FOR.A®
INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

UFM-128FS

Frame Synchronizer

1st Edition - Rev. 2

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-128FS units 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-128FS	1	
Operation Manual	1	

Check

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

Table of Contents

1. Prior to Starting

1-1. Welcome

Congratulations! By purchasing UFM-128FS 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.

1-2. About the UFM-128FS

The UFM-128FS is a plug-in type module unit that is used by mounting to the Universal Frame Series (UFM frames). Designed by using the latest technology, the UFM-128FS provides high quality time base correction / frame synchronization performance at a reasonably low cost.
Besides providing the excellent support our customers have come to expect from FOR-A signal processors, that correct by up to one full frame the time base error / phase shift problems that can occur during record / playback of composite signals when using heterodyne process VCRs.

Features

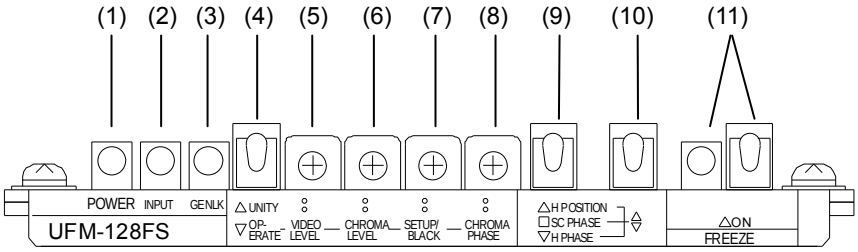
- Analog composite video input / output standard.
- 14-bit digital Y/C separation/decoding/encoding.
- 3 Line Adaptive Comb Filter for high quality decoding of composite sources.
- 4:2:2 digital component signal processing.
- Full frame memory to prevent picture field inversion during processing.
- Hot swap module.
- 625/50, 525/60, auto detection.
- Network monitoring and control available by using UFM-100NET and UFM-100CTL optional units together.

1-3. About This Manual

This manual is intended to help the user easily operate the UFM-128FS 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 UFM-128FS. 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) Power indicator

Indicator status	Indication
Lit	Indicates that power is supplied to the system, and the system is operational.
Unlit	Indicates that no power is supplied to the system.

(2) INPUT indicator
Indicator lights green whenever video signal (s) is inputted to the unit.

Indicator status	Indication
Lit	Receiving video signal input and the unit is working properly.
Unlit	No input video signals. Input level too low Off video random noise.
Flashing	Sync signal is considerably unstable. Sync signal has dropout.

(3) GENLOCK indicator
Indicator lights green whenever UFM-128FS signal is synced (LOCK) with the external black burst (B.B.) input to the rear panel GENLOCK connector of the module.

Indicator status	Indication
Lit	UFM-128FS signal synced to external reference signal input.
Unlit	No external reference signal input. Input level too low Internal timing signal used for reference.
Flashing	External reference signal not stable. Check external signal input.

(4) UNITY / OPERATE switch

UNITY	Sets all processes settings for (5), (6), (7), and (8) to UNITY at the same time. (UNITY default setting)
OPERATE	Process controls (5), (6), (7), and (8) at front panel can be used to adjust signal processing parameters.

(5) VIDEO LEVEL
Used to adjust video level.
See sec. “4-2-2. VIDEO LEVEL.”

(6) CHROMA LEVEL
Used to adjust chroma level.
See sec. “4-2-3. CHROMA LEVEL.”

(7) SETUP / BLACK
Used to adjust setup level.
See sec. “4-2-4. SETUP / BLACK.”

(8) CHROMA PHASE
Used to adjust chroma phase.
See sec. “4-2-5. CHROMA PHASE.”

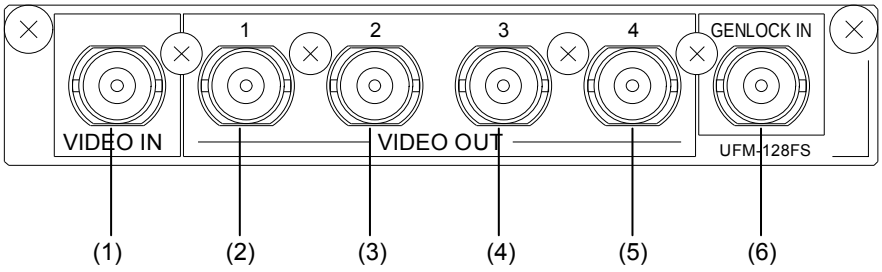
(9) SYSTEM PHASE SWITCH
Used to switch between H POSITION, SC PHASE, and H PHASE. Phase is adjusted using (10) PHASE SWITCH.

(10)PHASE SWITCH
Used to adjust phase. See sec. “4-2-6 H POSITION,” “4-2-7SC PHASE,” and “4-2-8 H PHASE.”

(11) FREEZE and indicator
Used to set freeze operation ON / OFF. Indicator lights green whenever freeze is set to ON. The freeze operation is set to ON when the switch is in the upper position. The operation is set to OFF when set to the lower position.
See sec. “4-2-9. FREEZE.”

IMPORTANT
Note that Freeze function doesn’t work and the FREEZE indicator blinks if the unit is powered on with the FREEZE switch at upper position (ON). In this case, turn the FREEZE switch at lower position (OFF). The FREEZE indicator light will turn off and the Freeze function will work correctly.

2-2. Rear Panel



(1) VIDEO IN
Used for analog composite video input connection.

(2) VIDEO OUT 1
Used to output the analog composite signal, corrected video input from (1) VIDEO IN, and bypass signal from input connector (1) whenever the unit power is off.

(3) VIDEO OUT 2
Used to output the analog composite signal, corrected video input from (1) VIDEO IN. Bypass is disabled when the unit power is off.

(4) VIDEO OUT 3
Used to output the analog composite signal, corrected video input from (1) VIDEO IN. Bypass is disabled when the unit power is off.

(5) VIDEO OUT 4
Used to output the analog composite signal, corrected video input from (1) VIDEO IN. This can be used for GENLOCK THRU (genlock loopthrough) by using an internal jumper setting. Factory setting is VIDEO OUT 4. Refer to sec. “5-2. Jumper Settings” for more details.

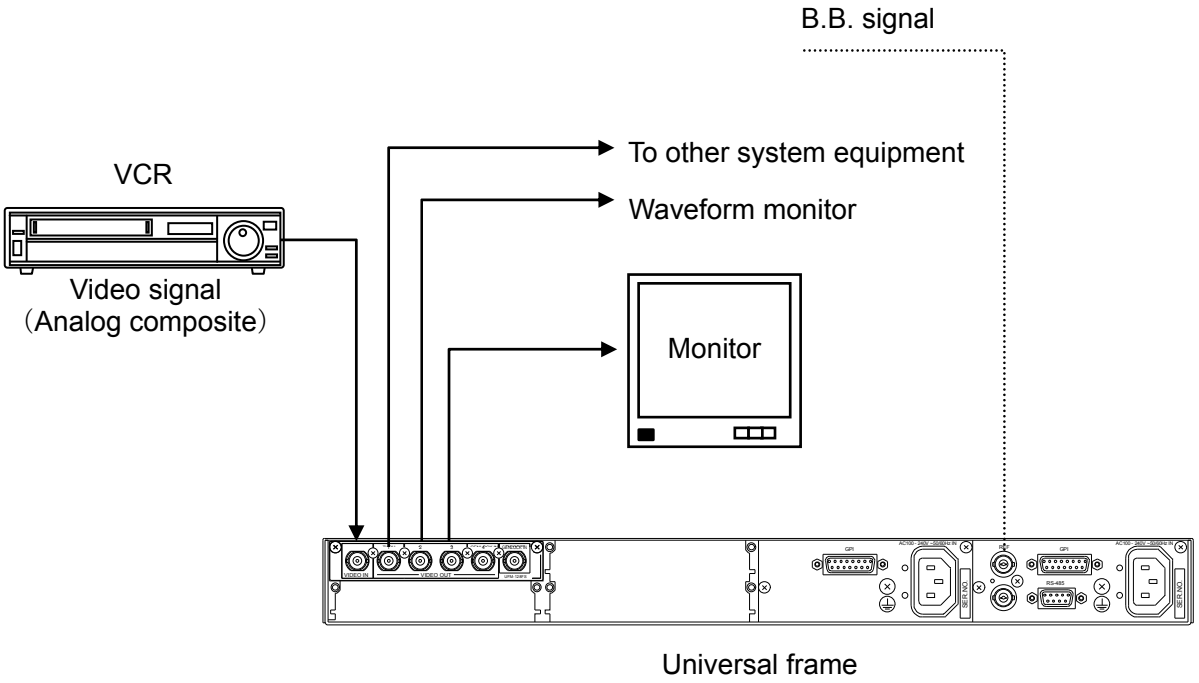
(6) GENLOCK IN
Used to input an external reference signal whenever the internal sync generator needs to be genlocked with it. The available input signal is 0.429 Vp-p composite black burst (for NTSC) or 0.450 Vp-p composite black burst (for PAL) .
Connector (5) can also be used for GENLOCK THRU (genlock loopthrough) by using an internal jumper setting. If connector (5) is set to GENLOCK THRU and is not connected to another system, the connector must be 75 Ω terminated using a terminator prepared by the user. (See sec.”5-2. Jumper Setting”.)
Front panel GENLOCK indicator lights green whenever UFM-128FS signal is synced with external black burst reference signal input here.

IMPORTANT
If reference signals are input to the both GENLOCK connector on the universal frame unit and GENLOCK IN connector on the UFM-128FS module, the reference signal from the UFM-128FS module is automatically selected. See sec.”5-1-2. SW6” for more details.

3. Connection

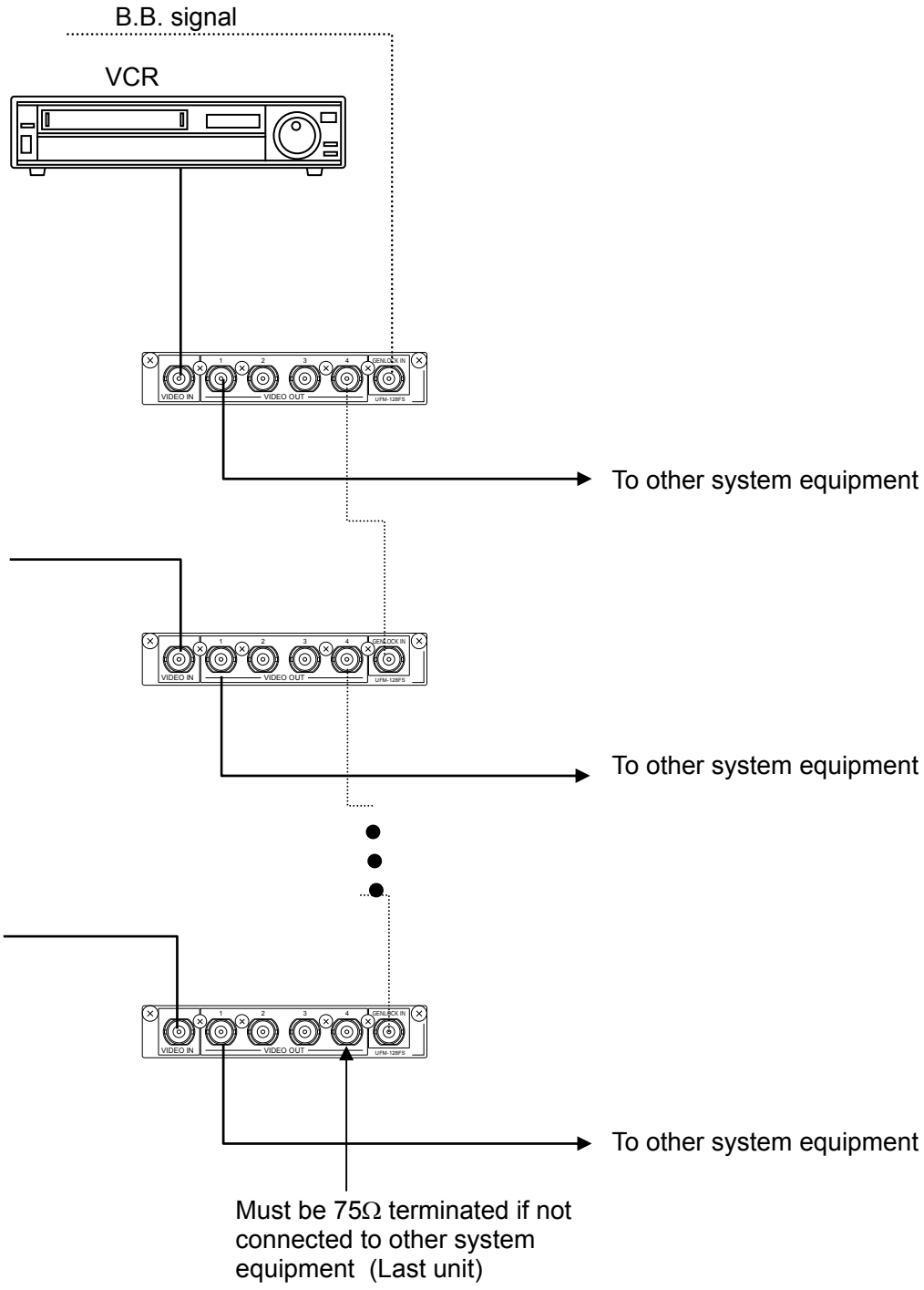
CAUTION	Turn all the power OFF before making connection.

3-1. Basic Connection



3-2. GENLOCK Connection

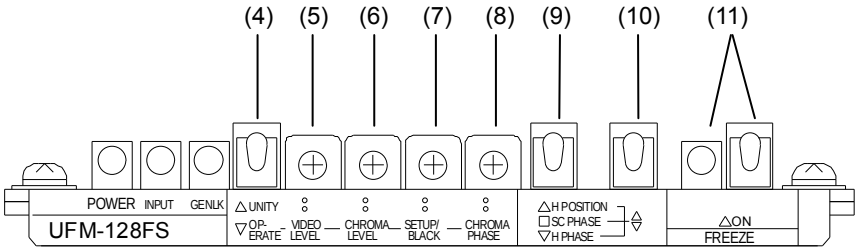
If output connector (5) on the rear panel is switched from VIDEO OUT 4 to GENLOCK THRU, multiple units can be configured as shown in the figure below. (See sec."5-2. Jumper Setting.")



4. Operation

4-1. Front Panel Controls

The UFM-128FS front panel controls can be used to select and change operational settings and levels and to make settings in the operational menus.

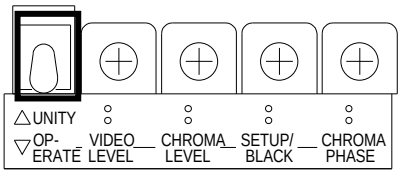


Switch and Controls	Factory Set Default	Reference
(4) UNITY/OPERATE	UNITY	4-2-1
(5) VIDEO LEVEL	CENTER	4-2-2
(6) CHROMA LEVEL	CENTER	4-2-3
(7) SETUP/BLACK	CENTER	4-2-4
(8) CHROMA PHASE	CENTER	4-2-5
(9) H POS / SC PHS / H PHS SELECT	H POS	4-2-6,7,8
(10) PHASE CONTROL	CENTER	4-2-6,7,8
(11) FREEZE	OFF	4-2-9

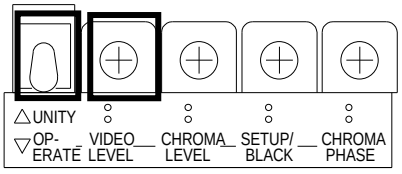
4-2. Front Panel Operations

4-2-1. UNITY/OPERATE

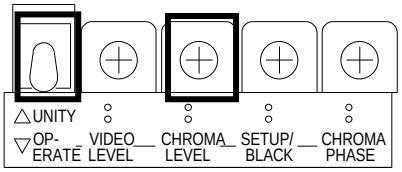
Set the switch to the upper or lower positions to switch between UNITY and OPERATE.

Switch and Controls		Description
Upper position (UNITY)		All process control settings are disabled and return to the default settings.
Lower position (OPERATE)		Following process controls will be enabled: VIDEO LEVEL CHROMA LEVEL SETUP/BLACK CHROMA PHASE

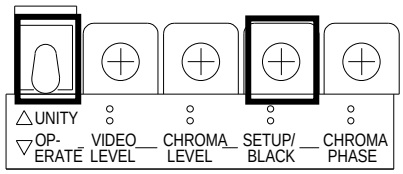
4-2-2. VIDEO LEVEL

Switch and Control		Description
UNITY/OPERATE: Lower position (OPERATE)		Adjusts output level. Setting range: -3 dB to +3 dB
Turn the VIDEO LEVEL control to adjust		

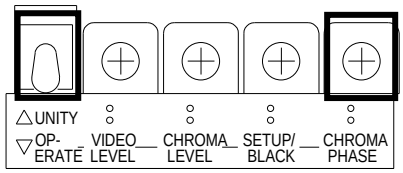
4-2-3. CHROMA LEVEL

Switch and Control		Description
UNITY/OPERATE: Lower position（OPERATE）		Adjusts chroma level (color saturation). Setting range: -3 dB to +3 dB
Turn the CHROMA LEVEL control to adjust		

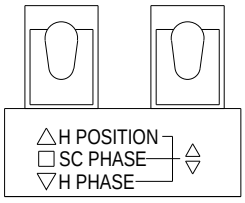
4-2-4. SETUP/BLACK

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

4-2-5. CHROMA PHASE

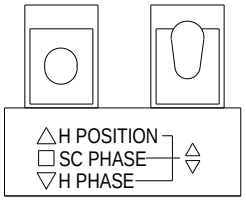
Switch and Control		Description
UNITY/OPERATE: Lower position （OPERATE） Turn the CHROMA PHASE control to adjust.		Adjusts chroma phase. Setting range: -30° to +30°

4-2-6. H POSITION

Switches		Description
PHASE ADJUST: Upper position (H POSITION) Move the PHASE switch (right) upward or downward position.		Used to adjust the H POSITION. Setting range: -2.0 µsec to +2.0 µsec * V POSITION can also be adjusted by using an internal dipswitch setting. See sec.”5-1-2. SW6.” Setting range: -128 Line to +127 Line

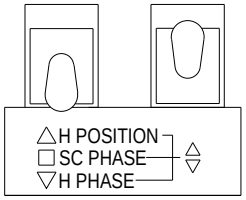
IMPORTANT
H POSITION is set to 0 µsec and V POSITION is set to 0 Line at factory shipment. You should reset this parameter to match the configuration of your system. Note that it takes approximately 1 second until the new setting takes effect. When turning the unit OFF, wait at least 1 second after the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

4-2-7. SC PHASE

Switches		Description
PHASE ADJUST: Center position (SC PHASE) Move the PHASE switch (right) upward or downward position.		Used to adjust the SC phase difference between the genlock input and video output signals. Upward: Moves SC phase clockwise. Downward: Moves SC phase counterclockwise. Setting range: -180° to +180° (Factory default: 0 µs)

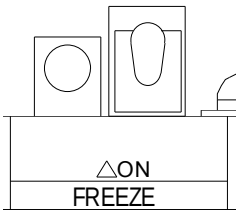
IMPORTANT
SC PHASE is set to 0° at factory shipment. You should reset this parameter to match the genlock input signal of your system. Note that it takes approximately 1 second until the new setting takes effect. When turning the unit OFF, wait at least 1 second after the setting.

4-2-8. H PHASE

Switches		Description
PHASE ADJUST: Lower position (H PHASE) Move the PHASE switch (right) upward or downward position.		Used to adjust the H phase difference between the genlock input and video output signals. Upward: Moves H phase forward. Downward: Moves H phase backward. Setting range: -2.0 µs to +2.0 µs (Factory default: 0 µs)

IMPORTANT
H PHASE is set to 0 µs at factory shipment. You should reset this parameter to match the genlock input 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.

4-2-9. FREEZE

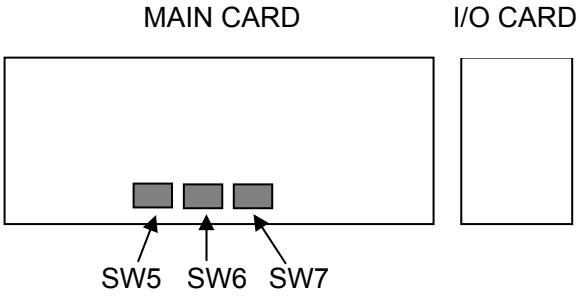
<table>
<tr><th>Switch</th><th colspan="2">Description</th></tr>
<tr><td rowspan="3"> 
</td><td colspan="2">Sets FREEZE mode ON/OFF.
Left indicator lit green when FREEZE ON.

FRAME or FIELD freeze can be set.</td></tr>
<tr><td>FRAME FREEZE
FRAME freeze gives a clearer picture if the video contains few moving elements.</td><td>FIELD FREEZE
FIELD freeze gives a picture with fewer jitters if the video contains rapid moving elements.</td></tr>
<tr><td colspan="2">FRAME/FIELD is selected by using the internal dipswitch settings. Factory default is FRAME. See sec. “5-1-1. SW5.”
ODD or EVEN field can be selected when using the FIELD setting. This is done using the internal dipswitch settings. See sec. “5-1-1. SW5.”</td></tr>
</table>

5. Internal Setting

5-1. Dipswitch Settings

Following settings can be made at dipswitch SW5, SW6, and SW7 on the MAIN CARD.



5-1-1. SW5

Dipswitch SW5

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

*Shaded cells indicate factory default.

◆ **BY-PASS (SW5-1)**
Enables bypass mode. If enabled, input signal routes to VIDEO OUT 1 with no processing.

◆ **TEST SIGNAL (SW5-2)**
Sets internal color bar ON/OFF.

◆ **FREEZE MODE SELECT (SW5-3)**
Used to select FRAME or FIELD freeze.

◆ **FIELD SELECT (SW5-4)**
Used to select ODD or EVEN field when FIELD freeze is set with SW5-3.

◆ **AUTO FREEZE (SW5-5)**

Sets AUTO FREEZE ON/OFF.

Used to freeze last received normal field of video input signal to compensate for input dropout due to signal loss.

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

◆ **FORCED FIELD (SW5-6)**

Used to select half frame output ON/OFF.

When set to ON, either the ODD or EVEN field will be output from the VIDEO OUT connector on the rear panel. ODD/EVEN is selected with SW5-4.

◆ **B/W (SW5-7)**

Used to select B/W or color video output from rear panel VIDEO OUT connectors.

ON: Black and white video output.

OFF: Color video output.

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 (SW5-8)**

ON:

If VITS signal is included in the input video, it is also included in the output signals. (Inserted to 10 H to 21 H vertical blanking interval)

OFF:

No VITS signal is included in output signals. Vertical blanking interval is 10H to 20 H.

5-1-2. SW6

Dipswitch SW6

Pin No.	Item	Setting	
		OFF	ON
1	REMOTE	LOCAL	REMOTE
2	SET UP	OFF	ON
3	SYNCHRO MODE	FRAME	LINE
4	WHITE CLIP 110%	OFF	ON
5	REF SEL MODE	AUTO	MANUAL
6	REF SEL	REAR	SYSTEM
7	ACC	OFF	ON
8	VIDEO PHASE SEL	H POSITION	V POSITION

*Shaded cells indicate factory default.

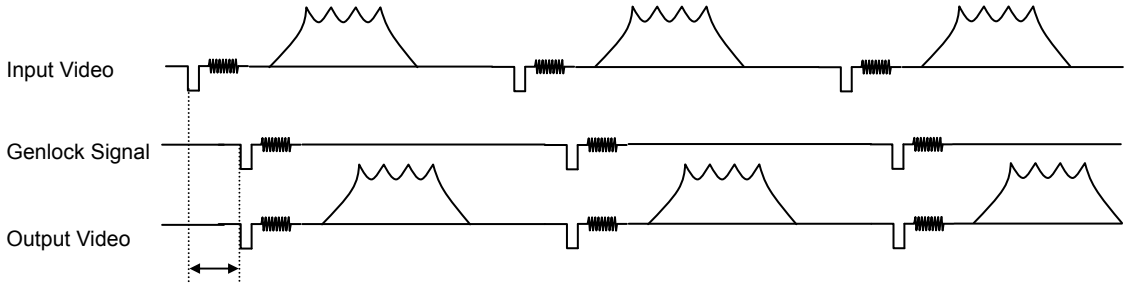
◆ **REMOTE (SW6-1)**
Used to select remote control. If set to ON (REMOTE), front panel control cannot be used.

IMPORTANT
When UFM-128FS is controlled remotely, jumper setting is also required: pins 2-3 shorted at JP4 and JP5. See 5-2-2 for details.

◆ **SET UP (SW6-2)**
Set to ON when processing the input video signal with setup. (US mode)

◆ **SYNCHRO MODE (SW6-3)**
If set to ON (LINE), input video signal is synchronized to external reference signal by adjusting the horizontal timing to minimize the input/output delay. In this case, the delay will be within the range of 1 H to 3 H as seen in the table below.

Input Video	Genlock Delay	Output Video Delay
Composite (NTSC)	4μs or more	Genlock delay + 1H
	Less than 4μs	Genlock delay + 2H
Composite (PAL)	5μs or more	Genlock delay + 2H
	Less than 5μs	Genlock delay + 3H



IMPORTANT
When the system is operated in the LINE mode (SYNCHRO MODE to ON), a reference signal previously synchronized with the input video must be used. If not, the GENLOCK lamp will blinks and a malfunction may occur.

◆ **WHITE CLIP 110% (SW6-4)**
Used to set the WHITE threshold of the input signal at 110%.

◆ **REF SEL MODE (SW6-5)**
Used to set the external reference signal selection mode.

AUTO:	Auto selection (The reference signal set at REF SEL (SW6-6) is used if both signals are available.)
MANUAL:	External reference signal set at REF SEL (SW6-6) is used.

◆ **REF SEL (SW6-6)**
Used to select which reference signal to be used; the reference signal from the GENLOCK IN connector on the module or reference signal from GENLOCK connector on the universal frame unit.

REAR:	Reference signal from GENLOCK IN connector on the module is used.
SYSTEM:	Reference signal from GENLOCK connector on the universal frame is used.

◆ **ACC (AUTO CHROMA CONTROL) (SW6-7)**
Enables automatic chroma level control. Setting range: 50% to 200%

◆ **VIDEO PHASE SEL (SW6-8)**

H POSITION:
When the PHASE ADJUST selection switch is set to H POS position, H POSITION can be adjusted using PHASE switch (right).

V POSITION:
When the PHASE ADJUST selection switch is set to V POS position, V POSITION can be adjusted using PHASE switch (right).

5-1-3. SW7 (NTSC/PAL Settings)

Dipswitch SW7

Pin No.	Item	Setting	
		OFF	ON
1	N / P DETECT MODE	AUTO	MANUAL
2	FORMAT DETECT SEL	INPUT	REF
3	NTSC / PAL SEL	NTSC	PAL
4	FACTORY SET	—	—
5	FACTORY SET	—	—
6	FACTORY SET	—	—
7	FACTORY SET	—	—
8	FACTORY SET	—	—

*Shaded cells indicate factory default.

◆ **NTSC / PAL DETECT MODE (SW7-1)**

AUTO:
Automatically detects NTSC or PAL using the reference signal selected at FORMAT DETECT SEL (SW7-2).

MANUAL:
Sets to select the video standard manually. NTSC or PAL should be selected at FORMAT DETECT SEL (SW7-3).

◆ **FORMAT DETECT SEL (SW7-2)**
Selects a signal used for NTSC/PAL automatic detection from following two signals.
*Effective only when SW7-1 is set to AUTO.

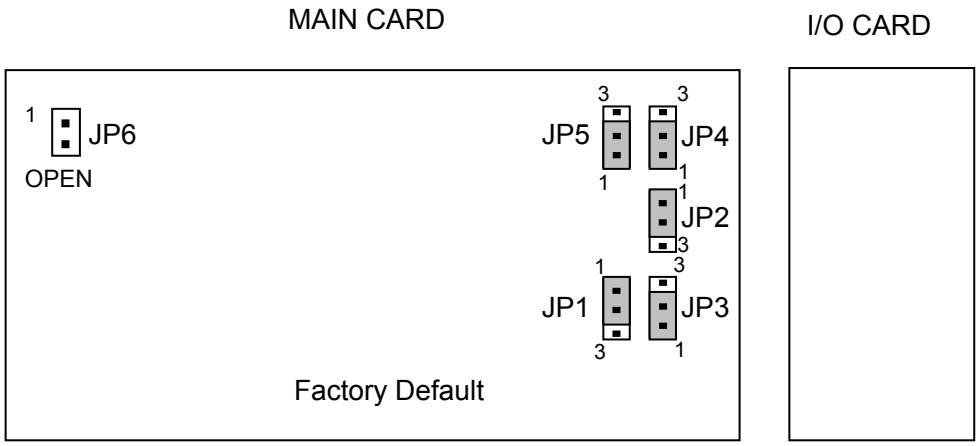
INPUT: input video signal（composite video）
REF:　external reference signal (genlock)

◆ **NTSC / PAL SELECT (SW7-3)**
Used to select video standard.
*Effective only when SW7-1 is set to MANUAL.

◆ **FACTORY SET**
Do not change this setting.

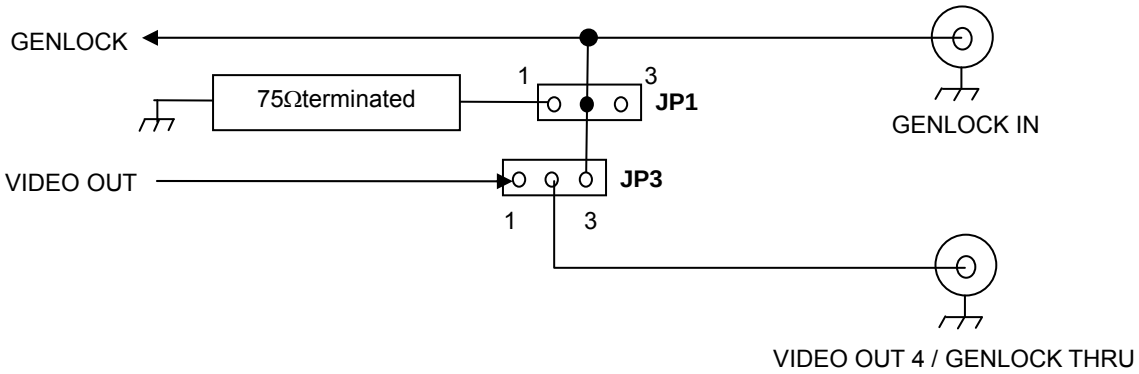
5-2. Jumper Settings

The following settings can be made at the jumpers on MAIN CARD inside the UFM-128FS.

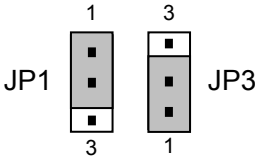


5-2-1. GENLOCK Setting

Jumper JP3 is used to select VIDEO OUT 4 /GENLOCK THRU . Jumper JP1 is used to select GENLOCK termination ON/OFF. The related circuitry for user-fabricated control devices as shown below.

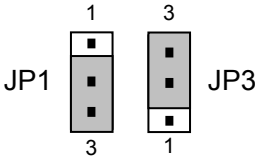


◆ **VIDEO OUT 4, GENLOCK terminated set**



JP1 1-2 short
JP3 1-2 short

◆ **GENLOCK THRU, GENLOCK not terminated set**

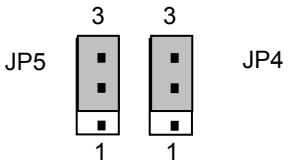


JP1 2-3 short
JP3 2-3 short

NOTE
If set to GENLOCK THRU, termination cannot be set.

5-2-2. Remote Setting

When UFM-128FS is controlled remotely, pins 2-3 should be shorted at two jumpers: JP4 and JP5.



IMPORTANT
When UFM-128FS remote setting should be made at both dipswitch and jumpers: SW6-1, JP4 and JP5. See section 5-1-2 “SW6 - REMOTE” for dipswitch setting.

5-2-3. Factory Default Settings

If the jumper settings are changed by mistake, refer to the table below to return them to the default settings.

JP NO.	Setting
JP1	1-2 short
JP2	1-2 short
JP3	1-2 short
JP4	1-2 short
JP5	1-2 short
JP6	Open

Do not change the settings in the shaded sections of the table above from their default settings.

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
Cannot use process controls	UNITY / OPERATE switch	If UNITY (upper), move the switch to OPERATE (lower) position. See sec. “2-1. Front Panel.“
Input video signal not bypassed when power OFF.	VIDEO OUT connection (rear panel)	Only VIDEO OUT 1 has bypass capability. See sec. “2-2. Rear Panel.“
Output video B/W (color signal input)	B/W setting (dipswitch)	If ON, change to OFF. See sec. “5-1-1. SW5.”
Output video frozen, FREEZE not set to ON	Verify video signal is input to VIDEO IN connector.	Verify video signal is input properly. See sec. “2-2. Rear Panel.“
	AUTO FREEZE setting (dipswitch)	If ON, and signal has dropout or has been lost, freeze frame will be output. See sec. “5-1-1. SW5.”
No output signal from VIDEO OUT 4 connector.	VIDEO OUT 4 / GENLOCK THRU setting (jumper setting)	If GENLOCK THRU, change to VIDEO OUT 4 See sec.”5-2. Jumper Setting.“
GENLOCK lamp flashing	SYNCHRO MODE setting (dipswitch setting)	Input signal and reference signal are not synchronized. If SYNCHRO MODE is set to ON (LINE), set to OFF (FRAME).

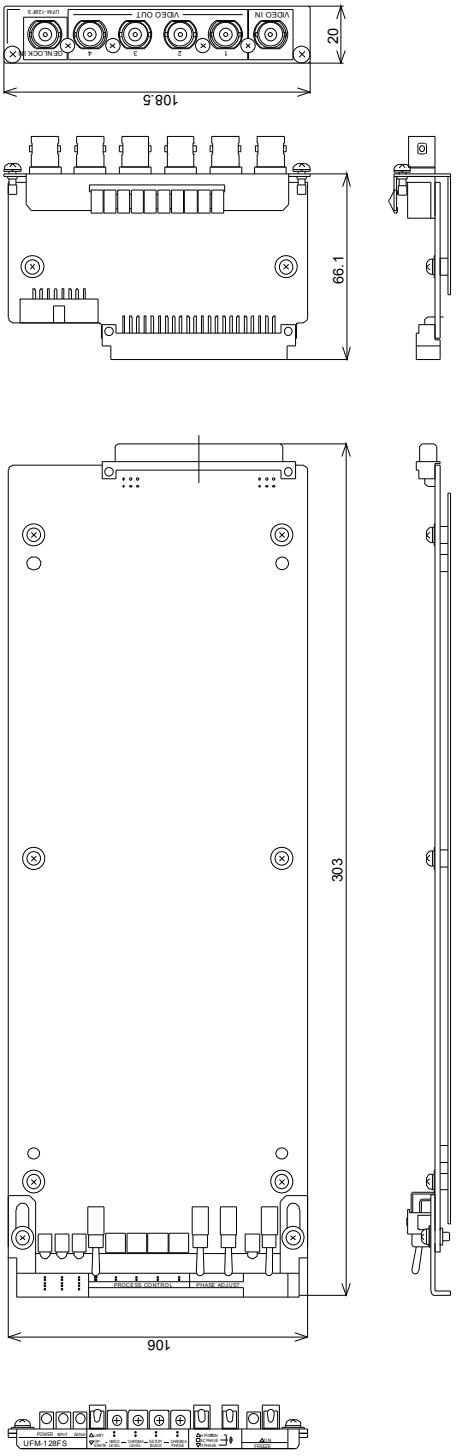
7. Specifications & Dimensions

7-1. Unit Specifications

Video Format	NTSC or PAL (Auto detect)
Video Input	Analog composite: 1.0 Vp-p 75Ω, BNC x 1
Genlock Input	BB: 0.429 Vp-p (NTSC)/0.45 Vp-p (PAL), 75Ω or loop-through (internal selection), BNC x 1
Video Output	Analog composite: 1.0 Vp-p 75Ω, BNC x 4
Signal Processing	4:2:2 component
Correction Range	2 fields (field inversion prevented)
Sampling Frequency	Y: 13.5 MHz, C: 6.75 MHz
Quantization	14-bit
Input composite signal:	
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	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: -2 µs to +2 µs SC Phase: -180º to +180º H Position: -2 µs to +2 µs V Position: -128 line to +127 line
Temperature	10ºC to 40ºC
Humidity	30% to 90% (no condensation)
Power	Supplied from UFM frame, +12 VDC - +24 VDC, 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
Accessories	Operation manual

7-2. External Dimensions

(All dimensions in mm)



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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FOR.A®

FOR-A COMPANY LIMITED

Head Office	3-8-1 Ebisu, Shibuya-ku, Tokyo 150-0013, Japan
Overseas Division	Phone: +81(0)3-3446-3936, Fax: +81(0)3-3446-1470
Japan Branch Offices	Osaka/Okinawa/Fukuoka/Hiroshima/Nagoya/Sendai/Sapporo
R&D/Production	Sakura Center/Sapporo Center

FOR-A America Corporate Office
11155 Knott Ave., Suite G&H, Cypress, CA 90630, USA
Phone: +1-714-894-3311 Fax: +1-714-894-5399

FOR-A America East Coast Office
2 Executive Drive, Suite 670, Fort Lee Executive Park, Fort Lee, NJ 07024, USA
Phone: +1-201-944-1120 Fax : +1-201-944-1132

FOR-A America Distribution & Service Center
2400 N.E. Waldo Road, Gainesville, FL 32609, USA
Phone: +1-352-371-1505 Fax: +1-352-378-5320

FOR-A Corporation of Canada
346A Queen Street West, Toronto, Ontario M5V 2A2, Canada
Phone: +1-416-977-0343 Fax: +1-416-977-0657

FOR-A Latin America & the Caribbean
5200 Blue Lagoon Drive, Suite 760, Miami, FL 33126, USA
Phone: +1-305-931-1700 Fax: +1-305-264-7890

FOR-A UK Limited
UNIT C71, Barwell Business Park, Leatherhead Road, Chessington Surrey, KT9 2NY, UK
Phone: +44(0)20-8391-7979 Fax: +44(0)20-8391-7978

FOR-A Italia S.r.l.
Via Volturno 37, 20047 Brugherio MB, Italy
Phone: +39-039-881-086/103 Fax: +39-039-878-140

FOR-A Corporation of Korea
1007, 57-5,Yangsan-ro,Yeongdeungpo-gu, Seoul 150-103, Korea
Phone: +82(0)2-2637-0761 Fax: +82(0)2-2637-0760

FOR-A China Limited
708B Huateng Bldg., No. 302, 3 District, Jinsong, Chaoyang, Beijing 100021, China
Phone: +86(0)10-8721-6023 Fax: +86(0)10-8721-6033

FOR-A Middle East-Africa Office
Jebel Ali Free Zone, LOB-16, Office 619, P. O. Box: 261914 Dubai, UAE
Phone: +971 4 887 6712 Fax: +971 4 887 6713