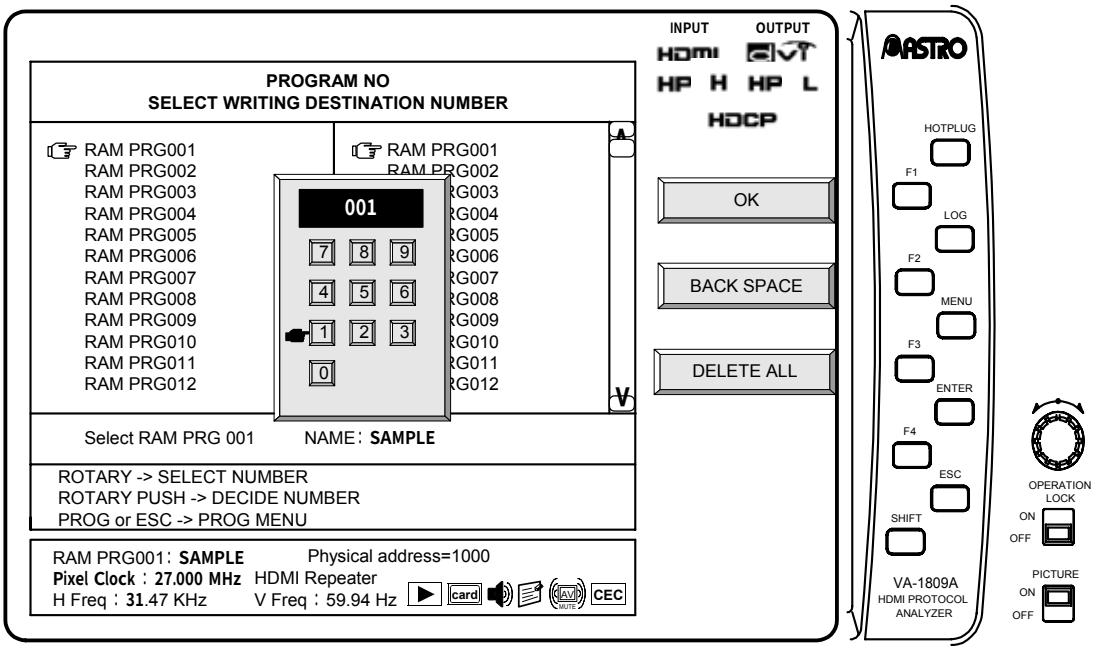
→ Use the [Rotary key] to select the program to be overwritten
→ Select [F1] OK or [F2] CANCEL.

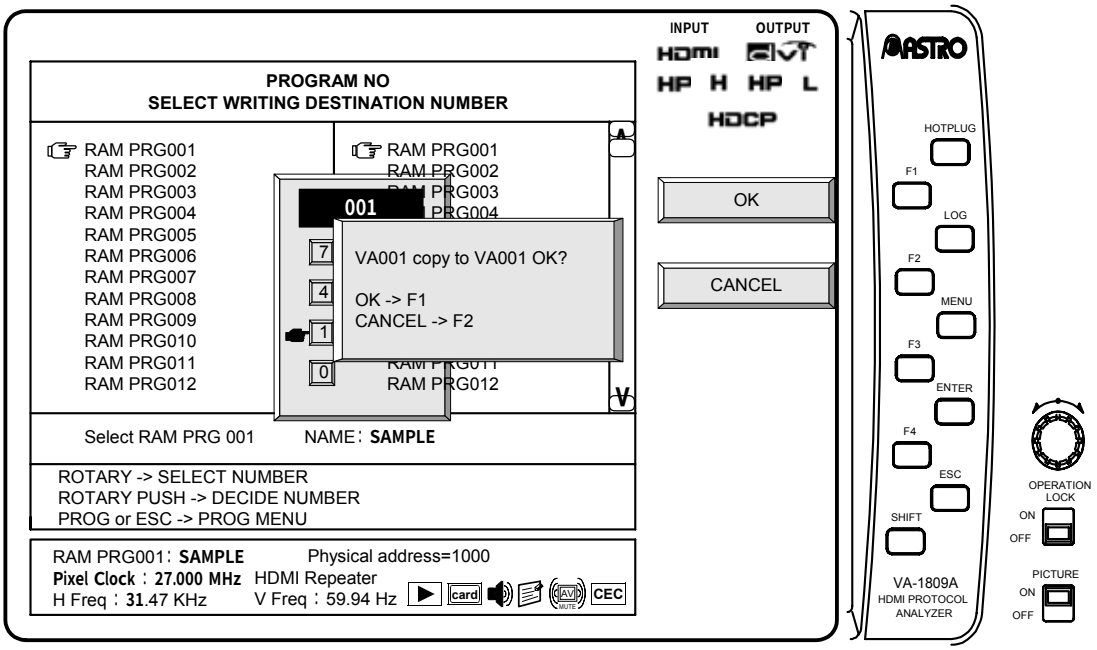




2) Saving data in a program with a new number

→ F2 New Card Number
→ Use the Rotary key to select a 3-digit program number
→ F1 OK → F1 OK or F2 CANCEL

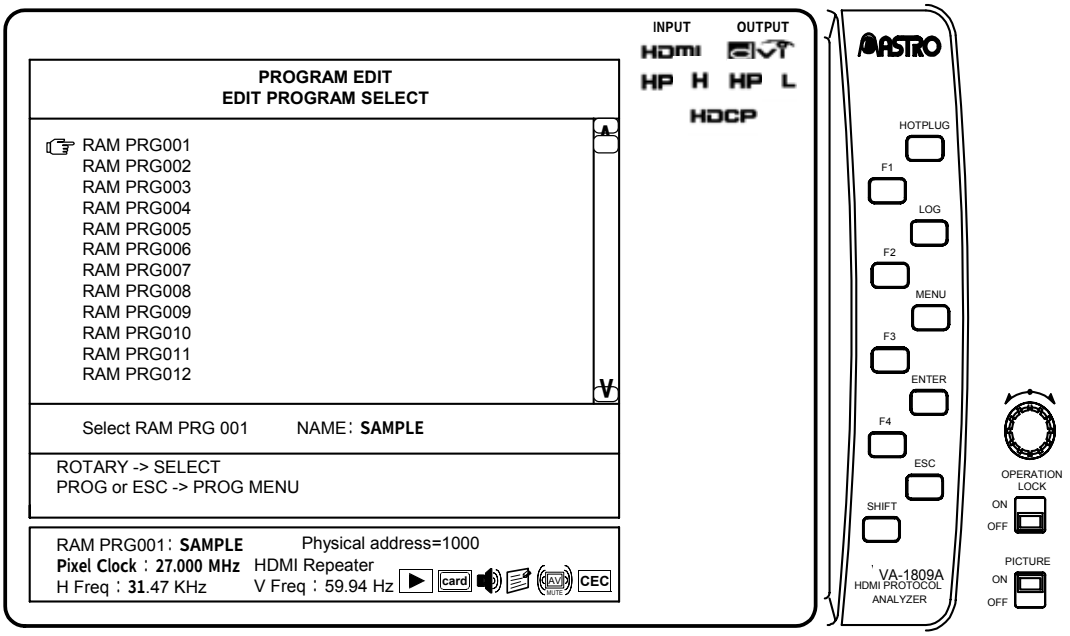


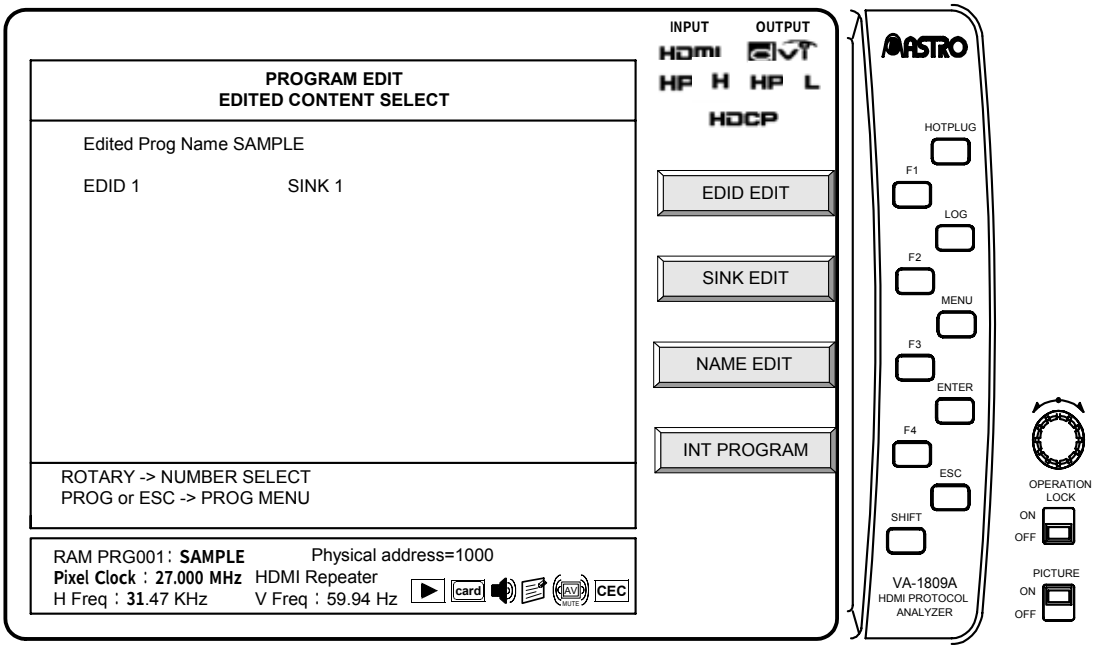


■ Editing programs (SINK, EDID, filenames)

While the on-screen display is blank: Select [PROGRAM] PROGRAM MENU
→ [F3] PROGRAM EDIT
→ Use the [Rotary key] to select the editing source program.

* First, perform these steps. All subsequent operation displays have been omitted.

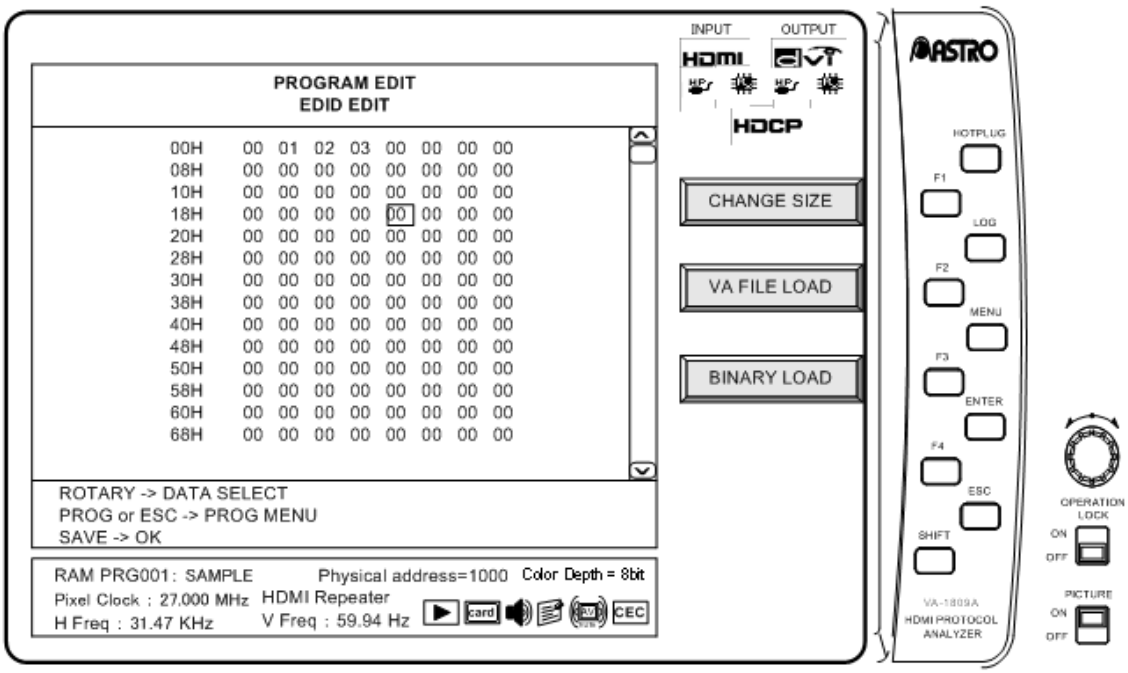




(1) EDID editing

With the EDID setting, the EDID register values for the 0xA0 address of the device connected to the DDC line of the VA-1809A receiver can be changed.

→ [F1] EDID EDIT → Use the [Rotary key] to select the address to be edited → Use the [Rotary key] to change the data. → [SAVE] OK



CHANGE SIZE [F1]

Change EDID data size.

VA FILE LOAD [F2]

Reads the file that is saved in a CF card made by VA-1809A as EDID data.

BINARY LOAD [F3]

Reads the file in a CF card as EDID data.

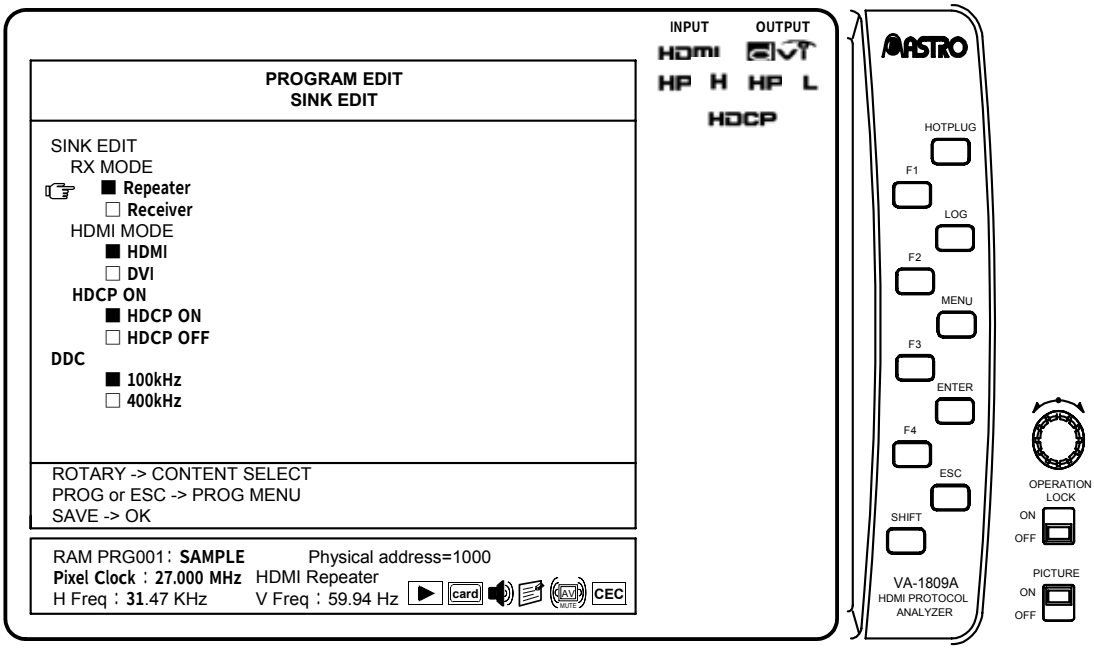
Caution

EDID data should be stored in the ASTRO folder in a CF card.
The data size to be read is up to 2048 byte.

(2) Editing SINK of one of the programs

With the SINK setting, the Bcaps register values for the 0x40 offset address and 0x74 address of the device connected to the DDC line of the VA-1809A receiver can be changed.

→ F2 SINK EDIT → Use the Rotary key to select the item to be set.
→ Press the Rotary key or ENTER. → Change the check marks.



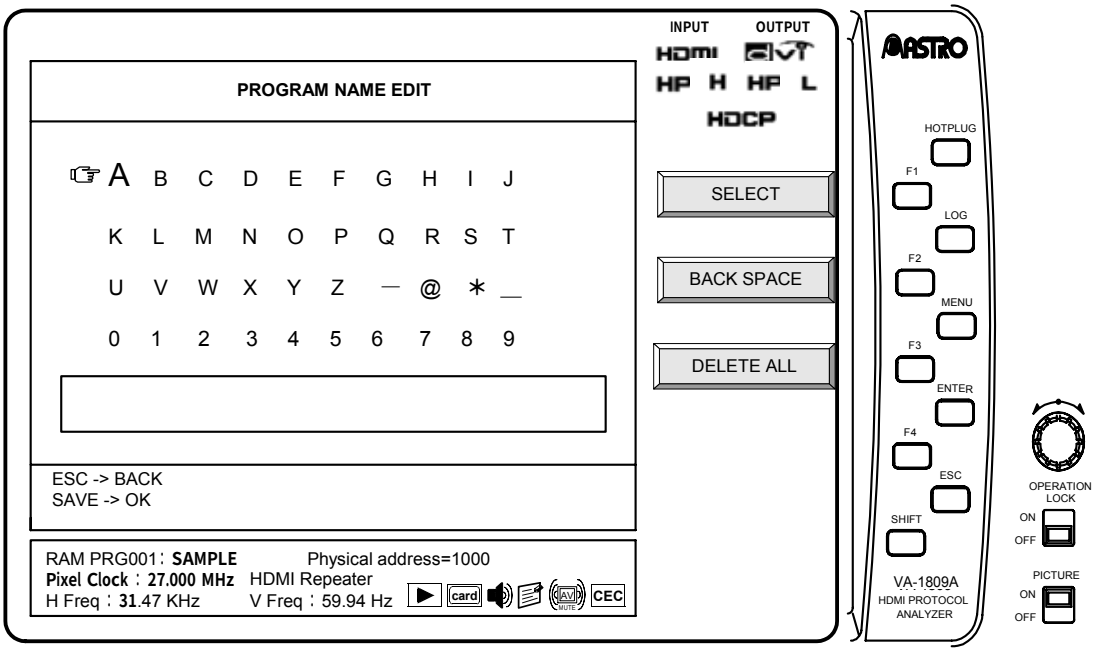
Details on the items are provided below.

Item	Details
Repeater	The VA-1809A is made to serve as a repeater.
Receiver	The VA-1809A is made to serve as a receiver (monitor).
DVI	The VA-1809A is made to serve as a DVI monitor (repeater).
HDMI	The VA-1809A is made to serve as an HDMI monitor (repeater).
HDCP ON	The VA-1809A is made to serve as a monitor (repeater) which supports HDCP.
HDCP OFF	The VA-1809A is made to serve as a monitor (repeater) which does not support HDCP.
100kHz	The DDC line of the VA-1809A is set to 100 kHz.
400kHz	The DDC line of the VA-1809A is set to 400 kHz.

* No signals are output from the HDMI output and COAX output connectors when the VA-1809A is used as a receiver (monitor).
* No sound can be input when the VA-1809A is used as a DVI monitor (repeater).
* No signals can be output from the VGA output connector if HDMI video signals have been input with HDCP when HDCP is not supported.
* To save this program in the CF card, press the SAVE button.
* To load saved data, the execution mode must be changed to PROGRAM MODE. Refer to “6.3.3 ANALYSIS MODE” on page 243.
* To load saved data, refer to “6.1.2 Executing programs (LOAD)” on page 234.

(3) Editing the filename of one of the programs

→ F3 NAME EDIT → Use the Rotary key to edit the filename.
→ SAVE OK



■ Creating groups

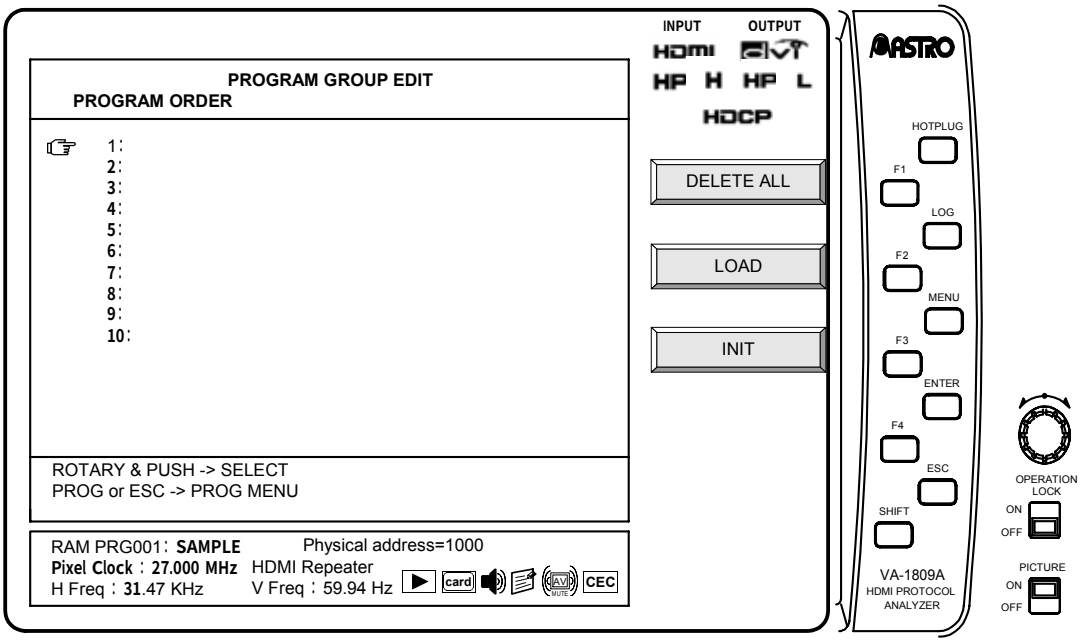
With the VA-1809A, it is possible to pick up a maximum of 10 programs among all the programs, and execute them as consecutive program data.
Follow the procedure set forth below.

While the on-screen display is blank: Select [PROGRAM] PROGRAM MENU → [F2] GROUP EDIT.

* First, perform these steps. All subsequent operation displays have been omitted.

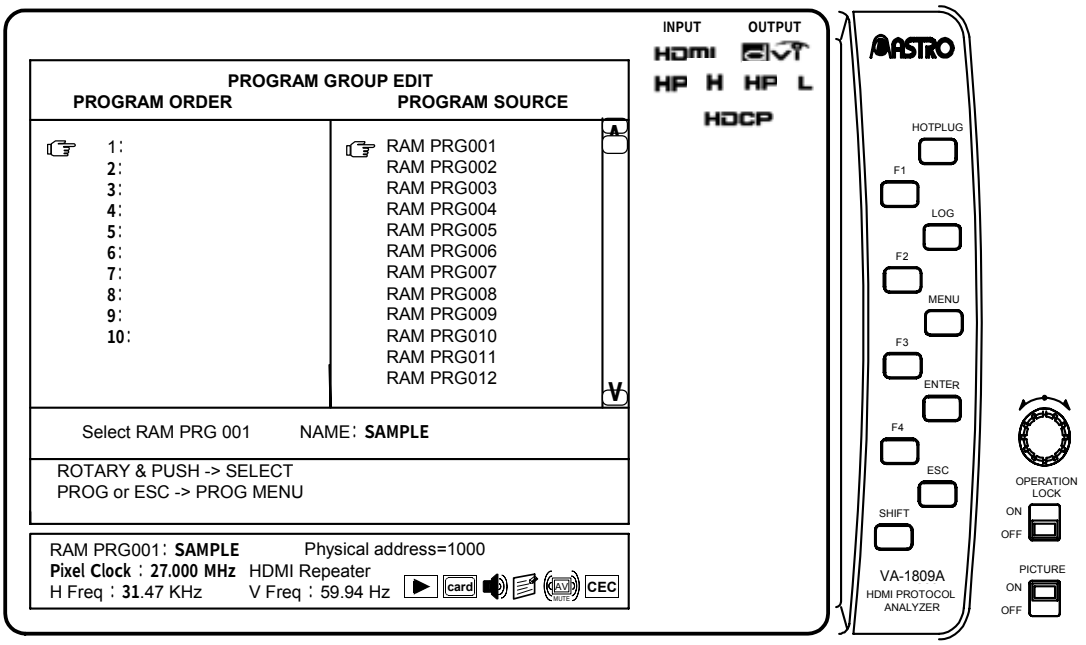
(1) Select the order in which the programs in the group are to be executed.

→ Use the [Rotary key] to select the numerical order.



(2) Select the programs to be executed.

→ Use the Rotary key to select the programs.



* To save group data, the SAVE button must be pressed to transfer operation to the SAVE MENU after the group data has been created. The PROGRAM GROUP MODE must be established. Refer to “6.5.2 PROGRAM GROUP” on page 253.
* To execute the group data, the PROGRAM GROUP MODE must be established. Refer to “6.3.3 ANALYSIS MODE” on page 243.
* To execute group data, refer to “6.1.2 Executing programs (LOAD)” on page 234.

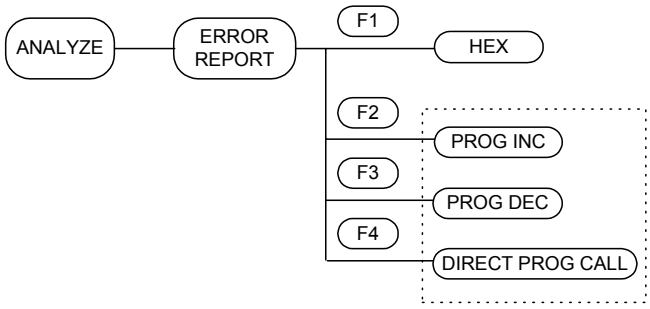
6.1.2 Executing programs (LOAD)

This section describes how programs or program groups are executed.

* With the equipment settings, whether to select the programs directly or select programs from program groups can be switched using the execution mode. For details on the execution mode settings, refer to “6.3.3 ANALYSIS MODE” on page 240.

There are two ways to execute programs while the on-screen display is blank: either establish the ANALYSIS mode using the ANALYZE button and then execute the programs or establish the PROGRAM MENU using the PROGRAM button and execute the programs.

■ Executing programs from ANALYZE EXE



While the on-screen display is blank: Select [ANALYZE] ANALYSIS

* First, perform these steps. All subsequent operation displays have been omitted.

(1) Executing programs using INC or DEC

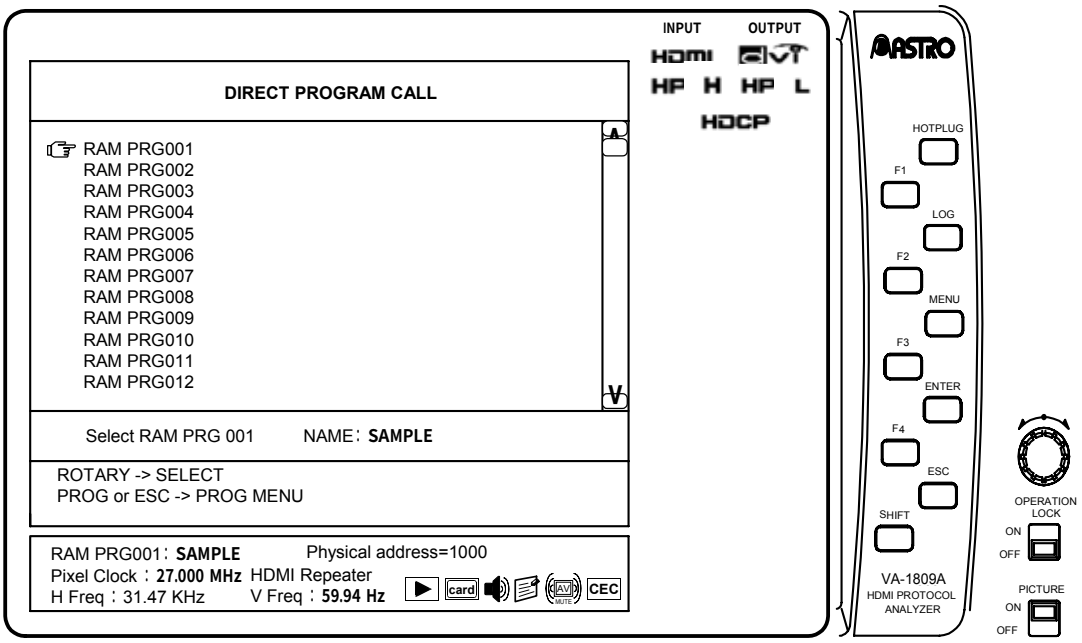
→ [F2] PROG INC or [F3] PROG DEC

INC executes the program whose number comes after the number of the current program conversely, DEC executes the program whose number comes before the number of the current program.

(2) Executing programs using DIRECT PROG CALL

→ F4 DIRECT PROG CALL
→ Use the Rotary key to select the program to be executed.

The program to be executed is selected in the program group, and executed.



■ Executing programs from PROGRAM EDIT

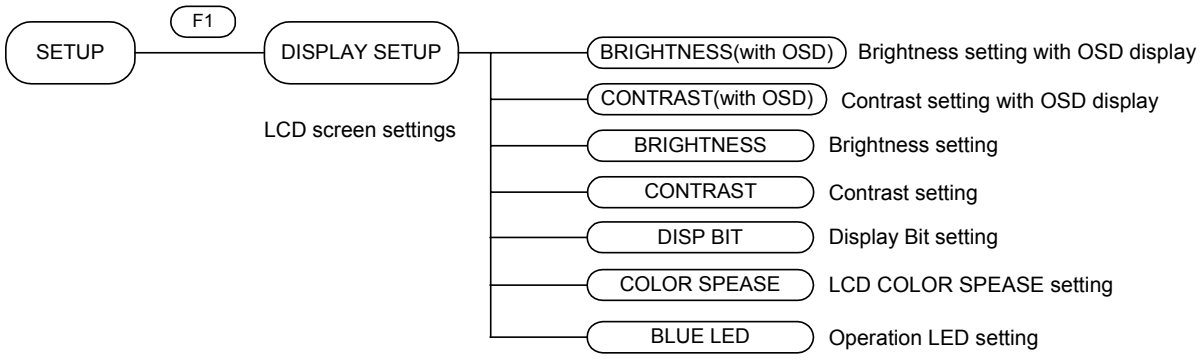
Programs can be executed using DIRECT PROG CALL from PROGRAM EDIT.

While the on-screen display is blank: Select PROGRAM PROGRAM MENU
→ F4 DIRECT PROG CALL
→ Use the Rotary key to select the program to be executed.

The program to be executed is selected in the program group, and executed.

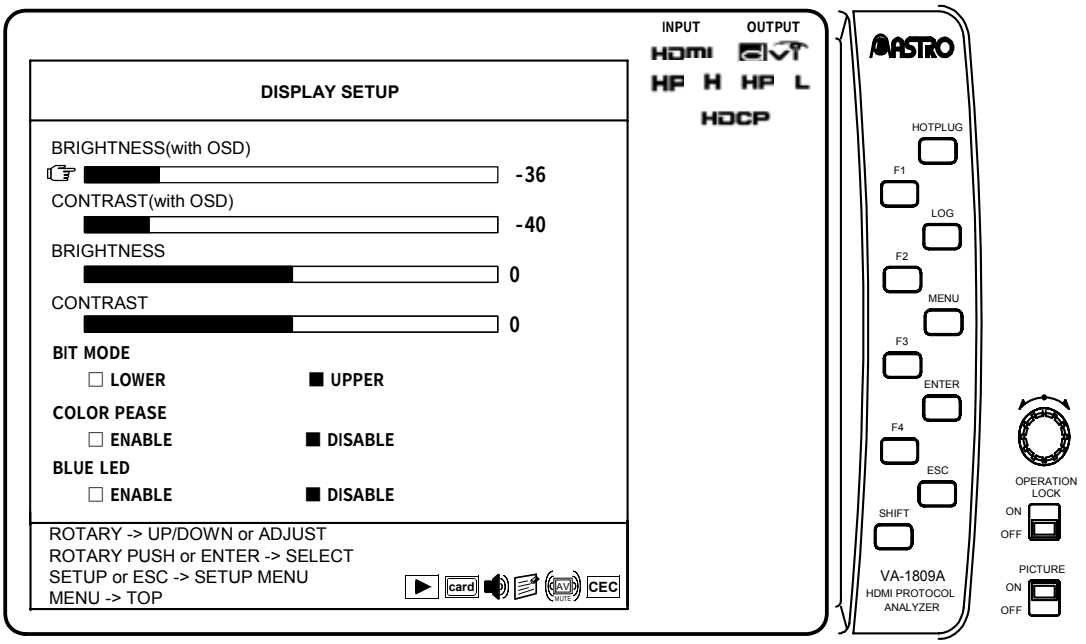
6.2 SETUP (DISPLAY SETUP)

The LCD settings are established with DISPLAY SETUP.
The menu is configured as shown below.



While the on-screen display is blank: Select [SETUP] SETUP MENU
→ [F1] DISPLAY SETUP.

* First, perform these steps. All subsequent operation displays have been omitted.



■ BRIGHTNESS (with OSD)

The background brightness for on-screen displays is set here.

→ Use the [Rotary key] to select BRIGHTNESS (with OSD).
→ Press the [Rotary key] or [ENTER]. (The meter bar turns yellow.)
→ Use the [Rotary key] to change the value. → Press the [Rotary key] or [ENTER].

Bring the cursor to BRIGHTNESS (with OSD), and adjust the value. The brightness can be changed to any value in the range of -50 to +50.

■ CONTRAST (with OSD)

The background contrast for on-screen displays is set here.

→ Use the [Rotary key] to select CONTRAST (with OSD).
→ Press the [Rotary key] or [ENTER]. (The meter bar turns yellow.)
→ Use the [Rotary key] to change the value. → Press the [Rotary key] or [ENTER].

Bring the cursor to CONTRAST (with OSD), and adjust the value. The contrast can be changed to any value in the range of -50 to +50.

■ BRIGHTNESS

The LCD brightness under normal display condition (on-screen display turned OFF) is set here.

→ Use the [Rotary key] to select BRIGHTNESS.
→ Press the [Rotary key] or [ENTER]. (The meter bar turns yellow.)
→ Use the [Rotary key] to change the value. → Press the [Rotary key] or [ENTER].

Bring the cursor to BRIGHTNESS, and adjust the value. The brightness can be changed to any value in the range of -50 to +50.

■ CONTRAST

The LCD contrast under normal display conditions (on-screen display turned OFF) is set here.

→ Use the [Rotary key] to select CONTRAST.
→ Press the [Rotary key] or [ENTER]. (The meter bar turns yellow.)
→ Use the [Rotary key] to change the value. → Press the [Rotary key] or [ENTER].

Bring the cursor to CONTRAST, and adjust the value. The contrast can be changed to any value in the range of -50 to +50.

■ BIT MODE

The area for the color gradations which are to be displayed (YCbCr -> RGB) after COLOR SPACE on the LCD is set here.

→ Use the [Rotary key] to select LOWER or UPPER for BIT MODE.
→ Press the [Rotary key] or [ENTER].

Images cannot be displayed in gradations greater than the gradations of the input signals. When 8-bit signals are input, nothing will appear when LOWER is selected.

* When color difference signals are input, the calculation error is displayed in the lower bits if COLOR SPACE is set to ENABLE.

■ COLOR SPASE

Whether to set COLOR SPACE to valid when displaying images on the LCD is set here.

→ Use the [Rotary key] to select ENABLE or DISABLE for COLOR SPACE.
→ Press the [Rotary key] or [ENTER].

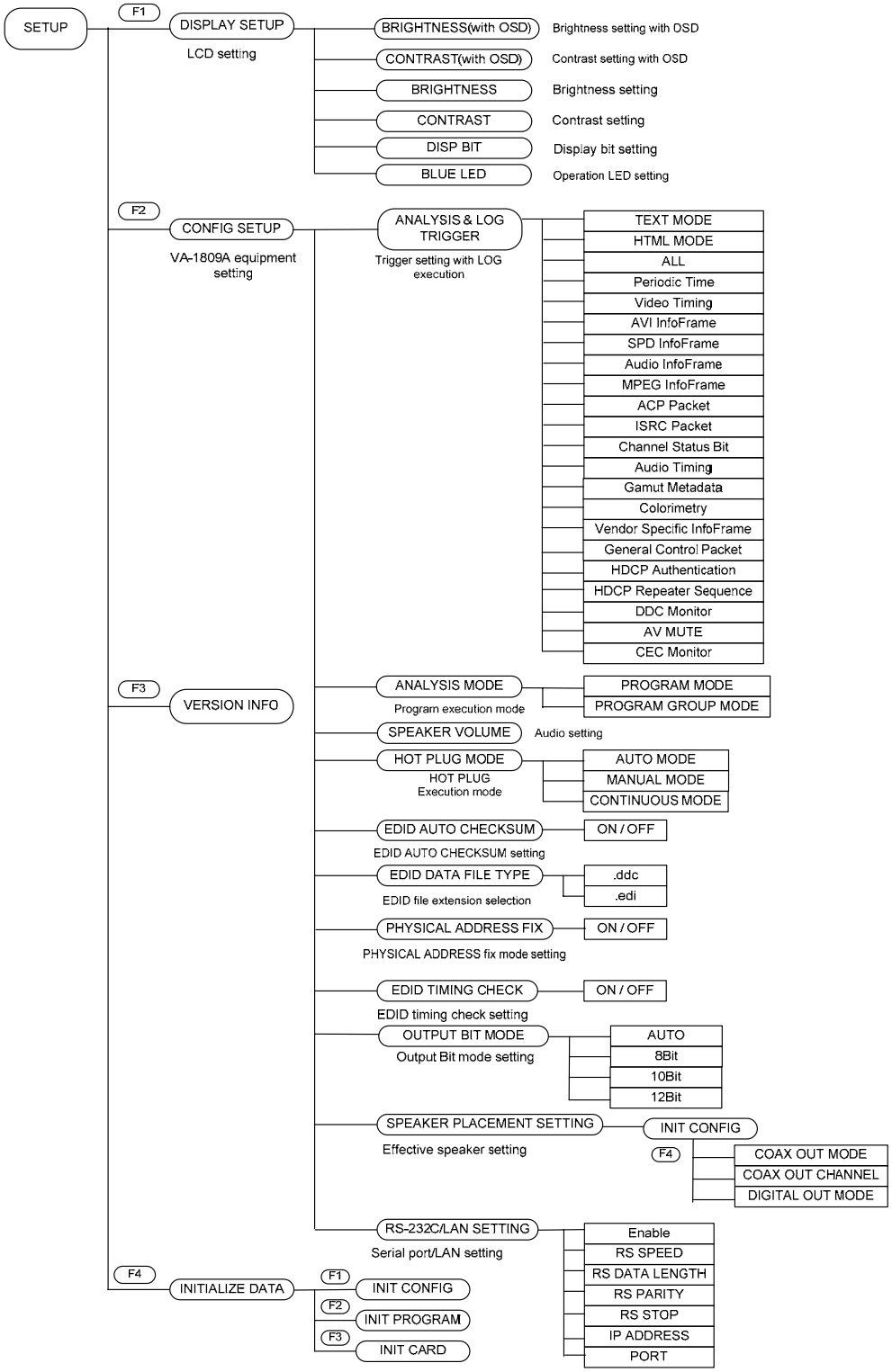
When performing normal operations, set COLOR SPACE to ENABLE. When checking the actual bus width, set COLOR SPACE to DISABLE.

■ BLUE LED

Whether to set the operation LED to valid is set here.

6.3 SETUP (CONFIG SETUP)

The equipment settings of the VA-1809A are performed using CONFIG SETUP.
The menu is configured as shown below.

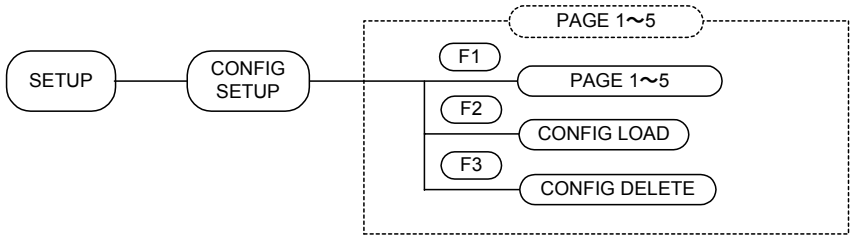


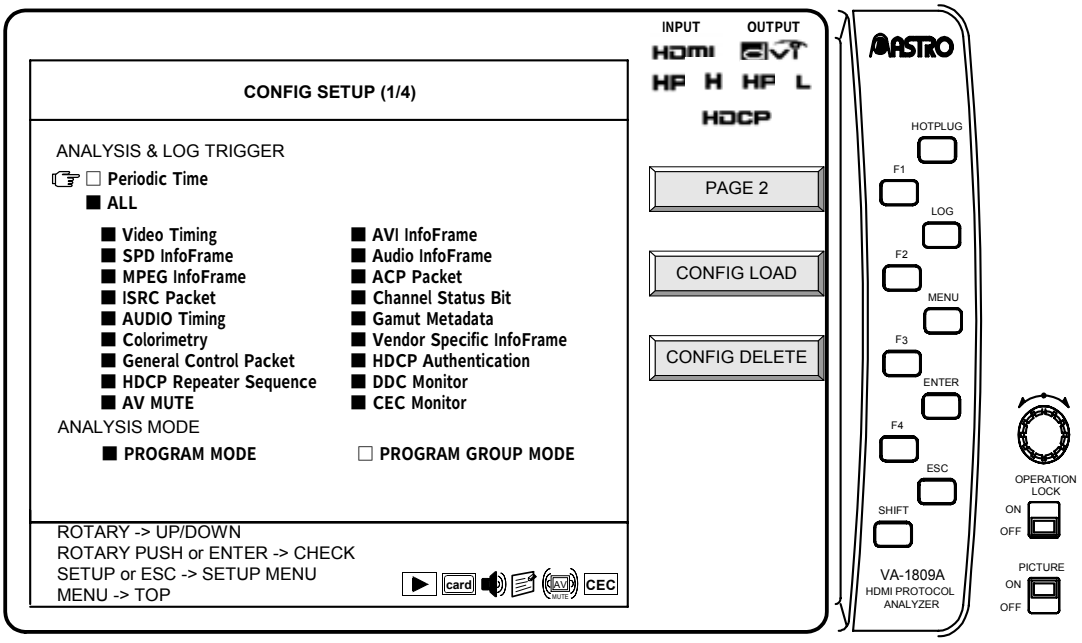
While the on-screen display is blank: Select [SETUP] SETUP MENU
→ [F2] CONFIG SETUP.

* First, perform these steps. All subsequent operation displays have been omitted.

6.3.1 Description of Function Keys Common to CONFIG SETUP

The common function keys while the CONFIG SETUP menu is being displayed (PAGES 1 to 5) are as follows. The items of KSV list are added to only PAGE 4. For more information, see page ???, “Description of Function Keys Dedicated to VIRTUAL REPEATER MODE.”





KEY	Item	Details
F1	PAGE 1 – 5	Switches pages.
F2	CONFIG LOAD	Loads configuration data.
F3	CONFIG DELETE	Deletes configuration data.

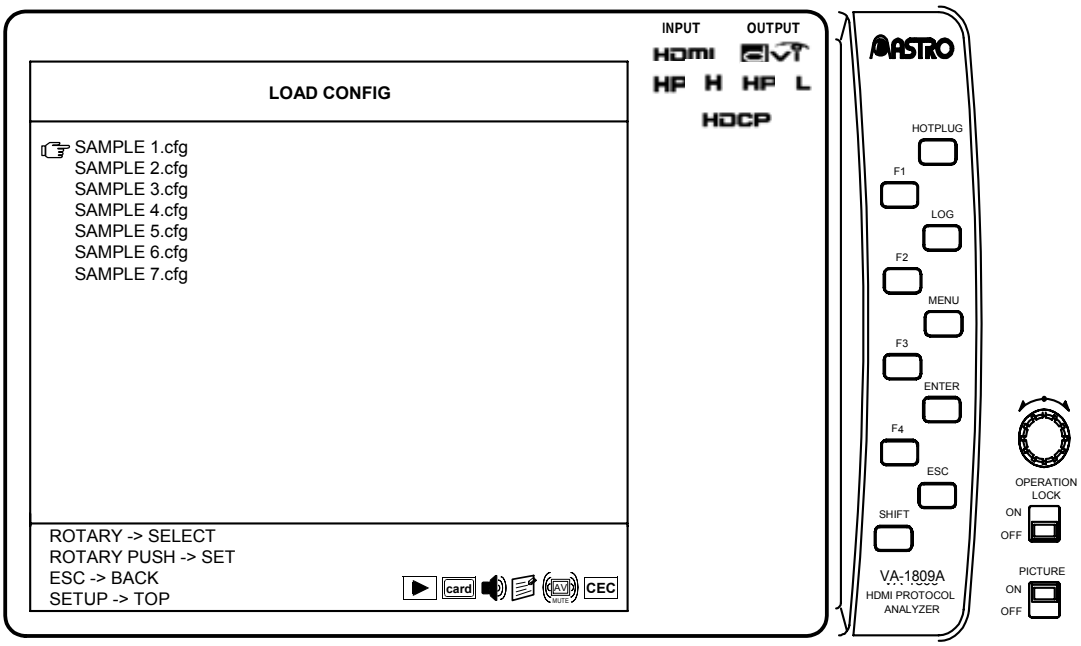
PAGE 1 – 5 F1

This function key switches pages. (There are a total of five pages.)

CONFIG LOAD F2

This function key loads the previously saved configuration data.

→ F2 CONFIG LOAD → Rotary Key Select configuration data

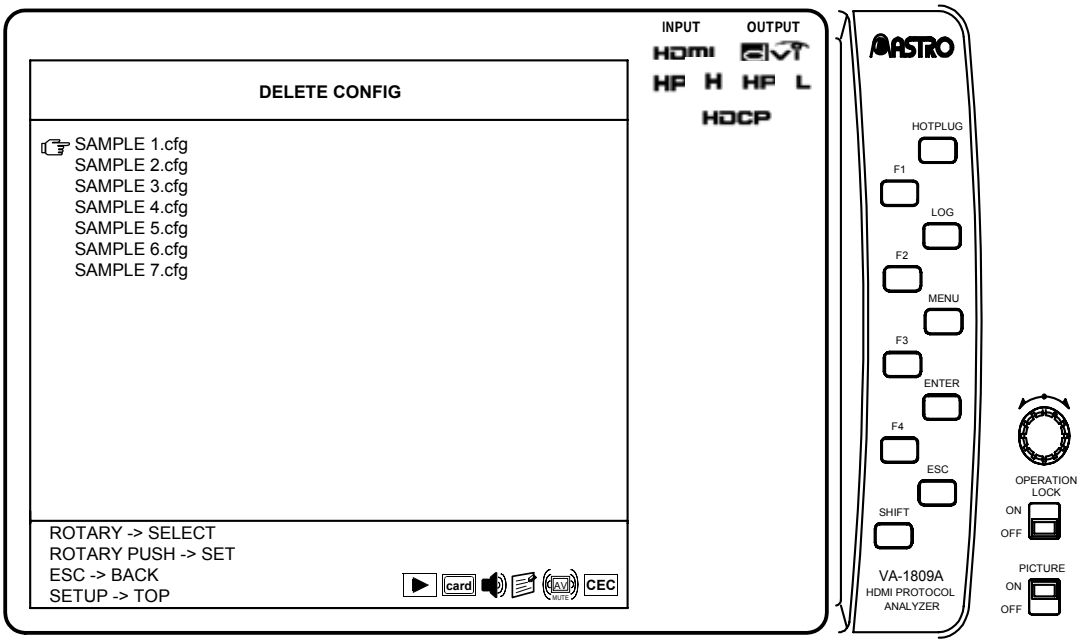


For the location of the configuration data to be loaded, see page 4, “1.4.4 Storage locations of registered data.”
For more information about the saving of configuration data, see page 255, “6.5.4 CONFIG DATA.”

CONFIG DELETE F3

This function key deletes the previously saved configuration data.

→ F3 CONFIG DELETE
→ Rotary Key Select configuration data to be deleted, and execute deletion.



6.3.2 ANALYSIS & LOG TRIGGER

The trigger settings for executing logs are established on this screen. All the trigger items are checked as the default.
To select only one or some of the items to trigger the log execution, proceed as follows.

→ Press the Rotary key or ENTER. The ALL check is removed.

→ Use the Rotary key to select the trigger items.

→ Press the Rotary key or ENTER. Add or remove the checks.

For details on log execution, refer to “4.28.2 Log function” on page 215. See below for details on the triggers. When a multiple number of triggers have been selected, they will all be OR-ed.

- Refer to “8.2 LOG DATA Structure” on page 304 about LOG data structure.

Item	Details
Log Type	Log file format is changed.
Periodic Time	The status is captured every so often (at specified intervals).
ALL	All the changes listed below serve as the trigger.
Video Timing	A change in Video Timing of the input HDMI serves as the trigger.
AVI InfoFrame	A change in AVI InfoFrame of the input HDMI serves as the trigger.
SPD InfoFrame	A change in SPD InfoFrame of the input HDMI serves as the trigger.
Audio InfoFrame	A change in Audio InfoFrame of the input HDMI serves as the trigger.
MPEG InfoFrame	A change in MPEG InfoFrame of the input HDMI serves as the trigger.
ACP Packet	A change in ACP Packet of the input HDMI serves as the trigger.
ISRC Packet	A change in ISRC Packet of the input HDMI serves as the trigger.
Channel Status Bit	A change in Channel Status Bit in the input HDMI Audio stream serves as the trigger.
AUDIO Timing	A change in the ACR constant (N or CTS) serves as the trigger.
Gamut Metadata	A change in the Gamut Metadata Packet of the input HDMI serves as the trigger.
Colorimetry	The color information history remains on the colorimetry screen.
Vendoer Specific InfoFrame	A change in the Vendor Specific InfoFrame of the input HDMI serves as the trigger.
General Control Packet	A change in the General Control Packet of the input HDMI serves as the trigger.
HDCP Authentication	HDCP Authentication execution serves as the trigger.
HDCP Repeater Sequence	The HDCP Repeater Sequence logs are captured.
DDC Monitor	Data in the DDC line serves as the trigger.
AV MUTE	The time of status change of AV Mute serves as the trigger
CEC Monitor	The CEC Line Monitor logs are captured.

6.3.3 ANALYSIS MODE

Take the following steps to set the program execution mode.

→ Use the [Rotary key] to select MODE.
→ Press the [Rotary key] or [ENTER]. Add or remove the checks.

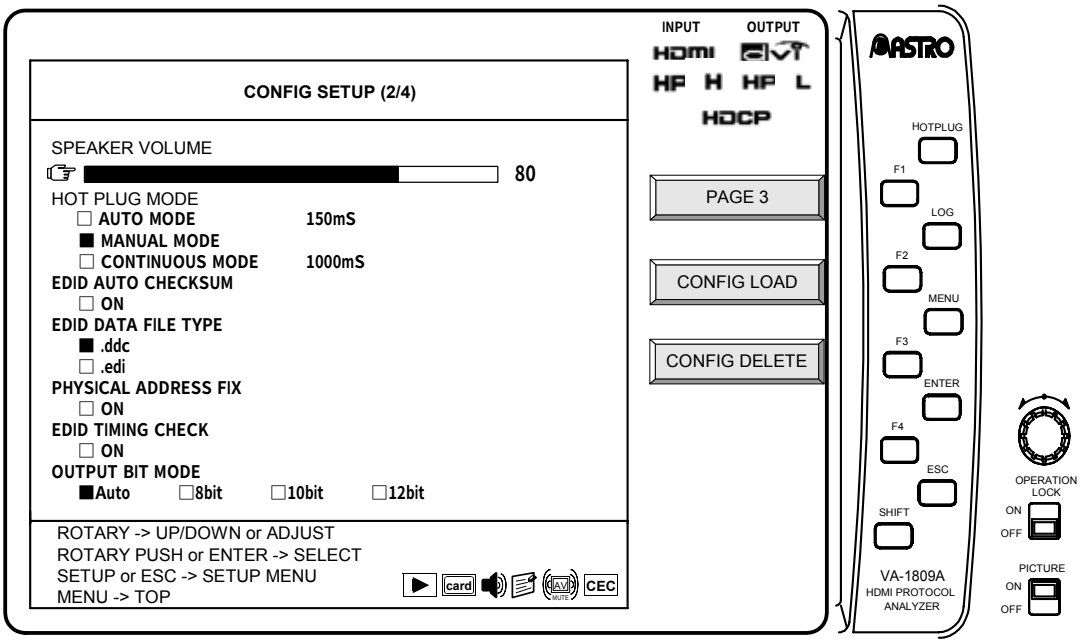
Mode details are provided below.

Item	Details
PROGRAM MODE	All the programs are executed.
PROGRAM GROUP MODE	Only the programs selected by PROGRAM GROUP EDIT are executed. Refer to “Creating groups” on page 231.

6.3.4 SPEAKER VOLUME

Take the following steps to adjust the volume level of the internal speaker. The volume of the sound delivered from the HDMI output connector and COAX OUT connector cannot be adjusted.

→ [F1] PAGE2 → Use the [Rotary key] to select SPEAKER VOLUME.
→ Press the [Rotary key] or [ENTER]. (The meter bar turns yellow.)
→ Use the [Rotary key] to adjust the volume level.



Even without displaying this screen, the volume level can be adjusted by simultaneously pressing and rotating the rotary key. When the rotary key is held down, the sound is muted.

* ither 2 channels (1 stream) of a maximum of 8 channels (4 streams) with frequencies from 32 to 96 kHz for linear PCM only or both channels of 2 channels with frequencies from 176.4 to 192 kHz can be output as the sound.

6.3.5 HOT PLUG MODE

The hot plug setting is established on this screen.

→ [F1] PAGE2 → Use the [Rotary key] to select HOT PLUG MODE.
→ Press the [Rotary key] or [ENTER]. Add or remove the checks.
(In AUTO MODE, use [Rotary key] to select the time.)

Mode details are provided below.

Item	Details
AUTO MODE	High changes to low and low changes to high when the [HOTPLUG] button is pressed once. Any time from 10 to 200 ms can be selected in 10ms increments for the low period. Use the [Rotary key] to select it. * This length also applies to changes in the hot plug signals when other processes (such as program switching) are undertaken.
MANUAL MODE	The level is reversed when the [HOTPLUG] button is pressed once. The mode is switched between HOTPLUG and ReceiverSense.
CONTINUOUS MODE	While executing CONTINUOUS MODE, hot plug level changes like H → L → H → L…. While executing CONTINUOUS MODE, by pressing [HOTPLUG] button, it switches like execute → stop → execute. Any time from 1000 to 10000 ms can be selected in 1000 ms increments for the high period. Use the [Rotary key] to select it. * High period may shift about 200 ms depending on the process. * The value that is set in AUTO MODE applies to the executing Low period. * When it stops, hotplug level is High.

6.3.6 EDID AUTO CHECKSUM

Take the following steps to set the EDID automatic checksum calculation function.

→ [F1] PAGE2 → Use the [Rotary key] to select EDID AUTO CHECKSUM.
→ Press the [Rotary key] or [ENTER]. Check/uncheck

If ON has been checked, the checksum is calculated and set automatically when EDIT is edited using EDID EDIT on PROGRAM MENU.
For details on editing EDID using EDID EDIT on PROGRAM MENU, refer to “Editing programs (SINK, EDID, filenames)” on page 225.

* Although calculation is also performed when being called, the calculated EDID will not be saved unless editing is done by EDID EDIT of the PROGRAM menu.

6.3.7 EDID DATA FILE TYPE

Take the following steps to set the format in which the EDID data files are to be loaded or saved.

→ [F1] PAGE2 → Use the [Rotary key] to select EDID DATA FILE TYPE.
→ Press the [Rotary key] or [ENTER]. Add or remove the checks.

Mode details are provided below.

Item	Details
.ddc	Priority is given to loading files with the .ddc extension. When saving programs on a CF card, they are saved as .ddc files.
.edi	Priority is given to loading files with the .edi extension. When saving programs on a CF card, they are saved as .edi files.

* The contents of data saved are independent of the file format.

* .ddc files are saved in the binary format and .edi files in the text format.

6.3.8 PHYSICAL ADDRESS FIX

If there is a physical address in the EDID of the VA-1809A currently being selected, set whether to fix the physical address.

→ [F1] PAGE2 → [Rotary key] Select PHYSICAL ADDRESS FIX.
→ Press [Rotary key] or [ENTER]. Check/uncheck

If ON is checked, the physical address of the EDID does not change even if the connections around the VA-1809A change.
If there is no physical address in the EDIT of the VA-1809A currently being selected, the physical address will be 0.0.0.0. Also, if there is no physical address in the connected device, the physical address will be 1.0.0.0.

6.3.9 EDID TIMING CHECK

When the VA-1809A is a repeater, check the EDID of the unit connected to the output side, and set whether to switch output.

→ [F1] PAGE2 → [Rotary key] Select EDID TIMING CHECK.
→ Press [Rotary key] or [ENTER]. Check/uncheck

Check	Details
ON	Outputs input video signals only when the EDID of the unit connected to the output side of the VA-1809A supports the input video timing (OFF if not supported).
OFF	Outputs all input video signals regardless of the EDID of the unit connected to the output side of the VA-1809A.

6.3.10 OUTPUT BIT MODE

When the VA-1809A is used as a repeater, the number of bits in the signals which can be output to the device connected to the output side is set on this screen.

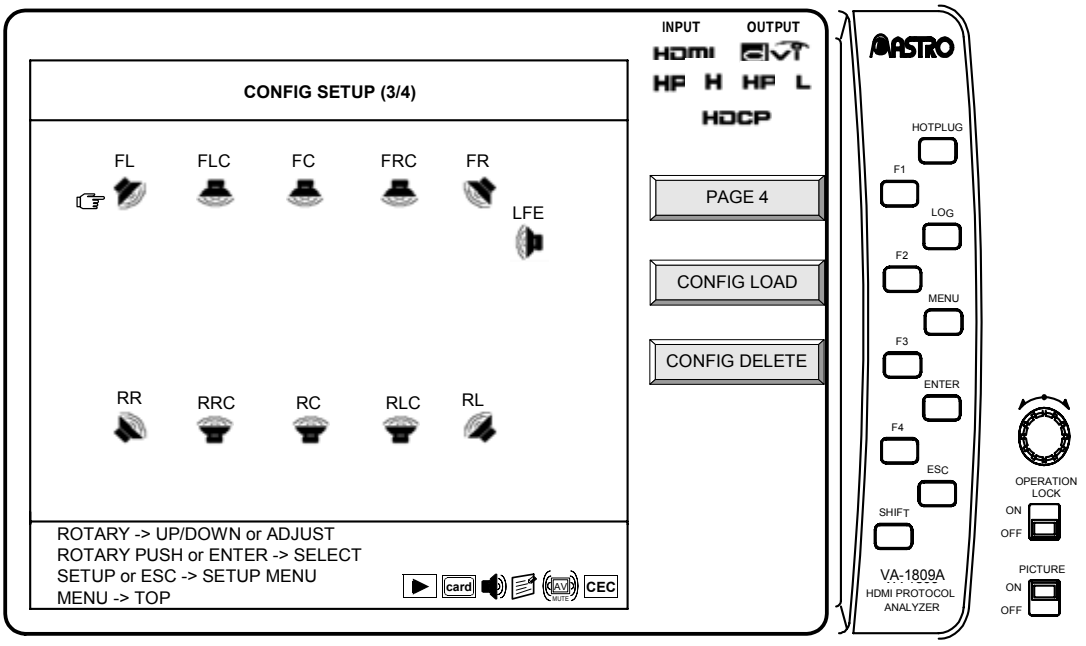
→ [F1] PAGE2 →Use the [Rotary key] to select OUTPUT BIT MODE.
→Press the [Rotary key] or [ENTER]. Add or remove the checks.

Check	Description
Auto	The maximum number of bits of the signals which can be output from the input signals and output side EDID are output.
8bit	Eight bits of the signals are output regardless of the input signals and output side EDID.
10bit	Ten bits of the signals are output regardless of the input signals and output side EDID.
12bit	Twelve bits of the signals are output regardless of the input signals and output side EDID.

6.3.11 SPEAKER PLACEMENT SET

The sound of which channel will be output from the speaker of the VA-1809A can be selected.

→ Press [F1] twice. PAGE 3 → [Rotary key] Select an audio channel.



* However, if there are three or more audio channels, switching can be done in the set of the audio channel laid out in the audio sample packet. For more information about the audio sample packet, refer to “5.3.4 Audio Sample Packet” and “7.6 Audio Data Packetization” in the High-Definition Multimedia Interface Specification Ver. 1.1.

* The picture and channel of the speaker being displayed are determined by InfoFrame.

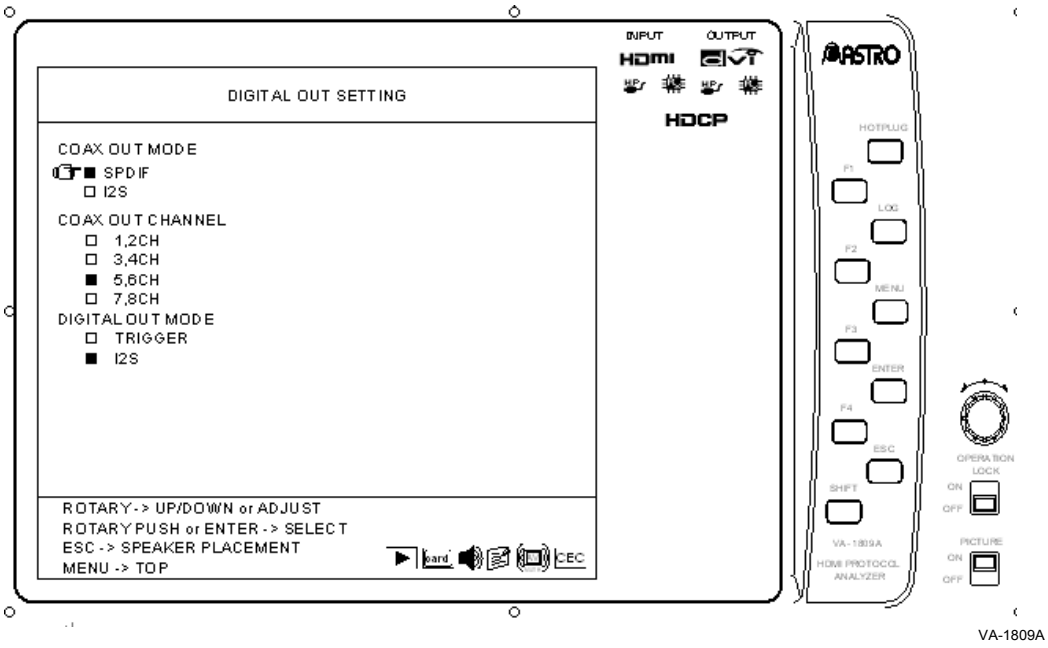
* If Speaker Placement has changed and the channel previsouly set before change cannot be set after change, change setting to FL, FR.

6.3.12 DIGITAL OUT SETTING

Which kinds of audio it to be output from COAX OUT and DIGITAL OUT from VA-1809A is selected.

→ Press [F1] twice. PAGE3 → [F4] DIGITAL OUT

* This is an option. Please ask ASTRODESIGN for details



Setting items are listed below.

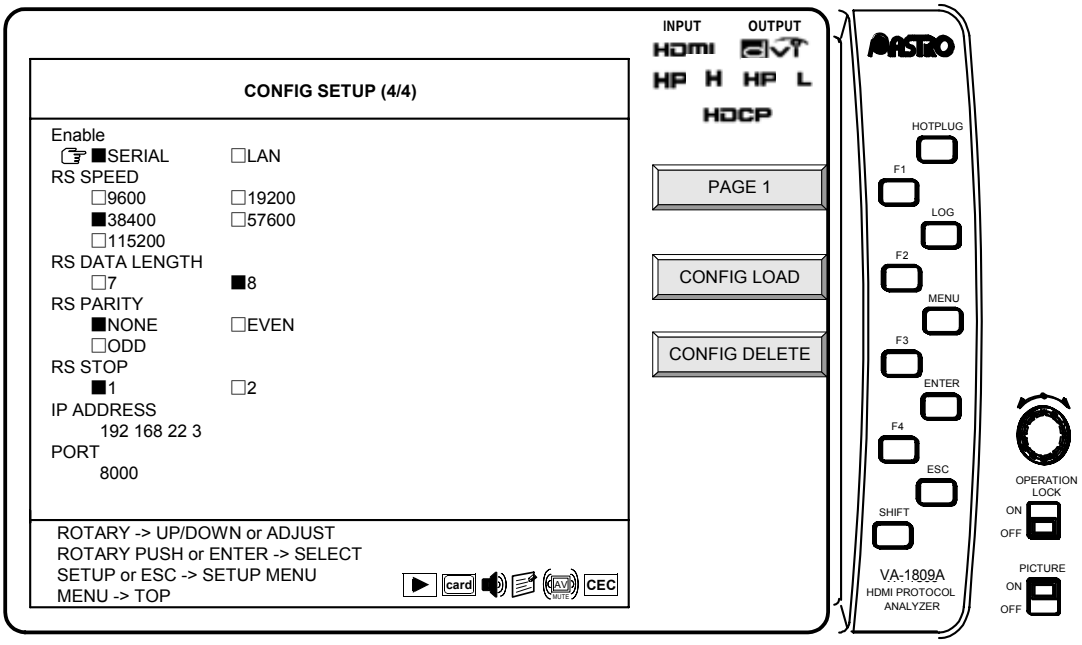
Item	Descriptions
COAX OUT MODE	Select either SPDIF or I2S to be output from COAX OUT.
COAX OUT CHANNEL	Set the channel to be output from COAX OUT.
DIGITAL OUT MODE	Select either TRIGGER or I2S to be output from DIGITAL OUT terminal.

Please refer to “8.3.4 DIGITAL OUT Connector” p314 for details.

6.3.13 Setting the Communication Port

Set the communication port of the VA-1809A.

→ Press [F1] four times. PAGE 5 → [Rotary key] Select an item.
→ Press [Rotary key] or [ENTER]. Check/uncheck



(1) Enable

Whether RS-232C or LAN is to be used is set here.

(2) RS SPEED

Set the baud rate of the RS-232C.

Check	Description
9600	Sets a baud rate of 9600bps.
19200	Sets a baud rate of 19200bps.
38400	Sets a baud rate of 38400bps.
57600	Sets a baud rate of 57600bps.
115200	Sets a baud rate of 115200bps.

(3) RS DATA LENGTH

Set the number of data bits of the RS-232C.

Check	Description
7	Sets the number of data bits to 7 bits.
8	Sets the number of data bits to 8 bits.

(4) RS PARITY

Set the parity bit of the RS-232C.

Check	Description
NONE	Sets the parity bit to “none.”
EVEN	Sets the parity bit to “even.”
ODD	Sets the parity bit to “odd.”

(5) RS STOP

Set the number of stop bits of the RS-232C.

Check	Description
1	Sets the number of stop bits to 1 bit.
2	Sets the number of stop bits to 2 bits.

(6) IP ADDRESS

The IP address of the LAN is set here.

(7) PORT

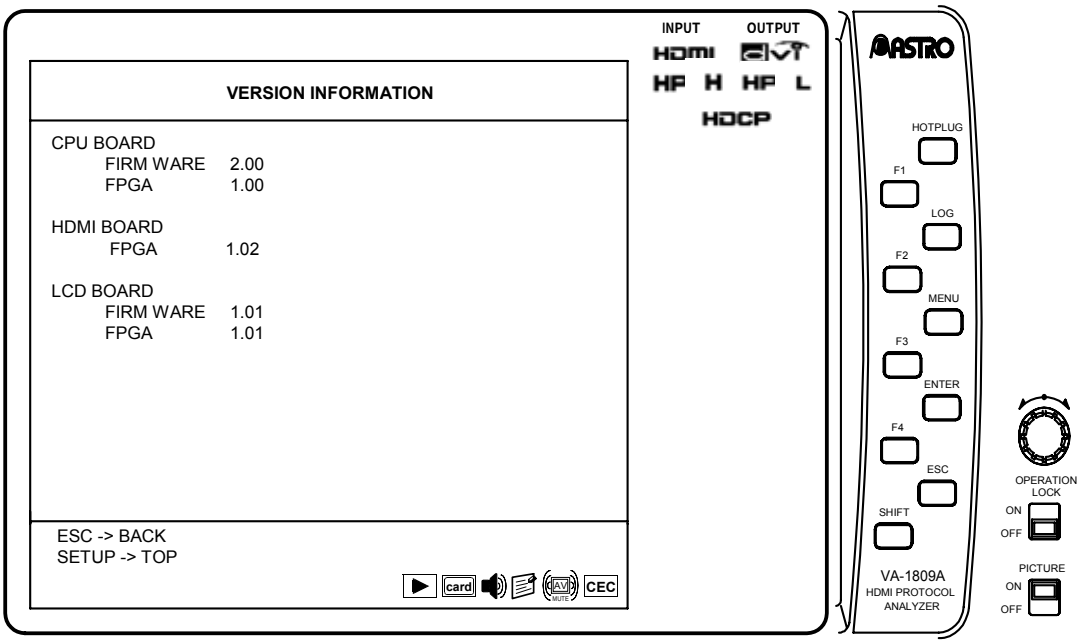
The LAN port is set here.

6.4 SETUP (Others)

6.4.1 VERSION INFO

The version information of the VA-1809A can be displayed.

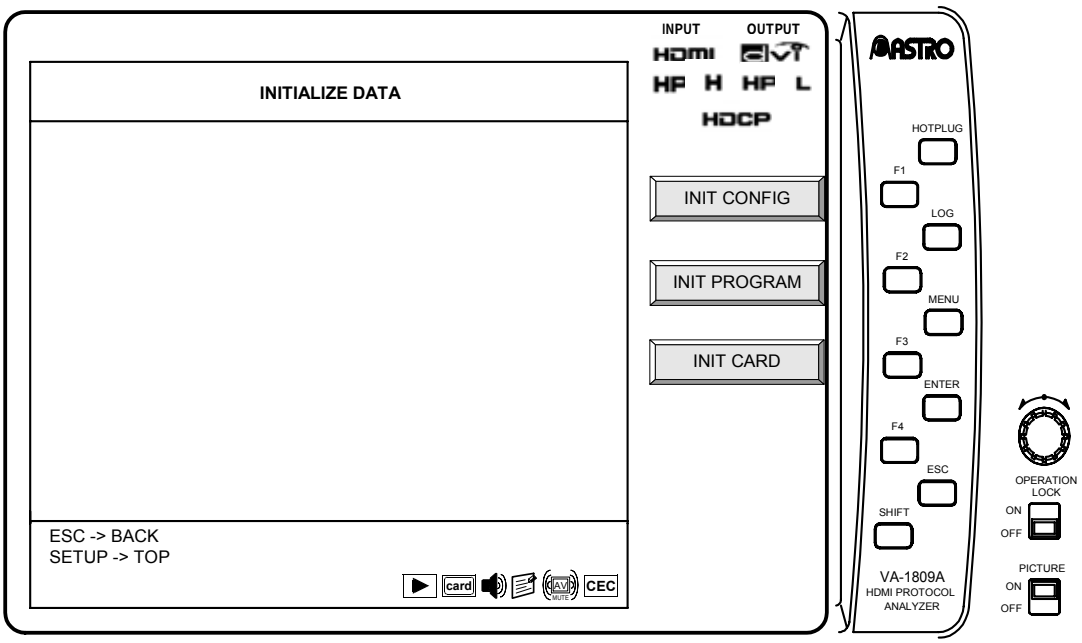
While the on-screen display is blank: Select [SETUP] → [F3] VERSION INFO



6.4.2 INITIALIZE

The built-in data and configuration data of the VA-1809A can be initialized, and the card can be initialized (erased).

While the on-screen display is blank: Select [SETUP] → [F4] INITIALIZE



(1) INIT CONFIG (Initialization of Configuration Data)

Among setup data, this function key restores the configuration data and display data to the default settings.

→ [F1] INIT CONFIG → [F1] OK or [F2] CANCEL

(2) INIT PROGRAM (Initialization of Built-In Program Data)

This function key restores built-in program data to the default settings.

→ [F2] INIT PROGRAM → [F1] OK or [F2] CANCEL

(3) INIT CARD (Erasing the Card)

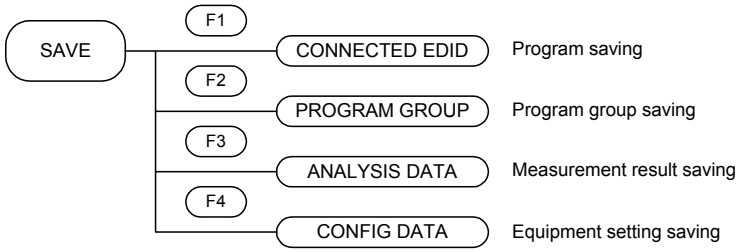
This function key erases the data on the card inserted in the VA-1809A.

→ [F3] INIT CARD → [F1] OK or [F2] CANCEL

6.5 SAVE

The SAVE MENU is used to save the programs and analysis data on a CF card or in the RAM contained in the VA-1809A main unit. The current data can be saved by pressing the SAVE button in any status.

The menu tree is as shown below.



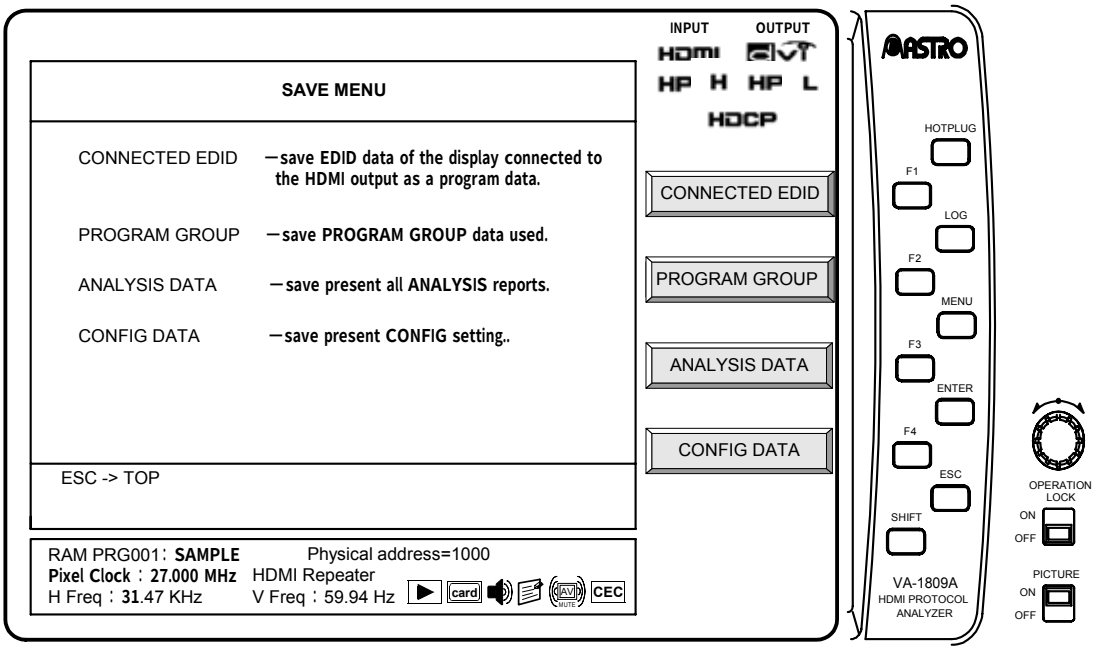
6.5.1 CONNECTED EDID

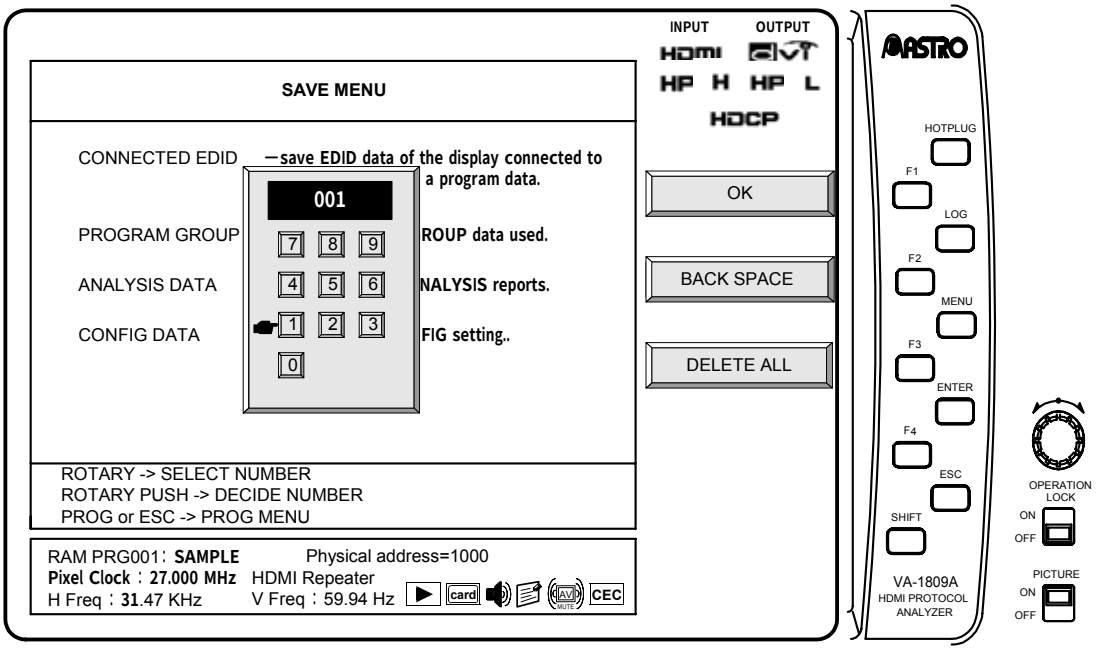
This procedure in this section is for saving the EDIDs of the monitor connected to the HDMI output connector as programs on a CF card or in the RAM contained in the VA-1809A main unit.

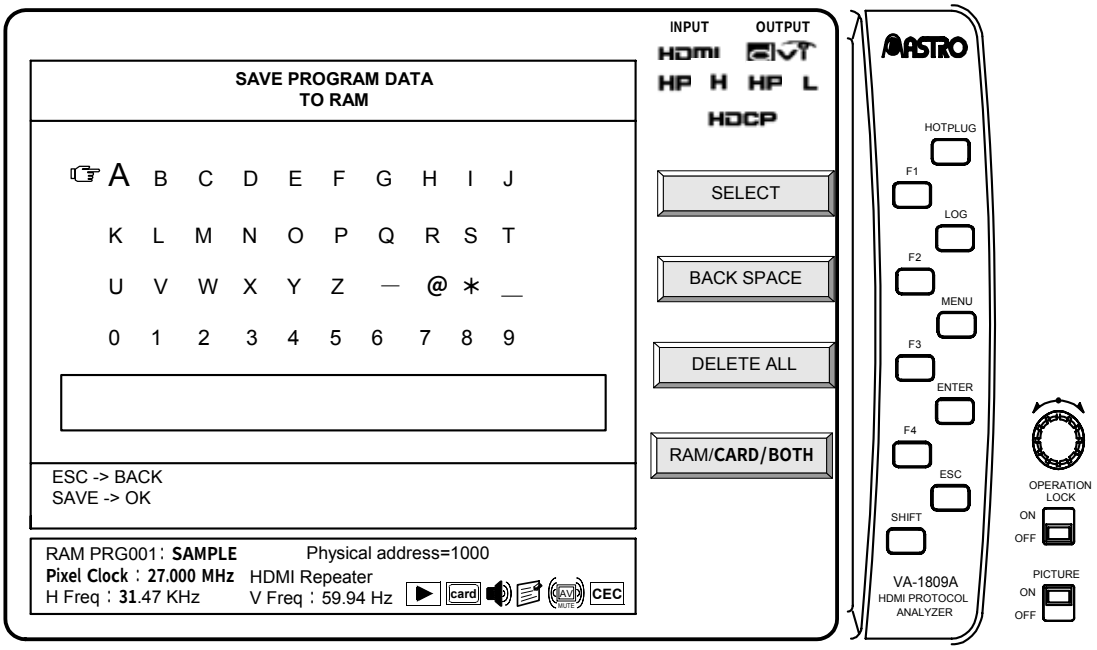
[SAVE] → [F1] CONNECTED EDIT
→ Use the [Rotary key] to select the program number. → [F1] OK
→ Use the [Rotary key] to edit the program name. → [F4] RAM/CARD/BOTH selection
→ [SAVE] OK

* The RAM (internal RAM), CF card or both the internal RAM and CF card must be selected as the place where the program is to be saved.

* When saving data in an existing program and thereby overwriting the data in that program, a confirmation window will appear. Press [F1] to save the data or [F2] to cancel.




SAVE MENU
CONNECTED EDID
—save EDID data of the display connected to a program data.
001
PROGRAM GROUP
ROUP data used.
ANALYSIS DATA
NALYSIS reports.
CONFIG DATA
FIG setting..
7 8 9
4 5 6
1 2 3
0
ROTARY -> SELECT NUMBER
ROTARY PUSH -> DECIDE NUMBER
PROG or ESC -> PROG MENU
RAM PRG001: SAMPLE
Pixel Clock : 27.000 MHz
H Freq : 31.47 KHz
Physical address=1000
HDMI Repeater
V Freq : 59.94 Hz
CEC
INPUT
OUTPUT
HDMI
HP H
HP L
HDCP
OK
BACK SPACE
DELETE ALL
ASTRO
HOTPLUG
F1
LOG
F2
MENU
F3
ENTER
F4
ESC
SHIFT
VA-1809A
HDMI PROTOCOL ANALYZER
OPERATION LOCK
ON
OFF
PICTURE
ON
OFF


SAVE PROGRAM DATA
TO RAM
A B C D E F G H I J
K L M N O P Q R S T
U V W X Y Z — @ * _
0 1 2 3 4 5 6 7 8 9
ESC -> BACK
SAVE -> OK
RAM PRG001: SAMPLE
Pixel Clock : 27.000 MHz
H Freq : 31.47 KHz
Physical address=1000
HDMI Repeater
V Freq : 59.94 Hz
CEC
INPUT
OUTPUT
HDMI
HP H
HP L
HDCP
SELECT
BACK SPACE
DELETE ALL
RAM/CARD/BOTH
ASTRO
HOTPLUG
F1
LOG
F2
MENU
F3
ENTER
F4
ESC
SHIFT
VA-1809A
HDMI PROTOCOL ANALYZER
OPERATION LOCK
ON
OFF
PICTURE
ON
OFF

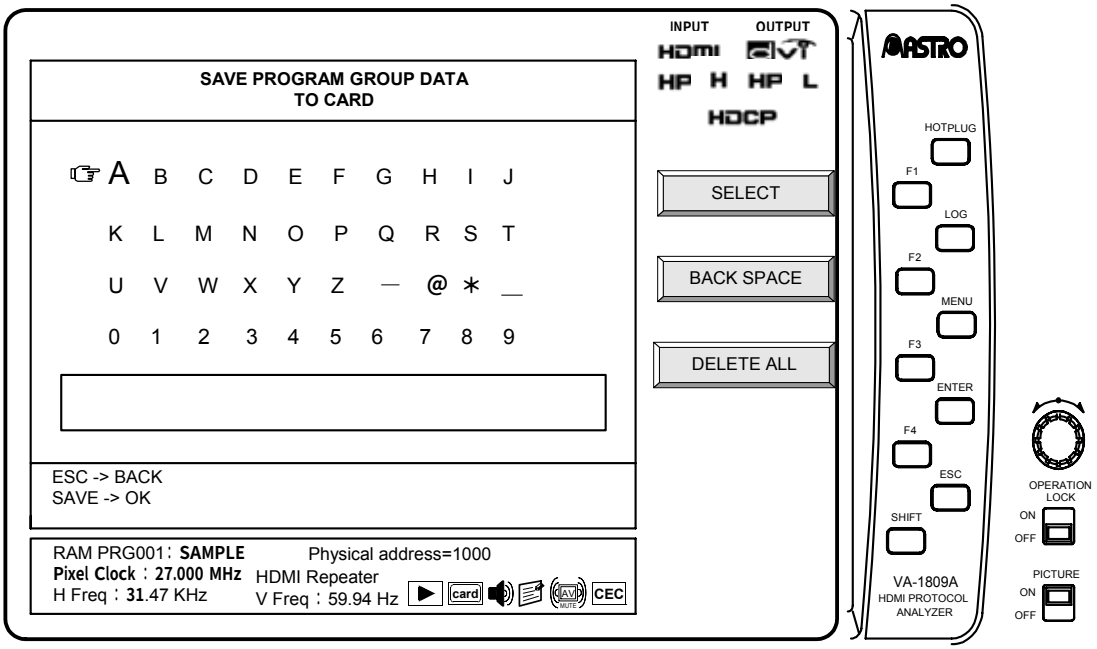
6.5.2 PROGRAM GROUP

This procedure in this section is for saving group data edited in “Creating groups” on page 209.

SAVE → F2 PROGRAM GROUP → Use the Rotary key to input the group name. → SAVE OK

* Group data can be saved on CF cards only. Data is saved on these cards under filenames with the .lst extension. For details on where the files are saved, refer to “1.4.4 Storage locations of registered data” on page 4.

* When saving data in an existing program and thereby overwriting the data in that program, a confirmation window will appear. Press F1 to save the data or F2 to cancel.

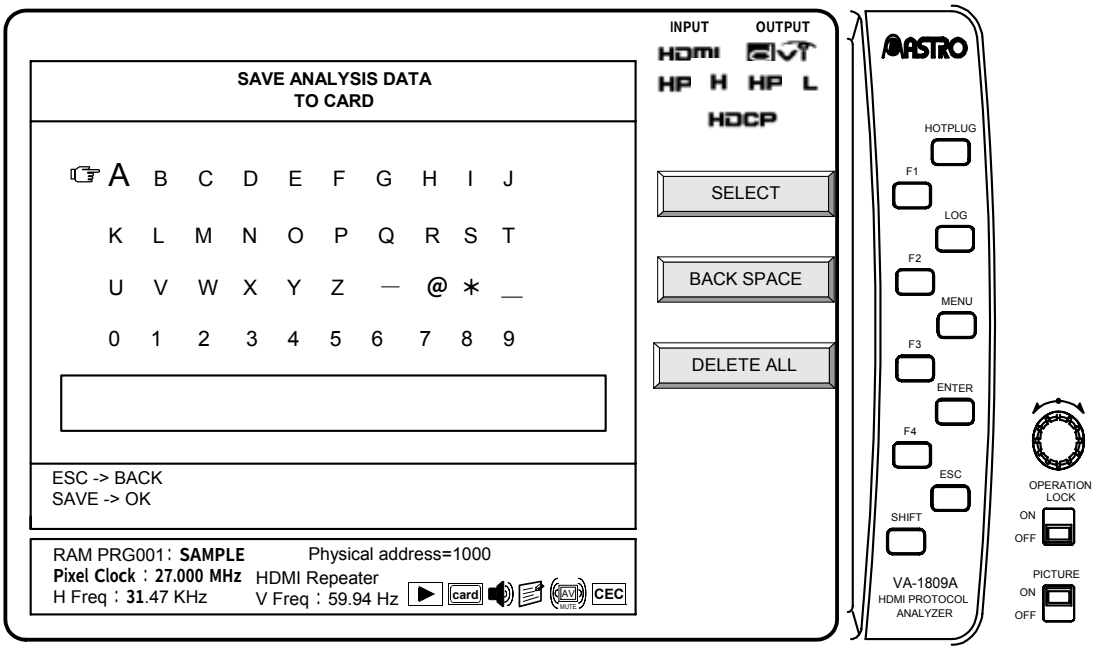


6.5.3 ANALYSIS DATA

The procedure in this section is for saving the measurement details of all the items for "ANALYZE (measurement result display methods)" described on page 21 on CF cards.

SAVE → F3 ANALYSIS DATA → Use the Rotary key to input the data name. → SAVE OK

* Analysis data can be saved on CF cards only. Data is saved on these cards under filenames with the .log extension. For details on where the files are saved, refer to "1.4.4 Storage locations of registered data" on page 4.
* When saving data in an existing program and thereby overwriting the data in that program, a confirmation window will appear. Press F1 to save the data or F2 to cancel.
* The analysis data available at the instant when the SAVE button is pressed is saved.



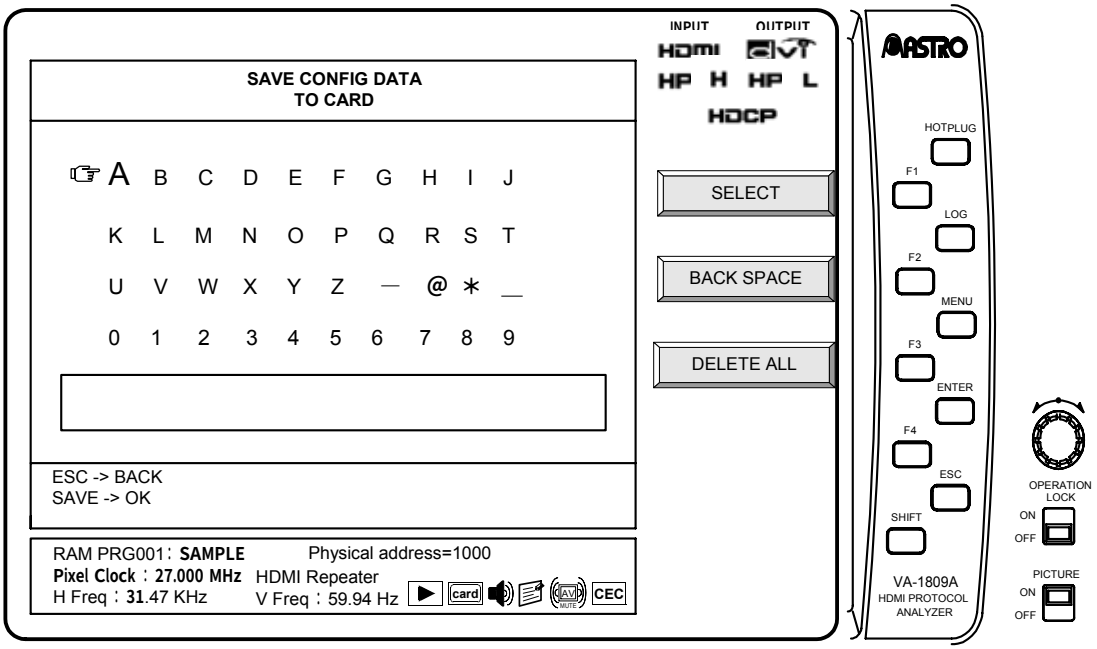
6.5.4 CONFIG DATA

The procedure in this section is for saving the equipment settings of the VA-1809A which were set in “6.3 SETUP (CONFIG SETUP)” on page 238.

SAVE → F4 CONFIG DATA → Use the Rotary key to input the data name.
→ SAVE OK

* Config data can be saved on CF cards only. Data is saved on these cards under filenames with the .cfg extension. For details on where the files are saved, refer to “1.4.4 Storage locations of registered data” on page 4.

* When saving data in an existing program and thereby overwriting the data in that program, a confirmation window will appear. Press F1 to save the data or F2 to cancel.



7 Error tables

7.1 ANALYSIS ERROR (displayed in red) tables

7.1.1 Video Timing

Item	Description
Pixel Clock	When the InfoFrame AVI Video Code is 1 to 59, the pixel clock frequency is not within ±0.5% of the value prescribed by the format specified in Video Code.
H Frequency	When the InfoFrame AVI Video Code is 1 to 59, the H frequency is not within ±0.5% of the value prescribed by the format specified in Video Code.
V Frequency	When the InfoFrame AVI Video Code is 1 to 59, the V frequency is not within ±0.5% of the value prescribed by the format specified in Video Code.
H Total Pixels	When the InfoFrame AVI Video Code is 1 to 59, the total number of H pixels is at variance from the value prescribed by the format specified in Video Code.
H Active Pixels	When the InfoFrame AVI Video Code is 1 to 59, the number of H active pixels is at variance from the value prescribed by the format specified in Video Code.
H Sync Pixels	When the InfoFrame AVI Video Code is 1 to 59, the number of H sync pixels is at variance from the value prescribed by the format specified in Video Code.
H Back Porch Pixels	When the InfoFrame AVI Video Code is 1 to 59, the number of H back porch pixels is at variance from the value prescribed by the format specified in Video Code.
H Front Porch Pixels	When the InfoFrame AVI Video Code is 1 to 59, the number of H front porch pixels is at variance from the value prescribed by the format specified in Video Code.
H Sync Polarity	When the InfoFrame AVI Video Code is 1 to 59, the H sync polarity is at variance from what is prescribed by the format specified in Video Code.
V Total Lines	When the InfoFrame AVI Video Code is 1 to 59, the total number of V lines is at variance from the value prescribed by the format specified in Video Code.
V Active Lines	When the InfoFrame AVI Video Code is 1 to 59, the number of V active lines is at variance from the value prescribed by the format specified in Video Code.
V Sync Lines	When the InfoFrame AVI Video Code is 1 to 59, the number of V sync lines is at variance from the value prescribed by the format specified in Video Code.
V Back Porch Lines	When the InfoFrame AVI Video Code is 1 to 59, the number of V back porch lines is at variance from the value prescribed by the format specified in Video Code.
V Front Porch Lines	When the InfoFrame AVI Video Code is 1 to 59, the number of V front porch lines is at variance from the value prescribed by the format specified in Video Code.
V Sync Polarity	When the InfoFrame AVI Video Code is 1 to 59, the V sync polarity is at variance from what is prescribed by the format specified in Video Code.
Interlace	When the InfoFrame AVI Video Code is 1 to 59, the interlace system is at variance from the value prescribed by the format specified in Video Code.

For details on the timing data ratings, refer to “7.4 AVI InfoFrame Video Code tables” on page 268.

7.1.2 AVI InfoFrame

Item	Description
InfoFrame Version Number	Not 0x02.
Length of AVI InfoFrame	Not 0x0d.
Checksum	The lower 8 bits of the value obtained by adding up AVI InfoFrame Type Code + AVI InfoFrame Version Number + Length of AVI InfoFrame + CheckSum are not 0.
RGB or YCbCr	Y1, Y0 of AVI InfoFrame are not applicable to the color systems (RGB, YCbCr 422 or YCbCr 444) supported by the program EDID.
Active Format Aspect	AVI InfoFrame Active Format Aspect (R) is not 0x08 to 0x0b.
Picture Aspect	AVI InfoFrame Picture Aspect (M) is 0x02. Alternatively, with an InfoFrame AVI Video Code of 1 to 59, this value is at variance from the value prescribed by the format specified in Video Code.
Colorimetry	Colorimetry is set to 0x03 (Extended Colorimetry), and Extended Colorimetry is set to Reserve.
RGB Quantization Renge	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 sent, RGB Quantization Range is set to Full Range or Default. When RGB or YCbCr is set to RGB and signals other than VGA are sent, RGB Quantization Range is set to Limited Range or Default.
Extended Colorimetry	Extended Colorimetry is set to Reserve.
Video Code	When this value is 1 to 59, an error occurs in Input Video Timing.
Repetition	When the InfoFrame AVI Video Code is 1 to 59, this value is at variance from the value prescribed by the format specified in Video Code.
Rsv of Data Byte 1	None of the values of the reserve bits of Data Byte 1 is 0.
Rsv of Data Byte 3	None of the values of the reserve bits of Data Byte 2 is 0.
Rsv of Data Byte 4	None of the values of the reserve bits of Data Byte 4 is 0.
Rsv of Data Byte 5	None of the values of the reserve bits of Data Byte 5 is 0.
NO AVI InfoFrame	No AVI InfoFrame.

7.1.3 SPD InfoFrame

Item	Description
Checksum	The lower 8 bits of the value obtained by adding up SPD InfoFrame Type Code + SPD InfoFrame Version Number + Length of SPD InfoFrame + CheckSum is 0.

7.1.4 Audio InfoFrame

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>InfoFrame Version Number</td><td>Not 0x01.</td></tr>
<tr><td>Length of Audio InfoFrame</td><td>Not 0x0A.</td></tr>
<tr><td>Checksum</td><td>The lower 8 bits of the value obtained by adding up Audio InfoFrame Type Code + Audio InfoFrame Version Number + Length of Audio InfoFrame + CheckSum is 0.</td></tr>
<tr><td>Audio Coding Type</td><td>Audio InfoFrame: Audio Coding Type (CT) value is not 0.</td></tr>
<tr><td>Audio Channel Count</td><td>Audio InfoFrame: The combination of the Audio Channel Count (CC) and Speaker Placement (CA) settings is not correct. (For details, refer to the table below.)
<table>
<tr><th>Audio Channel Count (CC)</th><th>Speaker Placement (CA)</th></tr>
<tr><td>0x00</td><td>Greater than 0x1F</td></tr>
<tr><td>0x01</td><td>Not 0x00.</td></tr>
<tr><td>0x02</td><td>Not 0x01, 0x02 or 0x04.</td></tr>
<tr><td>0x03</td><td>Not 0x03, 0x05, 0x06, 0x08 or 0x14.</td></tr>
<tr><td>0x04</td><td>Not 0x07, 0x09, 0x0A, 0x0C, 0x15, 0x16 or 0x18.</td></tr>
<tr><td>0x05</td><td>Not 0x0B, 0x0D, 0x0E, 0x10, 0x17, 0x19, 0x1A or 0x1C.</td></tr>
<tr><td>0x06</td><td>Not 0x0F, 0x11, 0x12, 0x1B, 0x1D or 0x1E</td></tr>
<tr><td>0x07</td><td>Not 0x13 or 0x1F.</td></tr>
</table></td></tr>
<tr><td>Sampling Frequency</td><td>A setting other than DSD is selected for Audio Type, and the value of the Sampling Frequency (SF) for Audio InfoFrame Audio Channel Count Audio InfoFrame is not 0.
One Bit Audio is set for Audio Type, and the value of the Sampling Frequency (SF) for Audio InfoFrame Audio Channel Count Audio InfoFrame is 0.</td></tr>
<tr><td>Sample Size</td><td>Audio InfoFrame: The value of Sampling Size (SS) for Audio InfoFrame is not 0.</td></tr>
<tr><td>Speaker Placement</td><td>Audio InfoFrame: Speaker Placement (CA) is greater than 0x1F.</td></tr>
<tr><td>Level Shift Value</td><td>Audio InfoFrame: Speaker Placement (CA) is 0. Audio InfoFrame: Level Shift Value (LSV) is not 0.</td></tr>
<tr><td>Down-mix Inhibit Flag</td><td>Audio InfoFrame: Speaker Placement (CA) is 0. Audio InfoFrame: Down-mix Inhibit Flag (DM_INH) is 0x01 (Prohibited).</td></tr>
<tr><td>Rsv of Data Byte 1</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 1 is 0.</td></tr>
<tr><td>Rsv of Data Byte 2</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 2 is 0.</td></tr>
<tr><td>Rsv of Data Byte 6</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 6 is 0.</td></tr>
<tr><td>Rsv of Data Byte 7</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 7 is 0.</td></tr>
<tr><td>Rsv of Data Byte 8</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 8 is 0.</td></tr>
<tr><td>Rsv of Data Byte 9</td><td>None of the values of the reserve bits of Audio InfoFrame Data Byte 9 is 0.</td></tr>
</table>

Rsv of Data Byte 10	None of the values of the reserve bits of Audio InfoFrame Data Byte 10 is 0.
No Audio InfoFrame	No Audio InfoFrame when Audio signals are input.

7.1.5 MPEG InfoFrame

Item	Description
Checksum	The lower 8 bits of the value obtained by adding up Mpeg InfoFrame Type Code + Mpeg InfoFrame Version Number + Length of Mpeg InfoFrame + CheckSum is not 0.
Rsv of Data Byte 6	Mpeg InfoFrame: None of the values of the reserve bits of Data Byte 6 is 0.
Rsv of Data Byte 7	Mpeg InfoFrame: None of the values of the reserve bits of Data Byte 7 is 0.
Rsv of Data Byte 8	Mpeg InfoFrame: None of the values of the reserve bits of Data Byte 8 is 0.
Rsv of Data Byte 9	Mpeg InfoFrame: None of the values of the reserve bits of Data Byte 9 is 0.
Rsv of Data Byte 10	Mpeg InfoFrame: None of the values of the reserve bits of Data Byte 10 is 0.

7.1.6 ACP Packet

Item	Description
ACP_TYPE	Greater 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 Byte 2	None of the values of the reserve bits of Header Byte 2 is 0.
Rsv of Data Byte 16 - 27	None of the values of the reserve bits of Data Bytes 16 - 27 is 0.

7.1.7 ISRC1 Packet

Item	Description
Rsv of Header Byte 1	None of the values of the reserve bits of ISRC1 Packet Header Byte 1 is 0.
Rsv of Header Byte 2	None of the values of the reserve bits of ISRC1 Packet Header Byte 2 is 0.
Rsv of Data Byte 16 - 27	None of the values of the reserve bits of ISRC1 Packet Data Bytes 16 - 27 is 0.
NO ISRC1 Packet	ACP Packet ACP Type is 0x02 (DVD), and ISRC1 is not sent.

7.1.8 ISRC2 Packet

Item	Description
Rsv of Header Byte 1	None of the values of the reserve bits of ISRC2 Packet Header Byte 1 is 0.
Rsv of Header Byte 2	None of the values of the reserve bits of ISRC2 Packet Header Byte 2 is 0.
Rsv of Data Byte 16 - 27	None of the values of the reserve bits of ISRC2 Packet Data Bytes 16 - 27 is 0.
NO ISRC2 Packet	ISRC2 Packet is not sent when ISRC1 Packet ISRC1_Cont is 1.

7.1.9 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 B Bit period 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.

* No measurements are possible when the sampling frequency is 96 kHz or above.

7.1.10 Audio Timing

Item	Description
N	N is not within the range of 128*FS/1500Hz ≥ N ≥ 128*FS/300Hz.
CTS	CTS is not within ±0.2% of the value obtained from (T_TMDS_clock*N)/(128*FS).
No Audio	No Audio input. Audio InfoFrame present.

* An error also results for N or CTS when the sampling frequency of Channel Status Bit is abnormal.

7.1.11 HDCP

Item	Description
AKSV	AKSV does not consist of twenty 1's and twenty 0's.
BKSV	BKSV does not consist of twenty 1's and twenty 0's.
DEVICE_CNT	The DEVICE_CNT value is greater than the maximum (127).
DEPTH	The DEPTH value is greater than the maximum (7).
Decription	Authentication is completed, but operation fails to move on to decryption.

7.1.12 HDCP Authentication VA-1809A->Sink

Item	Description
AKSV	AKSV is not composed of twenty "1s" and twenty "0s."
BKSV	BKSV is not composed of twenty "1s" and twenty "0s."
DEVICE_CNT	DEVICE_CNT value has exceeded the MAX value (127).
DEPTH	DEPTH value has exceeded the MAX value (7).
Ri, Ri'	The Ri value is different from the Ri' value.

7.1.13 HDCP Authentication Part 3 VA-1809A->Sink

Item	Description
Ri, Ri'	The Ri value is different from the Ri' value.

7.1.14 HDCP Repeater Sequence

Item	Description
1st DownStream Connect	No sink device is connected.
1st DDC Line Status	The DDC line is abnormal.
1st YCbCr Support	Sink devices are not supported by YCbCr.
1st BKSV Check	BKSV is abnormal.
1st Link Check	R_0 is different from R_0'.
2nd KSV FIFO Ready	Sink device's FIFO Ready does not turn ON.
2nd Depth Check	The Depth value read from the sink device is 7 or larger.
2nd Count Check	The Count value read from the sink device is 128 or larger.
2nd Compare V	V is different from V'.

7.1.15 Compliance Test Item Check

■ EDID Related Behavior

Compliance test items 7-1 can be checked.
The items to be inspected vary depending on the size of the EDID data of the program set in the VA-1809A.

Item	Classification	Description
128 bytes	Error	A combination of <0xA0+ack> <0x00+ack> and <0xA1+ack> cannot be detected by the DDC line command.
256 bytes	Error	A combination of <0xA0+ack> <0x00+ack> and <0xA1+ack> cannot be detected by the DDC line command. All areas of the EDID that were set were not read.
	Warning	An area exceeding the EDID size that has been set was read.
257 bytes or more	Error	A combination of <0x60+ack> <0x01+ack> and <0xA0+ack> cannot be detected by the DDC line command.
	Warning	An area exceeding the EDID size that has been set was read.

■ Packet Type

Compliance test items 7-19 can be checked.
The following packets are checked.

Item	Description
ACP Packet	See page 256, "7.1.6 ACP Packet."
ISRC1 Packet	See page 256, "7.1.7 ISRC1 Packet."
ISRC2 Packet	See page 257, "7.1.8 ISRC2 Packet."

■ RGB to RGB-only Sink

Compliance test items 7-23 can be checked.
“RGB or YCbCr” of AVI InfoFrame is not set to “0 (RGB).”

■ YCbCr to YCbCr Sink

Compliance test items 7-24 can be checked.
“RGB or YCbCr” of AVI InfoFrame is not set to “1” or “2 (YCbCr).”

■ Video Format Timing

Compliance test items 7-25 can be checked.
See page 255, “7.1.1 Video Timing.”

■ Pixel Repetition

Compliance test items 7-26 can be checked.
When the video code of InfoFrame AVI is (1-59), the repetition value of InfoFrame is different from the value defined in the format to be specified in the video code.
Or, the specified repetition value and the repetition value of the actual image are different.

■ AVI InfoFrame

Compliance test items 7-27 can be checked.
See page 257, “7.1.2 VI InfoFrame.”

■ IEC 60958 / IEC 61937

Compliance test items 7-28 can be checked.
See page 257, “7.1.9 Channel Status Bit.”

■ ACR

Compliance test items 7-29 can be checked.
N and CTS on page 260, “7.1.10 Audio Timing” are checked.

■ Audio InfoFrame

Compliance test items 7-31 can be checked.
See page 258, “7.1.4 Audio InfoFrame.”

■ Audio Packet Layout

Compliance test items 7-32 can be checked.
The “Audio Channel Count” value of Audio InfoFrame and the Layout value of the Audio Sample Packet do not match.

■ Interoperability with DVI

Compliance test items 7-33 can be checked.
There is an input to the VA-1809A although an EDID other than HDMI is set in the VA-1809A.

■ One Bit Audio

Compliance test items 7-37 can be checked.

■ EDID Readable

Compliance test items 8-1 can be checked.

Item	Description
EDID Block 0 Size	The size of EDID block 0 is not 128 bytes.
Extension Flag	The extension flag is set to “0.”
Extension Block Num	The number of extension blocks is different from the extension flag.

■ EDID VESA Structure

Compliance test items 8-2 can be checked.

Item	Description
EDID Block 0 Header	The header of the EDID is not 0x00, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF, 0xFF or 0x00.
EDID Version, Revision	“Version” and “Revision” of the EDID are not 0x01 and 0x03, respectively.
Video Information Byte	“Basic Display Parameter/Feature” of the EDID is set to “Analog Interface.”
Preferred Timing bit is set	“Preferred Timing Mode” of the EDID is not set to “1.”
Detailed Timing Descriptions	First two bytes in the “1st Detailed Timing Section” of the EDID are all set to “0x00.”
	“Monitor Range Limits” and “Monitor Name Descriptor” are not included in the “Detailed Timing Section” of the EDID.
	“Monitor Descriptor” is before “Detailed Timing Descriptor” of the EDID.
EDID Block 1	The CEA timing extension or block map is not assigned to block 1 of the EDID.
Block Map	The block map and the header of each block do not match. (It is checked when the extension count is greater than “1.”)
	The unused area of the block map is not set to “0.”
Block Checksum	The checksum value is incorrect.

■ EDID CEA Structure

Compliance test items 8-3 can be checked.

Item	Description
Revision Number	The revision number is not “0x03.”
Data structure	The tag code of the data block is “0,” “5,” “6” or “7 (reserved).” The value of Byte#2 (Byte number offset “d” where Detailed Timing data begins) of the CEA timing extension is incorrect when converted from the length of each data block.
Audio Data Block	If there is an audio data block, bit#6 (audio) in byte#3 of the 1st CEA timing extension is not set to “1.” (Basic audio is not supported.)
	The audio data block length is not a multiple of 3.
	Bit#7 in the 1st byte and bit#7 in the 2nd byte of a block in the CEA short audio descriptor are not set to “0” (reserved area).
	When the audio format code of a block of the CEA short audio descriptor is linear PCM, bit#7 through bit#3 in the 3rd byte are not set to “0” (reserved area).
Speaker Allocation Data Block	If there is a speaker allocation data block, the speaker allocation data block length is not set to “3.”
	Bit#7 in the 1st byte and all bits in the 2nd byte and 3rd byte are not set to “0” (reserved area).
	There are two or more speaker allocation data blocks in the 1st CEA timing extension. In addition, there are speaker allocation data blocks in other CEA timing extensions.
	There is no speaker allocation data block although multi-channel audio is supported by the CEA short audio descriptor.
Detailed Timing Descriptor	When the first two bytes of the detailed timing descriptor are set to “0,” all subsequent block data (other than the checksum bit) are not set to “0.”
HDMI Vendor-Specific Data Block	There is no data block whose first four bytes are set to 0b011xxxxx, 0x03, 0x0C or 0x00 in the 1st CEA timing extension. (There is no particular specification for x.) (There is no HDMI vendor specific data block.)
	The physical address is incorrect. (The bits other than the upper four bits of the 1st byte in the physical address are not all set to “0.”)
	Byte 6 in the HDMI vendor-specific data block is not 0x80 or 0x00.
	The reserved area of the extension field in the HDMI vendor-specific data block is not set to “0.”
	There is a data block whose first four bytes are set to 0b011xxxxx, 0x03, 0x0C or 0x00 in blocks other than the 1st CEA timing extension. (There is no specific specification for x.) (There is an HDMI vendor specific data block.)
Others	Bit#7 through bit#4 (number of preferred timings plus flags) in byte#3 of all CEA timing extension blocks are not the same.
Native Format	The number of detailed timing descriptors in the EDID is smaller than the number of native formats.

7.2 ANALYSIS OVER LIMIT (yellow display) table

Video Timing

Item	Description
Pixel Clock	When the InfoFrame AVI Video Code is not 1 to 59, the pixel clock frequency is not in the 25.000 to 165.000 MHz range.
H Total Pixels	(1) When the InfoFrame AVI Video Code is not 1 to 59, the total number of H pixels is not a multiple of 2. (2) When the InfoFrame AVI Video Code is not 1 to 59, the total number of H pixels is not in the 200 to 2500 range. (3) When the InfoFrame AVI Video Code is not 1 to 59 and the H Period is greater than 2144 pixels, Hsync + H Back Porch is not ≥ H period - 2048.
H Active Pixels	(1) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Active pixels is not a multiple of 2. (2) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Active pixels is not in the 128 to 200 range.
H Sync Pixels	(1) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Sync pixels is not a multiple of 2. (2) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Sync pixels is less than 2. (3) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Blanking pixels (H Sync pixels + H Back Porch pixels + H Front Porch pixels) is less than 138.
H Back Porch Pixels	(1) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Back Porch pixels is not a multiple of 2. (2) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Back Porch pixels is less than 2. (3) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Blanking pixels (H Sync pixels + H Back Porch pixels + H Front Porch pixels) is less than 138.
H Front Porch Pixels	(1) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Front Porch pixels is not a multiple of 2. (2) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Front Porch pixels is less than 2. (3) When the InfoFrame AVI Video Code is not 1 to 59, the number of H Blanking pixels (H Sync pixels + H Back Porch pixels + H Front Porch pixels) is less than 138.
V Total Lines	When the InfoFrame AVI Video Code is not 1 to 59, the number of V Total lines is not in the 200 to 2000 range.
V Active Lines	When the InfoFrame AVI Video Code is not 1 to 59, the number of V Active lines is not in the 128 to 1320 range.
V Sync Lines	When the InfoFrame AVI Video Code is not 1 to 59, the number of V Sync lines is not in the 4 to 500 range.
V Back Porch Lines	When the InfoFrame AVI Video Code is not 1 to 59, the number of V Back Porch lines is not in the 1 to (1/2 × V Total lines) range.

7.3 ERROR CODE table

ERROR CODE	Description
0x80000026	Memory card read error
0x80000027	Memory card write protected
0x80000028	Memory card is not inserted.
0x80000029	Memory card is not formatted.
0x8000002a	Memory capacity of memory card exceeded.
0x80000035	Flash ROM write error
0x80000100	File open error
0x80000101	File write error
0x80000110	VA-1809A information write error
0x80000111	Log information write error
0x80000112	HDMI information write error
0x80000120	Input timing data write error
0x80000121	Audio timing data write error
0x80000122	HDCP data write error
0x80000130	Data write error in AVI InfoFrame data for GUI
0x80000131	Data write error in SPD InfoFrame data for GUI
0x80000132	Data write error in Audio InfoFrame data for GUI
0x80000133	Data write error in MPEG InfoFrame data for GUI
0x80000134	Data write error in ACP Packet data for GUI
0x80000135	Data write error in ISRC1 Packet data for GUI
0x80000136	Data write error in ISRC2 Packet data for GUI
0x80000137	Data write error in Channel Status Bit data for GUI
0x80000140	Data write error in AVI InfoFrame data for HEX
0x80000141	Data write error in SPD InfoFrame data for HEX
0x80000142	Data write error in Audio InfoFrame data for HEX
0x80000143	Data write error in MPEG InfoFrame data for HEX
0x80000144	Data write error in ACP Packet data for HEX
0x80000145	Data write error in ISRC1 Packet data for HEX
0x80000146	Data write error in ISRC2 Packet data for HEX
0x80000147	Data write error in Channel Status Bit data for HEX
0x80000148	Data write error in Vendor Specific InfoFrame data for HEX
0x80000149	Data write error in Gamute Meta data Packet data for HEX
0x80000200	EDID Read error of output side. (Not Connect)
0x80000201	EDID Read error of output side. (I2C ERROR)
0x80000202	EDID Read error of output side. (Hotplug ERROR)

7.4 AVI InfoFrame Video Code tables

Video Code	1		2		3		4		5		6	
Name	640×480p@59.94/60		720×480p@59.94/60		720×480p@59.94/60		1280×720p@59.94/60		1920×1080i@59.94/60		1440×480i@59.94/60	
Table No.	1	2	1	2	1	2	1	2	1	2	1	2
Pixel Clock	25.175	25.200	27.000	27.027	27.000	27.027	74.175	74.250	74.175	74.250	27.000	27.027
H Frequency	31.469	31.500	31.469	31.500	31.469	31.500	44.955	45.000	33.716	33.750	15.734	15.750
V Frequency	59.940	60.000	59.940	60.000	59.940	60.000	59.939	60.000	59.939	60.000	59.940	60.000
H Sync	96	96	62	62	62	62	40	40	44	44	124	124
H Total	800	800	858	858	858	858	1650	1650	2200	2200	1716	1716
H Active	640	640	720	720	720	720	1280	1280	1920	1920	1440	1440
V Sync	2	2	6	6	6	6	5	5	5	5	3	3
V Back Porch	33	33	30	30	30	30	20	20	15	15	15	15
H Back Porch	48	48	60	60	60	60	220	220	148	148	114	114
V Total	525	525	525	525	525	525	750	750	1125	1125	525	525
V Active	480	480	480	480	480	480	720	720	1080	1080	480	480
H Front Porch	16	16	16	16	16	16	110	110	88	88	38	38
V Front Porch	10	10	9	9	9	9	5	5	2	2	4	4
Scan	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace	Interlace	Interlace
Hsyncpolarity	nega	Nega	Nega	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Nega	Nega
Vsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Nega	Nega
AspectRatio	4:3	4:3	4:3	4:3	16:9	16:9	16:9	16:9	16:9	16:9	4:3	4:3

Video Code	7		8				9				10	
Name	1440×480i@59.94/60		1440×240p@59.94/60				1440×240p@59.94/60				2880×480i@59.94/60	
Table No.	1	2	1	2	3	4	1	2	3	4	1	2
Pixel Clock	27.000	27.027	27.000	27.027	27.000	27.027	27.000	27.027	27.000	27.027	54.000	54.054
H Frequency	15.734	15.750	15.734	15.750	15.734	15.750	15.734	15.750	15.734	15.750	15.734	15.750
V Frequency	59.940	60.000	59.826	59.886	60.054	60.115	59.826	59.886	60.054	60.115	59.940	60.000
H Sync	124	124	124	124	124	124	124	124	124	124	248	248
H Total	1716	1716	1716	1716	1716	1716	1716	1716	1716	1716	3432	3432
H Active	1440	1440	1440	1440	1440	1440	1440	1440	1440	1440	2880	2880
V Sync	3	3	3	3	3	3	3	3	3	3	3	3
V Back Porch	15	15	15	15	15	15	15	15	15	15	15	15
H Back Porch	114	114	114	114	114	114	114	114	114	114	228	228
V Total	525	525	263	263	262	262	263	263	262	262	525	525
V Active	480	480	240	240	240	240	240	240	240	240	480	480
H Front Porch	38	38	38	38	38	38	38	38	38	38	76	76
V Front Porch	4	4	5	5	4	4	5	5	4	4	4	4
Scan	Interlace	Interlace	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace
Hsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Vsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
AspectRate	16:9	16:9	4:3	4:3	4:3	4:3	16:9	16:9	16:9	16:9	4:3	4:3

Video Code	11		12				13				14	
Name	2880×480i@59.94/60		2880×240p@59.94/60				2880×240p@59.94/60				1440×480p@59.94/60	
Table No.	1	2	1	2	3	4	1	2	3	4	1	2
Pixel Clock	54.000	54.054	54.000	54.054	54.000	54.054	54.000	54.054	54.000	54.054	54.000	54.054
H Frequency	15.734	15.750	15.734	15.750	15.734	15.750	15.734	15.750	15.734	15.750	31.469	31.500
V Frequency	59.940	60.000	59.826	59.886	60.054	60.115	59.826	59.886	60.054	60.115	56.940	60.000
H Sync	248	248	248	248	248	248	248	248	248	248	124	124
H Total	3432	3432	3432	3432	3432	3432	3432	3432	3432	3432	1716	1716
H Active	2880	2880	2880	2880	2880	2880	2880	2880	2880	2880	1440	1440
V Sync	3	3	3	3	3	3	3	3	3	3	6	6
V Back Porch	15	15	15	15	15	15	15	15	15	15	30	30
H Back Porch	228	228	228	228	228	228	228	228	228	228	120	120
V Total	525	525	263	263	262	262	263	263	262	262	525	525
V Active	480	480	240	240	240	240	240	240	240	240	480	480
H Front Porch	76	76	76	76	76	76	76	76	76	76	32	32
V Front Porch	4	4	5	5	4	4	5	5	4	4	9	9
Scan	Interlace	Interlace	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive
Hsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Vsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
AspectRate	16:9	16:9	4:3	4:3	4:3	4:3	16:9	16:9	16:9	16:9	4:3	4:3

VideoCode	15		16		17	18	19	20	21	22
Name	1440×480p@59.94/60		1920×1080p@59.94/60		720×576p@50	720×576p@50	1280×720p@50	1920×1080i@50	1440×576i@50	1440×576i@50
TableNo.	1	2	1	2	1	1	1	1	1	1
PixelClock	54.000	54.054	148.350	148.500	27.000	27.000	74.250	74.250	27.000	27.000
HFrequency	31.469	31.500	67.432	67.500	31.250	31.250	37.500	28.125	15.625	15.625
VFrequency	56.940	60.000	59.939	60.000	50.000	50.000	50.000	50.000	50.000	50.000
HSync	124	124	44	44	64	64	40	44	126	126
HTotal	1716	1716	2200	2200	864	864	1980	2640	1728	1728
HActive	1440	1440	1920	1920	720	720	1280	1920	1440	1440
VSync	6	6	5	5	5	5	5	5	3	3
VBackPorch	30	30	36	36	39	39	20	15	19	19
HBackPorch	120	120	148	148	68	68	220	148	138	138
VTotal	525	525	1125	1125	625	625	750	1125	625	625
VActive	480	480	1080	1080	576	576	720	1080	576	576
HFrontPorch	32	32	88	88	12	12	440	528	24	24
VFrontPorch	9	9	4	4	5	5	5	2	2	2
Scan	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace	Interlace
Hsyncpolarity	Nega	Nega	Posi	Posi	Nega	Nega	Posi	Posi	Nega	Nega
Vsyncpolarity	Nega	Nega	Posi	Posi	Nega	Nega	Posi	Posi	Nega	Nega
AspectRate	16:9	16:9	16:9	16:9	4:3	16:9	16:9	16:9	4:3	16:9

VideoCode	23			24			25	26	27		
Name	1440×288p@50			1440×288p@50			2880×576i@50	2880×576i@50	2880×288p@50		
TableNo.	1	2	3	1	2	3	1	1	1	2	3
PixelClock	27.000	27.000	27.000	27.000	27.000	27.000	54.000	54.000	54.000	54.000	54.000
HFrequency	15.625	15.625	15.625	15.625	15.625	15.625	15.625	15.625	15.625	15.625	15.625
VFrequency	49.761	49.920	50.080	49.761	49.920	50.080	50.000	50.000	49.761	49.920	50.080
HSync	126	126	126	126	126	126	252	252	252	252	252
HTotal	1728	1728	1728	1728	1728	1728	3456	3456	3456	3456	3456
HActive	1440	1440	1440	1440	1440	1440	2880	2880	2880	2880	2880
VSync	3	3	3	3	3	3	3	3	3	3	3
VBackPorch	19	19	19	19	19	19	19	19	19	19	19
HBackPorch	138	138	138	138	138	138	276	276	276	276	276
VTotal	314	313	312	314	313	312	625	625	314	313	312
VActive	288	288	288	288	288	288	576	576	288	288	288
HFrontPorch	24	24	24	24	24	24	48	48	48	48	48
VFrontPorch	4	3	2	4	3	2	2	2	4	3	2
Scan	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace	Progressive	Progressive	Progressive
Hsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Vsyncpolarity	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
AspectRate	4:3	4:3	4:3	16:9	16:9	16:9	4:3	16:9	4:3	4:3	4:3

VideoCode	28			29	30	31	32		33	34	
Name	2880×288p@50			1440×576p@50	1440×576p@50	1920×1080p@50	1920×1080p@23.97/24		1920×1080p@25	1920×1080p@29.97/30	
TableNo.	1	2	3	1	1	1	1	2	1	1	2
PixelClock	54.000	54.000	54.000	54.000	54.000	148.500	74.175	74.250	74.250	74.175	74.250
HFrequency	15.625	15.625	15.625	31.250	31.250	56.250	26.973	27.000	28.125	33.716	33.750
VFrequency	49.761	49.920	50.080	50.000	50.000	50.000	23.976	24.000	25.000	29.970	30.000
HSync	252	252	252	128	128	44	44	44	44	44	44
HTotal	3456	3456	3456	1728	1728	2640	2750	2750	2640	2200	2200
HActive	2880	2880	2880	1440	1440	1920	1920	1920	1920	1920	1920
VSync	3	3	3	5	5	5	5	5	5	5	5
VBackPorch	19	19	19	39	39	36	36	36	36	36	36
HBackPorch	276	276	276	136	136	148	148	148	148	148	148
VTotal	314	313	312	625	625	1125	1125	1125	1125	1125	1125
VActive	288	288	288	576	576	1080	1080	1080	1080	1080	1080
HFrontPorch	48	48	48	24	24	528	638	638	528	88	88
VFrontPorch	4	3	2	5	5	4	4	4	4	4	4
Scan	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive
Hsyncpolarity	Nega	Nega	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Posi	Posi
Vsyncpolarity	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Posi	Posi	Posi	Posi
AspectRate	16:9	16:9	16:9	4:3	16:9	16:9	16:9	16:9	16:9	16:9	16:9

VideoCode	35		36		37	38	39	40	41	42
Name	2880×480p@59.94/60		2880×480p@59.94/60		2880×576p@50	2880×576p@50	1920×1080i@50	1920×1080i@100	1280×720p@100	720×576p@100
TableNo.	1	2	1	2	1	1	1	1	1	1
PixelClock	108.000	108.108	108.000	108.108	108.000	108.000	72.000	148.500	148.500	54.000
Hfreq	31.469	31.5	31.469	31.5	31.25	31.25	31.25	56.25	75	62.5
Vfreq	59.94	60	59.94	60	50	50	50	100	100	100
Htotal	3432	3432	3432	3432	3456	3456	2304	2640	1980	864
Hactive	2880	2880	2880	2880	2880	2880	1920	1920	1280	720
Hsync	248	248	248	248	256	256	168	44	40	64
Hback	240	240	240	240	272	272	184	148	220	68
Hfront	64	64	64	64	48	48	32	528	440	12
Hpola	Nega	Nega	Nega	Nega	Nega	Nega	Posi	Posi	Posi	Nega
Vtotal	525	525	525	525	625	625	1250	1125	750	625
Vactive	480	480	480	480	576	576	1080	1080	720	576
Vsync	6	6	6	6	5	5	5	5	5	5
Vback	30	30	30	30	39	39	57	15	20	39
Vfront	9	9	9	9	5	5	23	2	5	5
Vpola	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Posi	Posi	Nega
Interlace	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace	Progressive	Progressive
Aspect	4:3	4:3	16:9	16:9	4:3	16:9	16:9	16:9	16:9	4:3

VideoCode	43	44	45	46		47		48	
Name	720×576p@100	1440×576i@100	1440×576i@100	1920×1080i@119.88/120		1280×720p@119.88/120		1280×720p@119.88/120	
TableNo.	1	1	1	1	2	1	2	1	2
PixelClock	54.000	54.000	54.000	148.352	148.500	148.352	148.500	54.000	54.054
Hfreq	62.5	31.25	31.25	67.432	67.5	89.909	90	62.937	63
Vfreq	100	100	100	119.88	120	119.88	120	119.88	120
Htotal	864	1728	1728	2200	2200	1650	1650	858	858
Hactive	720	1440	1440	1920	1920	1280	1280	720	720
Hsync	64	126	126	44	44	40	40	62	62
Hback	68	138	138	148	148	220	220	60	60
Hfront	12	24	24	88	88	110	110	16	16
Hpola	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Nega	Nega
Vtotal	625	625	625	1125	1125	750	750	525	525
Vactive	576	576	576	1080	1080	720	720	480	480
Vsync	5	3	3	5	5	5	5	6	6
Vback	39	19	19	15	15	20	20	30	30
Vfront	5	2	2	2	2	5	5	9	9
Vpola	Nega	Nega	Nega	Posi	Posi	Posi	Posi	Nega	Nega
Interlace	Progressive	Interlace	Interlace	Interlace	Interlace	Progressive	Progressive	Progressive	Progressive
Aspect	16:9	4:3	16:9	16:9	16:9	16:9	16:9	4:3	4:3

VideoCode	49		50		51		52	53	54	55
Name	720×480p@119.88/120		1440×480i@119.88/120		1440×480i@119.88/120		720×576p@200	720×576p@200	1440×576i@200	1440×576i@200
TableNo.	1	2	1	2	1	2	1	1	1	1
PixelClock	54.000	54.054	54.000	108.000	108.000	108.000	108.000	108.000	108.000	108.000
Hfreq	62.937	63	31.469	125	125	62.5	62.5	125	62.5	62.5
Vfreq	119.88	120	119.88	200	200	200	200	200	200	200
Htotal	858	858	1716	864	864	1728	1728	864	1728	1728
Hactive	720	720	1440	720	720	1440	1440	720	1440	1440
Hsync	62	62	124	64	64	126	126	64	126	126
Hback	60	60	114	68	68	138	138	68	138	138
Hfront	16	16	38	12	12	24	24	12	24	24
Hpola	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Vtotal	525	525	525	625	625	625	625	625	625	625
Vactive	480	480	480	576	576	576	576	576	576	576
Vsync	6	6	3	5	5	3	3	5	3	3
Vback	30	30	15	39	39	19	19	39	19	19
Vfront	9	9	4	5	5	2	2	5	2	2
Vpola	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Interlace	Progressive	Progressive	Interlace	Progressive	Progressive	Interlace	Interlace	Progressive	Interlace	Interlace
Aspect	16:9	16:9	4:3	4:3	16:9	4:3	16:9	16:9	4:3	16:9

VideoCode	56		57		58		59	
Name	720×480p@239.76/240		720×480p@239.76/240		720(1440)×480i@239.76/240		720(1440)×480i@239.76/240	
TableNo.	1	2	1	2	1	2	1	2
PixelClock	108.000	108.108	108.000	108.108	108.000	108.108	108.000	108.108
Hfreq	125.874	126	125.874	126	62.937	63	62.937	63
Vfreq	239.76	240	239.76	240	239.76	240	239.76	240
Htotal	858	858	858	858	1716	1716	1716	1716
Hactive	720	720	720	720	1440	1440	1440	1440
Hsync	62	62	62	62	124	124	124	124
Hback	60	60	60	60	114	114	114	114
Hfront	16	16	16	16	38	38	38	38
Hpola	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Vtotal	525	525	525	525	525	525	525	525
Vactive	480	480	480	480	480	480	480	480
Vsync	6	6	6	6	3	3	3	3
Vback	30	30	30	30	15	15	15	15
Vfront	9	9	9	9	4	4	4	4
Vpola	Nega	Nega	Nega	Nega	Nega	Nega	Nega	Nega
Interlace	Progressive	Progressive	Progressive	Progressive	Interlace	Interlace	Interlace	Interlace
Aspect	4:3	4:3	16:9	16:9	4:3	4:3	16:9	16:9

Video Code	60		61	62		63		64
Name	1280x720p@23.97/24		1280x720p@25	1280x720p@29.97/30		1920x1080p@119.88/120		1920x1080p@100
Table No.	1	2	1	1	2	1	2	1
Pixel Clock	59.327	59.400	74.250	74.177	74.250	296.703	297	297
Hfreq	17.978	18	18.75	22.478	18.75	134.865	135	135
Vfreq	23.97	24	25	29.97	25	119.88	120	120
Htotal	3300	3300	3960	3300	3300	2200	2200	2640
Hactive	1280	1280	1280	1280	1280	1920	1920	1920
Hsync	40	40	40	40	40	44	44	44
Hback	220	220	220	220	220	148	148	148
Hfront	1760	1760	2420	1760	1760	88	88	528
Hpola	Posi	Posi	Posi	Posi	Posi	Posi	Posi	Posi
Vtotal	750	750	750	750	750	1125	1125	1125
Vactive	720	720	720	720	720	1080	1080	1080
Vsync	5	5	5	5	5	5	5	5
Vback	20	20	20	20	20	36	36	36
Vfront	5	5	5	5	5	4	4	4
Vpola	Posi	Posi	Posi	Posi	Posi	Posi	Posi	Posi
Interlace	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive	Progressive
Aspect	16:9	16:9	16:9	16:9	16:9	16:9	16:9	16:9

8 Product specifications

8.1. Internal data

The VA-1809A contains ten sets of sample data as its internal data.
The default settings are shown below.

8.1.1 SAMPLE1

* The SAMPLE1 data serves as the EDID data when the power of the VA-1809A is OFF. The EDID data cannot be edited while the power of the VA-1809A is OFF.

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	1C
80	02	03	43	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	7F	07	17	1F	38	1F	07	30	2F	07	72	3F
A0	7F	72	4F	7F	00	57	7F	00	5F	7F	01	37	7F	72	83	4F
B0	00	00	E3	05	03	01	6C	03	0C	00	10	00	B8	2D	00	00
C0	00	00	00	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81
D0	49	00	00	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2
E0	00	81	60	00	08	08	18	8C	0A	D0	90	20	40	31	20	0C
F0	40	55	00	81	60	00	00	00	18	00	00	00	00	00	00	38

byte	Item	Setting
07-00	Headder	0x00FFFFFFFFFFFF00
09-08	ID Manufacturer Name	0x8F06 = ATO
0B-0A	ID Product Code	0x1107h
0F-0C	ID Serial Number	0x00000001
10	Week of Manufacture	0x17 = 23
11	Year of Manufacture	0x11 = 2007
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	0x0C = 12cm
16	Max. Vertical Image Size	0x09 = 9cm
17	Display Transfer Characteristic(Gamma)	0x7A= 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 Green-x Green-y Blue-x Blue-y White-x White-y	0x57522928855659981EAC 0x280 = 0.594 0x15C = 0.349 0x11F = 0.339 0x262 = 0.521 0x09F = 0.158 0x048 = 0.162 0x122 = 0x323 0x131 = 0.340
23	[Established Timings 1] 720x400 @ 70Hz 720x400 @ 88Hz 640x480 @ 60Hz 640x480 @ 67Hz 640x480 @ 72Hz 640x480 @ 75Hz 800x600 @ 56Hz 800x600 @ 60Hz	0x00 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support
24	[Established Timings 2] 800x600 @ 72Hz 800x600 @ 75Hz 832x624 @ 75Hz 1024x768 @ 87Hz(Interlace) 1024x768 @ 60Hz	0x00 0b0 = not support 0b0 = not support 0b0 = not support 0b0 = not support 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@75 Hz	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 = 480 H
	Vertical Blanking Lines	0x2D = 45 H
41-3E	Horizontal sync offset	0x10 = 16 dots
	Horizontal sync pulse width	0x3E = 62 dots
	Vert sync offset	0x09 = 9 H
	Vert sync pulse width	0x06 = 6 H
44-42	Horizontal Image Size	0x81 = 129 mm
	Vertical Image Size	0x60 = 96 cm
45	Horizontal Border	0x00 = 0 dots
46	Vertical Border	0x00 = 0 H
47	Interlace	0b0 = non-Interlace
	Stereo Mode	0b0 = Normal display, no stereo
	sync signal description 1	0x3 = Digital Separate
	sync signal description 2	0b0 = Vertical Polarity negative
	sync signal description 3	0b0 = Horizontal Polarity negative
59-48	[Detailed Timing Descriptions #2]	
37-36	Pixel Clock	0x1D01 = 74.25 MHz
3A-38	Horizontal Active Pixels	0x780 = 1920 dots
	Horizontal Blanking Pixels	0x118 = 280 dots
3D-3B	Vertical Active Lines	0x21C = 540 H
	Vertical Blanking Lines	0x16 = 22 H
41-3E	Horizontal sync offset	0x58 = 88 dots
	Horizontal sync pulse width	0x2C = 44 dots
	Vert sync offset	0x02 = 2 H
	Vert sync pulse width	0x05 = 5 H
44-42	Horizontal Image Size	0x81 = 129 mm
	Vertical Image Size	0x49 = 73 cm
45	Horizontal Border	0x00 = 0 dots
46	Vertical Border	0x00 = 0 H
47	Interlace	0b1 = Interlace
	Stereo Mode	0b0 = Normal display, no stereo
	sync signal description 1	0x3 = Digital Separate
	sync signal description 2	0b0 = Vertical Polarity negative

	sync signal description 3	0b0 = Horizontal Polarity negative
6B-5A	[Monitor Descriptor Description #1]	
5B-5A	FLAG	0x00 = Monitor Descriptor
5C	Reserved	0x00
5D	Data Type Tag	0xFC = Monitor name, stored as ASCII
5E	Reserved	0x00
6B-5F	Monitor Name	0x56412D31383039410A = VA-1809A
7D-6C	[Monitor Descriptor Description #2]	
6D-6C	FLAG	0x00 = Monitor Descriptor
6E	Reserved	0x00
6F	Data Type Tag	0xFD = Monitor range limits, binary coded
70	Reserved	0x00
71	Min. Vertical rate	0x17 = 23 Hz
72	Max. Vertical rate	0x3D = 61 Hz
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	0x1C
80	Extended Block Type	0x02 = CEA861B
81	Revision Number	0x03 = ver. 3
82	Detailed Timing Blocks start at Byte	0x44
83	[DTV Monitor Support]	0x71
	under scan	0b0 = not support
	Basic Audio	0b1 = support
	YCbCr 4:4:4	0b1 = support
	YCbCr 4:2:2	0b1 = support
	total number of native formats	0b1 = 1
84	[Video Short Description]	0x4D
	Tag Code	0x02 = Video Short Descritpion
	Length	0x0D
85	Video Code/Native Format	0x82 = [2] = 720x480p / Native Format
86		0x05 = [5] = 1920x1080i
87		0x04 = [4] = 1280x720p
88		0x01 = [1] = 640x480p
89		0x10 = [16] = 1920x1080p
8A		0x11 = [17] = 720x576p
8B		0x14 = [20] = 1920x1080i
8C		0x13 = [19] = 1280x720p
8D		0x1F = [31] = 1920x1080p
8E		0x06 = [6] = 1440x480i
8F		0x15 = [21] = 1440x567i
90		0x03 = [3] = 720x480pW
91		0x12 = [18] = 720x576pW
92	[Audio Short Block Description 1]	0x3B
	Tag Code	0x01 = Audio Short Block Descritption
	Length	0x0B

93	Audio Format Code#1	0x01 = Linier PCM
94	Max Number of Audio#1	0x7 = 8 channels
	Supported Sampling Frequency#1	0x7F = 32,44.1,48,88.2,96,176,192 kHz
95	Supported Bit Size#1	0x07 = 16,20,24 bits
96	Audio Format Code#2	0x02 = AC-3
97	Max Number of Audio#2	0x07 = 8 channels
	Supported Sampling	0x1F = 32,44.1,48,88,96 kHz
98	Max Bit Rate#2	0x38 = 448 kHz
99	Audio Format Code#3	0x03 = MPEG1
9A	Max Number of Audio#3	0x07 = 8 channels
	Supported Sampling Frequency#3	0x07 = 32,44.1,48 kHz
9B	Max Bit Rate#3	0x30 = 384 kHz
9C	Audio Format Code#4	0x05 = MPEG2
9D	Max Number of Audio#4	0x07 = 8 channels
	Spported Sampling Frequency#4	0x07 = 32,44.1,48 kHz
9E	Max Bit Rate#4	0x72 = 912 kHz
9F	Audio Format Code#5	0x07 = DTS
A0	Max Number of Audio#5	0x07 = 8 channels
	Supported Sampling Frequency#5	0x7F = 32,44.1,48,88.2,96,176,192 kHz
A1	Max Bit Rate#5	0x72 = 912 kHz
A2	Audio Format Code#6	0x4F = One Bit Audio
A3	Max Number of Audio#6	0x07 = 8 channels
	Supported Sampling Frequency#6	0x7F = 32,44.1,48,88.2,96,176,192 kHz
A4	User Define #6	0x00 = 0
A5	Audio Format Code#7	0x0A = DolbyDigital+
A6	Max Number of Audio#7	0x07 = 8 channels
	Supported Sampling Frequency#7	0x7F = 32,44.1,48,88.2,96,176,192 kHz
A7	User Define #7	0x00 = 0
A8	Audio Format Code#8	0x0B = DTS-HD
A9	Max Number of Audio#8	0x07 = 8 channels
	Supported Sampling Frequency#8	0x7F = 32,44.1,48,88.2,96,176,192 kHz
AA	User Define#8	0x01 = 1
AB	Audio Format Code#9	0x37 = AAC
	Max Number of Audio#9	0x07 = 8 channels
AC	Supported Sampling Frequency#9	0x7F = 32,44.1,48,88.2,96,176,192 kHz
AD	Max Bit Rate#9	0x72 = 912 kHz
AE	[Speaker Allocation Data Block]	0x83
	Tag Code	0x04 = Speaker Allocation Data Block
	Length	0x03
AF	Speaker	0x2F = FLC/FRC,RL/RR,FC,LFE,FL/FR
B0-B1	Reserved	0x0000
B2	[Use Extended Tag]	0xE3
	Tag Code	0x07 = Use Extended Tag
	Length	0x03
B3	Extended Tag Code	0x05 = Colorimetry Data Block
B4	xvYCC709/xvYCC601	0x03 = support
B5	MD	0x00
B6	[Vendor Specific Data Block]	0x6C

	Tag Code	0x03 = Vendor Specific Data Block
	Length	0x0C
B7- B9	24-bit IEEE Registration Identifier	0x000C03
BA-BB	Physical Address	0x1000 = 1.0.0.0
BC	Support_AI	01b = Support
	DC_48 bits	00b = Not Support
	DC_36 bits	01b = Support
	DC_30 bits	01b = Support
	DC_Y444 bits	01b = Support
	DVI_Dual	00b = Not Support
BD	Max TMDS Clock	0x2D = 225 MHz
BE	Latency Fields Present	0x00 = Not Present
BF	Video Latency	0x00
C0	Audio Latency	0x00
C1	Interlaced Video Latency	0x00
C2	Interlaced Audio Latency	0x00
	[Detailed Timing Description 1]	
C4-C3	Pixel Clock	0x1D01 = 74.25MHz
C7-C5	Horizontal Active Pixels	0x500 = 1280dot
	Horizontal Blanking Pixels	0x172 = 370dot
CA-C8	Vertical Acrive Lines	0x2D0 = 720H
	Vertical Blanking Lines	0x1E = 30H
CE-CB	Horizontal sync offset	0x6E = 110dot
	Horizontal sync pulse width	0x28 = 40dot
	Vert sync offset	0x5 = 5H
	Vert sync pulse width	0x5 = 5H
D1-CF	Horizontal Image Size	0x81 = 129mm
	Vertical Image Size	0x49 = 73mm
D2	Horizontal Border	0x00 = 0dot
D3	Vertical Border	0x00 = 0H
D4	Interlace	0x00 = non-Interlace
	Stereo Mode	0x0 = Normal display, no stereo
	sync signal description1	0x3 = Digital Separate
	sync signal description2	0x1 = Vertical Polarity positive
	sync signal description3	0x01 = Horizontal Polarity positive
	[Detailed Timing Description 2]	
D6-D5	Pixel Clock	0x09D6 = 25.18MHz
D9-D7	Horizontal Active Pixels	0x280 = 640dot
	Horizontal Blanking Pixels	0xA0 = 160dot
DC-DA	Vertical Acrive Lines	0x1E0 = 480H
	Vertical Blanking Lines	0x2D = 45H
E0-DD	Horizontal sync offset	0x10 = 16dot
	Horizontal sync pulse width	0x60 = 96dot
	Vert sync offset	0x0A = 10H
	Vert sync pulse width	0x2 = 2H
E3-E1	Horizontal Image Size	0x81 = 129mm
	Vertical Image Size	0x60 = 96mm
E4	Horizontal Border	0x08 = 8dot
E5	Vertical Border	0x08 = 8H
E6	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	0x0 = Horizontal Polarity negative
	[Detailed Timing Description 3]	
E8-E7	Pixel Clock	0x0A8C = 27.00MHz
EB-E9	Horizontal Active Pixels	0x2D0 = 720dot
	Horizontal Blanking Pixels	0x90 = 144dot
EE-EC	Vertical Acrive Lines	0x240 = 576H
	Vertical Blanking Lines	0x31 = 49H
F2-EF	Horizontal sync offset	0x0C = 12dot
	Horizontal sync pulse width	0x40 = 64dot
	Vert sync offset	0x5 = 5H
	Vert sync pulse width	0x5 = 5H
F5-F3	Horizontal Image Size	0x81 = 129mm
	Vertical Image Size	0x60 = 96mm
F6	Horizontal Border	0x00 = 0dot
F7	Vertical Border	0x00 = 0H
F8	Interlace	0x0 = 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	0x0 = Horizontal Polarity negative
FE-F9	Reserved	0x000000000000
FF	Check sum	0x38

8.1.2 SAMPLE 2

(1) SINK

rx_mode=repeater
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	1C
80	02	03	43	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	7F	07	17	1F	38	1F	07	30	2F	07	72	3F
A0	7F	72	4F	7F	00	57	7F	00	5F	7F	01	47	7F	72	83	4F
B0	00	00	E3	05	03	01	6C	03	0C	00	10	00	B8	2D	00	00
C0	00	00	00	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81
D0	49	00	00	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2
E0	00	81	60	00	08	08	18	8C	0A	D0	90	20	40	31	20	0C
F0	40	55	00	81	60	00	00	00	18	00	00	00	00	00	00	28

8.1.3 SAMPLE 3

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	1C
80	02	03	3F	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	7F	07	17	1F	38	1F	07	30	2F	07	72	3F
A0	7F	72	4F	7F	00	57	7F	00	5F	7F	00	27	7F	28	83	4F
B0	00	00	E3	05	03	01	68	03	0C	00	10	00	B8	2D	00	01
C0	1D	00	72	51	D0	1E	20	6E	28	55	00	81	49	00	00	00
D0	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60	00
E0	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00	81
F0	60	00	00	00	18	00	00	00	00	00	00	00	00	00	00	9B

8.1.4 SAMPLE 4

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	01	1C
80	02	03	3F	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	7F	07	17	1F	38	1F	07	30	2F	07	72	3F
A0	7F	72	4F	7F	00	57	7F	00	5F	7F	00	37	7F	72	83	2F
B0	00	00	6C	03	0C	00	10	00	B8	2D	00	00	00	00	00	01
C0	1D	00	72	51	D0	1E	20	6E	28	55	00	81	49	00	00	00
D0	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60	00
E0	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00	81
F0	60	00	00	00	18	00	00	00	00	00	00	00	00	00	00	29

8.1.5 SAMPLE 5

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	1D	71	49	82	05	04	01	10	11	14	13	1F	23	09
90	7F	07	83	01	00	00	66	03	0C	00	10	00	80	01	1D	00
A0	72	51	D0	1E	20	6E	28	55	00	81	49	00	00	00	1E	D6
B0	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60	00	08	08
C0	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00	81	60	00
D0	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C	25	80	81
E0	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20	B8	28	55
F0	40	81	49	00	00	00	1E	00	00	00	00	00	00	00	00	8A

8.1.6 SAMPLE 6

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	1D	71	49	82	05	04	01	10	11	14	13	1F	23	0F
90	1F	07	83	2F	00	00	66	03	0C	00	10	00	80	01	1D	00
A0	72	51	D0	1E	20	6E	28	55	00	81	49	00	00	00	1E	D6
B0	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60	00	08	08
C0	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00	81	60	00
D0	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C	25	80	81
E0	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20	B8	28	55
F0	40	81	49	00	00	00	1E	00	00	00	00	00	00	00	00	B6

8.1.7 SAMPLE 7

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	39	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	1F	07	09	7F	07	17	1F	00	1F	07	00	27
A0	07	28	2F	07	72	37	1F	72	3F	7F	72	47	7F	72	83	4F
B0	00	00	66	03	0C	00	10	00	80	01	1D	00	72	51	D0	1E
C0	20	6E	28	55	00	81	49	00	00	00	1E	D6	09	80	A0	20
D0	E0	2D	10	10	60	A2	00	81	60	00	08	08	18	8C	0A	D0
E0	90	20	40	31	20	0C	40	55	00	81	60	00	00	00	18	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	BF

8.1.8 SAMPLE 8

(1) SINK

rx_mode=repeater
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	39	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	1F	07	09	7F	07	17	1F	38	1F	07	30	27
A0	07	28	2F	07	72	37	1F	72	3F	7F	72	47	7F	72	83	4F
B0	00	00	66	03	0C	00	10	00	80	01	1D	00	72	51	D0	1E
C0	20	6E	28	55	00	81	49	00	00	00	1E	D6	09	80	A0	20
D0	E0	2D	10	10	60	A2	00	81	60	00	08	08	18	8C	0A	D0
E0	90	20	40	31	20	0C	40	55	00	81	60	00	00	00	18	00
F0	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	BF

8.1.9 SAMPLE 9

(1) SINK

rx_mode=receiver
hdmi_mode=dvi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	02	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	FF	FF	80	81	40	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	51	0E	11	00	00	1E	00	00	00	FF	00	43	32	32
50	35	37	31	32	33	0A	20	20	20	20	00	00	00	FD	00	3B
60	3D	1F	40	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	56	41	2D	31	38	30	39	41	0A	20	20	20	20	00	0D

8.1.10 SAMPLE 10

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	1F	71	49	82	05	04	01	10	11	14	13	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	81	49	00	00	00
B0	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60	00
C0	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00	81
D0	60	00	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C	25
E0	80	81	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20	B8
F0	28	55	40	81	49	00	00	00	1E	00	00	00	00	00	00	A3

8.1.11 Compliance 1

(1) SINK

rx_mode=receiver
hdmi_mode=dvi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	02	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	FF	FF	80	81	40	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	51	0E	11	00	00	1E	00	00	00	FF	00	43	32	32
50	35	37	31	32	33	0A	20	20	20	20	00	00	00	FD	00	3B
60	3D	1F	40	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	56	41	20	31	38	30	39	41	0A	20	20	20	20	00	0D

8.1.12 Compliance 2

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	20	71	49	82	05	04	01	10	11	14	13	1F	26	0F
90	1F	07	09	7F	07	83	2F	00	00	66	03	0C	00	10	00	80
A0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81	49	00	00
B0	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60
C0	00	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00
D0	81	60	00	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C
E0	25	80	81	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20
F0	B8	28	55	40	81	49	00	00	00	1E	00	00	00	00	00	21

8.1.13 Compliance 3

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	81	60	00	00	00	18	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	81	49	00	00	00	9E	00	00	00	FC	00	56
60	41	2D	31	38	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	11	00	0A	20	20	20	20	20	20	03	62
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	36	71	4A	82	04	05	06	08	0A	0C	0E	10	23	3B
110	0F	1F	07	09	7F	07	17	1F	00	1F	07	00	27	07	00	2F
120	07	02	37	17	02	3F	7F	02	47	7F	02	83	2F	00	00	66
130	03	0C	00	10	00	80	01	1D	80	18	71	1C	16	20	58	2C
140	25	00	81	49	00	00	00	9E	8C	0A	A0	14	51	F0	16	00
150	26	7C	43	00	81	49	00	00	00	98	8C	0A	A0	14	51	F0
160	16	00	26	7C	43	00	81	60	00	00	00	18	18	15	40	28
170	B2	F0	16	00	4C	F8	43	00	81	49	00	00	00	98	00	A3
180	02	03	0F	71	4A	11	13	14	15	17	19	1B	1D	1F	25	8C
190	0A	D0	90	20	40	31	20	0C	40	55	00	81	60	00	00	00
1A0	18	01	1D	00	BC	52	D0	1E	20	B8	28	55	40	81	49	00
1B0	00	00	1E	01	1D	80	D0	72	1C	16	20	10	2C	25	80	81
1C0	49	00	00	00	9E	8C	0A	A0	20	51	20	18	10	18	7E	23
1D0	00	81	60	00	00	00	98	8C	0A	A0	20	51	20	18	10	18
1E0	7E	23	00	81	60	00	00	00	18	18	15	40	40	B2	20	18
1F0	10	30	FC	23	00	81	60	00	00	00	98	00	00	00	00	B4

8.1.14 Compliance 4

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	20	41	49	82	05	04	01	10	11	14	13	1F	26	0F
90	1F	07	09	7F	07	83	2F	00	00	66	03	0C	00	10	00	80
A0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81	49	00	00
B0	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60
C0	00	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00
D0	81	60	00	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C
E0	25	80	81	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20
F0	B8	28	55	40	81	49	00	00	00	1E	00	00	00	00	00	51

8.1.15 Compliance 5

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	20	71	49	82	05	04	01	10	11	14	13	1F	26	0F
90	1F	07	09	7F	07	83	2F	00	00	66	03	0C	00	10	00	80
A0	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81	49	00	00
B0	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2	00	81	60
C0	00	08	08	18	8C	0A	D0	90	20	40	31	20	0C	40	55	00
D0	81	60	00	00	00	18	01	1D	80	D0	72	1C	16	20	10	2C
E0	25	80	81	49	00	00	00	9E	01	1D	00	BC	52	D0	1E	20
F0	B8	28	55	40	81	49	00	00	00	1E	00	00	00	00	00	21

8.1.16 Compliance 6

(1) SINK

rx_mode=receiver
hdmi_mode=dvi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	02	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	FF	FF	80	81	40	01	01	01	01	01	01	01	01
30	01	01	01	01	01	01	30	2A	00	98	51	00	2A	40	30	70
40	13	00	51	0E	11	00	00	1E	00	00	00	FF	00	43	32	32
50	35	37	31	32	33	0A	20	20	20	20	00	00	00	FD	00	3B
60	3D	1F	40	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	56	41	20	31	38	30	39	41	0A	20	20	20	20	00	0D

8.1.17 Compliance 7

(1) SINK

rx_mode=receiver
hdmi_mode=hdmi
hdcp_on=on
ddc_speed=100

(2) EDID

	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	07	11	01	00	00	00
10	17	11	01	03	80	0C	09	78	0A	1E	AC	98	59	56	85	28
20	29	52	57	00	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	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	30	39	41	0A	20	20	20	20	00	00	00	FD
70	00	17	3D	0D	2E	0F	00	0A	20	20	20	20	20	20	01	1C
80	02	03	43	71	4D	82	05	04	01	10	11	14	13	1F	06	15
90	03	12	3B	0F	7F	07	17	1F	38	1F	07	30	2F	07	72	3F
A0	7F	72	4F	7F	00	57	7F	00	5F	7F	01	37	7F	72	83	4F
B0	00	00	E3	05	03	01	6E	03	0C	00	10	00	B8	22	00	00
C0	00	00	00	01	1D	00	72	51	D0	1E	20	6E	28	55	00	81
D0	49	00	00	00	1E	D6	09	80	A0	20	E0	2D	10	10	60	A2
E0		00	81	60	00	08	08	18	8C	0A	D0	90	20	40	31	20
F0	0C	40	55	00	81	60	00	00	00	18	00	00	00	00	00	38

8.2 LOG DATA structure

8.2.1 Analyze Data

Analyze Data is consisted as below.

[Log]		Below is the header information of LIG data
	Count	Number after LOG starts
	Time	Time after LOG starts
	InputSync	Input sync (In Sync / No Sync)
	DataMode	Display method (GUI / HEX) *1
	AV MUTE	AV MUTE ON / OFF
[HDMI Status]		Below is the HDMI status information
	Input Mode	HDMI / DVI
	HDMI Version	HDMI version, over 1.1/1.0
	HDCP	HDCP ON / OFF
	OUTPUT Hot Plug	Hot Plug status of output side (Hot PLUG Low / High)
	Trigger	Trigger item (Refer to 1.2.1 Trigger setting)
[Video Timing]		Same data as ANALYSIS item. (Refer to 4.3 Video Timing)
[AVI InfoFrame]		Same data as ANALYSIS item. (Refer to 4.4 AVI InfoFrame)
[SPD InfoFrame]		Same data as ANALYSIS item. (Refer to 4.5 SPD InfoFrame)
[Audio InfoFrame]		Same data as ANALYSIS item. (Refer to 4.6 Audio InfoFrame)
[MPEG Source InfoFrame]		Same data as ANALYSIS item. (Refer to 4.7 MPEG Source InfoFrame)
[ACP Packet]		Same data as ANALYSIS item. (Refer to 4.8 ACP Packet)
[ISRC1 Packet]		Same data as ANALYSIS item. (Refer to 4.9 ISRC1 Packet)
[ISRC2 Packet]		Same data as ANALYSIS item. (Refer to 4.10 ISRC2 Packet)
[Channel Status Bit]		Same data as ANALYSIS item. (Refer to 4.11 Channel Status Bit)
[Audio Timing]		Same data as ANALYSIS item. (Refer to 4.12 Audio Timing)

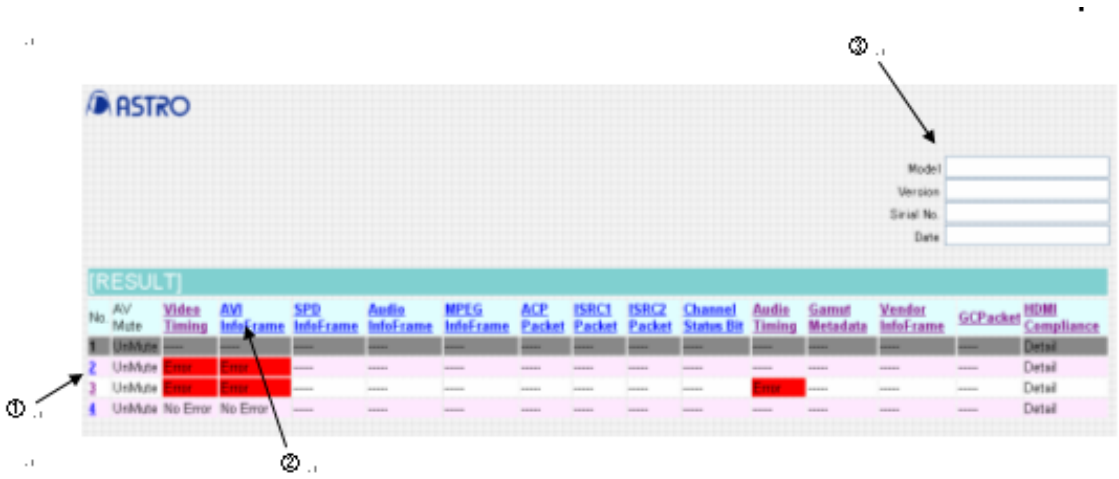
[HDCP Authentication Part 1 - 2 UP]	HDCP Authentication Source -> VA-1809A data (Refer to 4.22.1 HDCP Authentication Source -> VA-1809A)
[HDCP Authentication Part 1 - 2 DOWN]	HDCP Authentication VA-1809A -> Sink data (Refer to 4.22.2 HDCP Authentication VA-1809A -> Sink)
[HDCP Repater Sequence Check]	Same data as ANALYSIS item. (Refer to 4.22.5 HDCP Repater Sequence Check)
[Compliance Test Item Check]	Same data as ANALYSIS item. (Refer to 4.23 Compliance Test Item Check)

Note: when LOG is started to be captured, one LOG data is captured automatically as a comparison data.

*1 F1 (GUI/HEX) setting of ANALYSIS screen of VA-1809A is reflected. (GUI: Graphical User Interface / HEX: hex decimal)

■ HTML MODE

In the HTML Mode, html file that has “main.html” and detail data is created. Detail data is linked from main.html.



Display Item	Figure
Link to Number “N” after Log is started to be taken.	(1)
Link to each data information.	(2)
Description area	(3)

(1)

8.2.2 HDCP Repeater Sequence

HDCP Repeater Sequence is consisted as below.

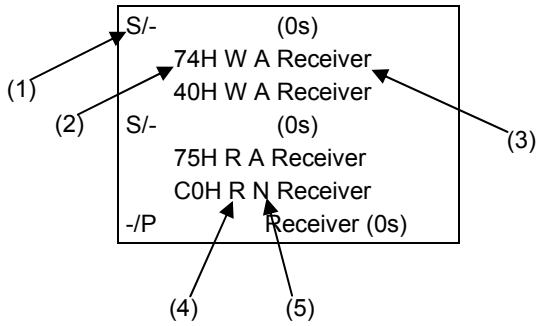
[LOGGING TIME]	Time after LOG starts
[DOWNSTREAM KSV]	KSV of connecting devices
Authentication Result	Authentication result
1st DownStream Connect	Connection status of connecting devices (Connected / Not Connected)
1st DDC Line Status	Connection status of DDC Line (Normal / Error)
1st YCbCr Support	Suppor status of YCbCr (Support / Not Support)
1st Repeater or Receiver	Conneting device is either Repeater or Receiver
1st BKSV Check	KSV data of connecting devices
1st Link Check	Ri Ready status
2nd KSV FIFO Ready	KSV FIFO Ready status
2nd Depth Check	Depth Check status
2nd Count Check	Count Check status
2nd Compere V	Compere V status

* The 2nd item is displayed when the connecting device is a repeater.

* The data of “Time after LOG starts” and “KSV of connecting devices” are added and saved to the result of HDCP Repeater Sequence Check of ANALYSIS. (Refer to 4.22.5 HDCP Repeater Sequence Check)

8.2.3 DDC DATA

DDC DATA is consisted as below.

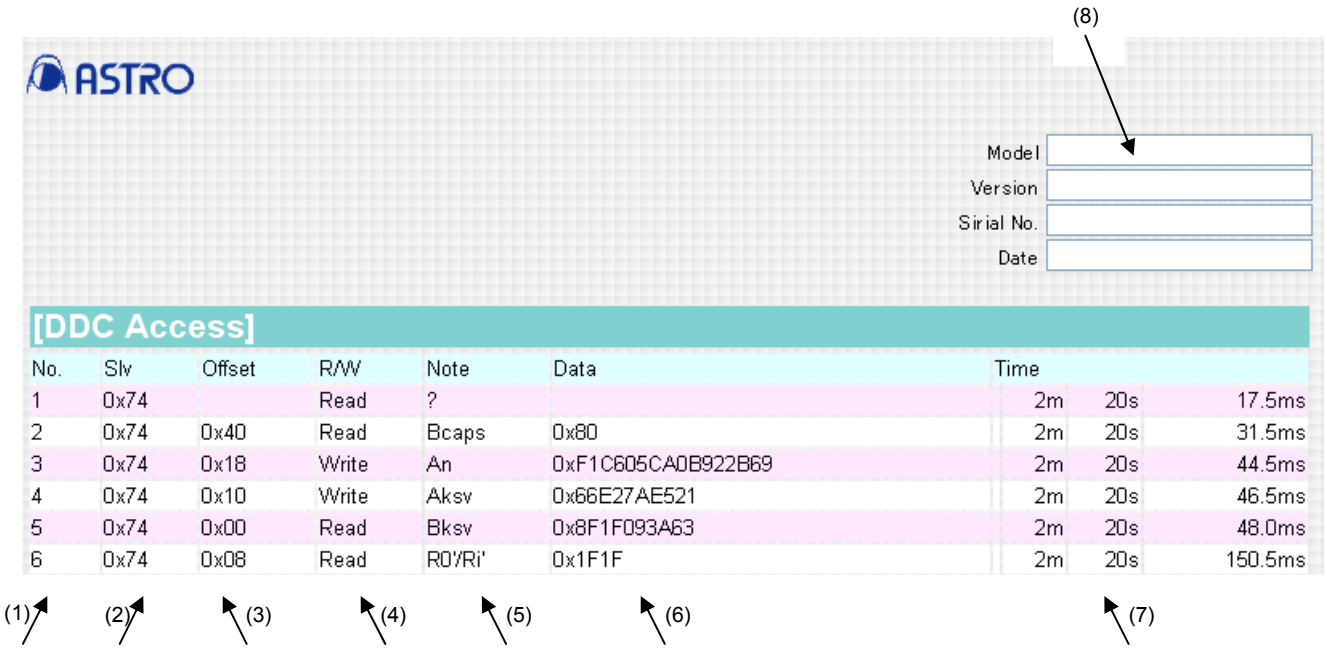


Item	Fig
S/ = Start Condition, -/P = Stop Condition	(1)
Slave Address, Sub Address or Data	(2)
Data type *	(3)
R = Read, W = Write	(4)
A = Acknowledge, N = not acknowledge	(5)

* Data type is divided as below depends on the Slave Address.

Slave Address	Data type display	Description
A0 H	EDID	Read command of EDID
60 H	Segment Pointor	Switching command of Segment Pointor of EDID.
74 H	Receiver	HDCP related commands.
Others	?	Commands other than EDID and HDCP

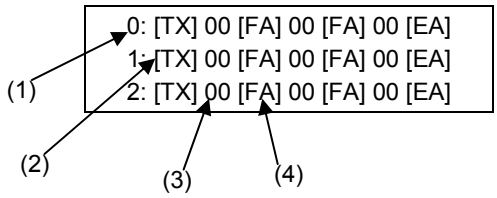
■ HTML MODE



Description	Figure
Consequtive number of DDC access during test period.	(1)
Slave address.	(2)
Offset address.	(3)
Read / Write of access.	(4)
Item of access.	(5)
Data to be accessed.	(6)
Time after VA-1809A starts up.	(7)
Description area	(8)

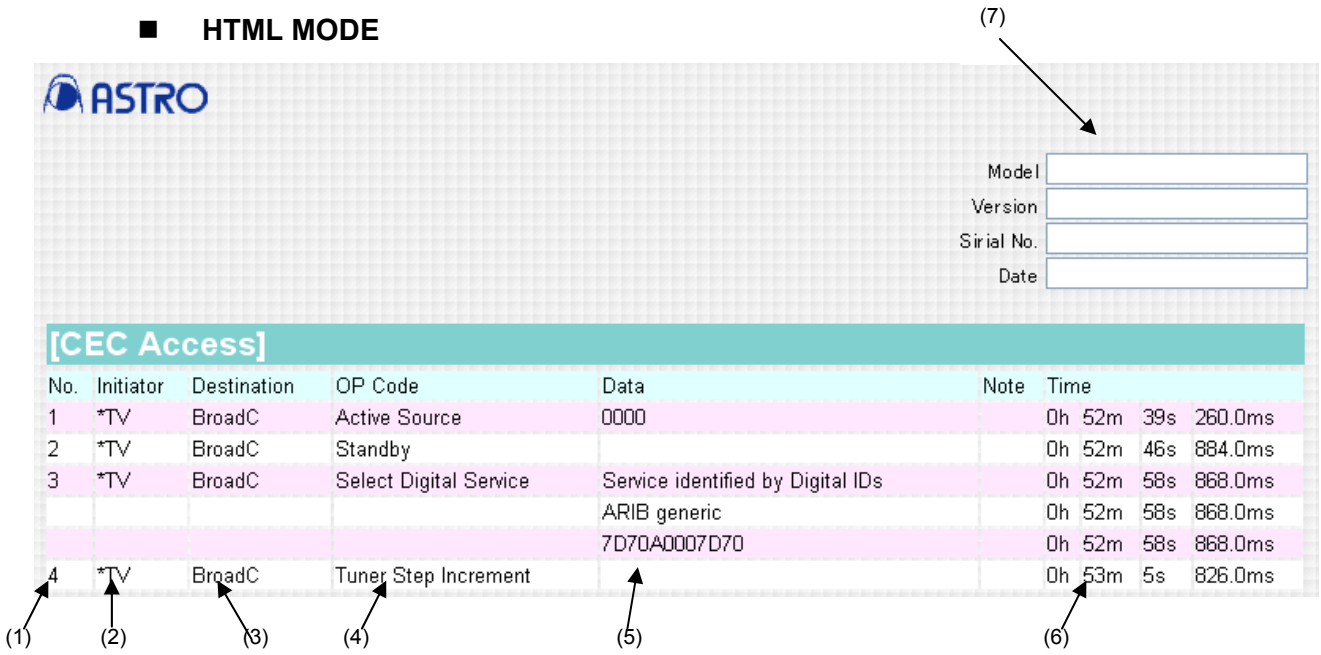
8.2.4 CEC DATA

CEC DAT is consisted as below.



Item	Fig
Number after starting capturing LOG data	(1)
TX: the data that the VA sends / RX: the data that the devices other than VA sends	(2)
Data	(3)
Left EOM (EndOfMessage) E = Available, F = N/A Right ACK (Acknowledge) A = Available, N = N/A	(4)

■ **HTML MODE**



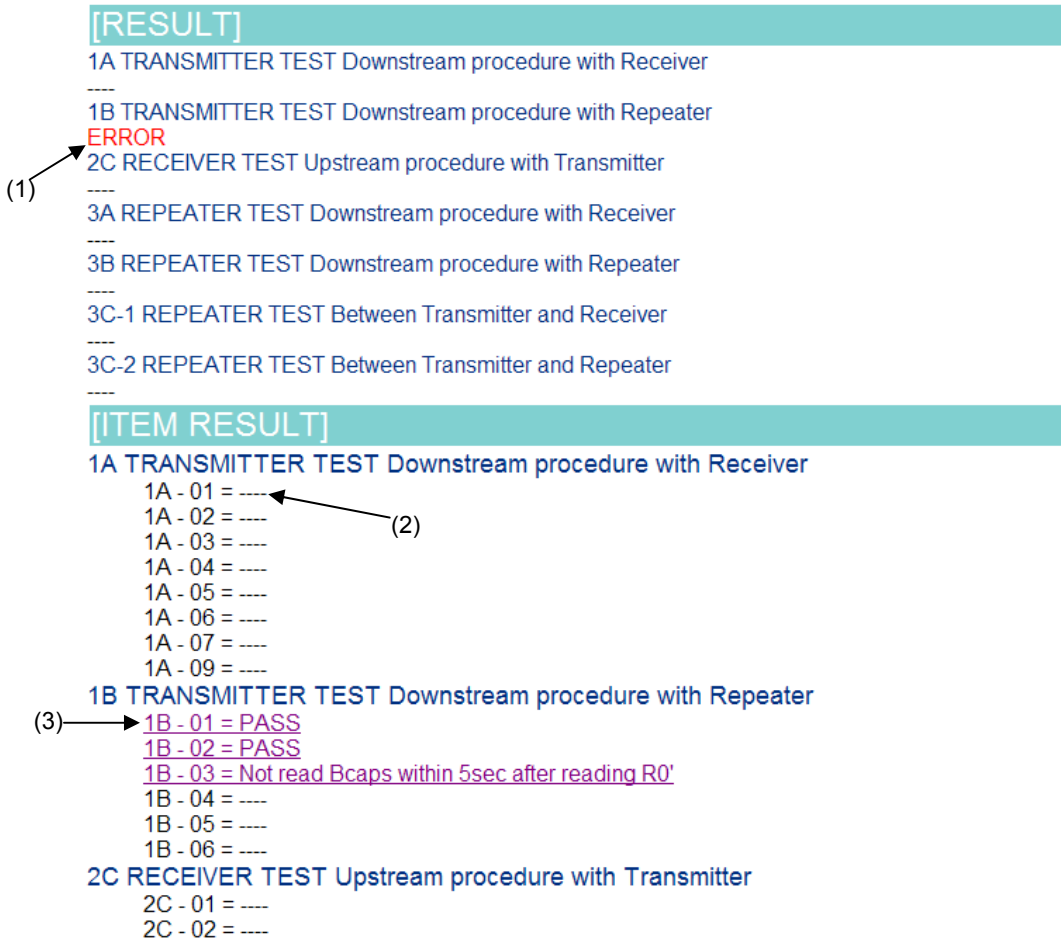
Description	Figure
Number after starting capturing LOG data	(1)
Initiator (if it has *, it is the data that is sent from VA-1809A.) **を表示しています。**	(2)
Destination	(3)
OP Code	(4)
Data	(5)
Time after VA-1809A starts up.	(6)
Description area	(7)

8.2.5 HDCP CTS DATA

HDCP_CTS_LOG.html and html files with IDs attached which have conducted tests are created as the HDCP CTS data.

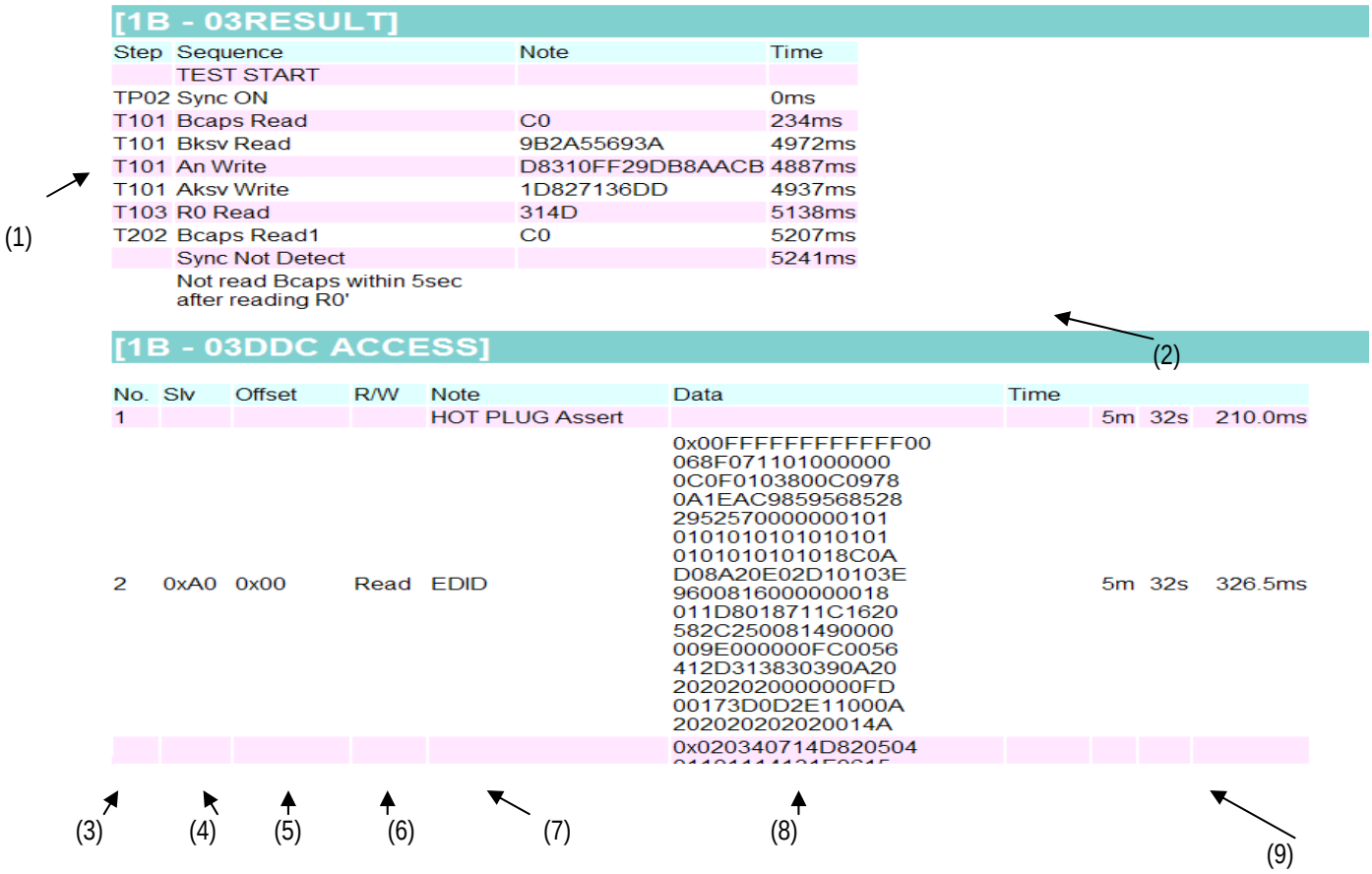
Example: HDCP_CTS_LOG3C - 1 – 01.html

Shown below is the structure of HDCP_CTS_LOG.html.



Display item	Fig.
The total pass/fail for the category is indicated here.	(1)
The pass/fail for each item is indicated here.	(2)
PASS or error details are displayed for those items for which tests have been performed. When an item is clicked, a detailed screen is opened.	(3)

Shown below is the structure of the item details.



[1B - 03RESULT]

Step	Sequence	Note	Time
	TEST START		
TP02	Sync ON		0ms
T101	Bcaps Read	C0	234ms
T101	Bksv Read	9B2A55693A	4972ms
T101	An Write	D8310FF29DB8AACB	4887ms
T101	Aksv Write	1D827136DD	4937ms
T103	R0 Read	314D	5138ms
T202	Bcaps Read1	C0	5207ms
	Sync Not Detect		5241ms
	Not read Bcaps within 5sec after reading R0'		

[1B - 03DDC ACCESS]

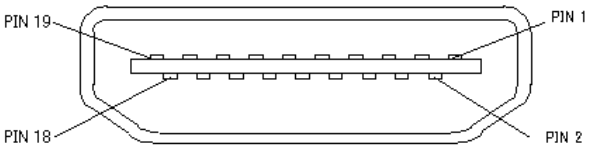
No.	Slv	Offset	R/W	Note	Data	Time			
1				HOT PLUG Assert			5m	32s	210.0ms
2	0xA0	0x00	Read	EDID	0x00FFFFFFFFFFFF00 068F071101000000 0C0F0103800C0978 0A1EAC9859568528 2952570000000101 0101010101010101 0101010101018C0A D08A20E02D10103E 9600816000000018 011D8018711C1620 582C250081490000 009E000000FC0056 412D313830390A20 202020200000000FD 00173D0D2E11000A 202020202020014A		5m	32s	326.5ms
					0x020340714D820504				

(1) (2) (3) (4) (5) (6) (7) (8) (9)

Display item	Fig.
The test sequence is indicated here.	(1)
The relative time of the sequence is indicated here.	(2)
The running number of the DDC access performed during the test period is indicated here.	(3)
The slave address is indicated here.	(4)
The offset address is indicated here.	(5)
Access read/write is indicated here.	(6)
The access item is indicated here.	(7)
The accessed data is indicated here.	(8)
The time which has elapsed from VA-1809A startup is indicated here.	(9)

8.3. Connector pin layouts

8.3.1. HDMI connector

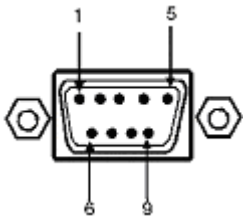


Pin layout

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	RESERVE
15	DDC CLK
16	DDC DATA
17	GROUND (for +5 V)
18	+5 V POWER
19	HOT PLUG DETECT
Shell	FG

8.3.2. RS-232C connector (D-sub 9 pins, male)

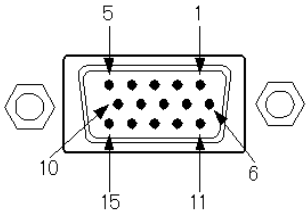


Pin layout

Pin assignment

Pin No.	I/O	Signal
1	-	NC
2	O	TXD (send data)
3	I	RXD (receive data)
4	-	Shorted with pin #6
5	-	FG (frame ground)
6	-	Shorted with pin #4
7	I	CTS (clear to send)
8	O	RTS (request to send)
9	-	NC

8.3.3. D-SUB connector



Pin layout

Pin assignment

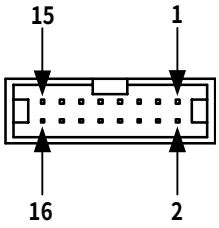
Pin No.	Signal	Pin No.	Signal
1	R	9	NC
2	G	10	GND
3	B	11	GND
4	NC	12	NC
5	NC	13	HS
6	GND (R)	14	VS
7	GND (G)	15	NC
8	GND (B)		

8.3.4. DIGITAL OUT connector

Connector: 7616-5002SCPL (maker : 3M)

Level : 3.3VTTL level (equivalent things as SN74LVC04)

*** This is an option. Please ask ASTRODESIGN for details.**

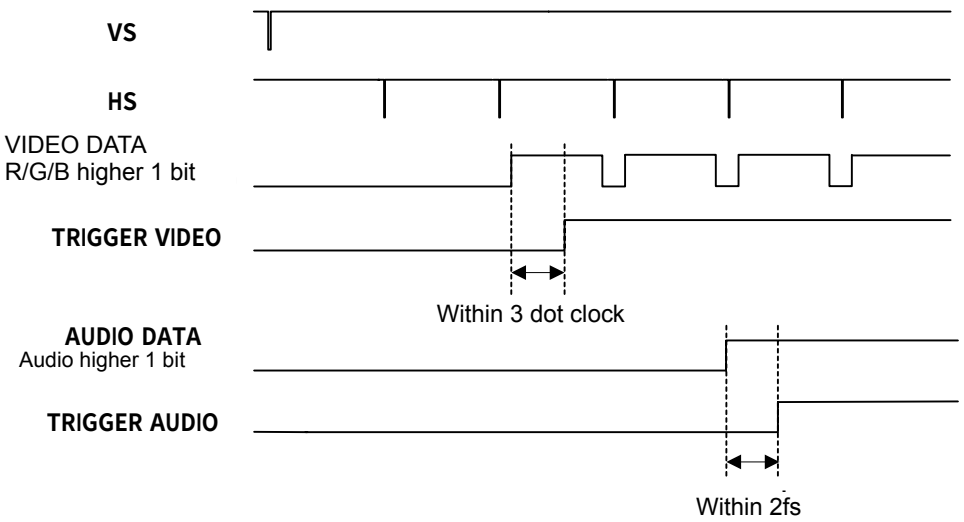


PIN ASSIGNMENT

Pin No.	TRIGGER	I2S	Pin No.	TRIGGER	I2S
1	GND	GND	9	GND	GND
2	TRIGGER VIDEO	MCLK	10	VIDEO(YgMSB)*	SD1
3	GND	GND	11	GND	GND
4	TRIGGER AUDIO	SCLK	12	AUDIO(SD0)*	SD2
5	GND	GND	13	GND	GND
6	HS	LRCLK	14	NC	SD3
7	GND	GND	15	GND	GND
8	VS	SD0	16	NC	NC

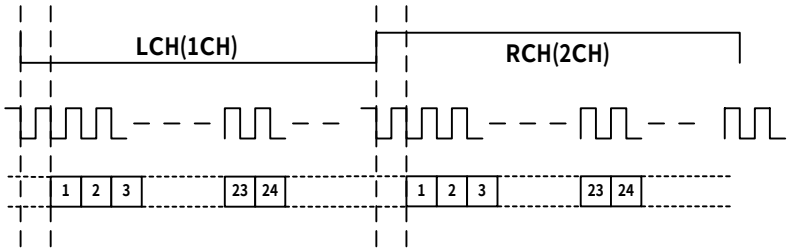
- VIDEO (YgMSB) becomes Y (or G), 7th bit in case of 8-bit mode. It becomes Y (or G), 11th bit in case of 12-bit mode.
- AUDIO (SD0) is 0th bit of I2S. In case of non compressed audio, serial data of 1CH and 2CH are output.

TRIGGER output : the below timing are output.



Please refer to P.52 “4.17 Lip Sync” for details.

I2S output : the below timing is output.



8.4. VA-1809A specifications

8.4.1. Specification

Item			Specification
Restrictions on timing signals	Pixel Clock		25 to 165 MHz (transfer rate: 225 MHz)
	Measurement pixel unit		2-pixel increments
	Color space		RGB / YCbCr 444 / YCbCr 422
	Input/output signals		TMDS
	HDCP		Transmission, reception enabled: Reception Ver. 1.1 Transmission Ver. 1.0
	HDMI		Ver. 1.3a
	Repeater function		Available (Up to 16 units)
	Generator function		Available (VGA or 480P&576P)
	Restrictions on LCD output	H Total Pixels	200 to 2500 pixels But Hsync + H back porch ≥ H period - 2048 when H period > 2144 pixels.
		H Active Pixels	128 to 2000 pixels
		H Blanking Pixels	138 pixels or more
		V Total Lines	200 to 2000 lines
		V Active Lines	128 to 1320 lines
		V Sync Lines	4 to 500 lines
		V Back Porch Lines	1 to (1/2 × V total lines) lines
	Restrictions on HDMI input/output signals	H Total Pixels	128 to 8195 pixels
		H Active Pixels	128 to 4095 pixels
		H Blanking Pixels	138 pixels or more
		V Total Lines	200 to 4095 lines
		V Active Lines	128 to 2047 lines
		V Sync Lines	4 to 2047 lines
		V Back Porch Lines	1 to (1/2 × V total lines) lines
Audio output	Signal format		SPDIF (COAX) output
	Sampling frequency		Max. 192 kHz, 8 channels * Restrictions may apply depending on the timing.
DDC			DDC2B supported
E-EDID			Ver. 1.3
CEA EDID Timing Extension			Ver. 3
EDIDROM size	When power is OFF		256 bytes (non-rewritable)
	When power is ON		2 kbytes
VGA output			D-Sub 15 pins, XGA
LCD output			XGA
DIGITAL OUT (Option)			TRIGGER or I2S

8.4.2. Ratings

Item	Rating
Supply voltage	AC 100 to 120 V, AC 200 to 240 V
Power line frequency	50 Hz / 60 Hz
Power consumption	70 VA max.
Dimensions	210 (W) × 168 (H) × 380 (D) mm (excluding protrusions)
Weight	Approx. 5.0 kg
Operating temperature	+5 to 40°C
Storage temperature	-10 to 60°C
Humidity	30 to 85%RH (no condensation)

8.4.3. Restrictions

- If the sink data of the VA-1809A is used by setting it to receiver (monitor), no signal is output from the HDMI output and COAX output.
- If the sink data of the VA-1809A is used by setting it to DVI, audio input/output is disabled.
- If HDMI or DVI video is input in HDCP, the VGA output cannot be used.
- If HDMI audio is input in HDCP, the COAX output cannot be used.
- If a unit is not connected to the HDMI output even though the sink data of the VA-1809A is set in the repeater, the receiver is used to execute (only for HDCP).
- If the sink data of the VA-1809A is set in the repeater and a unit that does not support HDCP is connected to the HDMI output, the execution of HDCP cannot be performed normally. (The sequence cannot be advanced due to a DDC line ACK error on the HDMI output side.)
- If a monitor without a physical address is connected to output, the physical address of the VA-1809A main unit does not change.
- If the sink data of the VA-1809A is set in the repeater, up to 16 connections can be used.

VA-1809A Instruction Manual

NOTICE

- An incorrectly collated manual or a manual with missing pages will be replaced.
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- The contents of this manual are subject to change without prior notice due to improvements.
- The manufacturer will not be liable for any effects caused by incorrect operation.
- All inquiries concerning this product should be addressed to your dealer or to the manufacturer at the contact numbers given below.
-

T0126E

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