FOR.A ®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

UFM-147DFS

Frame Synchronizer and Time Base Corrector

1st Edition - Rev. 4

FOR-A COMPANY LIMITED

Precautions

Important Safety Warnings

[Power]

Stop	**Do not** place or drop heavy or sharp-edged objects on power cord. A damaged cord can cause fire or electrical shock hazards. Regularly check power cord for excessive wear or damage to avoid possible fire / electrical hazards.

[Circuitry Access]

Stop	**Do not** touch any parts / circuitry with a high heat factor. Capacitors can retain enough electric charge to cause mild to serious shock, even after power is disconnected. Capacitors associated with the power supply are especially hazardous. Avoid contact with any capacitors.
Hazard	Unit **should not** be operated or stored with cover, panels, and / or casing removed. Operating unit with circuitry exposed could result in electric shock / fire hazards or unit malfunction.

[Potential Hazards]

Caution	If abnormal smells or noises are noticed coming from the unit, turn power off immediately and disconnect power cord to avoid potentially hazardous conditions. If problems similar to above occur, contact authorized service representative **before** attempting to again operate unit.

[Consumables]

Caution	The consumables used in unit must be replaced periodically. For further details on which parts are consumables and when they should be replaced, refer to the specifications at the end of the Operation Manual. Since the service life of the consumables varies greatly depending on the environment in which they are used, they should be replaced at an early date. For details on replacing the consumables, contact your dealer.

Upon Receipt

Unpacking

UFM-147DFS and their accessories are fully inspected and adjusted prior to shipment. Operation can be performed immediately upon completing all required connections and operational settings.

Check your received items against the packing lists below.

ITEM	QTY	REMARKS
UFM-147DFS	1	
Operation Manual	1	

Option

ITEM	QTY	REMARKS
UFM-147CNT	1	Optional analog component I/O module
UFM-100AED	1	Optional audio embedder/de-embedder module

Check

Check to ensure no damage has occurred during shipment. If damage has occurred, or items are missing, inform your supplier immediately.

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1. Prior to Starting

1-1. Welcome

Congratulations! By purchasing UFM-147DFS Frame Synchronizer and Time Base Corrector you have entered the world of FOR-A and its many innovative products. Thank you for your patronage and we hope you will turn to FOR-A products again and again to satisfy your video and audio needs.
FOR-A provides a wide range of products, from basic support units to complex system controllers, which have been increasingly joined by products for computer video based systems. Whatever your needs, talk to your FOR-A representative. We will do our best to be of continuing service to you.

1-2. Features

The UFM-147DFS is a plug-in type unit that is used by mounting to the Universal Frame Series. (UFM frames), the UFM-147DFS is capable of analog composite to digital component conversion, and has wide range internal genlock capability, so that almost any VHS signal can be genlocked. Perfect solution for an existing analog system to be upgraded to digital component system.

- SD-SDI or Analog composite input

- SD-SDI and Analog composite output

- A/D and D/A converter.

- Line Synchronization (Minimum Delay mode) selectable.

- Internal Processing :10-bit 4:2:2 component

- 10-bit digital Y/C separation/decoding/encoding.

- Full frame memory to prevent picture field inversion during processing.

- 10-bit quantization each for Y and C.

- Auto-detection for NTSC and PAL signals.

- UFM-100AED: Optional audio embedder/de-embedder

- UFM-147CNT: Optional analog component I/O

1-3. About This Manual

This manual is intended to help the user easily operate this product and make full use of its functions during operations. Before connecting or operating your unit, read this operation manual thoroughly to ensure you understand the product. After reading, it is important to keep this manual in a safe place and available for reference.

2. Panel Descriptions

2-1. Front Panel
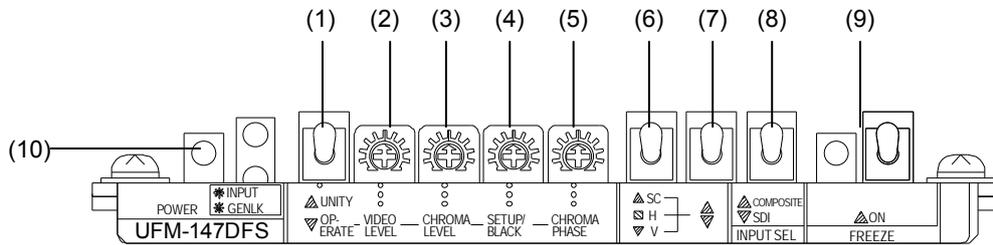
(1) UNITY / OPERATE toggle switch

UNITY	Resets all settings for VIDEO LEVEL, CHROMA LEVEL, SETUP/BLACK, and CHROMA PHASE to the factory defaults. (UNITY default setting)
OPERATE	Enables all controls for VIDEO LEVEL, CHROMA LEVEL, SETUP/BLACK, and CHROMA PHASE.

(2) VIDEO LEVEL
Used to adjust the video level. See section 4-3-2, "VIDEO LEVEL."

(3) CHROMA LEVEL
Used to adjust the chroma level. See section 4-3-3, "CHROMA LEVEL."

(4) SETUP / BLACK
Used to adjust the setup level. See section 4-3-4, "SETUP/BLACK."

(5) CHROMA PHASE
Used to adjust the chroma phase. See section 4-3-5, "CHROMA PHASE."

(6) SYSTEM PHASE toggle switch
Used to select the system phase.
    Up position: SC PHASE
    Center position: H PHASE
    Down position: V PHASE
See section 4-3-6, "SC PHASE," section 4-3-7, "H PHASE," and section 4-3-8, "V PHASE."
Switch (7) is used to adjust the phase.

(7) PHASE adjustment switch
Used to adjust the phase by moving the switch up and down.
See section 4-3-6, "SC PHASE," section 4-3-7, "H PHASE," and section 4-3-8, "V PHASE."

(8) INPUT select switch
Used to switch the input signal selection.
    Up position: COMPOSITE IN
    Down position: SD-SDI IN
*If the UFM-147CNT (option) is installed, COMPONENT IN is selected by setting the switch to the center position.
See section 4-3-9, "INPUT SELECT."

(9) FREEZE swtich and indicator
Used to set freeze operation ON / OFF. The indicator lights green whenever freeze is set to ON.
Up position: ON
Down position: OFF
See section 4-3-10, "FREEZE."

(10) POWER, INPUT, and GENLOCK indicators

Name	Indicator	Description
POWER	Lit green	Power is applied to the unit.
	Unlit	Power is not applied to the unit.
INPUT	Lit green	The UFM-147DFS is receiving the selected video signal and operating properly.
	Unlit	The selected signal is not present. The signal level is too low. Random noise is present.
GENLOCK	Lit green	The UFM-147DFS is receiving the external reference signal and operating properly.
	Unlit	No signal is present. The signal level is too low. The internal reference signal is used.

2-2. Rear Panel
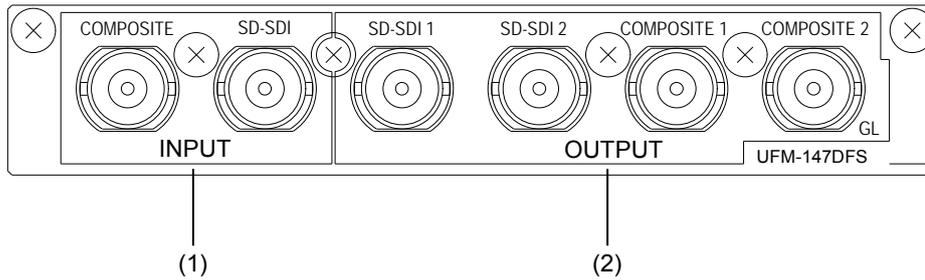
(1) INPUT

COMPOSITE	Used to input an analog composite signal.
SD-SDI	Used to input an SD-SDI signal.

(2) OUTPUT

SD-SDI 1	Used to output a corrected SD-SDI signal.
	The signal input to the INPUT SD-SDI is bypassed to SD-SDI 1 when power is turned off or when SW1-1 is set to ON. See section 5-1-1, "SW1."
SD-SDI 2	Used to output a corrected SD-SDI signal.
COMPOSITE 1	Used to output a corrected analog composite signal.
	The signal input to the INPUT COMPOSITE is bypassed to COMPOSITE 1 when power is turned off or when SW1-1 is set to ON. See section 5-1-1, "SW1."
COMPOSITE 2 GL	COMPOSITE 2 or GL (GENLOCK IN) can be selected by changing the jumper setting. See section 5-2, "Jumper Settings."

	COMPOSITE 2	Used to output a corrected analog composite signal.
	GL (GENLOCK IN)	Used to input a reference signal (black burst).

| **IMPORTANT** |
|---|
| If the reference signal is connected to the REF connector of the UFM frame unit and the GL (GENLOCK IN) connector of the UFM-147DFS module at the same time, the reference signal connected to the GL (GENLOCK IN) connector of the UFM-147DFS module is selected automatically. |

3. Connection

⚠️ **CAUTION**	Turn all the power OFF before making connection.

3-1. Connection Example

Whether to process the analog composite or SD-SDI input signal is selectable with the INPUT SELECT switch.

◆ **Wiring Diagram**
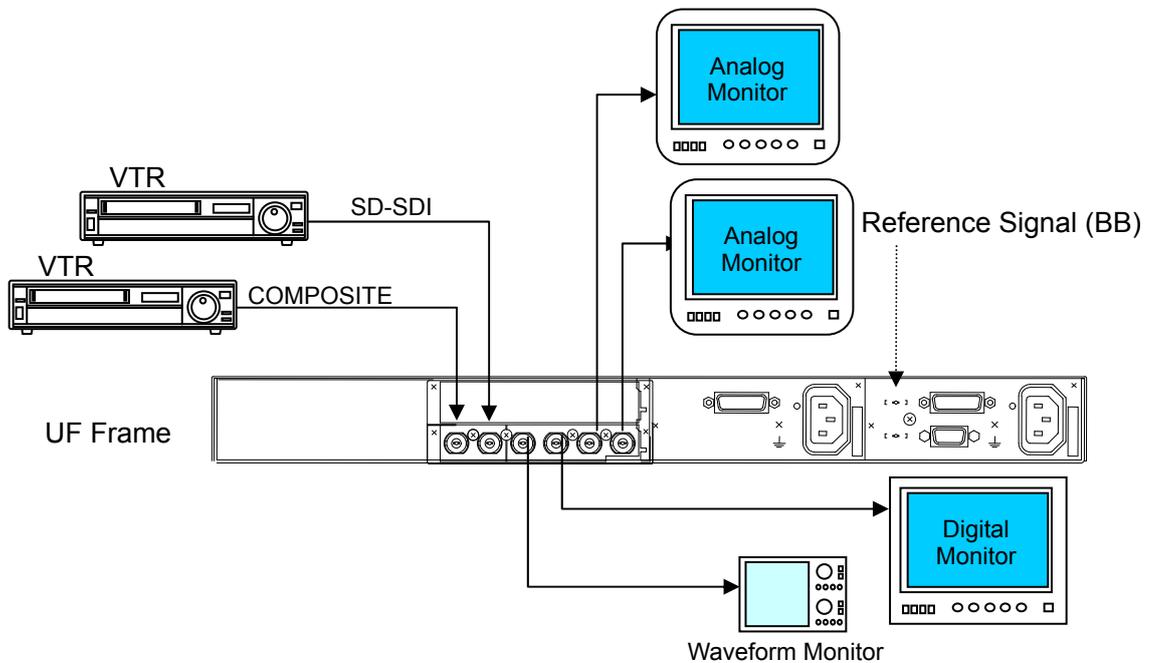
| **NOTE** |
|---|
| The connection example above uses GENLOCK IN as COMPOSITE2 output. Switching between GENLOCK IN and COMPOSITE2 is made by the internal jumper switch. (See section 5-2-1. GENLOCK IN and COMPOSITE2 Switching.") |

4. Operation

4-1. Power On

Turn the POWER switch on the UFM frame to ON after all system connections are complete. When the unit is powered on, the POWER indicator should light up green. If the video signal is input to the unit, the INPUT indicator shown below will light up green. If the reference signal is input to the unit, the GENLOCK indicator shown below will light up green.
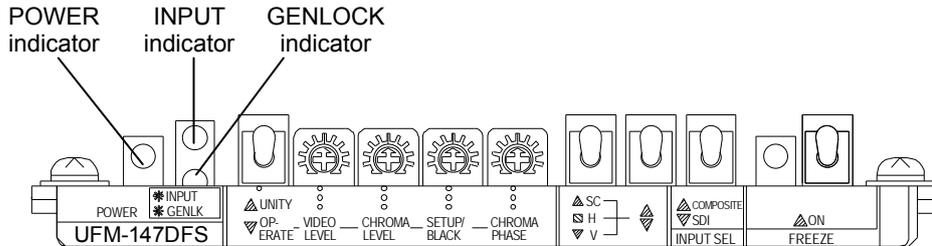
4-2. Front Panel Switches and Controls

The switches and controls on the UFM-147DFS front panel can be used to select and change operational settings and levels and to make settings in the operational menus.
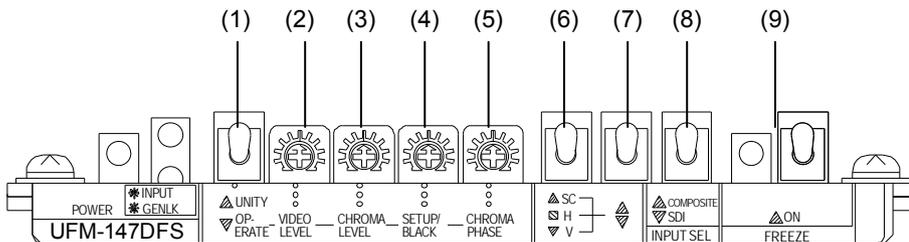
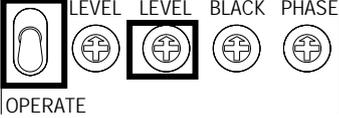| Switches and Controls	Factory Default	Refer to
(1) UNITY/OPERATE	UNITY	4-3-1
(2) VIDEO LEVEL	CENTER	4-3-2
(3) CHROMA LEVEL	CENTER	4-3-3
(4) SETUP/BLACK	CENTER	4-3-4
(5) CHROMA PHASE	CENTER	4-3-5
(6) SYSTEM PHASE SELECT	SC PHASE	4-3-6 4-3-7 4-3-8
(7) PHASE ADJUST	CENTER	4-3-6 4-3-7 4-3-8
(8) INPUT SELECT	COMPOSITE	4-3-9
(9) FREEZE	OFF	4-3-10

4-3. Front Panel Operation

4-3-1. UNITY/OPERATE

Move the switch up and down to switch between UNITY and OPERATE.

Switch and Controls		Description
Up position (UNITY)	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/ CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Disables all process control settings and returns the settings to the factory defaults.
Down position (OPERATE)	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/ CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Enables all settings for VIDEO LEVEL, CHROMA LEVEL, SETUP/BLACK, and CHROMA PHASE.

4-3-2. VIDEO LEVEL

Switch and Control		Description
UNITY/OPERATE Down position (OPERATE)	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/ CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Adjusts the video output level.
Turn the VIDEO LEVEL control to adjust		Setting range: -3dB to +3dB

4-3-3. CHROMA LEVEL

Switch and Control		Description
UNITY/OPERATE Down position (OPERATE) Turn the CHROMA LEVEL control to adjust	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Adjusts the chroma level (hue). Setting range: -3dB to +3dB

4-3-4. SETUP/BLACK

Switch and Control		Description
UNITY/OPERATE Down position (OPERATE) Turn the SETUP/BLACK control to adjust	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Adjusts the setup black level. Turning the control clockwise brightens the setup black level. Setting range: -15 IRE to +15IRE

4-3-5. CHROMA PHASE

Switch and Control		Description
UNITY/OPERATE Down position (OPERATE) Turn the CHROMA PHASE control to adjust	PROCESS CONTROL UNITY VIDEO CHROMA SETUP/CHROMA LEVEL LEVEL BLACK PHASE OPERATE	Adjusts the chroma phase. Setting range: -30° to +30°

4-3-6. SC PHASE

Switches		Description
PHASE ADJUST Up position (SC PHASE)	PHASE ADJUST SC PHASE H PHASE V PHASE	Adjusts the SC phase of the video signal with respect to the genlock signal. Up position: turns the SC phase clockwise. Down position: turns the SC phase counterclockwise.
Move the right switch up and down		Setting range: -180° to +180° (Default: 0°)
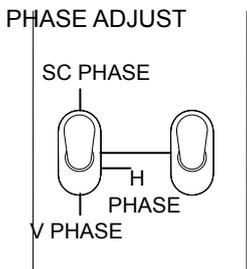
IMPORTANT
SC PHASE is set to 0 at factory shipment. You should reset this parameter to match the reference signal of your system. Note that it takes approximately 1 second until the new setting takes effect. When turning the unit OFF, wait at least 1 second after the setting.

4-3-7. H PHASE

Switches		Description
PHASE ADJUST Center position (H PHASE)	PHASE ADJUST SC PHASE H PHASE V PHASE	Adjusts the H phase of the video output signal with respect to the genlock signal. Up position: moves H phase forward. Down position: moves H phase backward.
Move the right switch up and down		*H POSITION can also be adjusted by changing the dipswitch setting. See section 5-1-2, "SW2." Setting range: -4.0μs to +4.0μs (Default: ±0 μs)
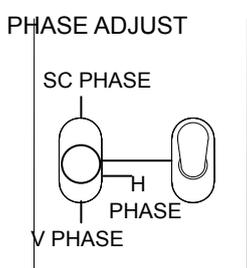
IMPORTANT
H PHASE is set to 0 at factory shipment. You should reset this parameter to match the reference signal of your system. H POSITION is set to 0 at factory shipment. You should reset this parameter to match your system. Note that it takes approximately 1 second until the new setting takes effect. When turning the unit OFF, wait at least 1 second after the setting.

4-3-8. V PHASE

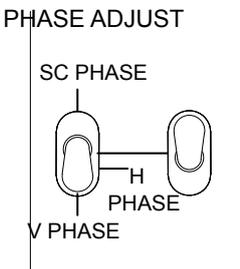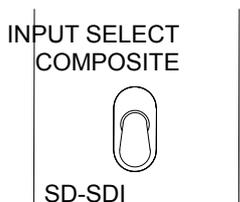| Switches		Description
PHASE ADJUST Down position (V PHASE)	PHASE ADJUST SC PHASE H PHASE V PHASE	Adjusts the V phase of the video output signal with respect to the genlock signal. Up position: moves V phase forward. Down position: moves V phase backward. *V POSITION can also be adjusted by changing the dipswitch setting. See section 5-1-2, "SW2." Setting range: -127 Line to +127 Line (Default: ±0 Line)
Move the right switch up and down		

IMPORTANT
V PHASE is set to 0 at factory shipment. You should reset this parameter to match the reference signal of your system. V POSITION is set to 0 at factory shipment. You should reset this parameter to match your system. Note that it takes approximately 1 second until the new setting takes effect. When turning the unit OFF, wait at least 1 second after the setting.

4-3-9. INPUT SELECT

Switch		Description
INPUT SELECT	INPUT SELECT COMPOSITE SD-SDI	Switches the input signal selection. Up position: COMPOSITE Down position: SD-SDI *If the UFM-147CNT (option) is installed, COMPONENT IN is selected by setting the switch to the center position.

4-3-10. FREEZE

Switch		Description
Up position (ON)	FREEZE ON OFF	Sets FREEZE mode ON/OFF. The left indicator is lit green when FREEZE is ON. The FRAME freeze and FIELD freeze are available.
		FRAME FREEZE FRAME freeze gives a clearer picture if the video contains few moving elements. **FIELD FREEZE** FIELD freeze gives a picture with fewer jitters if the video contains rapid moving elements.
Down position (OFF)		FRAME or FIELD is selected by changing the internal dipswitch settings. The factory default is **FRAME**. See section 5-1-1, "SW1." ODD or EVEN field can be selected when using the FIELD setting. This is done using the internal dipswitch settings. See section 5-1-1, "SW1."

5. Internal Settings

5-1. Dipswitch Settings

The following settings can be made with SW1, SW2, and SW3 on the MAIN CARD of the UFM-147DFS.

```
    MAIN CARD          I/O CARD

  ┌──────────────┐   ┌────────┐
  │              │   │        │
  │              │   │        │
  │   ▢ ▢ ▢      │   │        │
  │   ↑ ↑ ↑      │   │        │
  └──────────────┘   └────────┘
    SW1 SW2 SW3
```
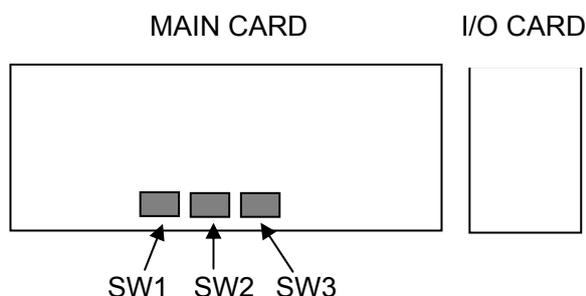
5-1-1. SW1

Dipswitch SW1

Pin No.	Item	Setting		Default
		OFF	ON	
1	BY-PASS	OPERATE	BY-PASS	OFF
2	TEST SIGNAL	OFF	COLOR BAR	OFF
3	FREEZE MODE SELECT	FRAME	FIELD	OFF
4	FIELD SELECT	ODD	EVEN	OFF
5	AUTO FREEZE	OFF	ON	OFF
6	FORCED FIELD	OFF	ON	OFF
7	B/W	OFF	ON	OFF
8	VITS	OFF	ON	OFF

◆ **OPERATE/BY-PASS (SW1-1)**
Bypasses the signal output from COMPOSITE OUT 1 and SD-SDI OUT1.

◆ **TEST SIGNAL (SW1-2)**
Outputs color bars.

◆ **FREEZE MODE SELECT (SW1-3)**
Selects FRAME freeze or FIELD freeze.

◆ **FIELD SELECT (SW1-4)**
Selects ODD or EVEN field when SW1-3 is set to FIELD freeze or when SW1-6 (FORCED FIELD) is set to ON.

◆ **AUTO FREEZE (SW1-5)**
Sets AUTO FREEZE ON/OFF.
If set to ON, freezes last received normal field of video input signal to compensate for input dropout due to signal loss.

NOTE
Random noise is considered to be a signal loss.
When the video is frozen, the freeze mode is not released until a normal video input is received or AUTO FREEZE is set to OFF.

◆ **FORCED FIELD (SW1-6)**
Selects either the ODD or EVEN field output from the OUTPUT connectors of the rear panel. ODD or EVEN can be selected with SW1-4.

◆ **B/W (SW1-7)**
Selects B/W or color output from the OUTPUT connectors of the rear panel.
   ON: black and white
   OFF: color

NOTE
B/W video is output when set to ON even if color video signals are input. In this case, the B/W video output still contains the color burst signal.

◆ **VITS (SW1-8)**
COMPOSITE IN
ON: The VITS signal is passed through from 10 to 21H.
OFF: The blanking is applied from 10 to 20H.

SD-SDI IN
   The blanking is not applied regardless of the setting.

5-1-2. SW2

Dipswitch SW2

Pin No.	Item	Setting		Default
		OFF	ON	
1	REMOTE	LOCAL	REMOTE	OFF
2	SET UP	OFF	ON	OFF
3	SYNCHRO MODE	FRAME	LINE	OFF
4	WHITE CLIP 110%	OFF	ON	OFF
5	FACTORY SET	—	—	OFF
6	FACTORY SET	—	—	OFF
7	FACTORY SET	—	—	OFF
8	VIDEO PHASE SEL	H/V PHASE	H/V POSITION	OFF

◆ **REMOTE (SW2-1)**
Used for remote control. If set to ON (REMOTE), the operation using the controls on the front panel and the dipswitch settings are disabled.
* If connected to UFM-100AED, this setting is made on the dipswitch SW1-1 in the UFM-100AED front module.

◆ **SET UP (SW2-2)**
Set to ON when processing the input video signal with setup. (US mode)

◆ **SYNCHRO MODE (SW2-3)**
Set SYNCHRO MODE = LINE (SW2-3 = ON), if you want to lock input signal to the H sync of the input reference genlock and to minimize input/output delay. In this case, the delay will vary depending on the reference signal delay and video signal format. (See the table below.)

Input video signal	Reference signal delay	Input/Output delay of the video signal
SD SDI	32µs or more	Reference signal delay
	Less than 32µs	Reference signal delay plus 1H
Composite (NTSC)	32µs or more	Reference signal delay plus 1H
	Less than 32µs	Reference signal delay plus 2H
Composite (PAL)	32µs or more	Reference signal delay plus 2H
	Less than 32µs	Reference signal delay plus 3H
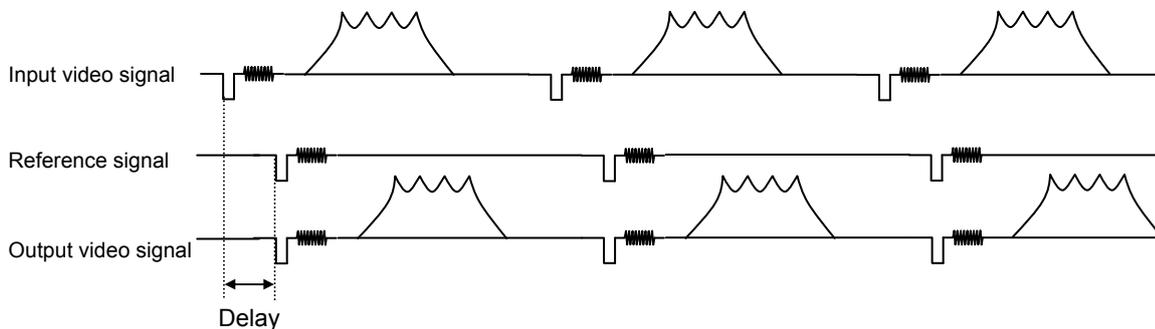
IMPORTANT
To use SYNCHR MODE = LINE in your system, the reference signal must be synchronized with the input video signal. Otherwise, this mode doesn't work properly.

◆ **WHITE CLIP 110% (SW2-4)**
Sets the white clip to 110% for the input signal.

◆ **FACTORY SET (SW2-5, SW2-6, SW2-7)**
Do not change this setting.

◆ **VIDEO PHASE SEL (SW2-8)**
H POSITION: If set to ON and the SELECT switch of PHASE ADJUST on the front panel
is set to H PHASE, H POSITION can be adjusted by moving the right switch.
V POSITION: If set to ON and the SELECT switch of PHASE ADJUST on the front panel
is set to V PHASE, V POSITION can be adjusted by moving the right switch.

5-1-3. SW3

Dipswitch SW3

Pin No.	Item	Setting		Default
		OFF	ON	
1	FACTORY SET	—	—	OFF
2	FACTORY SET	—	—	OFF
3	FACTORY SET	—	—	OFF
4	NR LEVEL	OFF	ON	OFF
5	NR LEVEL	OFF	ON	OFF
6	NR LEVEL	OFF	ON	OFF
7	FACTORY SET	—	—	OFF
8	FACTORY SET	—	—	OFF

◆ **NR LEVEL (SW3-4, SW3-5, SW3-6)**
Enables or disables noise reduction filter by reducing frame-recursive 3D noise in video
and sets its reduction level. (*)

| NR LEVEL	Switch Setting		
	SW3-4	SW3-5	SW3-6
OFF	OFF	OFF	OFF
1	ON	OFF	OFF
2	OFF	ON	OFF
3	ON	ON	OFF
4	OFF	OFF	ON
5	ON	OFF	ON

The shaded cells represent the default settings.

(*) If a noise is present, gradually increases the reduction level from 1 (lower) to 5 (higher)
while monitoring the video. Basically, the higher the level, the more the noise is reduced,
however, the lower the quality of video. An overlap noise will be noticeable especially in
moving video if the level is set high.

◆ **FACTORY SET (SW3-1, SW3-2, SW3-3, SW3-7, SW3-8)**
Do not change this setting.

5-2. Jumper Settings

The following settings can be made with the jumpers on the MAIN CARD of the UFM-147DFS.
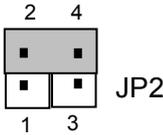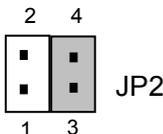
MAIN CARD   I/O CARD

Factory Default Settings
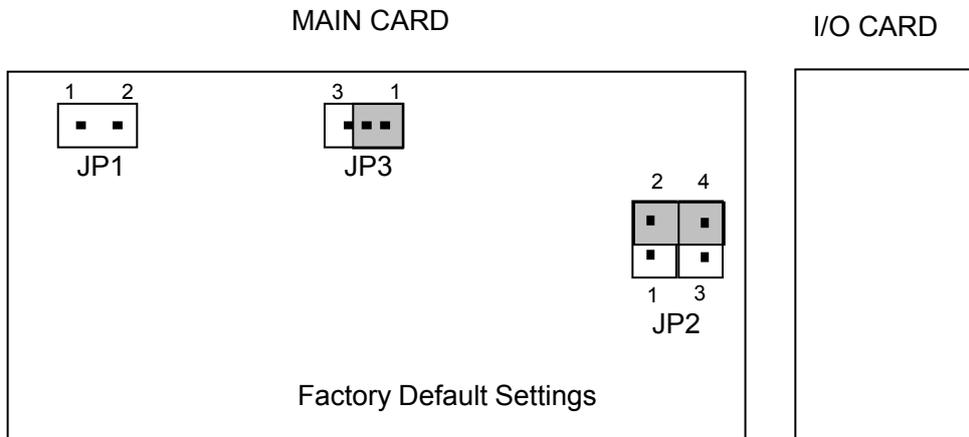
JP NO.	Factory Default
JP1	Open
JP2	2-4 short
JP3	1-2 short

*Do not change JP1 and JP3.

5-2-1. GENLOCK IN and COMPOSITE2 Switching

COMPOSITE 2 or GL (GENLOCK IN) can be selected by changing **JP2**.

GL (GENLOCK IN) (default)	2-4 short	COMPOSITE 2 is used to input a reference signal.
COMPOSITE 2	3-4 short	Outputs a corrected composite signal from COMPOSITE 2.

GL (GENLOCK IN)◄

COMPOSITE 2

JP2

COMPOSITE 2 / GL (GENLOCK IN)
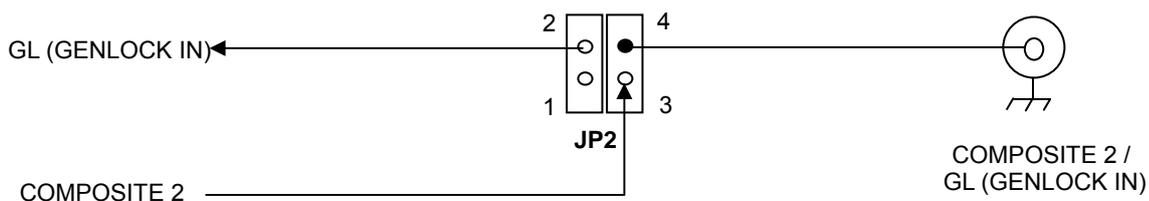
6. If Problems Occur

If any of the following problems occur during operation of your unit, proceed as indicated below to see if problem can be corrected before assuming a unit malfunction has occurred.

Problem	Check	Action
Switches and controls on the front panel are disabled.	REMOTE setting (dipswitch)	If SW2-1 is set to REMOTE, change to LOCAL. See section 5-1-2, "SW2."
Dipswitches are disabled.	REMOTE setting (dipswitch)	If SW2-1 is set to REMOTE, change to LOCAL. See section 5-1-2, "SW2."
Controls for PROCESS CONTROL on the front panel are disabled.	PROCESS CONTROL toggle switch (front panel)	If set to UNITY (up position), change to OPERATE (down position). See section 2-1, "Front Panel."
The SD-SDI input signal is not bypassed at power off.	SD-SDI OUT connection (rear panel)	The bypass function is effective for SD-SDI OUT 1 only. See section 2-2, "Rear Panel."
The output image is black and white even when a color signal is input.	B/W setting (dipswitch)	If set to ON, change to OFF. See section 5-1-1, "SW1."
The output image is frozen even when the FREEZE switch is turned off.	Input signal connection	Verify that the signal is input properly. See section 2-2, "Rear Panel."
	AUTO FREEZE setting (dipswitch)	If AUTO FREEZE is set to ON, and signal has dropout or has been lost, a freeze frame will be output. See section 5-1-1, "SW1."
No signal is output from COMPOSITE2	COMPOSITE2 / GL (GENLOCK IN) setting (jumper setting)	If set to GL (GENLOCK IN), change to COMPOSITE2. See section 5-2, "Jumper Settings."
FREEZE indicator flashes at power on.	FREEZE setting (front panel)	If FREEZE on the front panel is set to ON (up position) at power on, change to OFF (down position). See section 2-1, "Front Panel."

# 7. Specifications and Dimensions

7-1. Unit Specifications

Video Format	525/60 (NTSC) or 625/50 (PAL) (Auto detect)
Video Input	Selectable as below
	Analog composite: 1.0 Vp-p 75Ω BNC x 1
	Digital component: 270 Mbps 75Ω BNC x 1
Genlock Input	BB: 0.429 Vp-p (NTSC)/0.45 Vp-p (PAL) 75Ω BNC x 1
Video Output	Analog composite 1.0 Vp-p, 75Ω BNC x 2
	Digital component: 270 Mbps 75Ω BNC x 2
Signal Processing	4:2:2 component
Correction Range	2 fields (field inversion prevented)
Sampling Frequency	Y: 13.5 MHz, C: 6.75 MHz
Quantization	10-bit
Frequency Response	100 kHz - 4.2 MHz: -0.5 dB - +0.5 dB 4.2 MHz - 5.0 MHz: -1.0 dB - +1.0 dB roll off above 5.0 MHz (NTSC)
	100 kHz - 5.0 MHz: -0.5 dB - +0.5 dB 5.0 MHz - 5.5 MHz: -1.0 dB - +1.0 dB roll off above 5.5 MHz (PAL)
S/N Ratio	60 dB
DG/DP	1% / 1º (APL: 50%)
K-Factor (2T Pulse)	Less than 1%
H/V Tilt	Less than 1%
Proc Amp	Video Level: -3 dB to +3 dB
	Chroma Level: -3 dB to +3 dB
	Setup Level: -15 IRE to +15 IRE
	Chroma Phase: -30º to +30º
Genlock Phase Control	H Phase: -4 µs to +4 µs
	SC Phase: -180º to +180º
	V Phase: Max.-127 line to +127 line
	H Position: -4 µs to +4 µs
	V Position: Max. -127 line to +127 line
Temperature	0ºC to 40ºC
Humidity	30% to 90% (no condensation)
Power	Supplied from UFM frame, +12 VDC - +24 VDC
Power Consumption	10 VA (10 W)
Dimensions	106 (W) x 303 (D) mm (Front board)
	108.5 (W) x 66.1 (D) mm (Rear board)

Weight	0.5 kg
Slot requirement	1 slot
Comsumables	None
Option	UFM-100AED: Audio multiplexer/demultiplexer

7-2. External Dimensions

108.5

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303

106

UFM-147DFS

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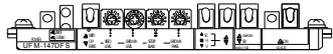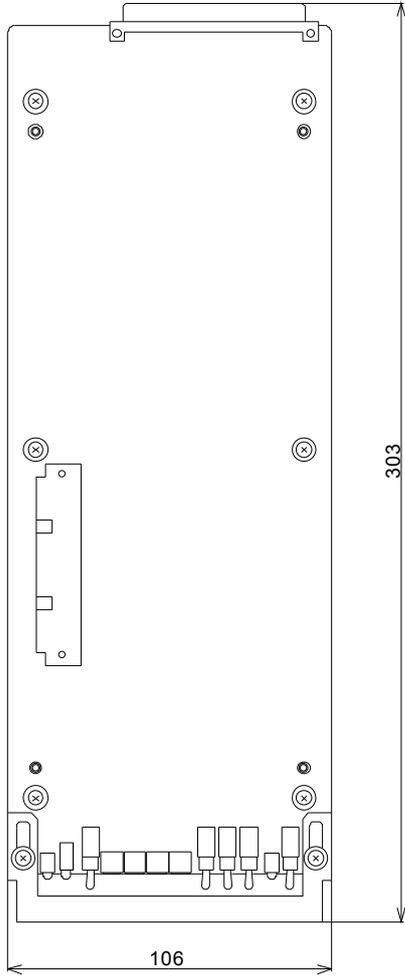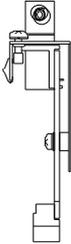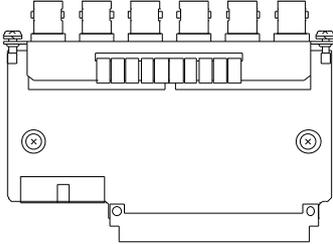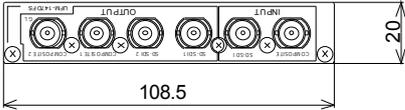
Warning

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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*The contents of this manual are subject to change without notice.