User's Manual

TS Monitoring Station
VT3100

YOKOGAWA
Yokogawa Electric Corporation

IM 706540-01E
1st Edition

Thank you for purchasing the TS Monitoring Station VT3100. This User's Manual contains useful information about the precautions, functions, and operating procedures of the instrument. To ensure correct use, please read this manual thoroughly before operation. Keep this manual in a safe place for quick reference in the event a question arises.

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. Illustrated screen contents in this manual may differ slighty from what actually appears on your screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.
- Copying or reproducing all or any part of the contents of this manual without YOKOGAWA's permission is strictly prohibited.
- The warranty card is included in the packing box, and replacement cards will not be provided. Please read the warranty carefully, and keep the card in a safe place.

Trademarks

- MS-DOS is a registered trademark of Microsoft Corporation.
- Other company and product names are trademarks or registered trademarks of their respective holders.

Revisions

- 1st Edition July 2001

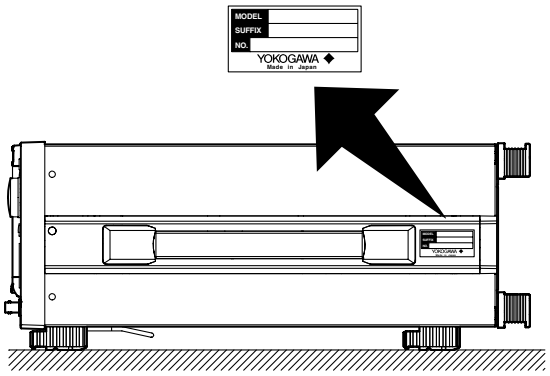
Disk No. CM20
1st Edition: July 2001 (YK)

Checking the Contents of the Package

Unpack the box and check the contents before operating the instrument. If some of the contents are not correct, are missing, or are physically damaged, contact the dealer from which you purchased them.

VT3100

Check that the model name and suffix code given on the name plate on the rear panel match those on the order.



MODEL

706540	channel output model, 256 MB memory
706541	channel output model, 256 MB memory per channel
706542	channel output model, 256 MB memory per channel

SUFFIX

Specifications	Code	Notes
Power cord	-M	UL/CSA Standard power cord (Part No.: A1006WD and A1253JZ) [Maximum rated voltage: 125 V, Maximum rated current: 7 A]
	-D	UL/CSA Standard power cord (Part No.: A1006WD)
	-F	VDE Standard power cord (Pat No.: A1009WD) [Maximum rated voltage: 250 V, Maximum rated current: 10 A]
	-R	AS Standard power cord (Part No.: A1024WD) [Maximum rated voltage: 240 V, Maximum rated current: 10 A]
	-Q	BS Standard power cord (Part No.: A1054WD) [Maximum rated voltage: 250 V, Maximum rated current: 10 A]
Options	/HD1	30 GB HDD option
	/BS1	BS digital multiplexing plug-in software
	/M11	Additional 256 MB of memory to ch1 (512 MB total)
	/M13	Additional 768 MB of memory to ch1 (1024 MB total)
	/M21	Additional 256 MB of memory to ch2 (512 MB total)
	/M23	Additional 768 MB of memory to ch2 (1024 MB total)
	/M31	Additional 256 MB of memory to ch3 (512 MB total)
	/M33	Additional 768 MB of memory to ch3 (1024 MB total)

NO. (Instrument Number)

When contacting the dealer from which you purchased the instrument, please quote the instrument number.

Standard Accessories

The following standard accessories are supplied with the instrument:

Part Name	Part Number	Quantity	Notes
1. Power cord	A1006WD	1	UL/CSA Standard
	A1009WD	1	VDE Standard
	A1024WD	1	AS Standard
	A1054WD	1	BS Standard angle type
2. Rubber feet for the hind feet	A9088ZM	1	Two rubber feet in one set
3. User's Manual	IM706540-01E	1	User's Manual (this manual)

Optional Accessories (Sold Separately)

The accessories in the chart below are sold separately. For information and ordering, contact your dealer.

Part Name	Part Number	Quantity	Notes
BNC cable	366924	1	BNC-BNC, length: 1 m
BNC cable	366925	1	BNC-BNC, length: 2 m
Rack mount kit	751535-E4	1	For EIA single mount
Rack mount kit	751535-J4	1	For JIS single mount

Safety Precautions

This instrument is an IEC safety class 1 instrument (provided with terminal for protective earth grounding).
The following general safety precautions must be observed during all phases of operation. If the instrument is used in a manner not specified in this manual, the protection provided by the instrument may be impaired. YOKOGAWA Electric Corporation assumes no liability for the customer's failure to comply with these requirements.

The following symbols are used on this instrument.


"Handle with care." To avoid injury, death, or damage to the instrument, the operator must refer to the explanation in the User's Manual or Service Manual.


Alternating current

ON (power)


OFF (power)


ON (power) state


OFF (power) state

Make sure to comply with the safety precautions listed below. Failure to comply might result in injury or death.

WARNING

Power Supply

Ensure that the source voltage matches the voltage of the power supply before turning ON the power.

Power Cord and Plug

To prevent the possibility of electric shock or fire, be sure to use the power cord supplied by YOKOGAWA. The main power plug must be plugged into an outlet with a protective earth terminal. Do not invalidate this protection by using an extension cord without protective earth grounding.

Protective Grounding

Make sure to connect the protective grounding to prevent electric shock before turning ON the power. The power cord that comes with the instrument is a three-pin type power cord. Connect the power cord to a properly grounded three-pin outlet.

Necessity of Protective Grounding

Never cut off the internal or external protective earth wire or disconnect the wiring of the protective earth terminal. Doing so poses a potential shock hazard.

Defect of Protective Grounding

Do not operate the instrument when the protective earth or the fuse might be defective. Also, make sure to check them before operation.

Do Not Operate in Explosive Atmosphere

Do not operate the instrument in the presence of flammable liquids or vapors. Operation in such environments is very dangerous.

Do Not Remove Covers

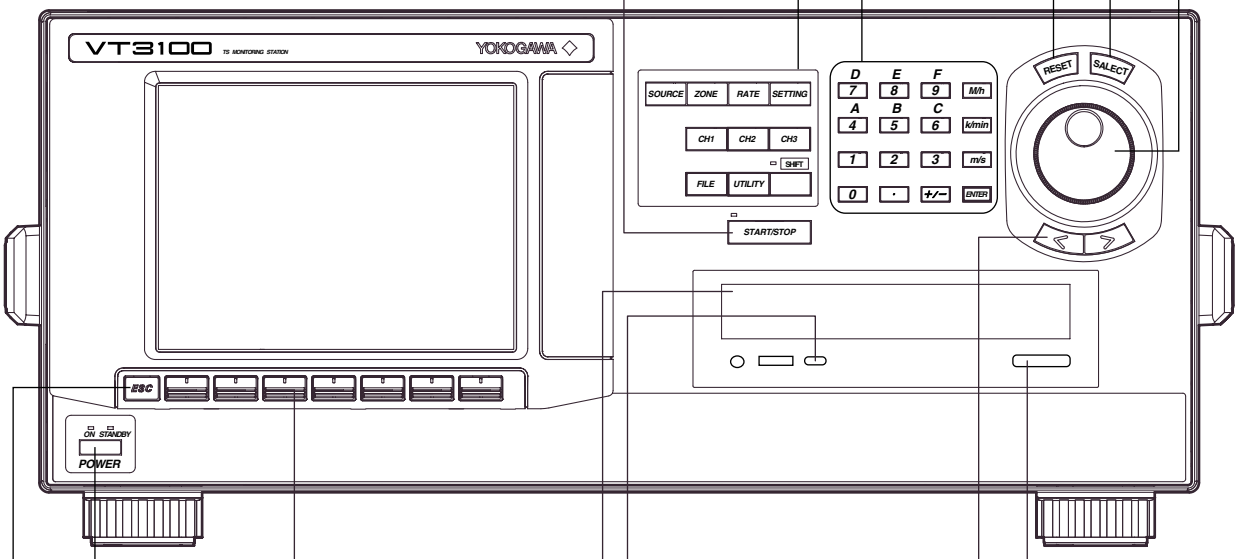
Some areas inside the instrument have high voltages. The cover should be removed by YOKOGAWA's qualified personnel only.

External Connection

Connect the protective grounding before connecting to the item under measurement or to an external control unit.

Contents

1.1 Front Panel



SOURCE key
Select the files to be output
ZONE key
Select the zone to be output
RATE key
Set the clock
SETTING key
Set the output port, level, etc.
FILE key
Delete or copy files on the built-in hard disk or create or delete directories
UTILITY key
Mount CD-ROM and SCSI devices, display setup information, and set other items

Rotary knob
Set values, select files, etc.

Numerical keys

SELECT key

RESET key

START/STOP key

Power switch (Auxiliary)

Soft keys

ESC key
Clear soft key menus

Access indicator

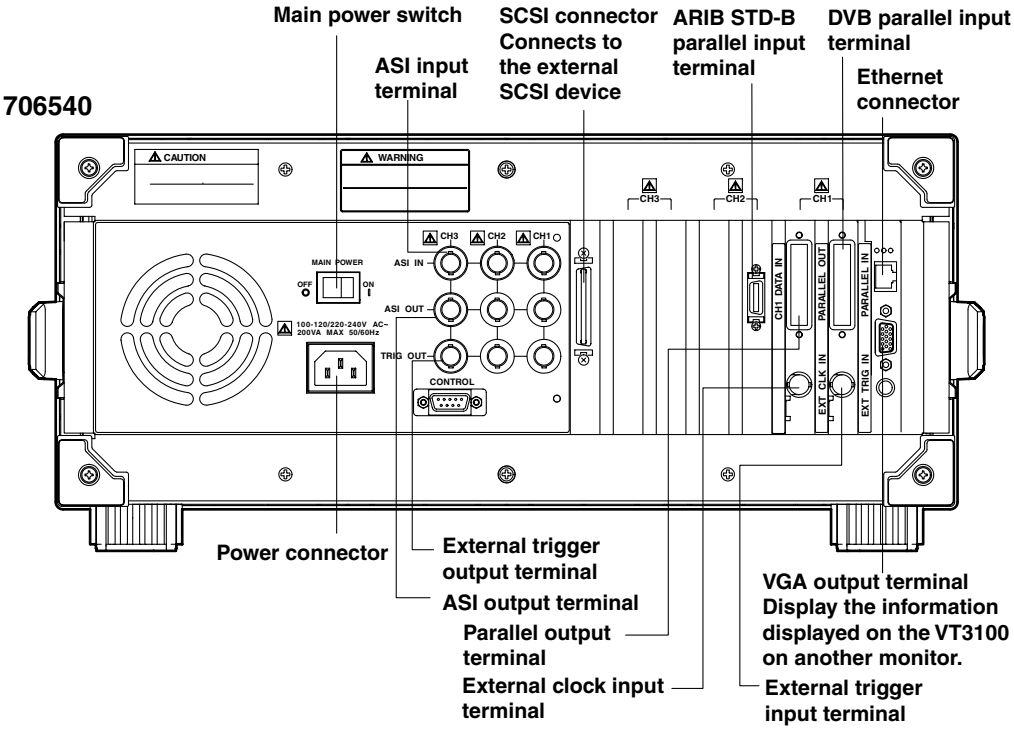
CD-ROM drive

Eject button
Eject CD-ROM

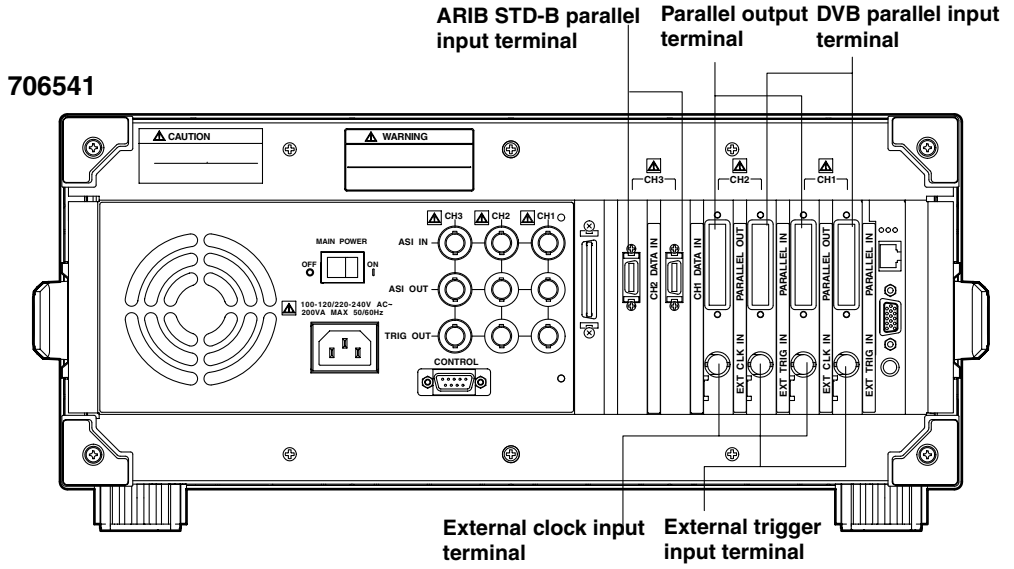
Arrow keys
Move between digits when setting values and backspace (< key)

1.2 Rear Panel

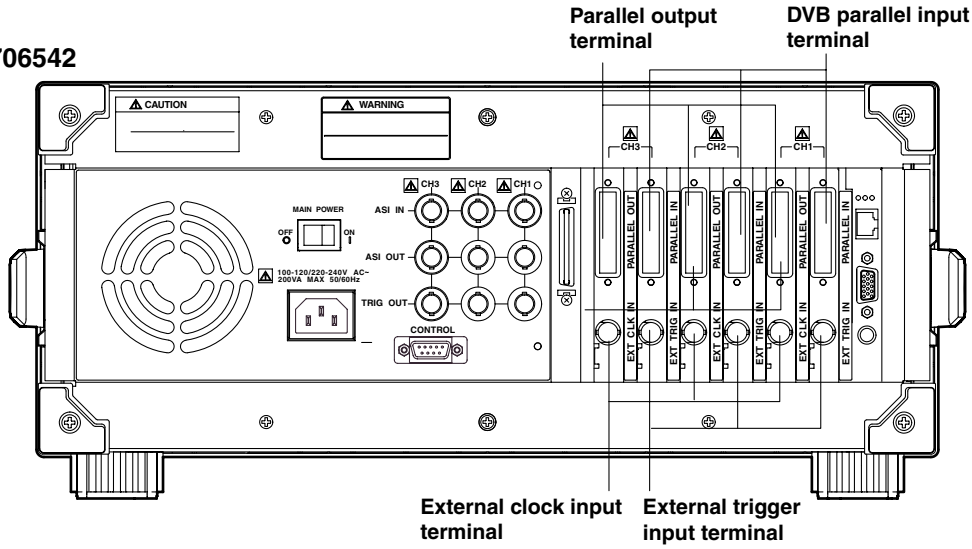
706540



706541



706542


Parallel output terminal
DVB parallel input terminal
CAUTION
WARNING
CH3
CH2
CH1
MAIN POWER
OFF
ON
ASI IN
ASI OUT
TRIG OUT
CONTROL
PARALLEL OUT
PARALLEL IN
EXT CLK IN
EXT TRIG IN
External clock input terminal
External trigger input terminal

1.3 Functions

Overview

The digital broadcasting is receiving attention from various quarters as a large-capacity, high-speed data communication infrastructure for connecting broadcasting enterprises and individual households; the image of it is changing from that of the conventional “broadcast” which carries images and sounds to that of the “infrastructure for communication”. The TS monitoring station VT3100 is a system which monitors, records and replays the broadcasting contents on the transport stream (TS) level; it flexes its muscles for monitoring and troubleshooting around the contents.

Powerful triggering functions

In addition to the existing ETR290 monitoring items, powerful triggering functions such as the TMCC trigger ready for 4-byte data patterns and the BS digital broadcast are newly equipped. Moreover, the multi-channel function monitor makes it possible to monitor up to three streams independently allowing you to capture your desired TS securely.

Various recording functions

The VT3100 is equipped with the PID filtering function which records the packets with the specified PID value only and the slot filtering function which records the data of the specified slot number only. (Applicable to the BS digital broadcast streams only.)
The combination of the powerful triggering functions and various recording functions allows you to record your desired TSs only with a high degree of efficiency.

Remote diagnoses

The VT3100 is provided with a browsing function that allows the content of the TS to be checked from a remote place. The recorded TS content and TMCC table, etc. can be referenced from anywhere if only a PC is available which has a network (Ethernet) environment and Web browser installed.

Replicating a problem

To troubleshoot a problem, it is necessary to replicate the problem, if possible. Various replay functions adopted by the VT3100 including the quick playback mode allows you to troubleshoot problems quickly.

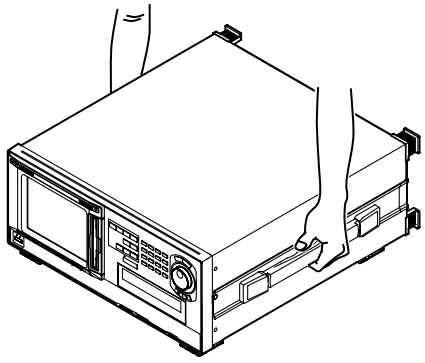
2.1 Usage Precautions on the Use of the Instrument

Safety Precautions

- If you are using this instrument for the first time, make sure to thoroughly read the “Safety Precautions” given on page iv.
- Do not remove the cover from the instrument. Some sections inside the instrument have high voltages that are extremely dangerous. For internal inspection or adjustment, contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.
- Never continue to use the instrument if there are any symptoms of trouble such as strange odors or smoke coming from the instrument. In such cases, immediately turn OFF the power and unplug the power cord. Then, contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.
- Nothing should be placed on top of the power cord. The power cord should also be kept away from any heat sources. When unplugging the power cord from the outlet, never pull by the cord itself. Always hold and pull by the plug. If the power cord is damaged, contact your dealer for replacement.

General Handling Precautions

- Never place any objects containing water on top of the instrument. A water spill can lead to malfunction of the instrument.
- Do not apply shock or vibration to the instrument. This can lead to malfunction. Take extra caution because the built-in hard disk is sensitive to vibration and shock. In addition, applying shock to the input terminal or the connected cable can cause electrical noise to enter the instrument.
- Do not bring charged objects near the input/output terminals. This can lead to malfunction.
- If you are not going to use the instrument for a long period of time, unplug the power cord from the outlet.
- When the instrument is not being used for an extended period of time, unplug the power cord from the outlet. The instrument weighs approximately 8 kg. To carry the instrument, use the handle as shown in the figure below, and move it with care.

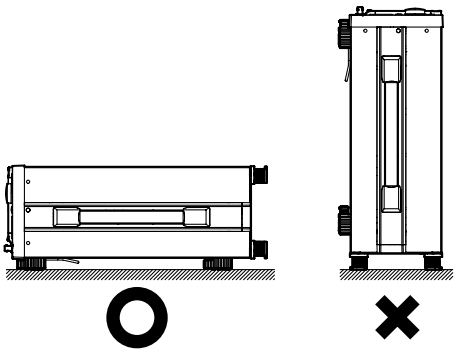


- Be careful not to scratch the surface of the LCD with sharp objects. This can lead to malfunction.
- When cleaning the case or the operation panel, first remove the power cord from the outlet. Then, wipe with a dry, soft cloth. Do not use volatile chemicals as this may cause discoloring and deformation.

2.2 Installing the Instrument

WARNING

To avoid the possibility of fire, never use the instrument with the rear side facing down, as the cooling vents will be obstructed. Placing the instrument with the rear side down can cause a fire when the instrument malfunctions. If you must use the instrument with the rear side down, place a metal plate or a flame-resistive barrier (grade UL94V-1 or higher) beneath the instrument.



Installation Condition

Install the instrument in a place that meets the following conditions:

Ambient temperature and humidity

Use the instrument in the following environment:

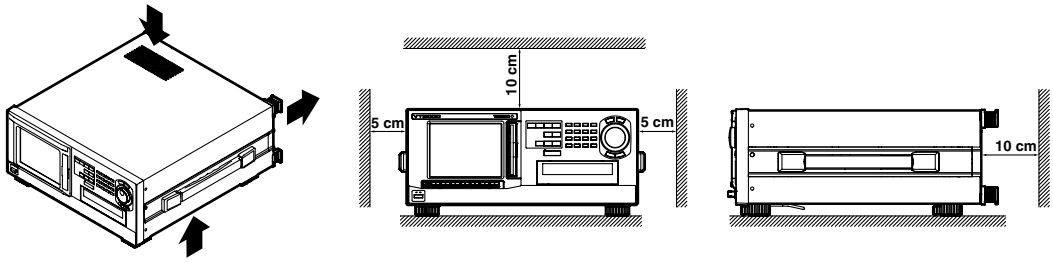
- Ambient temperature: 5 to 40°C
  However, in order to obtain highly accurate measurements, operate the instrument in the 23 ± 5°C temperature range.
- Ambient humidity: 20 to 80% RH
  No condensation should be present. However, in order to obtain highly accurate measurements, operate the instrument in the 55 ± 10% RH range.

Note

Condensation may occur if the instrument is moved to another place where the ambient temperature is higher, or if the temperature changes rapidly. In this case, let the instrument adjust to the new environment for at least an hour before using the instrument.

Well-ventilated location

Vent holes are located on the top and bottom of the instrument. In addition, vent holes for the cooling fan are located on the rear. To prevent internal overheating, allow for enough space around the instrument (see the figure below) and do not block the vent holes.

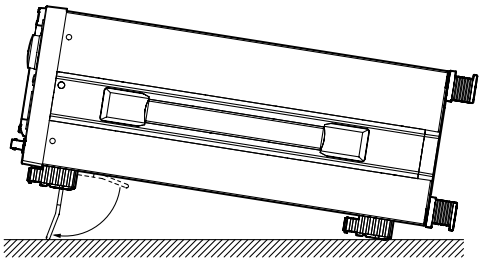


Do not install the instrument in the following places:

- In direct sunlight or near heat sources.
- Where an excessive amount of soot, steam, dust, or corrosive gases are present.
- Near strong magnetic field sources.
- Near high voltage equipment or power lines.
- Where the level of mechanical vibration is high.
- In an unstable location.

Installation Position

Place the instrument in a horizontal position or inclined position using the stand as shown in the figure below.
When using the stand, pull it forward until it locks (perpendicular to the bottom surface of the instrument). If you are installing the instrument on a slippery surface, attach the rubber feet (two pieces, included in the package) to the hind feet.
If you are not using the stand, return it to the original position while pressing the leg section of the stand inward.



2.3 Connecting the Power Supply

Before Connecting the Power Supply

Follow the warnings below when connecting the power supply. To prevent the possibility of electric shock and damaging the instrument, follow the warnings below.

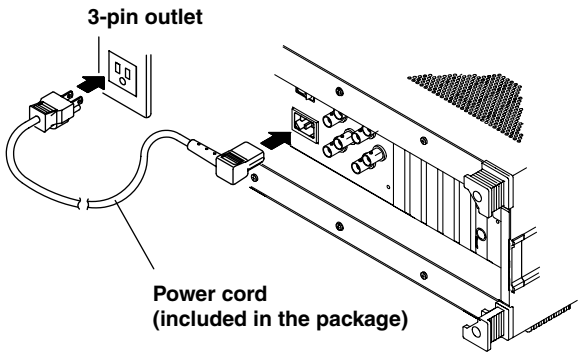
WARNING

- Ensure that the supply voltage matches the rated supply voltage of the instrument before connecting the power cable.
- Check that the power switch is turned OFF before connecting the power cord.
- To prevent the possibility of electric shock or fire, be sure to use the power cord supplied by YOKOGAWA.
- Make sure to perform protective earth grounding to prevent the possibility of electric shock. Connect the power cord to a properly grounded three-pin outlet.
- To minimize the possibility of electric shock, do not use an extension card without a protective earth ground.

Connection Procedure

1. Check that the power switch on the rear panel is OFF.
2. Connect the power cord plug to the power connector on the rear panel. (Use the power cord that came with the package.)
3. Connect the plug on the other end of the power cord to the socket that meets the conditions below. The AC outlet must be of a three-pin type with a protective earth terminal.

Rated supply voltage:	100 to 240 VAC
Permitted supply voltage range:	90 to 264 VAC
Rated supply voltage frequency:	50/60 Hz
Permitted supply voltage frequency range:	48 to 63 Hz
Maximum power consumption:	200 VA
Power cord (included in the package)	



2.4 Turning ON/OFF the Power Switch

Things to Check before Turning ON the Power Switch

- The instrument is properly installed.
- The power cord is properly connected.

Location of the Power Switch and ON/OFF Operation

There are two power switches on the instrument.

- The main switch on the rear panel
- The sub switch at the lower left corner on the front panel

Turning ON the power

Turn ON the main switch on the rear panel and then the sub switch on the front panel to start up the VT3100. The instrument will be ready approximately 90 s after you turn ON the sub switch.

CAUTION

Do not turn OFF the power until the instrument has finished the start-up cycle. Otherwise, the hard disk or the files on it may be damaged.

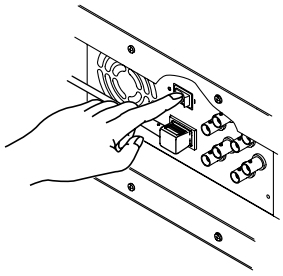
Turning OFF the power

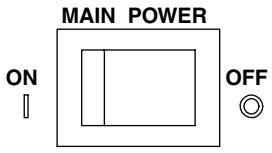
To turn OFF the power, press the sub switch on the front panel. After the instrument is in the standby condition (approximately 20 s later), turn OFF the main switch on the rear panel.

CAUTION

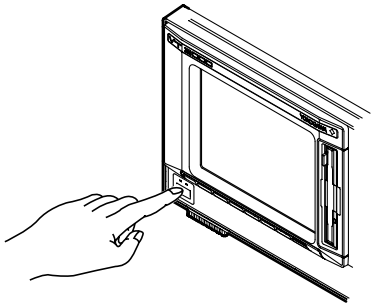
Do not turn OFF the main power switch until the instrument is in the standby condition after pressing the sub switch. Otherwise, the hard disk or the files on it may be damaged.

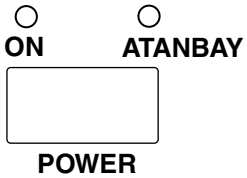
Main power switch





Sub power switch





Power Up Operation

When the power switch is turned ON, BIOS and LINUX startup messages are displayed. Front panel key operations are disabled during this period.

Note

- If the VT3100 does not start up even if you turn ON the main switch, turn OFF the main switch and check the following points:
  - Is the power cord securely connected?
  - Is the correct voltage coming from the power outlet?

  If the instrument still fails to power up after checking these points, it is probably a malfunction. Please contact your nearest YOKOGAWA dealer as listed on the back cover of this manual for repairs.
- If the voltage level of the lithium battery used to store information falls below a minimum level, the VT3100 will fail to operate properly such as inaccurate display of date and time and inability to save or recall setup data. If these symptoms appear, you must quickly replace the lithium battery. The user cannot replace the battery. For battery replacement, contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.

Operation when Sub Switch is OFF

Turning OFF the sub switch shows a BIOS and LINUX shutdown message.

Note

The following message may appear in the shutdown message.
Shutting down SMB services: [FAILED (red characters)]
This is the message for when the SMB (Samba) server is shut down and the Samba server is started when the client sends a request. Therefore, this message appears if there is no access to the Samba server after the VT3100 is started until the shutdown, but this is not an error.

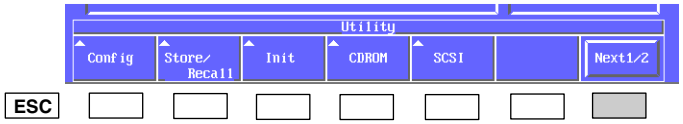
Warm Up

In the installation condition indicated in section 2.2, allow the instrument to warm up for at least 30 minutes after the power switch is turned ON

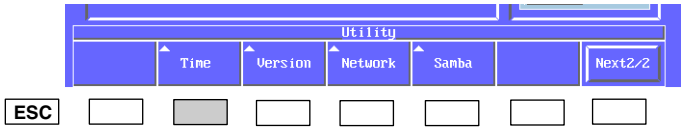
2.5 Setting the Date and Time

Procedure

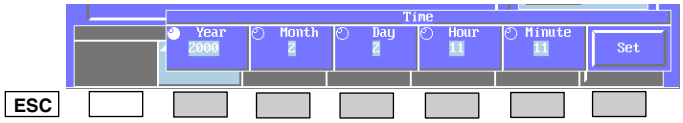
1. Press the UTILITY key to display the Utility menu.
2. Press the [Next1/2] soft key to display the next menu.



3. Press the [Time] soft key to display the Time menu.



4. Press the [Year], [Month], [Day], [Hour], and [Minute] soft keys and set the date and time using the rotary knob.
5. Press the [Set] soft key to confirm the changes.



Explanation

Setting the date

Set the Year/Month/Day.

- Year
  Range: 1999 to 20037
- Month
  Range: 1 to 12
- Day
  Range: 1 to 31

Setting the time

Set the Hour/Minute.

- Hour
  Range: 0 to 23
- Minute
  Range: 0 to 59
  Seconds will be set to 00 when you press the [Set] soft key.

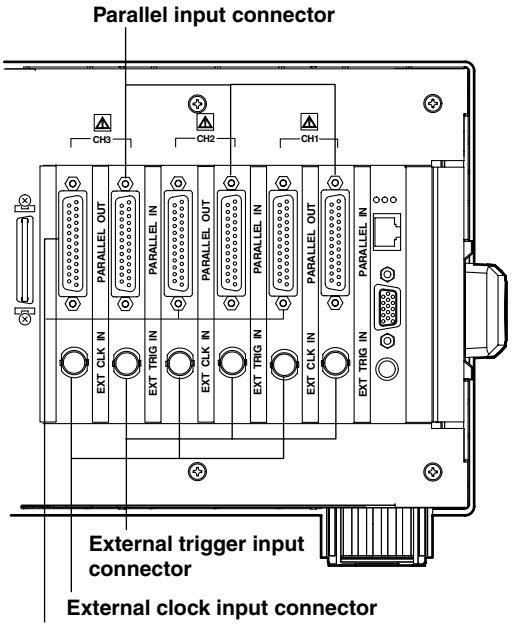
Display position of date and time

The date and time are displayed in the upper right corner of the screen.

3.1 Connecting the Cable to the Parallel Output Connector

Position of the Output Terminal

The output terminal is located on the rear panel. Connect a Dsub25-pin cable to the connector of the channel to be output.



Parallel Output Specifications

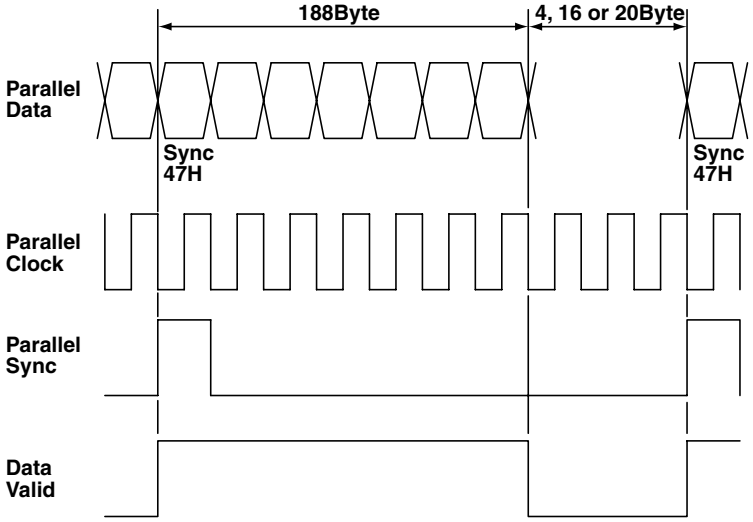
Output level: LVDS (DVB-A010), RS422
Connector: Dsub25

Connection

Pin No.	Signal Name	Pin No.	Signal Name
1	CLKA	14	CLKB
2	SYS GND	15	SYS GND
3	DATA7 A	16	DATA7 B
4	DATA6 A	17	DATA6 B
5	DATA5 A	18	DATA5 B
6	DATA4 A	19	DATA4 B
7	DATA3 A	20	DATA3 B
8	DATA2 A	21	DATA2 B
9	DATA1 A	22	DATA1 B
10	DATA0 A	23	DATA0 B
11	DATA VALID A	24	DATA VALID B
12	SYNC A	25	SYNC B
13	NC		

Parallel Output Timing

The figure below indicates the parallel output timing. You can specify Dummy Out only on packets that are 188 bytes in length. You can select Dummy Out from 4, 16, and 20. Dummy Out data will be all 0s.
If DataValid is set to A, Valid during Dummy Out of a 188-byte packet or 4, 16, or 20 bytes after the 188th byte of a 192-, 204-, or 208-byte packet will be Low.
If DataValid is set to B, Valid will be High during the above period.
If Slope is switched using Setting Output, the phases of Parallel Data and Parallel Clock change. (The slope of the example below is ↓.)
If Out Type is set to Inverse ON, Parallel Sync and Data Valid are inverted. (OFF in the example below)



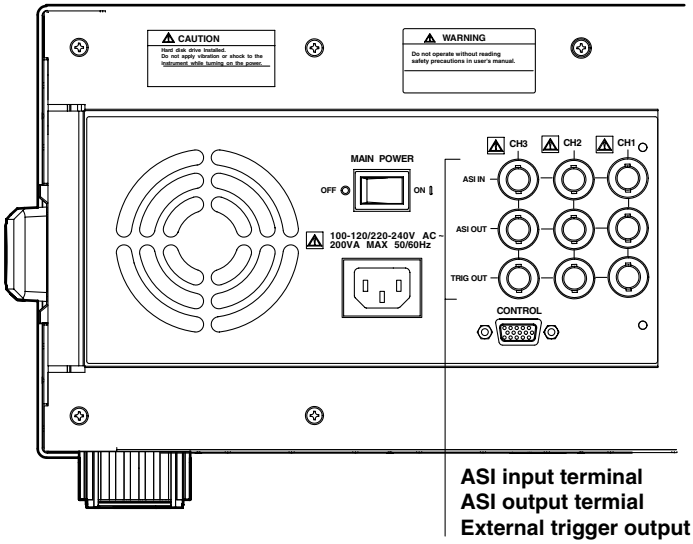
Note

If you select “Super Frame Synchronizing Output” as the synchronizing signal output, the Super Frame synchronizing signal is output from pins 12 (Sync A) and 25 (Sync B) of the parallel output connector.

3.2 Connecting the Cable to the ASI Output Connector

Position of the Output Terminal

The ASI output connector is located on the rear panel. Connect a cable with a BNC connector.



ASI input terminal
ASI output termial
External trigger output terminal

Serial Output Specifications

Item	Specifications
Data output	Complies with DVB-ASI (BSEN 5083-9) Output level : 800 mVp-p Output connector : BNC

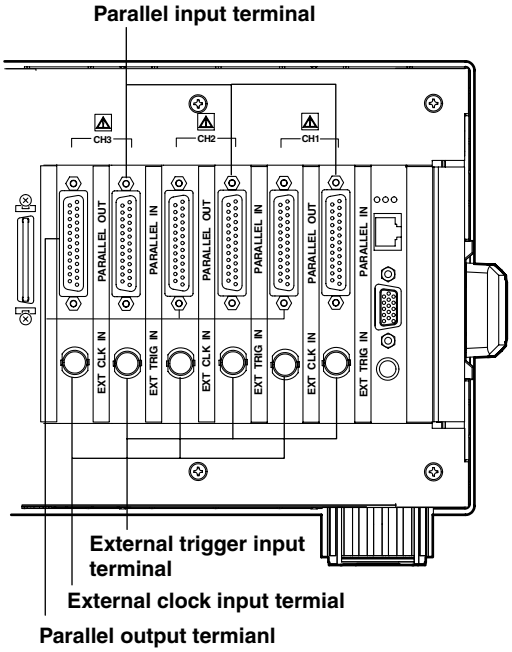
Note

In the TS OUTPUT mode, both the parallel output terminal and the ASI output terminal output the same contents.

3.3 Connecting the Cable to the External Clock Input Connector

Position of the Input Terminal

An external clock input connector is provided on the rear panel for each channel. Connect a cable with a BNC connector.



External Clock Specifications

Item	Specifications	
External clock	Input level	: TTL (50 Ω) input ECL (50 Ω Unbalanced) can be switched
	Input timing	: Rising and falling can be switched
	Connector	: BNC
	Format	: Serial/Parallel (Inputs a clock obtained by frequency dividing the serial clock by eight)

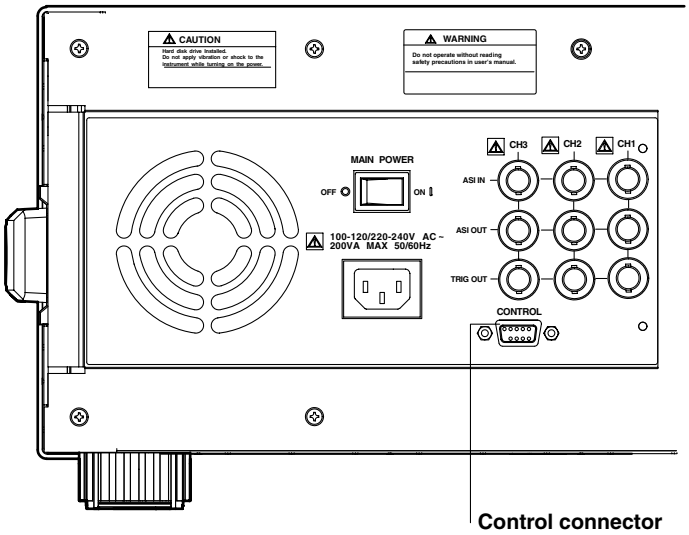
Note

If you set Output Type to Parallel, and Ext Clock under Rate to Serial, data will be output every eight cycles of the clock. (This function is useful depending on the modulator.)
For AS output, if you set Ext Clock to Parallel, the data rate is 8 times faster than that of Serial.

3.4 Connecting the Cable to the Control Signal Connector

Position of the Input Terminal

A control connector is provided on the rear panel.



External Start Signal Specifications

Item	Specification
External start Input	Input level: Contact input (make a short circuit with the grounding pin for 20 µs seconds or longer) Connector: Dsub9

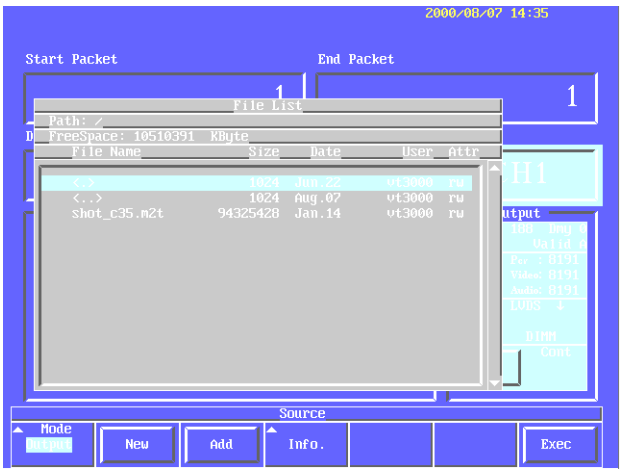
Connection

Pin No.	Signal Name
1	CH1 START
2	CH1 WAIT
3	GND
4	CH2 START
5	CH2 WAIT
6	GND
7	CH3 START
8	CH3 WAIT
9	GND

3.5 Selecting the Contents to Be Output

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SOURCE key to display the Source menu.
3. Press the [Mode] soft key and select Output.



Selecting the Directory

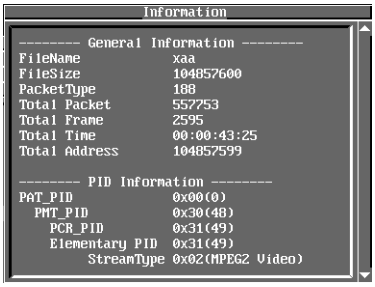
4. Highlight the directory with the rotary knob and press the SELECT key. Select <..> to move up a directory.

Selecting the contents

5. Highlight the content that you wish to output first with the rotary knob and press the [New] soft key. A [0*] mark is placed by the content indicating that it is selected. You can place up to eight [0*] marks. To add a new content, select the desired content with the rotary knob and press the [Add] soft key. A [1*] mark is placed by the content. Every time you press the [Add] soft key the number indicating the output order is displayed in a similar fashion.
6. Press the [Exec] soft key to confirm the contents to be output. At this point, the menus and file list disappear and the selected contents are displayed under File Name.

Viewing the contents information

7. Press the [Info] soft key to view the information about the file that is highlighted in the file list.



Note

- When the content is 2 GB or greater, divide the content into portions and write them into the HDD and reconnect them by pressing [Add] when selecting them. At this time, the content can be divided at any point (there is no restriction such as division by TS packet).
- Regarding the order of the selected contents, the order from the 9th content onward is a, b, c, d, e, f.
- If a discontiguous TS is connected to PCR, PTS or DTS, etc., the output rate may not be set correctly or images or voice, etc. may not be reproduced during reproduction.
- While the content is being output, it is not possible to operate the Source menu by pressing the SOURCE key.
- If the selected file is not a TS file, a warning is displayed.
- Can be set for each channel.
- When more than one file is selected, those files must exist in the same directory.

Explanation

Selecting the Contents

You can continuously output contents by selecting multiple contents. If you saved a large content by dividing it into multiple contents, you can select the divided contents and output them as though they were a single continuous content.

Contents information

Contents information includes the following items:

TS file

File Name : File name of the content
File Size : Size
Packet Type : TS packet type
Total Packet : Total number of packets
Total Frame : Total number of frames
Total Time : Playback time
Total Address : Total number of addresses

----- ---------PID Information----------
PAT PID : PID of the PAT included in the TS
NIT PID : PID of the NIT included in the TS
PMT PID : PID of the PMT packet included in the TS
PCR PID : PID of the PCR packet included in the TS
Elementary PID : PID of the Elementary packet included in the TS
Stream Type : Stream type
Elementary PID : PID of the Elementary packet included in the TS

----- ---------Video Information----------

Video PID : PID of the Video packet included in the TS
Frame Size : Frame size of this video
Picture Rate : Frame rate
Video Bit Rate : Data rate
Aspect Ratio : Aspect ratio
Buffer Size : Buffer size

----- ---------Audio Information----------

Audio PID	: PID of the Audio packet included in the TS
Layer	: Layer
Sampling Rate	: Sampling rate
Audio Bit Rate	: Data rate
Audio Mode	: Mode

BS file

File Name	: File name of the content
File Size	: Size
Packet Type	: TS packet type
Total SuperFrame	: Total number of super frames

Note

- If more than one content is selected in the DIMM mode or DIMM/HDD mode and the total size of the selected contents exceeds the capacity of the DIMM, an error results.
- If more than one content is selected and the packet types of the selected contents are different, the contents will be identified as No TS (not a TS file) even if the individual content is a TS file.
- In judgment of a BS file (ARIB-STD-B20), a maximum of 10 MB of data is searched from the beginning and from the last and each portion of data is judged to have at least five consecutive Super Frame signals.
- In judgment of a TS file, a maximum of 10 MB of data of a non-BS file is searched from the beginning and from the last and each portion of data is judged to have at least five consecutive synchronizing signals.
- In the case of a BS file, you can view detailed information using TS Viewer.
- Video and Audio Information each display the first detected information. Furthermore, you can view complete information of Video and Audio using TS Viewer.
- If Audio is MPEG2-Audio AAC, no detailed information is displayed. However, you can view detailed information using TS Viewer.
- If Audio is AC3, you cannot view detailed information.

3.6 Setting the Zone

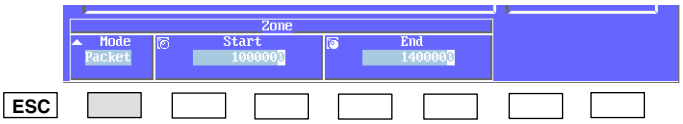
In addition to playing the entire content, the VT3100 can also output a section of the content that is specified by the user. This range is called a zone and is specified by Start and End points.

Procedure

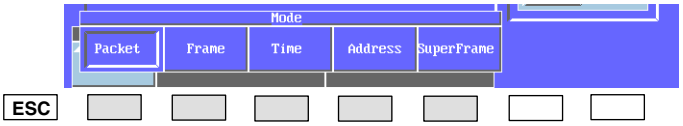
1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the ZONE key to display the Zone menu.

Setting the Mode

3. Press the [Mode] soft key to display the Mode menu.

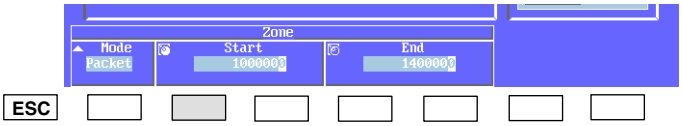


4. Using the soft key, select the unit of the output range (zone) from Packet, Frame, Time, Address, and SuperFrame.



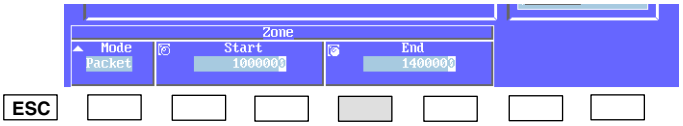
Setting the Start position of the content to be output

5. Press the [Start] soft key and set the start position of the content to be output using numerical keys or rotary knob.



Setting the End position of the content to be output

6. Press the [End] soft key and set the end position of the content to be output using numerical keys or rotary knob.



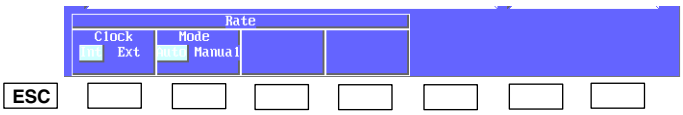
Note

- You cannot change the Start and End positions if the file to be output is not selected.
- The range of Start and End positions is automatically determined from the TS information of the selected file.
- If the mode is set to Frame or Time, the Start and End positions are computed based on the output rate. If you manually change the output rate, the Start and End positions are recomputed. If the output rate is Auto or Ext, the Start and End positions are computed with the Auto value of the output rate.
- If the mode is set to Packet, the Start and End positions are set to 188, 192, 204, or 208 bytes (the unit of packets) according to the Packet setting in section 3.9, “Setting Packet Parameters.”
- If the mode is set to SuperFrame, the Start and End positions are set to values in unit of super frames.
- To output a file that has been identified as a non-TS file, set the Mode to Address.
- You cannot operate the Zone menu while contents are being output.
- Can be set for each channel.

3.7 Setting the Output Rate

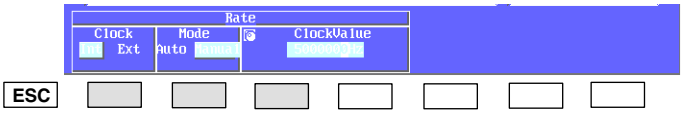
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the RATE key to display the Rate menu.



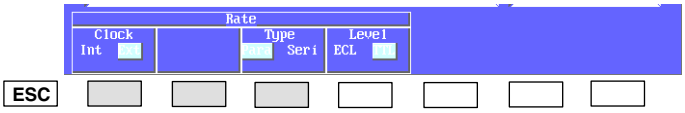
Selecting the internal clock

3. Press the [Clock] soft key to select [Int].
4. Press the [Mode] soft key to select [Auto] or [Manual].
5. If “manual” is selected, set the clock frequency using numerical keys or rotary knob. The range is from 1000 Hz to 57000000 Hz.



Selecting the external clock

6. Press the [Clock] soft key to select [Ext].
7. Press the [Type] soft key to select [Para] or [Seri].
8. Press the [Level] soft key to select [ECL] or [TTL].



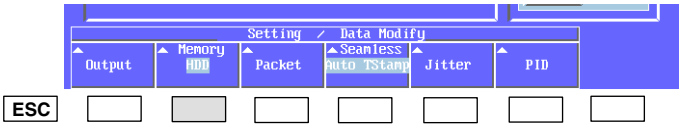
Note

- If the internal clock or external clock is Para in the memory output mode, DVB parallel can be output at a rate of up to 80 MHz, but the performance specification is 57 MHz.
- When the Clock is set to Auto, if the selected file is a TS file, the Clock value (data rate) calculated from the TS file is displayed. However, when more than one file is selected the Clock value may not be correct. When more than one file is selected, it is recommended to output them with the Clock set to Manual.
  When the selected content is not TS (displayed as “No TS”), 0.001000 Mbit/s (1000 Hz) is displayed.
- With the TS without PCR, no correct clock value is set even if the clock is set to Auto.
- In the case of PCR, 3 MB data is searched from the beginning and from the last and the clock value is calculated from the respective first-detected PCR values.
- When the output rate is set to an external clock, set the external clock to be input to a continuous clock. No burst signal can be used as the clock signal. Furthermore, if an external clock is stopped during output, this equipment may not operate correctly.
- Can be set for each channel.
- When an internal clock is used, do not input any signal to the external clock input terminal (EXT CLK IN). This may cause the equipment to fail to operate correctly.

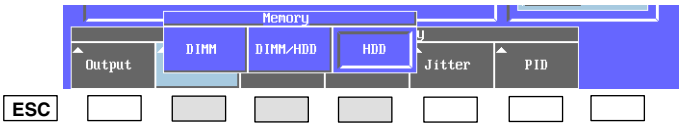
3.8 Setting the Output Mode

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.



3. Press the [Memory] soft key.
4. Select [DIMM] (memory output mode), [HDD&DIMM] (quick output mode), or [HDD] (HDD output mode).



Explanation

Select from the following output modes:

Memory output mode:	Transfers the contents from the built-in hard disk to the memory and then outputs the contents. The contents in the hard disk can be accurately output.
Quick output mode:	Outputs the contents directly from the hard disk the first time. Outputs from the memory subsequently.
HDD output mode:	Outputs the contents directly from the hard disk. Large contents that exceed the available memory can be output.

Note

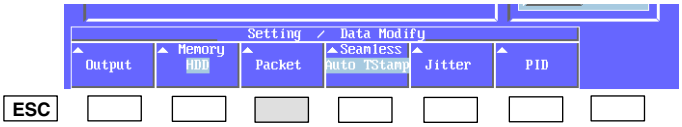
- In the quick output mode, the initial output may not be accurate depending on the internal state of the hard disk or CD-ROM drive. The output will be accurate after the first time.
- In the HDD output mode, the possibility of a hard disk crash is higher because the contents are directly output from the hard disk. Avoid outputting the contents using this mode for an extended period of time.
- During output in the HDD output mode or quick output mode, if FIFO OVER FLOW occurs, red characters "FIFO" are displayed at the top left of the screen. The data at this time may not be correct.
- The OutData indicator is red while contents are being output from the built-in hard disk or CD-ROM drive or while contents are being transferred from the built-in hard disk or CD-ROM drive to the memory. The OutData indicator is green while contents are being output from the memory.
  Furthermore, while the contents are being transferred to the memory in the memory output mode (the indicator is red), the data is not output from the output terminal.
- If the same content (same zone) is already transferred to the memory, the content is not transferred again.
- Can be set for each channel.

When the HDD output mode is selected, it is possible to reproduce the TS directly from the CD-ROM, but FIFO OVER FLOW may occur depending on the data rate, preventing the TS from being reproduced correctly (use 20 Mbps or less as a standard).
If FIFO OVER FLOW occurs, output the contents in the memory output mode or copy the contents from the CD-ROM to the HDD, and then output them in the HDD output mode.

3.9 Setting Packet Parameters

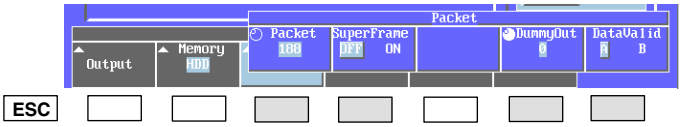
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Packet] soft key.



Setting the packet length

4. Press the [Packet] soft key.
5. Set the packet length using the rotary knob. Select the packet length from [188], [192], [204], or [208].



Selecting the Super Frame Synchronizing Output

6. Press the [SuperFrame] soft key to select [OFF] or [ON].
7. If you turned ON the SuperFrame, press the [Sync] soft key and select [SuperFrame], [Frame], or [Slot] using the rotary knob.

Setting a dummy packet (when the packet length is set to 188)

8. Press the [DummyOut] soft key.
9. Set the number of bytes of the dummy packet to be attached to the TS using the rotary knob. Select the number of bytes of the dummy packet from [0], [4], [16], or [20].

Selecting Data Valid

10. Press the [DataValid] soft key to select [A] or [B].

Note

- You cannot operate the Packet menu while contents are being output.
- If a dummy packet is attached and the output rate is AUTO, the output rate is recomputed.
- Can be set for each channel.

Explanation

Packet length

Set the packet length of the TS to be output.

Super Frame

Super Frame	Specifications
OFF	Turn this OFF when outputting normal TS complying with ISO/IEC13818-1.
ON	Turn this ON to attach a TMCC signal complying with ARIB STD-20 and output the Super Frame synchronizing signal from multiple TS synthesis signals that have been aligned into frames.

Note

- During parallel output, the Super Frame synchronizing signal is output from pins 12 (Sync A) and 25 (Sync B) of the 25-pin Dsub connector.
- When Super Frame is ON, specify the Zone in bytes in the “Address” mode. Set the difference between Start and End to units of Super Frames (204*48*8 bytes or 188*48*8 bytes). Otherwise, the TMCC signal will not be output correctly when repeatedly outputting the TS.
- If you specify Packet, Time, or Frame for the Zone setting, the display may show incorrect values.

If Super Frame is turned ON, you can select the synchronizing signal from Super Frame, Frame, and Slot.

Selecting the attachment of dummy packets

You can attach dummy packets when the packet length of the TS of the content is 188 bytes. You can select 4, 16, or 20 for the dummy packet. After 188 bytes are output, 4, 16, or 20 bytes of all-zero data are output as dummies.

Data Valid

Data Valid	Specifications
A	If the packet length of the TS is 188 bytes, Data Valid will be Low during the attached dummy packet. If the packet length of the TS is 192, 204, or 208 bytes, Data Valid will be Low for 4, 16, or 20 bytes, respectively, from the end of the TS.
B	Data Valid will be High over the entire duration.

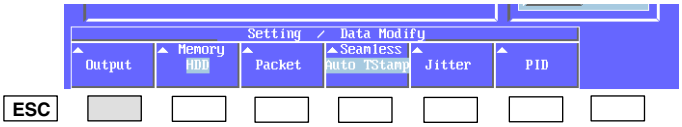
Note

- If the packet length is not 188 bytes, the DummyOut menu is not displayed.
- If the selected file is identified as a TS file, the menu will change according to the packet length that is automatically detected. If the selected file is not identified as a TS file, the packet length will be 188 bytes.
- If you attempt to change the packet length that is automatically detected from the TS file, a warning is displayed.

3.10 Setting Other Parameters Related to the Output

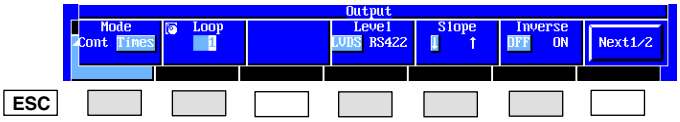
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Output] soft key.



Setting the repetition count of the output

4. Press the [Mode] soft key to select [Cont] or [Times].
5. If you select [Times], set the repetition count using numerical keys or the rotary knob. The range is from 1 to 256.



Selecting the Level

6. Press the [Level] soft key to select [LVDS] or [RS422] during Parallel output or [TTL] or [ECL] during Serial output.

Selecting the Slope

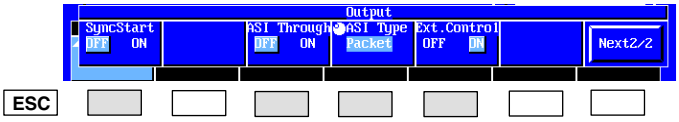
7. Press the [Slope] soft key to select [↓] or [↑].

Selecting the output logic

8. Press the [Inverse] soft key to select [OFF] or [ON].

Select sync output mode (2CH, 3CH model)

9. Press the [Next1/2] soft key.



10. Press the [Sync Start] soft key and select [ON].

Selecting the ASI Through

11. Press the [ASI Through] soft key to select [OFF] or [ON].

Selecting the ASI Type

12. Select “packet” or “burst” for ASI Type with the rotary knob.

Selecting the Ext Control

13. Press the [Ext Control] soft key to select [OFF] or [ON].

Note

- You cannot operate [Output]-[Mode] and [Output]-[Loop] while contents are being output.
- Can be set for each channel.

Explanation

Setting the repetition count of the output
If you select Cont, output will repeat indefinitely from the Start position to the End position specified for Zone. If you select Times, output will repeat the specified number of counts and stop at the End position. If you select one for the count, the content will be output once. If the content is extremely short, the output count may not be correct.

Selecting the Level
If you select LVDS, the content is output using the voltage levels standardized by TIA/EIA-644 and IEEE1596.3 SCI LVDS.
If you select RS422, the content is output using the voltage levels standardized by TIA/EIA-422.

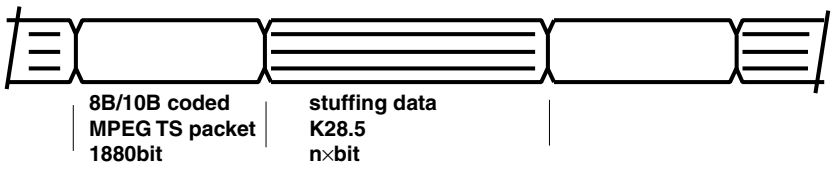
Selecting the output logic
If turned ON, the DATA VALID and SYNC signals are inverted (negative logic).

Sync output mode (2CH, 3CH model)
This is the mode in which channel outputs are started simultaneously. Output methods and output settings of clock, etc. of the channels can vary from one channel to another.

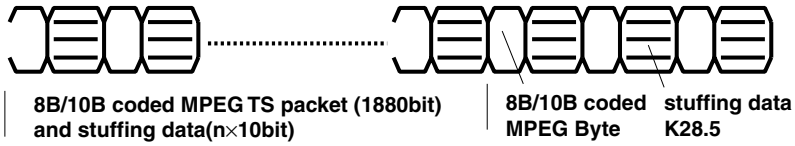
ASI Through mode
When ON has been selected, the ASI input signal is output as is.

ASI Type selection
The output signal configurations for “packet” and “burst” are as shown in the figure below.

Type Packet



Type brst



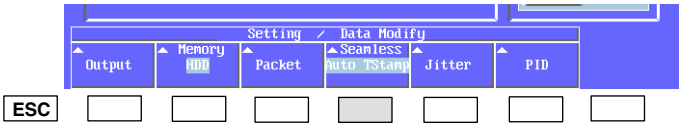
When “packet” has been selected for ASI Type, the contents always requires synchronizing signals. A TS cannot be output without synchronizing signals inserted properly. Even if “packet” has been selected for ASI Type, a BS signal with the TS multiplexed and the TMCC inserted can be output by setting the sync type to “slot”.

Ext Control
If ON has been selected, the VT3100 will enter the output-wait state when you press the START/STOP key. Output is performed when the external start input is connecting to the ground. The VT3100 will enter the output-wait state again when the external wait input is connected to the ground.

3.11 Making Seamless TS Packets

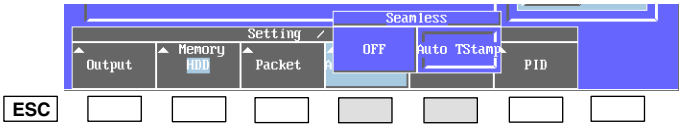
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Seamless] soft key.



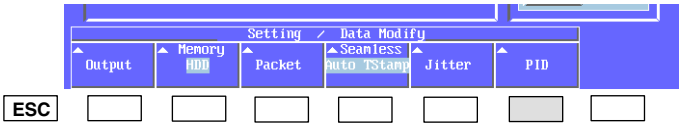
Setting Seamless

4. Select [AUTO Tstamp] or [OFF].

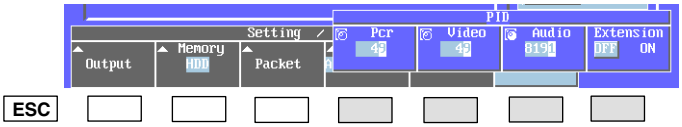


Set the PCR (PID)

5. Press the [PID] soft key to display the PID menu.



6. Press the [PCR] soft key and select the PCR (PID) using numerical keys or the rotary knob. The range is from 0 to 8191.



Setting the Video (PID)

7. Press the [Video] soft key and select the Video (PID) using numerical keys or the rotary knob. The range is from 0 to 8191.

Setting the Audio (PID)

8. Press the [Audio] soft key and select the Audio (PID) using numerical keys or the rotary knob. The range is from 0 to 8191.

Setting the Extension

9. Press the [Extension] soft key to select [OFF] or [ON].

Note

- The seamless function cannot be used on the playback of contents that have been placed in frames that are compatible with the BS digital broadcast (ARIB STD-B20).
- If the selected file is identified as a TS file, the detected PID is used for each PID. If the selected file is not identified as a TS file, PCR (PID), Video (PID), and Audio (PID) will be 8191. In addition, the Audio (PID) is 8191 if there are no Audio data.
- You cannot operate the Seamless and PID menus while contents are being output.
- Can be set for each channel.

Explanation

Making seamless packets

The following two types of seamless processes are available:

- Auto Time Stamp
- Splicing

Auto Time Stamp

Automatically updates time stamps to maintain continuity of the Video, Audio, PTS, DTS, and PCR when repetitively outputting contents according to the ISO/IEC-13818 standard.

When Extension is turned ON, time stamps of all PTS, DTS, and PCR are updated.

Time stamping method (method to compute the summed value)

The cycle period derived from the bit rate and data length are added to the PTS, DTS, and PCR.

Splicing

To maintain the continuity of video, you must process the start point and end point (repeat point) of the TS file in addition to updating the time stamp. The function that carries out this process is called Splicing.

Splicing is based on the method described below. In some cases, depending on the decoder, the continuity of video cannot be maintained even if Splicing is used.

Method used to detect the position of the seamless process

Detecting the start position

Start position is the beginning of the sequence header, GOP, or I frame. The start position of the seamless process is searched in the area that comes after the specified address (time axis direction in which the values get larger, where address indicates PACKET, FRAME, and TIME).

The search is performed in the following order: sequence header, GOP, and I frame.

The search range is 6 Mbytes from the specified address.

Searching the end position

The end position is before the sequence header, the end of GOP, or the I or P picture.

The end position is searched sequentially in the area before the specified address (time axis direction in which the values get smaller). The search range is 6 Mbytes from the specified address.

Seamless process of VIDEO data

Processing the start point of the packet that is to be made seamless

- The TS packet before the GOP header data is deleted.
- PES header that includes DTS or PTS of an I frame is placed at the beginning of the TS packet.
- If there is space left after inserting the GOP header, it is filled with stuffing bytes using the adaptation field of the TS.
- If there is no space for the PES header before the GOP header, another TS packet is inserted before it.

Processing the end point of the packet that is to be made seamless

- If DTP and PTS are included in the PES header immediately after the end point, the time stamp inside the PES header goes through a stuffing process. (This is because the time stamp inside the PES header is indicating the playback time of the P picture that was deleted.)
- The remainder of the last TS packet is filled with stuffing bytes.

Broken link flag

The broken link flag of the first GOP that has gone through seamless processing is set to ON.

Seamless process of AUDIO data

- The extraction of both the start and end points are based on the SYNC signal that contains PTS.
- Based on the PTS of the VIDEO data, the AUDIO data are made into NULL packets so that
  Start VIDEO PTS < AUDIO PTS
  Stop VIDEO PTS > AUDIO PTS
  are satisfied.

Time stamping method (method to compute the summed value)

The time stamp of PCR is processed in the same fashion as the Auto Time Stamp.
If the content includes Video, the cycle period derived from the DTS of the Video is added.
If the content only includes Audio, the cycle period derived from the PTS of the Audio is added.

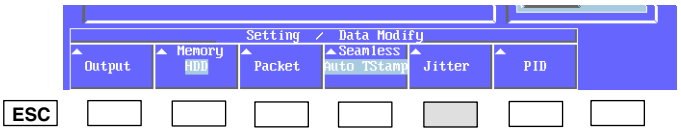
Note

- The continuity of the Continuity Counter is secured only for the set PCR PID, Video PID and Audio PID.
- When Audio is AC3, no splicing is performed on the Audio data.

3.12 Using the Jitter Addition Function

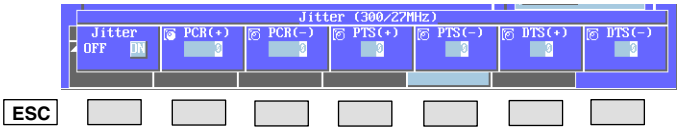
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Jitter] soft key.



Turning ON/OFF the Jitter

4. Press the [Jitter] soft key to select [OFF] or [ON].



Setting PCR(+)

5. 5. Press the [PCR(+)] soft key and set PCR(+) using numerical keys or the rotary knob. The range is from 0 to 65535.

Setting PCR(-)

6. Press the [PCR(-)] soft key and set PCR(-) using numerical keys or the rotary knob. The range is from 0 to 65535.

Setting PTS(+)

7. Press the [PTS(+)] soft key and set PTS(+) using numerical keys or the rotary knob. The range is from 0 to 255.

Setting PTS(-)

8. Press the [PTS(-)] soft key and set PTS(-) using numerical keys or the rotary knob. The range is from 0 to 255.

Setting DTS(+)

9. Press the [DTS(+)] soft key and set DTS(+) using numerical keys or the rotary knob. The range is from 0 to 255.

Setting DTS(-)

10. Press the [DTS(-)] soft key and set DTS(-) using numerical keys or the rotary knob. The range is from 0 to 255.

Note

- The jitter addition function cannot be used on the playback of contents that have been placed in frames that are compatible with the BS digital broadcast (ARIB STD-B20).
- Can be set for each channel.

Explanation

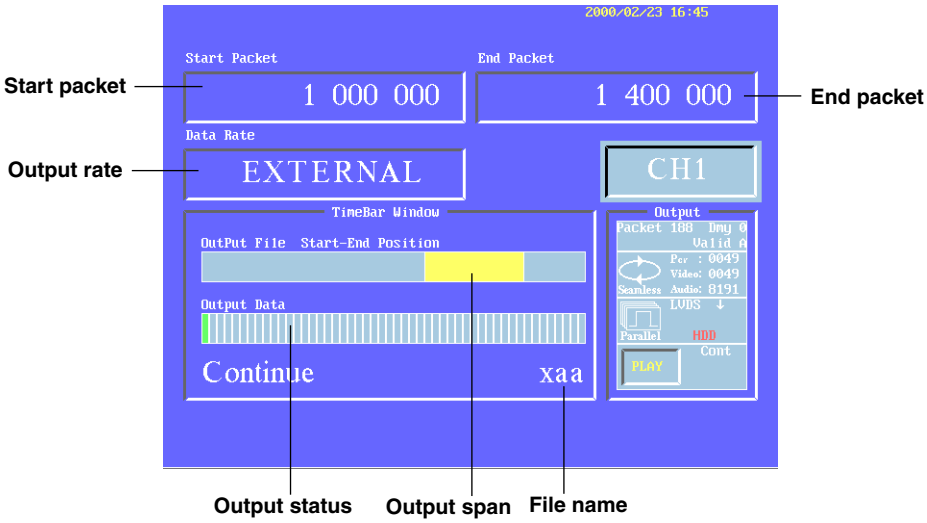
The jitter addition function adds jitter to the TS packet in the following manner:

- For the TS packet, when the first PCR is detected, the time specified for PCR(+) is added to the original PCR. When the next PCR is detected, the time specified for PCR(-) is added to the original PCR. These processes are alternated.
- For the TS packet, when the first PTS is detected, the time specified for PTS(+) is added to the original PCR. When the next PCR is detected, the time specified for PTS(-) is added to the original PTS. These processes are alternated.
- For the TS packet, when the first DTS is detected, the time specified for DTS(+) is added to the original PCR. When the next DTS is detected, the time specified for DTS(-) is added to the original PCR. These processes are alternated.
- The jitter is added to the PCR, PTS, and DTS that have PIDs specified during the seamless process.

3.13 Outputting the Contents

Procedure

1. Press the START/STOP key to output the contents over the range specified by zone. The menu that was displayed is cleared. Press the START/STOP key to stop the output.
   With Ext Control ON, the output stops when you press the START/STOP key, and starts when you set the external start terminal input to GND. Also, if you connect the external wait input terminal to GND, output stops once again.



Explanation

- If you specified the output count, the output automatically stops after outputting the contents the specified number of times.
- The screen displays the Start and End Positions of the output buffer and the contents to be output. (Output File Start-End Position)
- The screen displays the current output position within the output span (from the Start position to the End position). (Output Data)
- The parallel output terminal and the ASI output terminal simultaneously output the same contents.

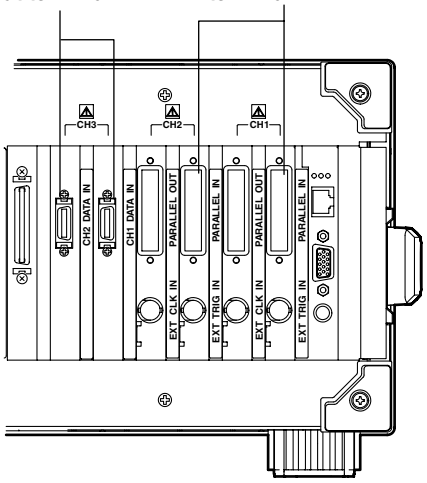
4.1 Connecting the Cable to the Parallel Input Terminal

Position of the Input Terminal

The parallel input terminal is located for each channel on the rear panel. Connect a 25-pin Dsub cable.

An ARIB standard compliant parallel input terminal is located in the position of the 2CH DVB parallel input terminal on the 1CH models, and the 3CH DVB parallel input terminal position on the 2CH models. There is no ARIB input terminal on the 3CH models.

ARIB STD-B parallel input terminal **DVB parallel input terminal**



Parallel Input Specifications

Output level: Switch between LVDS (DVB-A010) and RS422
Connector: Dsub25

Connection

Pin No.	Signal Name	Pin No.	Signal Name
1	CLKA	14	CLKB
2	SYS GND	15	SYS GND
3	DATA7 A	16	DATA7 B
4	DATA6 A	17	DATA6 B
5	DATA5 A	18	DATA5 B
6	DATA4 A	19	DATA4 B
7	DATA3 A	20	DATA3 B
8	DATA2 A	21	DATA2 B
9	DATA1 A	22	DATA1 B
10	DATA0 A	23	DATA0 B
11	DATA VALID A	24	DATA VALID B
12	TRIGER A	25	TRIGER B
13	NC		

Parallel Input Specifications (ARIB STD-B1 parallel interface)

Output level: TTL
Connector: 20-pin mini-SCSI (amphenole, female type)

Connection

Pin No.	Signal Name	Pin No.	Signal Name
1	TPD7	11	3.3V output
2	TPD6	12	Open
3	TPD5	13	3.3V output
4	TPD4	14	GND
5	TPD3	15	GND
6	TPD2	16	GND
7	TPD1	17	GND
8	TPD0	18	Open
9	BCK	19	Open
10	Open	20	Open

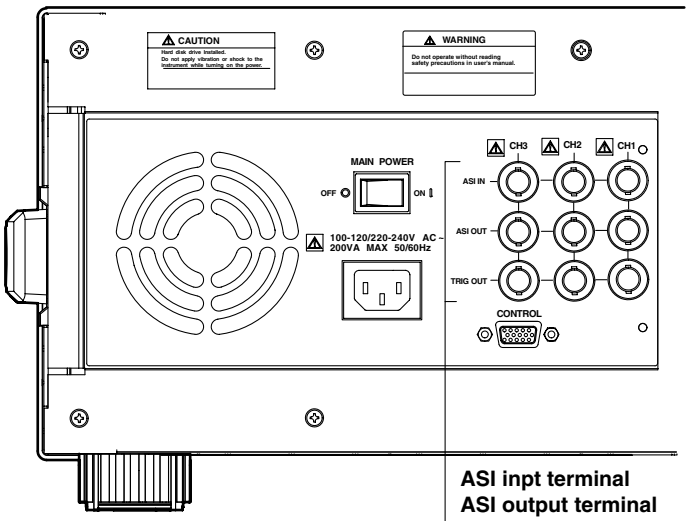
Note

In case of parallel input (DVB), if a BSEN50083-9-conforming DVB parallel output is connected and the input clock is set to ↑, data can be extracted with VALID.

4.2 Connecting the Cable to the ASI Input Terminal

Position of the Input Terminal

The ASI input terminal is located for each channel on the rear panel. Connect a BNC cable.



ASI inpt terminal
ASI output terminal
External trigger output terminal

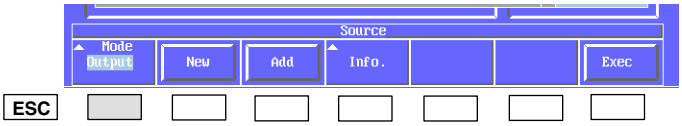
ASI Input Specification

Item	Specification
Data input	Complies with DVB-ASI (BSEN 5083-9) Input level: 800 mVp-p Connector: BNC (75 Ω)

4.3 Setting the VT3100 in the Record Mode and Setting the File Name

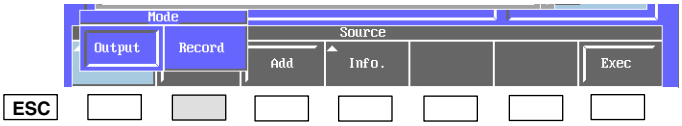
Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SOURCE key to display the Source menu.



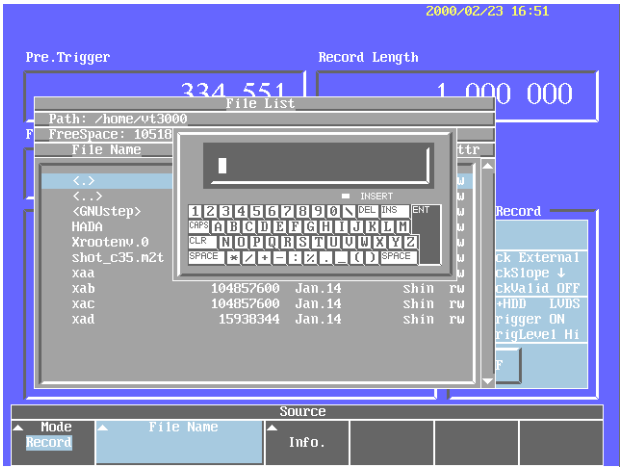
Setting the mode

3. Press the [Mode] soft key and select Record.



Setting the save destination

4. Highlight the destination directory with the rotary knob and press the SELECT key.
   Select <..> to move up a directory.
   When you change the directory, the file name that is entered is cleared.



Setting the file name

5. Press the [File Name] soft key to display a keyboard screen.
6. Enter the file name using up to 24 characters on the keyboard.

Viewing the file information

7. Press the [Info] soft key to view the information about the file that is highlighted.

Explanation

Save destination

The file is saved to the Path of the file list that is currently displayed.

File name

You can enter up to 24 characters for the file name, but the VT3100 can only display 15 characters in the file list.

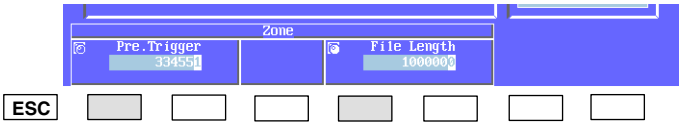
Note

- You cannot operate the Source menu while recording is in progress.
- Can be set for each channel.

4.4 Setting the Pre-trigger and Data Length

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the [ZONE] key to display the Zone menu.
3. Press the [Pre. Trigger] soft key and select the pre-trigger using numerical keys or rotary knob. If you set the pre-trigger to 0, data before the trigger point will not be recorded.



4. Press the [File Length] soft key and select the length of the data to be recorded using numerical keys or rotary knob.

Explanation

Pre-trigger range

The pre-trigger range is 0 MB to the DIMM size × 3/4 MB.

Data length range

The data length range varies depending on the [Memory] setting in section 4.6, “Setting the Record Mode” as follows:

When the Memory setting is DIMM

0 MB to the DIMM size × 3/4

When the Memory setting is DIMM/HDD

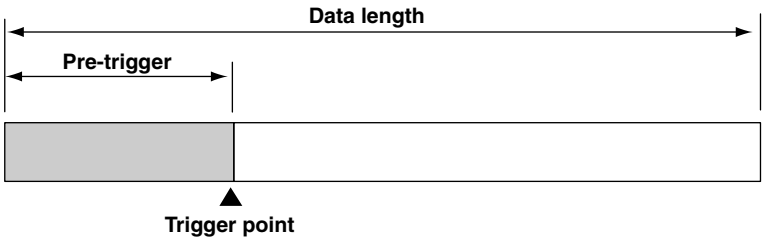
0 MB to the free space on the built-in hard disk (100 GB maximum = 102400 MB)

Note

- If you abort the recording before reaching the data length, data up to that point are recorded.
- If the free space on the hard disk is insufficient, data are recorded until the hard disk is full.
- Can be set for each channel.

Relationship between the pre-trigger and data length

The relationship between the pre-trigger and data length is as follows:



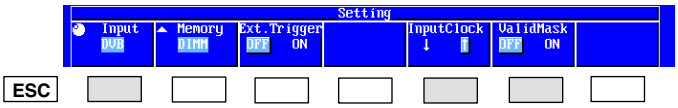
Note

- If you set the pre-trigger larger than the data length, an error occurs.
- You cannot operate the Zone menu while recording is in progress.

4.5 Setting the Input Format and the Clock

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Input] soft key to select [DVB], [ARIB] or [ASI].



4. If the Input is DVB or ARIB, press the [InputClock] soft key to select rising [↑] or falling [↓].
5. If the Input is DVB, press the [ValidMask] soft key to select [ON] or [OFF].

Explanation

Clock

For the clock signal applied to the external clock terminal during DVB parallel input, up to a 10-MHz signal is operable in the DIMM mode. However, the assured range is up to 7.5 MHz.

Slope

Sampling is carried out on the rising or falling edge of the clock signal.

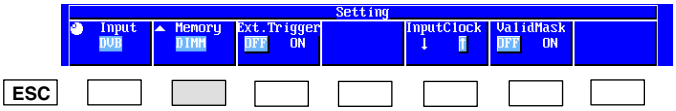
Note

- Input a continuous clock for the external clock. Burst signals cannot be used as clock signals. In addition, if you stop the external clock while recording, the VT3100 may not operate properly.
- If Valid is ON, the external clock is masked when Valid is at the “L” level.
- Can be set for each channel.

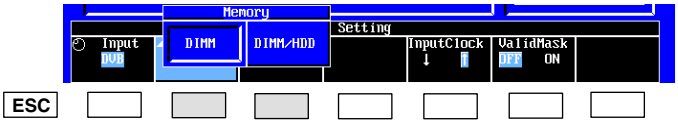
4.6 Setting the Recording Mode

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Memory] soft key to display the Memory menu.



4. Select [DIMM] or [DIMM/HDD].



Explanation

Recording mode

The following two recording modes are availables:

- **DIMM**
  The entire data are recorded to memory. After recording is finished, the data residing in the memory is saved to the hard disk.
- **DIMM/HDD**
  Stores the pre-trigger section of data to the memory. Stores the post-trigger section of data (after the trigger point) to the built-in hard disk. After recording is finished, the data residing in the memory is saved to the hard disk.
  This is useful when recording large quantities of data.

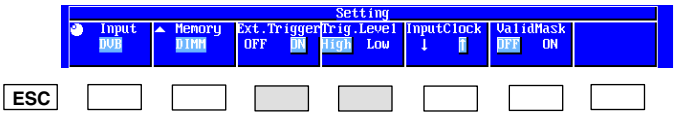
Note

- In the DIMM/HDD mode, you can record data that exceed the size of the memory. However, the disk write speed may be insufficient to keep up with the input data stream, if, for example, the VT3100's HD is busy due to external access via Ethernet using Samba or FTP. In such case, recording is aborted. We recommend that you turn OFF the network function when recording using the DIMM/HDD mode.
- If you abort the recording while recording in the DIMM mode, a file with 0 size is created and a TS file is not recorded.
- Can be set for each channel.

4.7 Setting the External Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Ext. Trigger] soft key to select [ON] or [OFF].



4. If the external trigger has been set to ON, press the [Trig. Level] soft key to select [High] or [Low].

Explanation

If the external trigger is turned ON, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when a trigger signal is input, the VT3100 will start recording.
If the external trigger is turned OFF, the VT3100 will enter the trigger-wait state when you press the START/STOP key. When you press the START/STOP key again, the VT3100 will start recording.
The external trigger signal is input through the parallel input connector.
The High or Low period of the external trigger signal must be at least 100 ns long.

Note

- In the Record mode, an external trigger can be input only through the BNC connector; it cannot be input through the DVB input connector (i.e. D-sub connector).
- Can be set for each channel.

4.8 Starting the Recording Operation

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. When you press the START/STOP key, the VT3100 enters the trigger-wait state. If the external trigger is OFF, recording starts when you press the START/STOP key again. If the external trigger is ON, recording starts when a trigger signal is input. If you press the START/STOP key while recording is in progress, recording stops.

Explanation

After you press the START/STOP key, recording stops when the specified length of data is recorded.

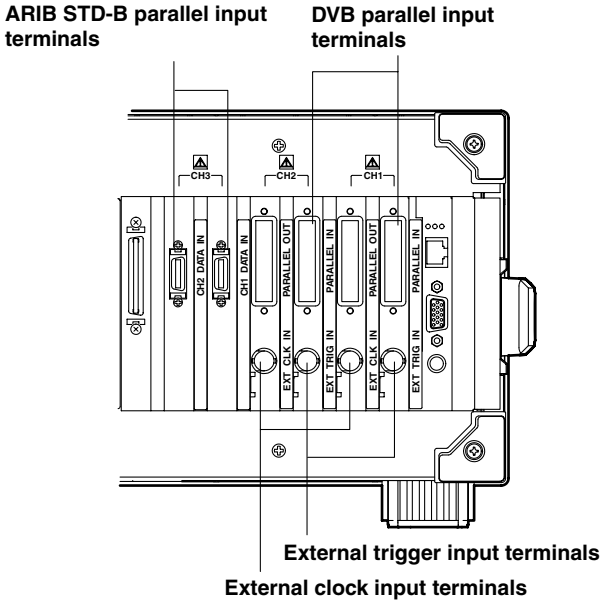
Note

- Even if the external trigger is ON and the VT3100 is in the trigger-wait state, recording will start when you press the START/STOP key.
- If the recording mode is DIMM and you abort the recording, a file with 0 size is created.
- If the recording mode is DIMM/HDD and you abort the recording, data up to that point are recorded.
- In the trigger-wait state, if the specified pre-trigger length of data are not recorded, the Pre.Trig indicator appears at the upper left corner of the screen. If you start recording while this indicator is displayed (pre-trigger length of data are not recorded), a file is created which has no content recorded at the beg of the record file.
- If the record file exceeds 2 GB, recording is carried out by segmenting the file every 2 GB. For the segment file name, an index number is attached to the end of the specified file name. For example, if you record a 6-GB file to the file name “TEST,” the file is divided into three files, “TEST.1,” “TEST.2,” and “TEST.3.”

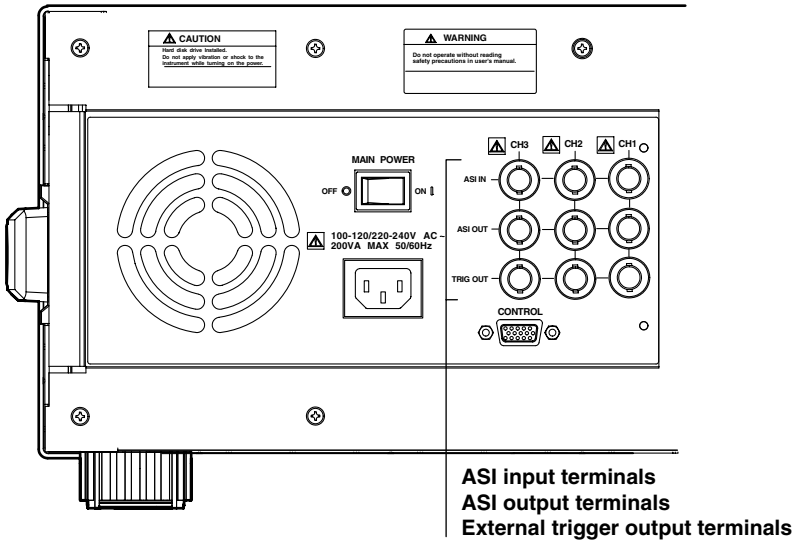
5.1 Connecting the Cable to the Input Terminal

In the Monitor mode, use the identical input terminal used in the Record mode.

DVB Parallel Input Terminal



ASI Input Terminal



External Trigger Output Terminal

If any of the various triggers selected by the monitoring function has occurred, a High signal with the pulse width of approx. 270 ns is generated from this terminal.

5.2 Setting the VT3100 in the Monitor Mode and Setting the File Name

Procedure

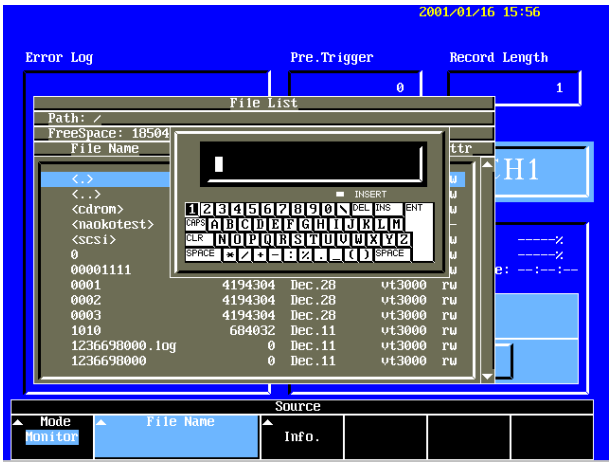
1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SOURCE key to display the Source menu.

Setting the mode

3. Press the [Mode] soft key to select Monitor.

Setting the save destination

4. Highlight the destination directory with the rotary knob and press the SELECT key. Select <..> to move up a directory. When you change the directory, the file name that has been entered is cleared.



Setting the file name

5. Press the [File Name] soft key to display the keyboard screen.
6. Enter the file name using up to 17 characters via the keyboard.

Viewing the file information

7. Press the [Info] soft key to view the information about the file that is highlighted.

Explanation

If a trigger is input while Record is ON in the Setting in the Monitor mode, the VT3100 will start recording.
If Record is OFF, the VT3100 does not record even if a file name is set.

Save destination

The file is saved to the Path of the file list that is currently displayed.

File name

If a file name is entered, “the file name + 000” is displayed. This “000” is incremented by one every time when a trigger is input up to 255. The file name is displayed in the form of “the file name + XXX”; this XXX is the incremented number from 000 to 255. Up to 17 characters is available for the file name.

Note

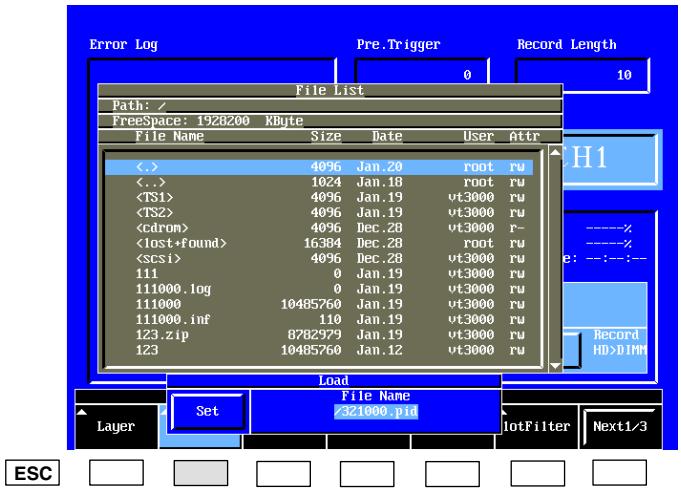
- If the hard disk is full, another recording operation is not conducted even if a trigger is input.
- Even if a trigger is input again while the VT3100 is recording, the next recording operation is not conducted until the current operation is completed. While the memory is in the DIMM mode, the recording operation is not conducted until the transmission from the DIMM to the HD is completed.

5.3 Conducting the PID Search

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [PID] soft key to display the PID menu.
4. Press the [Search] soft key to select [Auto] or [Manual].

5. When Manual has been set for Search, select a PID information setting file from among the File List with the rotary knob and the SELECT key and press the [Set] soft key.



Displaying/saving Layer

6. Press the [Layer] soft key to display the PID setting information.

7. When you press the [Save] soft key, the current PID setting information is saved with the file name of Layer.pid.

Explanation

The PID setting information is used as the setting information for ETR290 Trigger. When Auto has been set for Search, the PID setting information is acquired from the input TS. The acquisition of the PID setting information is conducted just after the monitoring operation is started or when synchronization is reestablished after Syncloss of the input TS for 5 seconds or longer.
The PID setting information is created on a PC as a text file and can be transferred to the VT3100 via FTP, etc. The file format of the PID setting information is as follows.

Note

- If the PID setting information is not acquired correctly (this is known by an error message) while Search is Auto, neither error log indication nor recording is conducted.
- When the PID setting information is displayed by pressing the [Layer] soft key, all the information may not be displayed on the Layer display window. If this is the case, scroll the window with the rotary knob.

Overall structure of the PID setting information

#!PID File
#!PSI
Eight descriptions on the PSI information (indispensable)
#!PMT
Up to ten descriptions on the PMT information
#!PCR
Up to ten descriptions on the PCR information
#!ELE
Up to 99 descriptions on the elementary stream information

Structure of the PSI information

The order of description for various PSI cannot be changed. PID, PSI interval (sec), PTS check and comment must be described in this order. Comments following # can be omitted. For the PSI interval, if the section includes two or more number of TSs, the PSI intervals for the TSs other than the first one are ignored. When you set the interval to 0, there is no interval stipulation for each PSI. As there is no PTS in the PSI information, set it to 0. You can change the PID value for PSI stipulated in the standard (for example, setting PAT to a value other than 0).
If a PSI does not exist, set the PID to the value in the example below and the interval to 0.

Example:

```
0X0000,    0.5,    0    #PAT
0X0001,    0,      0    #CAT
0X0010,    10,     0    #NIT
0X0011,    2,      0    #SDT
0X0012,    2,      0    #EIT
0X0013,    0,      0    #RST
0X0014,    30,     0    #TDT
0X1FFF,    0,      0    #NULL
```

The DVB and ARIB standards for the PSI interval are as follows. When Auto is set for PID search, the value of DVB standard is used as the initial value.

PSI Type	DVB Standard	ARIB Standard
PAT	500 ms	100 ms
CAT	No Time	1 S
NIT	10 S	10 S
SDT	2 S	2 S
EIT	2 S	2 S
RST	No Time	No Time
TDT	30 S	30 S
NULL	No Time	No Time
PMT	500 mS	100 mS

Structure of the PMT information

Up to ten descriptions are available. PID, PMT interval (sec), PTS check and comment are described in this order. Comments following # can be omitted. If the section includes two or more number of TSs, the PMT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question). When you set the interval to 0, there is no interval stipulation for each PMT. As there is no PTS in the PMT information, set it to 0.

Example:

```
0X0030,    0.5,    0
0X0040,    0.5,    0
0X0050,    0.5,    0
0X0060,    0.5,    0
```

Structure of the PCR information

Up to ten descriptions are available. PID, PID interval (sec), PTS check and comment are described in this order. Comments following # can be omitted. The interval is not that of the adaptation in which the PCR is included but that of the set PID. The interval of the PCR only is set in the PCR Int of ETR Extend. When Auto is set for PID search, the PID interval is the value set in the User Def of ETR Extend. When you set the interval to 0, there is no interval stipulation for each PCR. If the PTS check is 1, the value set in the PTS Int of ETR Extend is applied.

Example:

```
0X0031,    0.5,    0
0X0041,    0.5,    0
0X0051,    0.5,    0
0X0061,    0.5,    0
```

Structure of the ELE information

Up to 99 descriptions are available. PID, PID interval (sec), PTS check and comment are described in this order. Comments following # can be omitted. When Auto is set for PID search, the PID interval is the value set in the User Def of ETR Extend. When you set the interval to 0, there is no interval stipulation for each ELE. If the PTS check is 1, the value set in the PTS Int of ETR Extend is applied.

Example:

```
0X0032,    0.5,    1    #MPEG2 Video
0X0042,    0.5,    1    #MPEG2 Audio
0X0052,    0.5,    1    #MPEG2 Video
0X0062,    0.5,    1    #MPEG2 Audio
```

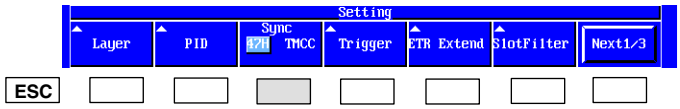
Note

- It is allowed to insert comments between lines. However, in case of columns, place comments in the last column.
- The notation “#!” is not a comment. Make sure to insert comments in the format shown above.
- The maximum setting interval for PSI, PMT and PID is 65.0 (sec).

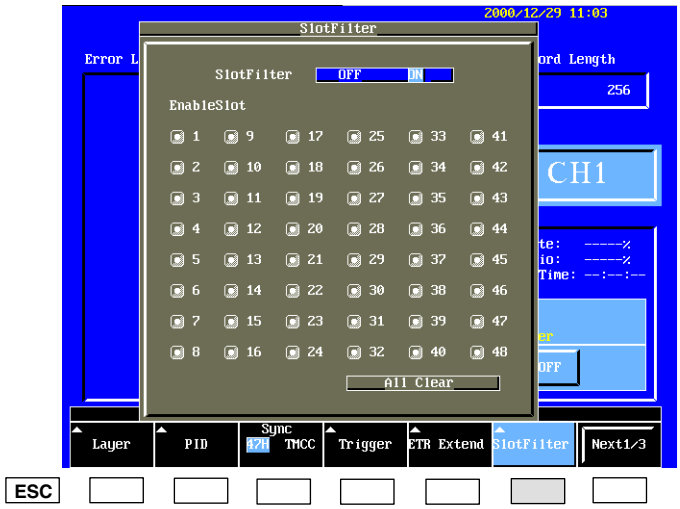
5.4 Making the Setting for Monitoring the TS for BS Digital Broadcast

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Sync] soft key to set to [TMCC].



4. Press the [Slotfilter] soft key to display the SlotFilter screen.



5. Select EnableSlot with the rotary knob and the SELECT key and turn it ON.

Explanation

In a transport stream (TS) for the ARIB STD-B20-conforming BS digital broadcast, multiple number of TSs are multiplexed. So it is necessary to separate the TSs using the SlotFilter. To acquire the Slot information of BS, record all the BS data in the Record mode and conduct analysis using the TS Viewer. If the SlotFilter is ON, triggers are generated and recorded for the selected Slot.

Note

- If no PID search is conducted after the SlotFilter is set, the correct PID setting information cannot be acquired.
- If a TS is recorded using the SlotFilter, the temporal relationship among the PCR, PTS and DTS may be confused. When this TS is output, images and sounds may not be played back normally.

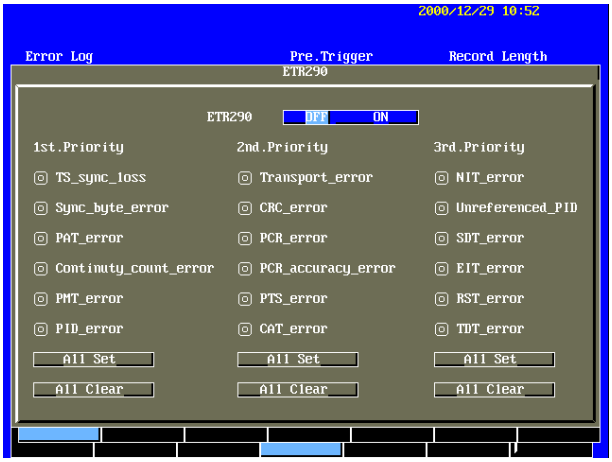
5.5 Setting the ETR290 Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key.

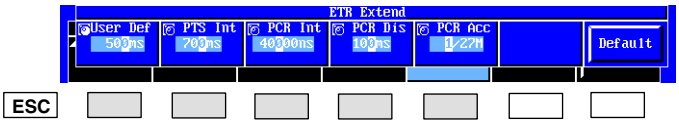
Setting the ETR290 trigger

4. Press the [ETR290] soft key.
5. Select the trigger conditions you want to make effective with the rotary knob and the SELECT key, then turn them ON. Using the [All Set] and [All Clear] keys allows you to make the selections collectively for each Priority. The selected triggering conditions are ORed (in other words, a trigger is generated any one of the conditions are satisfied). The OR operation is also applied to all the other triggering conditions (EXT_Trigger, Patter_Trigger, PCR_Trigger, Section_Trigger and TMCC_Trigger).



Setting the ETR Extend

6. Press the SETTING key to display the Setting menu.
7. Press the [ETR Extend] soft key.



8. Press the [User Def] soft key and set User Def using numerical keys or the rotary knob. The range is from 0 to 65534 (ms).
9. Press the [PTS Int] soft key and set PTS Int using numerical keys or the rotary knob. The range is from 2 to 2046 (ms).
10. Press the [PCR Int] soft key and set PCR Int using numerical keys or the rotary knob. The range is from 1 to 255 (ms).
11. Press the [PCR Dis] soft key and set PCR Dis using numerical keys or the rotary knob. The range is from 1 to 728 (ms).
12. Press the [PCR Acc] soft key and set PCR Acc using numerical keys or the rotary knob. The range is from 1 to 254 (/27M).

Explanation

ETR290 trigger

The ETR290 trigger is a trigger to start the log indication or recording operation when an error has occurred which conforms to “The ETSI TECHNICAL REPORT 290”, the guideline for the MPEG-2/DVB transport stream.

ETR290

The ETR290 has three priorities and 20 errors. The table below shows the items to be measured, contents of the errors, contents of the error log indicated by the VT3100 when an error has occurred, and the event-on triggers.

Priority	No	Items to be measured	Contents	Error log indication	Event-on trigger
1	1.1	TS_sync_loss	LOSS	TSSyncOK	○
			OK	TSSyncLoss	(LOSS only)
	1.2	Sync_byte_error	–	SyncByteErr	○
	1.3	PAT_error	Over	PATErr	△
			table_ID	PATErr	○
			Scramble	PATErr	○
	1.4	Continuity_count_error	–	ContCountErr	○
	1.5	PMT_error	Over	PMTErr	△
			Scramble	PMTErr	○
	1.6	PID_error	Over	PIDErr	△
2	2.1	Transport_error	Error ON	TransportErr	○
	2.2	CRC_error	PAT	CRCErr	○
			CAT	CRCErr	○
			PMT	CRCErr	○
			NIT	CRCErr	○
			EIT	CRCErr	○
			BAT	CRCErr	○
			SDT	CRCErr	○
			TOT	CRCErr	○
	2.3	PCR_error	Discontinuity	PCRErr	○
			Over	PCRErr	△
	2.4	PCR_accuracy_error	Accuracy	PCRAccuracy	○
	2.5	PTS_error	Over	PTSErr	△
	2.6	CAT_error	Scramble	CATErr	○
			Table_ID	CATErr	○
3	3.1	NIT_error	Table_ID	NITErr	○
			Over	NITErr	△
	3.4	Unreferenced_PID	Unrefe	UnrefPID	○
	3.5	SDT_error	Table_ID	SDTErr	○
			SDTover	SDTErr	△
	3.6	EIT_error	Table_ID	EITErr	○
			EITover	EITErr	△
	3.7	RST_error	Table_ID	RSTErr	○
	3.8	TDT_error	Table_ID	TDTErr	○
			TDTover	TDTErr	△

Note

- ○ indicates that a trigger is generated just when an error has occurred.
- △ indicates that a trigger is generated when a predetermined period of time has elapsed. Consequently, there is no error existing at the point of the TS.

The following are the details of the ETR290.

TS_Sync_loss

A status, in which five or more synchronization bytes (0X47) of the header of a transport stream continue, is called “synchronization”. From this state, if two or more synchronizing signals are lost in succession, this error is issued. This error does not occur as long as TSSyncOK does not appear in the error log indication.

Sync_byte_error

This error occurs when the synchronization byte of a transport stream is other than 0X47.

PAT_error

This error occurs when one of the following three conditions is satisfied:

- A packet of which the PID is 0x00 does not appear at the interval of 500 ms or less.
- The table_id of a packet of which the PID is 0x00 is other than 0X00.
- A packet of which the PID is 0x00 has been sent in an encrypted form. (Scrambling_control_field is other than 00.)

Continuity_count_error

This error occurs when a discontinuity is observed in the PID Continuity_conuter described in the PID setting information.

PMT_error

This error occurs when one of the following two conditions is satisfied:

- The PMT section does not appear at the interval of 500 ms or less. If the section includes two or more number of TSs, the PMT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question).
- A PMT packet has been sent in an encrypted form. (Scrambling_control_field is other than 00.)

PID_error

This error occurs when an elementary stream including the PCR described in the PCR information and the ELE information in the PID setting information has appeared or an elementary stream does not appear at the described interval or less. When Auto is set for PID search, this interval is the value set in the User Def of ETR Extend (the initial value is 500 ms).

Transport_error

This error occurs when the Transport_error_indicator of a packet is 1.

CRC_error

This error occurs when the CRC (Cyclic Redundancy Check) is not correct in the packet of PAT, CAT, PMT, NIT, EIT, BAT, SDT or TOT described in the PID setting information.

PCR_error

This error occurs when one of the following two conditions is satisfied:

- The difference between the continuous two PCR values for the same PCR described in the PCR information in the PID setting information is not greater than the value set in the PCR Dis of ETR Extend (the initial value is 100 ms).
- The PCR described in the PCR information in the PID setting information does not appear at the interval of the value set in the PCR Int of ETR Extend (the initial value is 40 ms) or less.

PCR_accuracy_error
This error occurs when the absolute error of the difference between the continuous two PCR values for the same PCR described in the PCR information in the PID setting information is not less than the error value set in the PCR Acc of ETR Extend (the initial value is 14/27 ms = about 518.5 ns).

PTS_error
This error occurs when the elementary stream or the PTS of the elementary stream including the PCR with the PTS check of 1 and described in the PCR information and the ELE information in the PID setting information does not appear at the described interval or less. When Auto is set for PID search, this interval is the value set in the PTS Int of ETR Extend (the initial value is 700 ms).

CAT_error
This error occurs when one of the following two conditions is satisfied:
- The table_id of a packet of which the PID is 0X0001 is other than 0X01.
- A packet of which the PID is 0X0001 has been sent in an encrypted form. (Scrambling_control_field is other than 00.)

NIT_error
This error occurs when one of the following two conditions is satisfied:
- A section of which the PID is 0x0010 does not appear at the interval of 10 sec or less. If the section includes two or more number of TSs, the NIT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question).
- The table_id of a packet of which the PID is 0X0010 is other than 0X40, 0X41 and 0X72.

Unreferenced_PID
This error occurs when a PID which is other than PAT, CAT, CAT_PIDs, MPT_PIDs, NIT_PID, SDT_PID, TDT_PID, EIT_PID and RST_PID and not defined in PMT has occurred.

SDT_error
This error occurs when one of the following two conditions is satisfied:
- A section of which the PID is 0x0011 and the table_id is 0X42 does not appear at the interval of 2 sec or less. If the section includes two or more number of TSs, the SDT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question).
- The table_id of a packet of which the PID is 0X0011 is other than 0X42, 0X46 and 0X72.

EIT_error
This error occurs when one of the following two conditions is satisfied:
- A section of which the PID is 0x0012 and the table_id is 0X4E does not appear at the interval of 2 sec or less. If the section includes two or more number of TSs, the SDT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question).
- The table_id of a packet of which the PID is 0X0011 is other than the values between 0X4E and 0X6F, and 0X72.

RST_error
This error occurs when the table_id of a packet of which the PID is 0X0013 is other than 0X71 and 0X72.

TDT_error

This error occurs when one of the following two conditions is satisfied:

- A section of which the PID is 0x0014 and the table_id is 0X70 does not appear at the interval of 30 sec or less. If the section includes two or more number of TSs, the SDT interval is the time period from the first TS of the section in question until the first TS of the next section (which is not shared by the section in question).
- The table_id of a packet of which the PID is 0x0014 is other than 0X70, 0X72 and 0X73.

Note

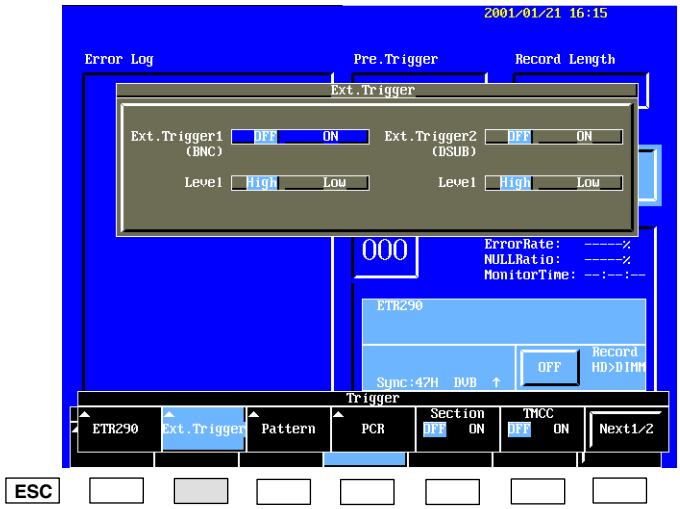
The DVB guideline ETS 300468 stipulates the PID, Table_ID and interval of PSI/SI as shown on the table below. PIDs and intervals can be set freely by changing the PID setting information file, then setting PID Search to Manual and loading this file. The VT3100 generates errors with reference to these changed values.

PSI/SI	PID	table_id	Interval
PAT	0X0000	0X00	500 mS
CAT	0X0001	0X01	–
NIT	0X0010	0X40,0X41,0x72(ST)	10 S
SDT	0X0011	0X42,0X46,0X72(ST)	2 S
EIT	0X0012	0X4E to X6F,0X72(ST)	2 S
RST	0X0013	0X71,0X72(ST)	–
TDT	0X0014	0X70,0X72(ST),0X73(TOT)	30 S

5.6 Setting the External Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key.
4. Press the [Ext. Trigger] soft key.



5. Select [ON] or [OFF] for Ext.Trigger1 with the rotary knob and the SELECT key.
6. If the Ext.Trigger1 has been set to ON, Select [High] or [Low] for Level1 with the rotary knob and the SELECT key.
7. Select [ON] or [OFF] for Ext.Trigger2 with the rotary knob and the SELECT key.
8. If the Ext.Trigger2 has been set to ON, Select [High] or [Low] for Level1 with the rotary knob and the SELECT key.

Explanation

The external trigger has two input terminals. Ext.Trigger1 is the BNC terminal located on the back; Ext.Trigger2 is the 12th and 25th pins of the 25-pin D-sub terminal located on the back. If both of them are ON, the VT3100 starts recording when a trigger signal is input through either of the terminals (OR condition).

The OR condition is also applied to the other triggering conditions (ETR290_Trigger, Pattern_Trigger, PCR_Trigger, Section_Trigger, TMCC_Trigger).

If the external trigger is turned ON while Record is ON in the monitor mode, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when a trigger signal is input, the VT3100 will start recording. The High or Low period of the external trigger signal must be at least 100 ns long.

5.7 Setting the Pattern Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key.
4. Press the [Pattern] soft key.

5. Select [ON] or [OFF] for Pattern with the rotary knob and the SELECT key.
6. If the Pattern has been set to ON, select “Pattern of 4byte” and “EnableBit” with the rotary knob and the SELECT key.

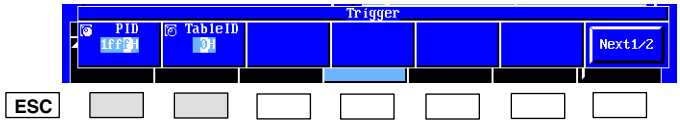
Explanation

The pattern trigger is a trigger generated when data strings of up to 4 bytes have coincided with each other. The left side of the “Pattern of 4byte” is earlier. Use the EnableBit to select the data to be made effective.
The OR condition is applied to all the other triggering conditions (ETR290_Trigger, EXT_Trigger, PCR_Trigger, Section_Trigger and TMCC_Trigger).
If the pattern trigger is turned ON while Record is ON in the Monitor mode, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when the patterns have coincided with each other, the VT3100 will start recording.

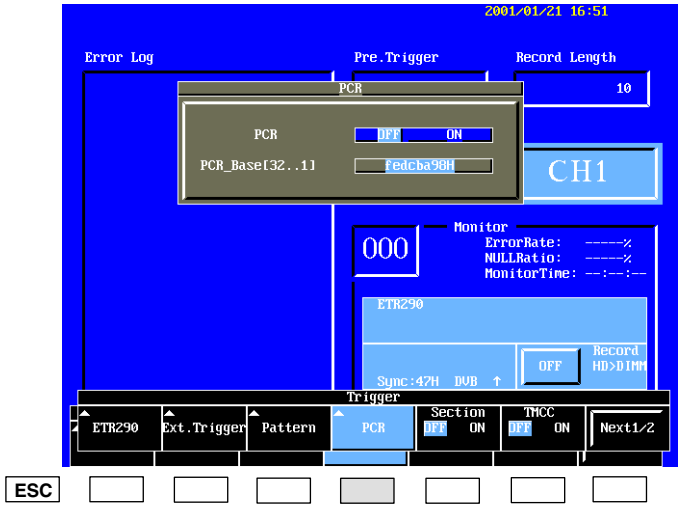
5.8 Setting the PCR Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key, then press the [Next1/2] soft key.
4. Press the [PID] soft key and set the PID value with the rotary knob and the SELECT key or the numerical keys.



5. Press the [Next1/2] soft key, then press the [Pcr] soft key.



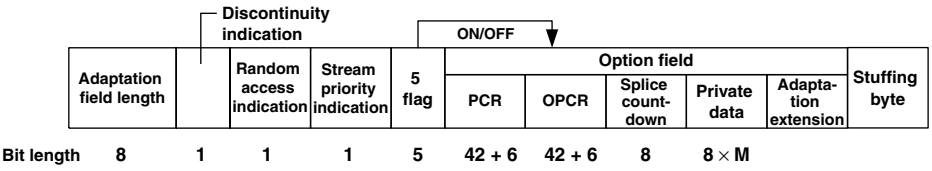
6. Select [ON] or [OFF] for Pcr with the rotary knob and the SELECT key.
7. If the Pcr has been set to ON, Select Pcr_Base with the rotary knob and the SELECT key.

Explanation

The PCR trigger is a trigger generated when the PCR value of the set PID is surpassed. The PCR value can be set only in the higher-order 32 bits of the higher-order Pcr_Base 33 bits. When PCR values are compared, the lower-order Pcr_Extension is ignored.
A status, in which five or more synchronization bytes (0X47) of the header of a transport stream continue, is called “synchronization”. The PCR trigger is effective only in this synchronized status.
The OR condition is applied to all the other triggering conditions (ETR290_Trigger, EXT_Trigger, Pattern_Trigger, Section_Trigger and TMCC_Trigger).

If the PCR trigger is turned ON while Record is ON in the Monitor mode, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when the PCR values coincide with each other, the VT3100 will start recording.

A transport stream packet consists of a packet header with a fixed length of 4 bytes, a variable-length adaptation field and a payload. The structure of the adaptation field is shown below. If it includes a PCR, it is picked up and compared with the set value.



PCR

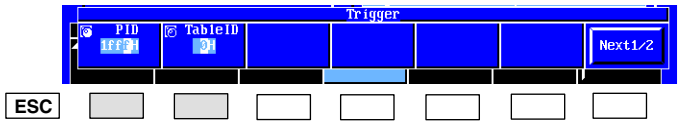
PCR_base	**33 bit**
reserved	**6 bit**
PCR_extension	**9 bit**

Time =(PCR_base × 300 + PCR_extension) × 1/27 MHz

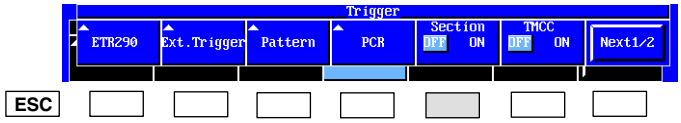
5.9 Setting the Section Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key, then press the [Next1/2] soft key.
4. Press the [PID] soft key and the [Table ID] soft key, then set the PID and Table ID values with the rotary knob and the SELECT key or the numerical keys.



5. Call the previous screen with the ESC key. Then press the [Section] soft key to select [ON] or [OFF] for Section.



Explanation

The section trigger is a trigger generated when the version number of the section form table data for the set PID is changed. This is effective only for the section form tables with a version number such as PAT, PMT, CAT, NIT, SDT, BAT, EIT, etc. If the PID is set to other than these, a trigger may not be generated correctly.
A status, in which five or more synchronization bytes (0X47) of the header of a transport stream continue, is called “synchronization”. The section trigger is effective only in this synchronized status.
The OR condition is applied to all the other triggering conditions (ETR290_Trigger, EXT_Trigger, Pattern_Trigger, PCR_Trigger and TMCC_Trigger).
If the section trigger is turned ON while Record is ON in the Monitor mode, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when the version number of the section form table data for the specified PID is changed, the VT3100 will start recording.

The following is the structure of the section for table data other than the descriptor area such as PAT, PMT, CAT, NIT, SDT, BAT, EIT, etc. The version numbers in this are compared.

	Table ID	Section syntax instruction	0	11	Section length	Broad-cast program ID	11	Version No.	Current next instruction	Section No.	Last section No.
Bit length	8	1	1	2	12	16	2	5	1	8	8

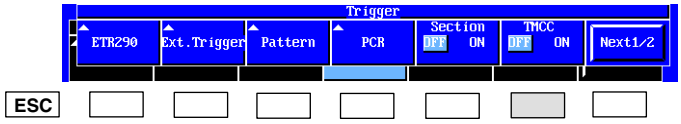
Note

One section table may have two or more number of table identifiers (Table ID). Make sure to specify the Table ID.

5.10 Setting the TMCC Trigger

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key.
4. Press the [TMCC] soft key and to [ON] or [OFF] for TMCC.



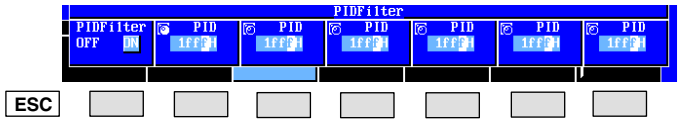
Explanation

The synchronization bytes of a transport stream (TS) for the ARIB STD-B20-conforming BS are fixed. The transmission scheme by TMCC is controlled by replacing these synchronization bytes with TMCC information. The TMCC trigger is generated when this TMCC information is changed.
A status, in which one super frame amount of synchronization bytes continue in the header of a transport stream for the ARIB STD-B20-conforming BS, is called “synchronization”. The TMCC trigger is effective only in this status. If the TMCC trigger is turned ON while Record is ON in the Monitor mode, the VT3100 will enter the trigger-wait state when you press the START/STOP key. Subsequently, when the TMCC information is changed, the VT3100 will start recording.

5.11 Using the PID Filter

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the SETTING key to display the Setting menu.
3. Press the [Trigger] soft key, then press the [Next1/3] soft key.
4. Press the [PID Filter] soft key to select [ON] or [OFF] for PID Filter.



5. Set the PID value with the rotary knob and the SELECT key or the numerical keys.

Explanation

From among the TS packets, up to 6 preset PID packets only are recorded.

Note

- The PIDFiler setting menu is displayed when Record is set to ON.
- If a TS is recorded using the PIDFilter, the temporal relationship among the PCR, PTS and DTS may be confused. When this TS is output, images and sounds may not be played back normally.

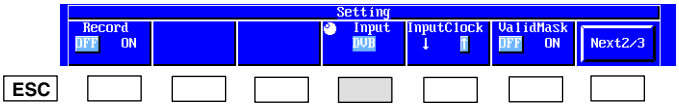
5.12 Making the Other Settings Related to Monitoring

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.

Setting the Clock

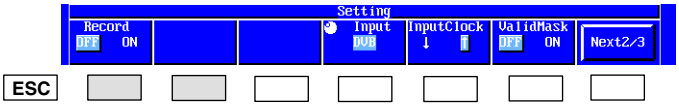
2. Press the SETTING key to display the Setting menu.
3. Press the [Next1/3] soft key.



4. Press the [Input] soft key and select [DVB], [ARIB] or [ASI] with the rotary knob.
5. If the Input is DVB or ARIB, press the [Slope] soft key to select rising [↑] or falling [↓].
6. If the Input is DVB, press the [ValidMask] soft key to select [ON] or [OFF].

Setting the recording method

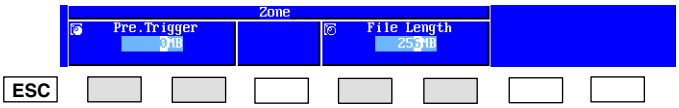
7. Press the SETTING key to display the Setting menu.
8. Press the [Next1/3] soft key to display the Next2/3 menu.
9. Press the [Record] soft key to select [ON].
10. Press the [RecordNum] soft key and set the maximum recording times with the numerical keys or the rotary knob.



11. Press the [Next2/3] soft key to display the Next3/3 menu.
12. Select either of [DIMM] or [DIMM/HDD].

Setting the pre-trigger length and the data length

13. Press the ZONE key to display the Zone menu.
14. Press the [Pre.Trigger] soft key and set the pre-trigger length with the numerical keys or the rotary knob. If 0 is set for pre-trigger, the data before the trigger point is not recorded.



15. Press the [File Length] soft key and set the data length to be recorded with the numerical keys or the rotary knob.

Explanation

Clock

For the clock signal applied to the external clock terminal, up to a 10-MHz signal is operable if the Memory is in the DIMM mode. However, the assured range is up to 7.5 MHz.

Slope

Sampling is carried out on the rising or falling edge of the clock signal.

Note

- Input a continuous clock for the external clock. Burst signals cannot be used as clock signals. In addition, if you stop the external clock while recording, the VT3100 may not operate properly.
- If Valid is ON, the external clock is masked when Valid is at the “L” level.

Recording mode

The following two recording modes are available:

- **DIMM**
  The entire data are recorded to the memory. After recording is finished, the data residing in the memory is saved to the hard disk.
- **DIMM/HDD**
  The pre-trigger section of the data is stored in the memory. The post-trigger section of the data (after the trigger point) is stored in the built-in hard disk. After recording is finished, the data residing in the memory is saved to the hard disk. This mode is suitable for recording data in high volume.

Note

- In the DIMM/HDD mode, you can record data that exceed the size of the memory. However, the disk write speed may be insufficient to keep up with the input data stream, if, for example, the VT3100’s HD is busy due to external access via Ethernet using Samba or FTP. In such case, recording is aborted. We recommend that you turn OFF the network function when recording using the DIMM/HDD mode.
- If you abort the recording while recording in the DIMM mode, a file with 0 size is created and the TS data is not recorded.

Pre-trigger range

The pre-trigger range is 0 MB to the DIMM size × 3/4 MB.

Data length range

The data length range varies as follows:

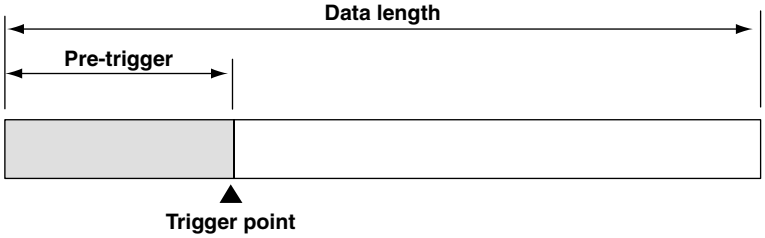
When the Memory setting is DIMM

0 MB to the DIMM size

When the Memory setting is DIMM/HDD

0 MB to the free space on the hard disk

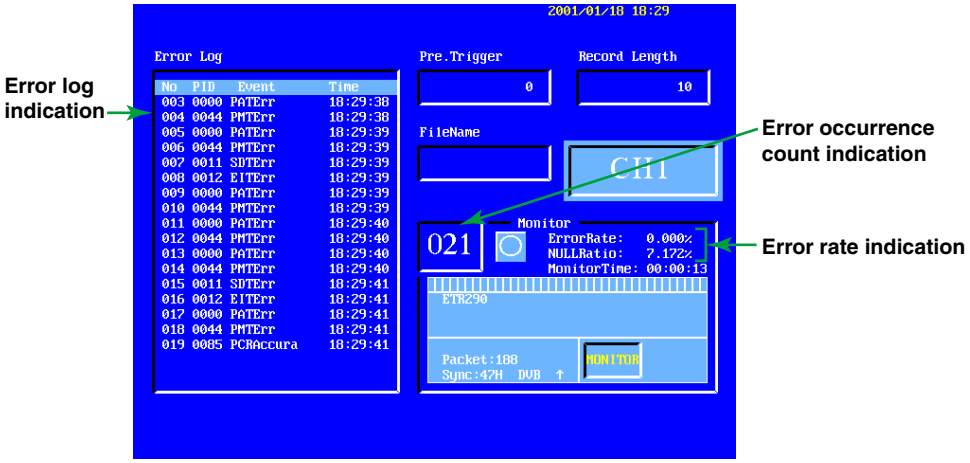
Relationship between pre-trigger and data length



5.13 Starting the Monitoring Operation

Procedure

1. In the case of the 2CH and 3CH models, a channel to be set is selected using the CH1 to CH3 keys.
2. Press the START/STOP key, and the VT3100 will start monitoring. Press the START/STOP key again, and the VT3100 will stop monitoring. If recording is started with Record ON, the VT3100 enters the trigger-wait state at the same time. Subsequently, when a trigger signal is input, the VT3100 will start recording. If you press the START/STOP key while the VT3100 is recording, it stops both monitoring and recording.



Explanation

Monitoring

If the ETR290 trigger is ON, the error log indication is displayed in the Error Log area which conforms to “The ETSI TECHNICAL REPORT 290”, the guideline for the MPEG-2/DVB transport stream. At the same time, the error logs for CH1 to CH3 are saved as monitor_ch1.log, monitor_ch2.log and monitor_ch3.log.

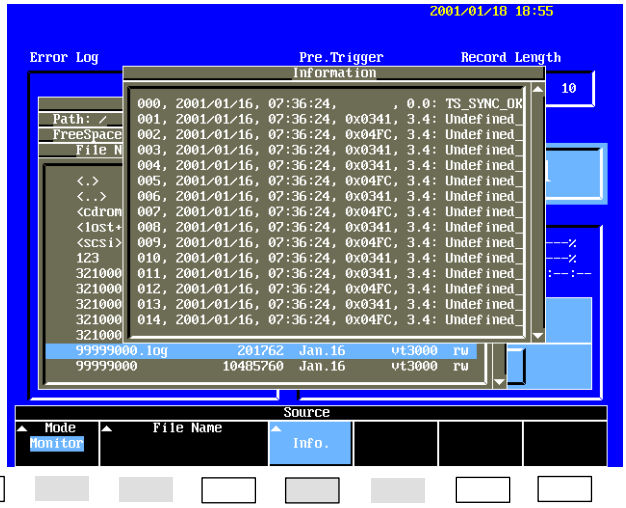
The error log indication displays the following in this order: error occurrence number, PID of the transport stream packet where the corresponding error has occurred, error description, time.

The table below shows the correspondence between error descriptions and ETR290.

Priority	No	Items to be measured	Contents	Error log indication	Event-on trigger
1	1.1	TS_sync_loss	LOSS	TSSyncOK	○
			OK	TSSyncLoss	(LOSS only)
	1.2	Sync_byte_error	–	SyncByteErr	○
	1.3	PAT_error	Over	PATErr	△
			table_ID	PATErr	○
			Scramble	PATErr	○
	1.4	Continuity_count_error	–	ContCountErr	○
	1.5	PMT_error	Over	PMTErr	△
			Scramble	PMTErr	○
	1.6	PID_error	Over	PIDErr	△
2	2.1	Transport_error	Error ON	TransportErr	○
	2.2	CRC_error	PAT	CRCErr	○
			CAT	CRCErr	○
			PMT	CRCErr	○
			NIT	CRCErr	○
			EIT	CRCErr	○
			BAT	CRCErr	○
			SDT	CRCErr	○
			TOT	CRCErr	○

Priority	No	Items to be measured	Contents	Error log indication	Event-on trigger
	2.3	PCR_error	Discontinuity	PCRErr	○
			Over	PCRErr	△
	2.4	PCR_accuracy_error	Accuracy	PCRAccuracy	○
	2.5	PTS_error	Over	PTSErr	△
	2.6	CAT_error	Scramble	CATErr	○
			Table_ID	CATErr	○
3	3.1	NIT_error	Table_ID	NITErr	○
			Over	NITErr	△
	3.4	Unreferenced_PID	Unrefe	UnrefPID	○
	3.5	SDT_error	Table_ID	SDTErr	○
			SDTover	SDTErr	△
	3.6	EIT_error	Table_ID	EITErr	○
			EITover	EITErr	△
	3.7	RST_error	Table_ID	RSTErr	○
	3.8	TDT_error	Table_ID	TDTErr	○
			TDTover	TDTErr	△

Error log files are provided in CSV format; they also can be called up with Info in the Source menu. An error log file contains the following items in this order: error occurrence number, date of occurrence, time of occurrence, PID of the transport stream packet where the corresponding error has occurred, corresponding number of ETR290, error description.



Note

- If the data rate of the TS is 1 Mbps or less, the ETR290 error log of monitoring may not be displayed correctly. Even when the data rate of the original TS is not less than 1 Mbps, if the data rate comes down below 1 Mbps due to Slot Filter or PID Filter, the ETR290 error log may not be displayed correctly either.
- An error log is added to the corresponding error log file (monitor_chX.log) every time when an error has occurred.
- If an error log file (monitor_chX.log) reaches 100,000 lines, an error message appears; there is no more log indication nor log file update.
- If you stop monitoring and then start again, error log files (monitor_chX.log) are overwritten. If you want to store a specific log file, change its name and save it.
- Even while monitoring, error log files (monitor_chX.log) can be transmitted to PCs in the network and other PCs via FTP.
- If the indication of error count has reached 999, it returns to 000.

Error rate measurement

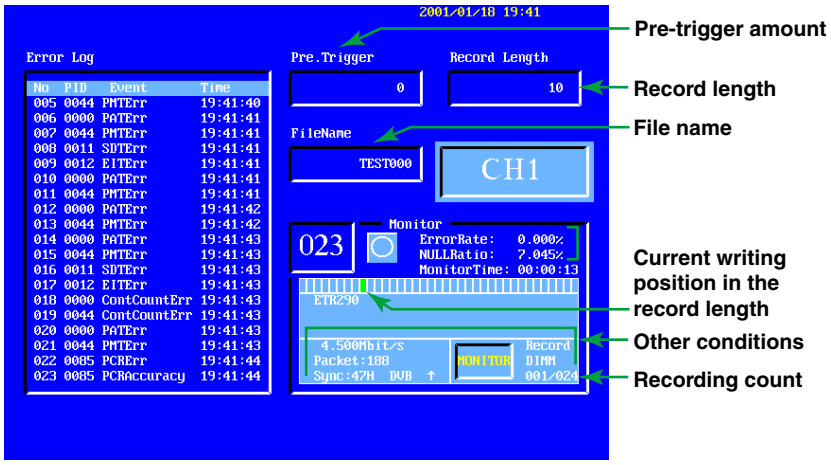
The VT3100 can conduct simple error rate measurement under a certain condition. The error rate is measured assuming that a payload data of 184 bytes is 0XFF when the PID of the transport stream packet is 0X1FFF (null packet).

ErrorRate = error occurrence data count in the null packet / total data count in the null packet × 100 (%)

NULLRatio = number of null packets / total number of TS packets ×100 (%)

Recording

If the START/STOP key is pressed while Record is ON in the Monitor mode, the VT3100 will enter the trigger-wait state. Subsequently, when a trigger signal is input, the VT3100 will start recording. After a recording operation is finished, if a trigger signal is input again, the VT3100 will start recording. The file name is displayed in the form of "the file name + XXX"; this XXX is the incremented number from 000. Recording is repeated the number of times set in RecordNum. Even if a trigger signal is input while recording, the signal is ignored.



When a trigger is generated and a TS is recorded, two files are created in addition to an ordinal data file; one with the extension .log and the other with the extension .inf.

The file with the extension .log is the error log file for the recording operation. Similar to the monitor_chx.log file, this file contains the error occurrence number, the PID of the packet where an error has occurred, the error description and the time of error occurrence.

The other file, the file with the extension .inf contains the following information.

RecordChannel: Channel for which recording was conducted

RecordTime: Data and time at which the recording was started

RecordSize: Record size

TriggerPoint:

Indicates the location at which the trigger was generated by the bytes from the top. This is 1 when the pre-trigger is 0.

InvalidSize:

When a pre-trigger setting is made, normally recording is started after the data of pre-trigger amount has been accumulated. However, if a trigger is generated before the data of pre-trigger amount has been accumulated, incorrect data is recorded in the deficient area. This item indicates the size of the incorrect data in bytes. Consequently, the data with the first part removed by this size is correct.

Note

- If the hard disk is full, another recording operation is not conducted even if a trigger is input.
- Even if a trigger is input again while the VT3100 is recording, the next recording operation is not conducted until the current operation is completed. While the memory is in the DIMM mode, the recording operation is not conducted until the transmission from the DIMM to the HD is completed.

6.1 Overview

The VT3100 is provided with a Web browsing function to support remote diagnosis. The contents of the recorded TS and TMCC table information, etc. can be referenced from a PC connected to a network using a Web browser such as Internet Explorer. The VT3100 adopts a link structure taking advantage of features of the Web browser and can thereby immediately access information you want to see. It also allows more than one user to access and develop work efficiently.

The transport stream (TS) analysis function includes the following three functions.

PACKET View

Provides binary display, header display, table display for every 1 packet of a TS file and a search function according to various conditions.

TS Information

Displays information of a TS file. Also displays information of an elementary stream such as Video and Audio.

PID Information

Displays all PID information included in the TS.

<Analyzable transport stream>

Transport stream

- Transport stream compliant with ISO/IEC-13818-1: Systems
- Transport stream with multiple ARIB STD-B20-compliant TSs multiplexed and with TMCC information added

Elementary stream

- MPEG-1Video compliant with ISO/IEC-11172-2: Video
- MPEG-2Video compliant with ISO/IEC-13818-2: Video
- MPEG-1Audio Layer I, II, III compliant with ISO/IEC-11172-3: Audio
- MPEG-2Audio compliant with ISO/IEC-13818-2: Audio
- MPEG-2AAC Audio compliant with ISO/IEC-13818-7: Audio

<Recommended browser>

It is recommended to use Internet Explorer version 5.00 or later.

Note

- The analysis result may vary depending on the monitoring condition.
- Since the above browser verifies the operation, data may not be displayed correctly if other browsers are used.
- Depending on the virus monitoring software, the operation may deteriorate drastically due to functions such as Web trap. When a PC is connected locally, it is a normal state that the next packet immediately appears when PACKET View - Next is selected.

6.2 Connection Method

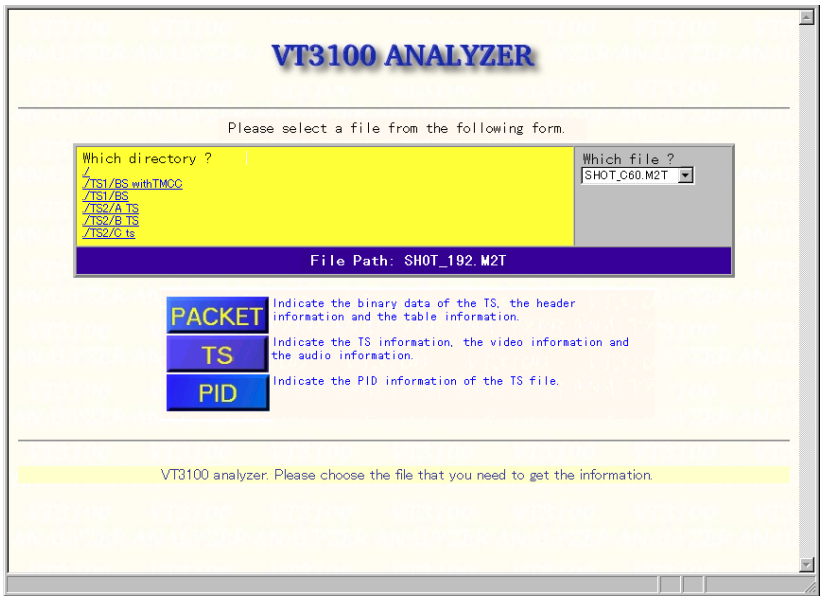
VT3100 configuring

1. Configure the network according to the network configuring in “7.3 Configuring the Network and SAMBA”.
2. Connect the network to the Ethernet interface connector on the rear panel.

PC configuring

3. Start a recommended Web browser from a PC connected to a network.
4. Enter the http: host name or IP Address/ in the address field of the Web browser.

5. The following screen appears. To show a Japanese display, click on the characters “Japanese”.



Note

- It is possible to analyze the TS from more than one Web browser simultaneously.
- When load increases during connection with the network, the output from the HDD of the VT3100 and record performance may deteriorate.

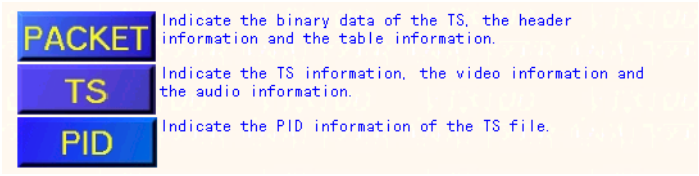
6.3 Selecting File and Selecting Function

Selecting File

1. On the left side, all directories containing files are displayed. Click on the letter of the directory containing the file to be analyzed.

2. Select the file to be analyzed from the pull-down menu.

3. Click on the button and select the function.

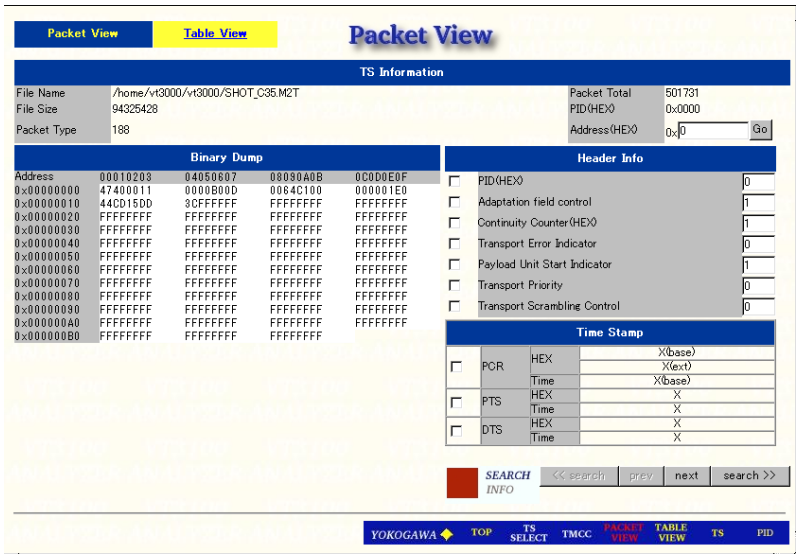


Note

The directory display section does not have a hierarchical structure. Directories with no files are not displayed.

6.4 Packet View Display

After selecting the file to be analyzed, click on the PACKET button from the function selection menu. The following screen appears.



TS Information

Displays basic information of the TS.

File Name:

File name

File Size:

Shows the file size in bytes.

Packet Type:

Automatically determines 188, 192, 204 or 208.

Packet Total:

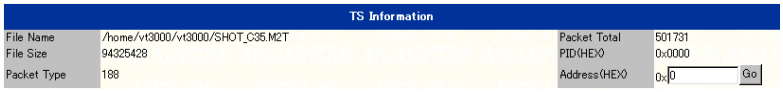
Total number of packets

PID(HEX):

PID of packet displayed

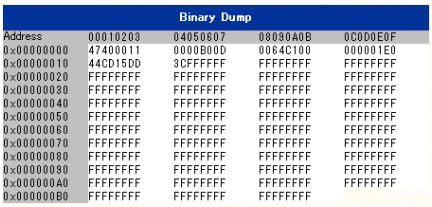
Address(HEX):

Shows the start address of the packet displayed in bytes. Entering Address and clicking on the Go button moves to the nearest address.



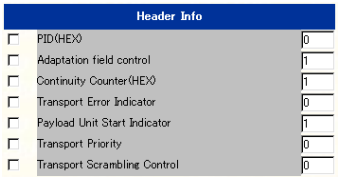
Binary Dump

Shows packets in binary notation. When the packet type is 188, shows data for every 188 bytes. Clicking on the letter “next” shows the next packet.



Header Info

Shows 4-byte header information of a transport stream packet.



PID:

13-bit long. Shows packet ID of a transport stream.
According to the ISO/IEC-13818-1, PID is assigned as follows.

PID value	Description
0X0000	PAT
0X0001	CAT
0X0002 to 0X000F	Reserved
0X0010 to 0X1FFE	Assigned to NIT, PMT, Elementary_PID, etc.
0X1FFF	NULL packet

Adaptation field control:

2-bit long. Shows adaptation control information.

Value	Description
00	Reserved
01	Payload only
10	Adaptation only
11	Payload next to adaptation

Continuity Counter:

4-bit long. Incremented for every packet with the same PID. Not incremented when adaptation field control is 00 or 10. Can be set discontiguous when discontinuity_indicator is 1.

Transport Error Indicator:

1-bit long. “1” indicates that the packet contains some error.

Payload Unit Start Indicator:

1-bit long. “1” indicates that the packet includes the start 1st byte of the PES and PSI.

Transport Priority:

1-bit long. “1” indicates that this packet has higher priority than other packets.

Transport Scrambling Control:
2-bit long. Shows scramble information.

Value	Description
00	No scramble
01	User-defined
10	User-defined
11	User-defined

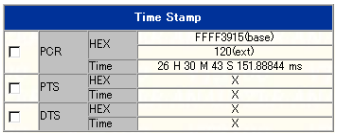
Checking the check button of each item of Header Info and clicking on the Search button allows the next (previous) packet to be searched under the same condition as that of the checked item. If more than one item is checked, a search is performed under an AND condition. When both the Head Info item and Time Stamp item are checked, a search is also performed under an AND condition.

Hint

Conducting check/search with Transport Error Indicator set to 1
Allows a packet containing a transport stream error to be searched.

Conducting check/search with PID set to XXX and Payload Unit Start Indicator set to 1
Allows the start of an elementary stream whose PID is XXX to be searched.

Time Stamp
Displayed in HEX and time if the transport stream packet contains information on PCR, PTS and DTS.



PCR:
A 42-bit value included in Adaptation field. Used to synchronize the system clock (27 MHz) of the decoder with the encoder by PLL. Configured in higher 33 bits (base) and lower 9 bits (ext) and the lower bits operate 0 to 299 at 27 MHz with a counter, while the higher bits operate at 90 kHz = 27 MHz/300.

PTS:
A 33-bit value at PES header. Indicates the time for outputting the content of the PES packet. This value indicates higher 33 bits of the PCR.

DTS:
A 33-bit value at PES header. Indicates the time for outputting the content of the PES packet. This value indicates higher 33 bits of the PCR. Used when the output sequence is different from the decoding sequence as in the case of MPEG Video.

Checking the check button of each item of Time Stamp and clicking on the Search button allows packets including the checked items to be searched. If more than one item is checked, a search is performed under an AND condition. When both the Head Info item and Time Stamp item are checked, a search is also performed under an AND condition.

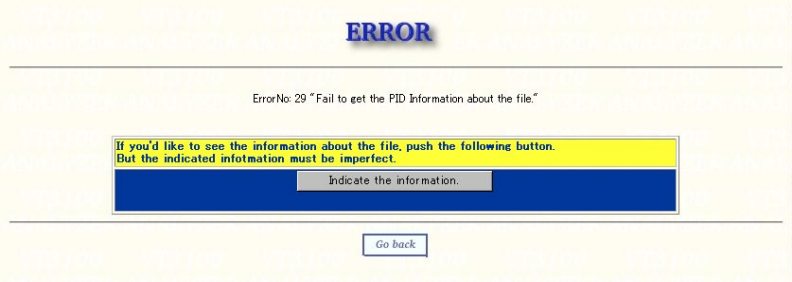
Hint

Conducting check/search of PID, PCR with PID set to XXX

Allows the PCR jitter to be measured from Address and the PCR value.

Note

If the packet is not a complete transport stream packet, the following error may be displayed. Clicking on the Indicate the information button allows items other than the error content to be displayed correctly.



6.5 Table View Display

After selecting a file to be analyzed, select PACKET from the function selection menu and further click on the Table View button. The following screen appears.

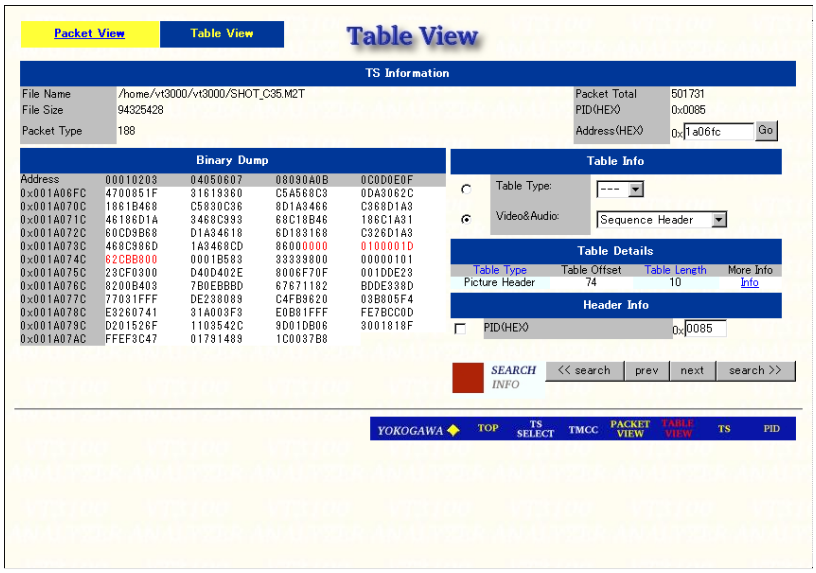
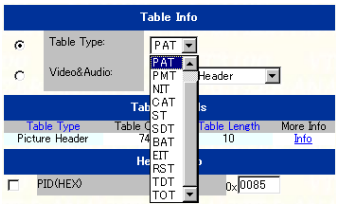
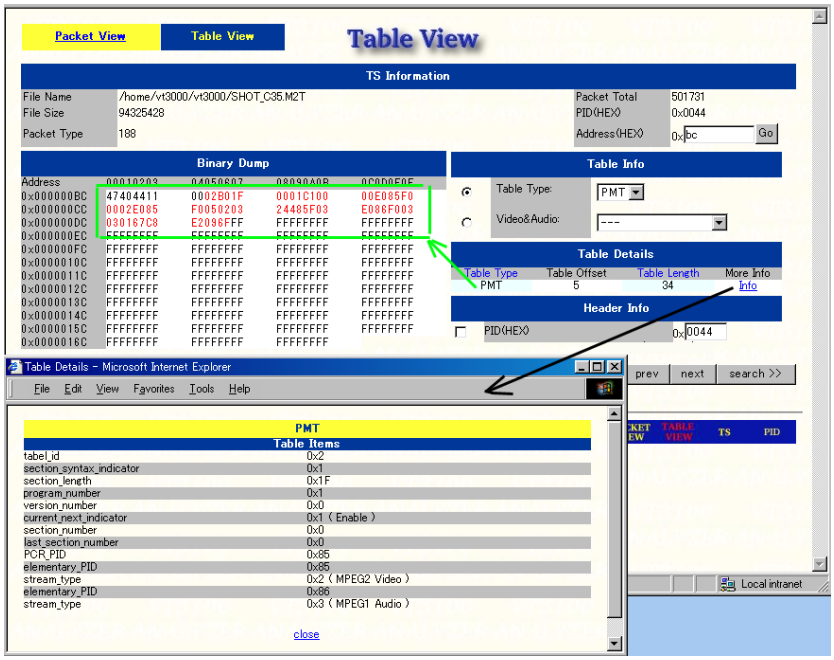


Table Info (Table Type)

Specifies the four Program Specific Information (PSI) tables (PAT, PMT, CAT, NIT) defined in the ISO/IEC-13818-1 and six Service Information (SI) tables (BAT, SDT, EIT, RST, TDT, TOT) defined in DVB and ARIB. The search result is color-coded (red) in Binary Dump and displayed in Table Details. Detailed information can also be displayed by a hyper link.





Explanation

More Info displays the following information.

PAT

table_id
section_syntax_indicator
section_length
transport_stream_id
version_number
current_next_indicator
section_number
last_section_number
program_number network_PID
program_number program_map_PID (display more than one)

PMT

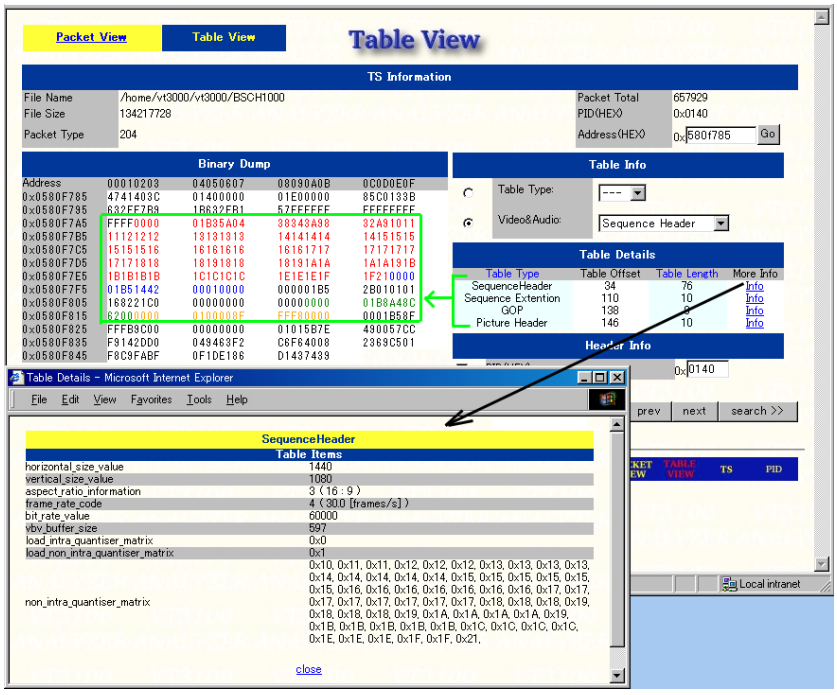
table_id
section_syntax_indicator
section_length
program_number
version_number
current_next_indicator
section_number
last_section_number
PCR_PID
elementary_PID stream_type (display more than one)

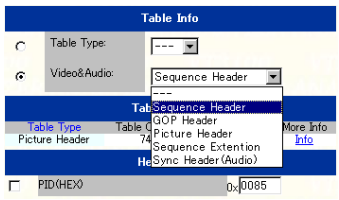
Others

table_id
section_syntax_indicator
section_length

Table Info (Video & Audio)

Specifies the Sequence Header, GOP Header, Picture Header, Sequence Extension defined in the ISO/IEC-13818-2 (MPEG2-Video) and Audio Sync Header defined in the ISO/IEC-11172-3 (MPEG1-Audio), 13818-3 (MPEG2-Audio) and 13818-7 (MPEG2-Audio AAC). The search result is color-coded in Binary Dump and displayed in Table Details. If there is more than one result, they are color-coded red, blue, green and orange, in order of Table Details. Detailed information can also be displayed by a hyper link.





Explanation

More Info shows the following information.

Sequence Header

horizontal_size_value
vertical_size_value
aspect_ratio_information
frame_rate_code
bit_rate_valu
vbv_buffer_size
load_intra_quantiser_matrix
load_non_intra_quantiser_matrix
non_intra_quantiser_matris

Sequence Extention

extension_start_code_identifier
profile_and_level_indication
progressive_sequence
chroma_format
horizontal_size_extension
vertical_size_extension
bit_rate_extension
vbv_buffer_size_extension
low_delay
frame_rate_extension_n
frame_rate_extension_d

GOP Header

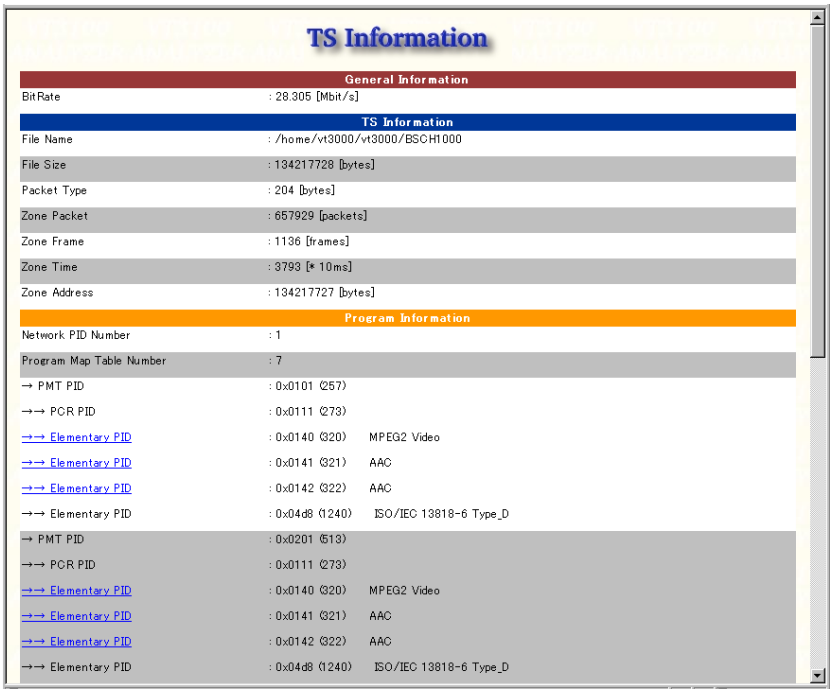
time_code
closed_gop
broken_link

Picture Header

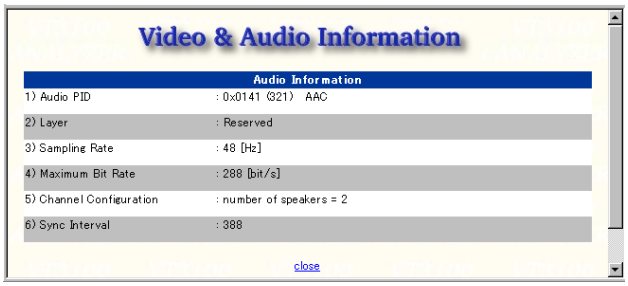
temporal_reference
picture_coding_type
vbv_delay

6.6 TS Information Display

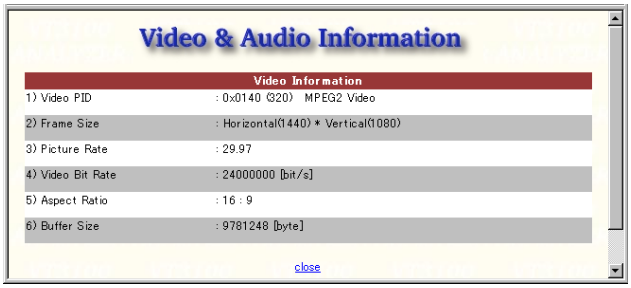
After selecting the file to be analyzed, clicking on the TS button from the function selection menu displays the following.



Clicking on the Elementary PID displays the following. (Video)

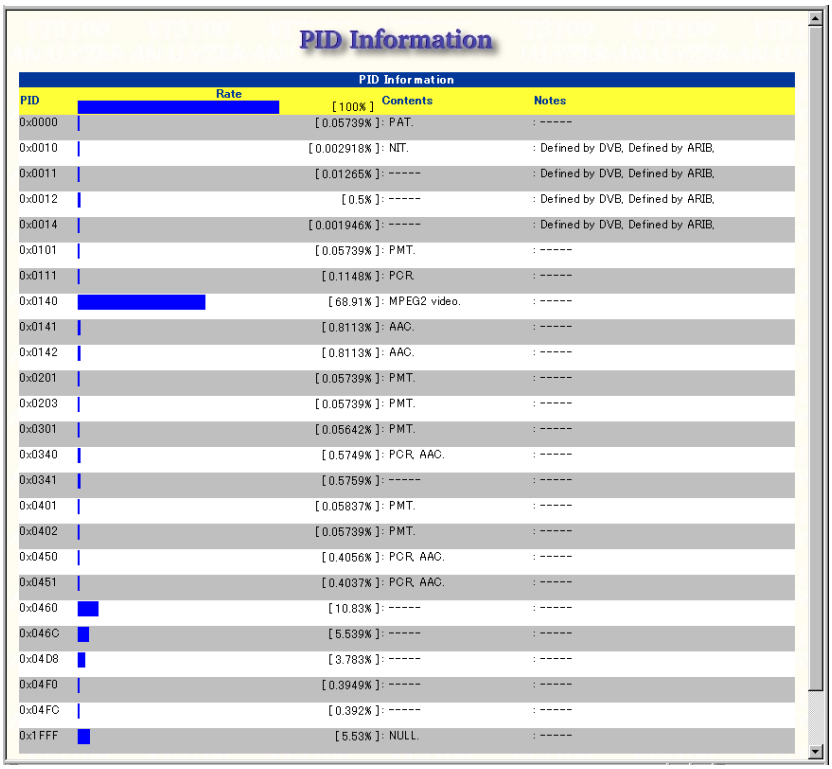


Clicking on the Elementary PID displays the following. (Audio)



6.7 PID Information Display

Clicking on the PID button from the file or function selection menu displays PIDs and rates of all packets including packets not described in the PMT as follows.



PID Information

PID Information

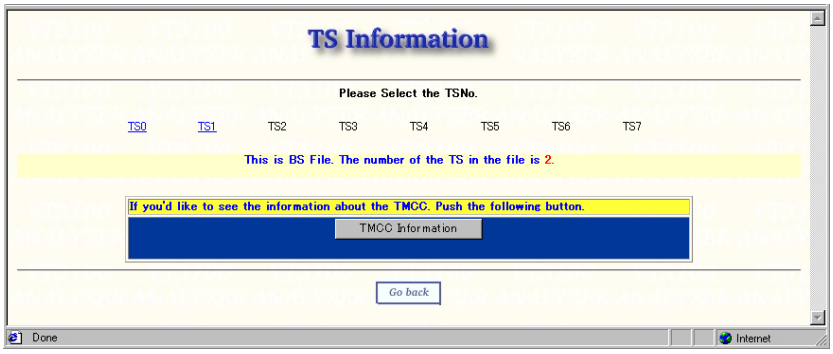
PID	Rate [100%]	Contents	Notes
0x0000		[0.05739%]: PAT.	: -----
0x0010		[0.002918%]: NIT.	: Defined by DVB, Defined by ARIB,
0x0011		[0.01265%]: -----	: Defined by DVB, Defined by ARIB,
0x0012		[0.5%]: -----	: Defined by DVB, Defined by ARIB,
0x0014		[0.001946%]: -----	: Defined by DVB, Defined by ARIB,
0x0101		[0.05739%]: PMT.	: -----
0x0111		[0.1148%]: PCR.	: -----
0x0140		[68.91%]: MPEG2 video.	: -----
0x0141		[0.8113%]: AAC.	: -----
0x0142		[0.8113%]: AAC.	: -----
0x0201		[0.05739%]: PMT.	: -----
0x0203		[0.05739%]: PMT.	: -----
0x0301		[0.05642%]: PMT.	: -----
0x0340		[0.5749%]: PCR, AAC.	: -----
0x0341		[0.5759%]: -----	: -----
0x0401		[0.05837%]: PMT.	: -----
0x0402		[0.05739%]: PMT.	: -----
0x0450		[0.4056%]: PCR, AAC.	: -----
0x0451		[0.4037%]: PCR, AAC.	: -----
0x0460		[10.83%]: -----	: -----
0x046C		[5.539%]: -----	: -----
0x04D8		[3.783%]: -----	: -----
0x04F0		[0.3949%]: -----	: -----
0x04FC		[0.392%]: -----	: -----
0x1FFF		[5.53%]: NULL.	: -----

6.8 BS Digital Broadcasting TS Display

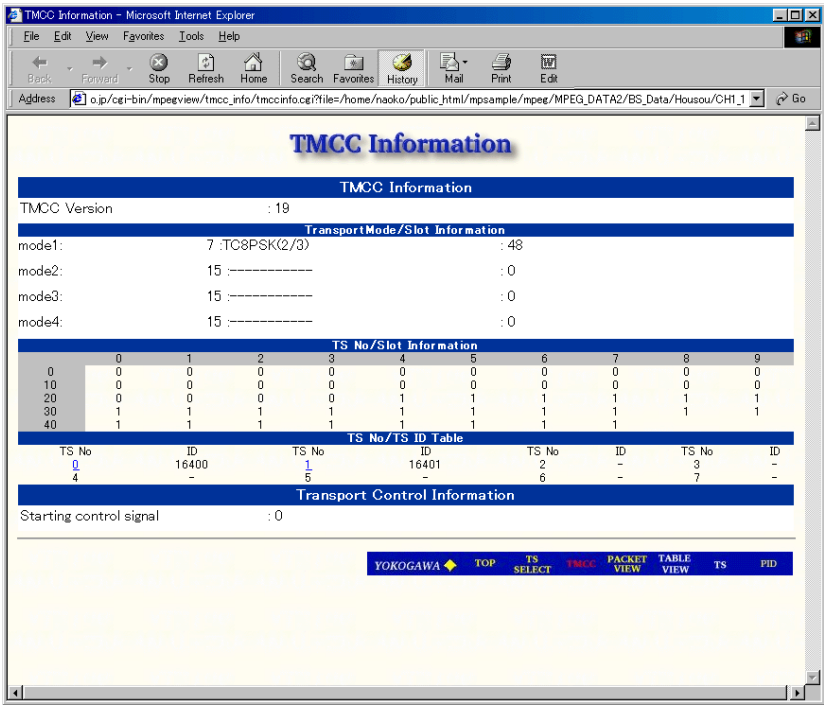
Since multiple BS digital broadcasting transport streams (TS) compliant with the ARIB STD-B20 are multiplexed and further provided with a TMCC signal, these TSs cannot be analyzed by a normal TS analyzer. The VT3100 can separate the TMCC signal and demultiplex multiple TSs and analyze in the same way as for a normal TS.

TS Information Display

Selecting the BS digital broadcasting TS and clicking on the TS button displays the following.



The characters displayed in blue are the multiplexed TSs; clicking on them display the TS Information. Clicking on the TMCC Information button shows TMCC information as follows.



Explanation

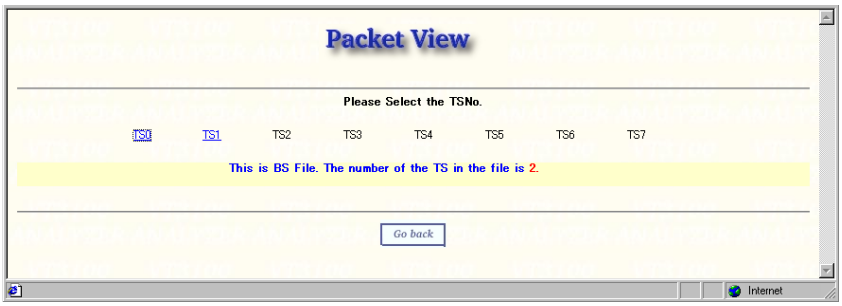
TMCC Version:
Indicates the version of the TMCC information.

TransportMode/Slot Information:
The ARIB STD-B20 adopts a hierarchic transfer system whereby a transfer is performed with modulation systems of up to 4 types. This indicates the modulation system and the number of slots.

TS No/Slot Information:
The ARIB STD-B20 arranges TSs in 48 slots and assigns a relative TS No (maximum 8) for every slot. TS No/Slot Information displays relative TS No for every slot.

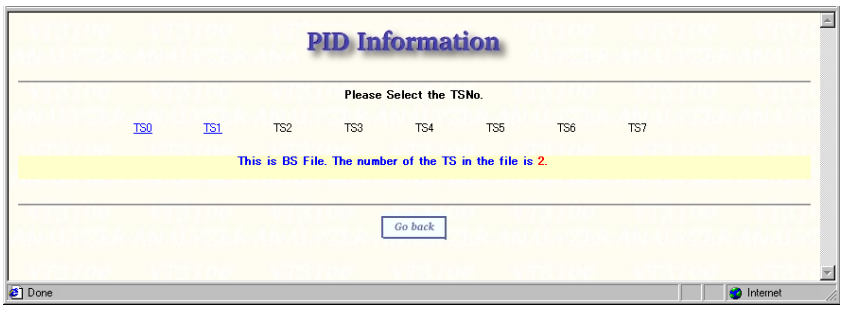
TS No/TS ID Table:
Shows a relative slot and the corresponding ID.

Packet View Display
Selecting a BS digital broadcasting TS and clicking on the TS button displays the following.



The characters displayed in blue are the multiplexed TSs. Clicking on them display the Packet View.

PID View Display
Selecting a BS digital broadcasting TS and clicking on the TS button displays the following.



The characters displayed in blue are the multiplexed TSs. Clicking on them display the PID View.

7.1 Connecting a SCSI Device

You can connect an external hard disk to the VT3100 and copy or move contents from the external hard disk to the built-in hard disk of the VT3100.
The hard disk performance significantly affects the performance such as the speed of outputting from the external SCSI hard disk and recording into the external SCSI hard disk, etc.

SCSI Specifications

Item	Specifications
Interface standard	SCSI (Small Computer System Interface), ANSI X3.131-1986
Connector type	68-pin Ultra Wide SCSI (pin type)

Items Necessary for Connection

Cable

Use a commercially sold cable that is 3 m or less in length, that has a ferrite core on each end of the cable, and that has a characteristic impedance between 90 and 132 Ω.

Terminator

Be sure to attach a terminator to the last external SCSI device.

Connection Procedure

1. Connect the SCSI cable to the SCSI connector on the rear panel of the instrument.
2. After turning on the SCSI device, turn ON the VT3100. To format the hard disk, follow the procedure described in the next section, “Formatting the Disk.”

Hard Disks that Can Be Connected

You can connect a single-partition hard disk that has been formatted in the expanded region of the FAT system using fdisk. You cannot connect a hard disk that has been formatted in the primary region using fdisk.
For general handling precautions for the connected hard disk, see the instruction manual that is provided with the hard disk.

Note

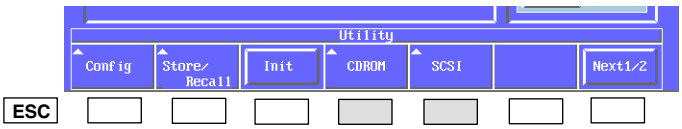
- A maximum of 7 SCSI devices can be connected to this equipment.
- Make sure all SCSI devices connected have unique ID numbers.
- The speed of outputting or recording may vary depending on the performance of the external SCSI hard disk connected.

7.2 Mounting a Internal CD-ROM Drive or External SCSI Device

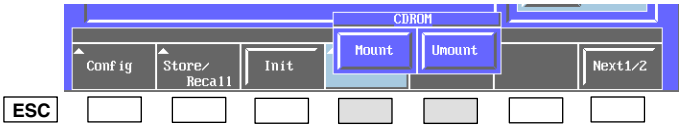
Procedure

Mount/unmount the internal CD-ROM drive

1. Press the UTILITY key to display the Utility menu.
2. Press the [CDROM] soft key.

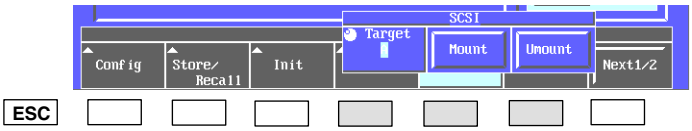


3. Press the [Mount] or [Unmount] soft key.



Mount/unmount the external SCSI device

1. Press the UTILITY key to display the Utility menu.
2. Press the [SCSI] soft key.



3. Press the [Target] soft key and select the target using rotary knob.
4. Press the [Mount] or [Unmount] soft key.

Explanation

You must mount the CD-ROM or SCSI device in order for the VT3100 to recognize it.
To unload the CD-ROM, unmount it.
When a SCSI device with more than one partition is mounted, only the first area can be mounted.

CAUTION

Do not turn OFF the SCSI device or remove the SCSI cable while mounting the device. This can damage the SCSI device or files on the SCSI device.

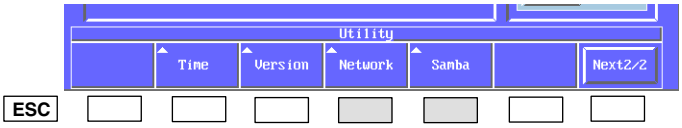
Note

- SCSI deviced which can be connected to the instrument are hard disks, PD, JAS, and Zip disk with EXT2 formatting.
- The <SCSI> and <cdrom> directories in the home directory are mount points for the SCSI and CD-ROM. Do not remove these directories.
- Do not place files or create directories under the <SCSI> and <cdrom> directories if they are not mounted.
- Use the VT3100 to format the SCSI device.
- If the current directory is below the <cdrom> directory, you cannot unmount the CD-ROM. Move to the current directory above the <cdrom> directory.
- If you try to mount a device that is already mounted, an error occurs.
- When directly outputting the contents from the CD-ROM in the HDD mode and the output rate is slower than the transfer rate from the CD-ROM (varies depending on the writing format of the CD-ROM), the contents may not be output correctly. If the output mode is DIMM/HDD, the contents may not be output correctly until the contents are transferred to the DIMM.
- While the CD-ROM drive or SCSI device directory (<cdrom>, <scsiA to scsiG>) are selected in the SOURCE menu or FILE menu, unmounting the CD-ROM causes a message “Device is busy” to appear and it is impossible to unmount the CD-ROM. In this case, select any drive other than the CD-ROM drive or any directory other than the directories of the SCSI devices and then unmount the CD-ROM.
- Target numbers are assigned to SCSI devices in ascending order of ID numbers. For example, if SCSI devices with ID numbers 2, 5, and 6 are connected, target numbers A, B, and C are assigned in that order.

7.3 Configuring the Network and SAMBA

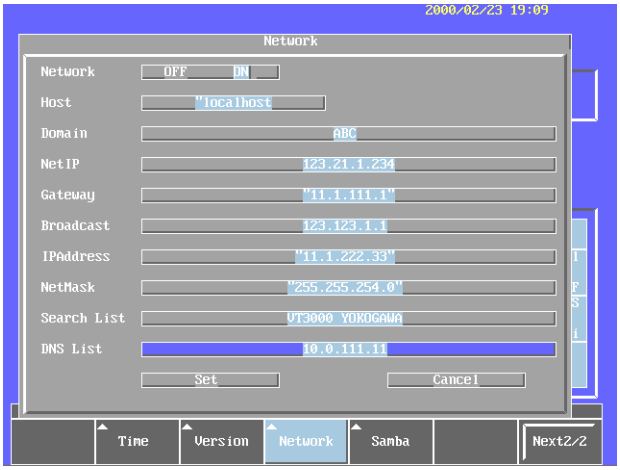
Procedure

1. Press the UTILITY key to display the Utility menu.
2. Press the [Next1/2] soft key.



Configuring the network

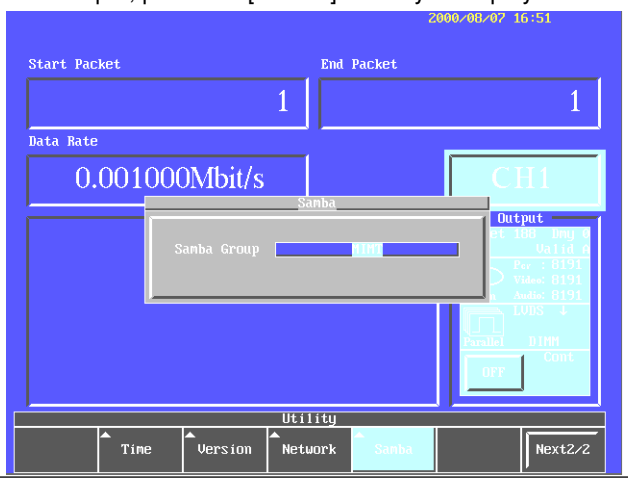
3. Press the [Network] soft key.
4. Press the [Config] soft key to display the Network cofiguration screen.



5. Highlight Network using the rotary knob.
6. Select [ON] or [OFF] using the SELECT key.
7. If you select ON, set the Host, Domain, Net IP, Gateway, Broadcast, IPAddress, NetMask, Search List, and DNS List. To set the Host, Domain, Net IP, Gateway, Broadcast, IPAddress, NetMask, Search List, and DNS List, press the SELECT key to display the keyboard. Enter up to 20 characters for the Host, up to 15 characters for the NetIP, Gateway, Broadcast, IPAddress, and NetMask, and up to 50 characters for the others.
8. Highlight [Set] or [Cancel] using the rotary knob and press the SELECT key.

Configuring SAMBA

9. After step 1, press the [Samba] soft key to display the Samba configuration screen.



10. Press the SELECT key to display the keyboard. Enter the work group name of Samba using up to 20 characters. It takes some time for the samba configuration to take effect.

Explanation

Network

You can connect to the network via Ethernet. Using ftp, you can exchange contents with a PC on the network.

If you put a file to the VT3100 using ftp, it is placed in the VT3100 directory. The file that has been put appears in the list when the file list is closed and opened once again.

Host

Enter the host name of the VT3100.

Domain

Set the network domain name that the VT3100 belongs to.

Net IP

Set the network address used to exchange data over the network.

Gateway

Set the IP address of the gateway (router, switch, etc.) used to communicate with other networks. Set the gateway according to the system or network to which the VT3100 belongs. You may not need to set the gateway.

Broadcast

The IP address with the host section set to all 1s in binary notation is called a broadcast address. This address is used to transmit the same packet to all hosts on the network to which the VT3100 is connected.

IP Address

Set the IP address to assign to the VT3100. The IP address is used to uniquely identify a device on the network when using TCP/IP.

NetMask

Set the mask value used when determining the subnet network address from the IP address. Set the netmask according to the system or network to which the VT3100 belongs. You may not need to set the netmask.

Search List

Set the domain name of the network to be searched. To set multiple domains, enter a space as a delimiter between the domain names.

DNS List

Set the DNS server address. To set multiple addresses, enter a space as a delimiter between the addresses.

Anonymous ftp

The VT3100 supports anonymous ftp. The user name of the file that is put to the VT3100 using anonymous ftp is automatically set to “VT3100.”

Note

- Set the NetIP, Gateway, Broadcast, IPAddress, and NetMask by specifying four values between 0 and 255 delimited by a period (“xxx.xxx.xxx.xxx”). An error occurs if the values are specified using any other format.
- Because the VT3100 does not support DHCP, obtain a fixed IP address for the Host and IP Address.
  For details, consult your network administrator.
- You cannot create directories below the VT3100 directory using ftp.
- You can only put files to the VT3100 directory using ftp.

SAMBA

Because the VT3100 uses Linux as its OS, SAMBA is used to connect to a PC running Windows on the network. Here, you will set the SAMBA work group. By setting the work group, the VT3100 is recognized as a SAMBA server from a PC running Windows. Then, you can exchange contents with the PC.

Note

When copying directories or files to the VT3100 (Samba server) from a PC running windows, use only alphanumeric characters for the directory and file names. Copying directories or files that use double-byte characters in their names will appear as garbled characters on the VT3100 file list.

7.4 Remotely Controlling VT3100 Using VNC

VNC is an abbreviation of “Virtual Network Computing” and is a GUI tool similar to an X window that displays the desktop of a remote machine on the desktop of a local machine. It is distributed as freeware and compatible with various platforms such as Linux, Windows and Macintosh. Furthermore, the VNC can also be displayed or remotely controlled from a Web browser without any viewer.

Note

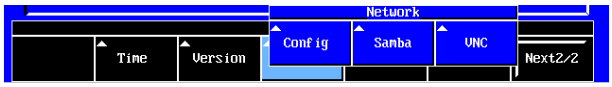
- When the VT3100 is remotely controlled using the VNC, operations from the front panel are not possible.
- Note that to close the VNC, the VT3100 must be shut down.

Procedure

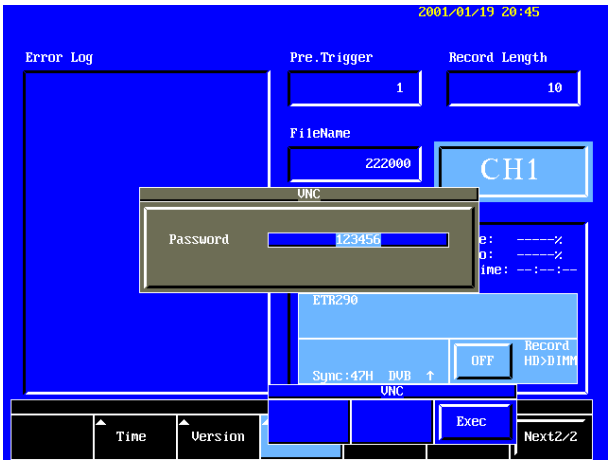
VT3100 configuring

1. Press the UTILITY key to display a Utility menu.
2. Press the [Next1/2] soft key.

3. Press the [Network] soft key and select VNC.



4. Press the SELECT key to show a keyboard and set a password. Set the password in 6 to 8 alphabetic characters (upper and lower cases) and numerals.



5. Pressing the [Exec] soft key displays “VNC Executing!!” on a white screen.
6. To return from the remote control to local, disconnect the PC, press the sub switch on the front panel of the VT3100 to turn OFF power and then press the sub switch again to turn ON power.

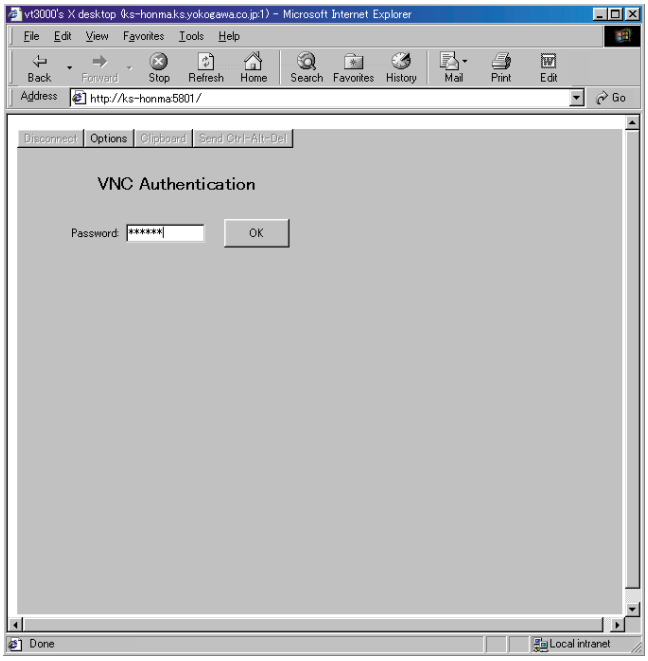
Note

- Use the Web browser with Java enabled.
- Use by more than one user is not possible.
- A password is case-sensitive.
- Do not turn OFF the main switch after the sub switch is pressed until this equipment is set in a standby sate. Failing to observe this may damage the hard disk or files in the hard disk.

PC configuring

An example of connection using a Web browser is shown. For connection using a VNC application, see other documents.

1. Start the Web browser on the PC connected to the network.
2. Enter the http: host name or IP Address:5801/ in the address field of the Web browser.
3. Enter the password entered in the VT3100.



Note

A password is case-sensitive in alphabetic characters, and therefore correctly distinguish upper and lower cases.

Remote control

The keys on the VT3100 panel are assigned to the following characters of the keyboard.

VT3100	Keyboard
ESC	ESC
Soft key 1 (leftmost)	F1
Soft key 2	F2
Soft key 3	F3
Soft key 4	F4
Soft key 5	F5
Soft key 6	F6
Soft key 7 (rightmost)	F7
SOURCE	q
ZONE	q
RATE	e
SETTING	r
CH1	s
CH2	d
CH3	f
FILE	x
UTILITY	c
SHIFT	Shift
START/STOP	g
0	0
.	.
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
0	0
A	Shift+4
B	Shift+5
C	Shift+6
D	Shift+7
E	Shift+8
F	Shift+9
M/h	o
K/min	k
m/s	m
RESET	Delete
SELECT	End
Rotary knob (clockwise)	Page Up
Rotary knob (counterclockwise)	Page Down
<	←
>	→

Note

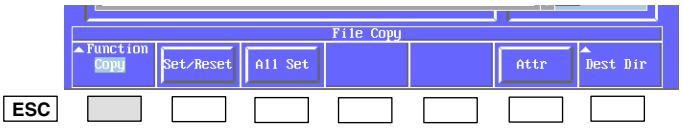
- The ten-key numeric pad cannot be used to enter numerals.
- Key input is not effective unless the mouse cursor is placed on the VT3100 screen of the Web browser.

8.1 Deleting Files

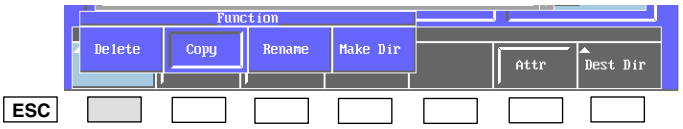
Procedure

Displaying the delete menu

1. Press the FILE key to display the File menu.
2. Press the [Function] soft key to display the Function menu.

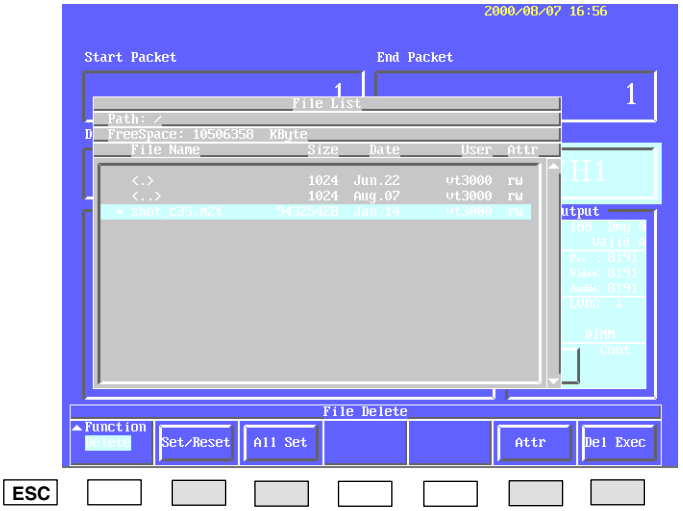


3. Press the [Delete] soft key to display the File List and Delete menus.



Changing the directory

4. Highlight the directory (displayed with <>) with the rotary knob and press the SELECT key. The file list of the selected directory is displayed.
   Select <..> and press the SELECT key to move up a directory.



Selecting the file to be deleted

5. Select the file to be deleted using the rotary knob and press the [Set/Reset] soft key. A [*] mark is placed by the file indicating that it is selected. Press the same soft key again to remove the [*] mark.

Selecting all files to be deleted

6. Press the [All Set] soft key (the name of the soft key changes to [All Reset]) to place [*] marks. Press the [All Reset] soft key (the name of the soft key changes to [All Set]) to remove [*] marks.

Executing the delete operation

7. Press the [Del Exec] soft key to delete all files that have [*] marks.

Setting the file attributes

8. Select the file using the rotary knob and press the [Attr] soft key to select [R] or [R/W].

Explanation

Deletes files that have been saved to the built-in hard disk or external SCSI device.

Setting the file attribute (Attr)

You can set file attributes for each file. The two attributes you can select are as follows:

- R/W: Reading and writing of the file are possible
- R: Only reading of the file is possible

If you set the attribute to [R], the file cannot be deleted. Set the attribute to [R] for those files you do not wish to delete.

Selecting the files to be deleted

Deletes all files that have [*] marks.

If files exist in the directory you wish to delete, delete the files in the directory first. Then, delete the directory.

Note

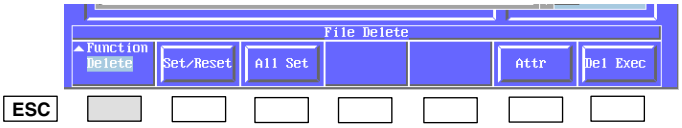
- You cannot delete files while stream output or recording is in progress. Press the START/STOP key to stop the output.
- Data that are deleted cannot be recovered. Make sure you do not erase important files. You can delete directories if there are no files in them.
- If an error occurs while deleting multiple files, the files after the error occurrence are not deleted.
- You cannot delete files that have [R] attributes (read-only).

8.2 Copying Files

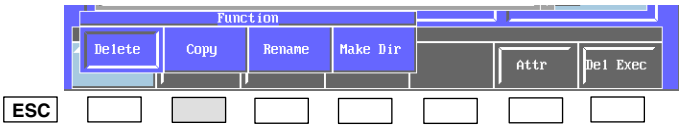
Procedure

Displaying the copy menu

1. Press the FILE key to display the File menu.
2. Press the [Function] soft key to display the Function menu.



3. Press the [Copy] soft key to display the File List and Copy menus.

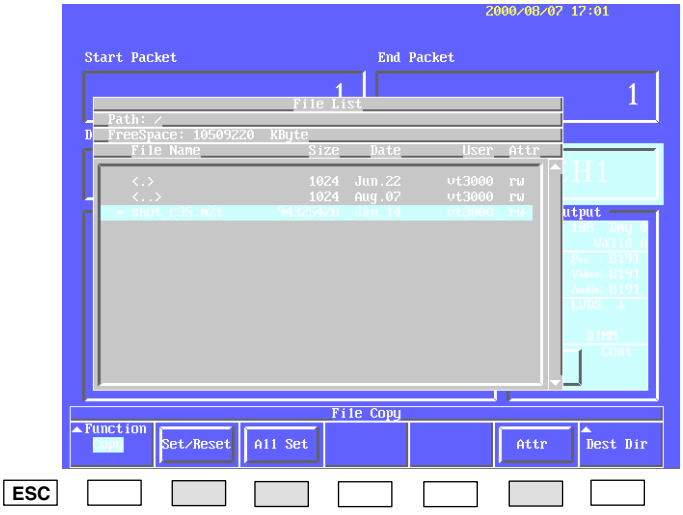


Changing the directory

4. Highlight the directory (displayed with <>) with the rotary knob and press the SELECT key. The file list of the selected directory is displayed.
   Select <..> and press the SELECT key to move up a directory.

Selecting the file to be copied

5. Highlight the file you wish to copy using the rotary knob and press the [Set/Reset] soft key. A [*] mark is placed by the file indicating that it is selected. Press the same soft key again to remove the [*] mark.



Selecting all files to be copied

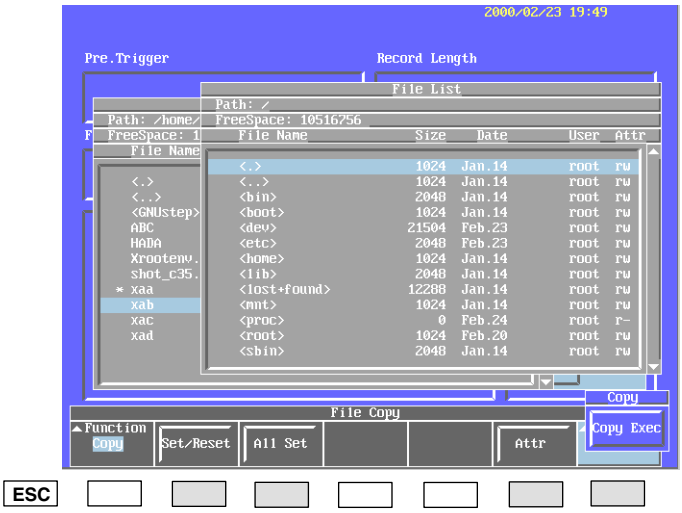
6. Press the [All Set] soft key (the name of the soft key changes to [All Reset]) to place [*] marks. Press the [All Reset] soft key (the name of the soft key changes to [All Set]) to remove [*] marks.

Selecting the copy destination medium or directory

7. Press the [Dest Dir] soft key to display the File List and Copy menus.
8. Select the copy destination medium or directory.

Executing the copy operation

9. Press the [Copy Exec] soft key to execute the copy operation.



Setting the file attributes

10. Highlight the file using the rotary knob and press the [Attr] soft key to select [R] or [R/W].

Explanation

Copies the files that are saved on the built-in hard disk or external SCSI device to the specified directory.

Setting the file attribute (Attr)

You can set file attributes for each file. The two attributes you can select are as follows:

- R/W: Reading and writing of the file are possible
- R: Only reading of the file is possible

Note

- You cannot copy files while stream output or recording is in progress. Press the START/STOP key to stop the output.
- If an error occurs while copying multiple files, the files after the error occurrence are not copied.
- If files with the same file name exist at the copy destination, they are overwritten.
- You cannot copy the same files to another directory after copying the files. Select the files to be copied again and copy them.
- An error occurs if the copy source and copy destination directories are the same.

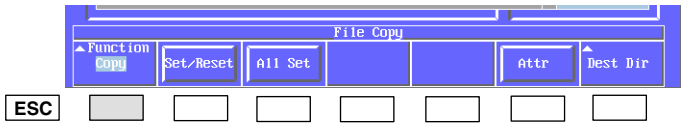
8.3 Renaming Files and Creating Directories

Procedure

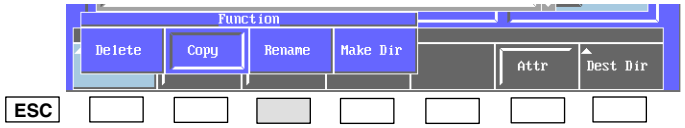
Renaming a file

Displaying the Rename menu

1. Press the FILE key to display the File menu.
2. Press the [Function] soft key to display the Function menu.



3. Press the [Rename] soft key to display the File List and Rename menus.



Changing the directory

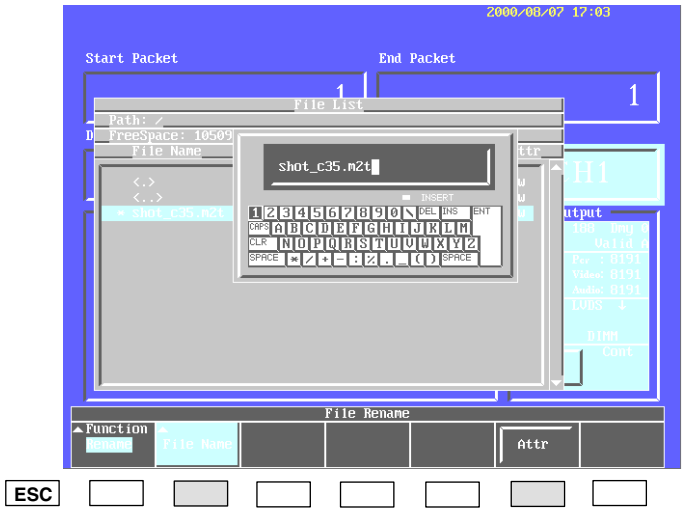
4. Highlight the directory (displayed with <>) with the rotary knob and press the SELECT key. The file list of the selected directory is displayed.
   Select <..> and press the SELECT key to move up a directory.

Selecting the files to be renamed

5. Highlight the files you wish to rename using the rotary knob.

Setting a new file name

6. Press the [File Name] soft key to display a keyboard screen. Enter the file name using up to 24 characters.



Creating a directory

Displaying the Make Dir menu

7. After step 2, press the [Make Dir] soft key to display the File List and Make Dir menus.

Selecting the directory

8. Highlight the directory (displayed with <>) with the rotary knob and press the SELECT key. The file list of the selected directory is displayed.
   Select <..> and press the SELECT key to move up a directory.

Setting the directory name

9. Press the [Dir Name] soft key to display a keyboard screen. Enter the directory name using up to 24 characters. Press the [ENTER] key to create the directory.

Explanation

Renaming files

You can rename files.

Creating directories

You can create directories on the floppy disk, built-in hard disk, or external SCSI device.

Note

- You cannot create directories while stream output or recording is in progress. Press the START/STOP key to stop the output.
- If a file with the same name exists in the same directory, it is overwritten.
- If a directory with the same name already exists in the same directory, the directory cannot be created.
- You can enter up to 24 characters for the file name and directory name. However, the VT3100 only displays the first 15 characters on the file list.

8.4 Operating Zip/UnZip (Compression/Expansion)

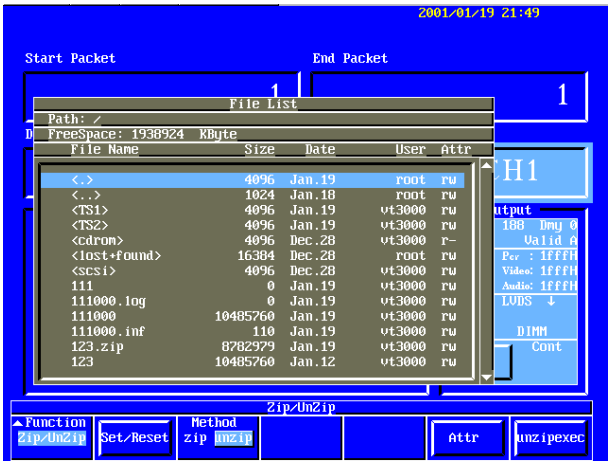
Procedure

Open Zip/UnZip menu

1. Press the FILE key to display the File menu.
2. Press the [Function] soft key to display the Function menu.

3. Press the [Zip] soft key to display the File and Zip menus.

4. Press the [Method] soft key and select [zip] or [unzip].



Change directory

5. Use the rotary knob to highlight the directory (displayed with <>) and press the SELECT key. A file list in the selected directory is shown. Select <..> and press the SELECT key to move to the directory one step superior.

Select file to be zipped

6. Use the rotary knob to select the file to be zipped and press the [Set/Reset] soft key. The file is marked [*] and becomes a zip target. Pressing the same soft key again erases the [*] mark. It is also possible to select more than one file and compress them into one file. The name of the compressed file is the first selected filename +.zip.

Select file to be unzipped

7. Use the rotary knob to select the file to be unzipped and press the [Set/Reset] soft key. The file is marked [*] and becomes an unzip target. Pressing the same soft key again erases the [*] mark. It is not possible to unzip more than one file simultaneously. If more than one file is selected, the first selected file is expanded.

Execution

8. Pressing the [zipexec] or [unzipexec] soft key will compress or expand all files marked [*].

Note

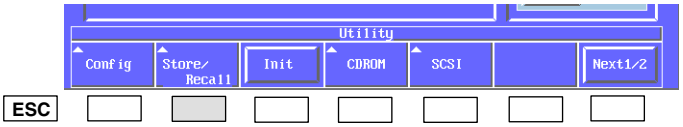
- The extension of a compressed (zipped) file is .zip.
- It is not possible to compress or expand while stream outputting, recording or monitoring is in progress.
  Press the START/STOP key to stop the output.
- The operation of Zip/Unzip has been verified by the WinZip Ver7.0J, LHMELT Ver1.15b JapanZip Ver2.0.32.

9.1 Storing Setup Data in the Setup Data File

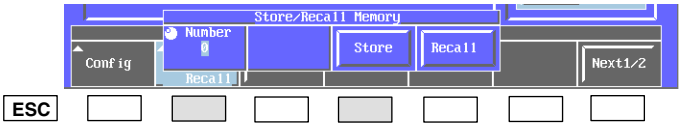
You can save and recall up to 32 sets of panel setup data and content name (file name) to the setup data file

Procedure

1. Press the UTILITY key to display the Utility menu.



2. Press the [Store/Recall] soft key to display the Store/Recall Memory menu.



Selecting the setup data number

3. Turn the rotary knob to set the setup data number.

Storing the data

4. Press the [Store] soft key.
5. A confirmation message appears. Select [OK] by turning the rotary knob and press the SELECT key to store the setup data.

Explanation

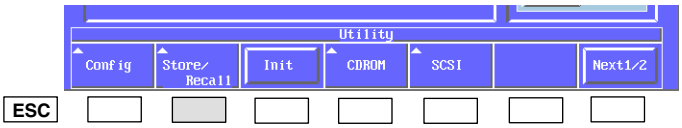
Setup data number

Select a value between 0 and 31. If setup data are already stored to the selected number, the previous data are overwritten.

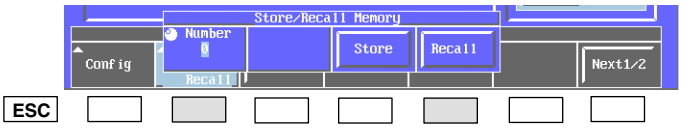
9.2 Recalling Setup Data from the Setup Data File

Procedure

1. Press the UTILITY key to display the Utility menu.



2. Press the [Store/Recall] soft key to display the Store/Recall Memory menu.



Selecting the setup data number

3. Turn the rotary knob to set the setup data number.

Recalling the data

4. Press the [Recall] soft key to recall the setup data.

Explanation

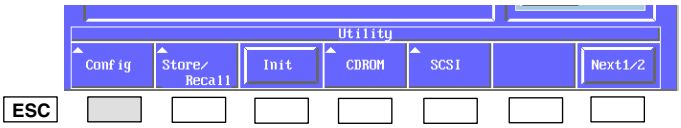
Setup data number

Select the setup data from a value between 0 and 31.

9.3 Turning ON/OFF the Alarm Sound and Screen Saver

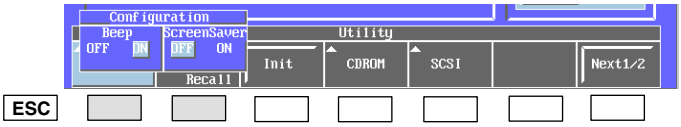
Procedure

1. Press the UTILITY key to display the Utility menu.
2. Press the [Config] soft key to display the Config menu.



Turning ON/OFF the alarm sound

3. Press the [Beep] soft key to select [ON] or [OFF].



Turning ON/OFF the screen saver

4. Press the [ScreenSaver] soft key to select [ON] or [OFF].

Explanation

Alarm sound

Selects whether or not to sound an alarm when you make a mistake in an operation and when errors and warnings are displayed. The initial value is ON.

Screen saver

If there is no key operation for approximately five minutes, the backlight of the display turns OFF. To exit the screen saver, press a key. The initial setting is OFF.

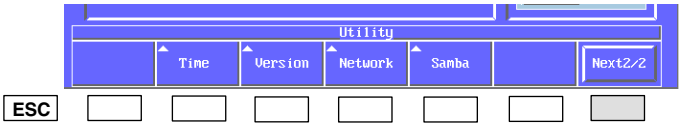
Note

The alarm sound and screen saver settings are reset to the initial values every time the power is turned OFF.

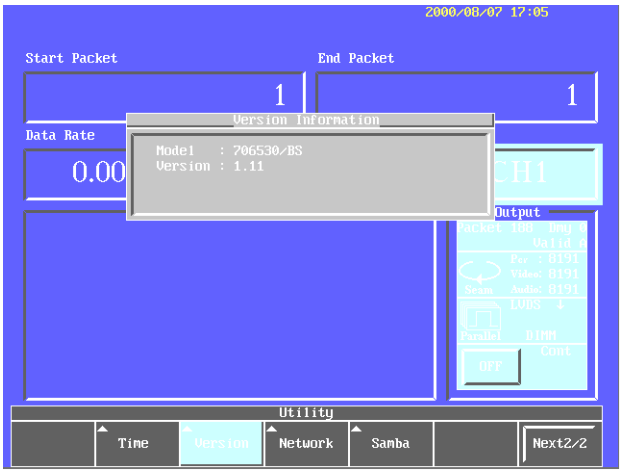
9.4 Displaying the Overview

Procedure

1. Press the UTILITY key to display the Utility menu.
2. Press the [Next1/2] soft key to display the next menu.



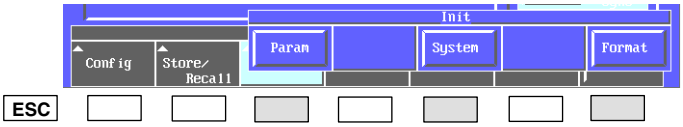
3. Press the [Version] soft key to display the version and model name.



9.5 Initializing the Settings

Procedure

1. Press the UTILITY key to display the Utility menu.
2. Press the [Init] soft key.



Initialization of setting information

3. Press the [Param] soft key. A comfirmation message appears.
4. Select [OK] using the rotary knob and press the SELECT key.

Initialization of system information

3. Press the [System] soft key. A comfirmation message appears.
4. Select [OK] using the rotary knob and press the SELECT key.

Initialization of built-in hard disk

3. Press the [Format] soft key. A comfirmation message appears.
4. Select [OK] using the rotary knob and press the SELECT key.

Explanation

Initialization of setting information

The channel setting information is initialized to the factory setting. However, the network setting cannot be initialized.

Initialization of system information

The channel setting and VT3100 setting are initialized to the factory setting.

Initialization of built-in hard disk

Formats the hard disk and reconstructs the file system. When initialization is completed, power to the VT3100 is automatically turned off.

CAUTION

Initializing the built-in hard disk erases all data contents in the hard disk.

9.6 Using the Keylock

The VT3100 has a keylock function for the purpose of preventing operating errors while monitoring TSs. While the keylock function is working, Pressing any key on the panel has no effect.

Procedure

Making the keylock function effective

1. Press the Reset key while holding down the Shift key (with the LED on).

Releasing the keylock function

2. Press the Reset key again while holding down the Shift key (with the LED on).

9.7 Creating BS Digital Broadcasting Stream (BS Option)

This function is used to convert a transport stream (TS) compliant with the ISO/IEC-13818-1 to a BS digital broadcasting transport stream compliant with the ARIB STD-B20 by inserting a dummy packet, multiplexing and adding a TMCC.

Procedure

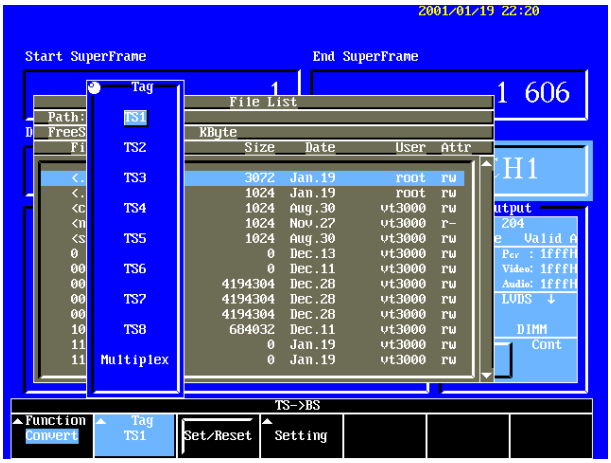
TS setting

Before multiplexing more than one TS, set each TS to be multiplexed.

1. Press the FILE key to display the File menu.
2. Press the [Function] soft key to display the Function menu.

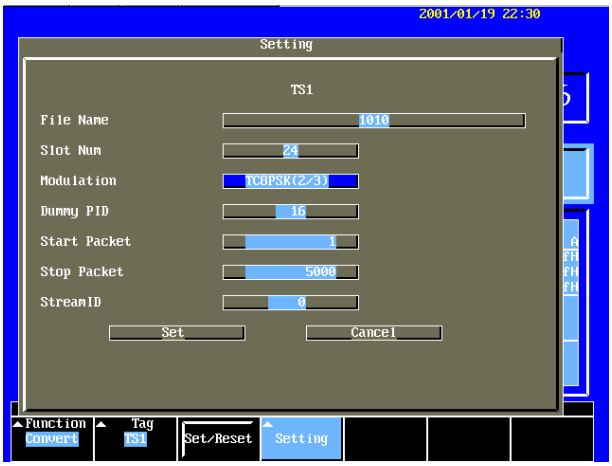
3. Press the [Convert] soft key to display the File and TS >BS menus.

4. Press the [TS] soft key and select one of TS1 to TS8.



5. Use the rotary knob to highlight the directory (displayed with <>) and press the SELECT key. A list of files in the selected directory is displayed. Select <..> and press the SELECT key to move to the directory one step superior.
6. Use the rotary knob to select a file to be converted and press the [Set/Reset] soft key. The file is marked [*] and becomes a file to be multiplexed. Pressing the same soft key again erases the [*] mark.

7. Press the [Setting] soft key to display the Setting menu.



8. Use the rotary knob and SELECT key to set Slot Num, Modulation, Dummy PID, Start Packet, Stop Packet, StreamID and then press Set.
9. Carry out the same procedure for all TSs to be multiplexed.

File Name:
Specifies a source file to be converted.
However, the prerequisite is that the file must be a TS file compliant with the ISO/IEC13818-1.

Slot Num:
Sets the number of slots according to the modulation system. The setting range is 1 to 48. The relationship between the modulation system and the number of slots is as shown in the table below.

Modulation:
Sets the modulation system. However, the setting of the number of slots varies depending on the modulation system. The relationship between the modulation system and the number of slots is as shown in the table below.

Modulation system	Minimum number of slots
BPSK(1/2)	4
QPSK (1/2)	2
QPSK (2/3)	3
QPSK (3/4)	4
QPSK (5/6)	6
QPSK (7/8)	8
TC8PSK (2/3)	1

The number of slots to be specified must be a multiple of the minimum number of slots. If the number of slots does not match the modulation system, an error results.

Dummy PID:
Specifies the PID of a dummy packet (TS header). The setting range is 0x0010 to 0x1FFF.

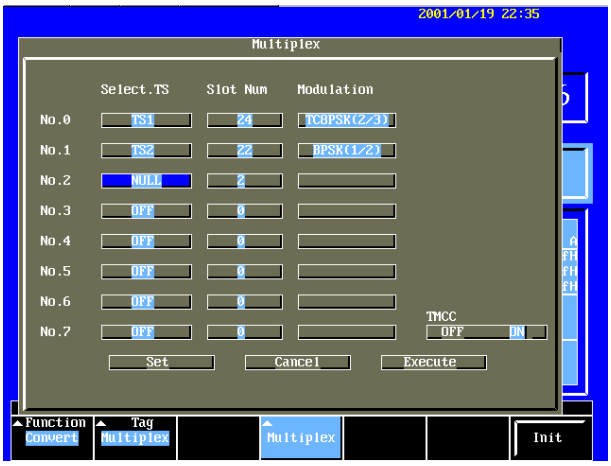
Start Packet:
Specifies the packet No. from which the conversion starts. The setting range is from 1 to the end packet of the selected MPEG file.

Stop Packet:
Specifies the packet No. at which the conversion ends. The setting range is from the start packet No. to the end packet of the selected MPEG file.

Stream ID:
An absolute TS number added to TMCC information. The setting range is 0x0010 to 0xFFFF. The relative TS number corresponds to No on the Multiplex setting screen.

TS multiplexing
Multiplexes the individually set TSs.

1. Press the [TS] soft key to select Multiplex.



2. Use the rotary knob and SELECT key to select Select.TS. When Select.TS. is selected, Slot Num and Modulation are automatically described from the individually set information. Only Slot Num can be changed from this menu.
3. If only multiplexing is required and TMCC information need not be added, set TMCC to OFF. Once all TSs to be multiplexed are set, use the rotary knob and SELECT key to perform Execute.

Slot Num:
Arrange the setting so that the total of the set Slot Num becomes 48.

TMCC:
Specifies whether TMCC is added to the start byte or not during multiplexing.

File after multiplexing:
The file name after multiplexing is conv.bscnv. Moreover, as a temporary file, a TS with a dummy packet added is created with a file name “tmp1.bscnv” to “tmp8.bscnv” for each TS.

Note

A BS stream is created according to the shortest one of TSs multiplexed.

10.1 Error Messages

Error Messages

A message may appear while you are using the VT3100. This section describes the meanings of the messages and the corrective actions. If the corrective action indicates servicing, please contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.

Error Messages

Code	Message	Cause Reference	Page
001	Status is local, then you cannot operate by remote.	Tried to display the remote menu while operating the local menu in the remote mode.	—
002	Status is remote, then you cannot operate by local.	Tried to display the local menu while operating the remote menu in the remote mode.	
003	VT3100 is now playing.	Tried to carry out an operation that cannot be carried out while outputting contents.	Ch3
004	VT3100 is now recording.	Tried to carry out an operation that cannot be carried out while recording is in progress.	Ch4
005	FileName is too long.	The length of the file name exceeds the limit.	4-2
007	Permission denied.	Tried to delete a read-only file.	8-1
008	Same File is exist.	A file with the same file name exists.	4-2
009	Netwrok setting is wrong. Please input ***.***.***.*** 0<=***<=255	Network configuration is not correct.	7-4
1300	Not selected file	Tried to output without any file being selected.	3-5, 3-22
1302	Can't operate while running.	Operated the Mode or Loop in the SETTING-Output menu while outputting contents.	3-13
1304	Over DIMM size.	The total size of the multiple contents you selected exceeded the DIMM size.	3-7
2301	Status is local, then you cannot operate by remote.	This error occurs when a command from the remote side menu has been received in a condition for receiving a command from the local side menu.	—
2302	Status is remote, then you cannot operate by local.	This error occurs when a command from the local side menu has been received in a condition for receiving a command from the remote side menu.	—
2303	VT3100 is now playing or recording.	Tried to carry out an operation that cannot be carried out while outputting contents or while recording is in progress.	Ch3, Ch4
2304	You cannot change Rate in Running when zone mode is Frame or Time.	Tried to operate the RATE menu while outputting contents with zone set to Time or Frame.	3-8, 3-9
2305	Zone is Out of range.	The Time value when zone is set to Time exceeds the range.	3-8
2306	Start position is greater than stop position.	The Start time value is greater than the End time value when zone is set to Time.	3-8
2307	Pretrigger size is greater than file length.	Recorded while PreTrigger is greater than FileLength.	4-3
2308	Zone size is less than 4096 byte in HDD mode.	With the output mode set to HDD, you specified an output zone that is less than or equal to 4096 bytes and output the data.	3-8
2309	Cannot output when output type is Serial and external clock is Parallel.	Tried to output with Output set to Serial and external clock set to Para.	3-9
2310	No files are selected, then selected files are not change.	This error occurs when a file name is not entered when a file is selected.	3-5, 4-2
2311	Cannot change in that directory.	This error occurs during a directory shift when the user attempts to move to a directory to which the system does not allow the user to move.	—
2312	You cannot delete this directory.	Tried to delete the SCSI and CD-ROM directory which are mount points for SCSI and CD-ROM.	7-2
2313	No SMB group name are filled.	The Samba group is not specified.	7-4

Code	Message	Cause Reference	Page
2314	No data are stored in this number.	Recalled a setup data number that has not been stored.	9-2
2315	FPGA Selftest Failed.	This error occurs when an FPGA self test fails.	—
2316	DIMM Selftest Failed.	This error occurs when a DIMM self test fails.	—
2317	Cannot delete or rename directory, which is show in source key.	This error occurs when the directory list shown by the Source Key is deleted or its name is changed.	8-1
2318	You cannot delete or rename selected file on output mode.	Tried to delete or rename the file that you have selected as an output file.	8-1, 8-5
2319	Device is busy.	Mounted SCSI (CD-ROM) while the file list is in the scsi (cdrom) directory.	7-2
2321	Cannot output when output memory is DIMM and output external trigger is enable.	This error occurs when OutputTrigger=ON and data is output in any mode other than DIMM mode.	—
2323	Cannot record to file which is selected in other channels.	This error occurs when a file, which is output and selected by one channel, is recorded by another channel.	—
2501	Setting packet length is different from TS File's.	This error occurs when a packet length is selected in Output mode and the packet length of the selected file is different from the packet length to be set.	3-8

Error Messages Related to LINUX

Code	Message	Cause Reference	Page
3101	No space left on device.	No space left on the built-in hard disk.	—
3101	*** and *** are the same file name.	Tried to copy to the same directory.	8-2
3105	*** exists but is not a directory.	The same file name existed, when Mkdir was executed.	8-3
3106	The kernel deos not recognize /dev/sda* as a block device.	Mounted the SCSI device without connecting the SCSI device.	7-1
3106	Wrong fs type, bad option, bad superblock on/dev/cdrom.	Mounted the CD-ROM without inserting a CD-ROM.	7-2
3106	According to mtab, /dev/*** is already mounted on ***.	Tried to mount a device that is already mounted.	7-2
3109	Directory not empty.	The directory you tried to delete contains files.	8-1
3111	Device is busy.	Unmounted the SCSI (CD-ROM) when the current directory is the scsi (cdrom) directory.	7-2

10.2 Recommended Replacement Parts

The one-year warranty applies only to the main unit of the instrument (starting from the day of delivery) and does not cover any other items or expendable items (items which wear out). The replacement period for expendable items may vary depending on the conditions of use. Refer to the table below as a general guideline. Contact your nearest YOKOGAWA dealer for replacement parts.

Parts Name	Replacement Period
LCD backlight	3 years
Built-in hard disk	One year after purchase (data are excluded)
Cooling fan	3 years
Backup battery (lithium battery)	3 years

11.1 Specifications

TS Output Function
Output Specifications

Item	Specifications
Output signal specifications	Complies with ISO/IEC-13818-1
Data rate	0.1 M to 56.61 Mbps (1 Hz resolution) Auto clock function included (used to synchronize the clock to the data rate computed from the data in the internal clock mode)*1
Memory length	Normal 256 MB Option 256 MB to 768 MB
Packet length	188, 192, 204, or 208 bytes
Data setting	Specify the start and stop position of playback with packet number, frame, or time.
Writing to the memory	Able to write one or multiple data sets.
Loop playback	Specify the number of playback repetitions from 1 to 256 times and infinity. Able to repetitively playback one channel of video and one channel of audio seamlessly.*2

*1: The auto clock function is not available for some contents. If this is the case, set the data rate manually.
*2: Seamless processing is available only on streams complying with the MPEG2-System standard.

Input/Output Format of Signal*3

Item		Specifications
ASI serial output	Specifications	Complies with BSEN5083-9
	Mode	Packet/Burst*3
	Level	800 mVp-p
	Connector	BNC (75 Ω)
DVB parallel output *4, *5	Specifications	Complies with DVB-A010
	Level	LVDS (DVB-A010) or RS422
	Connector	25-pin D-sub
External CLK input *6	Level	TTL (50 Ω) or ECL (50 Ω unbalanced)
	Timing	Rise or Fall
	Connector	BNC
	Format	Serial/Parallel (input a clock obtained by frequency dividing the signal by eight)

*3: Select the signal level from the menu.
*4: Select SF-Sync or Pkt-Sync from the menu.
*5: Switch Data Valid signal between Low and High for the latter 4, 16, 20 bytes of the 192-, 204-, and 208-byte packet.
*6: Do not use any external clock signal while an internal clock is being used.

Jitter Addition Function*7

Item	Specifications
PCR	+ side 0 to 728.16 ms (11.11 μs steps) – side 0 to 728.16 ms (11.11 μs steps)
PTS, DTS	+ side 0 to 2.83 ms (11.11 μs steps) – side 0 to 2.83 ms (11.11 μs steps)

*7: Select + side and – side for each PCR, PTS, and DTS. The value on the + side and – side are alternately added to each time stamp.

TS Record/Monitor Function

Item	Specifications	
Sampling rate	0.1 Mbit/s to 57 Mbit/s	
Record length	Pre-trigger	Up to 3/4 of the maximum memory length
	Post-trigger	Up to the HDD size.
PID filtering	Function	Records only the specified PID packet
	PID setting	Up to 6 PIDs can be specified
Slot filtering	Function	Records only the data included in the specified slot
	Slot specification	Specify by the slot number (1 to 48)

Input Format of Signal

Item	Specifications	
ASI serial input*8	Specifications	Complies with BSEN5083-9
	Level	800 mVp-p
	Connector	BNC (75 Ω)
DVB parallel input	Specifications	Complies with DVB-A010
	Level	LVDS (DVB-A010) or RS422
	Connector	25-pin D-sub
ARIB data input*9	Specifications	ARIB STD-B1 parallel interface
	Level	TTL
	Connector	20-pin mini-SCSI (amphenole, female type)

*8: ASI through output function provided.
*9: The ARIB data input is available only on 706540 (1-channel model) and 706541 (2-channel model).

TS Monitor Function Trigger Specifications

Item	Specifications		
ETR290	No. Indicator	No.Indicator	No.indicator
	1.1 T_SyncLoss	2.1 Transport_Error	3.1 NIT Error
	1.2 Sync_Byte_Error	2.2 CRC_Error	3.4 Unreference_PID
	1.3 PAT Error	2.3 PCR_Error	3.5 SDT_Error
	1.4 Cont,Count,Error	2.4 PCR Acc Error	3.6 EIT_Error
	1.5 PMT Error	2.5 PTS_Error	3.7 RST_Error
	1.6 PID Error	2.6 CAT_Error	3.8 TDT_Error
TMCC	When the TMCC has changed.		
Data pattern	When coincided with the freely preset 4-byte data.		
PCR trigger	When the PCR value specified in a PID has surpassed the preset value.		
Section	When the section information specified in a PID has changed.		
External trigger input 1	Input level	LVDS	
	Trigger level	High or Low	
	Connector	25-pin D-sub (pins No. 12 and No. 25 are used)	
External trigger input 2	Input level	TTL (50 Ω)	
	Trigger level	High or Low	
	Connector	BNC	
External trigger output	Output level	TTL (50 Ω)	
	Trigger level	High or Low	
	Connector	BNC	

TS Viewer

Item	Specifications
Web browser	Internet Explorer 5.X or later
Items to be analyzed	TMCC table view TS information view Packet view Table view

Other
Storage Media and Communications

Item	Specifications	
Built-in HDD	Size	6.4 Gbytes or 30 Gbytes*10
	Other	Available as a drive in a network
Built-in CD-ROM	×32 speed, SCSI interface	
SCSI	Standard	Ultra Wide SCSI*11
Communication	10/100Base-T Ethernet (TCP/IP)	

*10: An optional 30-Gbyte HDD is available as an alternative to the standard 6.4-Gbyte HDD.
*11: Up to 7 units. Only the file format of Ext2 is supported. Ext2 formatting is available from the VT3100 menu.

General Specifications

Item	Specifications	
Standard operating condition	Ambient temperature	23 ±5°C
	Ambient humidity	55 ±10% RH
	Supply voltage and frequency	1% of rating
	Warm-up	At least 30 minutes
Storage conditions	Temperature	–20 to 60°C
	Humidity	20 to 85% RH
		* No condensation
Operating conditions	Temperature	5 to 40°C
	Humidity	20 to 85% RH
		* No condensation
Rated supply voltage	100 to 240 VAC	
Permitted supply voltage range	90 to 264 VAC	
Rated supply voltage frequency	50 Hz or 60 Hz	
Permitted supply frequency range	48 to 63 Hz	
Maximum power consumption	200 VA	
Withstanding voltage	1.5 kVAC for one minute	
Insulation resistance	10 MΩ or more (500 VDC)	
External dimensions	Approx. 426(W) × 176(H) × 450(D) mm	
Weight	Approx. 15 kg	