Dual Link HD-SDI output module

OM-598

Instruction Manual

Ver.1.02

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Instruction Manual

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Ver.1.02

ASTRODESIGN,Inc

CONTENTS

INTRODUCTION

Thank you very much for purchasing this OM-598 Dual Link HD-SDI Output Module.

This manual contains details on the functions featured by the OM-598 and the procedures for operating this module as well as the checkpoints and precautions to be observed.

Since improper handling may result in malfunctioning, before using the OM-598, please read through these instructions to ensure that you will operate the module correctly.

After reading through the manual, keep it in a safe place for future reference.

SAFETY PRECAUTIONS

⚠ WARNING

Concerning foreign matter

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

Concerning disassembly of the product

- Do not attempt to disassemble the module. Users run the risk of electric shocks or injury and of causing malfunctioning if they open the panels and plug or unplug the internal circuit boards themselves.

⚠CAUTION

Handling the module

- This module is composed of precision components. Take special care when handling it.
- Do not plug or unplug the module while the power is supplied to it. You run the risk of electric shocks or injury and of causing malfunctioning.
- Bear in mind that when removing the module, its connector may come into contact with your hands.

Concerning impact

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

If trouble or malfunctioning should occur

- In the unlikely event that trouble or malfunctioning should occur in the module, disconnect its power cord, and contact your dealer or an Astrodesign sales representative.

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1 VERSION UPDATE HISTORY

Ver.	Date	Page	Section No.	Details of version update
1.00	2005/10/19			Initial version
1.01	2005/12/18	4	2.2	(4) Locking range in "Restrictions imposed by the specifications." Before the change: A phase error of up to 2H (approx.) occurs each time the locking operation is performed. After the change: A phase error of approx. ±1H occurs each time the locking operation is performed.
		19	7.1	"Specifications" "4:2:2 → 4:4:4 interpolation" deleted.
				New menus supported SC-2055A supported
1.02	2006/01/13			Final page changed

2 CONCERNING THE OM-598

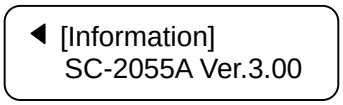
2.1 Introduction

- The OM-598 is a Dual Link HD-SDI output module which is incorporated into the model SC-2055A super scan converter (equipped with 2 inputs and 3 outputs).
- It comes with Dual Link HD-SDI output connectors for two channels and an external sync input connector for one channel (automatic 75-ohm termination).
- The module supports the input of HDTV binary and HDTV tri-level CS signals and BBS signals as the external sync signals.
- The module outputs serial digital signals complying with the SMPTE-292M and SMPTE-372M standards.

2.2 Restrictions imposed by the specifications

(1) Concerning incorporation into the SC-2055 and SC-2055A

The OM-598 cannot be used in the SC-2055. It can be used only in the SC-2055A.

SUPPLEMENTARY NOTE	**How to identify SC-2055 and SC-2055A** **A super scan converter is identified by its product name which is displayed on the default screen in the Information mode.** 

(2) Concerning Dual Link 12-bit output

With 12-bit output, the lower 2 bits are fixed at "0" and output.

(3) External sync signals

If there are no serration pulses in the external sync signals supplied to the module, the signals cannot be locked properly even if the front panel LED should indicate the locked status.

It may not be possible to lock the signals properly when VTR or other poor-quality signals or signals exceeding +/-50 ppm of the rating have been input.

Since analog signals are input as the external sync signals, with some input signals an error of several dots or so may occur in the output phase from the phase of the external sync signals.

(4) Locking range

Frame locking operations can be conducted provided that the vertical frequencies of the input and output signals stand in a ratio of 1:1, 1:2, 2:5 or 4:5. During frame locking operations with the same input and output signal timing, the phase difference upon locking will always be the same. If, however, the timing is not the same, a phase difference of +/-1H or so will occur upon each locking operation. (This difference can be adjusted by adjusting the lock phase.)

(5) 1080p50, p59 and p60 locking

When conducting locking operations with the output signals of the 1080p50, p59 or p60 system, the vertical phase of the output signals will be aligned with that of the input signals, but the sequence of the first field and second field may differ for the F flag under the SMPTE-372M standard upon each locking operation.

3 PARTS AND THEIR FUNCTIONS

3.1 OM-598 rear panel view and parts

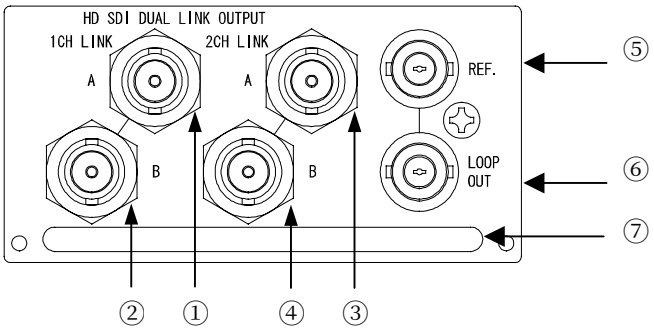


Fig. 3.1 OM-598 rear panel view

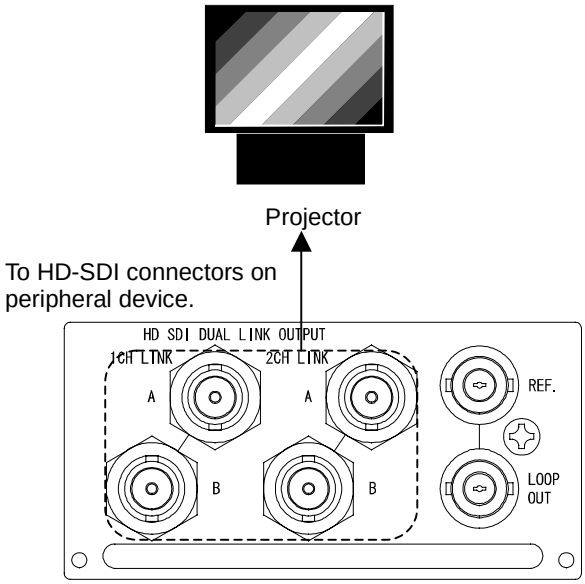
Table 3.1 Names of rear panel parts

No.	Name of part		Description
①	CH1	LINK A HD-SDI output connecto	These are the HD-SDI output connectors (BNC connectors) for channel 1.
②		LINK B HD-SDI output connector	
③	CH2	LINK A HD-SDI output connector	These are the HD-SDI output connectors (BNC connectors) for channel 2.
④		LINK B HD-SDI output connector	
⑤	REF input connector		This is the external reference sync signal input connector (BNC connector).
⑥	LOOP OUT output connector		This is the through-output connector (BNC connector).
⑦	Handle		This is used when plugging in or unplugging the module.

4 CONNECTIONS

4.1 Connecting the output signals

As shown in the figure below, connect the HD-SDI output signals from the HD-SDI OUTPUT connectors in line with the input conditions of the peripheral device.

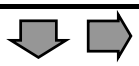


5 ADJUSTMENTS AND SETTINGS

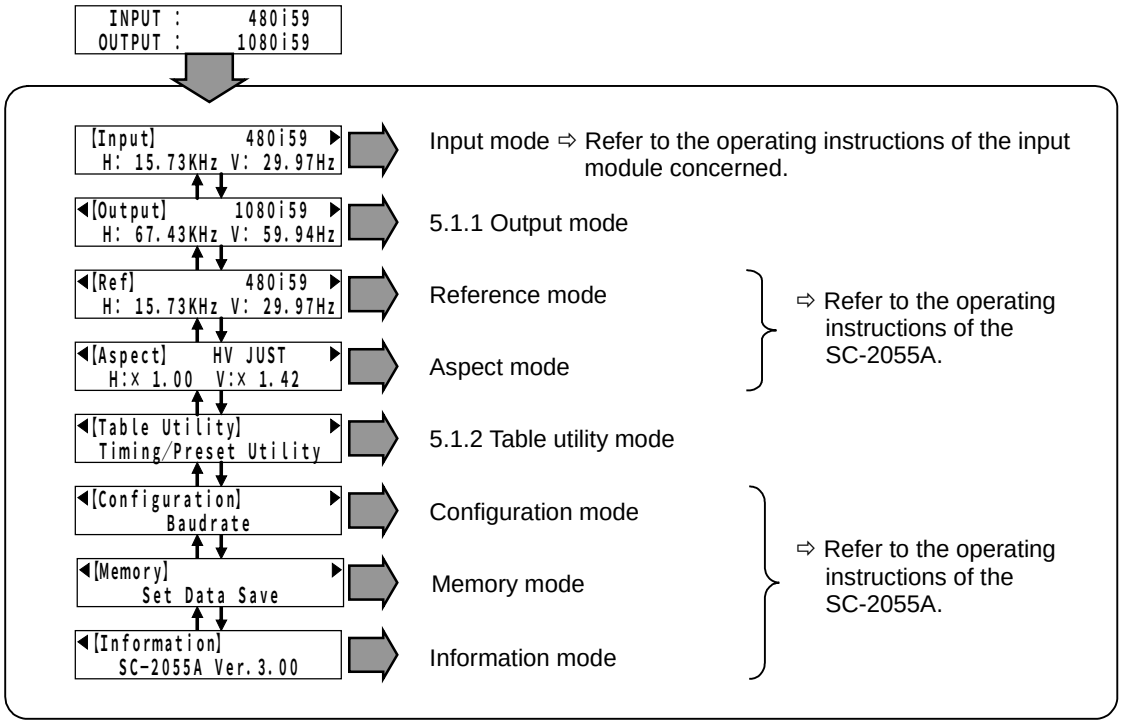
5.1 Menu configuration

The menu is displayed in the configuration shown below by pushing the rotary encoder from the default screen. For details on the operation methods, refer to the operating instructions of the SC-2055A.

The symbols below signify the following.

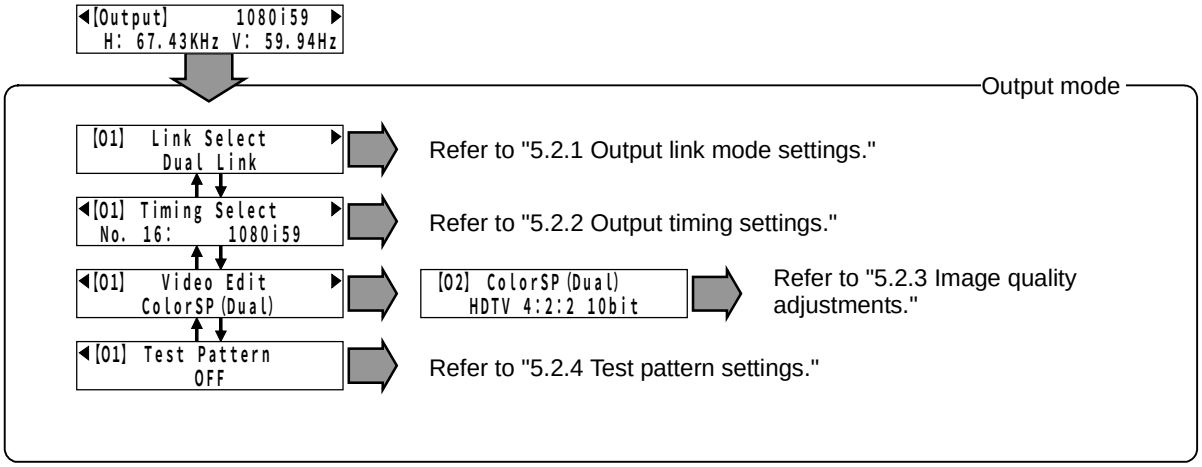
	Operations involving pushing the rotary encoder
	Operations involving turning the rotary encoder

Default screen



5.1.1 Output mode

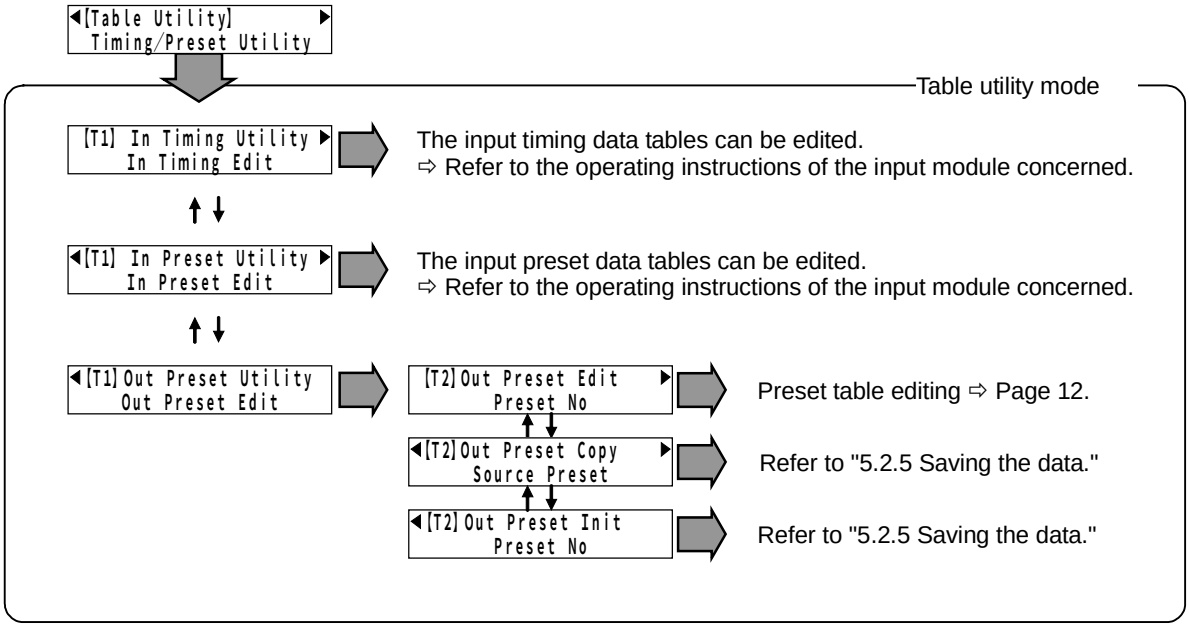
The selected output timing signals are displayed on the default screen of the output mode.



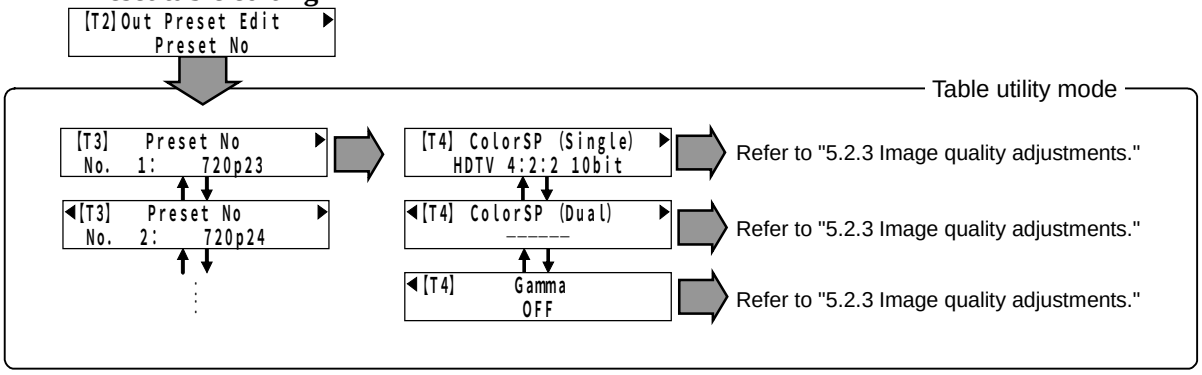
The ColorSP menu corresponding to the current output link mode is displayed for the ColorSP menu in Video Edit.

Example: When Single Link is the current output link mode, the ColorSP menu for Single Link is displayed, and the ColorSP menu for Dual Link is not displayed.

5.1.2 Table utility mode



Preset table editing



5.2 Setting items

5.2.1 Output link mode settings

The output link mode is set using the following item.

Setting item	Description of setting	Setting value	Remarks
Link Select	Output link mode	Single Link, Dual Link	Sets the output link mode.

5.2.2 Output timing settings

The output timing is set using the following item.

Setting item	Description of setting	Setting value	Remarks
Timing Select	Output timing	Timing system name *1 SLAVE *2	Selects the output timing.

*1: The number of timing system names which can be selected differs depending on the output module type.
*2: When SLAVE is selected, the same timing signals as the ones output by the other output channel are output. SLAVE can be selected only when modules have been incorporated for both output channels. The SLAVE setting cannot be selected for both channels.

The output timing system which can be selected differs depending on the output link mode.

In the table below, "O" denotes an output timing system which can be selected and "X" denotes one which cannot be selected.

Output timing system		Output link mode		Output timing system		Output link mode	
		Single Link	Dual Link			Single Link	Dual Link
1	720p23	○	×	14	1080p50	×	○
2	720p24	○	×	15	1080i50	○	○
3	720p25	○	×	16	1080p59	×	○
4	720p29	○	×	17	1080i59	○	○
5	720p30	○	×	18	1080p60	×	○
6	720p50	○	×	19	1080i60	○	○
7	720p59	○	×	20	1035i59	○	×
8	720p60	○	×	21	1035i60	○	×
9	1080p23	○	○	22	1080sF23	○	○
10	1080p24	○	○	23	1080sF24	○	○
11	1080p25	○	○	24	1080sF25	○	○
12	1080p29	○	○	25	1080sF29	○	○
13	1080p30	○	○	26	1080sF30	○	○

5.2.3 Image quality adjustments

The settings related to the image quality adjustment and image display are selected using the following items.

Setting item	Description of setting	Setting value	Remarks
ColorSP (Single)	Color space system setting	Refer to *1.	Sets the color space system for Single Link.
ColorSP (Dual)	Color space system setting	Refer to *1.	Sets the color space system for Dual Link.
Gamma	Gamma	OFF, User-1, User-2	Sets the gamma mode.

*1: The color space system which can be selected differs depending on the output link mode and output timing system.

In the table below, "O" denotes a color space system which can be selected and "X" denotes one which cannot be selected.

Data cannot be edited in the case of a timing system which is not supported by the output link mode concerned. (This is indicated by ------- on the menu.)

Color space system setting	Output link mode setting		
	Single Link	Dual Link	
		Output timing systems A (note)	All other systems
RGB 4:4:4 10bit	×	×	○
RGB 4:4:4 12bit	×	×	○
HDTV 4:2:2 10bit	○	○	×
HDTV 4:2:2 12bit	×	×	○
HDTV 4:4:4 10bit	×	×	○
HDTV 4:4:4 12bit	×	×	○
HDTV1035 4:2:2 10bit	○	○	×
HDTV1035 4:2:2 12bit	×	×	○
HDTV1035 4:4:4 10bit	×	×	○
HDTV1035 4:4:4 12bit	×	×	○
SDTV 4:2:2 10bit	○	○	×
SDTV 4:2:2 12bit	×	×	○
SDTV 4:4:4 10bit	×	×	○
SDTV 4:4:4 12bit	×	×	○

Note: 1080p50, 108059, 1080p60

5.2.4 Test pattern settings

The test pattern output is selected using this item. Use it when adjusting display devices.

Setting item	Setting value	Remarks
Test Pattern	OFF	Normal display setting.
	Bright	Stepped-up pattern with black serving as the reference.
	Contrast	Stepped-down pattern with white serving as the reference.
	Hue&Color	Pattern in which the white level in the color bar signals has been attenuated by 75% and the black level has been attenuated by 25% for the R, G and B signals.
	Colorbar	100% color bars displayed.
	Crosshatch	Crosshatch pattern consisting of 1-dot and 1-line intervals.
	Burst	Pattern in which the white and black are repeated horizontally in 1-dot increments.
	Frame	Frame display for a full video display period.
	White	White displayed over the entire screen.
	Red	Red displayed over the entire screen.
	Green	Green displayed over the entire screen.
	Blue	Blue displayed over the entire screen.

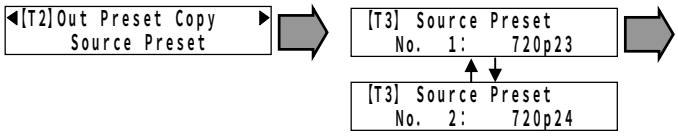
5.2.5 Saving the data

The data can be copied or initialized using these items.

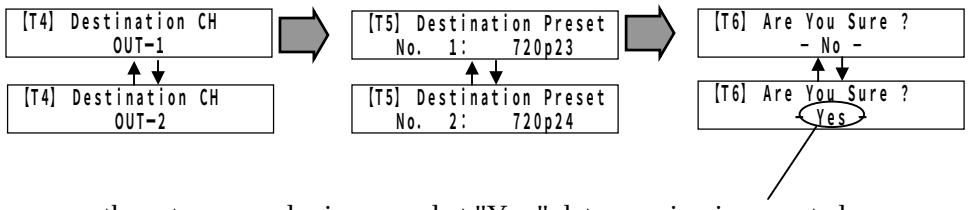
Setting item	Setting value	Remarks
Out Preset Copy	Preset data copy	The preset data is copied into an empty table. Data cannot be copied into a table by overwriting the existing data in that table.
Out Preset Init	Preset data initialization	The preset data is initialized to the factory data.

Example: Copying preset data

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



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



As soon as the rotary encoder is pressed at "Yes," data copying is executed.

⇨ See "5.1.2 Table utility mode" on page 11.

6 TIMING SYSTEM TABLES

6.1 Output timing system table

No	System	Clock (MHz)	Hperiod (dot)	Hdisp (dot)	Hcync (dot)	Hbp (dot)	Vtotal (line)	Vdisp (line)	Vsync (line)	Vbp (line)	Scan
1	720p23	74.25 /1.001	4125	1280	40	260	750	720	5	20	Progressive
2	720p24	74.25	4125	1280	40	260	750	720	5	20	Progressive
3	720p25	74.25	3960	1280	40	260	750	720	5	20	Progressive
4	720p29	74.25 /1.001	3300	1280	40	260	750	720	5	20	Progressive
5	720p30	74.25	3300	1280	40	260	750	720	5	20	Progressive
6	720p50	74.25	1980	1280	40	260	750	720	5	20	Progressive
7	720p59	74.25 /1.001	1650	1280	40	260	750	720	5	20	Progressive
8	720p60	74.25	1650	1280	40	260	750	720	5	20	Progressive
9	1080p23	74.25 /1.001	2750	1920	44	192	1125	1080	5	36	Progressive
10	1080p24	74.25	2750	1920	44	192	1125	1080	5	36	Progressive
11	1080p25	74.25	2640	1920	44	192	1125	1080	5	36	Progressive
12	1080p29	74.25 /1.001	2200	1920	44	192	1125	1080	5	36	Progressive
13	1080p30	74.25	2200	1920	44	192	1125	1080	5	36	Progressive
14	1080p50	148.5	2640	1920	44	192	1125	1080	5	36	Progressive
15	1080i50	74.25	2640	1920	44	192	1125	1080	10	30	Interlace
16	1080p59	148.5 /1.001	2200	1920	44	192	1125	1080	5	36	Progressive
17	1080i59	74.25 /1.001	2200	1920	44	192	1125	1080	10	30	Interlace
18	1080p60	148.5	2200	1920	44	192	1125	1080	5	36	Progressive
19	1080i60	74.25	2200	1920	44	192	1125	1080	10	30	Interlace
20	1035i59	74.25 /1.001	2200	1920	44	192	1125	1035	10	69	Interlace
21	1035i60	74.25	2200	1920	44	192	1125	1035	10	69	Interlace
22	1080sF23	74.25 /1.001	2750	1920	44	192	1125	1080	10	30	Progressive (sF)
23	1080sF24	74.25	2750	1920	44	192	1125	1080	10	30	Progressive (sF)
24	1080sF25	74.25	2640	1920	44	192	1125	1080	10	30	Progressive (sF)
25	1080sF29	74.25 /1.001	2200	1920	44	192	1125	1080	10	30	Progressive (sF)
26	1080sF30	74.25	2200	1920	44	192	1125	1080	10	30	Progressive (sF)

6.2 Reference timing system table

No	System	Clock (MHz)	Hperiod (dot)	Hdisp (dot)	Hcync (dot)	Hbp (dot)	Vtotal (line)	Vdisp (line)	Vsync (line)	Vbp (line)	Scan
1	720p23	74.25 /1.001	4125	1280	40	260	750	720	5	20	Progressive
2	720p24	74.25	4125	1280	40	260	750	720	5	20	Progressive
3	720p25	74.25	3960	1280	40	260	750	720	5	20	Progressive
4	720p29	74.25 /1.001	3300	1280	40	260	750	720	5	20	Progressive
5	720p30	74.25	3300	1280	40	260	750	720	5	20	Progressive
6	720p50	74.25	1980	1280	40	260	750	720	5	20	Progressive
7	720p59	74.25 /1.001	1650	1280	40	260	750	720	5	20	Progressive
8	720p60	74.25	1650	1280	40	260	750	720	5	20	Progressive
9	1080p23	74.25 /1.001	2750	1920	44	192	1125	1080	5	36	Progressive
10	1080p24	74.25	2750	1920	44	192	1125	1080	5	36	Progressive
11	1080p25	74.25	2640	1920	44	192	1125	1080	5	36	Progressive
12	1080p29	74.25 /1.001	2200	1920	44	192	1125	1080	5	36	Progressive
13	1080p30	74.25	2200	1920	44	192	1125	1080	5	36	Progressive
14	1080p50	148.5	2640	1920	44	192	1125	1080	5	36	Progressive
15	1080i50	74.25	2640	1920	44	192	1125	1080	10	30	Interlace
16	1080p59	148.5 /1.001	2200	1920	44	192	1125	1080	5	36	Progressive
17	1080i59	74.25 /1.001	2200	1920	44	192	1125	1080	10	30	Interlace
18	1080p60	148.5	2200	1920	44	192	1125	1080	5	36	Progressive
19	1080i60	74.25	2200	1920	44	192	1125	1080	10	30	Interlace
20	1035i59	74.25 /1.001	2200	1920	44	192	1125	1035	10	69	Interlace
21	1035i60	74.25	2200	1920	44	192	1125	1035	10	69	Interlace
22	1080sF23	74.25 /1.001	2750	1920	44	192	1125	1080	10	30	Progressive (sF)
23	1080sF24	74.25	2750	1920	44	192	1125	1080	10	30	Progressive (sF)
24	1080sF25	74.25	2640	1920	44	192	1125	1080	10	30	Progressive (sF)
25	1080sF29	74.25 /1.001	2200	1920	44	192	1125	1080	10	30	Progressive (sF)
26	1080sF30	74.25	2200	1920	44	192	1125	1080	10	30	Progressive (sF)
27	480i59	13.5	858	720	63	59	525	483	6	30	Interlace
28	576i50	13.5	864	720	63	69	625	576	5	39	Interlace

7 MAIN SPECIFICATIONS

7.1 Specifications

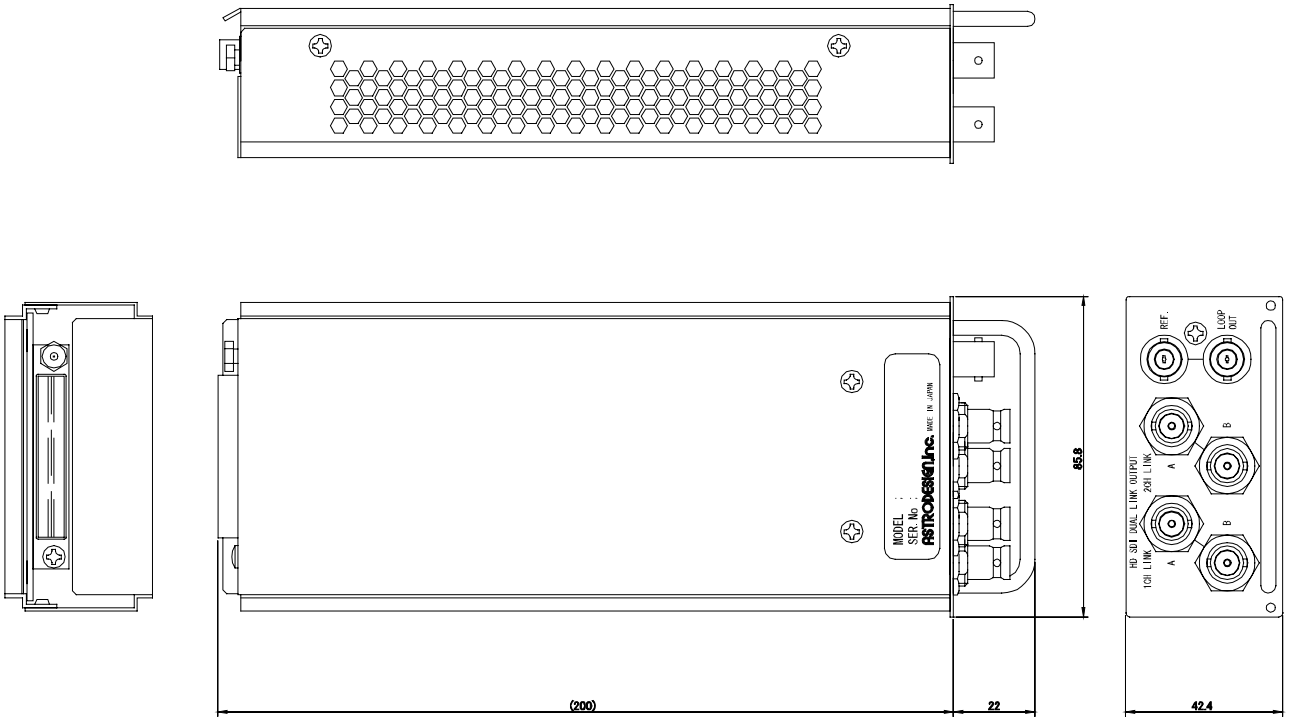
Table 7.1 OM-598 specifications

Item		Specification
Standards supported		SMPTE-292M、SMPTE-372M
Timing systems		1920×1080×60/59.94p 1920×1080×50p 1920×1080×60/59.94i 1920×1080×50i 1920×1080×30/29.97p 1920×1080×25p 1920×1080×24/23.98p 1920×1080×24/23.98sF 1920×1035×60/59.94i 1280× 720×60/59.94p 1280× 720×50p 1280× 720×30/29.97p 1280× 720×25p 1280× 720×24/23.98p
Color formats		YPbPr, RGB (SMPTE240M, SMPTE274M, SMPTE296M)
Video data resolution		10 bits (lower 2 bits fixed at "0" when 12 bits are output)
Number of channels		2 (BNC connectors x 4)
External sync	CS (BBS)	HDTV binary (0.3 Vp-p, 75-ohm termination) HDTV tri-level (± 0.3 Vp-p, 75-ohm termination) Black burst signal (0.3 Vp-p, 75-ohm termination) (NTSC horizontal frequency = 13.5 MHz/858) (PAL horizontal frequency = 13.5 MHz/864)
	Number of input channels	1 (BNC connector)
	Through output connector	Provided
	Timing systems	All systems listed above except 1080/60 (59.94)P and 1080/50P

7.2 Accessories

Operating instructions	1 copy

7.3 Outline drawings



OM-598 Instruction Manual

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