DVI output module

OM-596

User's Manual

Ver.1.04

DVI output module

OM-596

User's Manual

2005.10

Ver.1.04

ASTRODESIGN,Inc

Table of Contents

Table of Contents i

Introduction iii

Safety Precautions iii

Avoid contact with foreign substances iii

Do not disassemble iii

Handling of the module iv

Avoid mechanical shock and impact iv

In case of an abnormality or malfunction iv

CHAPTER 1. Edition revision history 1

CHAPTER 2. About the OM-596 3

2.1 Overview 3

2.2 Limitations to the specifications 4

CHAPTER 3. Names and Functions of Individual Components 5

3.1 OM-596 rear panel view and component names 5

CHAPTER 4. Connecting the Module 7

4.1 Connecting the output signal 7

CHAPTER 5. Adjustments and Settings 9

5.1 Menu structure 9

5.1.1 MENU mode 10

5.1.2 OUTPUT mode 13

5.2 Setting parameters 14

5.2.1 Setting the output timing 14

5.2.2 Editing the output timing data 15

5.2.3 Adjusting the image quality 16

5.2.4 Setting the sync signals 16

5.2.5 Setting the test pattern 16

5.2.6 Storing the data 17

CHAPTER 6. Timing Table List 21

6.1 Output timing table 21

CHAPTER 7. Main Specifications 23

7.1 Specifications 23

7.2 Accessory 23

7.3 Outline drawing 24

Introduction

Thank you for purchasing the OM-596 DVI OUT module.
This document describes the functions and operating method of the OM-596, as well as the precautions to observe when using it. Be sure to read this document before using the OM-596 since improper use may result in accidents.
After reading, please retain this document in a safe place for future reference.

Safety Precautions

⚠ Warning

Avoid contact with foreign substances

- **Do not spill liquid or drop a flammable substance or metal inside the module. Usage under such conditions may result in fire, electrical shock, or malfunction.**

Do not disassemble

- **Do not attempt to disassemble this module. To avoid the risk of electrical shock or injury to the user, or malfunction of the module, do not open the case or remove/reinstall the internal board.**

⚠ Caution

Handling of the module

- **The module consists of precision components ; handle it with extreme care.**
- **To avoid the risk of electrical shock, injury, or breakdown, do not remove or add a module while the power is on.**
- **When removing the module, be careful to avoid brushing your hand against the connectors.**

Avoid mechanical shock and impact

- **The module is a precision instrument that may be damaged by mechanical shock and impact. Be extremely careful when transporting the module.**
- **Do not drop the module.**

In case of an abnormality or malfunction

- **If an abnormality or malfunction occurs, unplug the power cord and then contact your local dealer or the ASTRODESIGN sales group.**

1 Edition revision history

Ver.	Date	Page	Item no.	Description
1.00	2005/04/14			Initial edition
1.01	2005/05/12	8	4.1.1	MENU mode: Misspelling of "Perset" corrected to "Preset."
1.02	2005/06/06	13	4.2.2	Editing the input timing data: Horizontal total width changed. Before change: 512 to 4096 After change: 512 to 1608
1.03	2005/07/06	1	1	Revised edition history added. Accompanying the addition of items, item numbers in subsequent chapters moved forward.
		15	5.2.2	Editing the output timing data: In the "Pixel clock" section, incorrect setting value of "10.00 to 165.00" corrected to "12.50 to 165.00." Note *1 changed.
		15	5.2.2	Editing the output timing data: In the "Horizontal back porch" section, incorrect setting value of "0 to 2048" corrected to "1 to 2048."
		15	5.2.2	Editing the output timing data: In the "Horizontal total width" section, incorrect setting value of "512 to 4608" corrected to "512 to 4096."
		15	5.2.2	Editing the output timing data: In the "Repetition" section, Note *4 changed.
		15	5.2.2	Editing the output timing data: In the "Horizontal total width" and "Vertical total width" sections, descriptions in remarks column changed.
		23	7.1	"Pixel clock" specifications item: Incorrect specification of "10.0 to 165" corrected to "12.5 to 165."
1.04	2005/08/12	9	5.1	Menu configuration: Diagram for VIDEO mode changed.

2 About the OM-596

2.1 Overview

- The OM-596 is an DVI output module that can be installed in the SC-2055 Series (2 inputs, 2 outputs).
- This unit supports HS/VS input and CS input signals for the external reference signals. (75-ohm termination fixed, no through-out facility)

2.2 Limitations to the specifications

The SC-2055 has certain limitations, which when exceeded may cause the image of the output video signal to appear distorted.

Because there are also some limitations to the functionality, please take appropriate precautions when using the device.

(1) External Sync Signal

If the external sync signal that is input does not contain a serration pulse, a correct lock will not be achieved, even if the front LED indicates a locked state.
If a signal of poor quality, such as from a VTR, or a signal that fluctuates by more than ±50ppm from the standard value is input, a correct lock may not be achieved in some cases.
Because the external reference signal is input as an analog signal, depending on that input signal, the output signal may exhibit a phase difference of several dots.
If the phase difference between the HSYNC and VSYNC signals which are input is great, the unit may not be able to track the input timing signals, the image on the output screen may be disturbed and the unit may not operate properly in other ways.

(2) Lock Range

If the ratio between the input and output vertical frequencies is 1:1, 1:2, 2:5 or 4:5, frame locking operations can be performed. Bear in mind that a phase difference of several H will occur each time a locking operation is undertaken. (This difference can be eliminated by adjusting the locking phase.)

3 Names and Functions of Individual Components

3.1 OM-596 rear panel view and component names

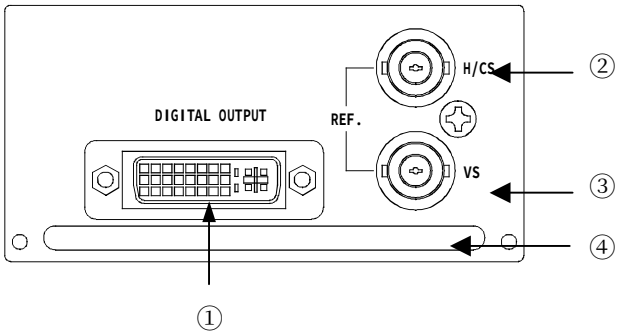


Fig. 3.1 OM-596 Rear Panel View

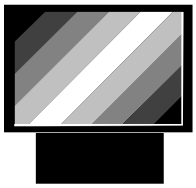
Table 2.1 Names of Rear Panel Components

Number	Name	Description
①	DVI output connector	This is the DVI (DVI-I) output connector. * Analog signals are not supported.
②	HS/CS input connector	This is the HS/CS sync signal input connector (BNC connector).
③	VS input connector	This is the VS sync signal input connector (BNC connector).
④	Handle	This is used when plugging in or unplugging the modules.

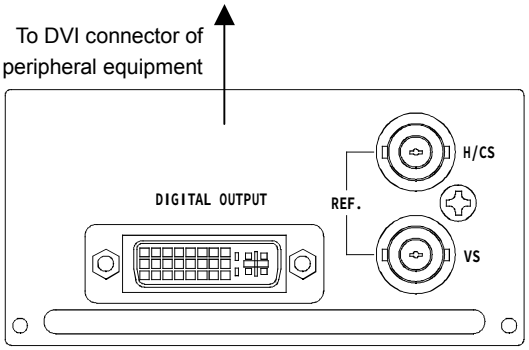
4 Connecting the Module

4.1 Connecting the output signal

The DVI output signal is connected from the DVI OUTPUT connector as shown in the figure below in accordance with the input conditions of the peripheral equipment.



Projector



5 Adjustments and Settings

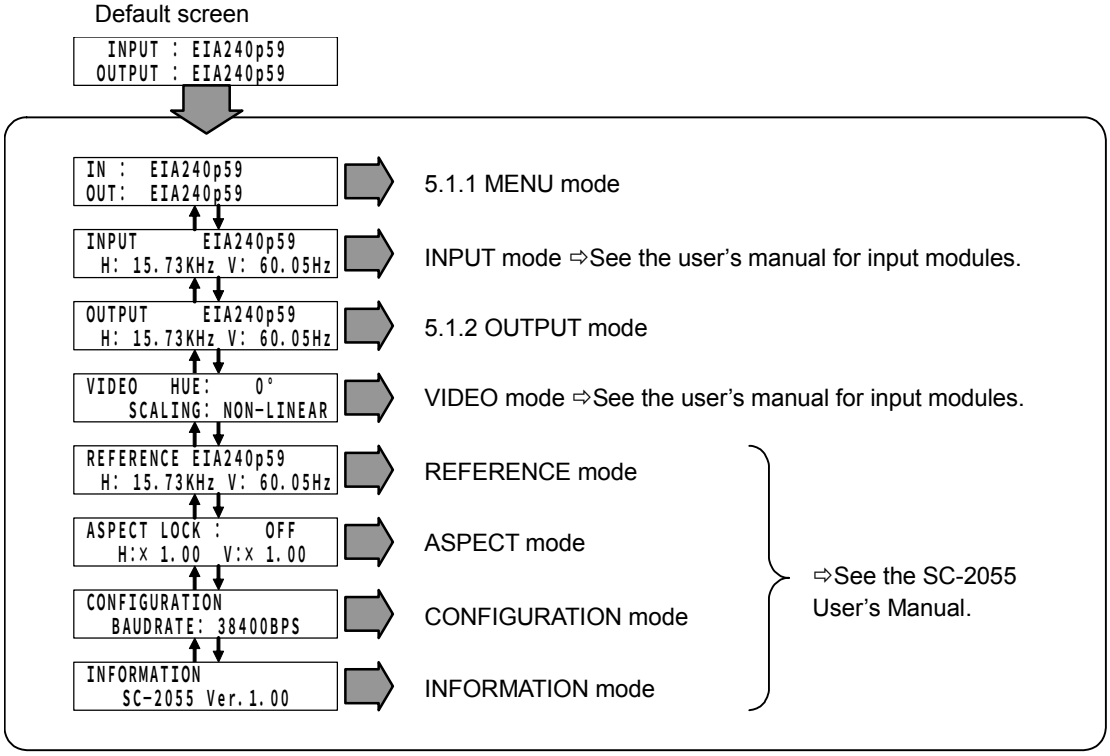
5.1 Menu structure

From the default screen, push the rotary encoder to enter the menu structure described below.
For the operation method, see the SC-2055 User's Manual.

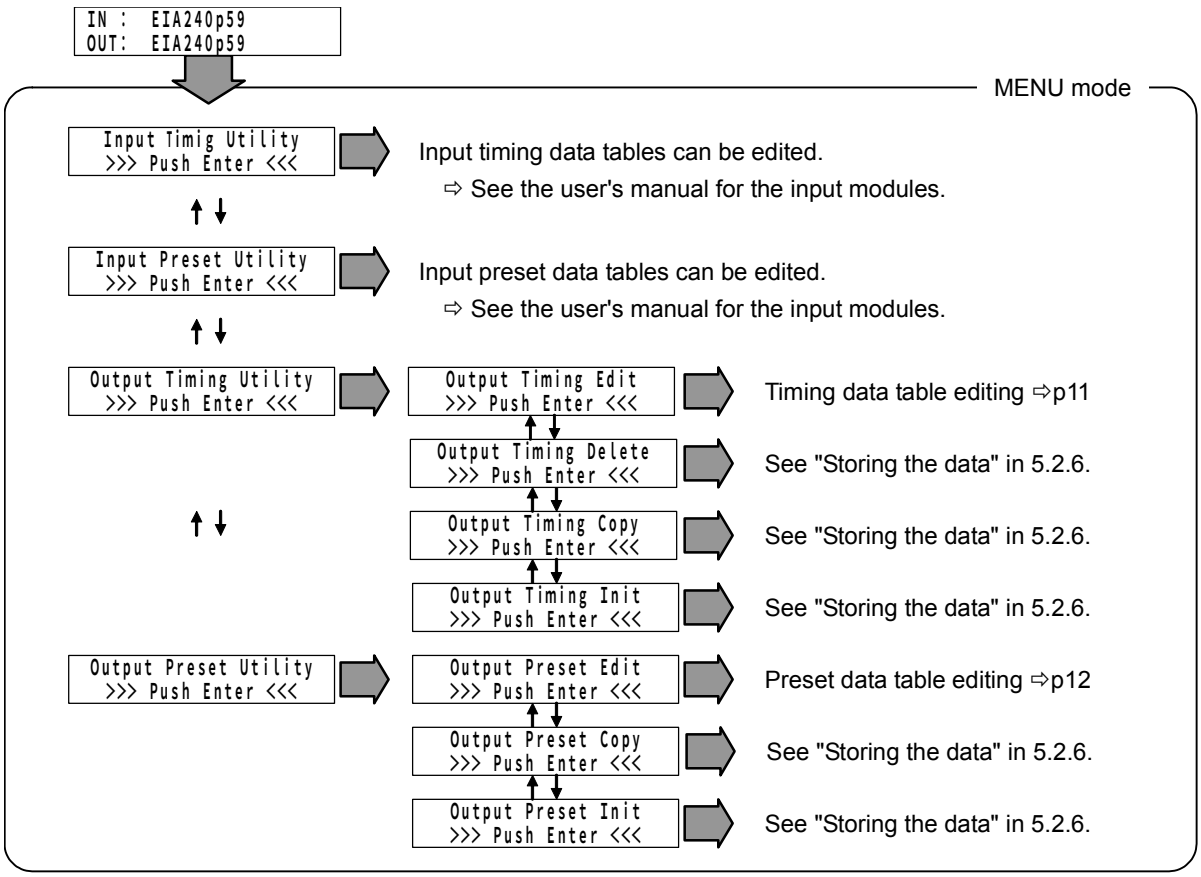
Symbols are defined below.

⇩ ⇨	PUSH operation
↑ ↓	Rotate operation

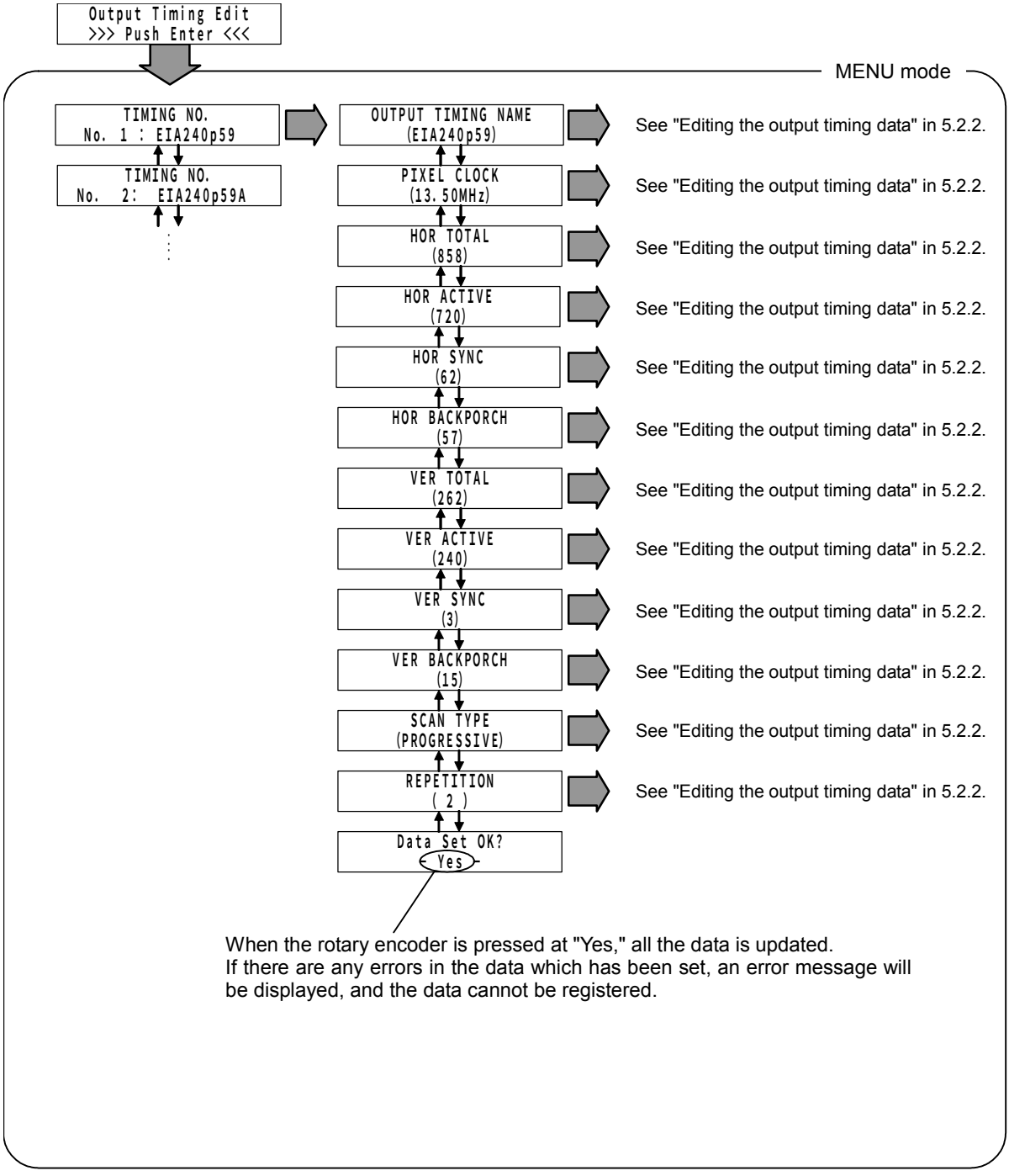
Default screen



5.1.1 MENU mode

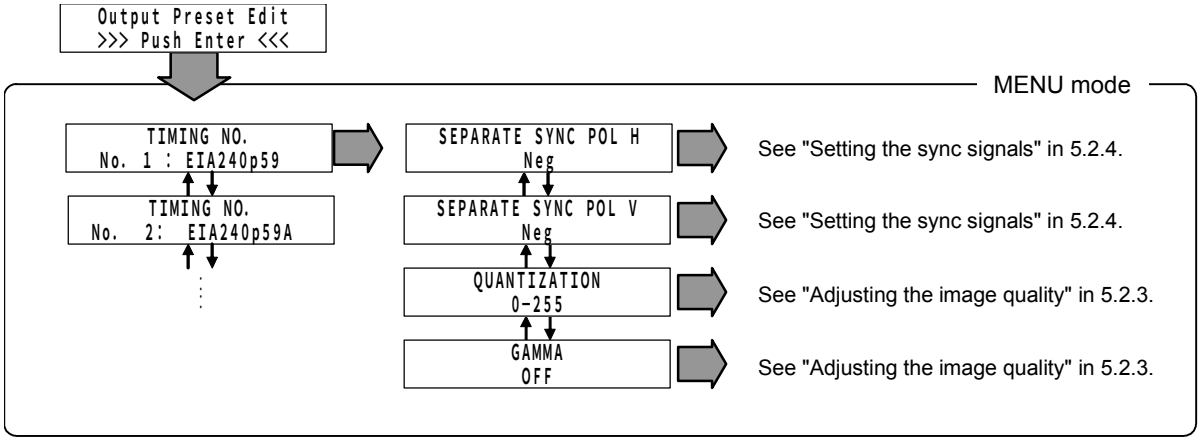


Timing data table editing



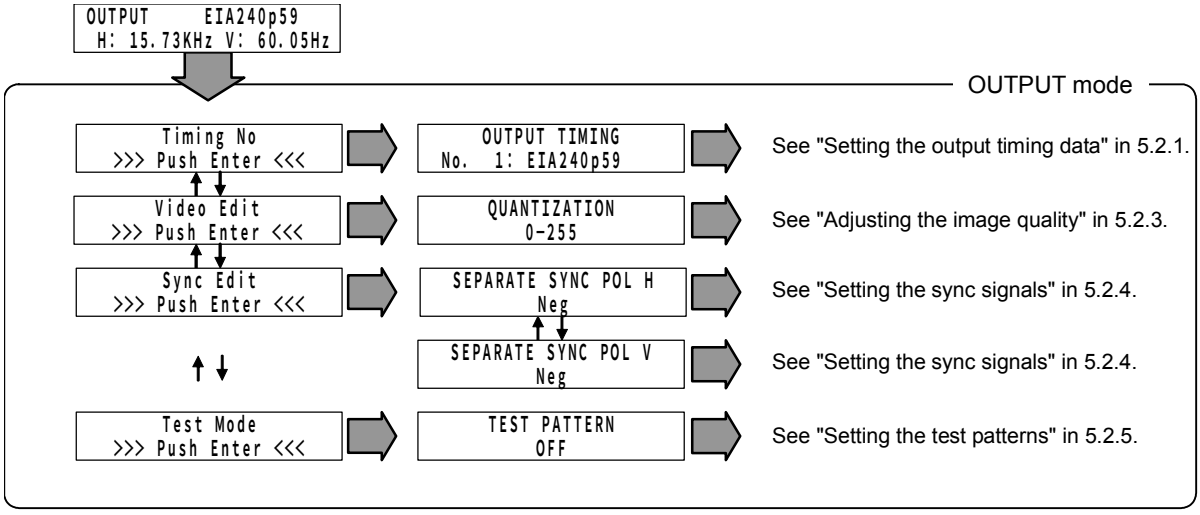
When the rotary encoder is pressed at "Yes," all the data is updated.
If there are any errors in the data which has been set, an error message will be displayed, and the data cannot be registered.

Preset data table editing



5.1.2 OUTPUT mode

The default screen of the OUTPUT mode displays the selected output timing.



5.2 Setting parameters

5.2.1 Setting the output timing

Sets the output timing.

Parameter	Description	Setting Value	Comments
OUTPUT TIMING	Output timing data	Timing data name *1 SLAVE *2	This parameter is used to select the output timing data.

*1: The number of timing data names which can be selected differs depending on the type of output module installed.
*2: When SLAVE is set, the same timing data as the timing data output by the other output channel is output. SLAVE can be selected only when modules have been installed in both output channels. SLAVE cannot be set for both channels at once.

5.2.2 Editing the output timing data

The parameters in this section are used to edit the output timing data which has been selected. However, the standard timing data cannot be edited. If data cannot be edited, its setting is enclosed in parentheses.

Setting item	Setting description	Setting value	Remarks
OUTPUT TIMING NAME	Output timing data name	14 characters	This parameter is used to display the name of the selected output timing data.
PIXEL CLOCK	Pixel clock	12.50 to 165.00 (in 10 kHz increments)	This parameter is used to adjust the pixel clock. *1
HOR TOTAL	Horizontal total width	512 to 4096 (in 1-dot increments)	This parameter is used to adjust the horizontal total width. *2
HOR SYNC	Horizontal sync width	16 to 1024 (in 1-dot increments)	This parameter is used to adjust the sync width when the image is shifted horizontally on the display. *2
HOR BACKPORCH	Horizontal back porch	1 to 2048 (in 1-dot increments)	This parameter is used to adjust the back porch when the image is shifted horizontally on the display. *2
HOR ACTIVE	Horizontal active width	256 to 2560 (in 1-dot increments)	This parameter is used to adjust the horizontal display period (size). *2
VER TOTAL	Vertical total width	256 to 2560 (in 1-line increments)	This parameter is used to adjust the vertical total width. *3
VER SYNC	Vertical sync width	1 to 64 (in 1-line increments)	This parameter is used to adjust the sync width when the image is shifted vertically on the display.
VER BACKPORCH	Vertical back porch	0 to 1024 (in 1-line increments)	This parameter is used to adjust the back porch when the image is shifted vertically on the display.
VER ACTIVE	Vertical active width	128 to 1580 (in 1-line increments)	This parameter is used to adjust the vertical display period (size).
SCAN TYPE	Scanning system	PROGRESSIVE/ INTERLACE/ SEGMENTFRAME	This parameter is used to select the scanning system.
REPETITION	Repetition adjustment	1 to 2	This parameter is used to adjust the repetition. *4

*1: The following must be satisfied: 25 MHz =< Output pixel clock x repetition ≤ 165 MHz.
*2: Set this parameter in 2-dot increments if the output pixel clock frequency is higher than 74.25 MHz.
*3: Set this parameter in odd-numbered increments when the interlace system is used.
*4: Repetition is a function which increases the pixel clock frequency by a multiple and repeatedly transfers the data. If 2 is set for repetition, the pixel clock frequency is doubled and the data is transferred twice. If the output pixel clock frequency is higher than 74.25 MHz, the repetition cannot be set (it is fixed at "1").

5.2.3 Adjusting the image quality

Adjusts the image quality and sets parameters related to the video display.

Parameter	Description	Setting Value	Comments
QUANTIZATION	Image quantizing level setting	0-255/16-235	This parameter is used to change the dynamic range of the digital output signals.
GAMMA	Gamma	OFF/ USER1/USER2	This parameter is used to set the gamma mode.

5.2.4 Setting the sync signals

The parameters in this section are used to set the sync signals.

Parameter	Description	Setting Value	Comments
SEPARATE SYNC POL H	Output sync polarity setting	Neg/Pos	This parameter is used to set the polarity of the horizontal output sync signal.
SEPARATE SYNC POL V	Output sync polarity setting	Neg/Pos	This parameter is used to set the polarity of the vertical output sync signal.

5.2.5 Setting the test pattern

Outputs a test pattern. Use this function for adjusting the display device.

Parameter	Description	Comments
TEST PATTERN	OFF	Normal screen display
	BRIGHT	Step-up pattern with black as the reference
	CONTRAST	Step-down pattern with white as the reference
	HUE&COLOR	Color signal RGB pattern in which the white level is attenuated to 75% and the black level is attenuated to 25%
	COLORBAR	100% colorbar display
	CROSSHATCH	1 dot, 1 line crosshatch pattern
	BURST	White/ black horizontal 1-dot repeated pattern
	FRAME	Frame display for the full video display interval
	WHITE	Displays WHITE on the entire screen
	RED	Displays RED on the entire screen
	GREEN	Displays GREEN on the entire screen
	BLUE	Displays BLUE on the entire screen

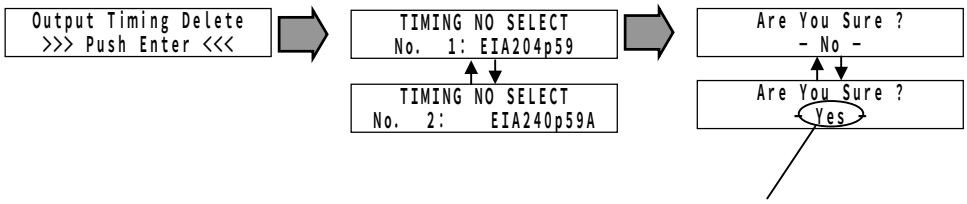
5.2.6 Storing the data

The parameters in this section enable data to be copied, initialized or deleted.

Parameter	Description	Comments
Output Timing Delete	Timing data deletion	This parameter is used to delete the output timing data. However, output timing data or the timing data specified as the external reference sync timing data cannot be deleted.
Output Timing Copy	Timing data copying	This parameter is used to copy output timing data into empty tables. Data cannot be copied if it involves overwriting already existing data in a table.
Output Timing Init	Timing data initialization	This parameter is used to initialize the output timing data to the factory data.

Example: Deleting timing data

Select deletion menu.→ Select timing data to be deleted.→ Confirm and enter.

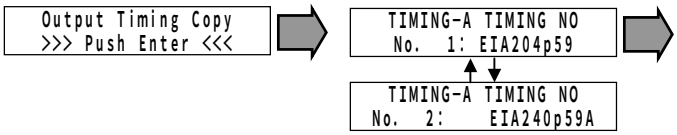


When the rotary encoder is pressed at "Yes," the data is deleted.
⇨ See "MENU mode" in 5.1.1 on page 10.

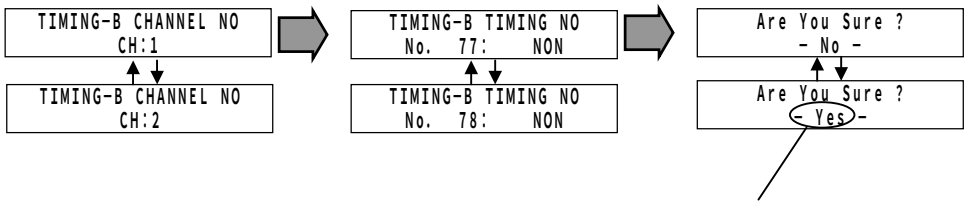
Example: Copying timing data

In this example, the TIMING-A timing data is copied to the TIMING-B timing data.

(1) Select copy menu.→ Select copy source timing data.



(2) Select copy destination channel. → Select copy destination timing data. → Confirm and enter.



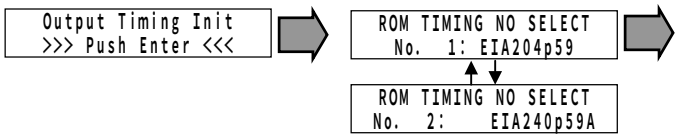
When the rotary encoder is pressed at "Yes," the data is copied.

⇨ See "MENU mode" in 5.1.1 on page 10.

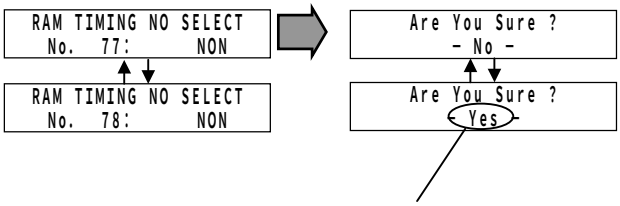
Example: Initializing timing data

In this example, the RAM timing data is initialized by the ROM timing data.

(1) Select initialization menu.→ Select factory timing data.



(2) Select operation timing data.→ Confirm and enter.



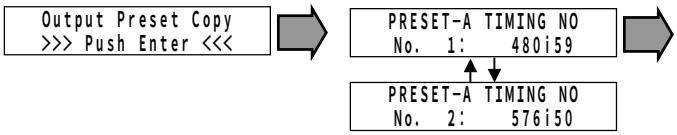
When the rotary encoder is pressed at "Yes," the data is initialized.

⇨ See "MENU mode" in 5.1.1 on page 10.

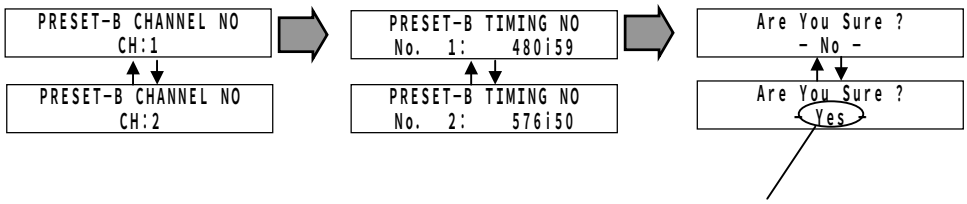
Parameter	Description	Comments
Output Preset Copy	Preset data copy	This parameter is used to copy preset data into empty tables. Data cannot be copied if it involves overwriting already existing data in a table.
Output Preset Init	Preset data initialization	This parameter is used to initialize the preset data to the factory data.

Example: Copying preset data

(1) Select copy menu.→ Select copy source preset data.



(2) Select copy destination channel. → Select copy destination preset data. → Confirm and enter.



When the rotary encoder is pressed at "Yes," the data is copied.

⇨ See "MENU mode" in 5.1.1 on page 10.

6 Timing Table List

6.1 Output timing table

No	Format	Clock (MHz)	Htotal (dot)	Hactive (dot)	Hcync (dot)	Hbp (dot)	Vtotal (line)	Vactive (line)	Vsync (line)	Vbp (line)	Scan	Rep
1	EIA240p59	13.5	858	720	62	57	262	240	3	15	PROG	2
2	EIA240p59A	13.5	858	720	62	57	263	240	3	15	PROG	2
3	EIA240pW59	13.5	858	720	62	57	262	240	3	15	PROG	2
4	EIA240pW59 A	13.5	858	720	62	57	263	240	3	15	PROG	2
5	EIA240p60	13.51	858	720	62	57	262	240	3	15	PROG	2
6	EIA240p60A	13.51	858	720	62	57	263	240	3	15	PROG	2
7	EIA240pW60	13.51	858	720	62	57	262	240	3	15	PROG	2
8	EIA240pW60 A	13.51	858	720	62	57	263	240	3	15	PROG	2
9	EIA288p50	13.5	864	720	63	69	312	288	3	19	PROG	2
10	EIA288p50A	13.5	864	720	63	69	313	288	3	19	PROG	2
11	EIA288p50B	13.5	864	720	63	69	314	288	3	19	PROG	2
12	EIA288pW50	13.5	864	720	63	69	312	288	3	19	PROG	2
13	EIA288pW50 A	13.5	864	720	63	69	313	288	3	19	PROG	2
14	EIA288pW50 B	13.5	864	720	63	69	314	288	3	19	PROG	2
15	EIA480p59	27	858	720	62	60	525	480	6	30	PROG	1
16	EIA480p59A	25.17	800	640	96	48	525	480	2	33	PROG	1
17	EIA480pW59	27	858	720	62	60	525	480	6	30	PROG	1
18	EIA480i59	13.5	858	720	62	57	525	480	6	30	INT	2
19	EIA480iW59	13.5	858	720	62	57	525	480	6	30	INT	2
20	EIA480p60	27.02	858	720	62	60	525	480	6	30	PROG	1
21	EIA480p60A	25.2	800	640	96	48	525	480	2	33	PROG	1
22	EIA480pW60	27.02	858	720	62	60	525	480	6	30	PROG	1
23	EIA480i60	13.51	858	720	62	57	525	480	6	30	INT	2
24	EIA480iW60	13.51	858	720	62	57	525	480	6	30	INT	2
25	EIA576p50	27	864	720	64	68	625	576	5	39	PROG	1
26	EIA576pW50	27	864	720	64	68	625	576	5	39	PROG	1
27	EIA576i50	13.5	864	720	63	69	625	576	5	39	INT	2
28	EIA576iW50	13.5	864	720	63	69	625	576	5	39	INT	2
29	EIA720p50	74.25	1980	1280	40	220	750	720	5	20	PROG	1
30	EIA720p59	74.17	1650	1280	40	220	750	720	5	20	PROG	1
31	EIA720p60	74.25	1650	1280	40	220	750	720	5	20	PROG	1
32	EIA1080p23	74.17	2750	1920	44	148	1125	1080	5	36	PROG	1
33	EIA1080p24	74.25	2750	1920	44	148	1125	1080	5	36	PROG	1
34	EIA1080p25	74.25	2640	1920	44	148	1125	1080	5	36	PROG	1
35	EIA1080p29	74.17	2200	1920	44	148	1125	1080	5	36	PROG	1
36	EIA1080p30	74.25	2200	1920	44	148	1125	1080	5	36	PROG	1
37	EIA1080p50	148.5	2640	1920	44	148	1125	1080	5	36	PROG	1
38	EIA1080i50	74.25	2640	1920	44	148	1125	1080	10	30	INT	1
39	EIA1080p59	148.35	2200	1920	44	148	1125	1080	5	36	PROG	1

No	Format	Clock (MHz)	Htotal (dot)	Hactive (dot)	Hcync (dot)	Hbp (dot)	Vtotal (line)	Vactive (line)	Vsync (line)	Vbp (line)	Scan	Rep
40	EIA1080i59	74.17	2200	1920	44	148	1125	1080	10	30	INT	1
41	EIA1080p60	148.5	2200	1920	44	148	1125	1080	5	36	PROG	1
42	EIA1080i60	74.25	2200	1920	44	148	1125	1080	10	30	INT	1
43	VESA350p85	31.5	832	640	64	96	445	350	3	60	PROG	1
44	VESA400p85	31.5	832	640	64	96	445	400	3	41	PROG	1
45	VESA400p85 A	35.5	936	720	72	108	446	400	3	42	PROG	1
46	VESA480p60	25.17	800	640	96	48	525	480	2	33	PROG	1
47	VESA480p60 A	33.75	1088	848	112	112	517	480	8	23	PROG	1
48	VESA480p72	31.5	832	640	40	128	520	480	3	28	PROG	1
49	VESA480p75	31.5	840	640	64	120	500	480	3	16	PROG	1
50	VESA480p85	36	832	640	56	80	509	480	3	25	PROG	1
51	VESA600p56	36	1024	800	72	128	625	600	2	22	PROG	1
52	VESA600p60	40	1056	800	128	88	628	600	4	23	PROG	1
53	VESA600p72	50	1040	800	120	64	666	600	6	23	PROG	1
54	VESA600p75	49.5	1056	800	80	160	625	600	3	21	PROG	1
55	VESA600p85	56.25	1048	800	64	152	631	600	3	27	PROG	1
56	VESA768i43	44.9	1264	1024	176	56	817	768	4	20	INT	1
57	VESA768p60	65	1344	1024	136	160	806	768	6	29	PROG	1
58	VESA768p70	75	1328	1024	136	144	806	768	6	29	PROG	1
59	VESA768p75	78.75	1312	1024	96	176	800	768	3	28	PROG	1
60	VESA768p85	94.5	1376	1024	96	208	808	768	3	36	PROG	1
61	VESA768pW 60	68.25	1440	1280	32	80	790	768	7	12	PROG	1
62	VESA768pW 60A	79.5	1664	1280	128	192	798	768	7	20	PROG	1
63	VESA768pW 60B	85.5	1792	1360	112	256	795	768	6	18	PROG	1
64	VESA768pW 75	102.25	1696	1280	128	208	805	768	7	27	PROG	1
65	VESA768pW 85	117.5	1712	1280	136	216	809	768	7	31	PROG	1
66	VESA864p75	108	1600	1152	128	256	900	864	3	32	PROG	1
67	VESA960p60	108	1800	1280	112	312	1000	960	3	36	PROG	1
68	VESA960p85	148.5	1728	1280	160	224	1011	960	3	47	PROG	1
69	VESA1024p60	108	1688	1280	112	248	1066	1024	3	38	PROG	1
70	VESA1024p75	135	1688	1280	144	248	1066	1024	3	38	PROG	1
71	VESA1024p85	157.5	1728	1280	160	224	1072	1024	3	44	PROG	1
72	VESA1050p60	101	1560	1400	32	80	1080	1050	1	23	PROG	1
73	VESA1050p60A	121.75	1864	1400	144	232	1089	1050	1	32	PROG	1
74	VESA1050p75	156	1896	1400	144	248	1099	1050	1	42	PROG	1
75	VESA1200p60	162	2160	1600	192	304	1250	1200	3	46	PROG	1
76	VESA1200p60A	154	2080	1920	32	80	1235	1200	6	26	PROG	1

7 Main Specifications

7.1 Specifications

Table 7.1 OM-596 Specifications

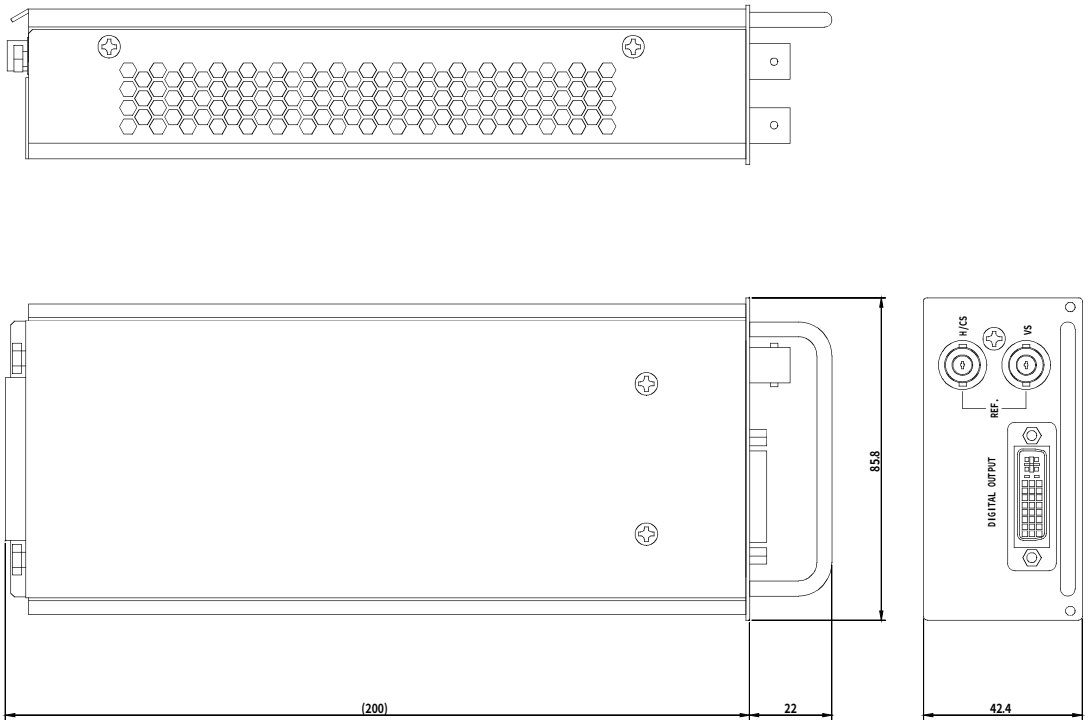
Item		Specifications
Data format		Digital RGB DVI R1.0
Scanning system		Progressive, interlace
Pixel clock frequency		12.5 to 165 MHz (max. 74.25 MHz for interlace) *
Image data resolution		8 bits
Horizontal frequency		15 to 150 kHz
Vertical frequency		24 to 150 Hz (differs depending on resolution of input/output)
Number of pixels displayed		Max. 2560 × 1580
Hot plug		Supported
Number of channels		1 system (DVI-I connector) * Analog signals are not supported
Through-out		None
External sync signals	CS	(0.3 Vp-p/75-ohm termination)
	HS/VS	TTL level (negative polarity/75-ohm termination)
	Number of input channels	1 system (BNC)
	Through-out	None

* Repetition output at frequencies of 25 MHz and below.

7.2 Accessory

User's Manual	1 copy

7.3 Outline drawing



Notes:

- Documents with missing or incorrectly collated pages will be replaced.
- The copyright of this product belongs to ASTRODESIGN, Inc.
- No part of this document may be used or reproduced without permission.
- The contents of this document are subject to revision without notice.
- ASTRODESIGN shall not be responsible for any damages resulting from misuse.
- For additional information relating to this product, contact your local dealer or ASTRODESIGN at the address listed below.
- All other products or product names listed in this document are trademarks or registered trademarks of their respective companies.

T0069

ASTRODESIGN, INC.

URL http://WWW.astrodesign.co.jp

First Sales Division
2-6-17 Haramachi, Meguro-ku, Tokyo, Japan 152-0011
Tel: (03) 5720-5838, Fax: (03) 5720-6353

Osaka Sales Office
1-18-27-1010 Higashi-Nakajima, Higashi-Yodogawa-ku,
Osaka, Japan 533-0033
Tel: (06) 6328-8558, Fax: (06) 6328-5058