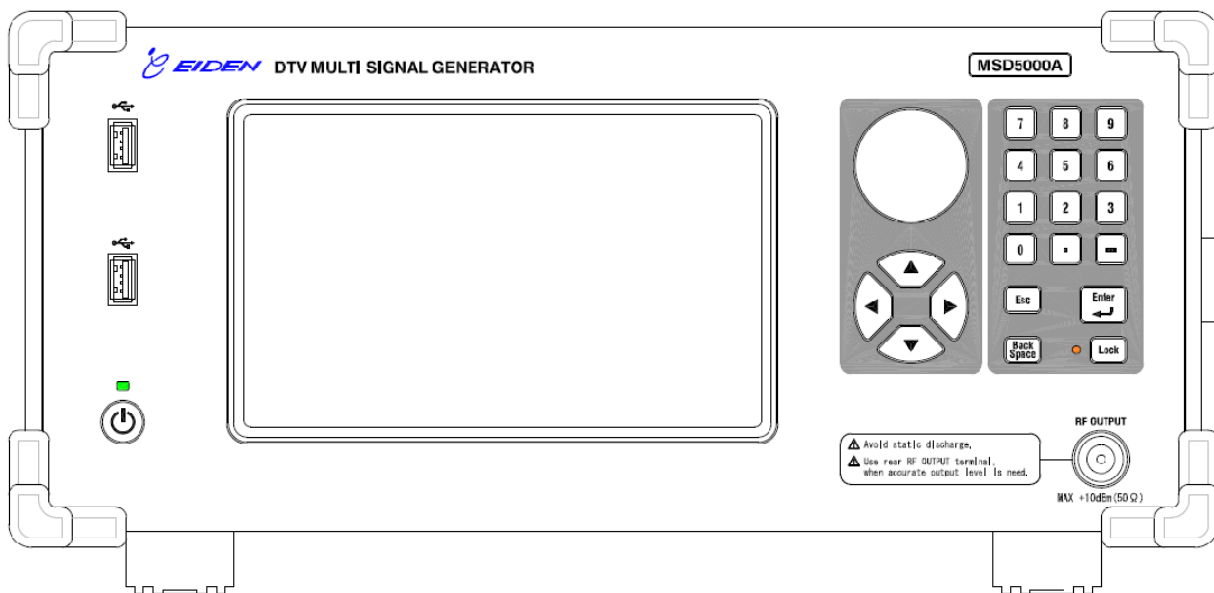


MSD5000A

DTV Multi Signal Generator

Instruction Manual

Ver. 1.1







Important Concerns

Important Contents

This instruction manual describes important information in order to use this device safely. Before using this device, read this document thoroughly. Especially, use this device after reading over “Caution for Safety” and getting well understanding.

Also, keep this manual always by keeping good care in order to allow you to refer at any time when this unit is used. Eiden is paying careful attention on safe usage of this device without having any damage or injury on user’s life, body or property. Follow to instructions of this document when this device is used.

Meaning of  WARNING and  CAUTION

 WARNING	Contents imagined possibility to be killed or to be gotten serious injury, if incorrect handling is made by ignoring this indication, are shown.
 CAUTION	Contents imagined possibility to be gotten injury or to be occurred only property damage, if incorrect handling is made by ignoring this indication, are shown.

Safety Concerns



Warning

Electric Shock



Pull out a power cord plug from an outlet immediately when abnormal condition is occurred, such as a generation of smoke, a bad smell or an abnormal sound by any chance.

In the case of the smoke generation, ask repair to Eiden after confirming on pulling out of the smoke.

Repair by user itself is dangerous, so do not do it unconditionally. If the device is keeping to use under abnormal condition, it may be the cause of electric shock or fire.

Electric Shock



When foreign material (water, metal piece, liquid and etc.) is put inside of the device, pull out the power cord plug from the outlet immediately.

If the device is used as it is, it may be the cause of electric shock or fire.

Cautions for Use of This Device



Warning

Electric Shock



Do not insert or drop foreign material, such as metal or flammable to inside of this device from ventilation hole.

It may be the cause of electric shock or fire.



Warning



Do not block ventilation holes of the device.

If ventilation holes are blocked, heat is filled in the unit and it may be the cause of fire. Especially, the ventilating hole of the FAN is apt to get the dust. Clean it regularly

Electric Shock



When work for installation or moving of this device is made, pull out power cord plug from outlet before work is done.

Also, connect plug to outlet after all work is finished.

If improper connection between ground terminal of unit and the earth, it may get electric shock through unexpected route.



Caution

Injury



If heavy devices and so on are placed on this device, not only the main body of this device but also human bodies may be damaged.

Injury



The weight of this device is less than 15 kg, but be careful when this device is carried for moving and etc

Failure



Do not place heavy objects on this device. Also, do not impact to this device.

Use the power source basing on the following “Ratings of Power Source”. Do not supply the voltage and the frequency out of the designated range. Malfunctions may occur.

Table Ratings of Power Source

Item	Contents
Kind of Power	Single Phase Alternate Current
Frequency	50 Hz or 60 Hz
Rated Input Voltage	AC 100 V - AC 240 V
Allowable Input Voltage Range	AC 90 V - AC 250 V
Connector	Rectangular 3P (With ground)
Maximum Power Consumption	Less than 100 VA

Use this device in the following environment.

Table Operation Environment

Item	Contents
Environment	Limited for only use in room
Use Altitude	Up to 200 m
Operating Temperature	+5 °C ~ +40 °C
Humidity	Less than 85 %RH (No dew generation)
Impulse Withstand (Overvoltage) Category	II
Pollution Degree	2



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This Instruction Manual

This instruction manual (Hereafter, this manual) describes a handling method of MSD5000A.

A configuration is shown following.

“Introduction”:	A general explanation, accessories and external view of this device
“Basic Operation”:	Main operations when this device is handled
“Detailed Operation”:	All operation when this device is handled.
“Appendix”:	Block diagram, ratings, specifications and etc. of this device

Rule in this instruction manual

[Name and etc.]: The brackets mean the characters on the screen or descriptions on the rear panel of this device.

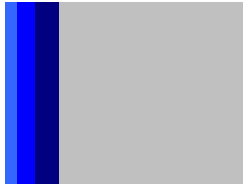
Key

: This figure means a key operation.

* This device is operated by a touch panel. On the operation, “XX are chosen” means “Touching” the panel.

* Figures of the displayed screen and functions described in this manual may be different from versions of the device and may be not equipped. Please contact Eiden’s Sales Department should you have further questions. Inquiries are at the back of this instruction manual





Chapter 1. General

1.1 General

This device is a multi platform DTV signal generator.

DTV signal (Terrestrial TV, Cable TV and Satellite TV) in the world, such as Japan, China, U.S.A, Europe, Brazil and etc., can be generated by this device only.

Also, options such as fading simulator, impulsive noise generator, BER counter and etc., are lined up, so that functions can be extended according to user's needs. This device can be used widely from production to development of receivers.

DTV: Digital Television

BER: Bit Error Rate

1.2 Features

- (1) The TS generator, the modulator and the RF converter are fitted into one device and small and portable size is enabled.
- (2) A seven-inch wide VGA touch panel is equipped, so that an excellent operability is provided by the combination of the operation keys, the rotary knob and it.
- (3) Modulation systems for Terrestrial TV, Cable TV and Satellite TV in Japan, China, U.S.A, Europe, Brazil and etc. are covered.
- (4) Two kinds of RF converter, such as a half-size converter (Standard) and a full-size converter (High performance), are lined up.
- (5) The output RF frequency covers 30 MHz to 1000 MHz. (*1)
- (6) The output RF level in the range from -120 dBm to +10 dBm can be varied in 0.01 dB step. (*2)
- (7) DTV signal (Terrestrial TV, Cable TV and Satellite TV) in the world can be chosen and be generated. (*3)
- (8) Up to 2 routes of TS can be generated. (*4)
- (9) The options such as fading simulator, impulsive noise generator, BER counter and etc., are lined up, so that functions can be extended according to user's needs. (*5)
- (10) Eiden's fading simulator (4409A) or impulsive noise generator (1908A) can be connected to this device. (*6)

*1 A central output frequency range is limited according to the modulation system chosen.

*2 The maximum output level is limited according to the output frequency.

*3 The modulation systems are limited according to the license bought.

*4 Total rate of two routes is less than 90 Mbps.

*5 There is a restriction in the combination of the option.

*6 Only the device having full-size converter can be connected to 4409A or 1908A through IF input/output terminal. In the case that this device is connected to 1908A, the RF output terminal of 1908A is used.

TS: Transport Stream

RF: Radio Frequency

VGA: Video Graphics Array

1.3 Accessories

Check that this device is not damaged by the transport after taking it out from a package. Also, check that following accessories are prepared. Inform to Eiden's Sales Department, if this device is damaged or if any accessories are lacked.

Table 1-1 Accessories

Item Name	No of pcs.
Instruction Manual	1
Test Data	1
Power Cable	1
3P - 2P Conversion Connector	1
N type U-link	1 set

1.4 External View

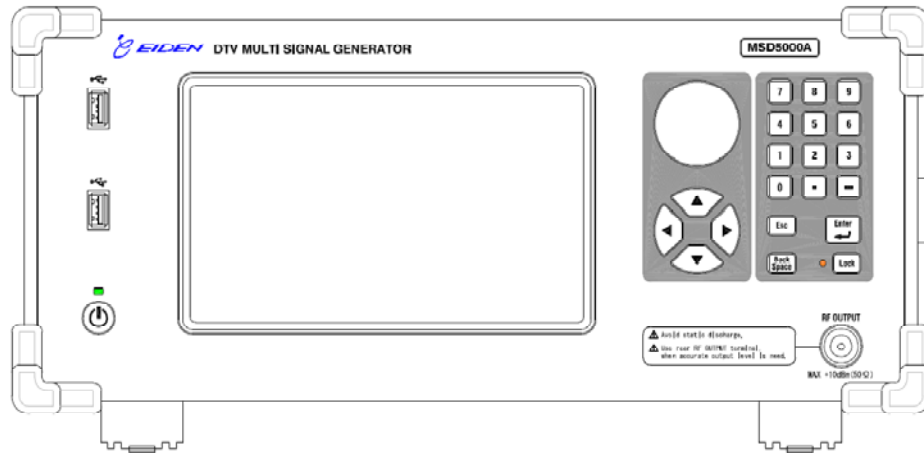


Figure 1-1 Front Panel

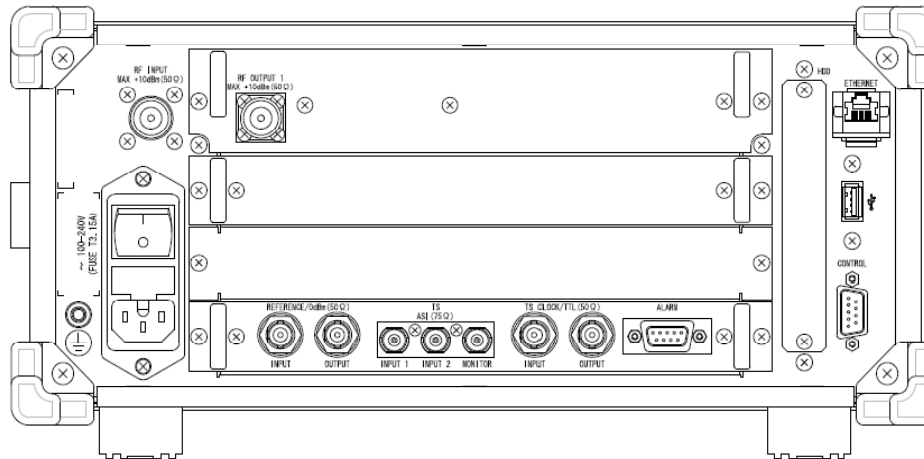


Figure 1-2 Rear Panel

Dimensions:

Width: 380 mm/ Height: 150 mm/ Depth: 440 mm]

(Excluding projections)

Weight:

Less than 14 kg

Chapter 2. Basic Operation

2.1 Names and Overviews of Each Parts

Here, the names and the overviews of each part are explained.

2.2 Front Panel

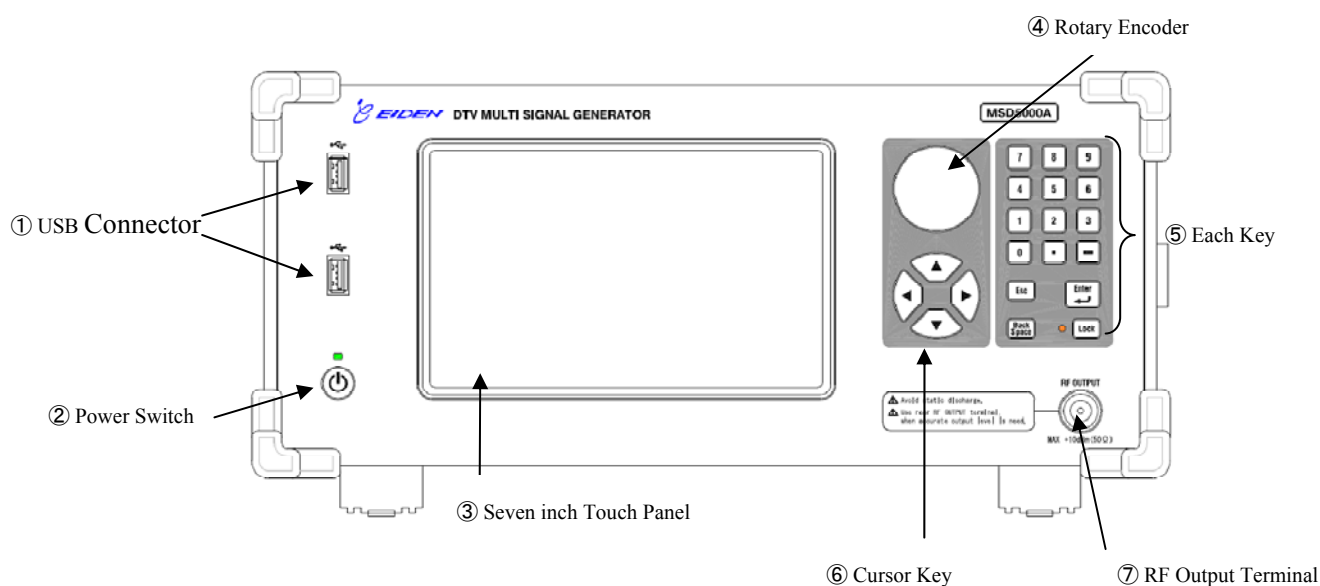


Figure 2-1 Front Panel

① USB Connector

Contents can be transmitted from an USB memory.
Also, a mouse or a keyboard can be connected.



② Power Switch [POWER]

This device is turned the power ON or OFF.
Hold down it for a while if this device is turned off.



③ Seven inch Touch Panel.

This is a screen of this device. This is the touch panel, so that this device is controlled by this. This is used by combing with cursor keys or ten-key pad according to the setting contents.

USB: Universal Serial Bus

④ Rotary Encoder

The value is increased or decreased. The cursor is moved up or down when file is chosen.

⑤ Each Key

Numeric Keypad: This is used for the input of the numerical value.

ENT Key: This is used for the input and the decision.

ESC Key: This is used for the escape and the cancel.

Back Space Key: This is used for the backspace.

Lock Key: This is used for avoiding error operations. If this button is pressed, the other keys are not accepted.

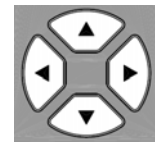
The condition is released if the lock key is pressed for a while.

During the keys are locked, an LED on the side of this key is lit.



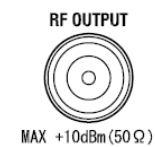
⑥ Cursor Key

These keys are used for up/down/right/left key. Only the up/down key or the right/left key is enabled by the condition of the screen.



⑦ RF OUTPUT Terminal

The RF signal is sent out.



ENT: Enter

ESC: Escape

2.3 Rear Panel

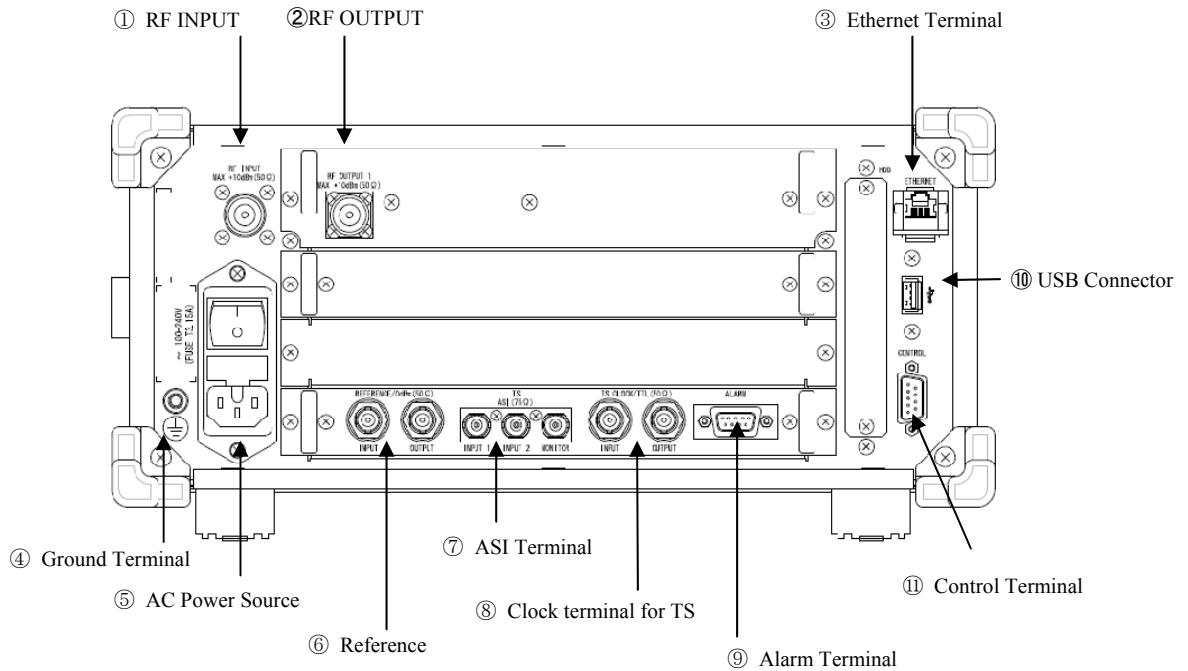
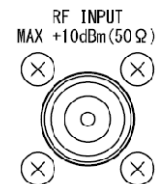


Figure 2-2 Rear Panel

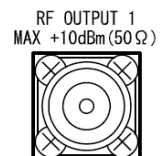
① RF Input Terminal [RF INPUT]

This is an RF input terminal. This terminal is connected to ② [RF OUTPUT].



② RF Output Terminal [RF OUTPUT]

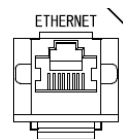
This is an RF output terminal. This terminal is connected to ① [RF INPUT].



ASI: (Digital Video Broadcasting) An-synchronous Serial Interface

③ ETHRNET Terminal [ETHRNET]

This is an Ethernet terminal. This is connected to LAN or etc. This is used for the remote control and the transmission of the contents files.



④ Ground Terminal

This is a ground terminal of this device. Ground this terminal surely.

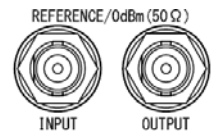


⑤ AC Power Source and Power Switch on the rear panel

Supply single phase AC voltage from 100 V to 240 V. The power source is turned On/Off.

⑥ Reference [REFERENCE]

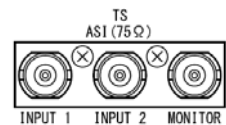
INPUT: 10 MHz clock signal is supplied. A clock of the modulation part is synchronized.



OUTPUT: The clock signal synchronized with the modulation part is sent out.

⑦ ASI Terminal [TS ASI]

INPUT 1: This is input 1. If the modulation system is DVB-T, the signal supplied is handled as HP. If the modulation system is ATSC or ISDB-T and if the broadcast TS is supplied, this is used as the external TS input terminal.

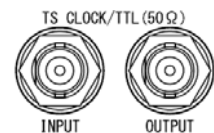


INPUT 2: This is input 1. If the modulation system is DVB-T, the signal supplied is handled as LP.

MONITOR: TS (TS1 or TS2) generated internally can be sent out.

⑧ Clock Terminal for TS [TS CLOCK]

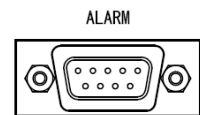
INPUT: An external clock signal is supplied.



OUTPUT: The clock signal synchronized with the TS output is sent out.

⑨ Alarm Terminal [ALARM]

* This terminal is not used at the present.



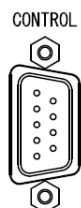
⑩ USB Terminal

The contents can be transmitted from an USB memory. Also, a mouse or a keyboard can be connected.



⑪ Control Terminal

This terminal is used for the connection to Eiden's fading simulator or etc.



2.4 Simple Setting Method

Procedures of the choice and the reproducing of TS file and the generation of the modulated wave (DVB-T) are explained. Refer to chapter 3 “Details of Operation” for the details.

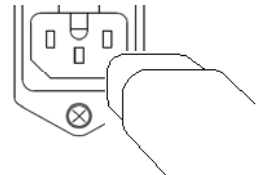
2.4.1 Preparation and Connection

1. Ground the ground terminal of this device.

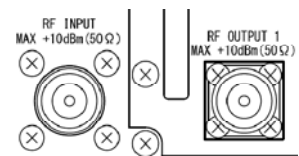


2. Insert the power cable attached to AC inlet on the rear panel and connect it to the outlet of the commercial power.

The power voltage range is AC 100 V - 240 V.



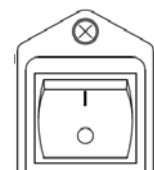
3. Use the N type U-Link (50 Ω) and connect [RF INPUT] and [RF OUTPUT 1] by it.



4. Connect the measurement device (DUT, a tuner, a spectrum analyzer or etc.) to the [RF OUTPUT] terminal.



5. Press the power switch on the rear panel to [I] (ON) direction.



6. Press the power switch on the front panel.

This device is turned on.



2.4.2 Output Frequency and Level Setting

The output frequency is set to 500 MHz and the output level is set to +5 dBm.

1. Choose [RF converter] tab.

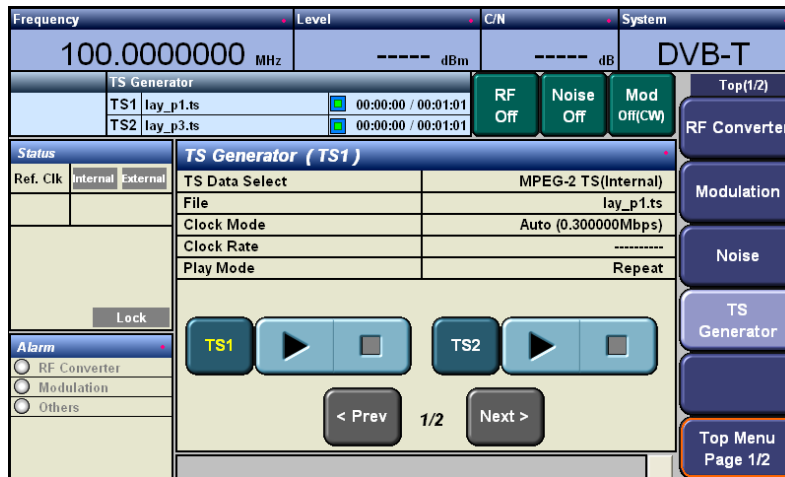


Figure 2-3 Main Screen

2. Choose area surrounded by a red square in following screen.

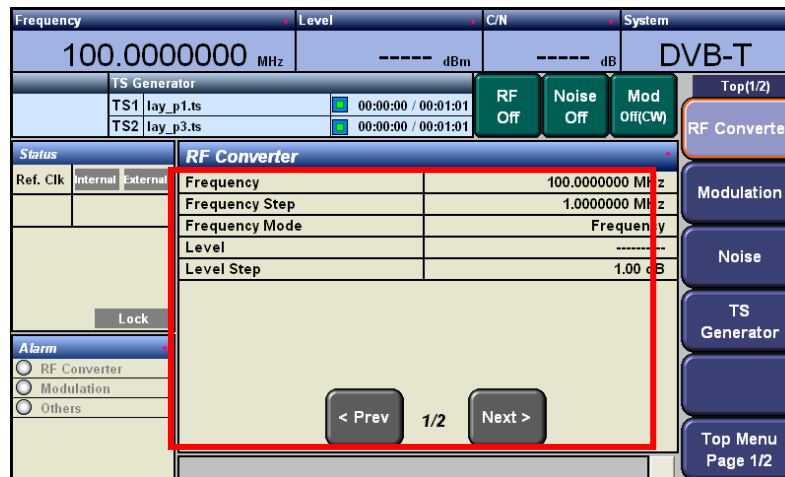


Figure 2-4 RF Converter Screen

3. Choose an arrow mark in the red circle.



Figure 2-5 RF Converter Setting Screen


4. Following window is opened. Type a numerical value and press ENT key .



Figure 2-6 Frequency Window

5. Next, an output level is set.

Choose an arrow mark of [Level] surrounded by the red circle.

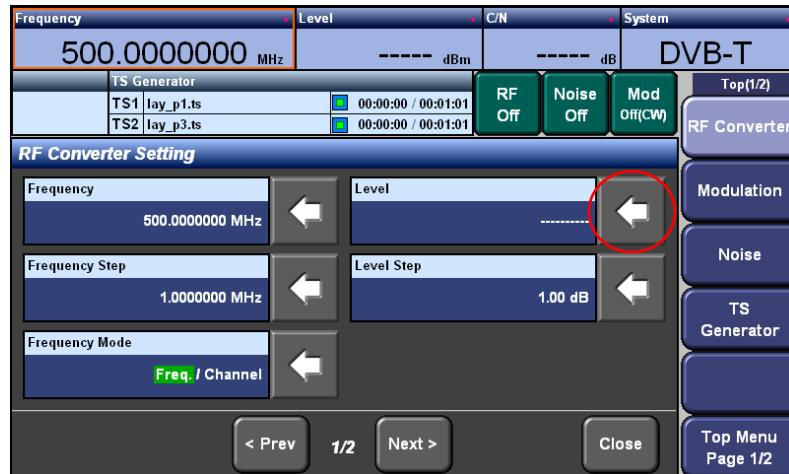



Figure 2-7 RF Converter Setting Screen

6. Type a numerical value and press ENT key .

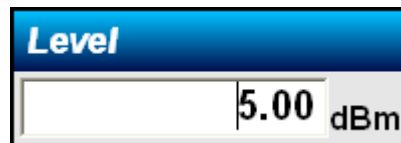


Figure 2-8 Level Window

7. The frequency is only displayed. The [Level] is displayed as [-----], however, this is normal. If the RF signal is not sent out, the level is not displayed.

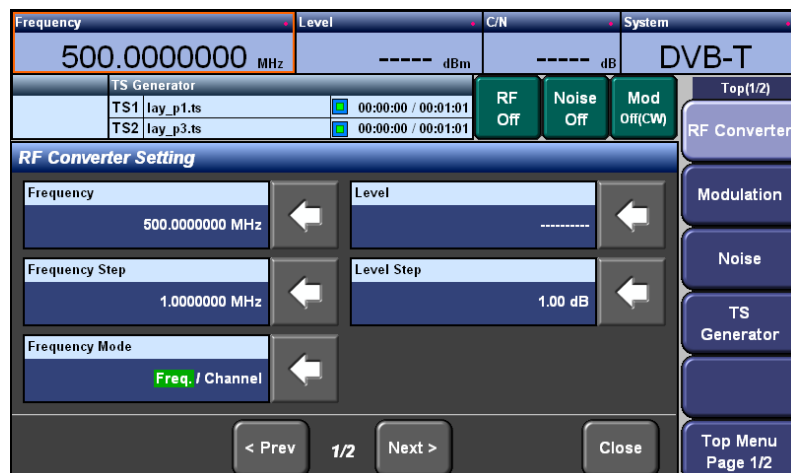


Figure 2-9 RF Converter Setting Screen

2.4.3 Transmission Parameter Setting

Here, following values are set.

System Bandwidth: 6 MHz, FFT Size: 8k, Guard Interval: 1/16,
 Constellation: 64QAM, Hierarchy Information: No, Code Rate (HP): 3/4,
 Cell ID: Not used

1. Choose [Modulation] tab.

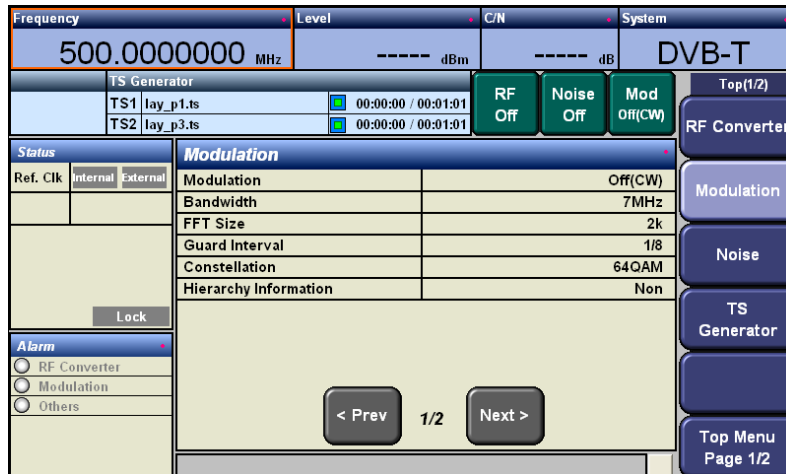


Figure 2-10 Modulation Screen

2. Choose area surrounded by a red square in following screen.

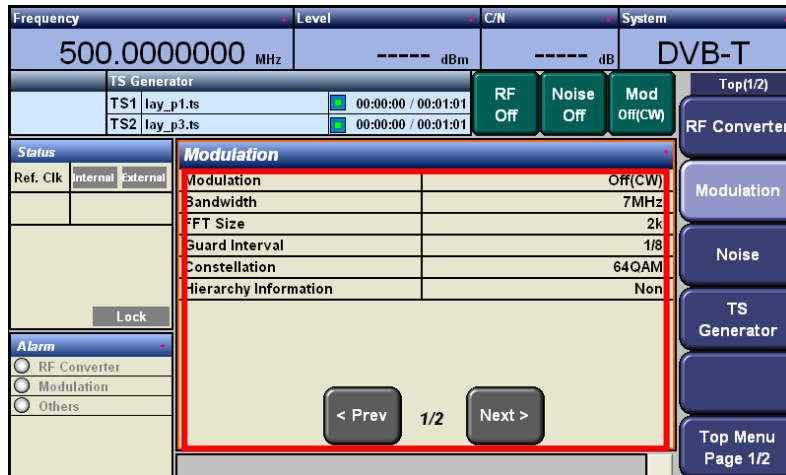




Figure 2-11 Modulation Screen

FFT: Fast Fourier Transform

3. Choose the arrow marks  on the right of items and set them from the top.

Press the [NEXT]  if the items in the window are finished setting.

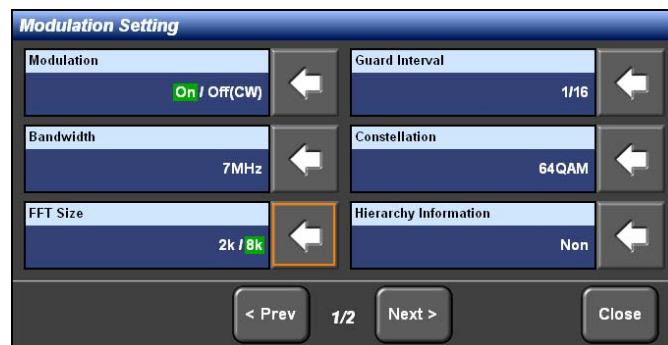



Figure 2-12 Modulation Setting Screen

- Modulation [Modulation]

Set [On].



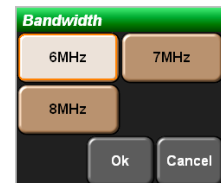
- Guard Interval [Guard Interval]

Choose [1/6] and press [Ok] .




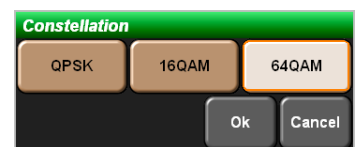
- Bandwidth [Bandwidth]

Choose [6 MHz] and press [Ok] .



- Constellation [Constellation]

Choose [64QAM] and press [Ok] .




- FFT Size [FFT Size]


Set [8k].



- Hierarchy Information [Hierarchy Information]

Choose [Non] and press [Ok] .



- If the [Next]  is chosen at the screen of procedure 3, following screen is displayed.

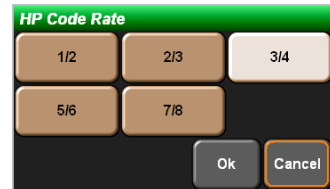
Choose the arrow marks  like procedure 3 and set each item.



Figure 2-13 Modulation Setting Screen

- HP Code Rate [HP Code Rate]

Choose [3/4] and press [Ok]



- Cell ID Switch [Cell ID Switch]

Set [Off].



Other items do not need to be set.

2.4.4 RF Output

A modulated RF signal is sent out.

- The RF signal is sent out if [RF Off]  or [Mod Off]  on the top display is chosen.

Also, when [RF on]  is displayed, the [Level] is displayed.

If the modulation is started, [Mod On]  is displayed.

If each button is chosen, they can be set to “Off”.

If the RF is set to “On”, the level is displayed.

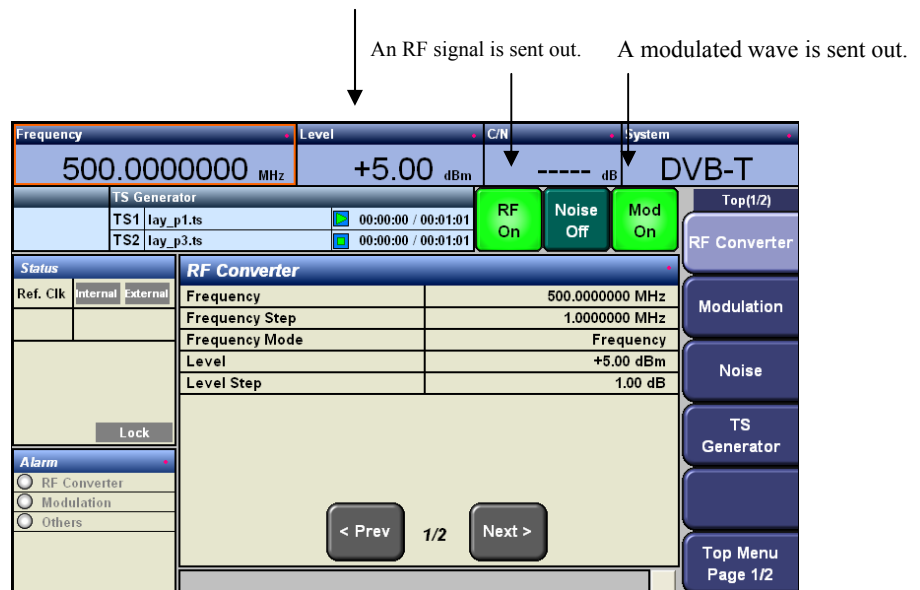


Figure 2-14 RF Converter Screen

2.4.5 Reproduction of TS File

How to choose TS files and how to reproduce them from the internal device are explained.

Here, “lay_p1.ts” of the TS file in F drive is loaded.

If the settings of 2.2.2 - 2.2.4 are finished, the modulated wave set is sent out by reproducing the TS.

1. Choose [TS Generator] tab.

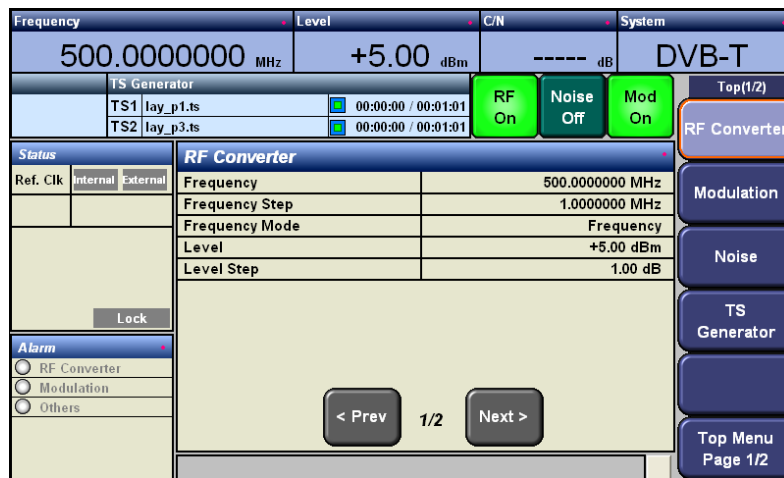


Figure 2-15 Main Screen

2. Choose area surrounded by a red square in following screen. Confirm that



is colored yellow. This device equips 2 routes of the TS output, however, only TS1 is used in this time.

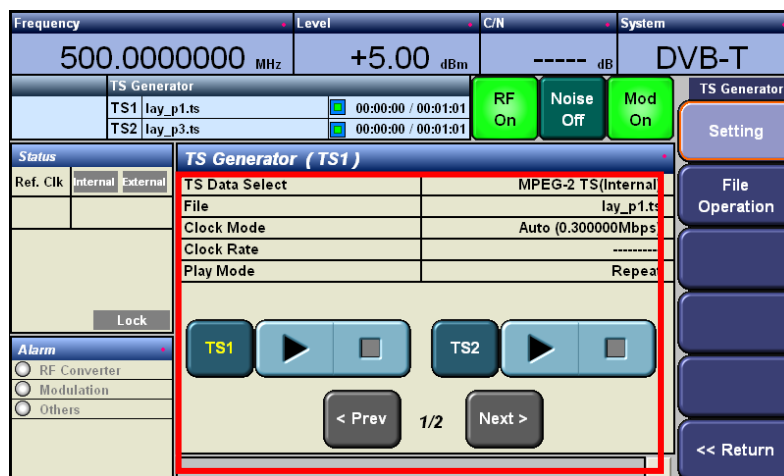


Figure 2-16 TS Generator (TS1) Screen

3. Choose the arrow marks  on the right of items and set them.

Only an item of [File] is set at the next procedure 4.


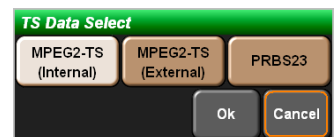

Choose an arrow mark  of [File] if the settings of the items other than [File] are finished.



Figure 2-16 TS Generator (TS1) Screen

- TS Data Selection [TS Data Select]




Choose [MPEG2-TS (Internal)] and press [Ok] .

(The TS is reproduced by the internal device.)

- Clock Mode [Clock Mode]



Choose [Auto] and press [Ok] .

(The reproduction rate is read from the TS file.)

- Clock Rate [Clock Rate]

No setting is needed.

- Play Mode [Play Mode]

Set [Repeat].



(The TS file is reproduced repeatedly.)

- The setting screen for [File] is opened. Choose a drive, a directory and a file name and press [Ok]

(The directory configuration and etc. may be different by the setting condition.)





Figure 2-18 File Select Screen

- Confirm that the file is set. Choose [Close] and exit the screen.



Figure 2-19 TS Generator (TS1) Screen

- The reproduction is started if the reproduce button  is pressed.

The reproduction is stopped when the stop button  is pressed.

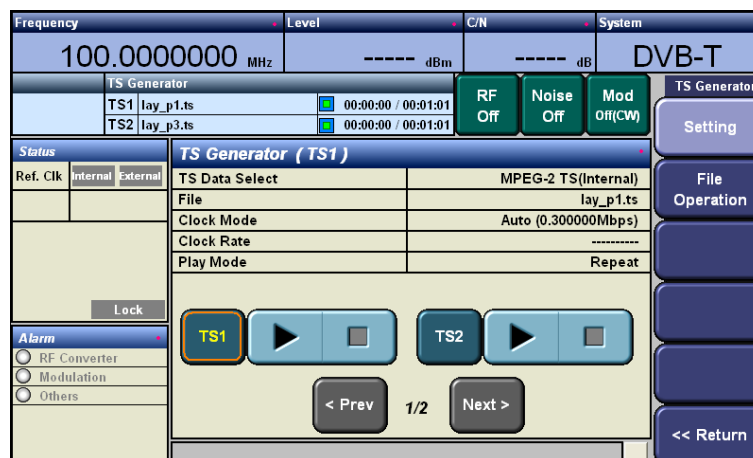


Figure 2-20 TS Generator (TS1) Screen

Chapter 3. Detailed Operation

3.1 Common Settings at RF Output

Common outlines of screens and RF settings in all modulation schemes are explained.

3.1.1 Outline of Screen

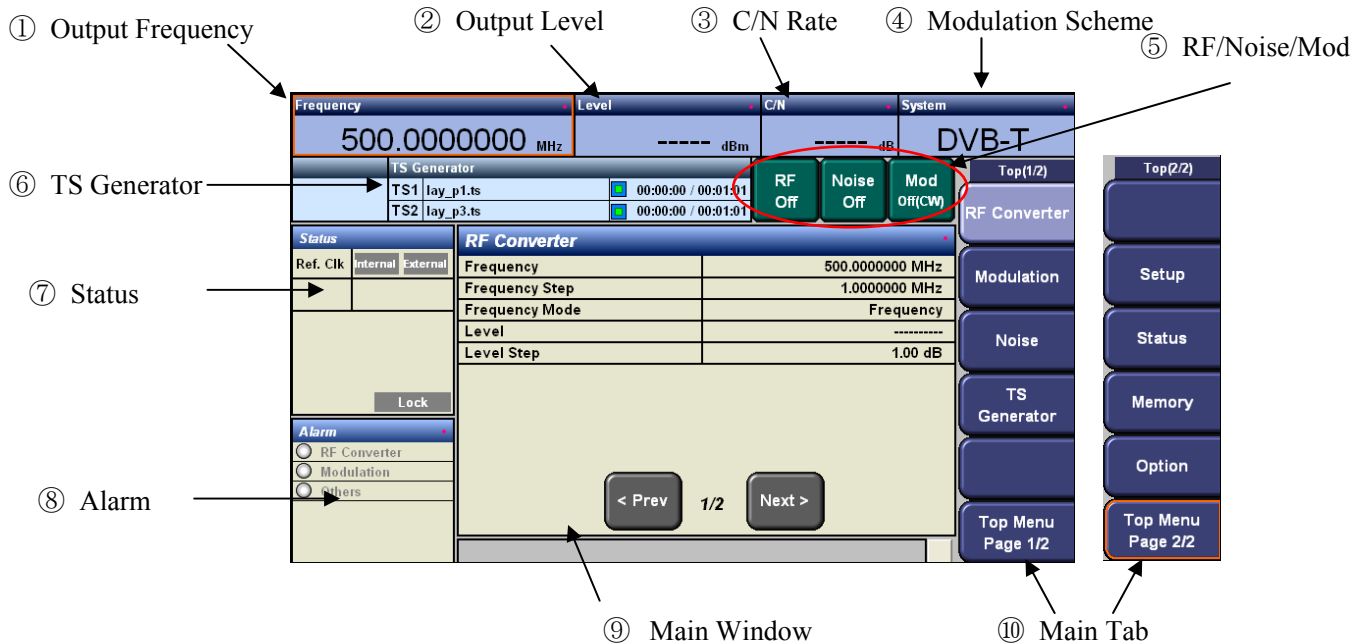


Figure 3-1 Main Screen

Items chosen (set) by the items other than the buttons are dotted by the red point.



The frame of the item chosen is surrounded by the orange square.



: If plural screens are opened, the next screen is displayed.



: If plural screens are opened, the previous screen is displayed.

- ① The output frequency or the channel is displayed.
If this item is chosen and the up/down key is operated, the value can be changed
- ② The output level is displayed If the RF output is turned Off, the numerical value is not displayed If this item is chosen and the up/down key is operated when the RF output is turned On, the value can be changed
- ③ A C/N rate is displayed If a Noise is turned Off, the numerical value is not displayed If this item is chosen and the up/down key is operated when the Noise is turned On, the value can be changed.
- ④ The modulation scheme is displayed. The setting is changed by the choice.
- ⑤ These are RF/Noise/Mode control buttons. The RF output, the noise addition, the modulation can be turned On/Off.
- ⑥ The conditions of the internal TS generators are displayed. The name and the time of the file reproduced are displayed.
- ⑦ The status is displayed. The conditions of the synchronization clock, the keylock and etc. are displayed. Ref.CLK[Internal] means the operation under the internal clock. [External] means the operation under the external clock.
If [Lock] is colored, the keys are locked. The control by the touch panel and the keys is impossible unless the lock key on this device is pressed for a while and the keylock condition is released.
- ⑧ The alarm is displayed. If this button is chosen, the details are displayed.
- ⑨ This is the main window. The contents are changed according to the condition chosen. If the main window is chosen, the detailed setting screen is displayed.
- ⑩ These are the main tabs. The settings of this device are changed. There are two tab screens.

3.1.2 Frequency and Level Setting [RF Converter]

The settings of the output frequency, the output level and the steps are explained.

The setting methods of the output frequency and the output level are common to each modulation scheme. However, the channel setting is different by the modulation scheme.

The frequency setting method is explained by procedure 1 - 3 and the channel setting method is explained by procedure 4.

1. Choose [RF Converter] tab and choose the main window (Surrounded by the red square). [RF Converter Setting] window is displayed.

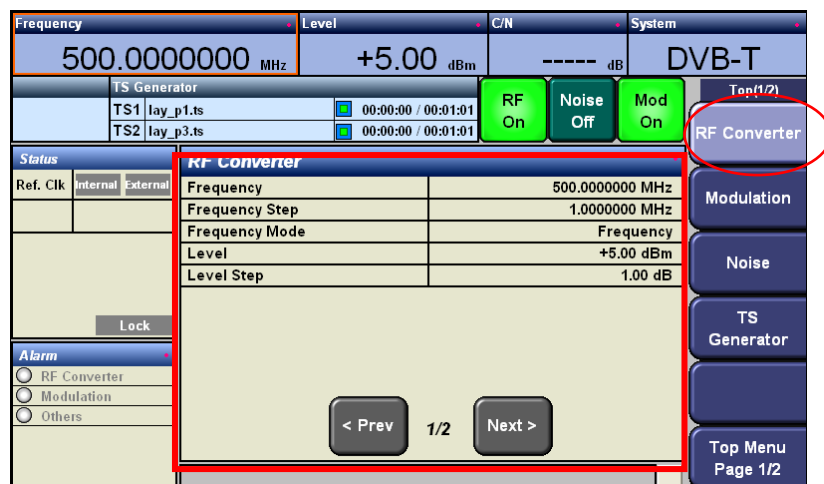


Figure 3-2 RF Converter Screen




2. Each value is set by choosing each arrow mark 



Figure 3-3 RF Converter Screen (1/2)

Type the numerical values of ① - ④ for the direct input by the cursor key and the numeric keypad and set the value by ENT key .

Press ESC key  if the screen is exited without the value setting.

① The output frequency [Frequency] is set.



Figure 3-4 Frequency Setting Window

② The output level [Level] is set.

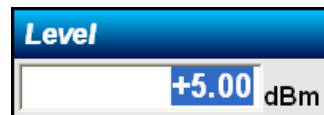


Figure 3-5 Frequency Setting Window

③ The frequency step [Frequency Step] is set. Change [Delta Mode] to [Step] if this value is used. The usage is explained in procedure 3.




Figure 3-6 Frequency Step Setting Window

- ④ The level step [Level Step] is set. Change [Delta Mode] to [Step] if this value is used. The usage is explained in procedure 3.



Figure 3-7 Level Step Setting Window

- ⑤ The frequency mode [Frequency Mode] is set. The setting by the frequency [Freq.] and the setting by the channel [Channel] are switched by choosing the arrow mark . The channel setting is different by the modulation scheme. The usage is explained in procedure 4.

3. Choose [Next] on [RF Converter Setting].

The screen (2/2) is displayed.

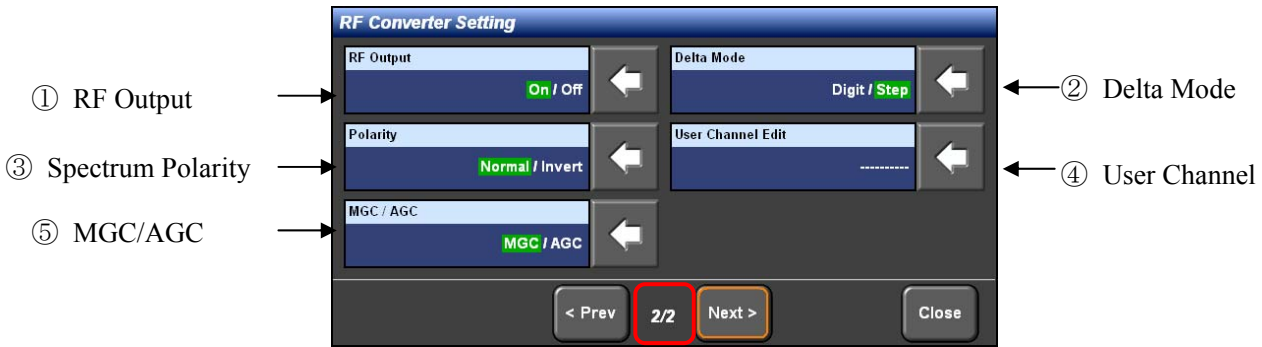




Figure 3-8 RF Converter Screen (2/2)

① The RF output [RF Output] is set. The RF output is turned On/Off by choosing

the arrow mark .

② The delta mode [Delta Mode] is set. Whether the frequency step changed up/down is set by the step set or by each voluntary digit is switched by choosing

the arrow mark .

* If [Level] is set on the top screen by the delta mode, [RF On] needs to be set.

- Step [Step] (Frequency/Level)

The frequency at the delta mode is changed by the up/down key after choosing of [Frequency] on the top screen and the numerical value is changed in the step width set.

Also, the level is changed after choosing [Level] and the numerical value is changed.



Figure 3-9 Settings of Frequency and Level at Delta Mode (Step)


- Digit [Digit] (Frequency/Level)



The frequency at the delta mode is changed by the up/down/left/right key after choosing of [Frequency] on the top screen and the numerical value of the digit designated is changed.

Also, the level is changed after choosing [Level] and the numerical value is changed.





Figure 3-10 Settings of Frequency and Level at Delta Mode (Digit)


③ The frequency spectrum polarity [Polarity] is set. The polarity [Normal/Invert] is switched by choosing the arrow mark .

④ The user channel [User Channel Edit] is set. If the arrow mark  is chosen, the setting window is opened. The channel number (1 - 100) and the name can be added to the voluntary frequency. Press [Ok]  after the setting.


- Channel Number Setting [Number]

The channel number is moved up/down by the upward arrow mark  and the downward arrow mark .

- Frequency Setting [Frequency]

The value is typed by the cursor and the numeric keypad and is decided by ENT key .

- Channel Name Setting [Frequency]

The name is typed and is decided by ENT key .

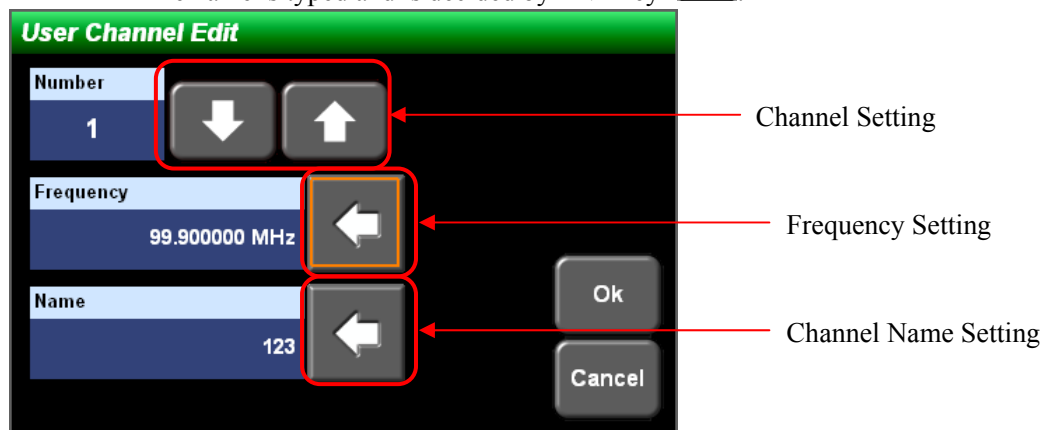



Figure 3-11 User Channel Edit Setting Window

⑤ MGC/AGC [MGC/AGC] is set. MGC (Manual Gain Control)/AGC (Automatic Gain Control) of the output level is switched by choosing the arrow mark .



4. Choose [Channel] at ⑤ in procedure 2 if the channel setting is needed.

If the setting is switched, [Frequency] is changed to ① [Channel] and [Frequency Step] is changed to ② [Offset].



Figure 3-12 RF Converter Setting (Channel Mode)

① The channel is set.

If the arrow mark  is chosen, the following setting window is opened. The window is different by the modulation scheme. If the channel is chosen and [Ok]  is pressed, the frequency is set according to the channel set by the user or the channel in each country.


If [Cancel]  is chosen, the operation is cancelled and the window is closed.



Figure 3-13 Channel (DVB-T/H) Window

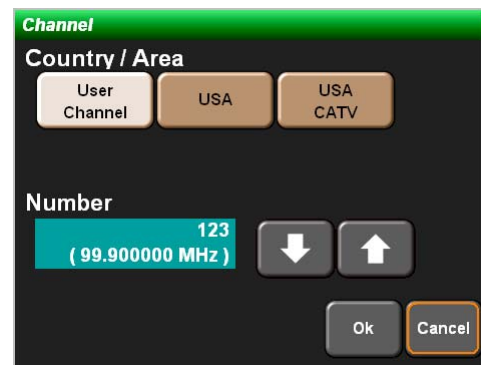


Figure 3-14 Channel (ATSC) Window

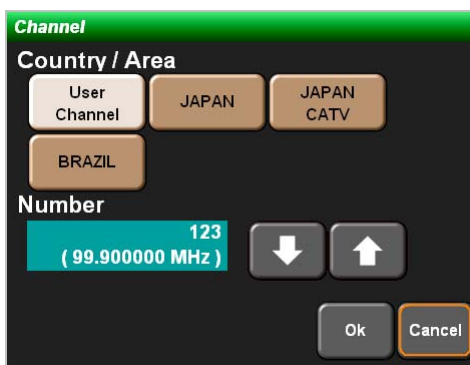




Figure 3-15 Channel (ISDB-T) Window

- ② The frequency offset is set.

If the arrow mark  is chosen, the following setting window is opened.

If the offset value is chosen and [Ok]  is pressed, it set.


If [Cancel]  is chosen, the operation is cancelled and the window is closed.





Figure 3-16 Offset Window

3.1.3 Modulation Scheme Setting [System]

The setting methods of the modulation scheme are explained.

1. Choose [System] on the top display and choose the modulation scheme in the window opened.

If [Ok]  is pressed, the modulation scheme is changed.

If [Cancel]  is chosen, the operation is cancelled and the window is closed.

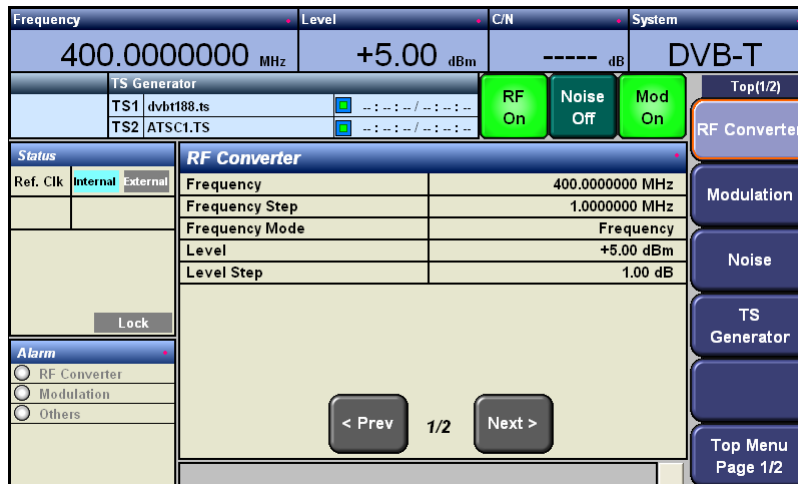


Figure 3-17 Main Screen



Figure 3-18 SYSTEM Window

3.1.4 Noise Setting [System]

The noise signal can be added to the output signal.

The C/N value set is added digitally in response to the modulation scheme.

1. Choose [Noise] tab and choose the main window (Surrounded by the red square).
[Noise] window is displayed.

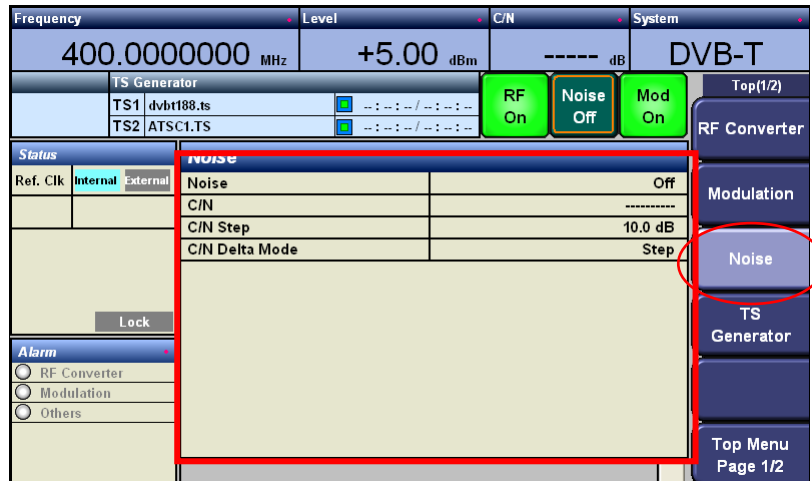


Figure 3-19 Noise Window






2. Each value is set by choosing each arrow mark .




Figure 3-20 Noise Setting Screen


Type the numerical values of ③ - ④ for the direct input by the cursor key and the numeric keypad and set the value by ENT key .

Press ESC key  if the screen is exited without the value setting.

① The noise [NOISE] is set.

The noise is turned On/Off by choosing the arrow mark .

② The C/N delta mode [C/N Delta Mode] is set. Whether the C/N step changed up/down is set by the step set or by each voluntary digit is switched by choosing

the arrow mark .

* If [C/N] is set on the top screen by the delta mode, [Noise On] needs to be set.

③ The C/N value [C/N] is set.

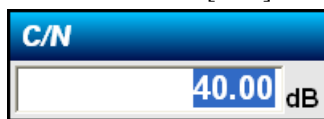


Figure 3-21 C/N Window

④ The C/N step [C/N Step] is set.



Figure 3-22 C/N Step Window


3.2 Transmission Parameter Settings [Modulation]

The setting methods of each modulation scheme are explained.

3.2.1 Setting Method of DVB-T/H

The setting methods in the case that the modulation scheme is DVB-T or DVB-H are explained.

1. Choose [System] on the top display and choose [DVB-T] or [DVB-H] in the window opened.

If [Ok]  is pressed, the modulation scheme is changed.

2. Choose [Modulation] tab and choose the main window (Surrounded by the red square). [Modulation] window is displayed.

* In the case of DVB-T, the window is configured in two pages. In the case of DVB-H, the window is configured in three pages. The third page [3/3] is the special setting window for DVB-H.



Figure 3-23 Modulation Window

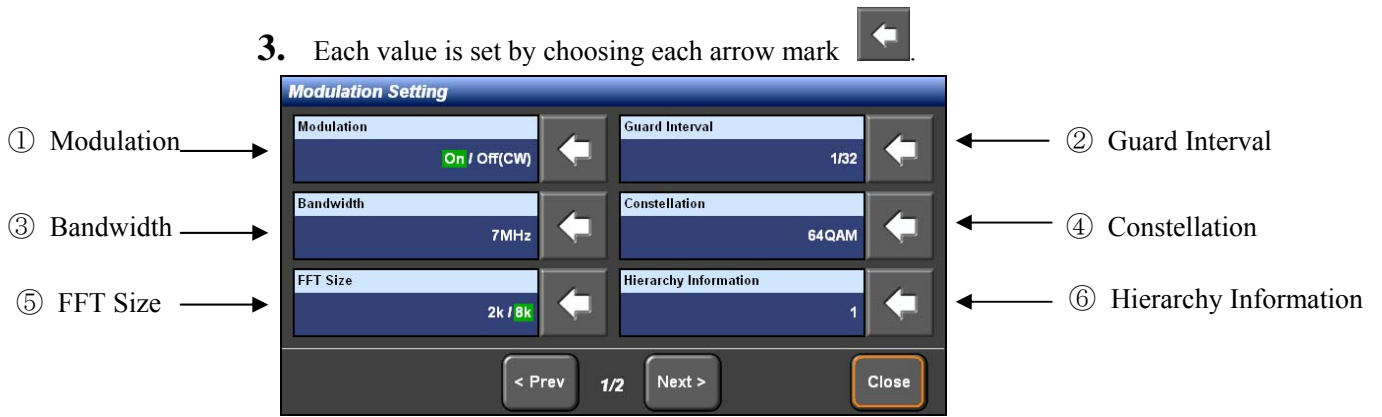




Figure 3-24 Modulation Setting (DVB-T/H) Screen

The items of ② - ④ and ⑥ can be set if [Ok]  is pressed after the setting in each window.


If [Cancel]  is chosen, the operation is cancelled and the window is closed.

① The modulation [Modulation] is set.

The modulation is turned On/Off by choosing the arrow mark .

In the case of Off, the no-modulated wave (CW: Continuous Wave) is sent out.

② The guard interval [Guard Interval] is set.

If the arrow mark  is chosen, the following window is opened.


If the value is chosen and [Ok]  is pressed, it is set.



Figure 3-25 Guard Interval Window

- ③ The bandwidth [Bandwidth] is set.

The setting item is a little different by DVB-T and DVB-H.

If the arrow mark  is chosen, the following window is opened.

If the value is chosen and [Ok]  is pressed, it is set.

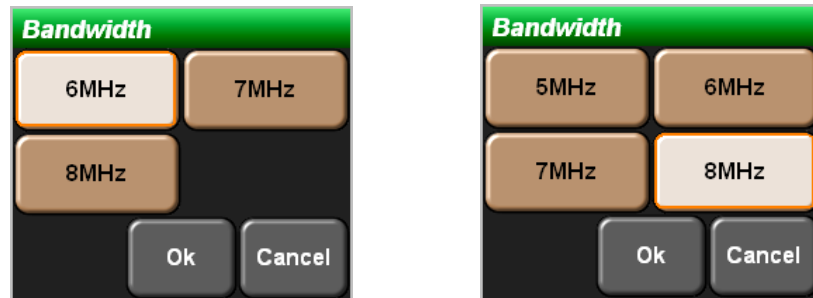



Figure 3-26 Bandwidth Window (Left: DVB-T, Right: DVB-H)

- ④ The constellation [Constellation] is set.

If the arrow mark  is chosen, the following window is opened.

If the value is chosen and [Ok]  is pressed, it is set.

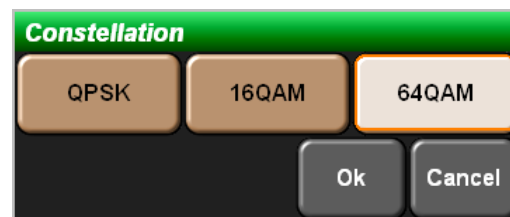





Figure 3-27 Constellation Window

- ⑤ The FFT size [FFT Size] is set.

The setting item is a little different by DVB-T and DVB-H.

If the arrow mark  is chosen, the following window is opened.

The FFT size is switched by choosing the arrow mark  in the case of DVB-T.

If the value is chosen and [Ok]  is pressed, it is set in the case of DVB-H.

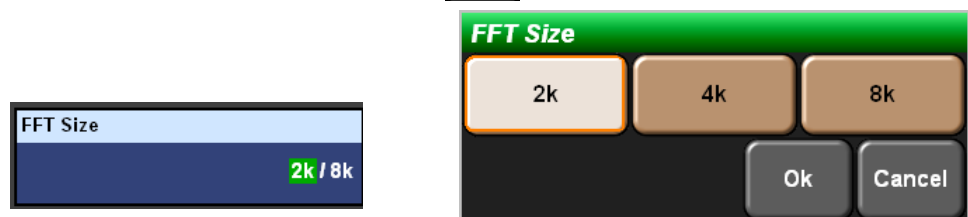




Figure 3-28 FFT Size Window (Left: DVB-T, Right: DVB-H)

- ⑥ The hierarchy information [hierarchy] is set.

If the arrow mark  is chosen, the following window is opened.


If the value of α is chosen and [Ok]  is pressed, it is set.


* If LP of the hierarchy information is needed, α needs to be set the value other than "Non". ($\alpha = 1, 2$ or 4).


* If the constellation [Constellation] is QPSK, α is set to "Non" only.



Figure 3-29 Hierarchy Information Window

4. Choose the Next>  on the lower part of [Modulation Setting].
2nd page of [Modulation Setting] is displayed.

If the <Prev  is pressed, the previous screen is displayed.

Each item can be set by choosing the arrow marks .

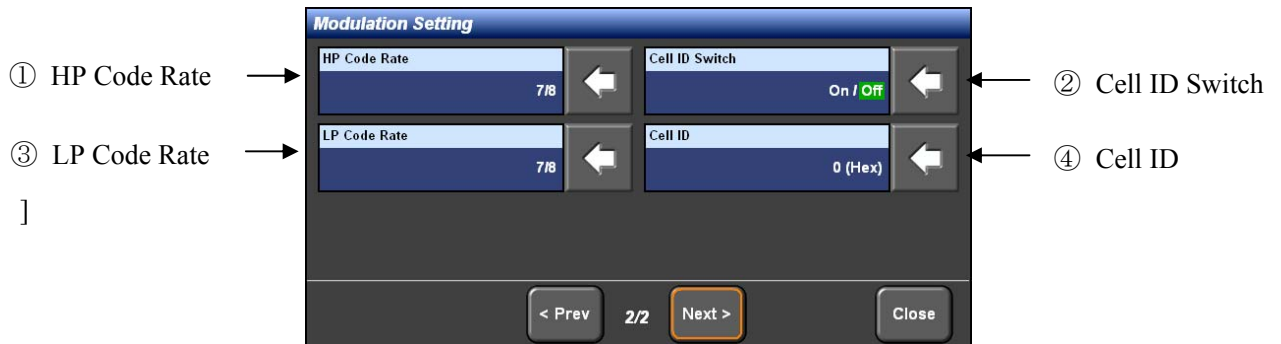



Figure 3-30 Modulation Setting (DVB-T/H) Screen

- ① HP code rate [HP Code Rate] is set.

If the arrow mark  is chosen, the following window is opened.

If the code rate is chosen and [Ok]  is pressed, it is set.

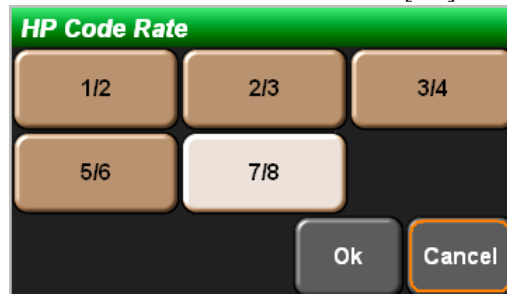



Figure 3-31 HP Code Rate Window


- ② The Cell ID switch [Cell ID Switch] is set.

The Cell ID switch is turned On/Off by choosing the arrow mark .

In the case of Off, ④ [Cell ID] is no-effective even if the Cell ID is set.

③ LP code rate [LP Code Rate] is set.

If the arrow mark  is chosen, the following window is opened.

If the code rate is chosen and [Ok]  is pressed, it is set.

* If LP needs to be used, ⑥ Hierarchy Information [Hierarchy] in procedure 2 needs to be set the value other than "Non". If "Non" is set, the LP code rate cannot be set.

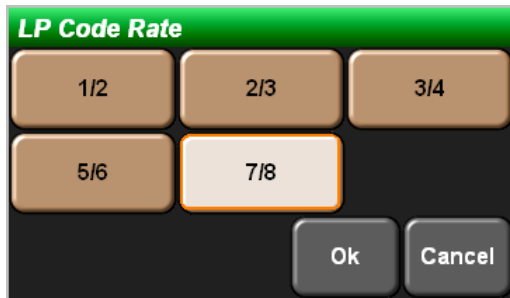




Figure 3-32 LP Code Rate Window

④ The Cell ID (Cell ID) is set.

If the arrow mark  is chosen, the following window is opened.

Type the value (Hexadecimal) by the up/down/left/right cursor key and set it by

ENT key .

Press ESC key  if the screen is exited without the value setting.

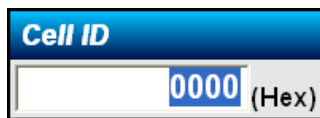





Figure 3-33 Cell ID Window

5. Choose the Next>  on the lower part of [Modulation Setting].
3rd page of [Modulation Setting] is displayed.

If the <Prev  is pressed, the previous screen is displayed.

Each item can be set by choosing the arrow marks .

* 3rd page is displayed only when DVB-H is chosen. In the case of DVB-T, 1st page and 2nd page are only displayed.



Figure 3-34 Modulation Setting (DVB-T/H) Screen

- ① The symbol interleave [Symbol Interleave] is set.

* If the FFT size [FFT Size] is 8k, the In-Depth cannot be chosen.

- ② MPE FEC [MPE FEC HP] in the HP side is set [On/Off].
③ Time Slicing [Time Slicing HP] in the HP side is set [On/Off].
④ MPE FEC [MPE FEC LP] in the LP side is set [On/Off].

* If LP needs to be used, ⑥ Hierarchy Information [Hierarchy] in procedure 2 needs to be set the value other than "Non". If "Non" is set, the [MPE FEC LP] cannot be set.


- ⑤ Time Slicing [Time Slicing LP] in the LP side is set [On/Off].

* If LP needs to be used, ⑥ Hierarchy Information [Hierarchy] in procedure 2 needs to be set the value other than "Non". If "Non" is set, the [Time Slicing LP] cannot be set.

3.2.2 Setting Method of ATSC

The setting methods in the case that the modulation scheme is ATSC are explained.

1. Choose [System] on the top display and choose [ATSC] in the window opened.

If [Ok]  is pressed, the modulation scheme is changed.

2. Choose [Modulation] tab and choose the main window (Surrounded by the red square). [Modulation] window is displayed.

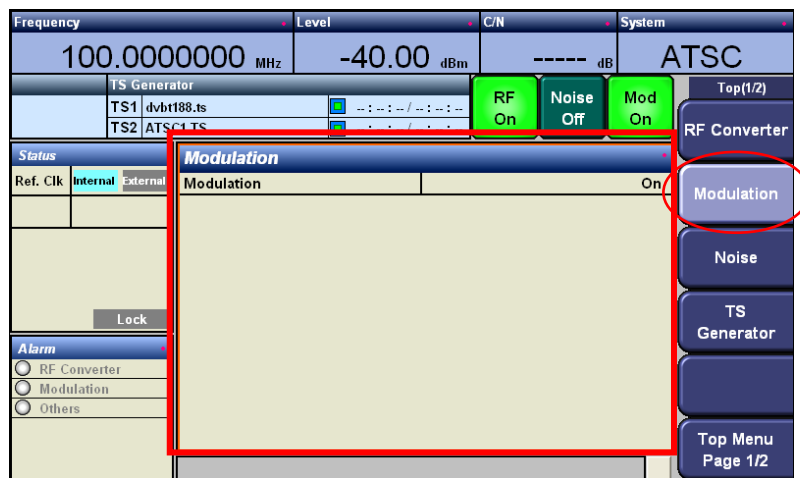



Figure 3-35 Modulation (ATSC) Window

3. Each value is set by choosing each arrow mark .

① Modulation Setting →

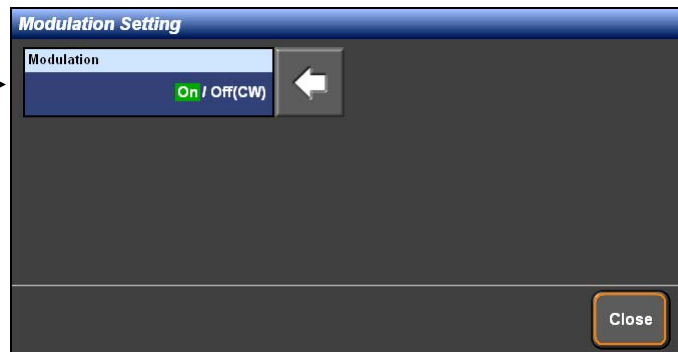


Figure 3-36 Modulation Setting (ATSC) Screen

- ① The modulation [Modulation] is set.

The modulation is turned On/Off by choosing the arrow mark .


In the case of Off, the no-modulated wave (CW: Continuous Wave) is sent out.

3.2.3

Setting Method of ISDB-T

The setting methods in the case that the modulation scheme is ISDB-T are explained.

1. Choose [System] on the top display and choose [ISDB-T] in the window opened.

If [Ok]  is pressed, the modulation scheme is changed.

2. Choose [Modulation] tab and choose the main window (Surrounded by the red square). [Modulation] window is displayed.

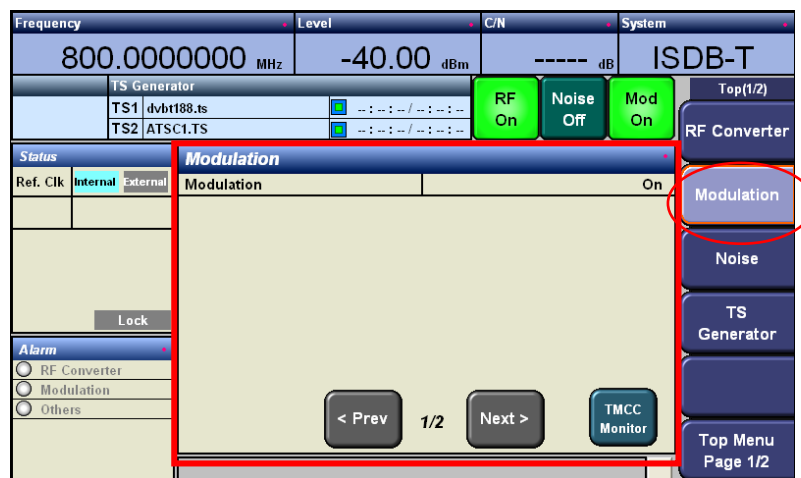



Figure 3-37 Modulation (ISDB-T) Window


3. Each value is set by choosing each arrow mark .

① Modulation Setting →




Figure 3-38 Modulation Setting (ISDB-T) Screen

① The modulation [Modulation] is set.

The modulation is turned On/Off by choosing the arrow mark .

In the case of Off, the no-modulated wave (CW: Continuous Wave) is sent out.

4. Choose TMCC Monitor  in the lower part of the [Modulation Setting] screen.

The transmission parameters are displayed.

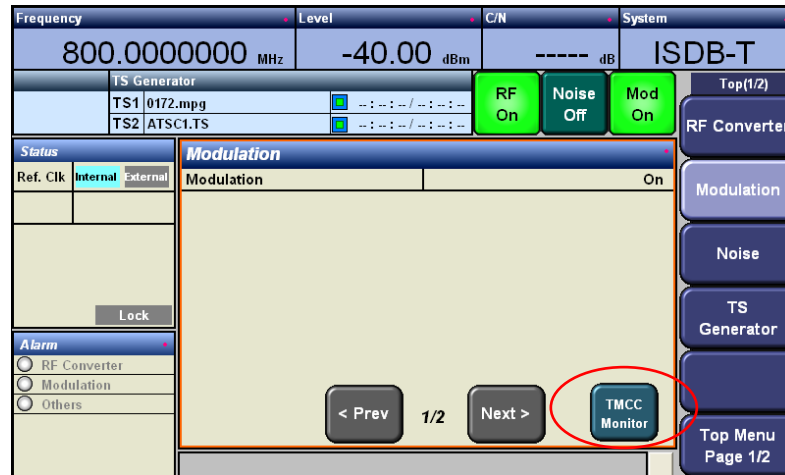


Figure 3-39 Modulation Setting (ISDB-T) Screen

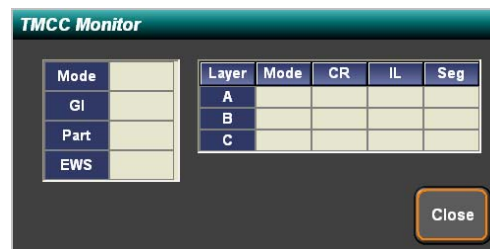



Figure 3-40 TMCC Monitor Window

3.2.4 Setting Method of CMMB

The setting methods in the case that the modulation scheme is CMMB are explained.

1. Choose [System] on the top display and choose [CMMB] in the window opened.

If [Ok]  is pressed, the modulation scheme is changed.

2. Choose [Modulation] tab and choose the main window (Surrounded by the red square). [Modulation] window is displayed.

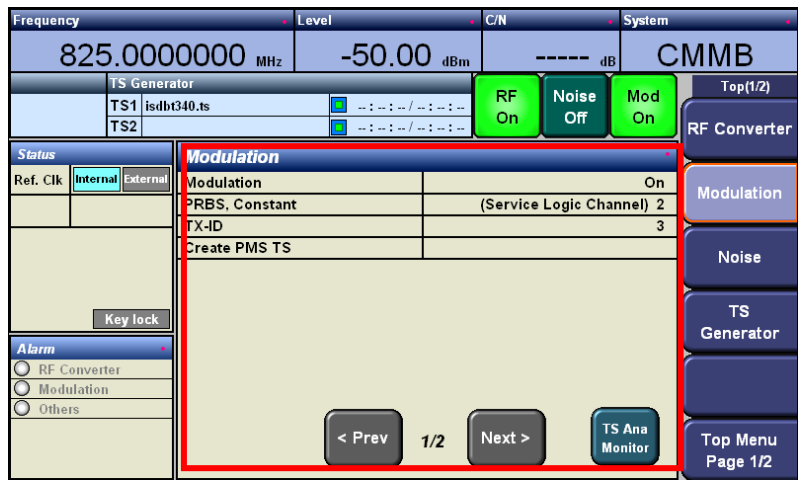


Figure 3-41 Modulation (CMMB) Window


3. Each value is set by choosing each arrow mark .



Figure 3-42 Modulation Setting (CMMB) Screen

① The modulation [Modulation] is set.

The modulation is turned On/Off by choosing the arrow mark .

In the case of Off, the no-modulated wave (CW: Continuous Wave) is sent out.

② PRBS, Constant [PRBS, Constant] is set.

The service logic channel changed is set to the data of PRBS or Constant by


choosing the arrow mark . Only one channel can be chosen. The kind of PRBS or Constant depends on the setting of the TS Data Select in TS Generator.



Figure 3-43 PRBS, Constant Setting Channel Window

③ TX-ID [TX-ID] is set.

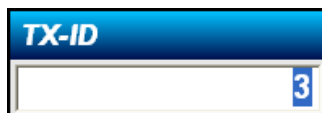


Figure 3-44 TX-ID Setting Window

- ④ Software of Create PMS TS [Create PMS TS] is run.

When this software is used, the transmission parameters in the PMS file can be changed.

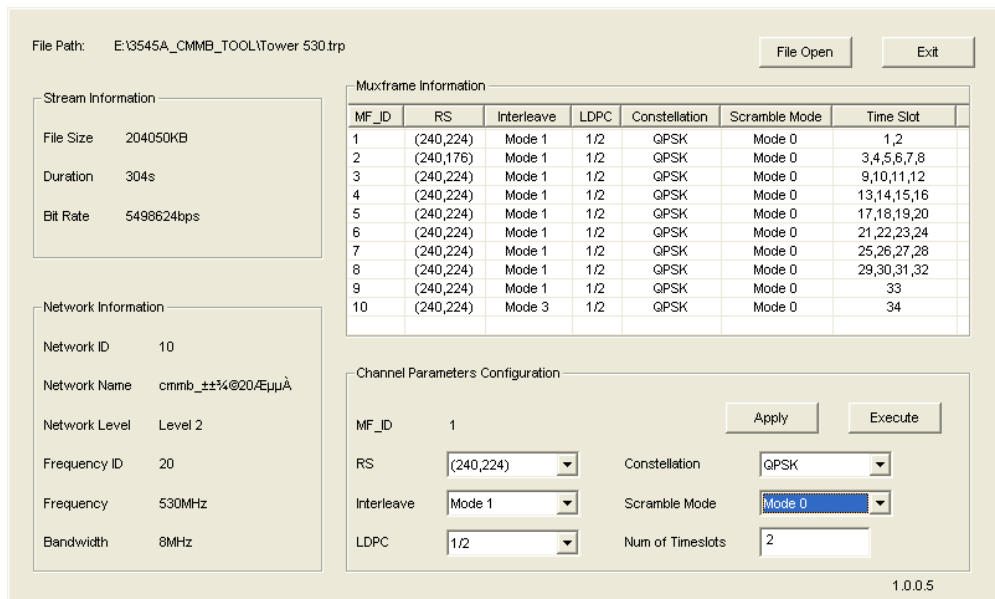


Figure 3-45 Create PMS TS Software Setting Window

Copy the contents to E-drive and choose [File Open].

* The contents cannot be read from the drives other than E-drive.

When the contents are read, the information is displayed in [Muxframe Information].

Choose a line of [MD_ID] desired to change and set each combo-box in [Channel Parameter Configuration].

[MF_ID]: Means the service logic channel.

[RS]: Means the kind of Reed-Solomon code.


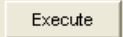
[Interleave]: Means interleave.

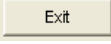
[Scramble Mode]: Means the scramble mode.


([Scramble code] is displayed on this device side.)


[LDPC]: The coding rate is set.

[Num of Timeslots]: The numbers of the slot are set.

The change is set by [Apply]  and the file is changed by [Execute] .

This software is exited by [Exit] .


4. Choose the Next>  on the lower part of [Modulation Setting].
2nd page of [Modulation Setting] is displayed.

If the <Prev  is pressed, the previous screen is displayed.

If each item in the red square is chosen, each item can be changed.

Choose the item from the setting window displayed and

press [Ok] . The change is set,

If [Cancel]  is chosen, the operation is cancelled and the window is closed.

* Following windows are opened only when the TS Data Select in the TS generator is set to the item other than PMS. The transmission parameter can be changed only when RRBS or Constant is set.)

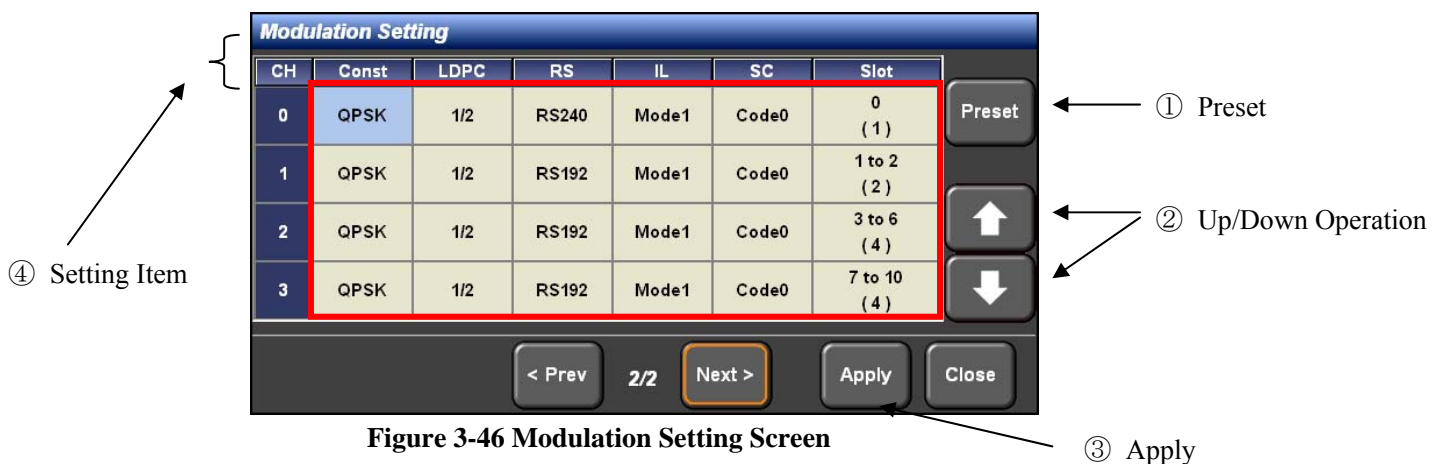


Figure 3-46 Modulation Setting Screen

- ① Preset [Preset] is set.
If the preset is chosen, the transmission parameter is changed to the condition which set already.
- ② UP/Down operation
The displayed CH moves to the top or bottom by each line.
- ③ The settings are applied [Apply].
If [Apply] is chosen after the change of each transmission parameter, the transmission parameters are set to this device.

- ④ The setting items are shown as follows.

[CH]: This is service logic channel. Up to 0 - 39 can be set.

[Const]: The modulation scheme is set.



Figure 3-47 Constellation Setting Window

[LDPC]: The coding rate is set.



Figure 3-48 LDPC Setting Window

[RS]: Reed-Solomon code is set.

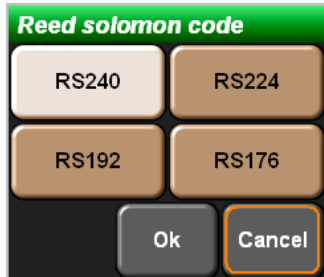


Figure 3-49 Reed-Solomon Code Setting Window

[IL]: Interleave is set.



Figure 3-50 Interleave Setting Window

[Slot]: The Time Slot is set. Set the start and end of the slot. The total slot number is displayed in the brackets. 3, 4, 5 and 6 are arranged in the following window and the total slot number is four.

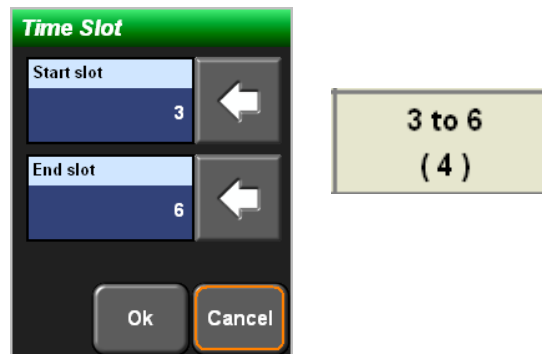


Figure 3-51 Time Slot Setting Window (Left) and Window after the setting (Right)

5. Choose Close.

The upper hierarchy is displayed.



Figure 3-52 Modulation Window

① Copy [Copy]

The transmission parameters of the contents supplied are read and PRBS and Constants are set to them. The transmission parameters of the contents can be confirmed at ③ [TS Ana Monitor]. (A conceptual diagram is shown below.)

② UP/Down operation

The displayed CH moves to the top or bottom by each line.

③ TS Analyze Monitor [TS Ana Monitor]

The transmission parameters of the contents supplied are displayed.

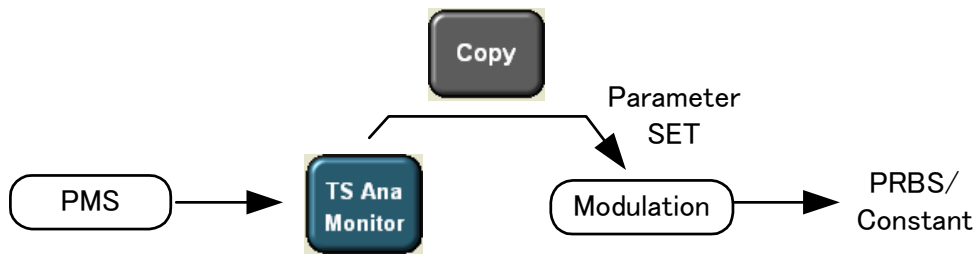


Figure 3-53 Copy Button Conceptual Diagram

3.3 Settings of TS Generator and File Operation

The TS generator can send out two routes of TS. The setting methods of the TS generator are explained.


Also, the operating methods of the files are explained.


3.3.1 Setting of TS Generator [TS Generator]

The setting methods excluding [TS Data Select] are same by the modulation scheme.

1. If the [TS Generator] tab is chosen, the TS Generator screen is displayed.

Here, TS1 of two TS output routes is set.

Choose  and the main window (Surrounded by a red square).

Choose TS2  in the case of TS2 like TS1.

There is no difference of the setting method of TS1 and TS2.

The characters of the route chosen are colored yellow.

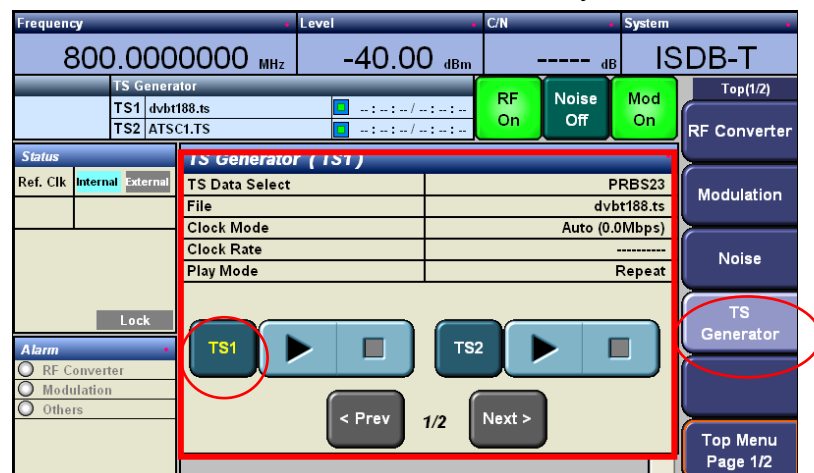


Figure 3-54 TS Generator (TS1) Window

2. Each value is set by choosing each arrow mark

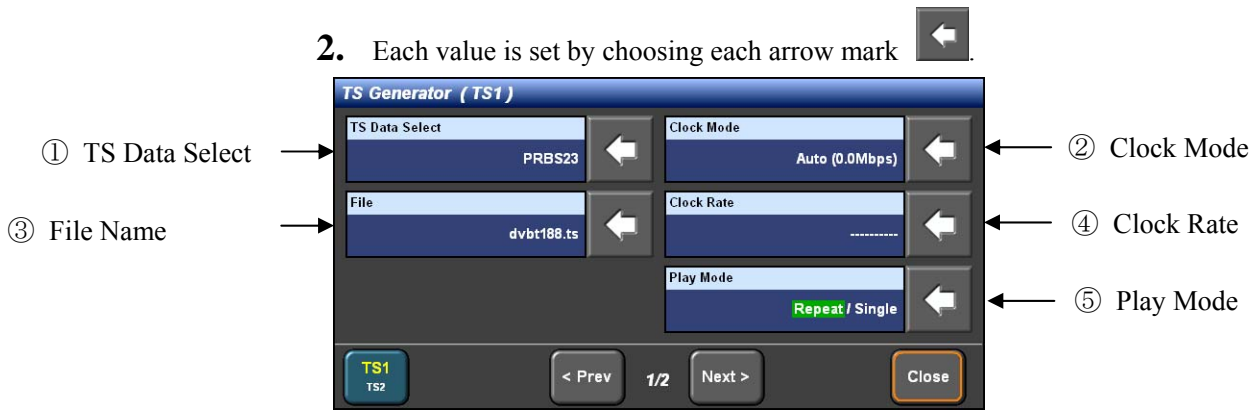


Figure 3-55 TS Generator (TS1) Screen

1 The TS data are chosen. [TS Data Select].

If the arrow mark is chosen, the following window is opened. The items displayed are different by the modulation scheme.

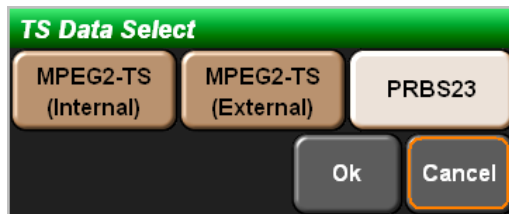


Figure 3-56 TS Data Select (DVB-T/H, ATSC) Window

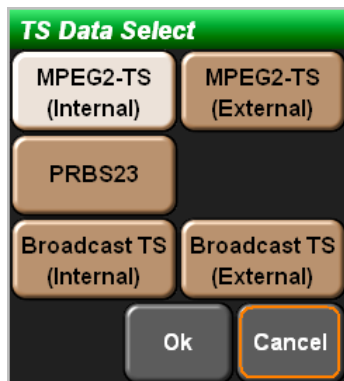


Figure 3-57 TS Data Select (ISDB-T) Window

[MPEG2-TS(Internal)]: MPEG2-TS is reproduced by the internal TS generator.

[MPEG2-TS(External)]: MPEG2-TS is supplied form the external device.

[PRBS23]: 23rd order M sequence PRBS is inserted to 187 Byte term after SYNC (47h) in the packet.

[BroadcastTS(Internal)]: The broadcast TS is reproduced by the internal TS generator.

[BroadcastTS(External)]: The broadcasting TS is supplied form the external device.

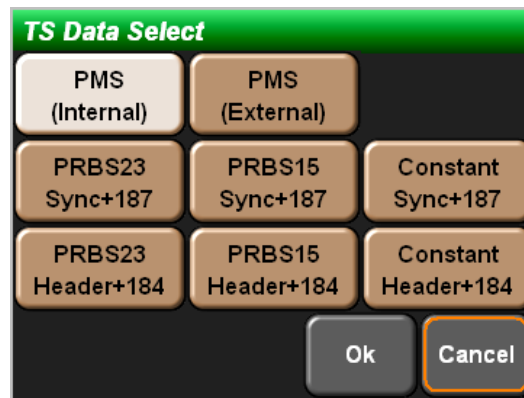


Figure 3-58 TS Data Select (CMMB) Window

[PMS(Internal)]: The PMS is generated by the internal TS generator.

[PMS(External)] : The PMS is supplied from the external TS generator.

[PRBS23 Sync+187]: The PN23 (Pseudorandom Signal) generated before the randomizer is modulated.

SYNC 47h (1 Byte) + PRBS (187 Byte)

[PRBS15 Sync+187] The PN15 (Pseudorandom Signal) generated before the randomizer is modulated.

SYNC 47h (1 Byte) + PRBS (187 Byte)

[Constant Sync+187]: The fixed pattern is modulated.

SYNC 47h (1 Byte) + Fixed Pattern 5Ah (187 Byte)

[PRBS23 Header+184]: The PN23 (Pseudorandom Signal) generated before the randomizer is modulated.

SYNC 47h (1 Byte) + HEADER 000110h (3 Byte) + PRBS (184 Byte)


[PRBS15 Header+184] The PN15 (Pseudorandom Signal) generated before the randomizer is modulated.

SYNC 47h (1 Byte) + HEADER 000110h (3 Byte) + PRBS (184 Byte)

[Constant Header+184]: The fixed pattern is modulated.

SYNC 47h (1 Byte) + HEADER 000110h (3 Byte) + Fixed Pattern 5Ah (184 Byte)

② The clock mode [Clock Mode] is set.

If the arrow mark  is chosen, the following window is opened.

If the clock mode is chosen and [Ok]  is pressed, it is set.

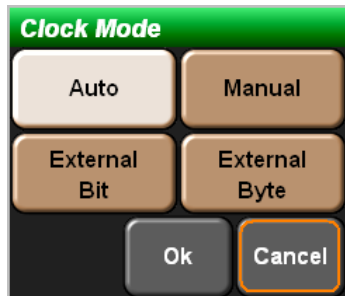


Figure 3-59 Clock Mode Window

[Auto]: The clock is calculated automatically by the PCR in the TS and the TS is reproduced.


[Manual]: Manual setting. The TS is reproduced according to the value of ④ [Clock Rate].

[External Bit]: The TS is synchronized with the external bit clock and is reproduced.

[External Byte]: The TS is synchronized with the external byte clock and is reproduced.

* In the case that the modulation scheme is ISDB-T and in the case that ① [TS Data Select] is BroadcastTS(External), 10 MHz clock needs to be supplied to the REFERENCE on the front panel and the broadcasting TS synchronized with the 10 MHz clock needs to be supplied.

③ The file is chosen. [File]

If the arrow mark  is chosen, the following window is opened.


If the file is chosen and [Ok]  is pressed, it is set.

(Directory configurations and etc. may be different by the setting condition.)





Figure 3-60 File Select Window

- ④ The clock rate [Clock Rate] is set.

If the arrow mark  is chosen, the following window is opened.

Type the value by the left/right cursor key and the numerical keypad and set it by

ENT key .

Press ESC key  if the screen is exited without the value setting.

- * This is enabled only when ② [Clock Mode] is [Manual].

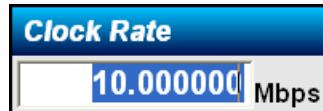



Figure 3-61 Clock Rate Window


- ⑤ The play mode [Play Mode] is set.

The play mode can be set to [Repeat/Single] by choosing the arrow mark .


[Repeat]: The TS file set is reproduced repeatedly.

[Single]: The TS file set is reproduced only once.

3. Choose the Next>  on the lower part of [TS Generator (TS1)].
2nd page of [TS Generator (TS1)] is displayed.

If the <Prev  is pressed, the previous screen is displayed.

Each item can be set by choosing the arrow marks .

If [TS1/TS2]  is chosen, TS1 and TS2 are switched.



Press [Close]  and close the window after setting.



Figure 3-62 TS Generator (TS1) Screen

① The seamless CC [Seamless CC] is set.

The setting of seamless CC is switched to [On/Off] by choosing the arrow mark .

In the case of On, the Continuity Counter in the TS is kept continuously and the TS is reproduced.


② The play range mode [Play Range Mode] is set.

The play range mode can be set to [All/Size] by choosing the arrow mark .

[All]: All TS file is reproduced.


[Size]: Only the TS file been set by ④ [Play Range] is reproduced.

③ The seamless TOT [Seamless TOT] is set.



The setting of seamless TOT is switched to [On/Off] by choosing the arrow mark .


In the case of On, the TOT is renewed according to the date of the system and the TS is reproduced.

- ④ The play range [Play Range] is set.

If the arrow mark  is chosen, the following window is opened.

Additionally, if the arrow mark is chosen, the numerical value input window is opened.

Type the value by the left/right cursor key and the numerical keypad and set it by ENT key . Press ESC key  if the screen is exited without the value setting.

If [Ok]  is pressed after typing, it is set.

[Play Start]: The start point of the TS reproduction is set. Set 0 if the TS is reproduced from the beginning.

[Play End]: The end point of the TS reproduction is set. Set the file size displayed at the first if the TS is reproduced to the end.

* The setting is enabled only when ② [Play Range Mode] is [Size].

* The range beyond the file size and the value that the Start value is larger than the End value cannot be designated.

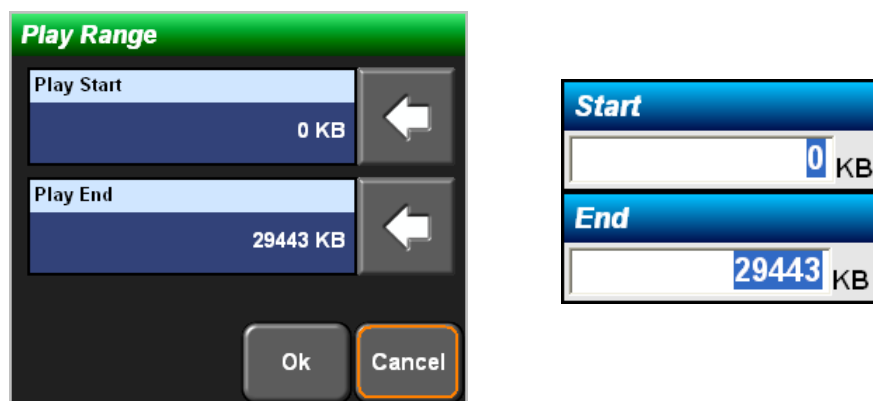




Figure 3-63 Play Range and Numerical Value Setting Windows



- ⑤ The TS monitor [TS Monitor] is set.



The [TS1/TS2] is switched by choosing the arrow mark .


The route chosen is sent out from [TS MONITOR] on the rear panel.


- Choose [Close]  on the lower part of [TS Generator (TS1)] and close the window.

The following screen is displayed.

Choose the route reproduced from [TS1]  or [TS2] .

The characters of the route chosen are colored yellow  .

The reproduction is started if the reproduce button  is pressed.

The reproduction is stopped when the stop button  is pressed.

* The TS1 and the TS2 are independent each other, so that 2 kinds of the TS can be reproduced.

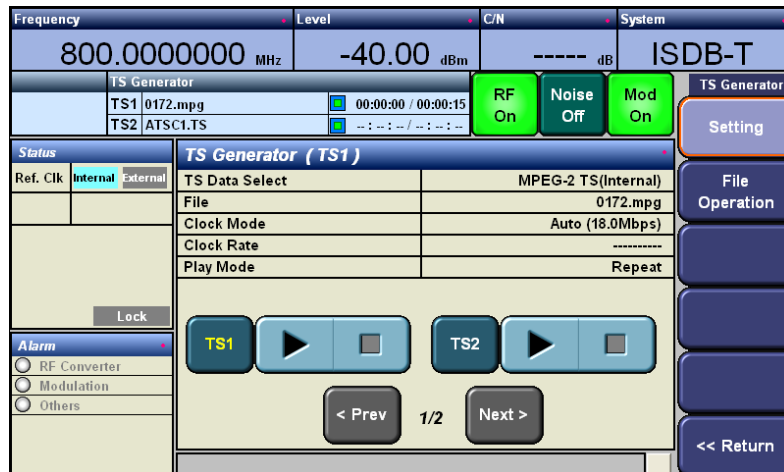


Figure 3-64 TS Generator Screen

3.3.2 File Operation [File Operation]

Each operation, such as the file copy and etc., is explained.

1. If the [TS Generator] tab is chosen, the TS Generator screen is displayed.
Choose [File Operation] tab

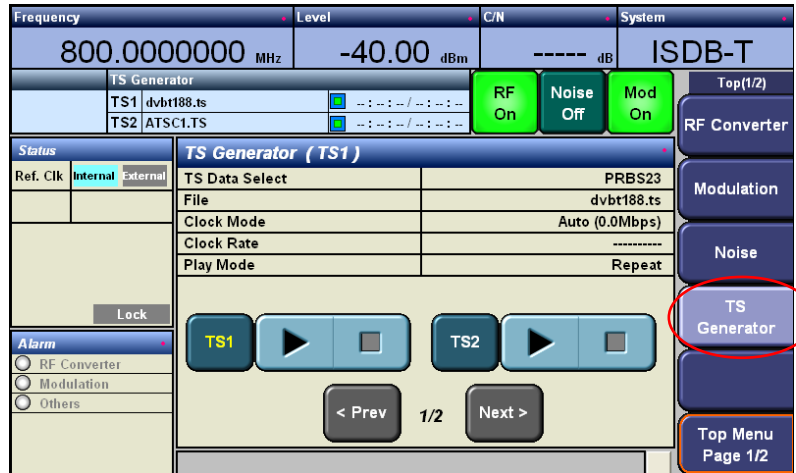


Figure 3-65 TS Generator Screen

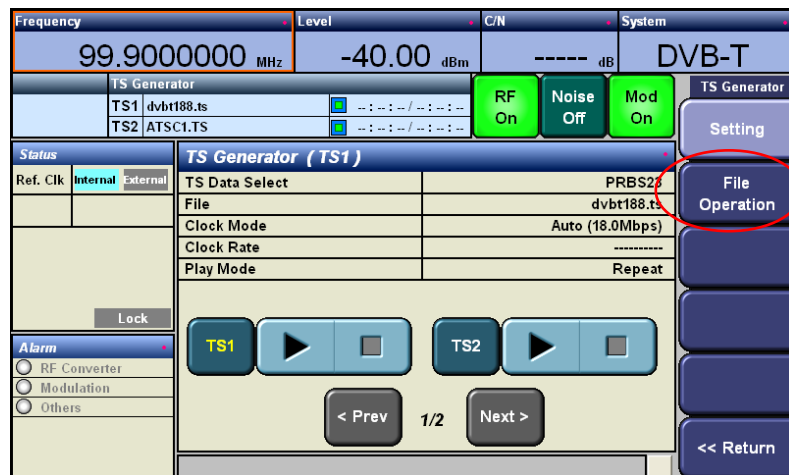



Figure 3-66 TS Generator Screen

2. The file is operated by pressing each button.

Press [Close]  and close the window after setting.

(The directory configuration and etc. may be different by the setting condition.)

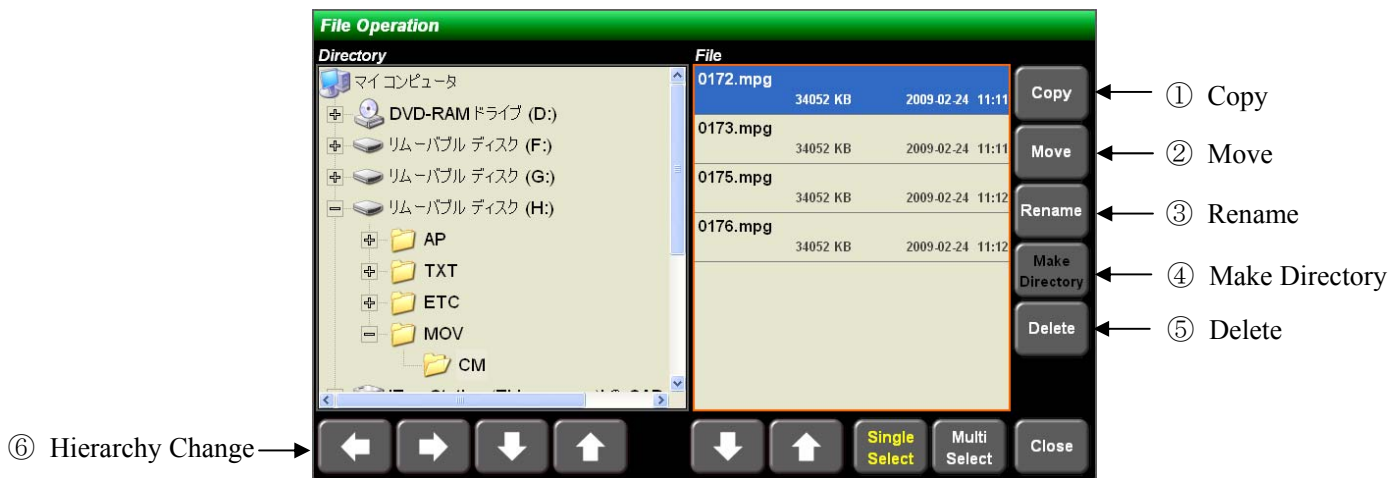




Figure 3-67 File Operation Window

⑦ Up/Down Choice ⑧ Single Select ⑨ Plural File Choice

- ① Copy [Copy]: The file is copied.
- ② Move [Move]: The file is moved.
- ③ Rename [Rename]: The file name is renamed.
- ④ Make directory [Make Directory]: A directory is made.
- ⑤ Delete [Delete]: The file is deleted.
- ⑥ The hierarchy referred is changed.

The upper directory is referred by pressing the left arrow key .

The lower directory is referred by pressing the right arrow key .

- ⑦ The directory or the file chosen is moved up/down
- ⑧ Single select [Single Select]: One file is chosen.
- ⑨ Plural files choice [Multi Select]: Plural files are chosen. The files chosen can be copied and etc.

* [Single Select] and [Multi Select] cannot be chosen at the same time. The side of the character colored yellow is set. [Single Select] is chosen in this sample figure.

* The characters of the invalid buttons by the operating condition are colored black.

Example)  

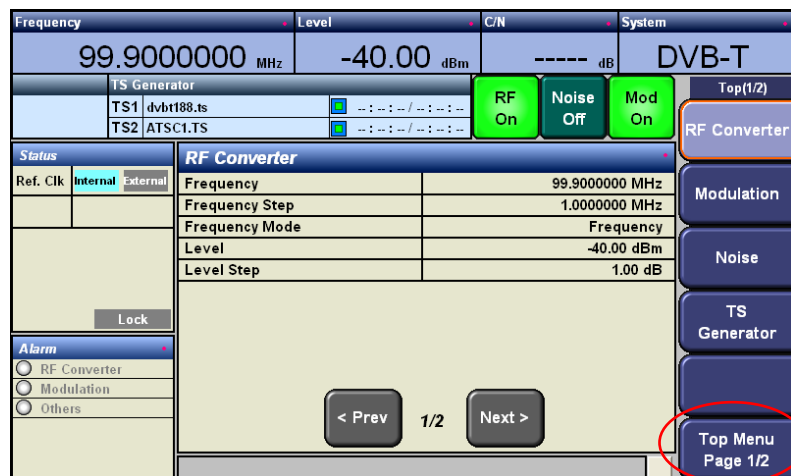
3.4 Operation Relating to Device

The setting methods and the confirmation relating to the setup of peripheral devices and the status display are explained.

3.4.1 Devise Setup [Setup]

The setup of this device is explained.

1. Choose [Top Menu Page 1/2] and change the tab to [Top Menu Page 2/2].



2. Choose [Setup] tab and the main window (Surrounded by red square).
[Setup] window is opened.

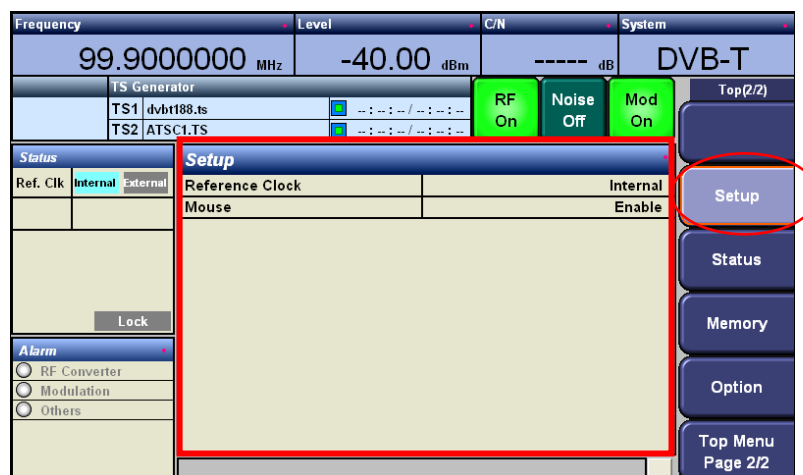




Figure 3-68 Setup Window

3. Each item can be set by choosing the arrow marks .

Press [Close]  and close the window after setting.

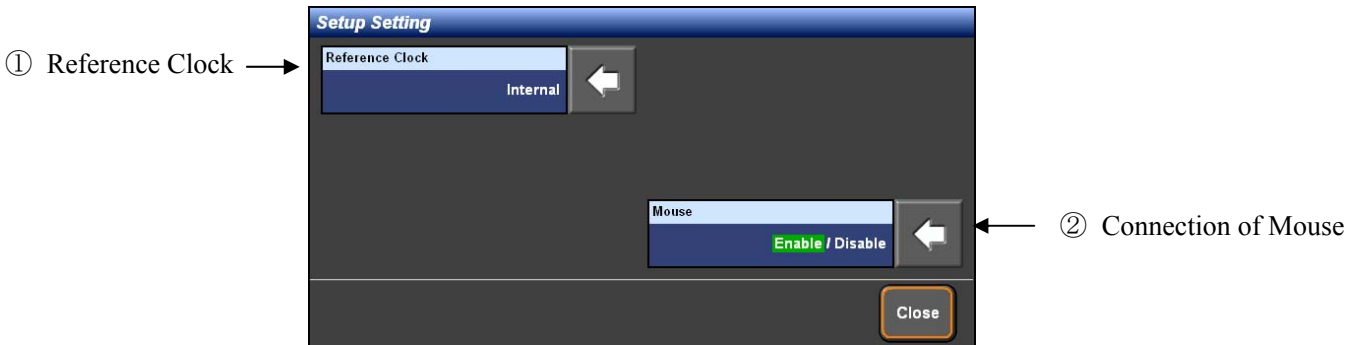




Figure 3-69 Setup Setting Window

① The reference clock of the modulation part [Reference Clock] is set.

If the arrow mark  is chosen, the following window is opened.

If the reference clock is chosen and [Ok]  is pressed, it is set.

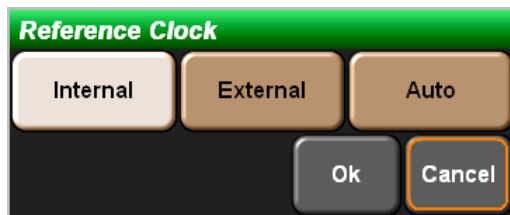



Figure 3-70 Reference Clock Window

[Internal]: This device operates according to the internal clock.

[External]: This device operates according to the external clock.

[Auto]: This device operates according to the external clock if the external clock is supplied. This device operates according to the internal clock if no external clock is supplied.

② The connection of the mouse [Mouse] is set.

If the arrow mark  is chosen, whether the mouse is [Enable] or is [Disable] to use is switched.

3.4.2 Confirmation of Status [Status]

The status of this device is explained.

1. Choose [Top Menu Page 1/2] and change the tab to [Top Menu Page 2/2].

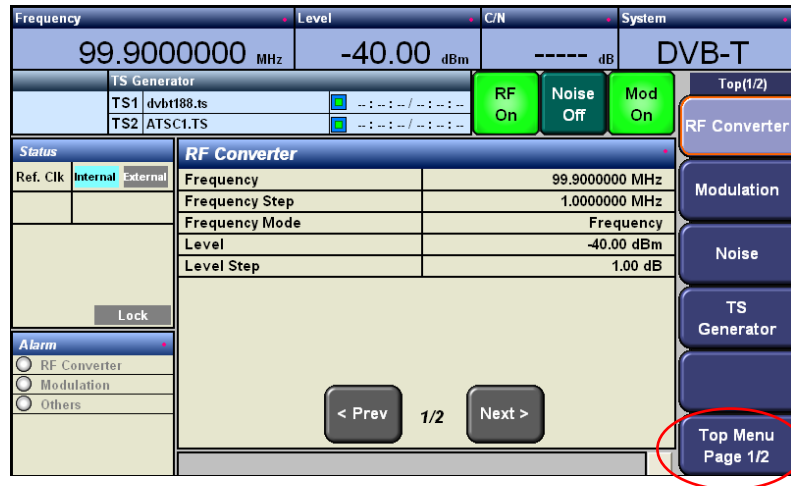


Figure 3-71 Top Menu 1/2 Screen

2. Choose [Status] tab.

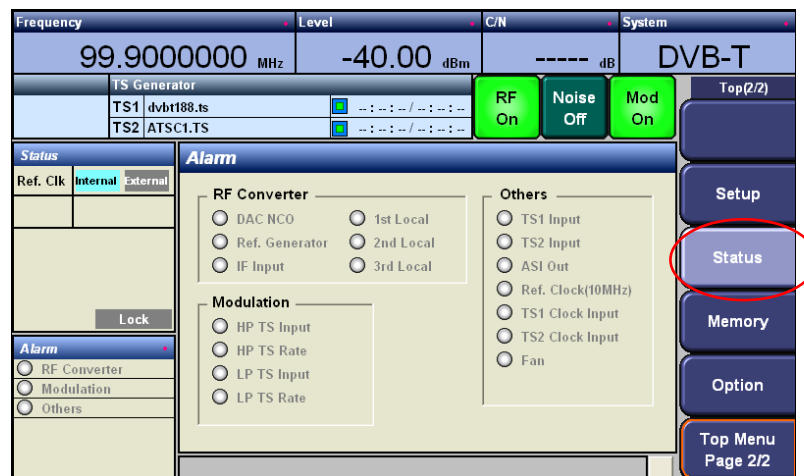


Figure 3-72 Top Menu 2/2 Screen

3. The alarm window is displayed.

The status of this device is displayed. [Modulation] is different by the modulation scheme.

The meanings of the alarms are explained.

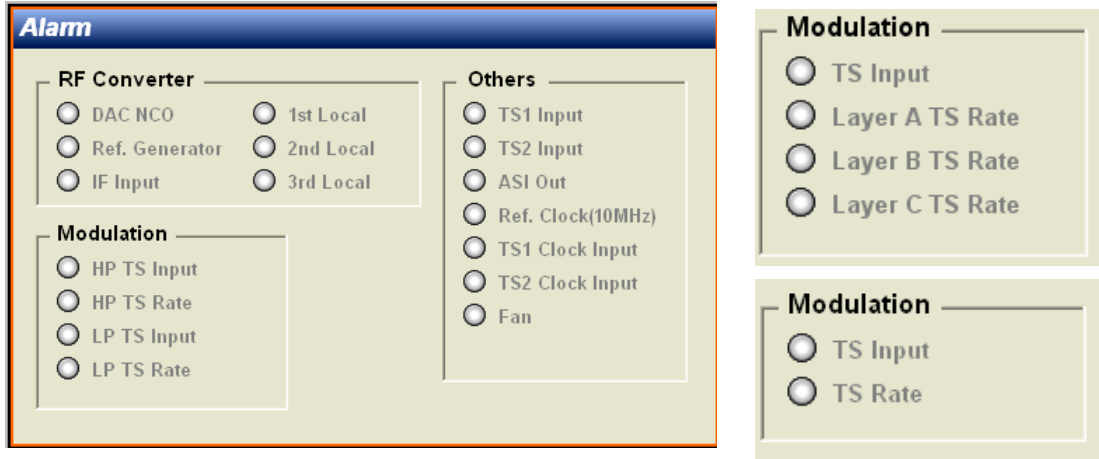


Figure 3-73 Alarm Window (Left: DVB-T/H, Upper Right: ISDB-T, Lower Right: ATSC)

[Modulation]

<DVB-T/H>

[HP TS Input]: The TS input for HP is abnormal.

[HP TS Rate]: The rate of the TS supplied to HP is abnormal.

[LP TS Input]: The TS input for LP is abnormal.

[LP TS Rate]: The rate of the TS supplied to HP is abnormal.

<ATSC>

[TS Input]: The TS input is abnormal.

[TS Rate]: The rate of the TS supplied is abnormal.

<ISDB-T>

[TS Input]: The TS input is abnormal.

[Layer A TS Rate]: The rate of the TS supplied to the layer-A is abnormal.

[Layer B TS Rate]: The rate of the TS supplied to the layer-B is abnormal.

[Layer C TS Rate]: The rate of the TS supplied to the layer-C is abnormal.

[RF Converter]

[DAC NCO]: This is an internal error. Inform to Eiden, please.

[1st, 2nd, 3rd Local]: These are the internal errors. Inform to Eiden, please.

[Ref. Generator]: The reference clock is abnormal.

* This is displayed in the case that the external clock is not supplied even if External clock is set.

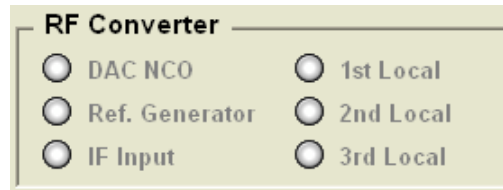


Figure 3-74 RF Converter Alarm Window

[Others]

[TS1 Input]: The input for TS1 is abnormal.

[TS2 Input]: The input for TS2 is abnormal

[ASI Out]: The ASI output is abnormal.

[Ref.Clock(10MHz)]: The reference clock is abnormal.

[TS1 Clock Input]: The clock supplied to the TS generator 1 is abnormal.

[TS2 Clock Input]: The clock supplied to the TS generator 2 is abnormal.

[Fan]: The fan is abnormal. Stop the use and inform to Eiden.

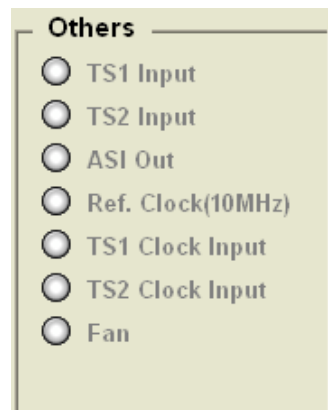


Figure 3-75 Other Alarm Window

3.4.3 Save of Device Setting [Memory]

How to save the device setting is explained.

1. Choose [Top Menu Page 1/2] and change the tab to [Top Menu Page 2/2].

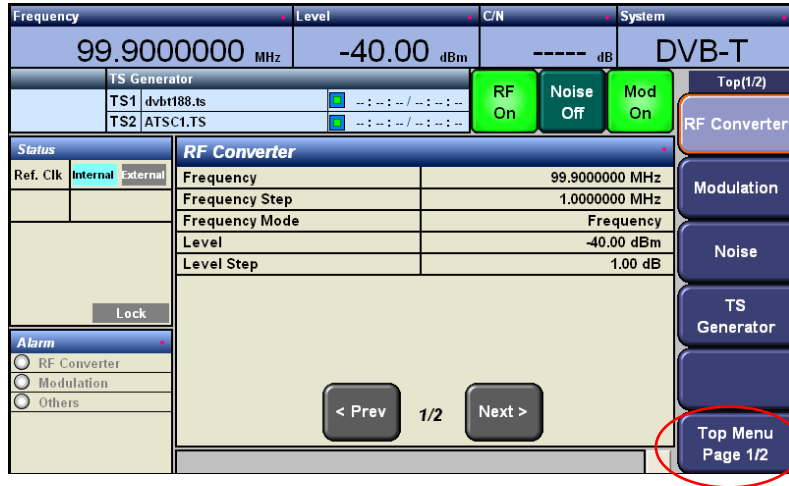


Figure 3-76 Top Menu 1/2 Screen

2. Choose [Memory] tab.

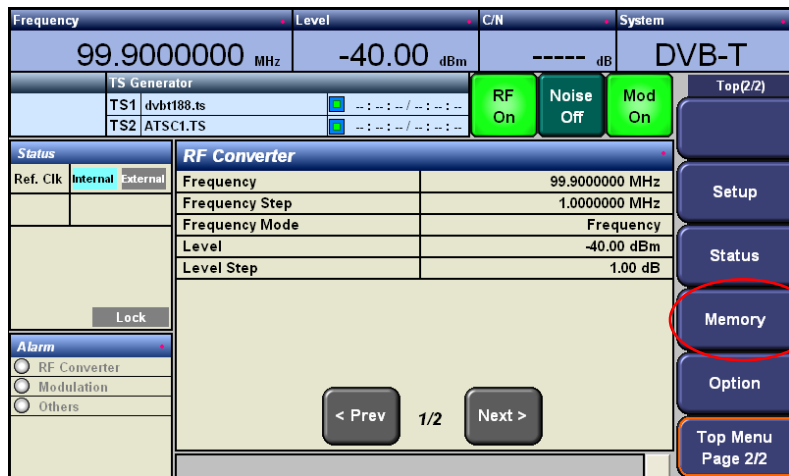


Figure 3-77 Top Menu 2/2 Screen

3. [Memory] window is opened.

The save of the device setting [Store] and the load [Recall] are possible in this window.

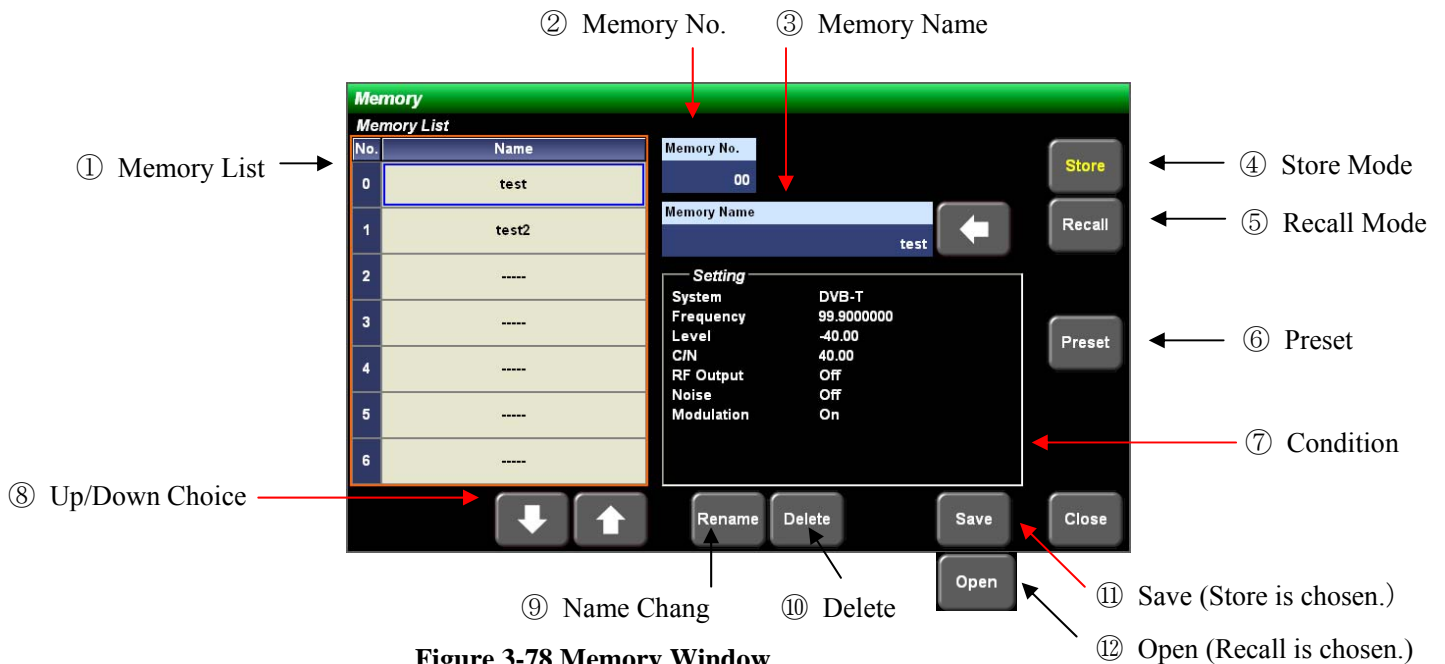





Figure 3-78 Memory Window

- ① Memory List [Memory List]: The number and the name for save and load
- ② Memory Number [Memory No.]: This is the number for save and load. 0 - 99 can be set.
- ③ Memory Name [Memory Name]: Choose the arrow mark  if the file is named. Type the name from the memory name window. The name is set by pressing ENT key . Press ESC  key if the screen is exited without the value setting

* The arrow mark is displayed only when [Store] is set.




Figure 3-79 Memory Name Window

- ④ Save Mode [Store]: The mode is changed to the mode for saving the setting condition of this device. When [Store] is set, ⑪ [Save] is displayed. The condition is saved if ⑪ [Save] is chosen after the setting of ② [Memory No.] and ③ [Memory Name].

* If the character of [Store]  is colored yellow, the mode is [Store] mode.

- ⑤ Recall Mode [Recall]: This is the mode that the setting condition of this device is loaded. When [Recall] is set, ⑫ [Open] is displayed. The condition of the device is loaded if the condition is chosen from ① [Memory List] and ⑫ [Open] is chosen.

* If the character of [Recall]  is colored yellow, the mode is [Recall] mode.

- ⑥ Preset [Preset]: The settings of this device are returned to the settings at the factory shipping. However, the memory list saved to this device [Memory List] and the settings of the memory are not deleted.

- ⑦ Condition [Setting]: The condition saved to this device is displayed. The display is changed by choosing the memory number in the memory list [Memory List].

- ⑧ Up/Down Choice: The chosen item in the memory list [Memory List] is up or down. These operate same as the cursor key.

- ⑨ Name Change [Rename]: The name set in the memory list [Memory List] is changed. The name is changed at [Store Mode] if ⑨ [Rename] is chosen after changing the name at ③ [Memory Name].

- ⑩ Delete [Delete]: The item is deleted from the memory list [Memory List]. The item is deleted if ⑩ [Delete] is chosen after the choosing the item desired to delete in [Memory List].

- ⑪ Save [Save]: This is displayed at [Store] mode. The item is saved if ⑪ [Save] is chosen after setting ② [Memory No.] and ③ [Memory Name].

- ⑫ Open [Open]: This is displayed at [Recall] mode. The device condition is loaded if ⑫ [Open] is chosen after choosing the loaded setting in ① [Memory List].

Chapter 4. Appendix

4.1 Block Diagram

The block diagram of this device is shown in the following.

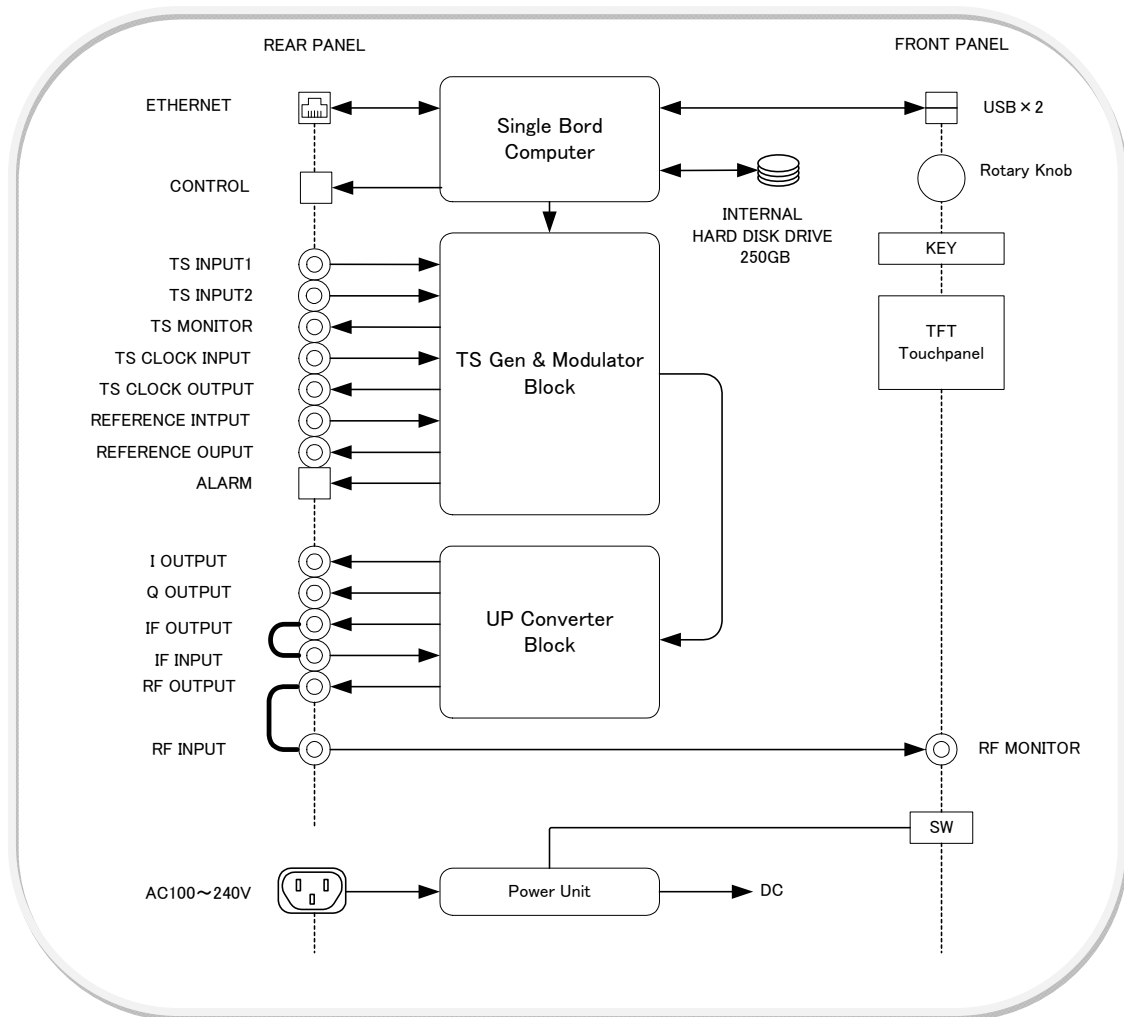


Figure 4-1 Block Diagram of this Device

4.2 Ratings

4.2.1 Power Source

Use this device in the following power source environment.

Table 4-1 Ratings of Power Source

Item	Contents
Kind of Power	Single Phase Alternate Current
Rated Supply Voltage	~ 100 - 240 V
Allowable Supply Voltage Range	~ 90 - 264 V
Rated Supply Frequency	50/60 Hz
Allowable Supply Frequency Range	47 to 63 Hz
Power Consumption	100 VA
Connector	Rectangular 3-P (With ground)

* This unit has cleared “Testing and measuring techniques-voltage dips, short interruptions and voltage variations immunity tests” conforming to “IEC61000-4-11 Rank C.

4.2.2 Usage Environment

Use this device in the following environment.

Table 4-2 Operation Environment

Item	Contents
Use Environment	Indoor use
Use Altitude	Up to 2000 m
Temperature	+5 °C to +40 °C
Humidity	Less than 85 %RH (No dew generation)
Impulse Withstand (Overvoltage) Category	II
Pollution Degree	2

4.2.3 System of This Device

The system configuration of this device is shown in the following table.

Table 4-3 System of This Device

Item	Contents
Operation System (OS)	Windows XP Embedded
Hard Disk	250 GB SATA Interface
Display	7 inch Wide VGA 800 x 480 With analog touch panel
Local Control	Touch panel, ten-key pad, Up/Down/Left/right cursor key, LOCK, ESC, BS, ENT key and Rotary knob
Remote Control	ETHERNET, GP-IB (Only when an optional USB-GP-IB conversion box is used.)

4.2.4 TS Input

These are the input terminals of the external TS.

Table 4-4 TS Input [TS INPUT1/TS INPUT2]

Item	Contents
Kind of TS	MPEG-2 TS (188/204 byte/packet) Broadcasting TS (204 byte/packet)
Connector	BNC-R
Number of Terminals	2
Interface	Conforming to DVB-ASI Only the TS INPUT 1 is enabled when the broadcasting TS is supplied.
Impedance	75 Ω
Data Rate	DVB-ASI: 270 Mbps

4.2.5 TS Monitor Output

This is the monitor output of the internal TS generators.

Table 4-2 TS Monitor Output [TS MONITOR]

Item	Contents
Kind of TS	MPEG-2 TS (188/204 byte/packet) Broadcasting TS (204 byte/packet)
Connector	BNC-R
Number of Terminals	1
Impedance	75 Ω
Interface	Conforming to DVB-ASI
Data Rate	270 Mbps

4.2.6 TS Clock Input

This is the clock input for TS synchronization.

Table 4-6 TS Clock Input [TS CLOCK INPUT]

Item	Contents
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω
Interface	TTL
Clock Frequency	[ISDB-T] Broadcasting TS Byte Clock: 256/63 MHz \doteq 4.063492 MHz Bit Clock: 2048/63 MHz \doteq 32.507937 MHz

4.2.7 TS Clock Output

This is the TS clock output.

Table 4-7 TS Clock Output [TS CLOCK OUTPUT]

Item	Contents
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω
Interface	TTL
Clock Frequency	[ISDB-T] Broadcasting TS Byte Clock: 256/63 MHz \div 4.063492 MHz Bit Clock: 2048/63 MHz \div 32.507937 MHz

4.2.8 10 MHz Input

This is the reference frequency input of this device.

Table 4-8 10 MHz Input [REFERENCE INPUT]

Item	Contents
Input Frequency	Within 10 MHz \pm 1 ppm
Input Level	Within 0 dBm \pm 3 dB
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω

4.2.9 10 MHz Output

This is the reference frequency output of this device.

Table 4-9 10 MHz Output [REFERENCE OUTPUT]

Item	Contents
Output Frequency	Within 10 MHz \pm 1 ppm (When the INTERNAL is set.)
Output Level	Within 0 dBm \pm 3 dB
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω

4.2.10 RF Output (On rear panel)

This is the RF output terminal of this device. The RF output level is regulated by this terminal.

Table 4-10 RF Output [RF OUTPUT]

Item	Contents
Output Center Frequency	30 MHz to 900 MHz
Output Level	+10 dBm
Connector	N-R
Number of Terminals	1
Impedance	50 Ω

4.2.11 RF Input

This is the RF input terminal of this device. This terminal is used when the RF output signal is monitored at the front panel.

Table 4-11 RF Input [RF INPUT]

Item	Contents
Input Frequency	100 kHz to 3000 MHz
Input Level	MAX +10 dBm
Connector	N-R
Number of Terminals	1
Impedance	50 Ω

4.2.12 RF Output (On front panel)

This is the RF monitor terminal of this device.

Table 4-12 RF Monitor [RF MONITOR]

Item	Contents
Output Frequency	100 kHz to 3000 MHz
Output Level	MAX +10 dBm
Connector	N-R
Number of Terminals	1
Impedance	50 Ω

* Connect the RF output terminal and the RF input terminal on the front panel by the U-Link attached if this terminal is used.

* The RF output level is regulated by the RF output terminal on the rear panel.

4.2.13 I/Q Baseband Output

This is I/Q baseband output terminal of this device.

Table 4-13 I/Q Baseband Output [BASEBAND OUTPUT I/Q]

Item	Contents
Output Frequency	DC to 50 MHz
Output Level	0.5 V
Connector	BNC-R
Number of Terminals	Each 1 route of I/Q
Impedance	50 Ω

4.2.14 IF Output

This is the IF output terminal of this device. This terminal can be used when this device is connected to Eiden’s fading simulator (4409A) or impulsive noise generator (1908A).

Table 4-14 IF Output [IF OUTPUT]

Item	Contents
Output Frequency	44 MHz
Output Level	-10 dBm
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω

* If the impulsive noise generator is connected, the RF output of 1908A is used.

4.2.15 IF Input

This is the IF input terminal of this device. This terminal can be used when this device is connected to Eiden's fading simulator (4409A).

Table 4-15 IF Input [IF INPUT]

Item	Contents
Input Frequency	44 MHz
Input Level	-10 dBm
Connector	BNC-R
Number of Terminals	1
Impedance	50 Ω

* The output of the impulsive noise generator (1908A) cannot be connected to this terminal.

4.2.16 CONTROL

This is the control terminal when this device is connected to Eiden's fading simulator (4409A) or impulsive noise generator (1908A).

Table 4-16 CONTROL Terminal [CONTROL]

Item	Contents
Connector	D-sub 9-pin female
Number of Terminals	1

4.2.17 ETHERNET

This terminal is used when each setting of this device is set by the remote control (Remote Desktop) or when the contents are transmitted to the internal HDD of this device.

The specifications of the ETHERNET terminal are shown in the following table.

Table 4-17 Ethernet [ETHERNET]

Item	Contents
Connector	RJ-45
Input/Output	10 BASE-T/100 BASE-TX (Auto-negotiation)
Number of Terminals	1

4.2.18 USB

The specifications of the USB terminals are shown in the following table.

Table 4-18 USB [USB]

Item	Contents
Connector	USB-A connector
Number of Terminals	3 (2 on the front panel and 1 on the rear panel)

4.2.19 ALARM

The ALARM terminal is not used at the present.

4.3 Specifications and Performance

The specifications and the RF performance of this device are explained.

4.3.1 Specification of TS Generator Part

The specifications of the TS generator part are shown in the following table.

Table 4-19 Specifications of TS Generator Part

Item	Contents
Routes of Reproduce	2 routes
HDD	250-Gbyte SATA Interface
Possible TS Reproduce Rate	100 kbps to 90 Mbps (The value can be set in 1 Hz unit) Within 90-Mbps of the total of 2 routes
Output Data Format	MPEG-2TS (188/204 byte)
Reproduce Mode	Single Reproduce/ Loop Reproduce / Reproduction with the range designation
Seamless function	Renewal of Continuity Counter of TS Renewal by the internal clock of TOT

4.3.2 Specifications of Noise Generator Part

The specifications of the noise generator part are shown in the following table.

Table 4-20 Specifications of Noise Generator Part

Item	Contents
C/N Setting Resolution	0 to 40 dB
Noise Setting Resolution	0.1 dB

4.3.3 Performance of RF Part

The specifications of the RF part are shown in the following table. The performance is different by the converter equipped.

Table 4-21 Specifications of RF Part

Item	Contents
Output Frequency Range	30 MHz to 900 MHz (There is the limited by the modulation scheme.)
Output Frequency Step	1 Hz
Output Frequency Accuracy	Within 1 ppm (When the internal reference clock is used)
Maximum Output Level	+10 dBm: 30 MHz \leq f<900 MHz
Minimum Output Level	-120 dBm
Minimum Level Step	0.01 dB

4.4 Transmission Parameter of Modulation Part

The transmission parameters of each modulation scheme are shown in following table.

Table 4-22 Specifications of DVB-T/TH

Item	Contents
Compliant	EN300744, EN302304
Bandwidth	5 MHz, 6 MHz, 7 MHz, 8 MHz
Max TS RATE	[5 MHz] (Only when DVB-H) 23.75 Mbps (188 byte) 25.77 Mbps (204 byte) [6 MHz] 23.75 Mbps (188 byte) 25.77 Mbps (204 byte) [7 MHz] 27.70 Mbps (188 byte) 30.06 Mbps (204 byte) [8 MHz] 31.66 Mbps (188 byte) 34.36 Mbps (204 byte)
Randomization	$1 + X^{14} + X^{15}$
Outer Coding	RS(204,188,t=8)
Outer Interleaving	Convolutional interleaving depth I=12
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
FFT Size	2k, 4k, 8k (4k is used at DVB-H only)
Guard Interval	1/4, 1/8, 1/16, 1/32
Constellation	QPSK, 16QAM, 64QAM
Alpha	Non, 1, 2, 4
Modulation	COFDM
Inner Interleaver	Native, In-depth (At DVB-H)
Time Slicing	ON, OFF (At DVB-H)
MPE FEC	ON, OFF (At DVB-H)

Table 4-23 Specifications of ATSC

Item	Contents
Compliant	ATSC DOC A53, A54
Max TS RATE	19.392658 Mbps
Randomization	$1 + X + X^3 + X^6 + X^7 + X^{11} + X^{12} + X^{13} + X^{16}$
Outer Coding	RS(207,187,t=10)
Outer Interleaving	Convolutional interleaving depth I = 52
Trellis Code	2/3
Roll-off Factor	11.52 %
Constellation	8VSB

Table 4-23 Specifications of ISDB-T

Item	Contents
Compliant	ARIB STD-B31
Max TS RATE	23.234 Mbps (Mode3 GI 1/32 CR 7/8)
Randomization	$1 + X^{14} + X^{15}$
Code Rate	1/2, 2/3, 3/4, 5/6, 7/8
Mode	1, 2, 3
Guard Interval	1/4, 1/8, 1/16, 1/32
Constellation	DQPSK, QPSK, 16QAM, 64QAM
Layer	Max 3(A layer, B layer, C layer)
Interleaving	0, 2, 4, 8 (mode 2) 0, 1, 2, 4 (mode 3)

Eiden Co., Ltd

URL: <http://www.eiden-gp.co.jp>

Address:

2-7-1 Kurigi, Asao-ku, Kawasaki-City, Kanagawa-Prefecture, 215-0033 Japan

Sales Dept.: +081-44-988-4111

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