FOR.A®

INNOVATIONS IN VIDEO
and AUDIO TECHNOLOGY

OPERATION MANUAL

UFM-100DCC
Digital Color Corrector

2nd Edition

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-100DCC modules 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-100DCC	1	
Control Cable	1	For UFM-100DCC and Operation Unit connection PC-2076-2, 10m
Operation Manual	1	

Note that DCC-OU or DCC-OUA Operation Unit is required for UFM-100DCC operation. DCC-OU/OUA is a separate purchase.

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-100DCC Digital Color 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

This is a digital color corrector that supports analog composite or SD-SDI input and output signals. It comes with a broad spectrum of functions ranging from the color correction of signals to various clip functions.

➢ Analog composite or SD-SDI input and output signals supported.

➢ 4:2:2 digital component signal processing.

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

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

➢ A-to-D or D-to-A conversion function.

➢ Varied color correction functions (Balanced, Differential and Sepia modes)

➢ Gamma adjustment functions (independent adjustment of G, B and R signals, center/ black/white tone adjustment)

➢ Functions for adjusting white, black and gamma levels either independently or as a group.

➢ YPbPr clip functions

➢ Proc Amp functions (video level, Y level, chroma level, chroma phase and setup level).

➢ Function for dividing the screen into sections to make it easier to compare and check the images before and after correction.

➢ Control of up to four units enabled by using the DCC-OU or DCC-OUA operation unit (option).

➢ Compact EIA 1RU half width. Rack mountable with an optional rack mount bracket set.

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
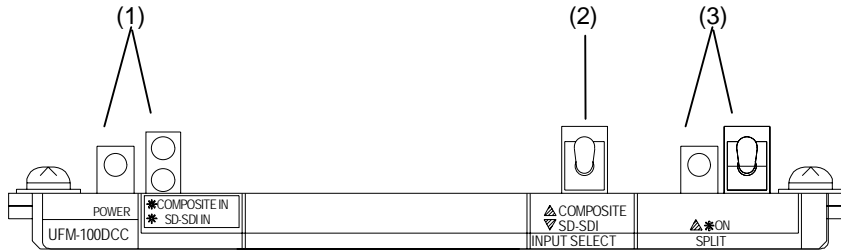
(1) POWER switch
 Used to turn power on or off.

(2) Indicators: POWER, COMPOSITE IN and SD-SDI IN

Indicator	Indication	Status
POWER	Lit green	Indicates that power is supplied to the system, and the system is operational.
	Unlit	Indicates that no power is supplied to the system.
	Flashing (Fan Alarm)	Indicates a fan failure occurs in a power supply. Consult your FOR-A supplier.
COMPOSITE IN	Lit green	Receiving composite signal input and the unit is working properly.
	Unlit	No input video signals. Input level too low. Off video random noise.
SD-SDI IN	Lit green	Receiving SD-SDI signal input and the unit is working properly.
	Unlit	No input video signals. Input level too low.

(3) INPUT SELECT
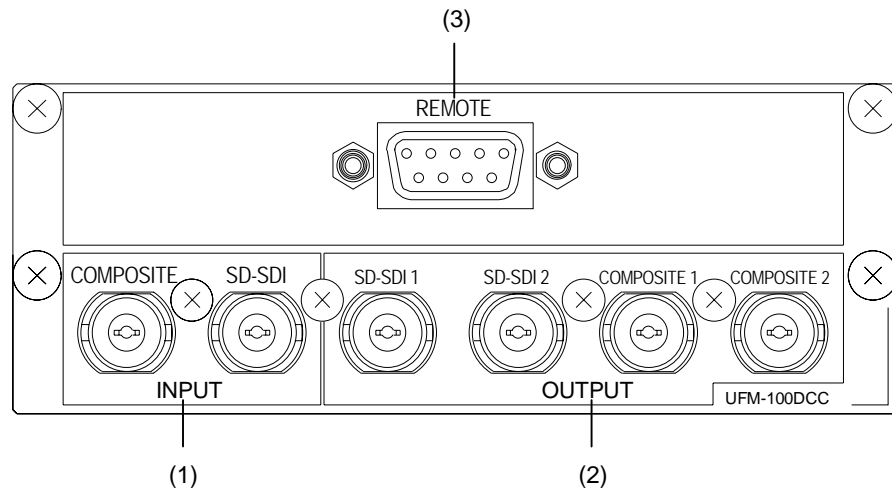 Used to switch between video inputs.
 Toggling the switch upward selects COMPOSITE IN and toggling downward selects SD-SDI IN. See section. 4-2-1. "INPUT SELECT."

(4) SPLIT
 Used to select a split screen mode (for processed and original images). See section 4-2-2. "SPLIT." SPLIT mode is turned OFF when you start up the unit.)

2

2-2. Rear Panel

(1) INPUT

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

(2) OUTPUT

SD-SDI 1	Used to output processed SD-SDI signal. Used to bypass the signal from (1) INPUT SD-SDI whenever the unit power is off.	
SD-SDI 2	Used to output processed SD-SDI signal.	
COMPOSITE 1	Used to output processed analog composite signal. Used to bypass the signal from (1) INPUT COMPOSITE whenever the unit power is off.	
COMPOSITE 2	Switching between COMPOSITE 2 and GENLOCK IN can be made at the jumper on MAIN CARD inside the unit.	
	COMPOSITE 2	Used to output processed analog composite signal. See section 5-2-1. "COMPOSITE OUT 2 / GENLOCK IN Switching."
	GENLOCK IN	Used to input reference signal (black burst).

(3) REMOTE
Used to connect DCC-OU or DCC-OUA . Use the supplied control cable for the connection. See section 3. " Connection", section 4-3-1. "REMOTE Connector" and section 5-1-2. "SW2."

IMPORTANT

The reference signal from GENLOCK IN of the UFM-100DCC module will be automatically selected when reference signals are input both from the GENLOCK IN connector of UFM-100DCC and the REF connector of the UF frame at the same time.

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3. Connection

3-1. Connection Example 1

UFM-100DCC requires two slots (up and down) on the UF frame. The front module should be inserted into the bottom slot of the two. Use the supplied control cable (PC-2076-2) to connect a DCC-OU or a DCC-OUA to the UFM-100DCC. Input both SD-SDI and analog composite video signals and perform correction by switching them.

◆ **Connection**
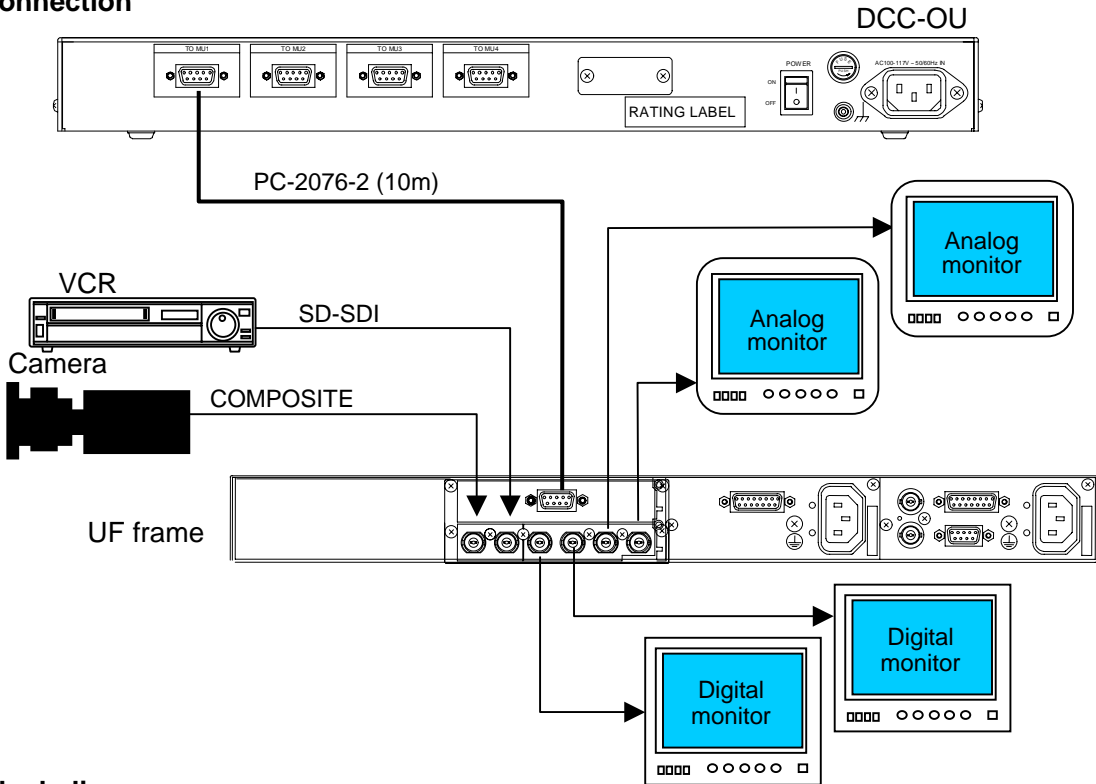
◆ **Block diagram**

See section 4-2-1. "INPUT SELECT."

DCC-OU/OUA operation manual

3-2. Connection Example 2

Input both SD-SDI and analog composite video signals and perform correction by switching them. To use a reference signal, change jumper setting to use COMPOSITE OUT 2 as GENLOCK IN. See section エラー! 参照元が見つかりません。. "COMPOSITE OUT 2 / GENLOCK IN Switching."

◆ **Connection**

◆ **Block diagram**

4. Operation

4-1. Power On

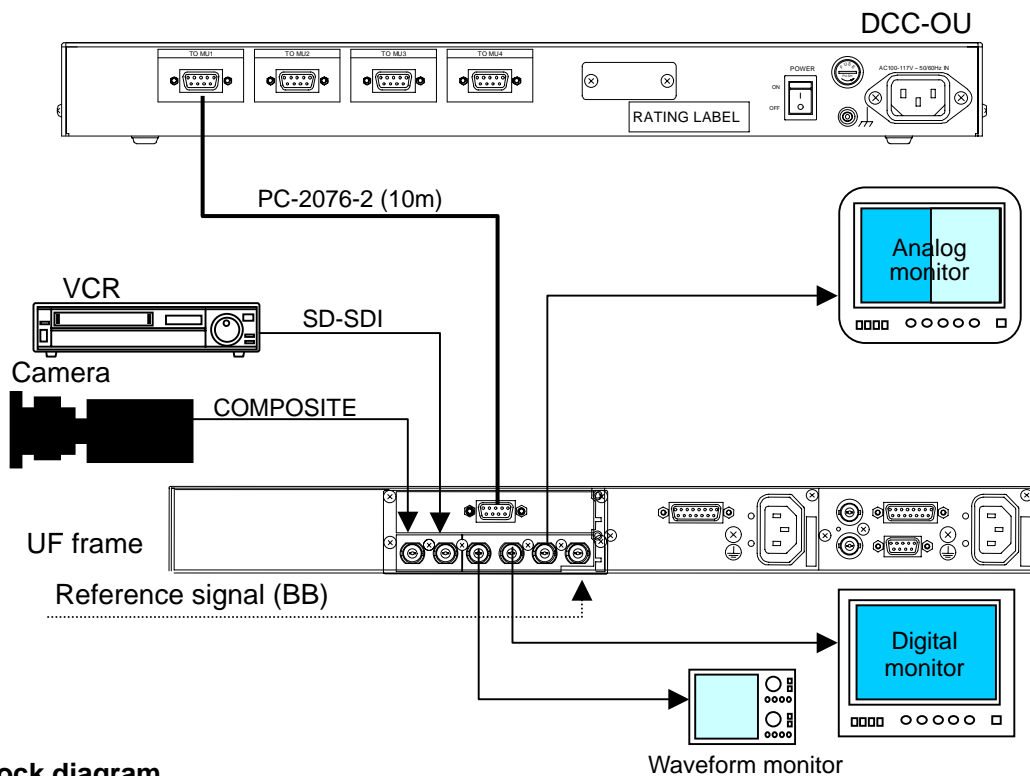Turn Power switch to ON after all system connections are complete. When the unit is powered ON, the green Power LED should go on. If either one (or both) of video signals is input to the unit, the COMPOSITE IN and/or SD-SDI IN LED shown below will turn on.

POWER lamp

COMPOSITE IN lamp

SD-SDI IN lamp
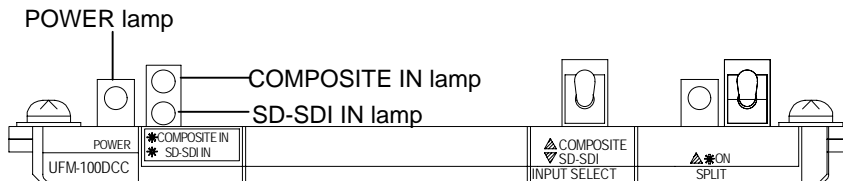
4-2. Front Panel Operations

The UFM-100DCC front panel controls can be used to select video input (INPUT SELECT) and split display mode (SPLIT).

4-2-1. INPUT SELECT

Set the switch to the upper or lower positions to switch the input video.
(When operating with DCC-OUA, change video standard from DCC-OUA.)

Up	Composite input (default)
Down	SD-SDI input

INPUT SELECT switch
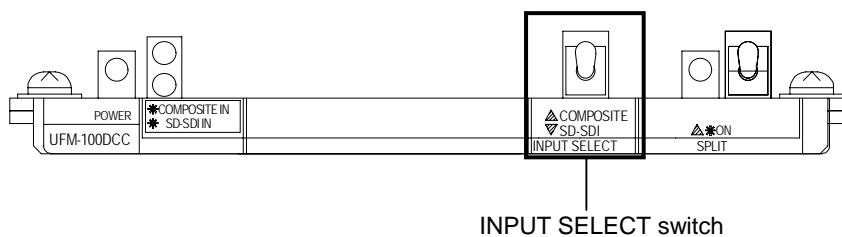
4-2-2. SPLIT

Move the switch to upward or downward to select split screen mode for COMPOSITE OUT1, COMPOSITE OUT2, SD-SDI OUT 1 and SD-SDI OUT 2, which allows direct comparison of images before and after correction. (When operating with DCC-OUA, change split mode from DCC-OUA.)
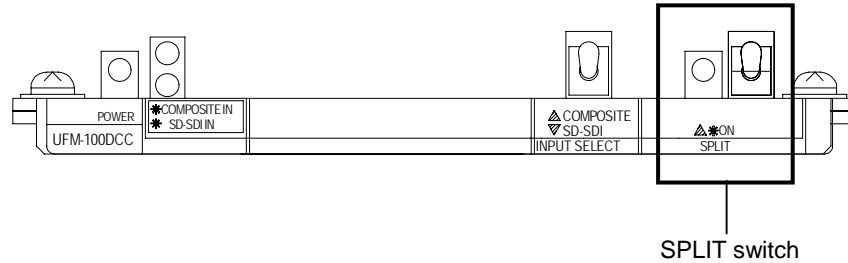
SPLIT switch

Each time moving the switch up and down changes mode in the sequential order: OFF, 1, 2 and 3. The SPLIT lamp lights up whenever a split-screen is selected.

| OFF	Displays the image after correction.(Factory default:)
1	Splits the screen vertically and displays images before and after correction.
2	Splits the screen horizontally and displays images before and after correction.
3	Displays the image before correction

Mode: OFF   Mode: 1   Mode: 2   Mode: 3

☐ Image before correction

▨ Image after correction
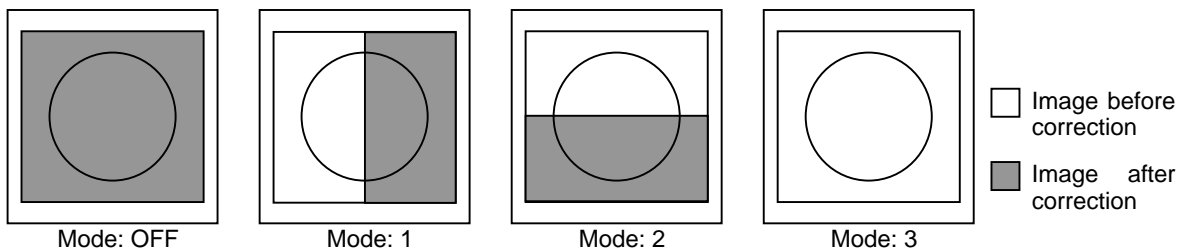
NOTE
SPLIT mode is OFF whenever you start up the unit.
Split mode can be set separately for COMPOSITE OUT and SD-SDI OUT. To do this, use the internal dipswitch SW1. SW1-3 switches to enable or disable the split function for COMPOSITE OUT. SW1-4 switches to enable or disable the split function for SD-SDI OUT. The factory default is enabled for both. (See section 5-1-1. SW1".)

4-3. Remote Control

Control UFM-100DCC remotely from the operation unit (DCC-OU or DCC-OUA) via REMOTE connector on the UFM-100DCC rear panel.
Refer to DCC-OU or DCC-OUA operation manual for details on color correction operation.

4-3-1. REMOTE Connector

◆ **Connector Appearance**
9-pin D-sub, female (inch screw type)
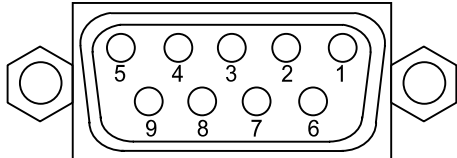
◆ **Pin Assignments (9-pin D-sub, female)**

Pin No.	Signal	Description
1	Reserved	Not used
2	TX(-)	TRANSMIT-
3	RX(+)	RECEIVE+
4	—	—
5	—	—
6	—	—
7	TX(+)	TRANSMIT+
8	RX(-)	RECEIVE-
9	FG	Frame ground

5. Internal Setting

5-1. Dipswitch Settings

Following settings can be made at dipswitch SW1, SW2, and SW3 on the MAIN CARD.

MAIN CARD   I/O CARD

SW1 SW2 SW3
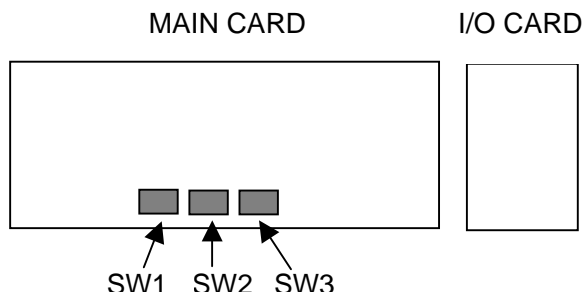
5-1-1. SW1

Dipswitch SW1

Pin No	Function	Setting	
		OFF	ON
1	TEST SIGNAL	—	COLOR BAR
2	SYNCHRO MODE	INPUT	FRAME
3	SPLIT OFF (Composite OUT)	SPLIT ON	SPLIT OFF
4	SPLIT OFF (SD-SDI OUT)	SPLIT ON	SPLIT OFF
5	VITS	OFF	ON
6-8	FACTORY SET	—	—

*Shaded cells indicate factory default.

◆ **TEST SIGNAL (SW1-1)**
Sets internal color bar ON/OFF.

◆ **SYNCHRO MODE (SW1-2)**

INPUT (Default)	Minimizes the input/output delay for the selected video signal.
FRAME	Synchronizes the frame timing of the output video and reference input. This setting is effective for input video with a lot of jitter.

If set to INPUT, the delay will be as shown in the table below.

Input video format	Signal delay
Composite (NTSC)	Approx. 2H
Composite (PAL)	Approx. 3H
SD-SDI	Approx. 1H

If set to FRAME, a maximum I/O delay will be one frame.

NOTE	
If set to INPUT:	

If set to INPUT:
- The amount of jitter on the SD-SDI output depends on that of input signal when analog composite is selected for input.
- Color framing is not always properly processed for COMPOSITE output when the SD-SDI input is used.

If set to FRAME:
- The composite input is horizontally locked, however, it is not correctly locked to the subcarrier of the applied genlock.
- The unit operates in free running mode when no genlock signal is input to the unit.

◆ **SPLIT OFF (Composite OUT) (SW1-3)**
Enables/Disables split screen mode (split display for direct comparison of images before and after correction) for COMPOSITE OUT.

SPLIT OFF	Disables split screen mode.
SPLIT ON (Default)	Displays split screen according to the SPLIT switch setting on the front panel. (See section 4-2-2. "SPLIT".)

◆ **SPLIT OFF (SD-SDI OUT) (SW1-4)**
Enables/Disables split screen mode (split display for direct comparison of images before and after correction) for SD-SDI OUT.

SPLIT OFF	Disables split screen mode.
SPLIT ON (Default)	Displays split screen according to the SPLIT switch setting on the front panel. (See section 4-2-2. "SPLIT".)

◆ **VITS (SW1-5)**
Selects to pass or blank vertical interval data of composite input.

OFF (Default)	Blanks vertical interval data of composite input from 10H to 20H. No vertical interval data is passed to the composite output.
ON	Vertical interval data from 10H to 21H is passed to an output. If vertical interval data is included in the composite input, it is also included in the composite output.

◆ **FACTORY SET (SW1-6, 7, 8)**
Factory default setting. Do not change.

5-1-2. SW2

Dipswitch SW2

Pin No.	Function	Setting	
		OFF	ON
1	REMOTE	DCC-OU	DCC-OUA
2	GAMMA MODE	OFF	ON
3		OFF	ON
4	FACTORY SET	—	—
5	FACTORY SET	—	—
6	FACTORY SET	—	—
7	FACTORY SET	—	—
8	FACTORY SET	—	—

* Shaded cells indicate factory default.

◆ **REMOTE (SW2-1)**

DCC-OU	Controls UFM-100DCC from DCC-OU.
DCC-OUA (Default)	Controls UFM-100DCC from DCC-OUA.
	INPUT SELECT (front panel), SPLIT (front panel) and GAMMA MODE (dipswitch SW2) must be set not from UFM-100DCC but from DCC-OUA.

◆ **GAMMA MODE (SW2-2, SW2-3)**

Select the suitable type of gamma correction from the following three adjustments with two dipswitches.

GAMMA MODE	Setting	
	SW2-2	SW2-3
CENTER	OFF	OFF
BLACK	ON	OFF
WHITE	OFF	ON

* Shaded cells indicate factory default.

CENTER (Default)	Gamma curve is weighted toward the mid tones (near 50%).
BLACK	Gamma curve is weighted toward Shadows (near 25%)
WHITE	Gamma curve is weighted toward Highlights (near 75%).

* Refer to the figures in the next pages.

◆ **FACTORY SET (SW2-4, 5, 6, 7, 8)**

Factory default setting. Do not change.

Gamma Mode

Correction
Range
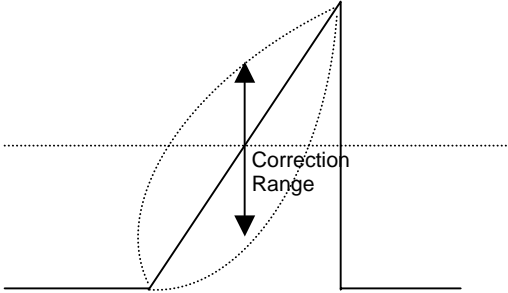
50%   If Center is selected
(default)

Correction
Range
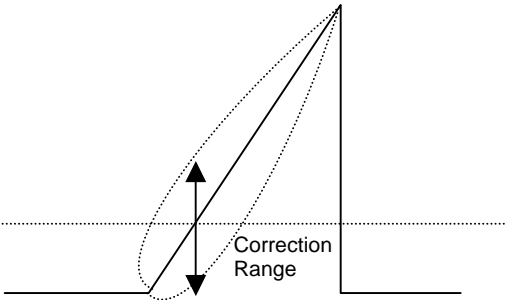
25%   If Black is selected

Correction
Range
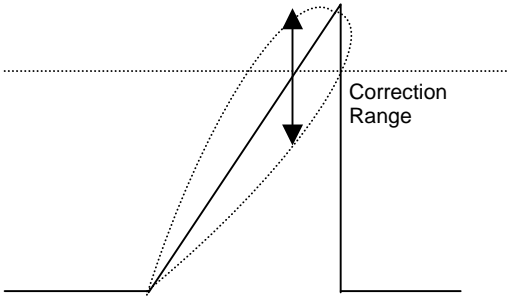
75%   If White is selected

5-1-3. SW3 (SETUP Setting)

Dipswitch SW3

Pin No.	Function	Setting	
		OFF	ON
1	SETUP	OFF	ON
2	FACTORY SET	—	—
3	FACTORY SET	—	—
4	FACTORY SET	—	—
5	FACTORY SET	—	—
6	FACTORY SET	—	—
7	FACTORY SET	—	—
8	FACTORY SET	—	—

* Shaded cells indicate factory default.

◆ **SET UP (SW3-1)**
Selects setup 0 or 7.5. Set to ON when processing NTSC Setup 7.5. (US mode)

OFF (Default)	Processes with 0 setup.
ON	Processes with 7.5 setup.

◆ **FACTORY SET (SW3-2, 3, 4, 5, 6, 7, 8)**
Factory default setting. Do not change.

5-2. Jumper Settings

The following settings can be made at the jumpers on MAIN CARD inside the UFM-100DCC.

MAIN CARD   I/O CARD

Factory Default Settings

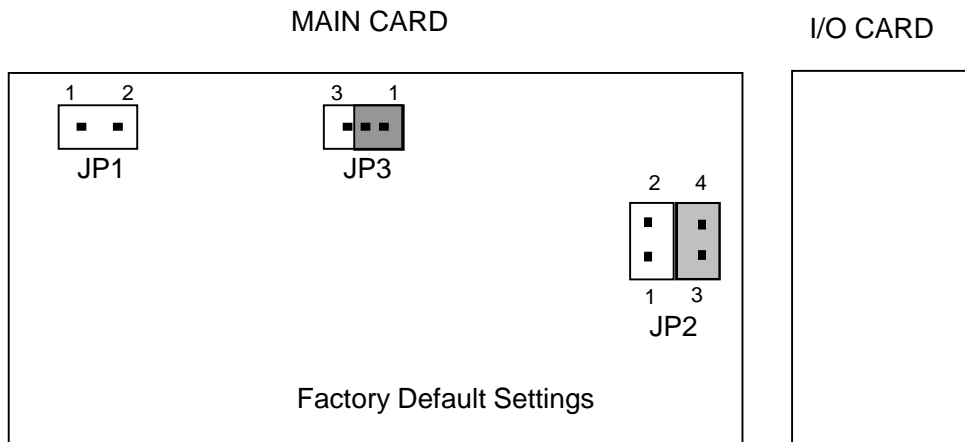| JP NO.	Factory Default
JP1	Open
JP2	3-4 short
JP3	1-2 short

* Do not change JP1 and JP3.

5-2-1. COMPOSITE OUT 2 / GENLOCK IN Switching

Jumper JP2 is used to select COMPOSITE OUT 2 or GENLOCK IN.

COMPOSITE OUT 2 (Default)	3-4 short	JP2	The connector is used as COMPOSITE OUT 2, which outputs the processed composite signal.
GENLOCK IN	2-4 short	JP2	The connector is used as GENLOCK IN, which inputs a reference signal.

GENLOCK

COMPOSITE OUT 2

JP2

COMPOSITE OUT 2 / GENLOCK IN
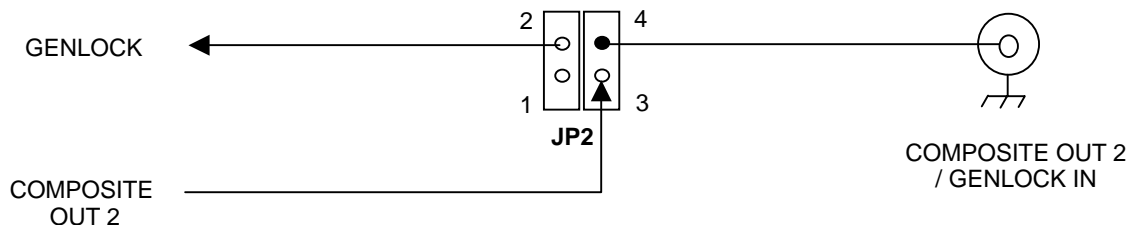
6. If Problems Occur

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
Cannot operate front panel.	With DCC-OU	If dipswitch SW2-1 is set to DCC-OUA(ON), change to DCC-OU (OFF). See section 5-1-2. "SW2."
	With DCC-OUA	INPUT SELECT and SPLIT cannot be set from UFM-100DCC front panel. Set them from DCC-OUA.
Cannot make GAMMA MODE setting by dipswitch.	With DCC-OU	If dipswitch SW2-1 is set to DCC-OUA(ON), change to DCC-OU (OFF). See section 5-1-2. "SW2."
	With DCC-OUA	GAMMA MODE cannot be set from the dipswitch on UFM-100DCC. Set it from DCC-OUA.
Input video signal not bypassed when powered OFF.	VIDEO OUT connection (rear panel)	Only SD-SDI OUT 1 and COMPOSITE OUT 1 have bypass capability. See section 2-2. "Rear Panel."
No split screen is displayed.	SPLIT mode setting (front panel)	If SPLIT switch is set to OFF, change split mode to 1 or 2. See section 4-2-2. "SPLIT
No split screen is displayed despite in SPLIT mode. (Composite out)	SPLIT OFF setting (dipswitch)	If SW1-3 is set to SPLIT OFF, change to SPLIT ON. See section 5-1-1. "SW1."
No split screen is displayed despite in SPLIT mode. (SD-SDI out)	SPLIT OFF setting (dipswitch)	If SW1-4 is set to SPLIT OFF, change to SPLIT ON. See section 5-1-1. "SW1."

7. Specifications & Dimensions

7-1. Unit Specifications

Standard	525/60 (NTSC) , 625/50 (PAL) (Auto detection)
Signal Processing	4:2:2 component
Correction Range	2 field (field inversion prevented)
Sampling Frequency	Y: 13.5MHz, C: 6.75MHz
Quantization	10-bit

Video Input

SDI	270Mbps, 75Ω, BNC, 1 input
Analog composite	1.0 Vp-p, 75Ω, BNC, 1 input

Video Output

SDI	270Mbps, 75Ω, BNC, 2 outputs
Analog composite *	1.0 Vp-p, 75Ω, BNC, 2 outputs
Genlock input *	B.B., NTSC: 0.429Vp-p PAL: 0.450Vp-p, 75Ω, BNC, 1 input

   * Select one of them (COMPOSITE OUT 2 or GENLOCK IN) by jumper switching.

Input lock range	1 frame with respect to genlock timing
I/O delay INPUTmode	2H (NTSC composite)
	3H (PAL composite)
	1H (SD-SDI)
FRAME mode	1 frame (when input video phase is same as genlock signal)

When composite input is used:

Frequency Response	NTSC	100 kHz to 4.2 MHz: within ±0.5 dB, 4.2 MH to 5.0 MHz: within ±1 dB, roll off above 5.0MHz
	PAL	100 kHz to 5.0 MHz: within ±0.5 dB, 5.0 MH to 5.5 MHz: within ±1 dB, roll off above 5.5 MHz
S/N Ratio	60dB or higher	
DG/DP	1% / 1 ° (ALP50%)	
K Factor (2T pulse)	1% or less	
H/V Tilt	1% or less	
Residual Jitter	Y: ±15ns C: ±2°	
FSC pull-in range	-300 Hz to +300 Hz (video input)	

Proc Amp (operated from DCC-OU or DCC-OUA)

Video level	0% to 200%
Y level	0% to 200%
Chroma level	0% to 200%
Setup/Black	More than ±150mV
Chroma phase	±180 °

Color Correction (operated from DCC-OU or DCC-OUA)

Correction mode	Balanced, Differenctial, Sepia
White level (RGB)	50% to150% (based on input signal)
Black level (RGB)	50% to 150% (based on input signal)
Gamma level (RGB)	75 to125% (based on input signal)

Color Gamut Control (operated from DCC-OU or DCC-OUA)

Y White clip	50% to 109%
C White clip	50% to 111%
Y Black clip	-7.5% to 50%

Interfaces

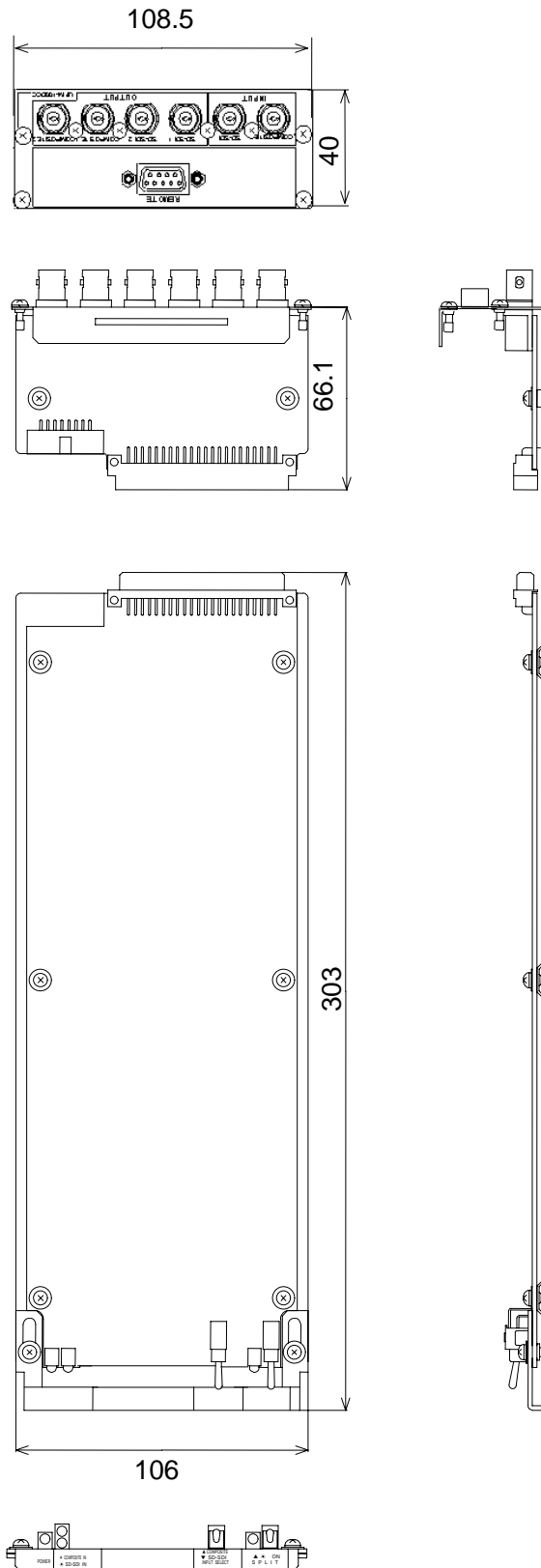|	
Remote (RS-422)	9-pin D-sub, 1port
Temperature	10 ° C to 40 ° C
Humidity	30 % to 90 % (no condensation)
Power	12/24VDC supplied from UF frame
Consumption	0.8A at 12V , 0.4A at 24V
Dimensions	Front module: 106 (W) x 300 (D) mm
	Rear module: 106 (W) x 66.1 (D) mm
Weight	0.5 Kg
Consumables	None
Required slots	Two slots (up and down)

7-2. External Dimensions

(All dimensions in mm)

108.5

40

66.1

303

106

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.