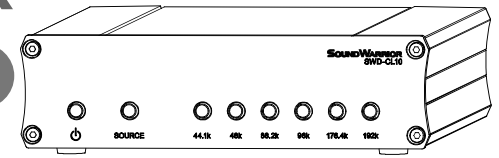


SOUNDWARRIOR

Clock Generator

SWD-CL10

User Guide



Sound Warrior's Digital Audio Clock Generator Doubles As a Clock Distributor

SOUNDWARRIOR

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Thank you for purchasing SWD-CL10US, a clock generator.

**READ AND FOLLOW ALL SAFETY INSTRUCTIONS BEFORE USING THE PRODUCT.
KEEP THE USER GUIDE WITH A WARRANTY CARD FOR FUTURE REFERENCE.**




1 IMPORTANT SAFEGUARDS

1-1 Safety Graphic Symbols







The following symbols are used to define the degree of danger when abused and misused the product.

 WARNING	.....	Negligence of the instructions may lead to mishandling that may cause death or serious injury.
 CAUTION	.....	Negligence of the instructions may lead to mishandling that may cause a minor injury, property or financial damage.

The following symbols are used to indicate the actions that should be followed.

	.....	This symbol indicates actions that call users' attention.
	.....	This symbol indicates prohibited actions that must not be performed.
	.....	This symbol indicates compulsory actions that must be performed.

1-2 WARNING

1-2-1		In the following cases, immediately turn off the power switch and disconnect the AC adapter from the power outlet. Then contact us for repair. <ul style="list-style-type: none"> ● Smoke, strange odor or strange sound. ● Damaged elements or cables. ● Penetration of liquids or foreign objects, or the like.
1-2-2		Do not prevent the product from releasing the heat by covering with a cloth, etc. Do not place the product in a stuffy room, narrow room or the like. This could result in fire.
1-2-3	 	Do not use the product outdoors, in a bathroom or the like. Penetration of liquids or foreign objects could result in fire or electrical shock. If liquids or foreign objects should enter the product, immediately disconnect the AC adapter from the power outlet and contact us for repair.
1-2-4		Never disassemble and modify. Modification and/or disassembly of the product or accessories could result in fire or electrical shock. Contact us for repair.
1-2-5		Do not use except the supplied AC adapter. Do not use over the rated voltage.

7 WARRANTY INFORMATION

We offer a 1 year limited warranty for repair from the original purchase date.

In-Warranty Repairs

We will check if the failure is covered by the warranty with the information below. Prepare it and the warranty card, and contact us via userinfo@shiroshita.com.

- | | |
|------------------|--|
| ● Name | ● Name of the Product (SWD-CL10US) |
| ● Email Address | ● Serial Number |
| ● Postal Address | ● Situation and details when the failure occurred. |

Out-of-Warranty Repairs

We also provide a repair quotation for out-of-warranty repair. Contact us via userinfo@shiroshita.com.

8 TECHNICAL SPECIFICATION

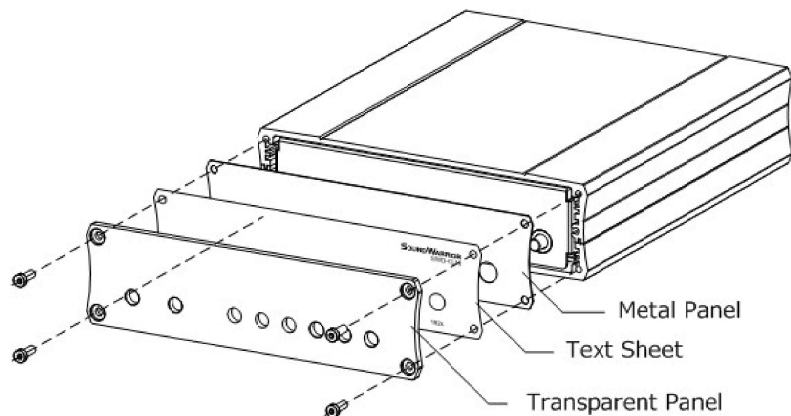
General	
Power Supply	AC100 - 240V 50/60Hz (AC adapter), DC12V (Main Unit)
Power Consumption	1W (Standard Model) / 2W (OCXO-mounted Model)
Operating Temperature	0 - 40°C
External Dimensions	W146 × H40 × D165 mm (Protruding part not included)
Weight	Approx. 0.7kg
Clock Output	
Connector	75Ω BNC
Frequency (Word Clock)	44.1k / 48k / 88.2k / 96k / 176.4k / 192kHz
Frequency (x256 Clock)	11.2896M / 12.288M / 22.5792M / 24.576MHz
Signal Level	Square Wave 5Vp-p
S/PDIF Output	
Connector	RCA pin jack
Signal Standard	S/PDIF
Sampling Rate	44.1k / 48k / 88.2k / 96k / 176.4k / 192kHz
Quantization Bit Rate	16bit
External Input (10MHz)	
Connector	BNC Terminal Resistance 50Ω (Factory setting) / 75Ω
Signal Level	Sine Wave 0.5Vrms at 50Ω
External Input (DIST)	
Connector	BNC Terminal Resistance 75Ω
Frequency	44.1kHz - 24.576MHz
Signal Level	Square Wave 5Vp-p

Design and specifications are subject to change without notice.

5-2 Changing Design of Front Panel

Enjoy customizing the front panel by changing the text sheet vertically/horizontally or inserting a self-build sheet between the text sheet and the metal panel. The fixation screws can be unbraced by the supplied hex key.

- ※ When changing the sheet, take care to prevent foreign objects from entering into the main unit.
- ※ Remove protective seals both sides of the supplied vertical text sheet before using the sheet.
- ※ Do not drive screws too tightly. This could result in breaking the front panel, etc.




6 TROUBLESHOOTING


6-1 Does not Turn on


Possible Factor	Solution
The AC adaptor is not connected properly.	Connect the AC adaptor properly.

6-2 Unable to Select Switches


Possible Factor	Solution
"DIST" of the CLOCK IN switch is selected.	Select "10MHz" of the CLOCK IN switch. The FREQUENCY/SOURCE switch will be invalid when "DIST" is selected.


1-2-6  Do not place anything on the product or cover it with a cloth, etc. Do not place anything on the cords or damage it. This could result in fire or electrical shock.

1-2-7  Clean the power plug periodically with a soft and dry cloth. Accumulated dust could result in fire.

1-2-8  Do not touch the product, the connected devices, the connecting cords, the AC adapter, etc. during a lightning storm. This could result in electrical shock.



1-3 CAUTION


1-3-1  Do not place the product on an unstable surface. This could result in falling and cause an injury. Place the product away from walls and other devices to release heat sufficiently.

1-3-2  Do not place the product in the following places. This could result in fire or electrical shock.

- Highly humid or dusty places.
- Places with smoke or oily smoke. (A kitchen, a humidifier or the like)

1-3-3  Place the product vertically or horizontally on a stable surface.

1-3-4   Do not touch the AC adapter with a wet hand. This could result in electrical shock. Do not pull the cord when disconnected. Hold the plug and disconnect. Disconnect the AC adapter from the power outlet when not used for a long time.

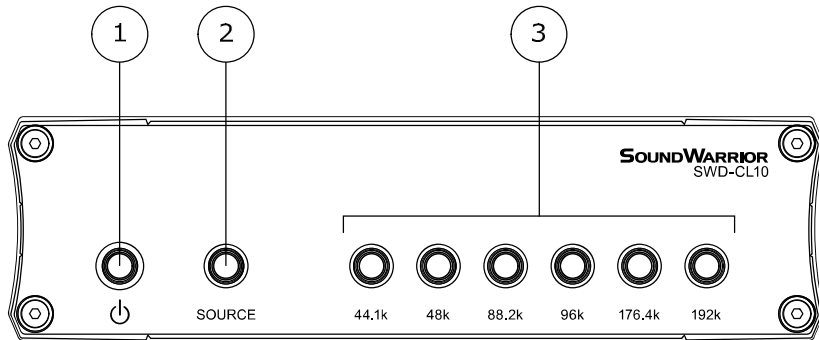
1-3-5  Disconnect the AC adapter from the power outlet when cleaning. Use a dry cloth to clean the product. Do not use thinner, alcohol or the like.

1-4 Accessories

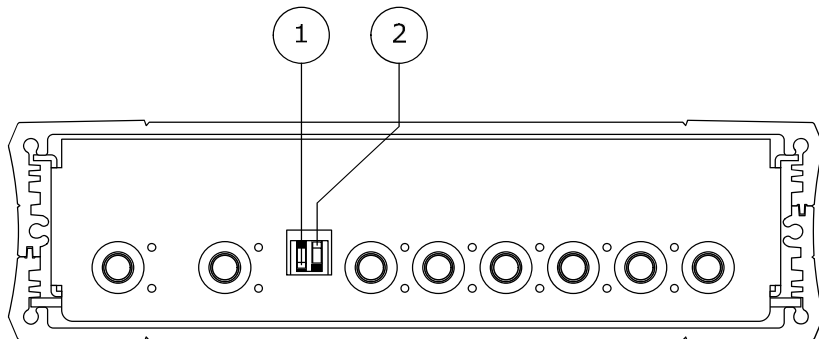
- AC adaptor ×1
- Text sheet for vertical setup ×1
- Hex key ×1
- Protective cushion ×4
- User Guide ×1
- Warranty Card ×1

2 PART NAMES AND FUNCTIONS

2-1 Front Panel Functions



2-2 Inside Panel



4-6-3 OCXO (Oven Controlled Xtal Oscillator)

The SWD-CL10US is able to generate clock signals from OCXO (Oven Controlled Xtal Oscillator) by the built-in DDS (Direct Digital Synthesizer) circuit.

- Switch to OCXO by holding down the SOURCE switch, and then select clock frequency by pressing the FREQUENCY switch.
- ※ OCXO source cannot be selected when OCXO is not mounted to the SWD-CL10US.
- ※ Select "10MHz" of the CLOCK IN switch when output a word clock. The FREQUENCY/SOURCE switch and clock signals from OCXO will be invalid when "DIST" is selected.
- ※ Please note that upgrade to OCXO (Oven Controlled Xtal Oscillator) is available for a fee on a first-come, first-served basis. Contact us for more detail.

4-7 Distributing Clock

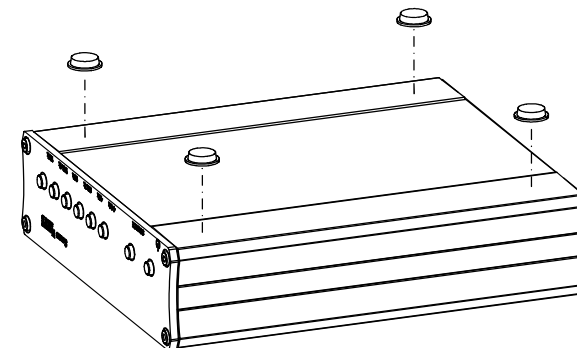
The SWD-CL10US also doubles as a clock distributor by inputting clock signals to the External input.

- Select "DIST" of the CLOCK IN switch, and then input clock signals to the External input
- ※ **NOTE: BE SURE TO SELECT "DIST" OF THE CLOCK IN SWITCH BEFORE INPUTTING CLOCK SIGNALS. IT MAY GENERATE ABNORMAL NOISE WITH "10MHz" SELECTED.**
- ※ The FREQUENCY/SOURCE switch will be invalid and the indicator turns off when "DIST" is selected.
- ※ When "DIST" of the CLOCK IN switch is selected, the terminal resistance will be 75Ω regardless of the setting of the Switch #1.

5 CUSTOMIZATION

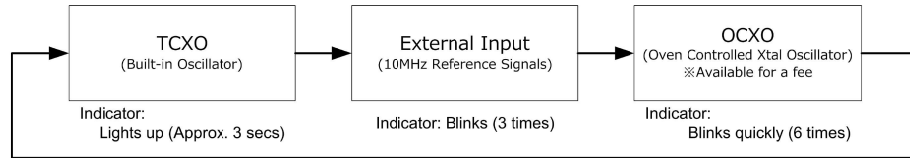
5-1 Attaching Protective Cushions

Attach the supplied protective cushions on the bottom surface of the main unit if need be.



4-6 Switching Clock Sources

Press and hold the SOURCE switch more than 2 seconds to switch clock sources when an external input (10MHz reference signals) is supplied and/or OCXO (Oven Controlled Xtal Oscillator) is mounted. After switching clock sources, the SOURCE indicator shows status of the clock source, and then the indicator turns off.



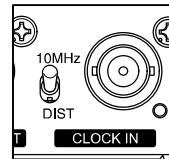
4-6-1 TCXO (Built-in Oscillator)

- Switch to TCXO by holding down the SOURCE switch, and then select clock frequency by pressing the FREQUENCY switch.
- ※ Select "10MHz" of the CLOCK IN switch when output a word clock. The FREQUENCY/SOURCE switch and clock signals from TCXO will be invalid when "DIST" is selected.

4-6-2 External Input (10MHz Reference Signals)

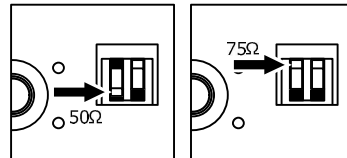
The SWD-CL10US is able to generate clock signals from 10MHz reference signals (via a rubidium oscillator, etc.) by the built-in DDS (Direct Digital Synthesizer) circuit. "External Input" cannot be selected when no signals are supplied to the CLOCK IN.

- Select "10MHz" of the CLOCK IN switch to input 10MHz reference signals to the CLOCK IN.
- ※ **NOTE: BE SURE TO SELECT "10MHz" OF THE CLOCK IN SWITCH BEFORE SUPPLYING 10MHz REFERENCE SIGNALS. IT MAY GENERATE ABNORMAL NOISE WITH "DIST" SELECTED.**



- Switch to External Input by holding down the SOURCE switch, and then select clock frequency by pressing the FREQUENCY switch.

- Terminal resistance of the External input is 50Ω when "10MHz" of the CLOCK IN switch is selected. (Factory setting) Flip up the Switch #1 to set terminal resistance of the SWD-CL10US as 75Ω when a terminal resistance of a rubidium oscillator, etc. is 75Ω.



- ※ Terminal resistance of the SWD-CL10US will be 75Ω when "DIST" of the CLOCK IN switch is selected.
- ※ It automatically switches to TCXO when signals from the CLOCK IN stopped and/or a cable was disconnected.

2-1 Front Panel Functions

- | | | |
|---|--|---|
| ① | POWER switch
POWER indicator | <p>Used to turn on/off the power.
This lights up while the power is on.</p> |
| ② | SOURCE SOURCE switch
& SOURCE indicator | <p><u>Press</u> : Displays type of clock sources as below.</p> <ul style="list-style-type: none"> • Lighting up : TCXO (The built-in oscillator of SWD-CL10US) • Blinking : External input (10MHz reference signals) • Blinking quickly : OCXO (Oven Controlled Xtal Oscillator) ※1 <p><u>Press and hold</u> : Switches type of clock sources.</p> |
| ③ | 44.1k - 192k FREQUENCY switch &
FREQUENCY indicator | <p><u>Press</u> : Selects frequency (44.1k-192kHz). The switch lights up.
<u>Press again</u> : Stops outputting the word clock. The light turns off.
<u>Press and hold</u> : Multiplies the clock frequency by 256.
The switch blinks. ※2 ※3 ※4</p> |

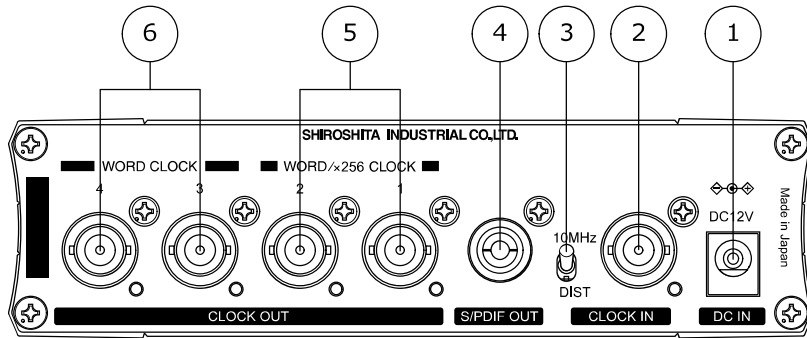
- ※1 Please note that upgrade to OCXO (Oven Controlled Xtal Oscillator) is available for a fee on a first-come, first-served basis. Contact us for more detail.
- ※2 Output of "x256 clock" is limited via the CLOCK OUT 1 and 2. The CLOCK OUT 3 and 4 is only for a word clock from 44.1k to 192kHz.
- ※3 When "DIST" of the CLOCK IN switch is selected, the SWD-CL10US distributes input clock from a clock generator to each CLOCK OUT. The SOURCE/FREQUENCY switch & indicator will be invalid and turned off.
- ※4 When 176.4k/192k is selected, it multiplies by 128 (= 22.5792MHz/24.576MHz).

2-2 Inside Panel

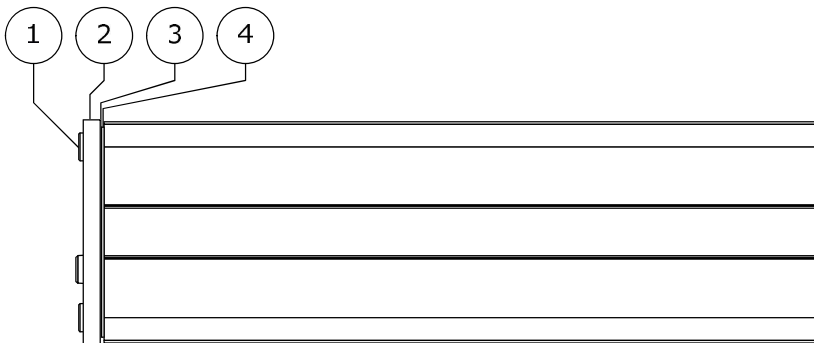
- | | | |
|---|--------------|---|
| ① | Switch #1 ※1 | <p>Used to change terminal resistance of the CLOCK IN. ※2</p> <ul style="list-style-type: none"> • DOWN (Factory setting) : 50Ω • UP : 75Ω |
| ② | Switch #2 ※1 | <p>Used to set up how to turn on/off the power.</p> <ul style="list-style-type: none"> • UP (Factory setting) : Turn on/off by the POWER switch. • DOWN : Turn on/off the power by connecting / disconnecting the AC adapter. |

- ※1 Detach the front panel when set up the Switch #1 and #2.
- ※2 When "DIST" of the CLOCK IN switch is selected, the terminal resistance will be 75Ω regardless of the setting of the Switch #1.

2-3 Rear Panel Functions



2-4 Side View



4-3 Outputting "x256 Clock"

- Press and hold the FREQUENCY switch (44.1k - 192k) more than 2 seconds. Then, the FREQUENCY indicator lights up and it outputs clock signals multiplied by 256 (Multiplied by 128 when 176.4k/192k is selected.) from the CLOCK OUT 1 and/or 2.
- The CLOCK OUT 3 and 4 is only for a word clock from 44.1k to 192kHz. "x256 clock" is not output via the CLOCK OUT 3 and 4.
- An output signal from the S/PDIF output is the same frequency as selected word clock.

Selected Frequency	Clock Frequency				Sampling Frequency S/PDIF OUT
	CLOCK OUT 1	CLOCK OUT 2	CLOCK OUT 3	CLOCK OUT 4	
44.1k	11.2896MHz		44.1kHz		44.1kHz
48k	12.288MHz		48kHz		48kHz
88.2k	22.5792MHz		88.2kHz		88.2kHz
96k	24.576MHz		96kHz		96kHz
176.4k	22.5792MHz		176.4kHz		176.4kHz
192k	24.576MHz		192kHz		192kHz

- ※ Select "10MHz" of the CLOCK IN switch when output "x256 clock".
The FREQUENCY/SOURCE switch will be invalid when "DIST" is selected.
- ※ **NOTE: BE SURE TO TURN OFF AUDIO EQUIPMENT, WHICH INPUTS CLOCK SIGNALS TO THE SWD-CL10US (A RUBIDIUM OSCILLATOR, ETC.) BEFORE SWITCHING BETWEEN A WORD CLOCK AND "x256 CLOCK". IT MAY GENERATE LOUD CRACKLING NOISE.**

4-4 Stopping Clock Output

The SWD-CL10US does not output clock signals when none of the FREQUENCY indicators are selected. (UNLESS "DIST" of the CLOCK IN switch is selected and clock signals are supplied to the CLOCK IN.)

- Press a lighted/blinking FREQUENCY switch. The Frequency indicator turns off and it stops outputting clock signals or S/PDIF signals.

4-5 Checking Current Clock Source

When pressed the SOURCE switch, the SOURCE indicator displays type of clock sources as below.

- Lighting up (Approx. 3 seconds) : TCXO (The built-in oscillator of SWD-CL10US)
- Blinking (3 times) : External input (10MHz)
- Blinking quickly (6 times) : OCXO (Oven Controlled Xtal Oscillator) ※Available for a fee

4 HOW TO USE

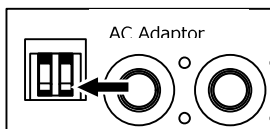
4-1 Turning On/Off

4-1-1 Turn On/Off by Pressing POWER Switch

- Press the POWER switch. The POWER indicator lights up, and the SWD-CL10US turns on.
- Press again to turn off the SWD-CL10US.
(It stores status of the clock source and the clock frequency.)

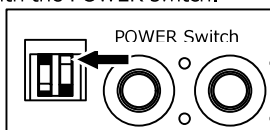
4-1-2 Turn On/Off by AC Adapter

- Flip down the Switch #2 in order to turn on/off the power automatically by connecting / disconnecting the supplied AC adaptor. (The POWER switch will be invalid.)



- When disconnected the AC adaptor, it does not store status of the clock source and the clock frequency. Press the POWER switch before disconnecting the AC adaptor to store status.

- Flip up the Switch #2 (factory setting) in order to turn on/off with the POWER switch.



※ Detach the front panel when set up the Switch #1 and #2.

※ Select the Switch #2 with the AC adaptor disconnected.

4-2 Outputting Word Clock

- Press the FREQUENCY switch (44.1k - 192k). Then, the FREQUENCY indicator lights up, and the SWD-CL10US outputs the selected word clock or S/PDIF signals.

Selected Frequency	Clock Frequency				Sampling Frequency S/PDIF OUT
	CLOCK OUT 1	CLOCK OUT 2	CLOCK OUT 3	CLOCK OUT 4	
44.1k	44.1kHz	44.1kHz	44.1kHz	44.1kHz	
48k	48kHz	48kHz	48kHz	48kHz	
88.2k	88.2kHz	88.2kHz	88.2kHz	88.2kHz	
96k	96kHz	96kHz	96kHz	96kHz	
176.4k	176.4kHz	176.4kHz	176.4kHz	176.4kHz	
192k	192kHz	192kHz	192kHz	192kHz	

※ Select "10MHz" of the CLOCK IN switch when output a word clock.
The FREQUENCY/SOURCE switch will be invalid when "DIST" is selected.

2-3 Rear Panel Functions

- | | | |
|------------------|-----------------|---|
| ① DC IN
DC12V | Power input | Used to connect the supplied AC adapter. |
| ② CLOCK IN | External input | <ul style="list-style-type: none"> • Used to input 10MHz reference signals (e.g. from a rubidium oscillator, etc.) when "10MHz" is selected. • Used to input word clock from a clock generator when "DIST" is selected. |
| ③ CLOCK IN | CLOCK IN switch | <ul style="list-style-type: none"> • 10MHz : Select this to input 10MHz reference signals. Also select this when using TCXO/OCXO. • DIST : Select this to distribute input word clock from a clock generator to each CLOCK OUT. The SOURCE/FREQUENCY switch & indicator will be invalid and turned off. |
| ④ S/PDIF OUT | S/PDIF output | Used to output S/PDIF signals (no sound). No signals output while "DIST" is selected. |
| ⑤ CLOCK OUT | Clock output | <ul style="list-style-type: none"> • CLOCK OUT 1, 2 : Used to output a word clock/x256 clock.※1 • CLOCK OUT 3, 4 : Used to output a word clock. |

※1 When 176.4k/192k is selected, it multiplies by 128 (= 22.5792MHz/24.576MHz).

2-4 Side View

- | | |
|---------------------|--|
| ① Fixing screws | These fix the front panel. Use the supplied hex key to detach the panel. |
| ② Transparent Panel | |
| ③ Text Sheet | Used for either vertical/horizontal setup. The horizontal sheet is set as default. |
| ④ Metal Panel | |

3 CONNECTIONS

3-1 CLOCK OUT: Connecting Word Clock Output

Connect a word clock input of a CD transport, a D/A converter, etc. and the SWD-CL10US with a BNC cable (75Ω).

3-2 S/PDIF OUT: Connecting S/PDIF Input

Connect a coaxial input of a digital recorder, etc. and the SWD-CL10US with a coaxial cable (RCA pin plugs).

3-3 CLOCK IN: Connecting External Word Clock Input

3-3-1 10MHz Reference Signals

Connect an output of a rubidium oscillator (10MHz, sine wave), etc. and the SWD-CL10US with a BNC cable.

- ※ Connect after switching to "10MHz" of the CLOCK IN switch.
- ※ Terminal resistance of the CLOCK IN is 50Ω (factory setting). Use the SWD-CL10US without change when terminal resistance of an oscillator is 50Ω. When it is 75Ω, change terminal resistance of the CLOCK IN to 75Ω.
- ※ Although matching terminal resistance among an oscillator, a cable and the SWD-CL10US is recommended, there is functionally no problem even if they are not matched.

3-3-2 Word Clock Distribution

Connect an output of a master clock generator and the SWD-CL10US with a BNC cable when used the SWD-CL10US as a clock distributor.

- ※ Connect after switching to "DIST" of the CLOCK IN switch.

3-4 DC IN: Connecting Power Source

Connect the supplied AC adapter to the DC IN of the SWD-CL10US.

Connections

