

TSA-1200
Portable TS Recording Analyzer
HACOBE 2

Instruction Manual



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Traffic Sim Co., Ltd.

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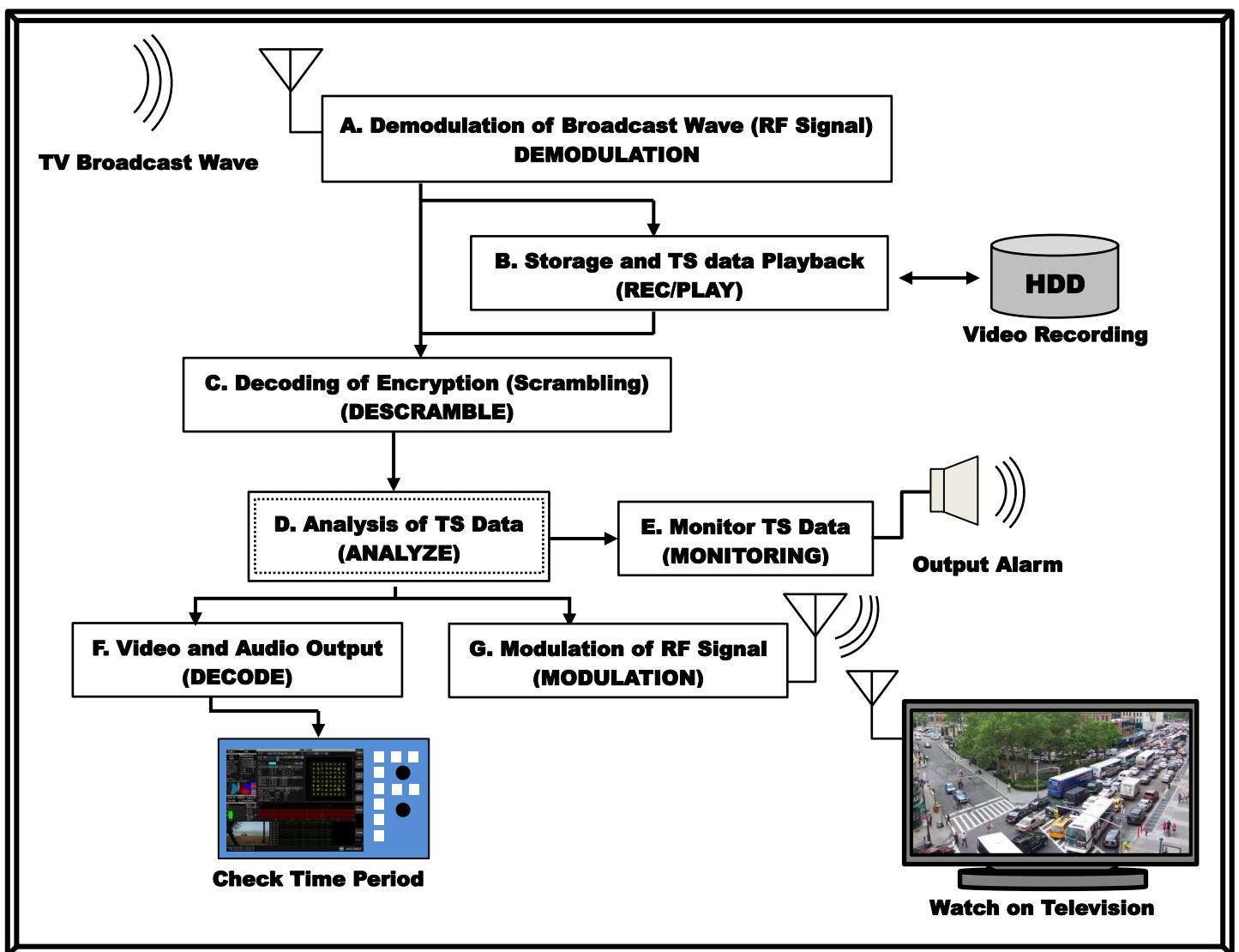
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1. Introduction

When checking and/or testing broadcast, various equipment are needed. Portable TS Recording Analyzer "HACOBE 2" assembled "all" in one single transport stream (TS) portable analyzer. (See diagram below)

Features:

- A. Due to demodulator function, receive broadcast directly from TV antenna;
- B. Analyze, record and playback TV broadcast as TS;
- C. With built-in descrambler, analyze and display scrambled (encrypted) programs;
- D. Analyze TS such as PCR jitter and PTS graph;
- E. Use it as simple monitor; log and alarm notifications;
- F. Built-in decoder. Check, at the same time, video, audio and TS analysis through screen and speaker;
- G. Added modulation function can output analyzed TS to RF signal. Confirm it on a TV.



*Some functions are optional.

2. Additional/ Extension Function

In addition to basic functions as TS analysis, HACOBE2 has several optional mounted in advance on HACOBE2's body or with license allowing its use.

*Some extensions might require added hardware license.

Extension (increase operation ability on HACOBE2)

- Demodulation;
ISDB-T/Tb RF and BS/ 110°CS IF input demodulation.
- Broadcast;
Enables recording and reproduction of TS data input.
- Descramble;
Enables descrambling in various formats as B-CAS/ C-CAS/ TRMP/ AES128.
**Traffic Sim Co., Ltd. does not provide IC Card. See section 4.3.5 IC Card Slot for more information.*
- Monitoring;
Monitors analyzed TS and outputs alarm.
- Modulation (*corresponding hardware required*).
Analyzed TS data can be modulated to output terrestrial digital or RF signal BS.

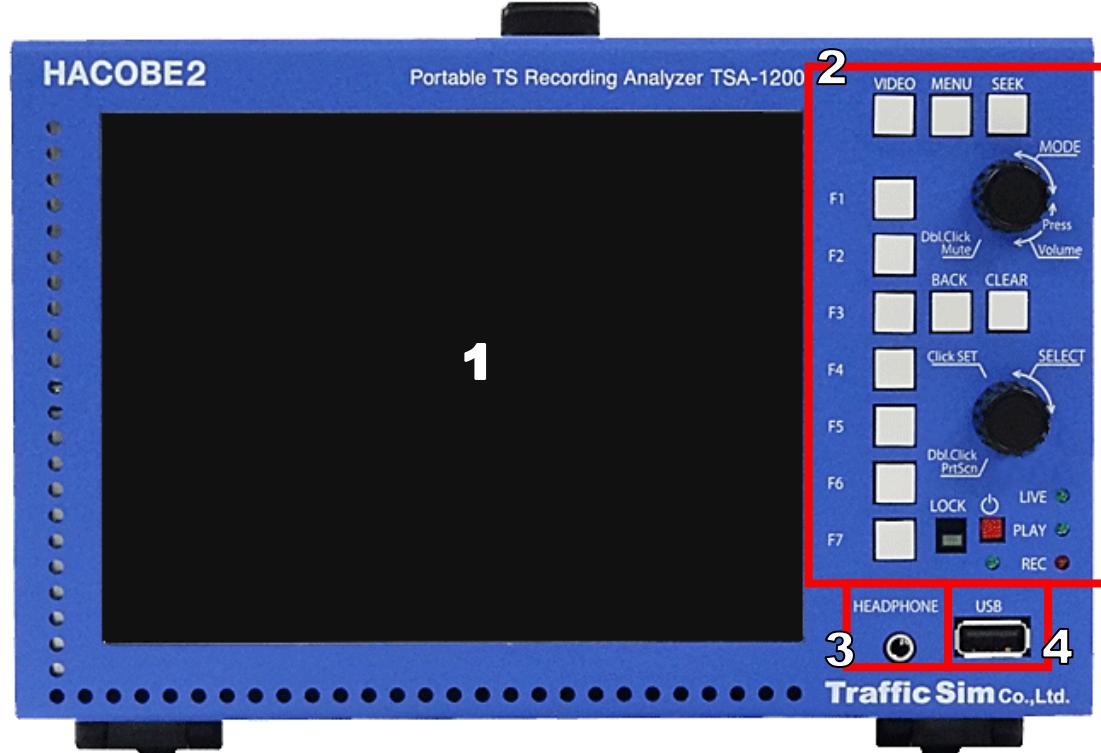
Additional (add functions to HACOBE2)

- Logging;
Check whether EMM packets and subtitle packets are properly transmitted.
- IP Input.
Receive and analyze TS delivered through network in RTP and UDP.

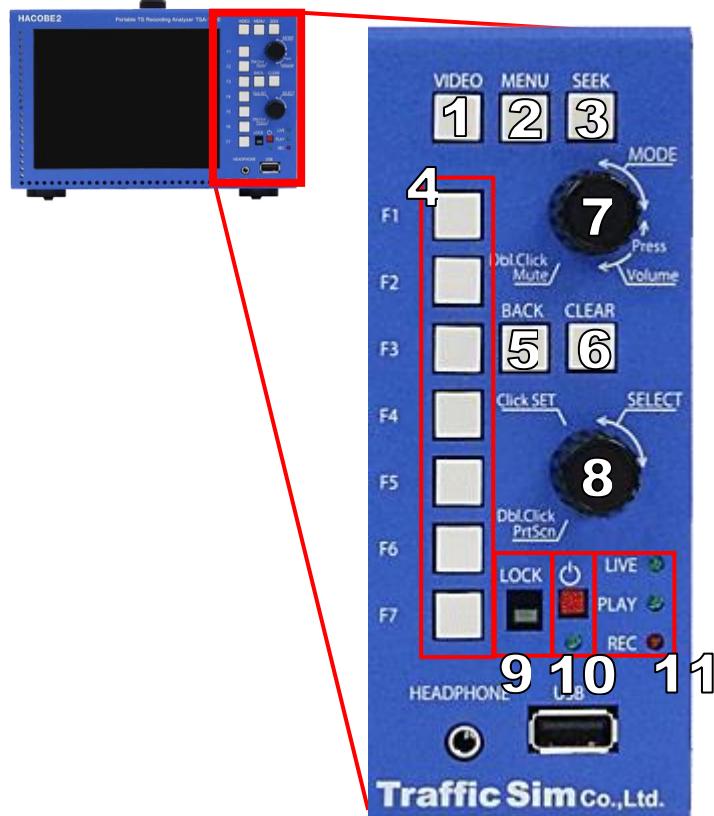
See section 14.1. License Option List for more information.

3. Description

3.1. Front View

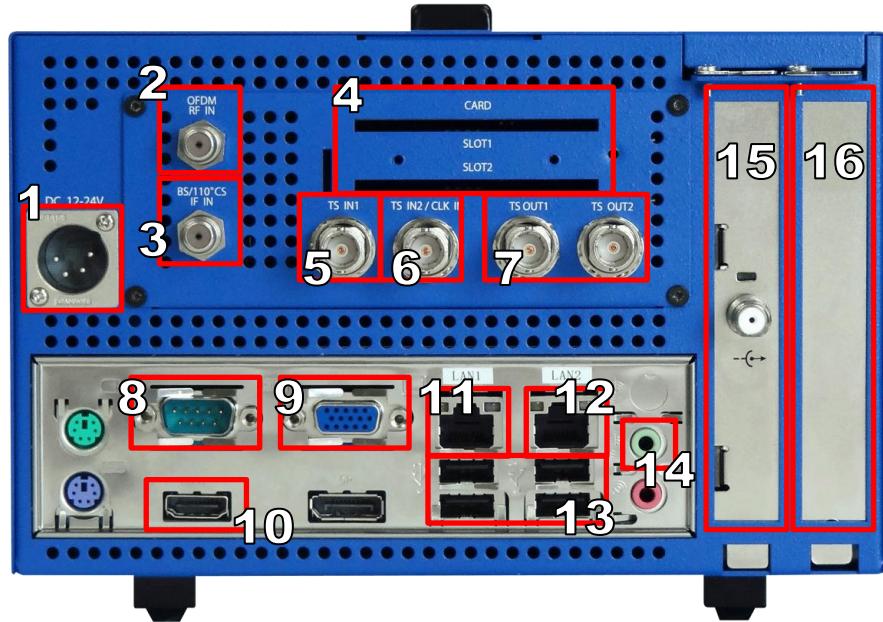


No.	Description
1	LCD panel. Display video and analysis results.
2	Control panel. <i>More information on following pages.</i>
3	Headphone jack.
4	USB port. Update and TS export port.



No.	Description
1	VIDEO button. Switch display screen between VIDEO and Analysis.
2	MENU button. Display MENU at screen top.
3	SEEK button. Display seek bar on the screen top during TS playback.
4	FUNCTION button (F1 to F7). Specific operations are assigned at each mode.
5	BACK button. Return or cancel.
6	CLEAR button. Reset TS information currently in analysis.
7	MODE/VOL encoder. Adjust volume and change analysis MODE.
8	DIAL encoder. Movement and selection.
9	Key Lock switch. Lock all keys with exception of POWER button. Green light indicates status.
10	POWER button. Power ON/OFF.
11	Status LED. Operating status of equipment. LIVE : Live TS input analysis. PLAY : Recorded TS playback analysis. REC : TS recording.

3.2. Rear View



No.	Description
1	Power supply. 4pin XLR connector.
2	RF (DTB) input terminal.
3	IF (BS/CS) input terminal. <i>*For Japan only.</i>
4	IC-CARD slot. Insert B-CAS or C-CAS card. (<i>No reading difference between slots</i>) <i>*For Japan only.</i>
5	ASI IN terminal.
6	ASI IN or CLOCK IN terminal. <ul style="list-style-type: none"> • ASI - IN terminal. • ASI - IN terminal + Clock input terminal
7	ASI OUT terminal.
8	Serial port. (<i>For remote console connection</i>)
9	VGA port Display HACOBE screen on monitor.
10	HDMI port Display HACOBE screen on monitor.
11	LAN port HACOBE's network connection port.
12	LAN port Receiving port for IP-TS.
13	USB port (<i>For remote console connection</i>)
14	Speaker terminal (<i>For remote console connection</i>)
15	PCI slot Modulation board or extension slot for hardware.
16	Expansion slot (<i>Cannot add modulation board on this slot</i>) QAM input board or contact input board slot and extensions for hardware, excluding modulation board.

**Do not use unspecified connectors.*

4. Specification

4.1. Input

4.1.1. DVB-ASI Input

2x ASI input 75Ω BNC connector

Maximum bitrate	215Mbps *During record mode only. Input bandwidth 60Mbps and recording, simultaneously, cannot be guaranteed.
Minimum bitrate	100Kbps
Available Packet Size	188, 192, 204, 208 byte

4.1.2. RF Input

ISDB-T/ISDB-S input (TSA1200-H0221)

Input Terminal	1x 75Ω F connector	
Level of Input	-75 to -20dBm (473 to 767 MHz) -67 to -28 dBm (93 to 465 MHz)	
Channel		
Channel	VHF	1 to 12 (NBR Preset: 7 to 13)
	UHF	13 to 62 (NBR Preset: 14 to 66)
	CATV	13 to 63 (NBR Preset: 5 to 99)
Level Range Measurement	-88dBm to -63dBm (93 to 767MHz)	

ISDB-T input (TSA1200-H0220)

Input Terminal	1x 75Ω F connector	
Level of Input	-85dBm to -5dBm (93 to 767MHz)	
Channel	VHF	1 to 12 (NBR Preset: 7 to 13)
	UHF	13 to 62 (NBR Preset: 14 to 66)
	CATV	13 to 63 (NBR Preset: 5 to 99)
	Specified Frequency ⁽¹⁾	50 ~ 980MHz
Level Range Measurement	-85 to -5dB (±3dB)	
C/N Range Measurement	5 to 35dB (±2dB, input level -50 to -5dBm) ⁽²⁾	

(1) Level and C/N measurement is reference value ("Uncalib").

(2) Input level range C/N measurement is reference value ("Uncalib").

4.1.3. BS-IF Input*

Input Terminal	1x 75Ω F connector	
Level of Input	-75dBm to -20dBm	
Channel	BS	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23.
	ND	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24.
Level Range Measurement	-80dBm to -22dBm	

*For Japan only.

4.1.4. QAM Input*

CATV tuner board (TSA1200-H0224) is required

Input Terminal	1x 75Ω F connector	
System	Broadcasting system: ITU-T J.83 Annex C Modulation: 64QAM / 128QAM / 256QAM Symbol rate: 5.274Msymbols/s	
Level of Input	-70 dBm to 0 dBm (93 to 767MHz)	
Channel	VHF	1 to 12
	UHF	13 to 62
	CATV	13 to 63
	Specified Frequency ⁽¹⁾	50 to 980MHz
Level Range Measurement	-70 to 0dB (± 3 dB)	
C/N Range Measurement	64QAM	22 to 35dB (± 2 dB, input level -50 to 0dBm) ⁽²⁾
	128QAM	24 to 37dB (± 2 dB, input level -40 to -10dBm) ⁽²⁾
	256QAM	27 to 40dB (± 2 dB, input level -40 to -10dBm) ⁽²⁾

(1) Level and C/N measurement value at the time is reference value ("Uncalib").

(2) C/N measurement of input level range described is reference value ("Uncalib").

*For Japan only.

4.1.5. TS over IP Input

Ethernet	2x Gigabit Ethernet LAN ports (10/ 100/ 1000 Mbps) *LAN1/ LAN2 must be the port for IP receiver.
Supported Protocols	RTP or UDP *ProMPEG FEC, Multicast, Promiscuous Mode.

4.2. Output

4.2.1. DVB-ASI Output

2x ASI output 75Ω BNC connector

Maximum bitrate	215Mbps
Minimum bitrate	100kbps
Available Packet Size	188, 192, 204, 208 byte

*Output on both terminals are the same.

4.2.2. RF Modulation Board Output

VHF/ UHF/ CATV band corresponding modulation board (TSA1200-H0226)

Output terminal	1x 75Ω F connector	
Corresponding Method*	ISDB-T/Tb ITU-T J83 Annex C (64QAM, 256QAM)	
Frequency range	36 to 870 MHz	
Output Level range	ISDB-T/Tb	-35 to -12 dBm
	ITU-T J83 Annex C	-32 to -9 dBm

(*) License is required for each corresponding method.

L-Band corresponding modulation board (TSA1200-H0227)

Output terminal	1x 75Ω F connector	
Corresponding Method*	ISDB-S	
Frequency range	950 to 2150 MHz	
Output Level range	-42 to -10 dBm	

(*) License is required for each corresponding method.

4.3. Others

4.3.1. Decoder

Video format	<ul style="list-style-type: none"> MPEG2-TS (compliant with ARIB/ STD-B21/ 6.2.1 video signal output format) H.264
Audio format	<ul style="list-style-type: none"> MP1-L1/ L2/ L3 MP2-L1/ L2/ L3 (MPEG-2 BC) AAC-LC/ LTP/ MAIN/ SSR/ HE-AAC/ ALS/ BSAC LPCM-16bit/ 20bit/ 24bit

4.3.2. Key Lock

Slide key to enable Key Lock function.

POWER button does not lock.

- When enabled the key lights up.

4.3.3. Volume Control

Adjust volume on the front panel.

- Speaker and headphone volume are equivalent.

4.3.4. Screen Brightness Adjustment

Adjust LCD backlight on the front panel, on the MENU options.

4.3.5. IC Card Slot

2x IC Card Slot

B-CAS	Range of card is less or equal to 0000-0001-****-****-**** to 0000-0999-****-****-**** 0000-9001-****-****-**** to 0000-9999-****-****-****
C-CAS	All card numbers.

*IC Card not included.

4.3.6. Built-in Speaker

Rating: 2W

4.3.7. Headphone Jack

Stereo

Rating: 95mW (32Ω)

4.3.8. Front USB Terminal

1x USB-A female

USB port for update and TS output.

Please do not connect other devices besides USB storage or GPS receiver (optional).

4.3.9. Built-in Storage

Version: 500GB SATA 2TBHDD (optional)

Version: 2.0TB SATA SDD (default)

4.3.10. LCD Panel

6.5 inches TFT color LCD

Display area	132.096 × 99.072 (mm)
Resolution	1024 × 768 (XGA)
Colors	16, 777, 216
Luminance	650cd/m ²
Viewing Angle	Horizontal right:80 ° Left:80 ° Vertical upper:80 ° Lower:60 °

4.3.11. Power

Corresponding power

Input	DC12V (12 to 36V)	
Connector shape	XLR connector 4-PIN Male	
AC Adapter	AC100V-100W Input voltage: 90 to 264VAC Frequency: 47 to 63Hz Output voltage: 12V Output current: 8.34A	AC100V-90W Input voltage: 90 to 264VAC Frequency: 47 to 63Hz Output voltage: 12V Output current: 7.5A

*In case of battery use be aware of power voltage.

4.3.12. Contact

HACOBE2 dedicated contact board (TSA1200-H0225)

Connector Shape	D-SUB25 pin female *Inch screws	
Contact Input	Relay Specification	Photo Coupler
	Input Withstand Voltage	27 V
	Continuous Load Current	7.0 mA (max.)
Contact Output	Relay Specification	Photo MOS FET
	Input Withstand Voltage	40 V
	Continuous Load Current	120 mA (max.)
	On-resistance	25 Ω (max.)

5. Handling

5.1. Startup and Shutdown

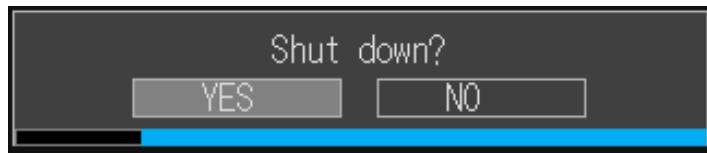
5.1.1. Startup

Make sure AC adapter connector is attached properly to HACOBE2 and press the red power button once briefly.

Indicator Power LED will light up. A time difference of 1-2 seconds may occur.

5.1.2. Shutdown

Press power button for the following message appear:



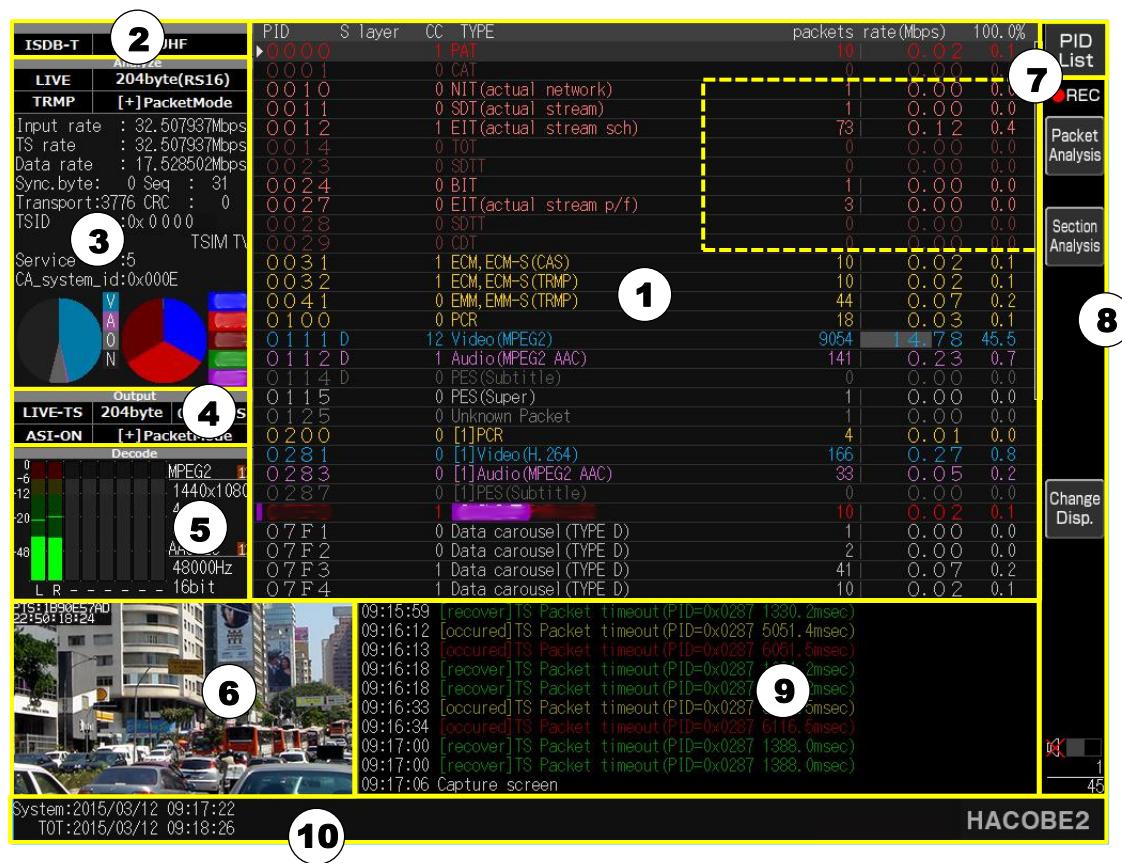
Press F4 [Yes] button or turn SELECT dial to [Yes].

No action within 10 seconds, shutdown will be cancelled automatically.

Please do not plug or unplug any connector or AC adapter until power LED is off.

5.2. Screen Configuration

The screen of HACOBE 2 is composed of eight windows detailed on the below picture.



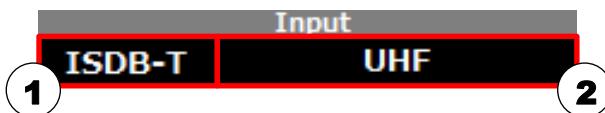
No.	Description
1	Main Window. Display operations, settings and each mode information.
2	Input information. Display information about current input.
3	Analysis information. Display information of TS currently in analysis.
4	Output information. Display status of ASI output.
5	Decode information. Display decoded TS data information currently in analysis.
6	Video Window. Display TS data video currently in analysis.
7	Mode Selection. Display mode currently in view. <i>*MODE dial operation is displayed on the dotted marked area.</i>
8	Function display. Display operation assigned to F1 – F7 buttons.
9	Log Window. Display alarm operation log and TS/RF Monitoring.
10	Device status. Display time, playback information and device connection status.

5.2.1. Main Window

Display analysis information, reproduction of recorded data, input and output settings of each mode.

5.2.2. Input Information

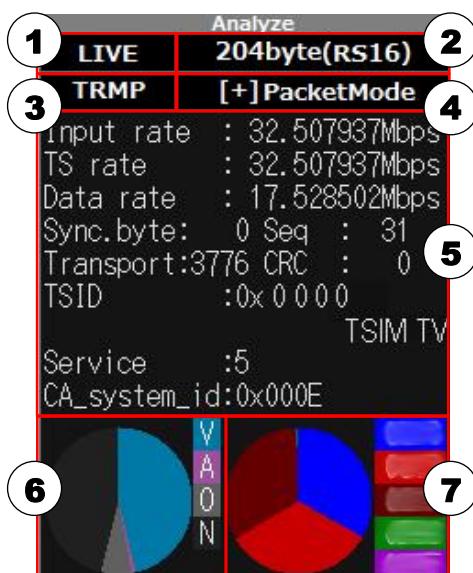
Display TS input method. HACOBE2 record TS continuously.



No.	Description
1	Currently selected input method. Terminal (connector) may be one of the following: Input-Off ASI-1 ASI-2 ISDB-T ISDB-S DVB-C TS over IP <small>* ISDB-T requires Terrestrial Digital Broadcasting option license. * ISDB-S requires BS corresponding option or ND (CS110°) corresponding option license. * DVB-C requires QAM (CATV) corresponding option license. * TS over IP requires "IP input corresponding option license.</small>
2	Input type currently selected. Type information displayed depends on Input method. ASI: Polarity (+/-) and transmission mode (Packet / Burst). ISDB-T: VHF UHF CATV ISDB-S: BS 110°CS DVB-C: QAM(VHF) QAM(UHF) QAM(CATV) TS over IP: UDP RTP

5.2.3. Analysis Information

Display information about input TS, LIVE analysis and TS information during playback in case of being displayed.

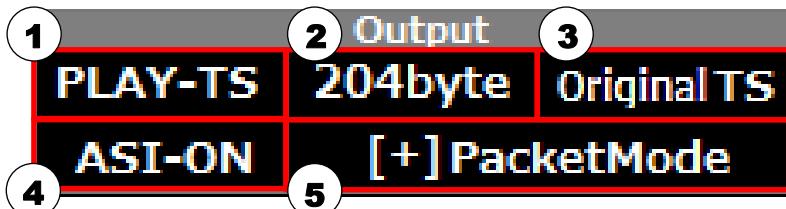


No.	Description
1	Type of play. Displays type of TS data currently in analysis. LIVE Real time analysis of TS data currently being recorded. Rec.TS Analysis of internal storage recorded data currently playing. Archive Analysis of internal or external storage recorded data currently playing. TS-RAW Analysis of internal or external storage recorded TS-Raw data currently playing. Together Analysis of recorded data currently streaming through network.
2	Packet information. TS data packet size currently on input. 188byte(TS only) TS packet only 192byte(TTS) Time-stamped TS packet (TTS) 204byte(DUMMY16) TS packet + dummy byte 204byte(RS16) TS packet + Reed-Solomon (error correction) 204byte(IIP+RS8) TS packet + ISDB-T information (IIP) + Reed-Solomon (error correction) 208byte(TTS+DUMMY16) Time-stamped TS (TTS) + dummy byte 208byte(TTS+IIP+DUMMY8) Time-stamped TS (TTS) + ISDB-T information (IIP) + dummy byte 208byte(TTS+IIP+RS8) Time-stamped TS (TTS) + ISDB-T information (IIP) + Reed-Solomon (error correction) No Input No TS input Unknown TS No recognized TS data. <i>*In case of unsuccessful synchronize lock.</i>
3	Type of descrambling selected. DescrambleOff Descrambler off. B-CAS Descramble using B-CAS card. C-CAS Descramble using C-CAS card. TRMP Descramble using TRMP method. AES128 Descramble using AES128 method
4	ASI input information. Displays ASI input TS data information. [+]PacketMode Positive polarity Packet Mode. [+]BurstMode Negative polarity Packet Mode. [+]BurstMode Positive polarity Burst Mode. [+]BurstMode Negative polarity Burst Mode. <i>* Display recording time ASI information when broadcast and archive playback.</i> <i>* In case of TS-Raw or Together playback, it will always be positive polarity packet mode.</i> <i>* In input of non-ASI, it will always be positive polarity packet mode.</i>

No.	Description
5	TS input information. Currently analyzed input TS information. <u>Input rate</u> : Input stream bitrate. <u>TS rate</u> : TS data included in the stream bitrate. <u>Data rate</u> : TS data excluding NULL packet bitrate. <u>Sync. bytes</u> : TS analysis synchronization byte error number. <u>Seq.</u> : TS analysis continuity index error number. <u>Transport</u> : TS analysis transport error indicator. <u>CRC</u> : TS analysis CRC errors number. <u>TSID</u> : Display TS name acquired from NIT and PAT in TS analysis. <u>Number of services</u> : Number of PMT specified in PAT in TS analysis. <u>CA system ID</u> : Display CA system ID obtained from CAT TS analysis.
6	Packet type bandwidth graph. Classification occupied by each packet on TS analysis. V : Video packet A : Audio packet N : NULL packet O : Other packets
7	Service bandwidth graph. Displays bandwidth percentage of each service occupied on TS analysis. Right side displays service ID.

5.2.4. Output Information

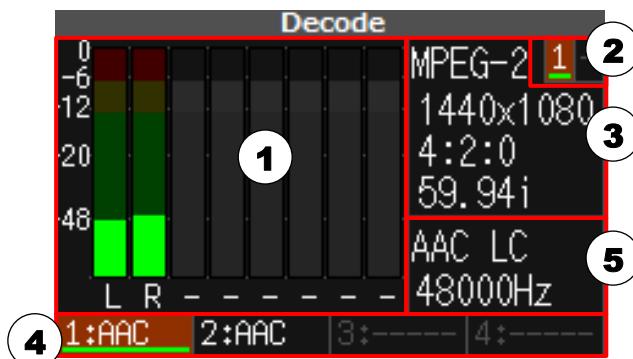
Display TS output setting of ASI and RF modulation.



No.	Description
1	TS data ASI output source. LIVE-TS TS data output is the current input. PLAY-TS TS data output is the current playback. --- Not output.
2	Output TS packet size. TS output source and settings vary between 188/ 192/ 204/ 208 byte.
3	Broadcast TS conversion settings currently set. Original TS Output remains the same. (Not converted) Broadcast TS Output is converted into broadcast TS.
4	Displays ON/OFF status of ASI output.
5	ASI output information. [+] PacketMode Positive polarity Packet Mode. [-] PacketMode Negative polarity Packet Mode. [+] BurstMode Positive polarity Burst Mode. [-] BurstMode Negative polarity Burst Mode.

5.2.5. Decoder Information

Displays number of audio and video; selected service current format encoding.



No.	Description
1	Sound level meter.
2	Decoded video selected status. - If TS has more than one image the number will be displayed in white. - Display current selected image number in red background. - Actual image number being decoded is displayed on green underline.
3	Video decoding information.
4	Decoded audio selected status. - If TS has more than one audio the number will be displayed in white. - Display current selected audio number in the red background. - Actual audio number being decoded is displayed on the green underline.
5	Audio decoding information.

5.2.6. Video Window

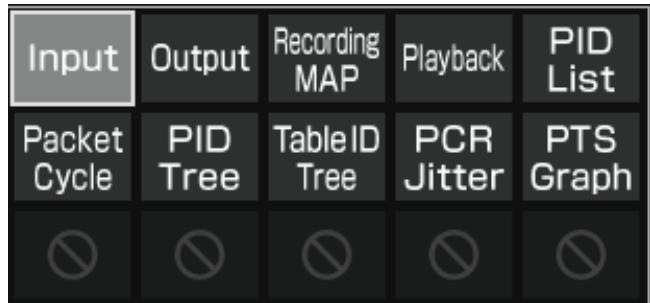
Displays the result of decoding video service packet currently selected.



No.	Description
1	If video decoding is successful, a frame with "PTS value" and "elapsed time PTS" (0 time basis) will be displayed in the upper left corner of the screen. After, about, 26 hours, it returns to 00:00:00.
2	If an abnormality occurs during decoding, a blue screen will be displayed with an error message on the center. <u>NO VIDEO</u> : Unrecognizable video packet or no video packet. <u>SCRAMBLED</u> : Scrambled (encrypted) video packet. <u>MISMATCHED</u> : PCR and PTS do not match, not recognizing when to display video frame.

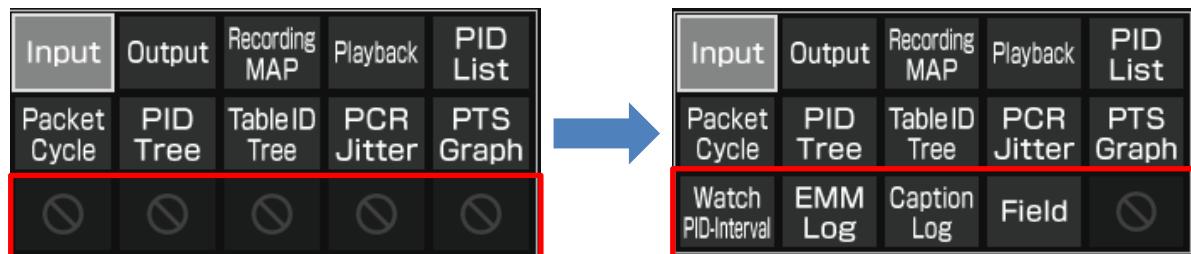
5.2.7. Mode Selection Window

In view of analysis information, reproduction of recorded data, input and output settings, there is an assorted screen state (Mode). Each selected Mode will be displayed in the upper right of the screen.



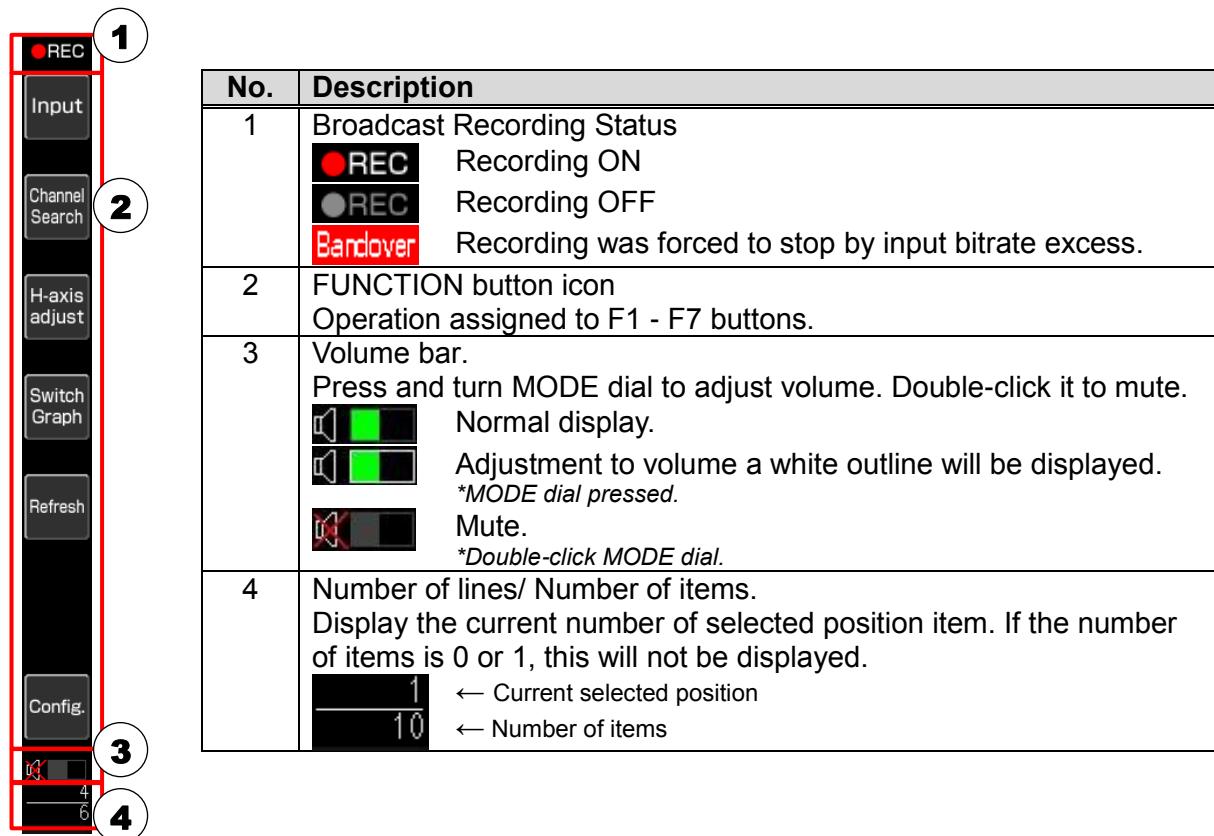
Mode Name	Function
	Set TS data input to be analyzed in HACOBE2.
	Set ASI board configuration for RF Modulation.
	Recording status of TS data. Create archive and TS-RAW files from recording data.
	Playback TS file data from internal storage or external USB.
	Input TS packet is listed. Displays type and number of packets of each PID, bandwidth rate and bitrate.
	Receiving packet cycle, which includes input TS, average and maximum gap and last update time.
	TS structure analyzed by PAT.
	Captured packets included in the TS, displays TableID and section number.
	Deviation of PCR.
	Relationship between PCR and PTS.
	Free slots for customization.

In addition, five empty slots (shortcut) were included to be assigned to frequently used Modes within added functions purchased.



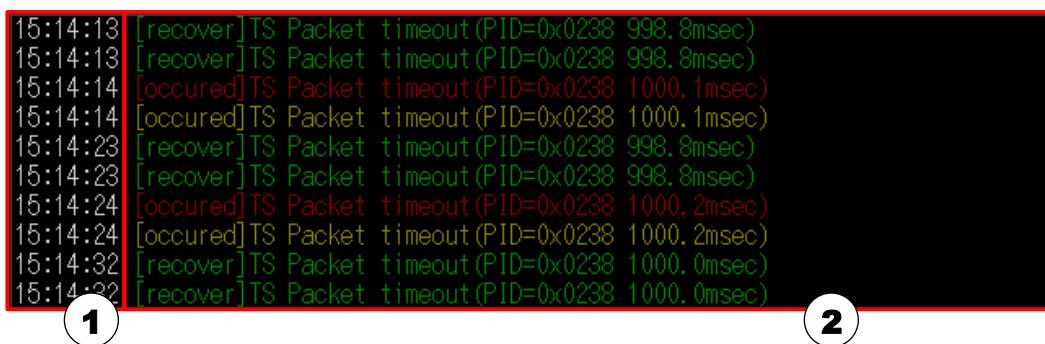
5.2.8. Function display

Displays operation assigned to each FUNCTION button (F1 - F7), record status, volume and selected item position.



5.2.9. Log Window

Display behavior logs, such as monitoring alarm log. Regardless of log type, it displays the last 10 minutes log.



```

15:14:13 [recover] TS Packet timeout (PID=0x0238 998.8msec)
15:14:13 [recover] TS Packet timeout (PID=0x0238 998.8msec)
15:14:14 [occurred] TS Packet timeout (PID=0x0238 1000.1msec)
15:14:14 [occurred] TS Packet timeout (PID=0x0238 1000.1msec)
15:14:23 [recover] TS Packet timeout (PID=0x0238 998.8msec)
15:14:23 [recover] TS Packet timeout (PID=0x0238 998.8msec)
15:14:24 [occurred] TS Packet timeout (PID=0x0238 1000.2msec)
15:14:24 [occurred] TS Packet timeout (PID=0x0238 1000.2msec)
15:14:32 [recover] TS Packet timeout (PID=0x0238 1000.0msec)
15:14:32 [recover] TS Packet timeout (PID=0x0238 1000.0msec)

```

No.	Description
1	Time of occurrence Displays generated time of log according to system time.
2	Log content Display contents of generated log. Text color changes according to warning level. Red: error log Yellow: alert log White: information log

*Warning level logs (character color) can be set on monitoring settings regardless of content.

5.2.10. Status Window



No.	Description
1	System and TOT time System time: Displays current date and time according to built-in clock. TOT Time: Display TOT time included in the TS currently being analyzed. (If there is no TOT packets "yyyy / mm / dd hh:mm:ss" will be displayed)

No.	Description								
2	<p>Playback Status Displays progress status of TS playback. Displayed information differs according to data reproduced.</p> <ul style="list-style-type: none"> Recorded TS data Displays TS time and playback status.  <ul style="list-style-type: none"> Data Archive Displays playback status and current playing time.  <ul style="list-style-type: none"> TS-RAW data Displays TS data size and reproduction status.  <ul style="list-style-type: none"> Network data Displays TS time, playback status and IP address. 								
3	<p>Remote console operation icon  Operation  Operation</p> <p>When connected to a remote console or side screen either icon will be displayed. Even when connected, in case of no operation the icon will no longer be in display.</p>								
4	<p>GPS Module icon </p> <p>GPS module icon when connected to the front USB port will be displayed. <i>*Accessory sold separately.</i></p>								
5	<p>USB Storage icon </p> <p>When connected to USB storage, this icon will be displayed. <i>*Not available in case of non-compliant USB storage.</i></p>								
6	<p>Modulation Board Status icon When RF modulation board is in use this icon will be displayed. Check modulated output status by the color of the icon in display.</p> <table border="1"> <tr> <td> MOD</td> <td>Modulation output status is normal.</td> </tr> <tr> <td> MOD</td> <td>Modulation output status has parameter error, etc.</td> </tr> <tr> <td> MOD</td> <td>Modulation output status is abnormal.</td> </tr> <tr> <td> MOD</td> <td>Modulation output status stopped.</td> </tr> </table>	 MOD	Modulation output status is normal.	 MOD	Modulation output status has parameter error, etc.	 MOD	Modulation output status is abnormal.	 MOD	Modulation output status stopped.
 MOD	Modulation output status is normal.								
 MOD	Modulation output status has parameter error, etc.								
 MOD	Modulation output status is abnormal.								
 MOD	Modulation output status stopped.								

5.3. Operation

Apart from MODE/ SELECT dial and MENU button functions, other features were designed to be displayed on the F1 - F7 buttons, when necessary.

5.3.1. Common operations between modes

Dial (MODE/ SELECT) have four different operations. F1 - F7 buttons have different functions and some are common among Modes, these will be described accordingly to each displayed Mode.

Object	Content
MODE dial (Turn left-right)	Switch mode displayed in Mode Selection Window (see p.23). Only under certain conditions, such as MENU operation, it is possible to perform cursor movement as SELECT dial.
MODE dial (Push)	Switch display/ non-display of decode screen operation menu. In decode screen operation menu, switch services, audio and video, such as analysis result display settings; operations related to screen display are listed. <i>*During SEEK operation, MENU screen is not available.</i>
MODE dial (Push and turn left-right)	Adjust decoded volume.
MODE dial (Double-click)	Mute decoded volume. Volume icon will be displayed in gray if it is muted.
SELECT dial (Turn left-right)	Change values.
SELECT dial (Push)	Specify main selection.
SELECT dial (Push and turn left-right)	Same action as SELECT dial (Turn left-right).
SELECT dial (Double-click)	Capture the screen (Screenshot). Up to 100 images can be stored in the body. If USB storage is connected, it will automatically be copied. The captured image can be checked on MENU > Screenshot.
VIDEO button	Switch to enable/ disable VIDEO mode. In VIDEO mode (see p.22) expand VIDEO window. Switch service of video/ audio decoded. <i>*VIDEO button is not available when MENU or SEEK function is on display.</i>
MENU button	Display MENU. Record/ Playback ON-OFF operation, Report, Log and Generic operation are listed.
SEEK button	SEEK bar Seek for recorded TS data. Even if not in play, allows broadcast playback. <i>*Log message not available during MENU function on display.</i>
BACK button	Cancel current or return to previous selected item. <i>*This button does not undo actions.</i>
CLEAR button	Clear (reset) current analysis. <i>*Continuity counter and descrambling key are not erased.</i>

5.3.2. Decoder and Operation Menu

Press MODE dial to display Quick Decode Control Menu displayed in the upper right corner of the main window. This menu is a shortcut to various settings of HACOBE2.

Decode Control Menu MODE/BACK : close menu	
F1	Next Page
F2	Change to Service(+)
F3	Change to Service(-)
F4	Change to Audio
F5	-----
F6	Downmix ON
F7	Change to Video

Page 1/2

Display Control Menu MODE/BACK : close menu	
F1	Prev Page
F2	PID in Hexadecimal
F3	ServiceID in Hexadecimal
F4	8-unit code ON
F5	PID-Custom OFF
F6	-----
F7	Change the Brightness

Page 2/2

Object	Content
Prev. Next	Switch menu items displayed.
DECODE OPERATION MENU	Service
	Switch to next decoded service.
	Service
	Switch to previous decoded service.
	Audio Select
	Switch decoded audio.
SCREEN OPERATION MENU	Down mix Down mix
	Output down mix in case of 5.1ch audio.
	Video Select
	Switch decoded video. <i>*Does not change to nonexistent video.</i>
	PID Decimal PID Hexadecimal
	Switch to decimal or hexadecimal PID displayed on analysis screen.
	ServiceID Decimal ServiceID Hexadecimal
	Switch to decimal or hexadecimal Service ID displayed on analysis screen.
	8 unit code OFF 8 unit code ON
	Switch ON/OFF 8 unit code decode.
	Customize OFF Customize ON
	Enable/Disable PID custom display settings.
	Change Brightness
Change LCD monitor brightness.	

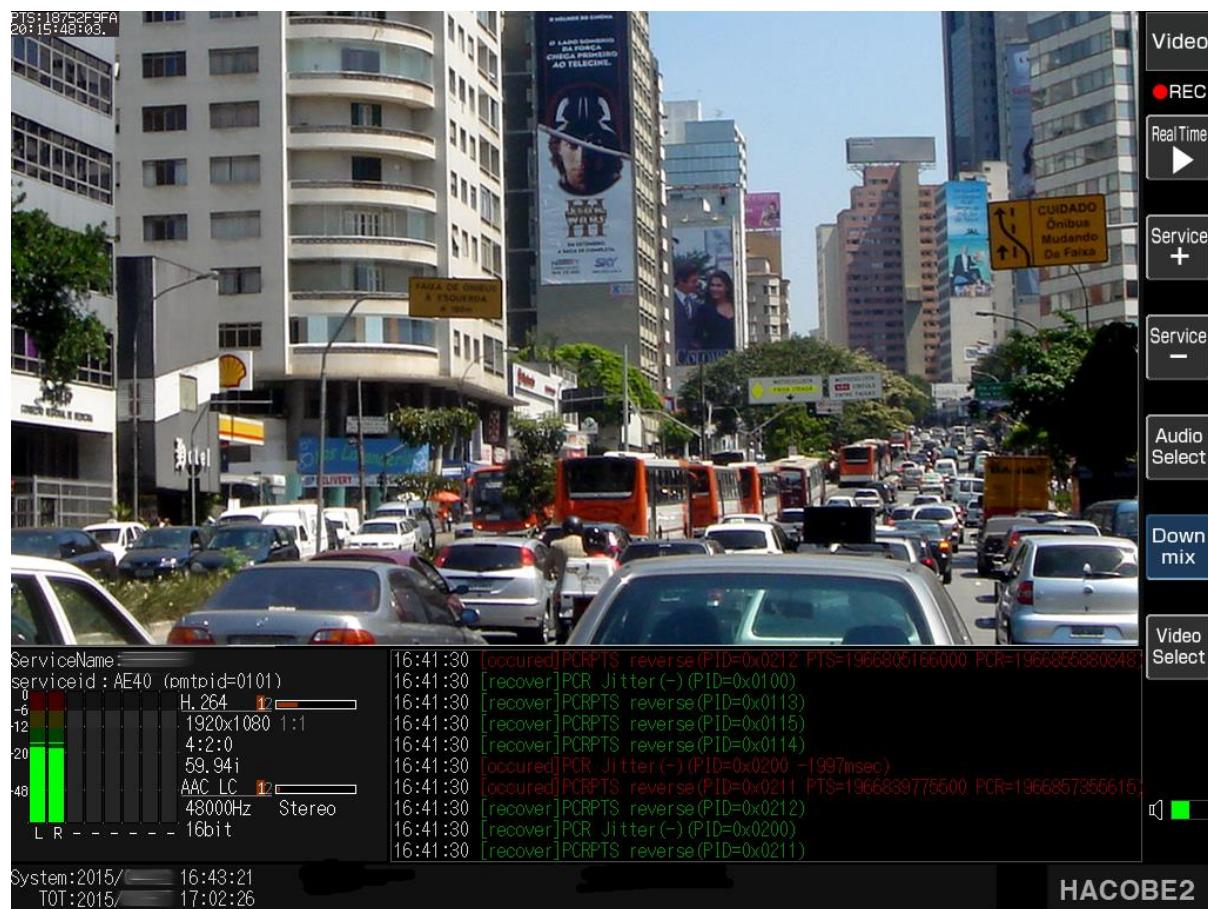
**Displayed items on Decode Operation Menu are the same as VIDEO mode.*

**Displayed items on Screen Operation Menu can be altered in "System Settings".*

5.3.3. VIDEO button (VIDEO mode)

Video window, usually displayed on the screen lower left corner, will be in the main window (960×540) when VIDEO button is pressed.

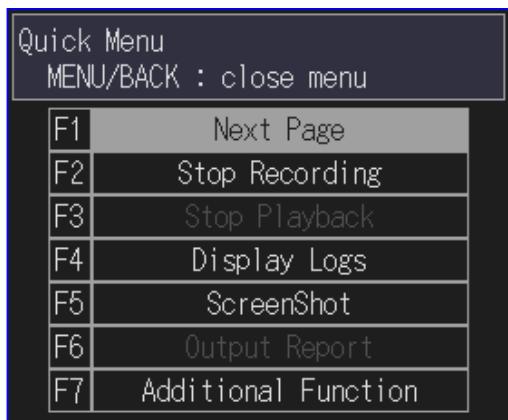
Additional information on Time Decode Information window is added on the lower left.



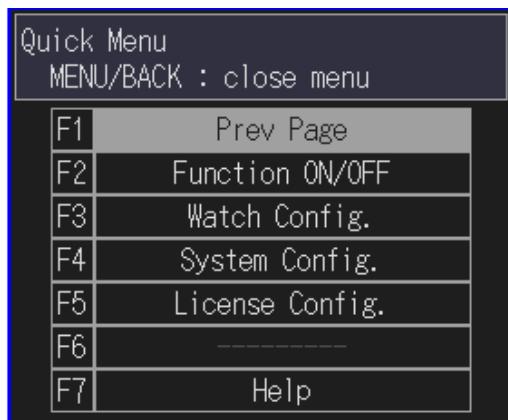
Object			Content
F1	Playback ■ ▶	Real Time	Return to real-time analysis and decode. <i>*Not available during LIVE analysis.</i>
F2	Service +		Switch decode to next services.
F3	Service -		Switch decode to previous services.
F4	Audio Select		Switch decoding target if there is more than one track. <i>*Not available in case of one track.</i>
F5	Down mix	Down mix	Down mix output in case of 5.1ch audio decode.
F6	Video Select		Switch decoding target if there is more than one video. <i>*Not available in case of one video.</i>

5.3.4. MENU

Press MENU button to display Quick Menu on the upper right corner. Select functions using SELECT or MODE dial or use function buttons F1-F7.



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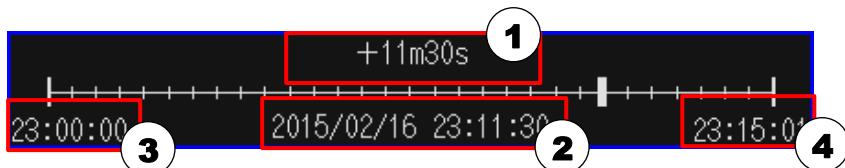
Page 2/2

Object	Content	
Next →	Switch menu items to be displayed.	
Start REC	Stop REC	Switch broadcast recording ON/OFF.
Playback	TS-Play Setting	Playback Stop function will be displayed during TS Playback. Playback Settings will be available when there is no TS playing.
LOG		Full screen log display.
Screen Shot		Display and edit Screenshots.
Report		Output reports to USB storage. <i>* Output is only available when USB memory is inserted. See section 11.6 Report Output for corresponding mode.</i>
Additional Function		Display optional features, which can be added to Mode List shortcut.
Func. ON/OFF		Display each function ON/OFF settings screen.
Watch Setting		Display TS/RF/IP monitoring settings.
License		Display verification and license authentication screen.
System		Display system configuration screen.
Help		Display Mode selection description image.

*See section 11. Quick Menu for more information.

5.3.5. SEEK

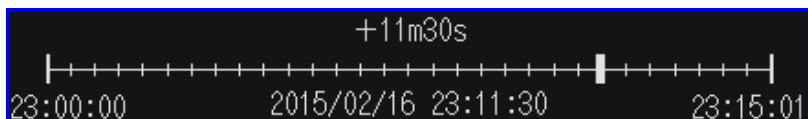
Press SEEK button to display, on main window, seek bar in the upper right corner. TS playback starts from selected date and time from SELECT/ MODE dial. Date, time and seek range displayed changes depending on operating status of HACOBE once the button is pressed.



No.	Description
1	Relative time seek position. Display time difference of currently playing TS.
2	Seek position. Specify date and time to start playing.
3	IN point time.
4	OUT point time.

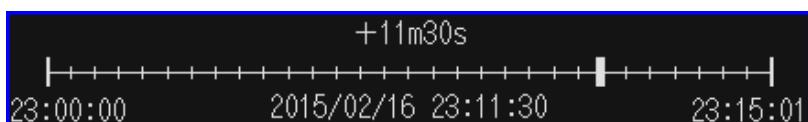
There are two types of reproduction pattern: With and without playback range (IN/ OUT point). Press seek button to change time unit on the reproduction pattern.

- Playback range (IN/ OUT point)



In case of set IN/OUT point, seek units will vary depending on time length.

- No playback range (IN/ OUT point)



In case there is no IN/OUT point, seek units starts from 5 seconds → 15 seconds → 30 seconds → 1 minute → 5 minutes → 10 minutes →...

Function buttons (F1 – F7) changes according to chart below:

Object	Content
F1 	Start playing 60 seconds before current playback position.
F2 	Start playing 30 seconds before current playback position.
F3 	Start playing 15 seconds before current playback position.
F4 	Start playing 15 seconds after current playback position.
F5 	Start playing 30 seconds after current playback position.
F6 	Stop playback and return to LIVE analysis.
F7 	Switch ON/ OFF loop playback. *Stop playback to change setting.

6. Input Switch

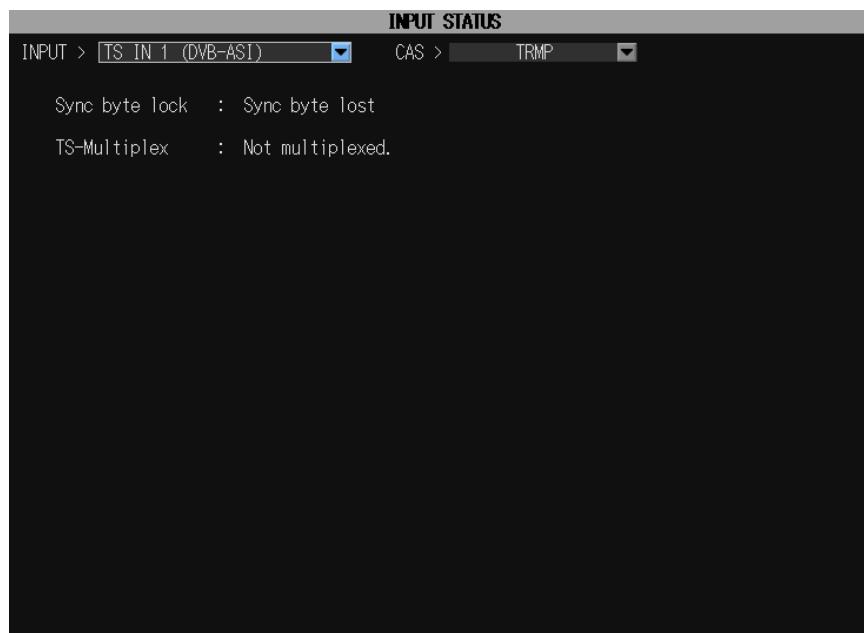
6.1. Overview

With six* types of input (DVB-ASI, Terrestrial digital, BS, 64QAM, 256QAM and IP), HACOBE 2 can analyze and record TS. Perform status check and input source settings and mode.

**Some inputs are available only in Japan. For more information, please contact Traffic Sim's local representative.*

6.2. DVB-ASI Input

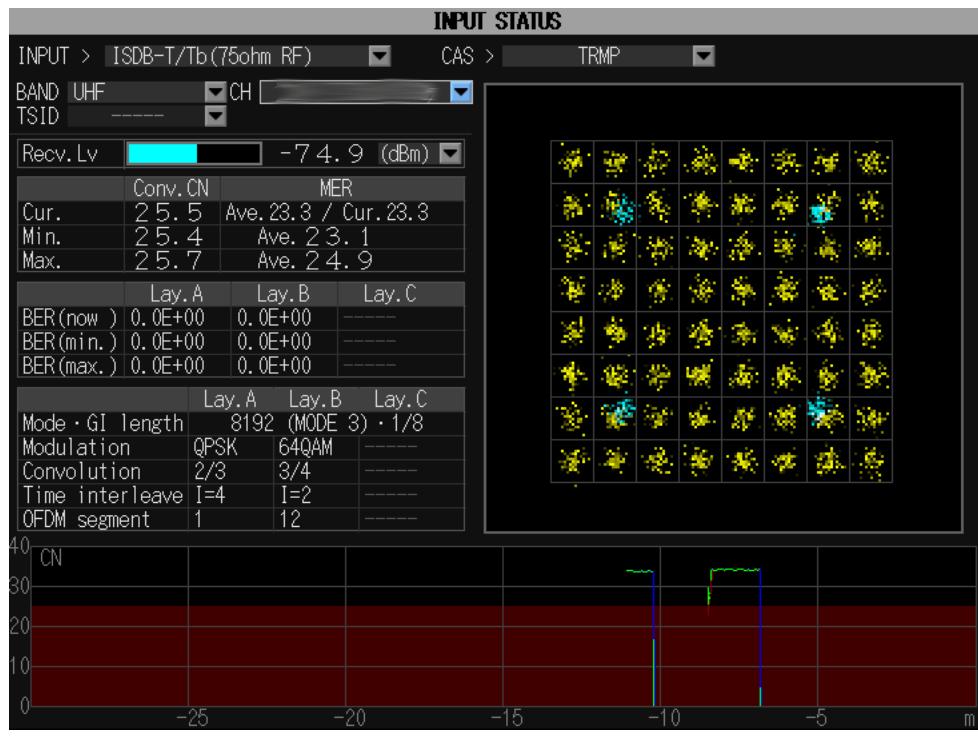
TS1 and TS2 input terminal screen (DVB-ASI) the main window has simple display.



Item Name	Description
Input	Set type of TS input.
CAS	Set input TS descrambling method.
Sync byte lock	Display input TS byte lock synchronization status.
TS-Multiplex	Input TS TSMF.

6.3. Digital Terrestrial Input (ISDB-T/Tb)

RF input terminal screen.



6.3.1. Screen Items

Name	Description
Input	Set type of TS input.
CAS	Set input TS descrambling method.
BAND	Select band frequency (VHF/ UHF/ CATV).
CH	Select receiving channel.
TSID	Specify Multiplexed TS TSID. <i>*Not available if not multiplexed.</i>
Received Level	Display reception radio waves level received. Strong signal is displayed in yellow and red when weak.
dBm	Select display unit, dbm or dBuV.
Conv. CN	Display carrier-to-noise ratio (C/N).
MER	Modulation Error Ratio.
BER	Bit Error Ratio.
Mode Length	Currently received TS modulation parameters (TMCC information).
Guard (GI) Length	
Modulation	
Convolution	
Time interleave	
OFDM segment	
Right corner screen	Constellation screen. Frequency band is displayed with different color.
Bottom screen	Displays BER (A to C), CN and MER changes in graph. Keep information of last 60 minutes.

6.3.2. Functions

Object	Content
SELECT dial (Turn)	Change control selection.
SELECT dial (Push)	Edit control selection.
F1 	Change input source.
F2 	Switch to Channel Search screen.
F3 	Change horizontal axis of the bottom of the screen graph. 60min → 30min → 10min → 5min → 60sec
F4 	Switch graph at the bottom of the screen. CN graph → BER-A graph → BER-B graph → MER graph
F5 	Clear constellation and graphs.
F6	No assigned function.
F7 	Switch to RF Input Settings screen.

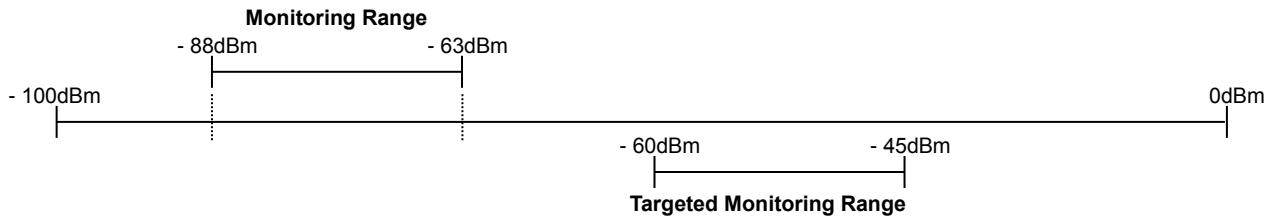
6.3.3. Others

Constellation Colors

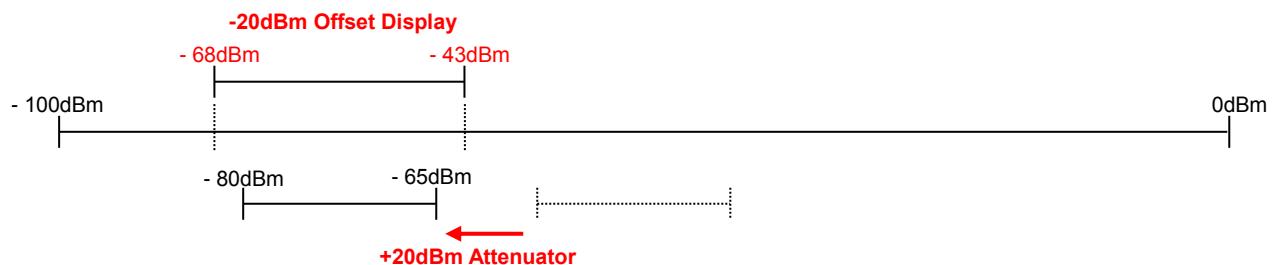
Frequency band	Light Blue	Yellow	Red
UHF・VHF・CATV	Hierarchy A	Hierarchy B	Hierarchy C

6.4. Offset Function of RF Input level

Simple measurement of RF signal strength is displayed in dBm or dBuV. However, since range characteristic of tuners are limited, amplify or attenuate may be necessary.

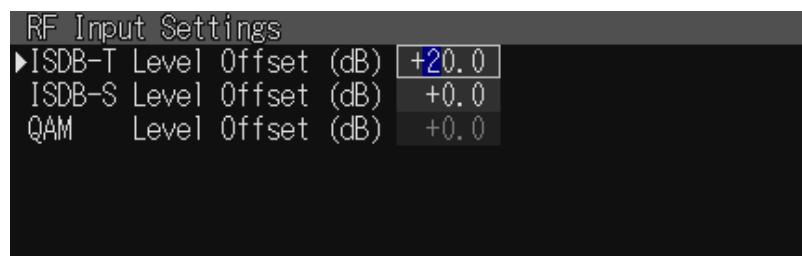


The same corresponding amount as the offset signal level increased or decreased by booster/attenuator is easily understood and displayed by HACOBE 2.



6.4.1. Settings

From "ISDB-T / Tb (75ohm RF)", "ISDB-S (75ohm IF)", "QAM (J.83 AnnexC 75ohm RF)" press F7 (Config.) button to open RF Input Settings.



To attenuate the RF signal use "+" value, if it was amplified enter "-" dBm value.
When completed, return to Input status screen pressing BACK key.

6.4.2. Others

- Offset setting is the adaptation of "reception level only". CN and MER, with or without offset setting, measurement results such as constellation will not change.

Before Offset

Recv. Lv	 -8 4. 5	(dBm)	<input type="button" value="▼"/>
	Conv. CN	MER	
Cur.	18. 6	Ave. 19.0 / Cur. 19.2	
Min.	9. 8	Ave. 17. 9	
Max.	29. 7	Ave. 27. 5	

After Offset

Recv. Lv	 +20. 0	-6 4. 5	(dBm)	<input type="button" value="▼"/>
	Conv. CN	MER		
Cur.	18. 6	Ave. 18.4 / Cur. 19.2		
Min.	9. 8	Ave. 17. 9		
Max.	29. 7	Ave. 27. 5		

- If input RF signal exceeds the measurement range of the tuner, Offset setting does not apply.

If the signal is too weak, accurate measurements cannot be obtained.



If the signal is too strong, accurate measurements cannot be obtained.



6.5. Channel Search

Search for all terrestrial digital/ BS/ CS/ CATV (QAM) channels* of RF signal and which associated band is to be received.

*Some inputs are available only in Japan. For more information, please contact Traffic Sim's local representative.

BAND(Std.)	CH	Freq.	CNR	NetID	Network	Broadcaster
UHF (ISDB-T)	13	473.143	29.7	0x7F		
UHF (ISDB-T)	15	485.143	29.9	0x7D		
UHF (ISDB-T)	17	497.143	30.6	0x7D		
UHF (ISDB-T)	18	503.143	29.4			
UHF (ISDB-T)	19	509.143	29.8			
UHF (ISDB-T)	20	515.143	29.3			
UHF (ISDB-T)	21	521.143	30.0			
UHF (ISDB-T)	22	527.143	29.6			
UHF (ISDB-T)	23	533.143	30.2			
CS (ISDB-S)	02	1613.000	1.7			
CS (ISDB-S)	04	1653.000	2.0			
CS (ISDB-S)	06	1693.000	5.0			
CS (ISDB-S)	08	1733.000	1.0			
CS (ISDB-S)	10	1773.000	1.0		Searching [Band:VHF] [CH :12]	
CS (ISDB-S)	12	1813.000	1.0			
CS (ISDB-S)	14	1853.000	1.0			
CS (ISDB-S)	18	1933.000	0.0			
CS (ISDB-S)	20	1973.000	0.0			
CS (ISDB-S)	24	2053.000	0.0			

6.5.1. Screen Items

Name	Description
BAND (Std.)	Display received channel band such as VHF and UHF.
CH	Display channel number received.
Frequency	Display channel frequency received.
CNR	Display channel C/N value received.
NetID	Display network_id of NIT included in the TS channel received.
Network	Display network_name_descriptor of NIT included in the TS channel received.
Broadcaster	Display ts_name_char of NIT included in the TS channel received.

6.5.2. Functions

Object	Content
SELECT dial (Turn)	Cursor movement. Switch selected channel.
SELECT dial (Push)	Switch input of currently selected channel.
F1 	Settings of channel search.
F2 	Switch input to currently selected channel. <i>*Not available if there is no search result.</i>
F3 	Switch order of search results. <i>*Not available if there is no search result.</i>
F4 	Move results page up. <i>*Not available if there is no search result.</i>
F5 	Move results page down. <i>*Not available if there is no search result.</i>
F6 	Save search results currently displayed. <i>*Only one result can be saved.</i>
F7 	Load saved search results.

6.5.3. Others

- During TS Playback it is not possible to perform Channel search.
- Pressing save channel button when there is no search result, current result search is discarded.
- When the signal is weak and fails to demodulate TS, it will be displayed as below.

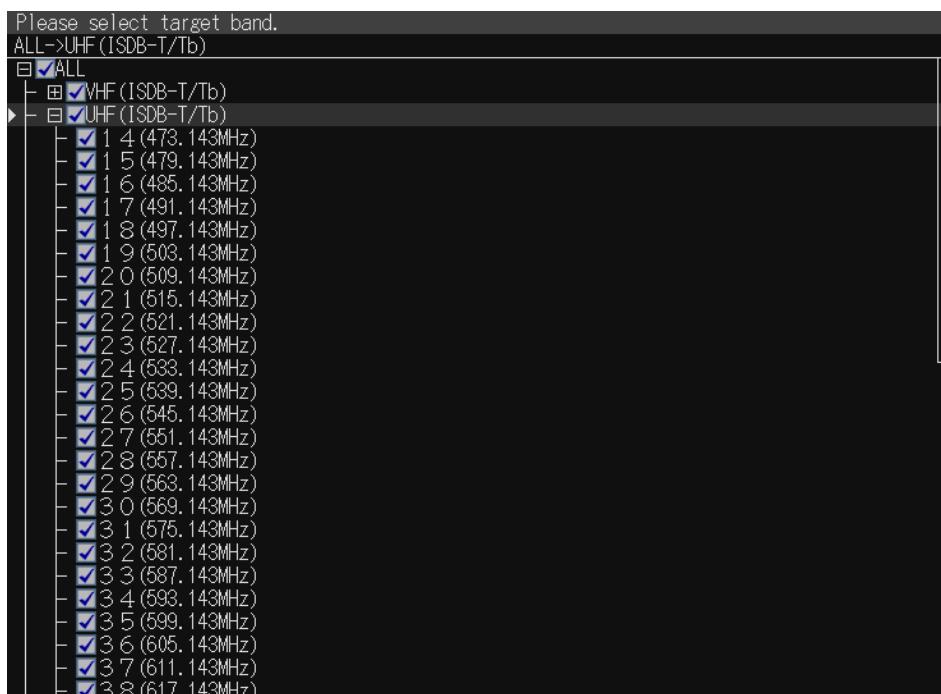
BAND(Std.)	CH	Freq.	CNR	NetID	Network	Broadcaster
UHF (ISDB-T)	13	473.143	13.1	0x0000	unknown	*** Not demodulate ***

- If there is no ts_name_char in the NIT, such as BS and CS, service name included in the PMT of newest PID is displayed.

BAND(Std.)	CH	Freq.	CNR	NetID	Network	Broadcaster
CS (ISDB-S)	02	1613.000	1.7	0x	BS Digital	ServiceName: =

6.5.4. Search Target Settings

Press F1 (Search) button for target (channel) search screen. Search RF signal target frequency band displayed in a tree. Check channel boxes for receiving test.



Object	Content
SELECT dial (Turn)	Cursor movement. Switch selected channel.
SELECT dial (Push)	Check box (ON/OFF).
F1	Start Channel search.
F2	Retry previous search settings. <i>*Current search settings will be discarded.</i>
F3	Expand and close selected tree.
F4	Regardless of tree status (expand/close), moves up through frequency band only.
F5	Regardless of tree status (expand/close), moves down through frequency band only.
F6	Save search target setting currently being edited. <i>*Only one result can be saved.</i>
F7	Load saved search target settings.

After complete check, press F1 (search) to begin channel search.

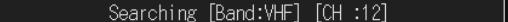
Two searches are performed: "Reception channel High-speed search" and "Channel information search". During high-speed search only C/N value is displayed.

BAND(Std.)	CH	Freq.	CNR	NetID	Network	Broadcaster
UHF (ISDB-T)	13	473.143	22.0			
UHF (ISDB-T)	15	485.143	22.5			
UHF (ISDB-T)	17	497.143	19.3			
UHF (ISDB-T)	18	503.143	17.6			
UHF (ISDB-T)	19	509.143	17.1			
UHF (ISDB-T)	20	515.143	17.6			
UHF (ISDB-T)	21	521.143	20.7			
UHF (ISDB-T)	22	527.143	20.4			
UHF (ISDB-T)	23	533.143	20.0			

Searching [Band:UHF] [CH :24]

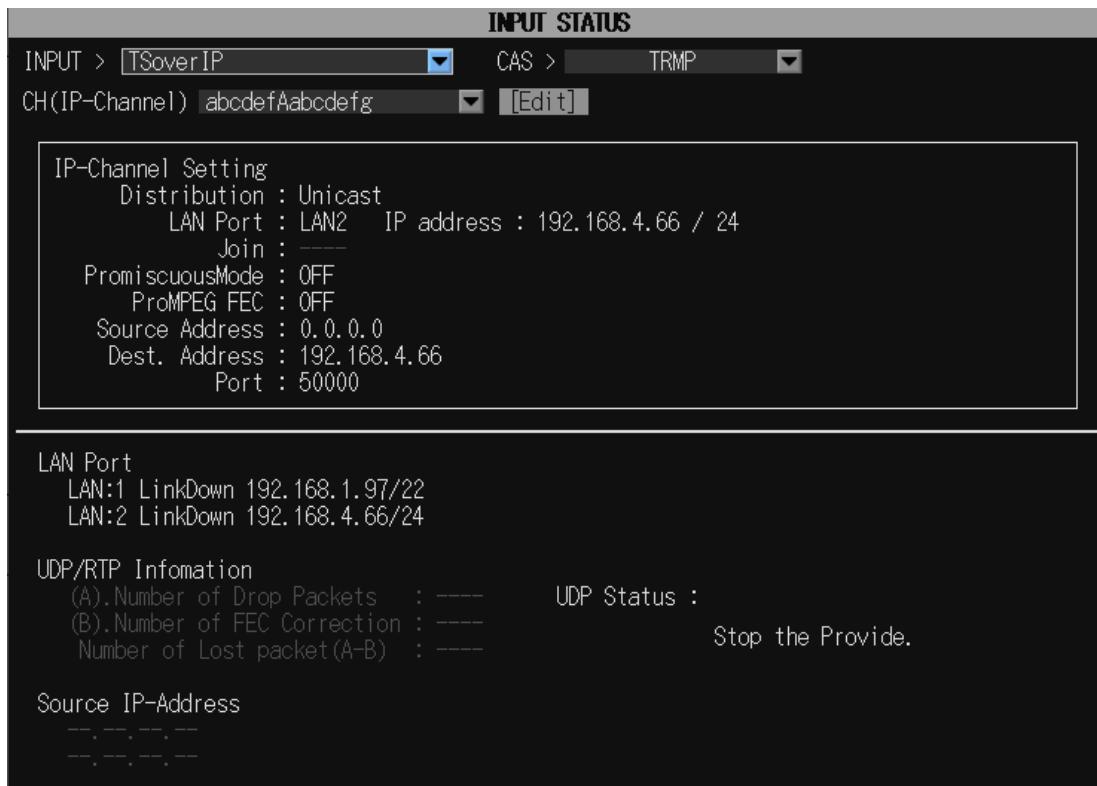

After high-speed search, channel information search will begin displaying network name and broadcaster.

BAND(Std.)	CH	Freq.	CNR	NetID	Network	Broadcaster
UHF (ISDB-T)	13	473.143	29.7	0x7F	[REDACTED]	[REDACTED]
UHF (ISDB-T)	15	485.143	29.9	0x7D	[REDACTED]	[REDACTED]
UHF (ISDB-T)	17	497.143	30.6	0x7D	[REDACTED]	[REDACTED]
UHF (ISDB-T)	18	503.143	29.4			
UHF (ISDB-T)	19	509.143	29.8			
UHF (ISDB-T)	20	515.143	29.3			
UHF (ISDB-T)	21	521.143	30.0			
UHF (ISDB-T)	22	527.143	29.6			
UHF (ISDB-T)	23	533.143	30.2			
CS (ISDB-S)	02	1613.000	1.7			
CS (ISDB-S)	04	1653.000	2.0			
CS (ISDB-S)	06	1693.000	5.0			
CS (ISDB-S)	08	1733.000	1.0			
CS (ISDB-S)	10	1773.000	1.0			
CS (ISDB-S)	12	1813.000	1.0			
CS (ISDB-S)	14	1853.000	1.0			
CS (ISDB-S)	18	1933.000	0.0			
CS (ISDB-S)	20	1973.000	0.0			
CS (ISDB-S)	24	2053.000	0.0			

Searching [Band:VHF] [CH :12]


6.6. IP Input

TS input from LAN port.



*This mode requires license.

6.6.1. Screen Items

Item Name	Description
Input	Set type of TS input.
CAS	TS input descrambling.
CH (IP-Channel)	Select receiving channel settings.
[Edit] button	Edit reception channel currently selected.
IP-Channel Setting	
Distribution	Multicast or Unicast
Reception LAN Port	Set LAN port for reception. IP address port will be displayed.
Join	ON or OFF. <i>*Not available in case of unicast.</i>
Promiscuous Mode	ON or OFF. <i>*Promiscuous Mode: Data packet signal not addressed to HACOBE2 can be received.</i>
Source Address	Sending data device address. In case of Unicast “delivery source address”. All segments not specified are displayed as 0.
Dest. Address	Multicast group address. <i>*Not available in case of unicast.</i>
Port	Receiving port.

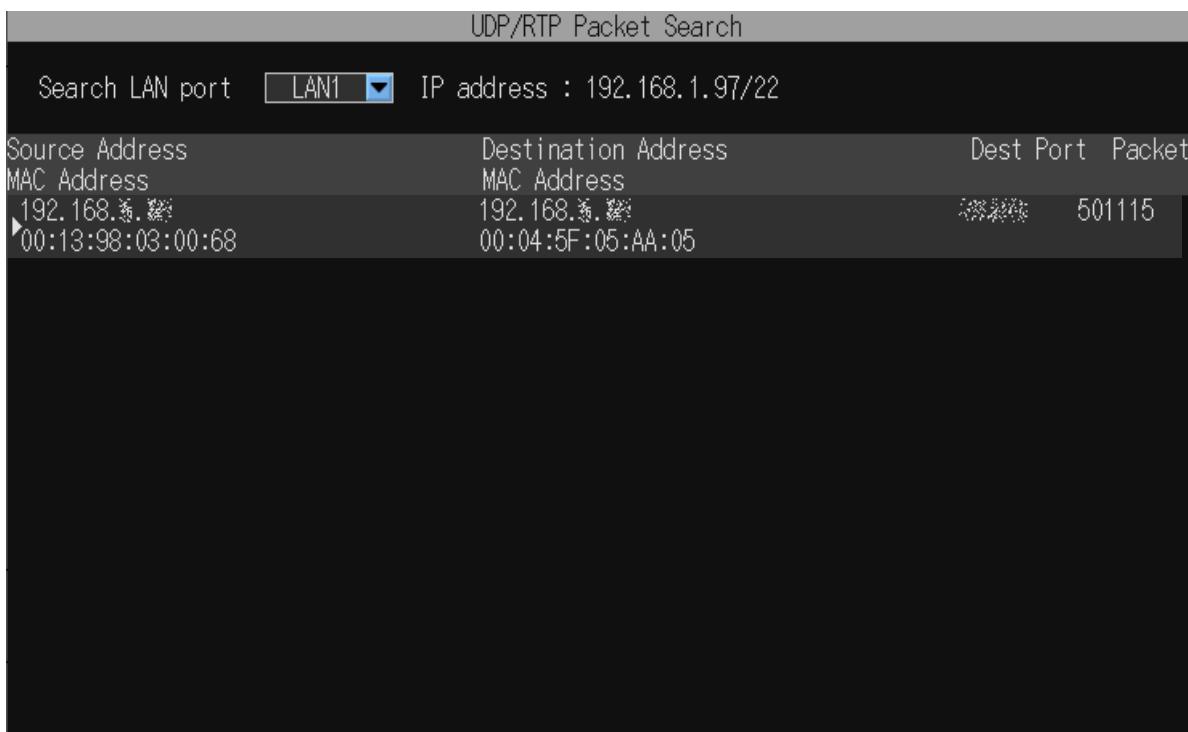
Additional Settings	
LAN Port	Display IP address settings from LAN1 and LAN2 port.
UDP/RTP information	<p>Display number of errors in RTP packet.</p> <p>(A) Missing RTP Packet: Number of RTP packets not received.</p> <p>(B) FEC Interpolation Packet: Number of RTP packets not received and can be interpolated by FEC.</p> <p>RTP packet loss: Number of RTP packets which can't be interpolated.</p>
RTP Status	<p>IP receiver TS broadcast status.</p> <ul style="list-style-type: none"> • Receive TS normally; • Cannot receive stream; • Multiple mixed streams; • Multiple mixed streams broadcast stopped; <p><i>*Broadcast IP received differ from ASI and RF input signal, playback broadcast data recorded when status is not normal, may not be successfully reproduced.</i></p>
Source IP-Address	<p>Displays IP address source.</p> <p>In case of multiple sources, it displays only the first two.</p> <p>If multiple IP is displayed, TS recording and analysis is not performed normally.</p>

6.6.2. Functions

Object	Content
SELECT dial (Turn)	Switch control selection.
SELECT dial (Push)	Edit control selection. When in editing, function switch to edit mode.
F1 	Change input source.
F2	No assigned function.
F3	No assigned function.
F4 	Create new receiving channel.
F5 	Open list of Receiving channel settings.
F6	No assigned function.
F7	No assigned function.

6.6.3. Packet Search

Packet search automatically establish reception settings, such as RF channel search. F2 (Port Selection) button specify LAN port; Start IP packet received search pressing F1 (start) button and add it to the list by specifying source. Once the source is found, select it with SELECT dial (push) or F4 (CH add) button, changing to "Receive CH Add" screen. After start, Packet Search will continue to process until end of search with BACK key or F1 (stop) button.

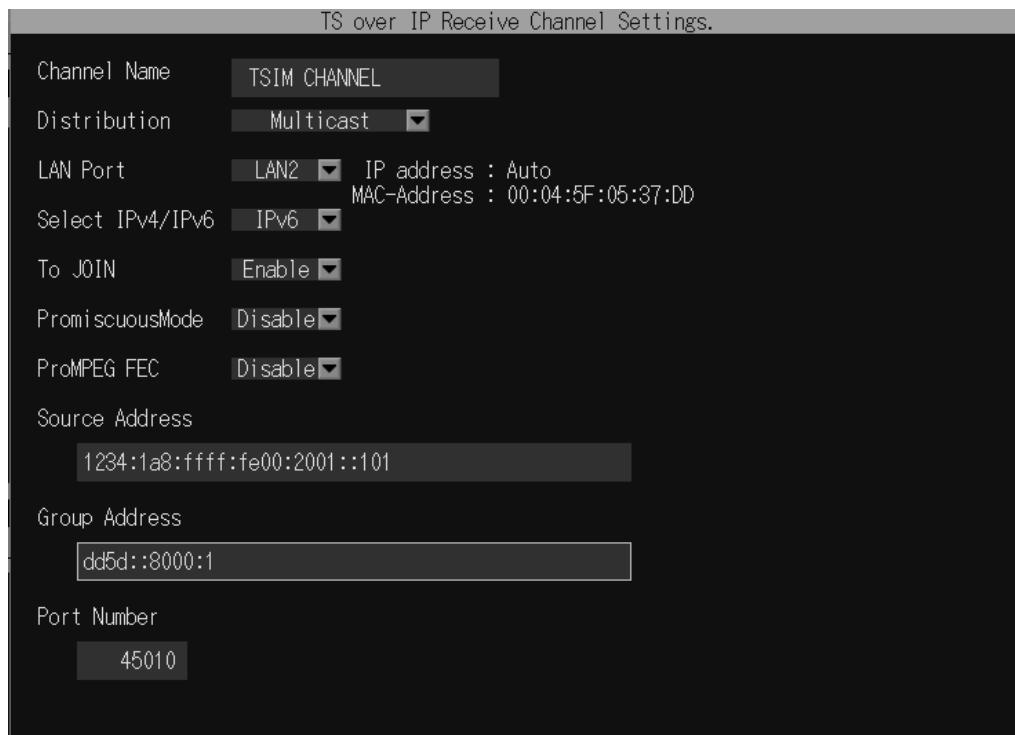


Item Name	Description
Search LAN Port	Specify which port (LAN 1 or LAN2) will perform the packet search.
IP Address	Display IP address set to selected LAN port.
Source Address	Display UDP or RTP packet source IP address.
MAC Address	Display UDP MAC address or RTP packet source.
Destination Address	Destination IP address information included in RTP packet.
Destination Port	Port number on which UDP or RTP packets are flowing.
Packet Count	Number of times TS over IP packets can be received. TS over IP reception number more likely to have been delivered.

6.6.4. Add Reception CH

For additional reception CH press F4 (CH Add) button and navigate through IP reception channel settings screen.

Select proper settings for receiving channel and press F5 (Enter). To cancel press BACK key.



Item Name	Description
Channel Name	Set name for the channel (Required).
Distribution	Choose between Unicast and Multicast.
LAN Port	Specify which port to use, LAN 1 or LAN 2.
Select IPv4/ IPv6	Specify network connection by IPv4 or IPv6.
To JOIN	Enable or Disable function. <i>*Not available in case of Unicast.</i>
Promiscuous Mode	Enable or Disable function. <i>*Promiscuous Mode process data packet signal is not address to itself.</i>
Source Address	Device's source data IP address. <i>*In case of unicast acts as "delivery source address". If not specified, set 0 to all segments.</i>
Group Address	Set multicast group address. <i>*In case of Unicast this is displayed as "Destination Address".</i>
Port Number	Set receiving port number.

6.6.5. Reception CH List

F5 (CH list) button on IP input status screen load reception CH list. Reception CH list has already been set on displayed screen, add channel, edit or delete new reception CH.

TS over IP Receive Channel List			
Channel Name			
▶192.168.4.66:50000	192.168.4.66 ----	Unicast Port:50000	PromiscuousMode
192.168.4.66:50000	192.168.4.66 ----	Unicast Port:50000	PromiscuousMode
192.168.4.49:50000	192.168.4.49 ----	Unicast Port:50000	
abcdefAabcdefg	0.0.0.0 ----	Unicast Port:50000	

Item Name	Description
Channel Name	Display channel name of set IP reception CH (setting name).
Distribution Source/ Destination Address	The IP address of distribution source is on the upper side; IP address of destination on the lower side.
Delivery Method/ Reception Settings	Multicast or Unicast and Receiving LAN Port are displayed on the upper side; Receiving Port Number and Join function (enabled/disabled) are display on the lower side.

Object	Content
SELECT dial (Turn)	Cursor movement/ On IP reception channel screen switch to selection.
SELECT dial (Push)	On IP input reception screen switch to select.
F1	No assigned function.
F2 	Transition UDP/ RTP packet search screen.
F3 	Switch IP reception input of currently selected channel.
F4 	Switch to IP reception CH additional screen, create new IP reception channel.
F5 	Edit IP reception channel currently selected.
F6 	Delete IP reception channel currently selected.
F7	No assigned function.

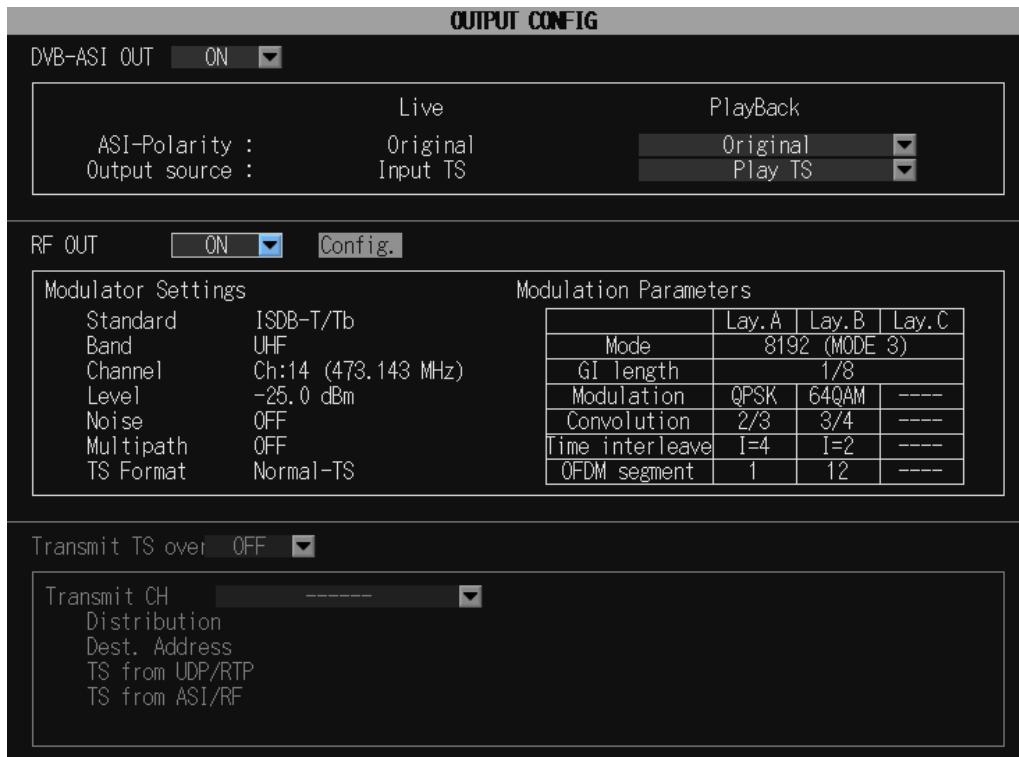
6.6.6. Others

- UDP/RTP will be automatically determined;
- TS packet size 1UDP/ RTP data not multiple to 188/ 192/ 204/ 208 byte will be discarded.
- 1UDP/RTP packet even if TS packet size in the UDP/RTP packet has been changed will be discarded;
- IGMPv2 later correspondence;
- MLDv1 later correspondence;
- Packets from the device not related to IP reception might be sent.

7. Output Settings

7.1. Overview

HACOBE 2 not only output TS on DVB-ASI terminal but can also output modulated RF. On output settings mode, set configuration for ASI and RF modulation.



**This function requires license.*

7.2. DVB-ASI Output

DVB-ASI terminal can output ASI directly, demodulated from RF/ IF terminal or by TS over IP input. It's also possible to output to ASI while playing TS data.

Item Name	Description
DVI-ASI OUT	Set ASI OUT-1 and ASI OUT-2 output as ON/OFF.
Output from analysis or broadcast.	During playback it is analyzed automatically. HACOBE 2 can record the input TS regardless of TS playback. Choose output form: input or playback data.

7.3. RF Output

RF output function can reproduce broadcast wave and check television reception. HACOBE 2 doesn't have ReMUX function. For RF output function, ISDB-T standard broadcast TS or MPEG-TS standard is required.

Item Name	Description
RF OUT	Set modulation output of TS currently in analysis as ON/OFF.
Config. button	Modulation screen settings.
Standard	Modulation standard.
Band	Display band frequency VHF/ UHF/ CATV/ BS/ CS.
Channel	Display output signal frequency (channel).
Level	Display output signal in dBm or dBuV strength.
Noise	Display CN ratio settings of output signal.
Multipath	Display Multipath (Multiple wave propagation) filter on output signal (ON/OFF) status.
TS Format	Display whether modulated TS is converted to Broadcasting TS.
Modulation Parameters	Modulation parameter added to TS during modulation (TMCC information).

7.4. Modulation Output Settings

Manage settings of Modulated RF Output. Switch ON/OFF (F1) modulated output. Since there is a large list of items in the Modulation Output, press F5 (Preset) to save and re-use same settings.



*Modulation Output requires two different licenses (hardware and software).

Item Name	Description
Modulation Settings	
Standard	Select modulation standard to be outputted. <i>*Available when there is VHF/ UHF/ CATV corresponding modulation board, Terrestrial Digital Modulation Output license and J.83AnnexC modulation output license.</i>
Channel	Set modulated signal frequency. Not only band and CH, output it at any frequency.
Level	Specify modulated signal strength.
Noise	Specify noise signal strength to be added for modulated output.
Modulation Parameters	
Settings Method	Set IIP parameters for modulation output automatically or manually.
Modulation Parameters	Modulation parameters when selecting "Manual Settings" method (TMCC information).
Modulation Parameters	
Status	Modulation board status. Any of the following will be displayed: <ul style="list-style-type: none"> · Stop; · Synchronization detection; · Modulation unit internal error; · Output Now; · TS structure and Modulation parameters do not match; · IIP cannot be detected; · TS structure does not match; · Frame synchronization detection.

7.4.1. Modulation Setting Preset List

Modulator Settings List			
No.	Standard	Description	Date
▶ 1:	[ISDB-T] UHF-14	Lvl=-25.0(dBm) CN=OFF	2015/08/12 14:26:33
2:	[ISDB-T] UHF-20	Lvl=-25.0(dBm) CN=OFF	2015/08/12 14:28:53
Standard : ISDB-T Band : UHF Channel : 14 Frequency : 473.143(MHz) Level : -25.0(dBm) Noise : OFF			
Mode : 3 Guard Interval : 1/8 Layer A : 1, QPSK, 2/3, 4 Layer B : 12, 64QAM, 3/4, 2 Layer C : -, ----, --, --			

Item Name	Description
Number	Preset number. Maximum registered is 20.
System	Modulation scheme of preset additional registration.
Description	Additional registration description.
Date and Time	Registration date and time.

7.4.2. Additional Modulation Setting Preset

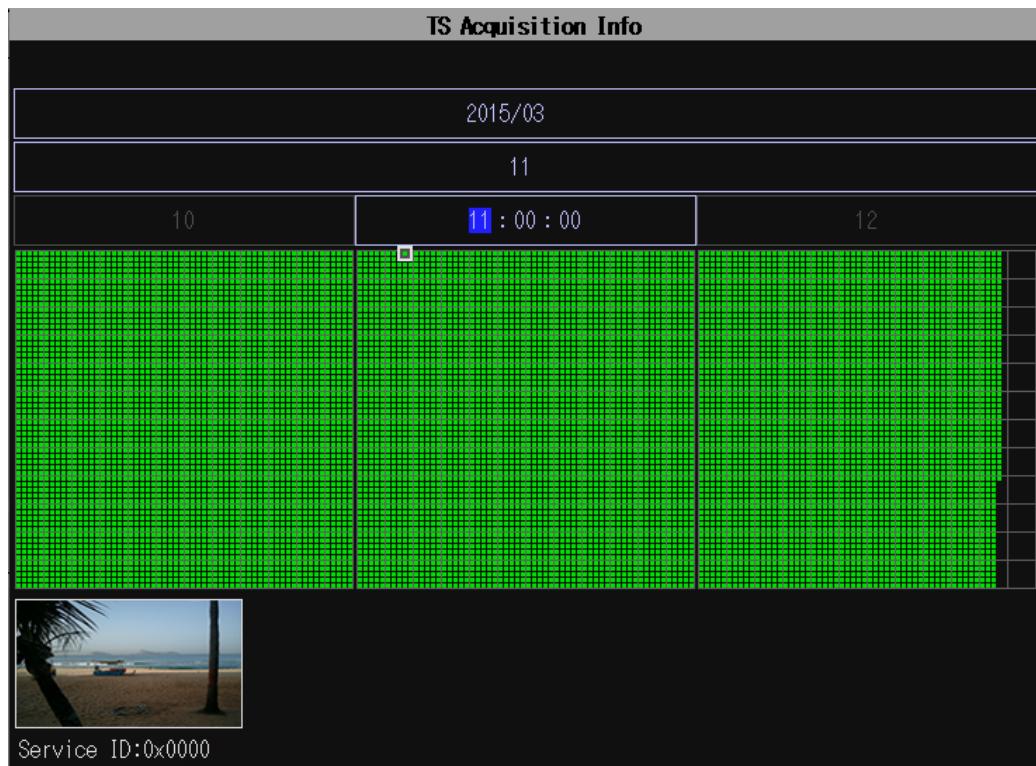
Modulator Settings List			
Description			
UHF-14 Lvl=-25.0(dBm) CN=OFF			
< Current Settings >			
Standard : ISDB-T Channel : UHF 14 / 473.143(MHz) Level : -25.0(dBm) Noise : OFF			
Mode : 3 Guard Interval: 1/8 Layer Settings: Segments Modulation CodeRate TimeInterleave Layer A : 1 QPSK 2/3 4 Layer B : 12 64QAM 3/4 2 Layer C : - ---- --			

Item Name	Description
Description	Comments on modulation setting (48 characters max), as above figure, are default. Band, channel, output level, noise ON/OFF will be input automatically.
Current Settings	Confirmation for modulation settings preview currently set. Displays Modulated output setting screen (modulation parameters).

8. Recording Map

8.1. Overview

Playback and output TS data recorded in HACOBE2 by shared folder or external USB. TS data recorded in HACOBE2 loops when reaches HDD capacity, automatically deleting old data. Therefore, copy/output TS in archives and TS-RAW data format to save it.



**This mode requires license.*

8.1.1. Screen Items

Item Name	Description
2015/--	Display recording map specified month.
--	Display date of recording map.
--:--:--	Display indicated white frame's (cursor) position time.
Recording Map (Partial Grid)	Recorded data are represented by green dots and black where there is no recording. Vertical axis is seconds and horizontal minutes. Each square is 60x60, resulting in one hour.
Thumbnail/ RF information	Thumbnail: Decoded TS selected on Recording Map. <i>*No display in case of scramble TS or no video packet.</i> RF information: Display RD reception status of selected time and date.

8.1.2. Functions

Page 1 / 2.

Object	Content
SELECT dial (Turn)	Move cursor through selected unit (F1 - F4 button).
SELECT dial (Push)	Start TS playback from selected date.
F1	SELECT dial will move through days on the map.
F2	SELECT dial will move hourly on the map.
F3	SELECT dial will move through minutes on the map.
F4	SELECT dial will move through seconds on the map.
F5	Start or stop TS playback from selected date.
F6	Specify TS data time range to be reproduced or output.
F7	Switch menu items to be displayed.

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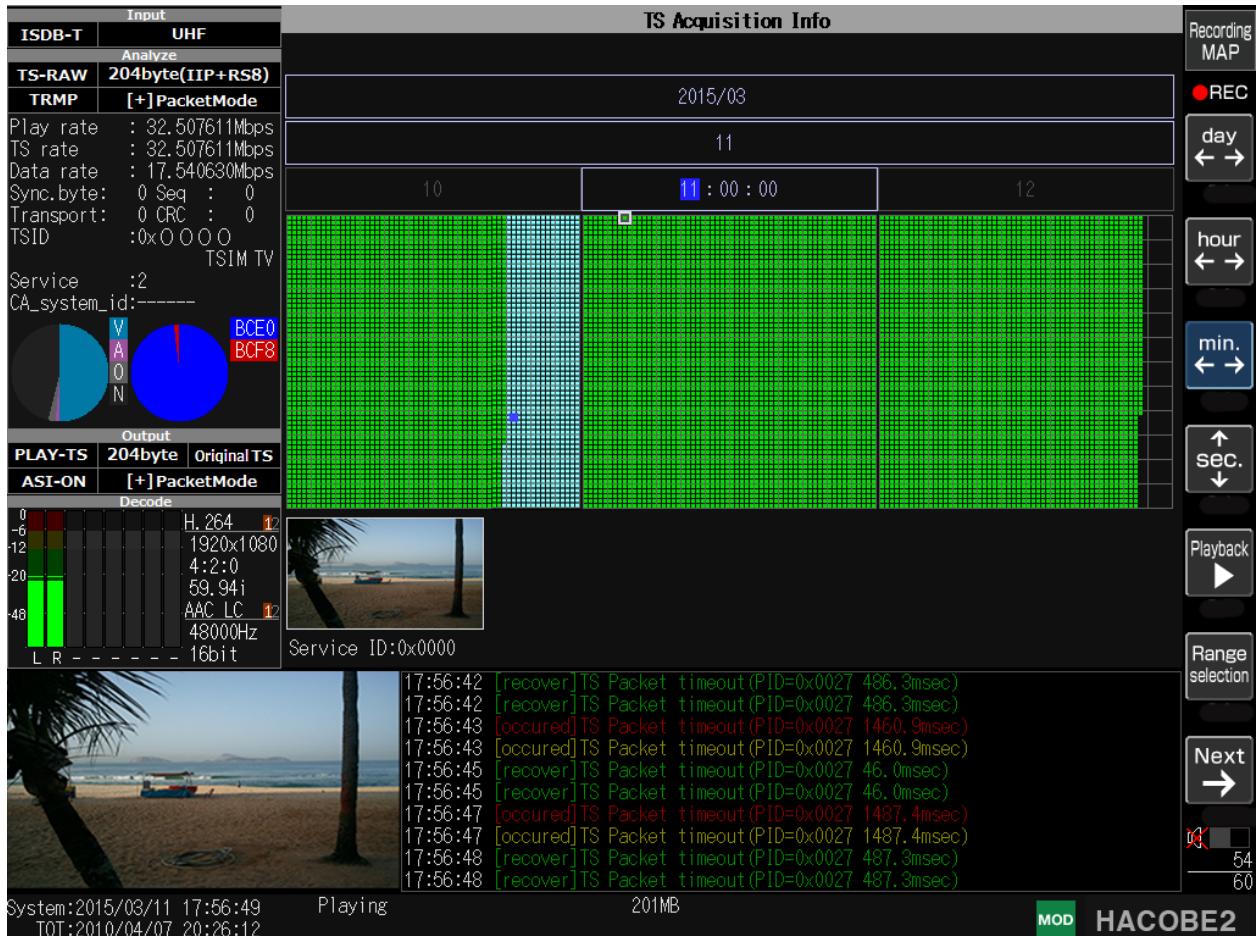
Object	Content
F1	Switch display. Bottom screen switches to "RF Status Display" and "Thumbnail display".
F2	No assigned function.
F3	No assigned function.
F4	Move cursor to oldest recording data position.
F5	Move cursor to latest recording data position.
F6	No assigned function.
F7	Switch displayed menu items.

8.1.3. Others

- Sync byte error during TS recording will be appointed in red on Recording Map.
- If recording process is operating properly, even with no TS input, it will be appointed in green on Recording Map.
- Blue is TS currently playing (analysis).
- Because of disk write delay, the dot may turn green a few seconds after current time.

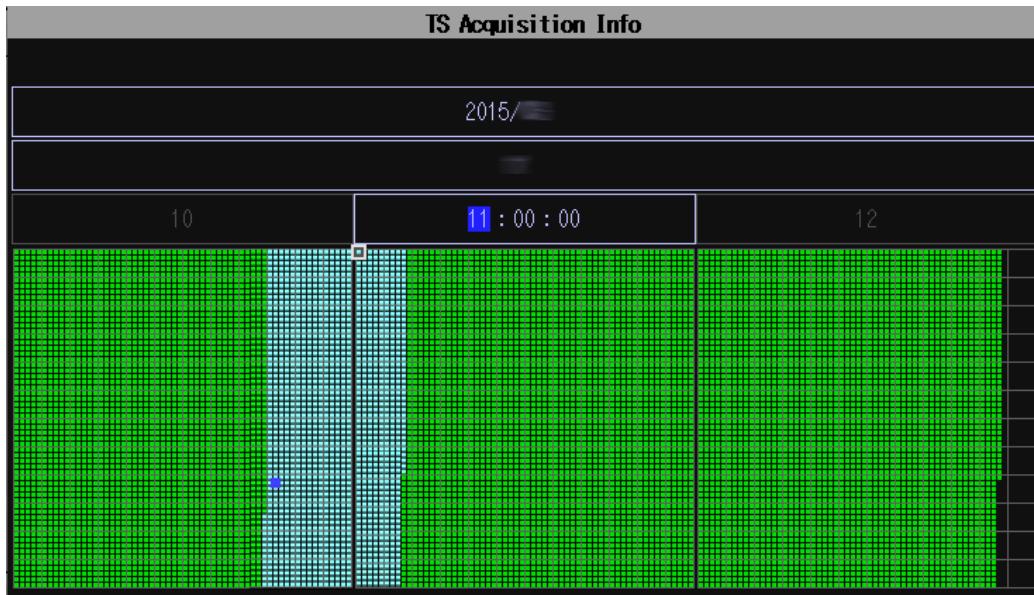
8.2. Range Selection

Specify range on recorded data by pressing Range Selection button (F6) on the Recording Map. Loop playback or output TS of specified range.



8.2.1. Range Selection Procedure

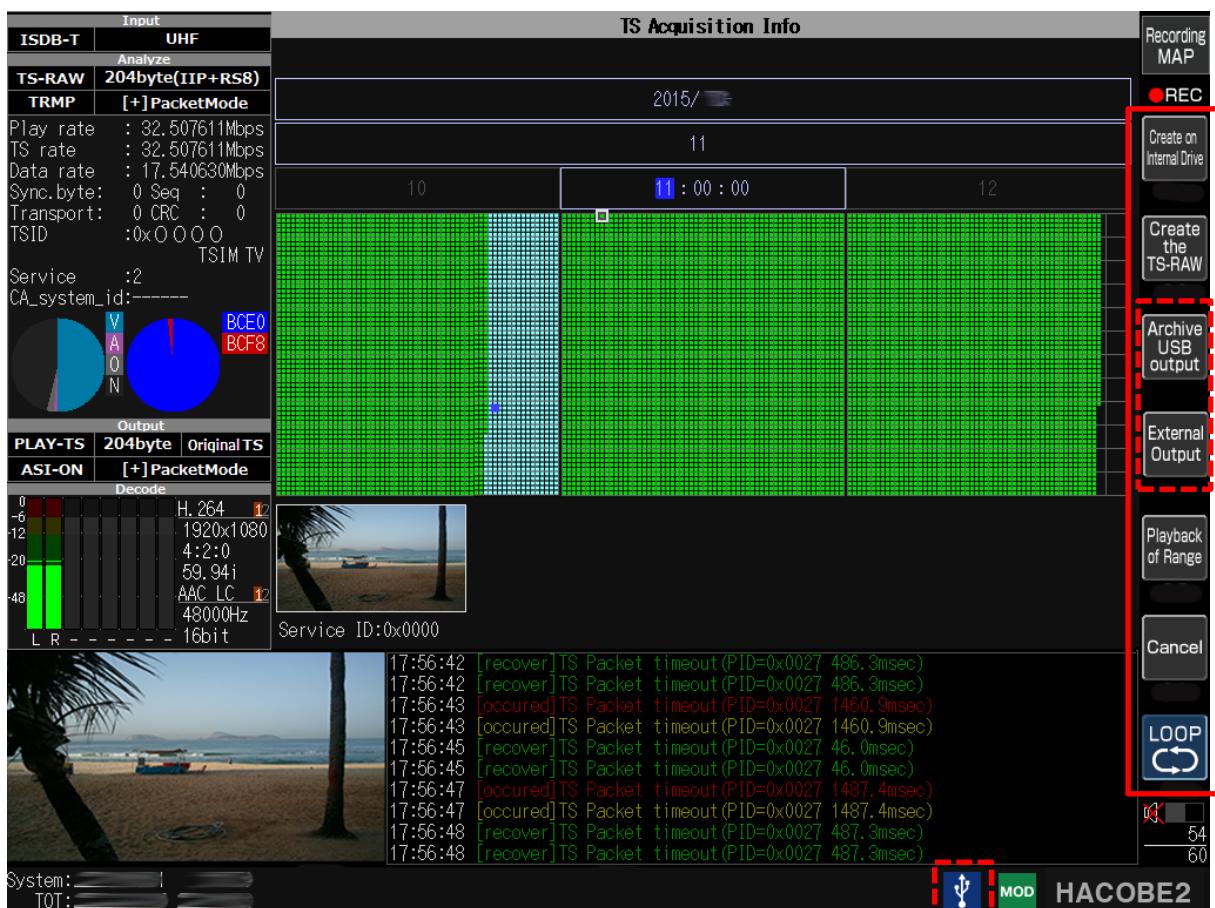
Press F6 (Range Selection) button.



Once "range selection" on top of the screen is blinking, mark IN point (beginning) with SELECT dial or F6 (Start Point) button.



Currently selected range is displayed in light blue, mark OUT point (end) with SELECT dial.
Move the cursor through date and time and press SELECT dial or F6 (End Point) button.



Functions, F1 - F7 buttons, assigned for Range Selection will change.
With range selection specified play it back or output it with/without USB drive. No action will automatically be canceled.
To deselect press BACK key or F6 (Cancel) button.

8.2.2. Range Selection Functions

Object	Content
MODE dial	Cancel range selection and shifts MODE.
SELECT dial	No assigned function.
F1 	Save archive format TS data selected on Shared Folder (built-in HDD).
F2 	Save TS-Raw format TS data selected on Shared Folder (built-in HDD).
F3 	Save archive format TS data selected on External USB. <i>*Not available if external USB is not connected.</i>
F4 	Save TS-Raw format TS data selected on External USB. <i>*Not available if external USB is not connected.</i>
F5 	Playback selected range TS data.
F6 	Cancel range selection.
F7  	Loop playback TS data.

8.2.3. Others

- F3 and F4 button are not available when external USB is not connected.
- A serial number on the file name will be made when same selection is saved creating new archive or TS-Raw.
- As archive or TS-Raw data stored in shared folder increases, recorded period of HACOBE2 will be shortened
- Change MODE will cancel selection range operation.

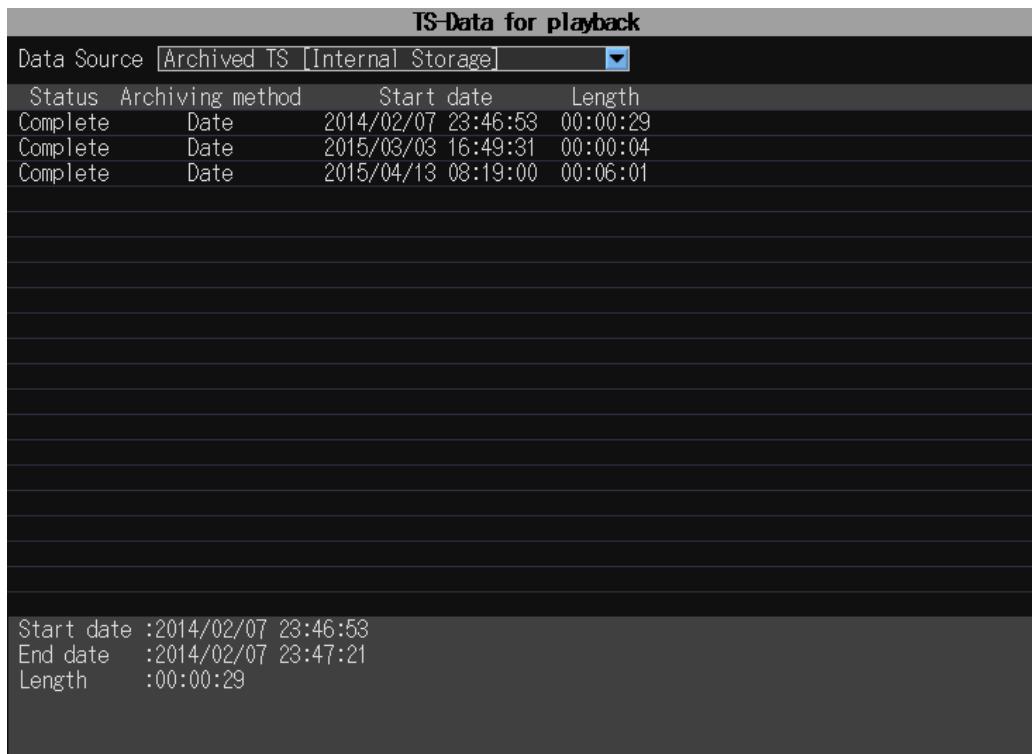
9. Playback

9.1. Overview

Playback TS recorded in the built-in HDD of HACOBE2, on a second device with network cooperation (“Together” function), outputted on shared folder or by USB memory.

9.2. Shared Folder (Archive Format)

HACOBE2 stores TS data in unique format (archive TS) for play mode. Archive TS is not compatible with other equipment. Access shared folder on Windows PC connecting HACOBE2 to LAN.



9.2.1. Screen Items

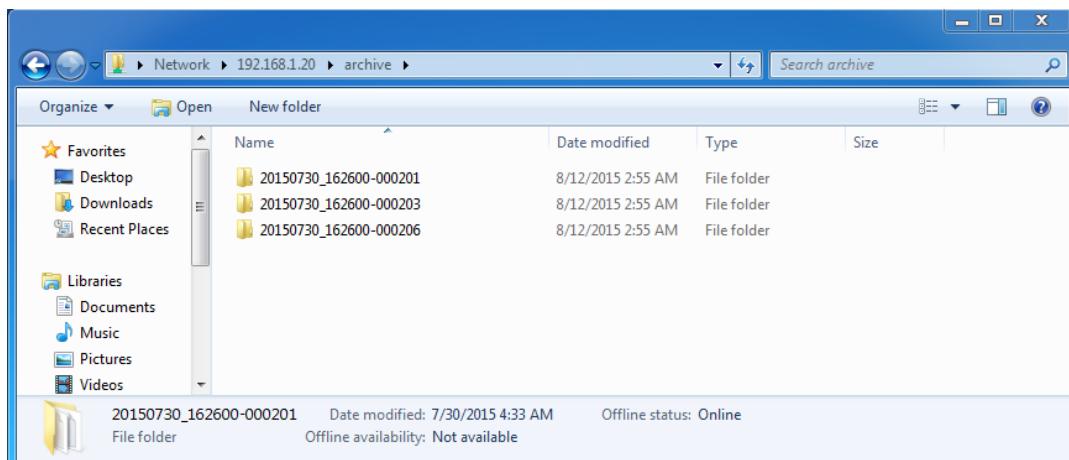
Item Name	Description
Data Source	Display playback source (TS data location).
Status	Display archive status. <u>Standby</u> : Waiting to archive. Switches to “Recording” when recording a selected range. <u>Recording</u> : Broadcast TS being archived. <u>Complete</u> : Archive complete.
Archiving Method	Display archive type.
Start date	Display date and time of archived TS data. HACOBE 2 recognizes received TS data date and time.
Length	Length of archived TS data.

9.2.2. Functions

Object	Content
SELECT dial (Turn)	Cursor movement. <i>*Not available if there are no saved files.</i>
SELECT dial (Push)	Play selected archive.
F1  	Switch storage playback source (TS data destination folder).
F2 	Re-search files and update file list.
F3 	Play selected archive.
F4  	Choose to loop selected TS data during playback. <i>*Not possible to change during playback.</i>
F5 	Copy selected output archive to USB storage. <i>*Available when an external USB is connected.</i>
F6 	Convert selected archive to TS-Raw format. Converted TS-Raw files are stored in the Shared Folder; meanwhile the original file will be maintained on the Source Archive.
F7 	Delete selected archive.

9.2.3. Others

- Archived TS data recorded at HACOBE 1 or HACOBE 2 can be played.
- Access Shared Folder:
 - Select MENU → System → Network Settings and set IP address and subnet mask of LAN1;
 - Connect LAN1 to a LAN cable;
 - Connect a Windows PC on the same network.
 Open Windows Explorer:
 \\<HACOBE2 default IP>\archive (*HACOBE 2 default IP address 192.168.1.20).

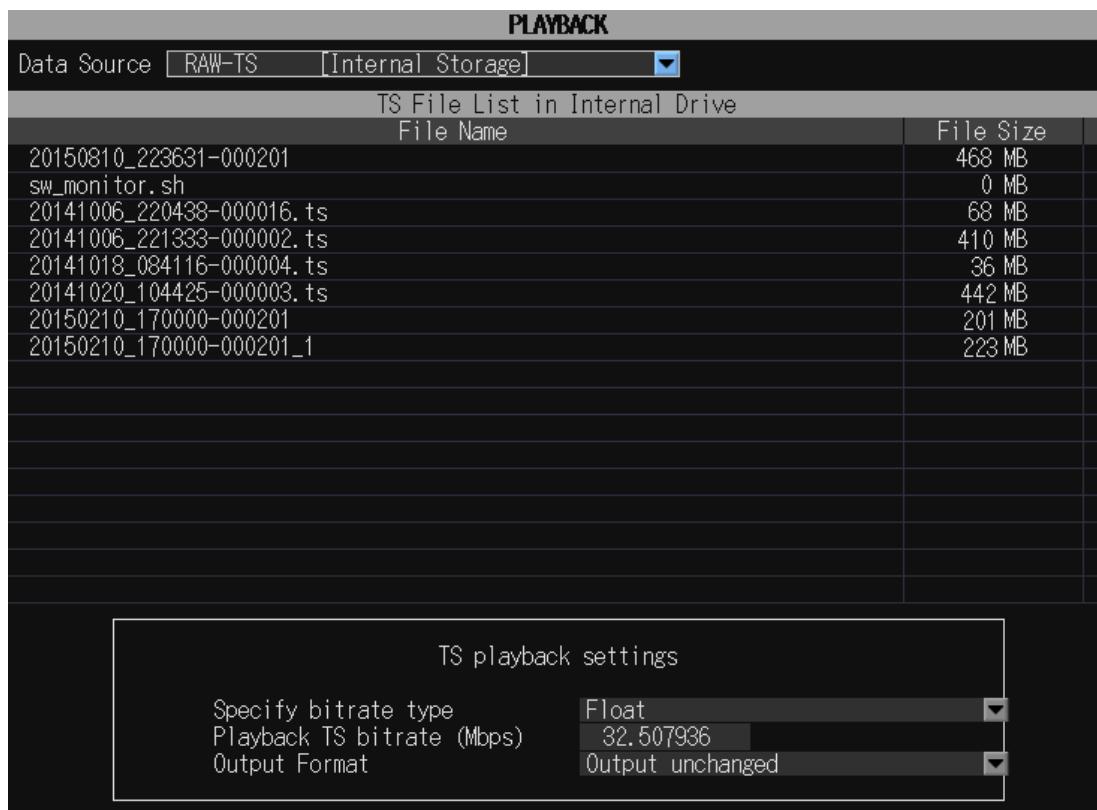


9.3. Shared Folder (TS-RAW format)

TS-RAW data (*.ts) is the playback mode for reproducing direct TS packet.

TS-RAW data is compatible to other devices since it is easy to handle and has simple structure. On the other hand, there is no information on playback bitrate and file length (playback time), so it may not play properly if appropriate bit rate is not set.

Access the shared folder with a Windows PC connected the HACOBE2 via LAN.



9.3.1. Screen Items

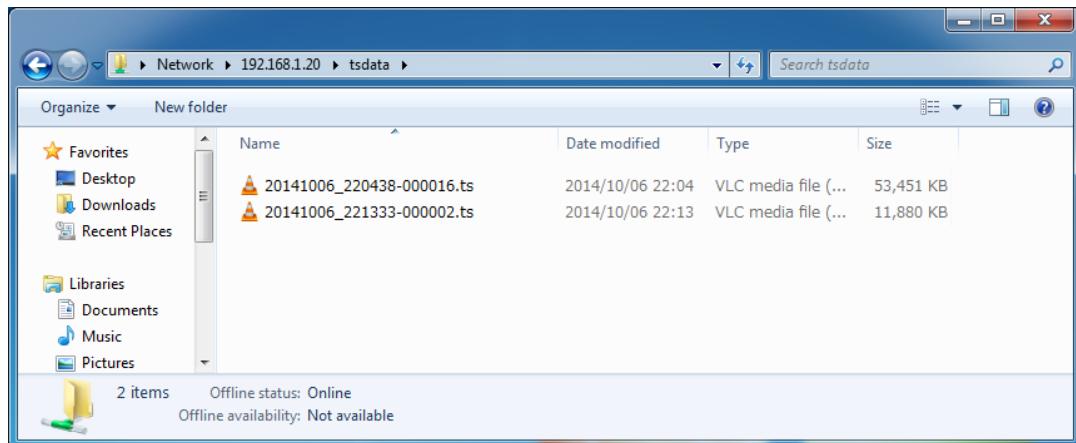
Item Name	Description
Data Source	Display playback source (TS data location).
File Name	Display stored TS data file name or folder.
Specify bitrate type	Specify playback bitrate in decimals and whether to specify the number of minutes.
Playback TS bitrate (Mbps)	Specify TS data playback speed (bitrate).
Output Format	Specify whether to play converted TS data or broadcast TS format.

9.3.2. Functions

Object	Content
SELECT dial (Turn)	Cursor movement. <i>*Not available if there are no saved files.</i>
SELECT dial (Push)	Play selected archive.
F1 	Switch storage playback source (TS data destination folder).
F2 	Re-search files in the folder and update file list.
F3 	Play selected TS-RAW file.
F4  	Choose to loop selected TS data during playback. <i>*Not possible to change during playback.</i>
F5 	Copy selected output archive to USB storage. <i>*Available when an external USB is connected.</i>
F6  	Edit playback settings of selected TS-RAW file.
F7 	Delete selected TS-RAW file.

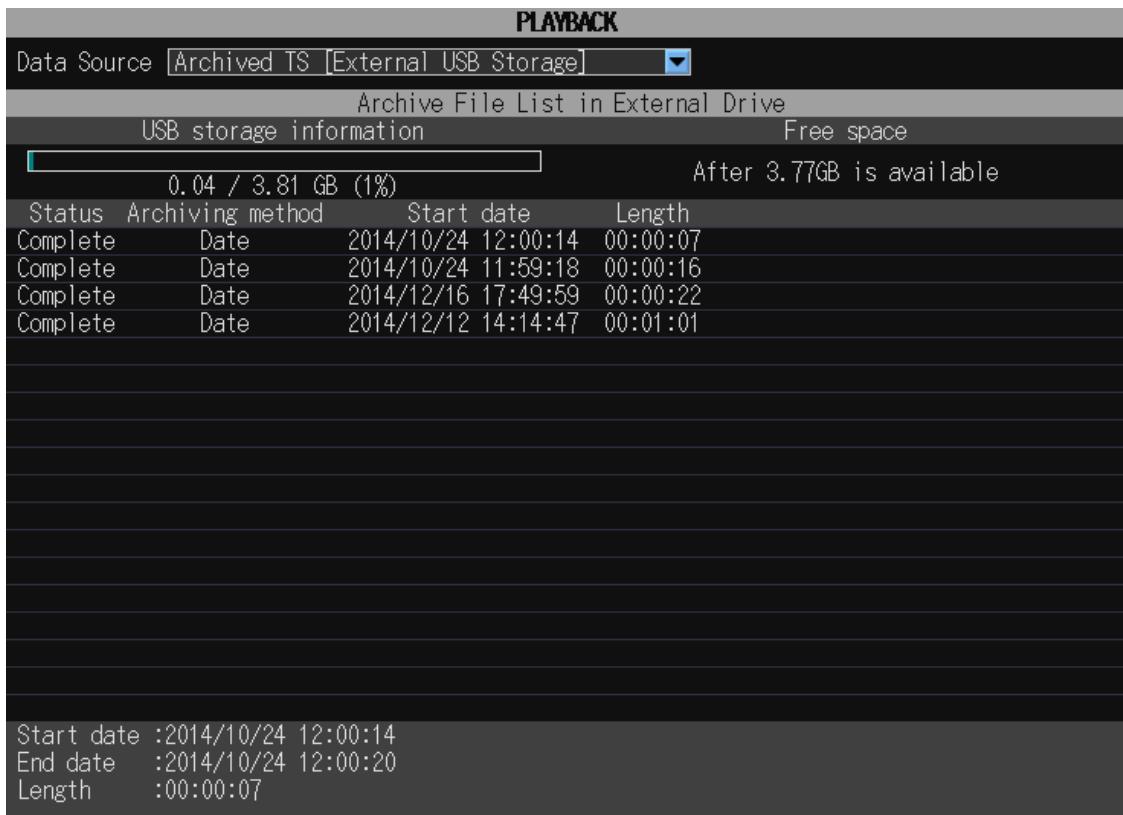
9.3.3. Others

- Access Shared Folder:
 - Select MENU of HACOBE2 → System → Network Settings and set IP address and subnet mask of LAN1;
 - Connect LAN1 to LAN cable;
 - Connect a Windows PC on the same network.
- Open Windows Explorer:
 \\<HACOBE2 default IP>\tsdata (*HACOBE 2 default IP address 192.168.1.20).



9.4. External USB (Archive format)

Playback mode for archive TS saved in external drive, USB storage, connected to HACOBE2.



9.4.1. Screen Items

Item Name	Description
Data Source	Display playback source (TS data location).
Status	Display status of the archive. <u>Standby</u> : Waiting to archive. Switch to “Recording” when recording selected range. <u>Recording</u> : Broadcast TS being archived. <u>Complete</u> : Archive complete.
Archiving Method	Display type of archive.
Start date	Display date and time of archived TS data. HACOBE 2 recognizes received TS data date and time.
Length	Length of archived TS data.

9.4.2. Functions

Object	Content
SELECT dial (Turn)	Cursor movement. <i>*Not available if there are no saved files.</i>
SELECT dial (Push)	Play selected archive.
F1  	Switch storage playback source (TS data destination folder).
F2 	Re-search files in the folder and update file list.
F3 	Play selected archive.
F4  	Choose to loop selected TS data during playback. <i>*Not possible to change during playback.</i>
F5 	Copy selected archive file on Shared Folder.
F6 	Convert selected archive to TS-RAW format. Converted TS-RAW files are stored in external USB (TS-RAW format); the source archive is not deleted.
F7 	Delete selected archive.

9.4.3. Others

- Do not remove USB storage drive during playback;
- USB Storage folder search is hacobe/archive and hacobe/archive/data.

[Image]

USB Memory

└ hacobe folder

 └ archive folder

 └ yyyyymmdd_hhmmss_0

 └ yyyyymmdd_hhmmss_1

 └ yyyyymmdd_hhmmss_2

 └ data folder

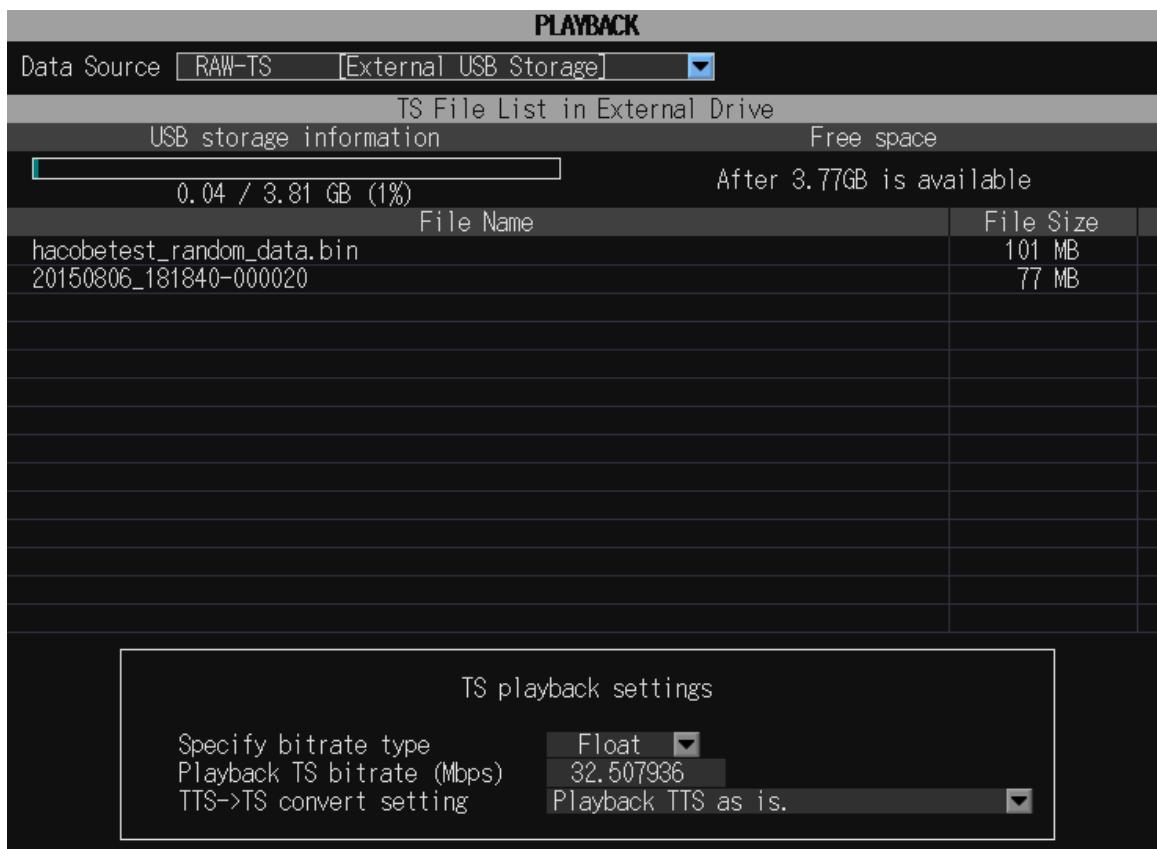
 └ yyyyymmdd_hhmmss_0

 └ yyyyymmdd_hhmmss_1

 └ yyyyymmdd_hhmmss_2

9.5. External USB (TS-RAW format)

TS-RAW playback mode of files in USB storage connected to HACOBE2.



9.5.1. Screen Items

Item Name	Description
Data Source	Display playback source (TS data location).
File Name	Display stored TS data file name or folder.
Specify bitrate type	Specify playback bitrate in decimals and whether to specify the number of minutes.
Playback TS bitrate (Mbps)	Specify TS data playback speed (bitrate).
Output Format	Specify whether to play converted TS data or broadcast TS format.

9.5.2. Functions

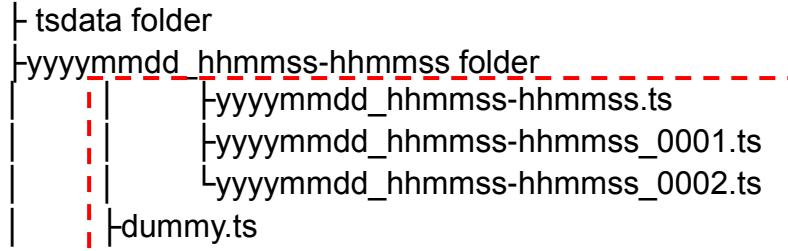
Object	Content
SELECT dial (Turn)	Cursor movement. <i>*Not available if there are no saved files.</i>
SELECT dial (Push)	Play selected archive.
F1  	Switch storage playback source (TS data destination folder).
F2 	Re-search files in the folder and update file list.
F3 	Play selected TS-RAW file.
F4  	Choose to loop selected TS data during playback. <i>*Not possible to change during playback.</i>
F5 	Copy selected TS-RAW file on Shared Folder.
F6  	Edit playback settings of selected TS-RAW file.
F7 	Delete selected TS-RAW file.

9.5.3. Others

- Do not remove USB storage drive during playback;
- USB Storage TS data search is hacobe/tsdata [Image]

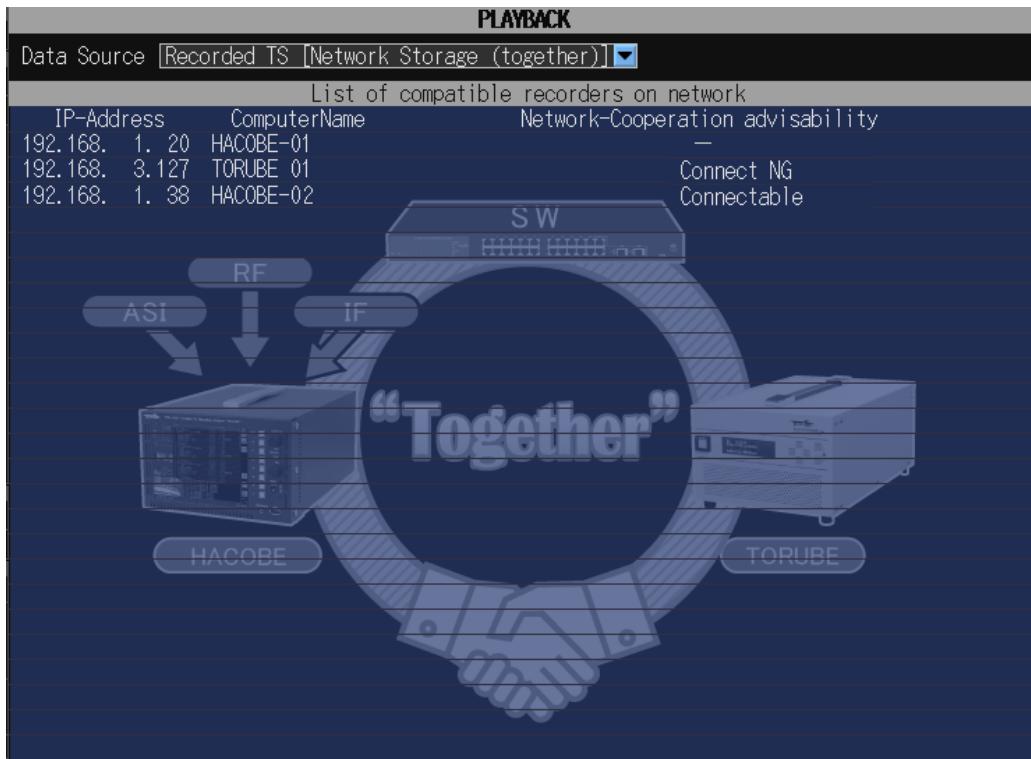
USB Memory

└ hacobe folder



9.6. Network TS data (Together)

Connect other Traffic Sim devices to HACOBE through network, and playback TS files in the recording device (TORUBE Pro/Lite). Network TS playback (Together function) playback fixed bit rate only.



9.6.1. Screen Items

Item Name	Description
Data Source	Display playback source (TS data location).
IP Address	IP address of recording device to be connected.
Computer Name	Name of recording device to be connected. Set any name of the device during connection settings.
Network Cooperation Advisability	Status of current connection settings.

9.6.2. Functions

Object	Content
SELECT dial (Turn)	Cursor movement. <i>*Not available if there are no saved files.</i>
SELECT dial (Push)	Same function as F4 button.
F1 	Switch storage playback source (TS data destination folder).
F2 	Create new connection settings.
F3 	Modify selected Connection settings.
F4 	Start communication with selected connection.
F5	No assigned function.
F6 	Clear selected connection settings.
F7 	Import connection settings from external USB. <i>*Available when an external USB is connected.</i>

9.6.3. Import and Export Connection Settings

Export

Connect external USB, press MENU button and afterwards F6 (report output) button. In case of more than one connection configuration, a "together_conf.csv" will be created on USB storage folder.

**Export connection settings pressing MENU button while viewing Connection Setting List.*

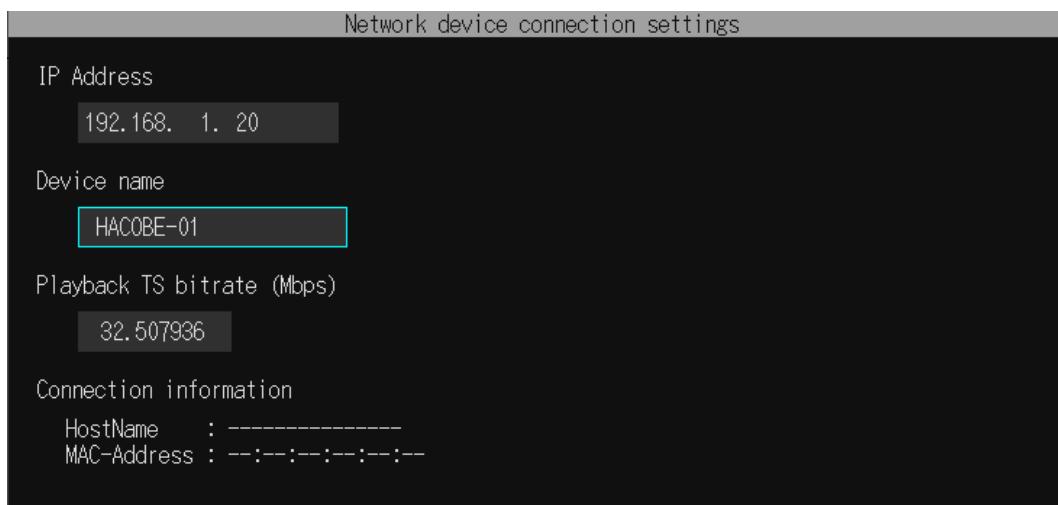
Import

After editing on Windows PC the exported file, "together_conf.csv", connect USB storage to HACOBE 2 and press F7 (import) button to import file.

**When successful import, the existing connection settings list will be deleted.*

9.6.4. Add or Edit Connection Settings

F1 (add target) or F2 (change target) button will go to Connection settings screen.



Item Name	Description
IP address	Broadcast equipment IP address.
Device Name	Name (label) the broadcast equipment connection.
Playback TS bitrate (Mbps)	Set bitrate of TS recorded at connected broadcast equipment.
Connection information	In case of testing connection, the results will appear. Display host name of destination PC, MAC address, availability of network TS playback.

Function buttons

Object	Content
F1	Test, currently displayed, connection settings. Connection test results are displayed in the connection destination information.
F2	No assigned function.
F3	Save current connection settings and return to destination setting list.
F4	No assigned function.
F5	Display advanced connection settings. Regular broadcast equipment doesn't need settings change.
F6	No assigned function.

9.6.5. Advanced Connection

On normal default settings communication using recording equipment, network playback may not be possible. In such cases, network connection must be properly set.

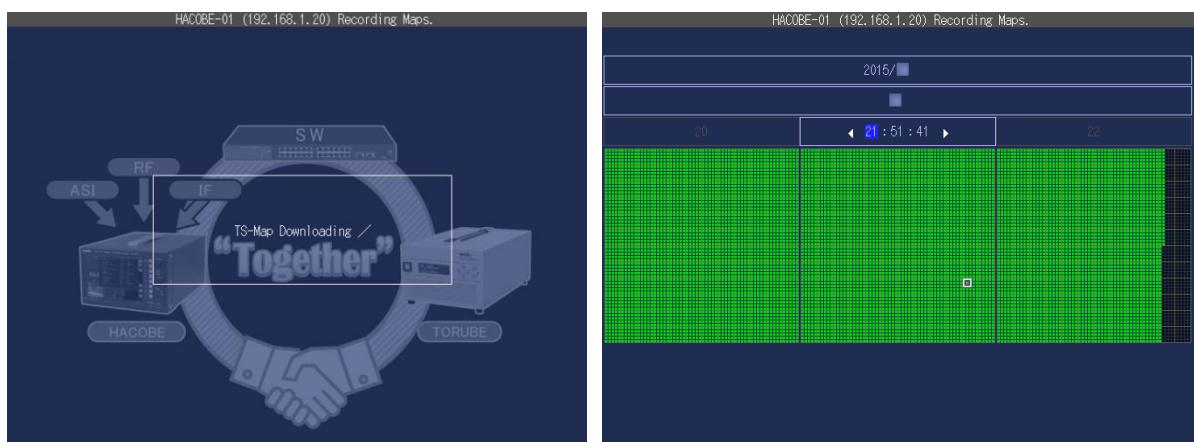
**In case of impossibility to connect the recording equipment or playback TS through network, please contact Traffic Sim.*



Item Name	Description
Connection Port to retrieve map	Port number to connect to broadcast equipment.
Communication timeout	Destination connection and set communication wait response timeout time (in seconds).

9.6.6. Operation during connection

Press F4 (Connect) button or DIAL encoder in Connection Settings List to connect. The screen will display "Connecting" and "Acquiring Map" during Broadcast data Map loading and Recording Map screen. Once complete, operation is the same as Recording Map mode.



Function buttons after connection

Page 1 / 2.

Object	Content
SELECT dial (Turn)	Move cursor through selected unit (F1 - F4 button).
SELECT dial (Push)	Start TS playback from selected date.
F1	SELECT dial will move through days on the map.
F2	SELECT dial will move hourly on the map.
F3	SELECT dial will move through minutes on the map.
F4	SELECT dial will move through seconds on the map.
F5	Start or stop TS playback from selected date.
F6	Specify time range of TS data to be reproduced or output.
F7	Switch menu items to be displayed.

Page 2 / 2.

Object	Content
F1	No assigned function.
F2	No assigned function.
F3	No assigned function.
F4	Move cursor to the oldest recording data position.
F5	Move cursor to the latest recording data position.
F6	No assigned function.
F7	Switch menu items to be displayed.

Function buttons after range selection

Object	Content
MODE dial	Cancel range selection and changes MODE.
SELECT dial	No assigned function.
F1	No assigned function.
F2	No assigned function.
F3	No assigned function.
F4	No assigned function.
F5 	Start/Stop TS playback from selected date.
F6 	Cancel selection.
F7  	Switch ON/ OFF loop playback.

9.6.7. Communication response timeout

Communication with other devices may not be performed normally at times, due to partner status and/or network problems. In some cases when "Connecting" notice is continuous a message will be displayed as follows:



Network TS playback (Together) function of HACOBE, while showing "Connecting" means the system continues to retry and fail to connect. For that reason if you cannot connect select "No" on the message display of "No response", to keep trying to connect or select "Yes" to return to the list of network connections and check for correct settings.

10. Analysis Functions

10.1. PID List

TS analysis mode display TS packet included in the TS in each PID separately listed.

PID	S	Layer	CC	TYPE	packets	rate(Mbps)	100.0%
0 0 0 0			1	PAT	10	0.02	0.1
0 0 0 1			0	CAT	0	0.00	0.0
0 0 1 0			0	NIT(actual network)	1	0.00	0.0
0 0 1 1			0	SDT(actual stream)	1	0.00	0.0
0 0 1 2			1	EIT(actual stream sch)	73	0.12	0.4
0 0 1 4			0	TOT	0	0.00	0.0
0 0 2 3			0	SDTT	0	0.00	0.0
0 0 2 4			0	BIT	1	0.00	0.0
0 0 2 7			0	EIT(actual stream p/f)	3	0.00	0.0
0 0 2 8			0	SDTT	0	0.00	0.0
0 0 2 9			0	CDT	0	0.00	0.0
0 0 3 1			1	ECM, ECM-S(CAS)	10	0.02	0.1
0 0 3 2			1	ECM, ECM-S(TRMP)	10	0.02	0.1
0 0 4 1			0	EMM, EMM-S(TRMP)	44	0.07	0.2
0 1 0 0			0	PCR	18	0.03	0.1
0 1 1 1 D		12		Video(MPEG2)	9054	14.78	45.5
0 1 1 2 D		1		Audio(MPEG2 AAC)	141	0.23	0.7
0 1 1 4 D		0		PES(Subtitle)	0	0.00	0.0
0 1 1 5		0		PES(Super)	1	0.00	0.0
0 1 2 5		0		Unknown Packet	1	0.00	0.0
0 2 0 0		0	[1]	PCR	4	0.01	0.0
0 2 8 1		0	[1]	Video(H.264)	166	0.27	0.8
0 2 8 3		0	[1]	Audio(MPEG2 AAC)	33	0.05	0.2
0 2 8 7		0	[1]	PES(Subtitle)	0	0.00	0.0
0 2 8 8		1			10	0.02	0.1
0 7 F 1		0		Data carouse1(TYPE D)	1	0.00	0.0
0 7 F 2		0		Data carouse1(TYPE D)	2	0.00	0.0
0 7 F 3		1		Data carouse1(TYPE D)	41	0.07	0.2
0 7 F 4		1		Data carouse1(TYPE D)	10	0.02	0.1

10.1.1. Screen Items

Item Name	Description									
PID	PID of TS packet. Displayed in 4 decimal digits or 16 hexadecimal according to display setting.									
S	Show presence or absence of encryption (scramble). <table border="1" style="margin-left: 20px;"> <tr> <td></td><td>Descrambled</td><td>Not descrambled</td></tr> <tr> <td>Scrambled</td><td>D</td><td>S</td></tr> <tr> <td>Non-scrambled</td><td>Blank</td><td>Blank</td></tr> </table>		Descrambled	Not descrambled	Scrambled	D	S	Non-scrambled	Blank	Blank
	Descrambled	Not descrambled								
Scrambled	D	S								
Non-scrambled	Blank	Blank								
Layer	Display hierarchy information of target packet.									
CC	Show number of error continuity occurrences of each PID.									
TYPE	Packet type. Determined from stream_type and table_id specified by PMT. In the case of 1SEG packet, it is displayed as [1] at the beginning.									
Packets	Number of received packets per second.									
Rate	Bitrate per second. Value obtained by rounding off the third number after the decimal point.									
100.0%	TS rate percentage. Graph is displayed on the background.									

10.1.2. Functions

Object	Content
SELECT dial (Push)	Preset operation (Packet analysis or Section analysis) on selected PID. <i>*Same function as F2 (section analysis) button.</i>
F1 	Packet analysis of selected PID.
F2 	Section analysis of selected PID.
F3 	Decode currently selected PID service. <i>*Not displayed in case it cannot identify the PID service.</i>
F4	No assigned function.
F5 	Switch bitrate display. Mbps ⇌ kbps
F6 	Move up the screen. <i>*This will not be displayed if the number of items is within two screens.</i>
F7 	Move down the screen. <i>*This will not be displayed if the number of items is within two screens.</i>

10.1.3. Others

- PID not received within 1 second, considered an error, will be displayed in dark colors;
- Service ID and service name from SDT are displayed after PMT;
- In case of PID from PMT being 1SEG, 0x1fc8 – 0x1fcf, mark [1] is added.

10.2. Packet Cycle

Analysis TS packet reception cycle included in PID as list.

PID	S	TYPE	Ave. (msec)	Max. (msec)	Last update
► 0000		PAT	99.9	399	03/12 09:17:27
0001		CAT	9988.1	9991	03/12 09:17:20
0010		NIT(actual network)	1000.1	1092	03/12 09:17:27
0011		SDT(actual stream)	2000.3	2060	03/12 09:17:27
0012		EIT(actual stream sch)	12.7	355	03/12 09:17:27
0014		TOT	4999.8	5009	03/12 09:17:27
0023		SDTT	3333.4	3419	03/12 09:17:26
0024		BIT	1000.1	1090	03/12 09:17:27
0027		EIT(actual stream p/f)	329.9	596	03/12 09:17:27
0028		SDTT	35999.7	36066	03/12 09:17:17
0029		CDT	13333.3	13415	03/12 09:17:19
0031		ECM, ECM-S(CAS)	100.0	500	03/12 09:17:27
0032		ECM, ECM-S(TRMP)	100.0	399	03/12 09:17:27
0041		EMM, EMM-S(TRMP)	25.3	1027	03/12 09:17:27
0100		PCR	57.8	404	03/12 09:17:27
O [■]	D	Video(MPEG2)	0.1	330	03/12 09:17:27
O [■]	D	Audio(MPEG2 AAC)	7.1	341	03/12 09:17:27
O [■]	D	PES(Subtitle)	1505.2	5022	03/12 09:17:26
O [■]	D	PES(Super)	1006.2	1053	03/12 09:17:27
O [■]		Unknown Packet	1006.2	1053	03/12 09:17:27
O [■]		[1]PCR	231.3	231	03/12 09:17:27
O [■]		[1]Video(H.264)	6.0	57	03/12 09:17:27
O [■]		[1]Audio(MPEG2 AAC)	29.9	57	03/12 09:17:27
O [■]		[1]PES(Subtitle)	3559.2	10033	03/12 09:17:19
O [■]	PMT		100.0	399	03/12 09:17:27
O [■]		Data carousel (TYPE D)	1000.1	1002	03/12 09:17:27
O [■]		Data carousel (TYPE D)	500.1	502	03/12 09:17:27
O [■]		Data carousel (TYPE D)	24.0	504	03/12 09:17:27
O [■]		Data carousel (TYPE D)	100.1	400	03/12 09:17:27

10.2.1. Screen Items

Item Name	Description									
PID	TS packet PID. Displayed in 4 decimal digits or 16 hexadecimal according to display setting.									
S	Show the presence or absence of encryption (scramble).									
	<table border="1"> <tr> <td></td><td>Descrambled</td><td>Not descrambled</td></tr> <tr> <td>Scrambled</td><td>D</td><td>S</td></tr> <tr> <td>Non-scrambled</td><td>Blank</td><td>Blank</td></tr> </table>		Descrambled	Not descrambled	Scrambled	D	S	Non-scrambled	Blank	Blank
	Descrambled	Not descrambled								
Scrambled	D	S								
Non-scrambled	Blank	Blank								
TYPE	Packet type. Determined from stream_type and table_id specified by PMT. In the case of 1SEG packet, it is displayed as [1] at the beginning.									
Average	Displays average reception interval of packets per PID.									
Maximum	Displays maximum reception interval of packets per PID.									
Last update	Displays date and time the latest packet was received.									

10.2.2. Functions

Object	Content
SELECT dial (Push)	Preset operation (Packet analysis or Section analysis) on selected PID. <i>*Same function as F2 button.</i>
F1 	Packet analysis of selected PID.
F2 	Section analysis of selected PID.
F3 	Decode currently selected PID service. <i>*Not available in case it cannot identify the PID service.</i>
F4	No assigned function.
F5 	Change average, maximum units. msec (1/1000sec) ⇔ sec (seconds)
F6 	Move up the screen. <i>*Not available if number of items is within two screens.</i>
F7 	Move down the screen. <i>*Not available if number of items is within two screens.</i>

10.2.3. Others

- PID not received within 1 second, considered an error, will be displayed in dark colors;
- Service ID and service name from SDT are displayed after PMT;
- In case of PID from PMT being 1SEG, 0x1fc8 – 0x1fcf, mark [1] is added.

10.3. PID Tree

Display analyzed TS tree from PAT.

TYPE	S	PID	rate (Mbps)	0%	50%	100%
►PAT		0 0 0 0	0.02			
NIT(actual network)		0 0 0 0	0.00			
►PMT		0 0 0 3	0.03			
PCR		0 0 0 0	0.03			
ECM, ECM-S (CAS)		0 0 0 1	0.02			
ECM, ECM-S (TRMP)		0 0 0 2	0.02			
Video (MPEG2)	D 0 1	14.81				
Audio (MPEG2 AAC)	D 0 2	0.23				
PES (Subtitle)	D 0 4	0.00				
PES (Super)	D 0 5	0.00				
Data carousel (TYPE D)	D 0 6	0.42				
Data carousel (TYPE D)	D 0 7	0.64				
Data carousel (TYPE D)	D 0 8	0.00				
Data carousel (TYPE D)	D 0 9	0.00				
Data carousel (TYPE D)	D 0 A	0.00				
Data carousel (TYPE D)	D 0 B	0.00				
Data carousel (TYPE D)	D 0 C	0.53				
Data carousel (TYPE D)	D 0 D	0.00				
►PMT		0 0 0 9	0.03			
PCR		0 0 0 0	0.03			
ECM, ECM-S (CAS)		0 0 0 1	0.02			
ECM, ECM-S (TRMP)		0 0 0 2	0.02			
Video (MPEG2)	D 0 1	14.81				
Audio (MPEG2 AAC)	D 0 2	0.23				
PES (Subtitle)	D 0 4	0.00				
PES (Super)	D 0 5	0.00				
Data carousel (TYPE D)	D 0 6	0.42				
Data carousel (TYPE D)	D 0 7	0.64				

10.3.1. Screen items

Item Name	Description									
TYPE	PID Packet type, specified in PAT/PMT, determines tree structure. No description PAT/PMT, such as EIT and SDT, are displayed separately from the tree.									
S	Show presence or absence of encryption (scramble). <table border="1" style="margin-left: 20px;"> <tr> <td></td><td>Descrambled</td><td>Not descrambled</td></tr> <tr> <td>Scrambled</td><td>D</td><td>S</td></tr> <tr> <td>Non-scrambled</td><td>Blank</td><td>Blank</td></tr> </table>		Descrambled	Not descrambled	Scrambled	D	S	Non-scrambled	Blank	Blank
	Descrambled	Not descrambled								
Scrambled	D	S								
Non-scrambled	Blank	Blank								
PID	PID of TS packet. Displayed in 4 decimal digits or 16 hexadecimal according to display setting.									
Rate	Bitrate per second. Value obtained by rounding off the third number after decimal point. The proportion of entire TS is on the right side of the bar.									

10.3.2. Functions

Object	Content
SELECT dial (Push)	Preset operation (Packet analysis or Section analysis) on selected PID. <i>*Same function as F2 (section analysis) button.</i>
F1 	Packet analysis of selected PID.
F2 	Section analysis of selected PID.
F3 	Decode the service of currently selected PID. <i>*Not displayed in case it cannot identify the PID service.</i>
F4  	100% → 70% → 50% → 30% → 20% → 15% → 10% → 7% → 5% → 3% → 2% → 1% → logarithmic display → 100% → 70% → ... Change bit rate order scale displayed on the right side.
F5 	Switch bitrate display. Mbps ⇔ kbps
F6 	Move up the screen. <i>*This will not be displayed if the number of items is within two screens.</i>
F7 	Move down the screen. <i>*This will not be displayed if the number of items is within two screens.</i>

10.3.3. Others

- PID not received within 1 second, considered an error, will be displayed in dark colors;
- Service ID and service name from SDT are displayed after PMT;
- In case of PID from PMT being 1SEG, 0x1fc8 – 0x1fcf, mark [1] is added;
- There is no display if PAT configuration cannot be analyzed.

10.4. Table ID Tree

Display analyzed TS table_id in tree sections.

table_id	table_section_id-ext	Name	Ave.	/ Max.	Last received
0x00(1table)	0x7FC3(v05/1sec.)	PAT	99ms	/399ms	03/12 09:18:11
0x01(1table)	-----(v19/1sec.)	CAT	10.0s	/10.0s	03/12 09:18:10
0x02(5table)	0x0C9F(v00/1sec.)	PMT(0x0C9F)G,\$I	100ms	/399ms	03/12 09:18:11
	0x0C18(v05/1sec.)	PMT(0x0C18)CB0F1S	99ms	/499ms	03/12 09:18:11
	0x0C19(v05/1sec.)	PMT(0x0C19)CB0F1S	99ms	/499ms	03/12 09:18:11
	0x0C1A(v05/1sec.)	PMT(0x0C1A)CB0F1S	99ms	/499ms	03/12 09:18:11
	0xD98(v24/1sec.)	[1]PMT(0xD98)CB0Cos;0	199ms	/206ms	03/12 09:18:11
0x3B(67table)	0xE8B(v00/1sec.)	Data carousel (TYPE D)	9.0s	/ 9.0s	03/12 08:58:55
	0xE8C(v00/1sec.)	Data carousel (TYPE D)	9.0s	/ 9.0s	03/12 09:18:10
	0xE8B(v00/1sec.)	Data carousel (TYPE D)	2.3s	/ 8.0s	03/12 08:58:54
	0xE8C(v00/1sec.)	Data carousel (TYPE D)	2.3s	/ 8.0s	03/12 09:18:11
	0xD17(v00/1sec.)	Data carousel (TYPE D)	2.2s	/ 2.5s	03/12 08:58:56
	0xD18(v00/1sec.)	Data carousel (TYPE D)	1.2s	/ 2.4s	03/12 08:59:03
	0xD19(v00/1sec.)	Data carousel (TYPE D)	2.3s	/ 2.5s	03/12 09:18:09
	0xFB5(v00/1sec.)	Data carousel (TYPE D)	2.3s	/ 2.3s	03/12 09:18:11
	0x35CE(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 08:55:10
	0x35CF(v00/1sec.)	Data carousel (TYPE D)	-----	/ -----	03/12 08:55:10
	0x35D0(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 09:00:15
	0x35D2(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 09:01:12
	0x35D4(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 09:05:07
	0x35D5(v00/1sec.)	Data carousel (TYPE D)	-----	/ -----	03/12 09:05:07
	0x35D6(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 09:05:40
	0x35D7(v00/1sec.)	Data carousel (TYPE D)	1.1s	/ 1.1s	03/12 09:10:04
	0x35D8(v00/1sec.)	Data carousel (TYPE D)	-----	/ -----	03/12 09:10:05

10.4.1. Screen items

Item Name	Description
tableid	Number of sections with the same table_id and value.
tableid_ext	Number of sections with the same table_id, table_id_extenstion, and table_id_extenstion value, version_number maximum value. *tableid-ext (table_id_extenstion) referred collectively to 2byte from the beginning section of 4 th byte (after section_length). Service_id and program_number are different by section.
Section no.	Corresponding section number of table_id and table_id_extention.
Name	Section packet name.
Average/Maximum	Section average and maximum reception cycle.
Latest/ Average	Latest and the average section reception cycle.
Last received	Latest time a section was received.

10.4.2. Functions

Object	Content
SELECT dial (Push)	Opening and closing of the tree when icons   are available. If not, switches to function analysis.
F1 	Switch current_next_indicator = 0 to current_next_indicator = 1 tree.
F2 	Section analysis of selected section.
F3 	Open and/or close the tree. <i>*To open or close the entire tree, press and hold the button.</i>
F4	No assigned function.
F5 	Switch display of section reception cycle. Average / Maximum ⇔ Latest / Average
F6 	Move up the screen.
F7 	Move down the screen.

10.4.3. Others

- PID not received within 1 second, considered an error, will be displayed in dark colors;
- Service ID and service name from SDT are displayed after PMT;
- In case of PID from PMT being 1SEG, 0x1fc8 – 0x1fcf, mark [1] is added;

10.5. Packet Analysis

Obtains TS packet and displays analysis results and binary data.

	Description	Type	Length	Data
+00000	transport_packet()			
47 01 61 9B D5 4E 93 75	sync_byte	bslbf	8	47
+00008 01 60 4C A5 8E 3F 8C 85	transport_error_indicator	bslbf	1	00
+00010 F5 24 0B 43 4C EA 29 24	payload_unit_start_indicator	bslbf	1	00
+00018 CF 00 E0 9D 2E 0B A1 2C	transport_priority	bslbf	1	00
+00020 0B BD 5C 20 15 59 E2 4D	PID	uimsbf	13	0161
+00028 2A A4 09 FE 96 93 2A E1	transport_scrambling_control	bslbf	2	02
+00030 B5 88 4E F2 CA 62 BC E2	adaptation_field_control	bslbf	2	01
+00038 75 E4 C9 2C 2F 3E 63 A0				only payload
+00040 1D 72 DE 52 44 1E C2 29	continuity_counter	uimsbf	4	0B
+00048 7B A9 4A AB B3 0B 80 04	if(adaptation_field_control == '10' adaptation_field_control == '11'){			
+00050 81 EC 40 F0 2A B2 AB 8C	if(adaptation_field_control == '01' adaptation_field_control == '11') {			
+00058 80 8E F3 76 0C 5A 89 79	for(i=0;i<N;i++){			
+00060 80 F1 13 79 FA F8 58 5C	data_byte	bslbf	8×184	
+00068 6A 72 7D EC B4 5B 3C E9	}			
+00070 40 27 87 73 4C 98 46 16	Reed Solomon{			
+00078 8F 34 5D B3 E4 F4 8E 31	for(i=0;i<N;i++){			
+00080 83 81 6B 59 E8 D8 72 17	data_byte	bslbf	8×16	
+00088 0B 01 EF FE DF DF 52 9E	}			
+00090 84 6D 53 D9 2C A6 6D 3B	}			
+00098 B6 1F 9F 34 32 10 5F 84				
+000A0 83 DB 9C 01 BE 9C 4F D0				
+000A8 3C 22 0A B0 AD 74 49 E1				
+000B0 42 5F 4B 4C 86 69 0D 80				
+000B8 99 46 44 4A F6 F5 DF 45				
+000C0 CE 2C 4D 61 90 9E 2E E0				
+000C8 04 2A D1 5D				
Len 204Byte bit:01000111-01011101	PID:0x0161 Data carousel (TYPE D)			

10.5.1. Screen items

Item Name	Description
Left screen	Display binary data packet. Selected area is displayed in blue.
Bottom left screen	Display binary data length first and last byte of selected data. Selected area is displayed in blue. Only shows left in case of 1 byte.
Right screen	Display analysis results table. Length is the number of bytes, data is displayed in hexadecimal.
Bottom right screen	Display PID of analyzed packet and packet type.

10.5.2. Functions

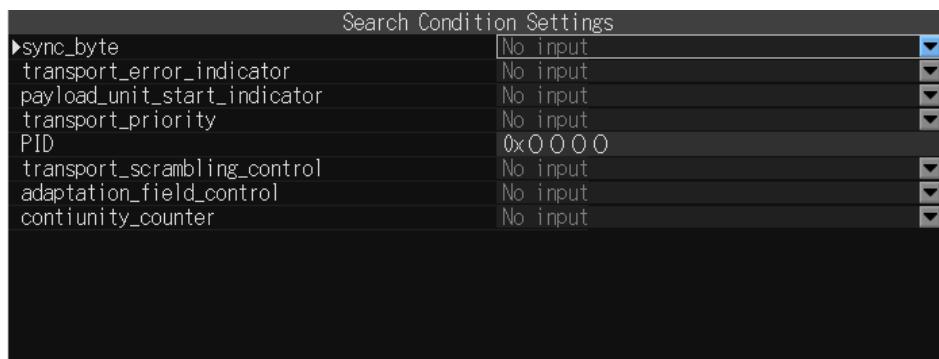
Object	Content
DIAL encoder (Push)	No assigned function.
F1 	Packet re-acquisition.
F2 	Set packet acquisition condition.
F3 	Move up the screen.
F4 	Move down the screen.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

10.5.3. Others

- Turning MODE encoder and "Back" button has the same function.
- Acquires and analyzes matching packet of first input condition.

10.6. Packet Analysis (Acquisition Condition Settings)

Set packet capture conditions.



10.6.1. Screen items

Item Name	Description
Left Screen	Display Condition item name.
Right Screen	Display Conditions for each item.

10.6.2. Functions

Object	Content
DIAL encoder (Push)	Enable condition. Change focus to control.
F1 	Acquire packet in current conditions.
F2 	Switch enable, disable condition.
F3	No assigned function.
F4	No assigned function.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

10.6.3. Others

- Depending on conditions, some packets cannot be obtained.
- Conditions will be kept until change of Packet Analysis Mode.

10.7. Section Analysis

Obtains section to display analysis results and binary data.

	Description	Type	Length	Data
+000000 00 B0 21 7F C1 C3 00 00	▶ program_association_section0{	uimsbf	8	00
+000008 00 00 E0 10 0C 08 E1 F0	table_id	bslbf	1	01
+000010 0C 09 E3 F0 0C 0A E4 F0	section_syntax_indicator	bslbf	1	00
+000018 0D 88 FF C8 FF F1 FD F0	'0'	bslbf	2	03
+000020 91 2F 8C 89	reserved	uimsbf	12	0021
+000028	section_length	uimsbf	8×2	7FC1
+000030	transport_stream_id	bslbf	2	03
+000038	reserved	uimsbf	5	01
+000040	version_number	bslbf	1	01
+000048	current_next_indicator	uimsbf	8	00
+000050	section_number	uimsbf	8	00
+000058	last_section_number	uimsbf	8	00
+000060	for(i=0;i<N;i++){	uimsbf	8×2	0000
+000068	program_number	bslbf	3	07
+000070	reserved	uimsbf	13	0010
+000078	if(program_number == '0') {	bslbf	3	07
+000080	network_PID	uimsbf	8×2	0C08
+000088	}	bslbf	3	07
+000090	program_number	uimsbf	13	01F0
+000098	reserved	bslbf	3	07
+0000A0	if(program_number == '0')	uimsbf	8×2	0C09
+0000A8	else{	bslbf	3	07
+0000B0	program_map_PID	uimsbf	13	01F0
+0000B8	}	bslbf	3	07
+0000C0	program_number	uimsbf	8×2	0C09
+0000C8	reserved	bslbf	3	07
	if(program_number == '0') {	uimsbf	8×2	0C09
	}else{	bslbf	3	07
	}	uimsbf	13	01F0
	}	bslbf	3	07
	36Byte bit:00000000-10001001	PID:0x0000	table_id:00	PAT

10.7.1. Screen items

Item Name	Description
Left screen	Display binary data sections. Selected area is displayed in blue.
Bottom left screen	Display binary data length of the first and last byte of selected data. Selected area is displayed in blue. Only shows left in case of 1 byte.
Right screen	Display analysis results table. Length is the number of bytes; the data is displayed in hexadecimal.
Bottom right screen	Display PID of analyzed section, table_id and packet type.

10.7.2. Functions

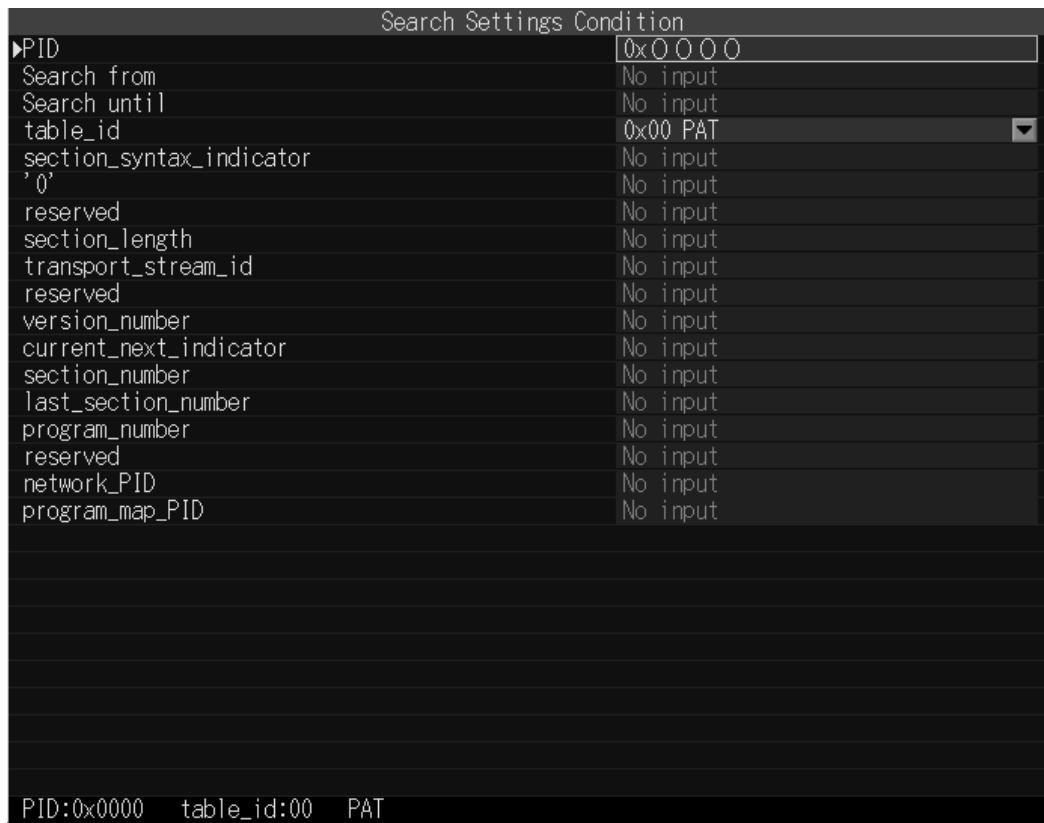
Object	Content
DIAL encoder (Push)	Display HELP for each item. *Some items have no HELP.
F1 	Packet re-acquisition.
F2 	Set packet acquisition condition.
F3 	Move up the screen.
F4 	Move down the screen.
F5 	Display section history change.
F6	No assigned function.
F7	No assigned function.

10.7.3. Others

- Turning MODE encoder and "Back" button has the same function.
- Acquires and analyzes matching packet of first input condition.

10.8. Section Analysis (Condition Settings)

Specify section acquisition conditions and search range to get history.



10.8.1. Screen items

Item Name	Description
Left Screen	Display Condition item. Vary item specified by table_id. Specify search range in history search; if search scope is not specified it will get matching condition.
Right Screen	Set conditions.
Bottom Screen	Display current PID and tableid.

10.8.2. Functions

Object	Content
DIAL encoder (Push)	Enable condition. Change focus to control.
F1 	Acquire packet in current conditions.
F2  	Switch Enable/Disable condition.
F3 	Move up the screen.
F4 	Move down the screen.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

10.8.3. Others

- Depending on conditions, some packets cannot be obtained.
- Conditions will be kept until change of Section Analysis Mode.

10.9. Section Analysis (History)

List of Section history variation. Re-analyze selected section data.

Data found	PID	tbl_id	Ver	Sec	Last	Ext	Len	CRC
►08/07 15:03:17	0x0 0 0 0	0x0 0	0x00	0x00	0x00		25	DF4978EA
08/07 15:03:22	0x0 0 0 0	0x0 0	0x0B	0x00	0x00		21	E4D9AFB6
08/07 15:03:27	0x0 0 0 0	0x0 0	0x0A	0x00	0x00		33	1312061D
08/07 15:03:38	0x0 0 0 0	0x0 0	0x01	0x00	0x00		29	9D9CF7D0
08/07 15:03:43	0x0 0 0 0	0x0 0	0x1F	0x00	0x00		29	9FE0A3B2
08/07 15:03:50	0x0 0 0 0	0x0 0	0x0B	0x00	0x00		29	EA2DCD16
08/07 15:03:55	0x0 0 0 0	0x0 0	0x0D	0x00	0x00		29	07C1EDED
08/07 16:01:14	0x0 0 0 0	0x0 0	0x01	0x00	0x00		33	912F8C89

10.9.1. Screen items

Item Name	Description	
Data found	Section detection change recording date and time.	
PID	Transmitting section PID packet.	
tbl_id	Section table_id.	
Bottom Screen	Right	Display table_id, packet type and section analysis PID.

10.9.2. Functions

Object	Content
DIAL encoder (Push)	Re-analyze selected history data section.
F1 	Re-analyze selected history data section.
F2 	Set packet acquisition condition.
F3 	Move up the screen.
F4 	Move down the screen.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

10.9.3. Others

- 3 days save section history length.
- Search results limit is 1000. In case of more items found it will display 1001 items. Narrow down the conditions and retry search.
- History will not be clear until next history search.

10.10. PCR Jitter

Display the interval of PCR; PCR Jitter graph and histogram.



*PCR Jitter Graph on the left; PCR Histogram on the right.

PCR jitter displays the difference between internal clock of HACOBE 2 and PCR clock, in form of graph. When graph line appears in the center, with no sharp ups and downs, playback is done without problems. When PCR clock reception is delayed the graph image appears on the upper side and on the lower side when advanced. Check distribution clock offset condition displayed by histogram.

10.10.1. Screen Items

PCR PID[0x] MIN[0]ns MAX[148]ns AVE[-2]ns CLOCK[1B96B6597 07C]

Item Name	Description
PCR_PID	Analyzed PID of PCR packet.
MIN/ MAX/ AVE	Minimum, maximum and average value of jitter (deviation extent). ± calculated value is disregarded.
CLOCK	Display received PCR value.

Interval MIN[231.105]ms MAX[231.105]ms AVE[231.105]ms

Item Name	Description
MIN/ MAX/ AVE	Minimum, maximum and average value of interval.

PMTPID[0x] Program[0x] Recommended: 32.507922Mbps

Item Name	Description
PMTPID	Display PID specified by PMT.
Program	Display program number specified by PMT.
Service Name	Display service name specified by PMT.
Recommended bitrate	Recommended reproduction bitrate value if TS is TS-RAW format.

10.10.2. Functions

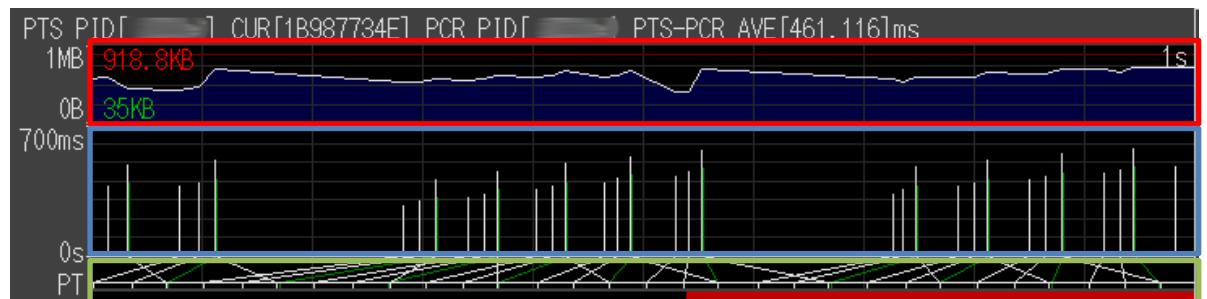
Object	Content
SELECT dial (Push)	No assigned function.
F1 	Change vertical axis. 700ns → 5us → 10us → 50us → 100us → 500us → 1ms → 5ms → 10ms → 50ms → 100ms → 700ns...
F2 	Change horizontal axis. 5s → 500ms → 1s → 2s → 5s...
F3	No assigned function.
F4  	Switch histogram display.
F5 	Switch upper graph display. <u>Jitter display</u> : Display minimum, maximum and average jitter; <u>Interval display</u> : Display minimum, maximum and average interval; <u>Service display</u> : Display PCR service information.
F6	No assigned function.
F7	No assigned function.

10.10.3. Others

- Hold maximum 256 PCR clock. Graph to the left may not be visible in case of PCR packet per second is high.
- Monitor settings are represented by yellow line.

10.11. PTS Graph

Display relationship between PTS packet and PCR packet in 3 graphs. PTS graph data amount (A), PTS-PCR (B) and time frame arrangement (C).



A
B
C

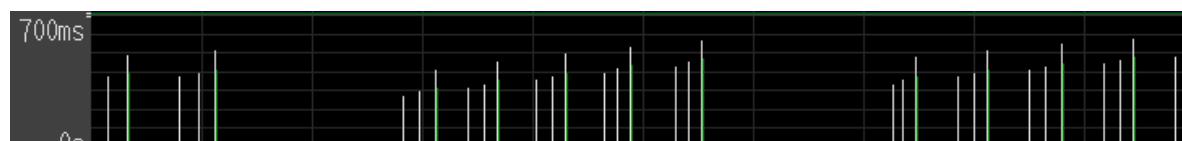
10.11.1. Screen Items



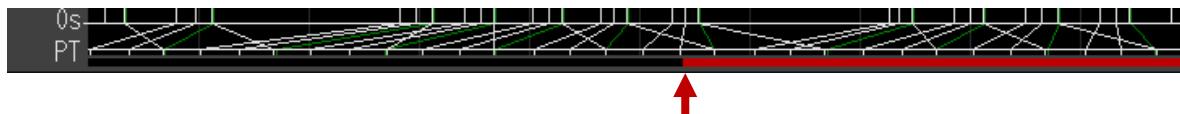
Item Name	Description
PTS_PID	Analyzed PID of PTS.
CUR	Current PTS value.
PCR PID	PID of PCR associated with PTS.
PTS-PCR AVE	Average difference between PCR and PTS during reception.



Item Name	Description
Vertical/Horizontal Axis	Vertical axis represents amount of PES data; Horizontal axis represents time.
White/Blue area	PES data amount held in the program transition graph.
Red character/line	Display maximum value of PES data held in the program.
Green character/line	Minimum value of PES data held in the program.



Item Name	Description
Horizontal axis	PTS reception time. Graph moves right to left (latest receiving time to oldest).
White line	Difference value of PTS and PCR. Represents displayed time from reception.
Green line	Difference value of DTS and PCR. Represents displayed time from reception.



Item Name	Description
PT (Presentation Timing)	Timing display frame. The starting point of PT is indicated (red arrow) on red bar.
Line between 0 and PT	Check used and received order turnover existence in receiving and linear time frame connection.
Red bar	Large red bar is the average difference PTS and PCR packets. The longer the bar the longer it takes to display the reception frame.

10.11.2. Functions

Object	Content
SELECT dial (Turn)	Move selection. In case of paused graph, moves time axis.
SELECT dial (Push)	No action while graph is updated. Select an item when in pause. <i>*Selected item displayed in blue can be moved from time axis with DIAL encoder.</i>
F1 V-axis adjust	Change vertical axis. 700ms → 1s → 2s → 5s → 700ms...
F2 H-axis adjust	Change horizontal axis. 1s → 2s → 5s → 1s...
F3 	Pause/ Resume graph update.
F4	No assigned function.
F5	No assigned function.
F6	No assigned function.

10.11.3. Others

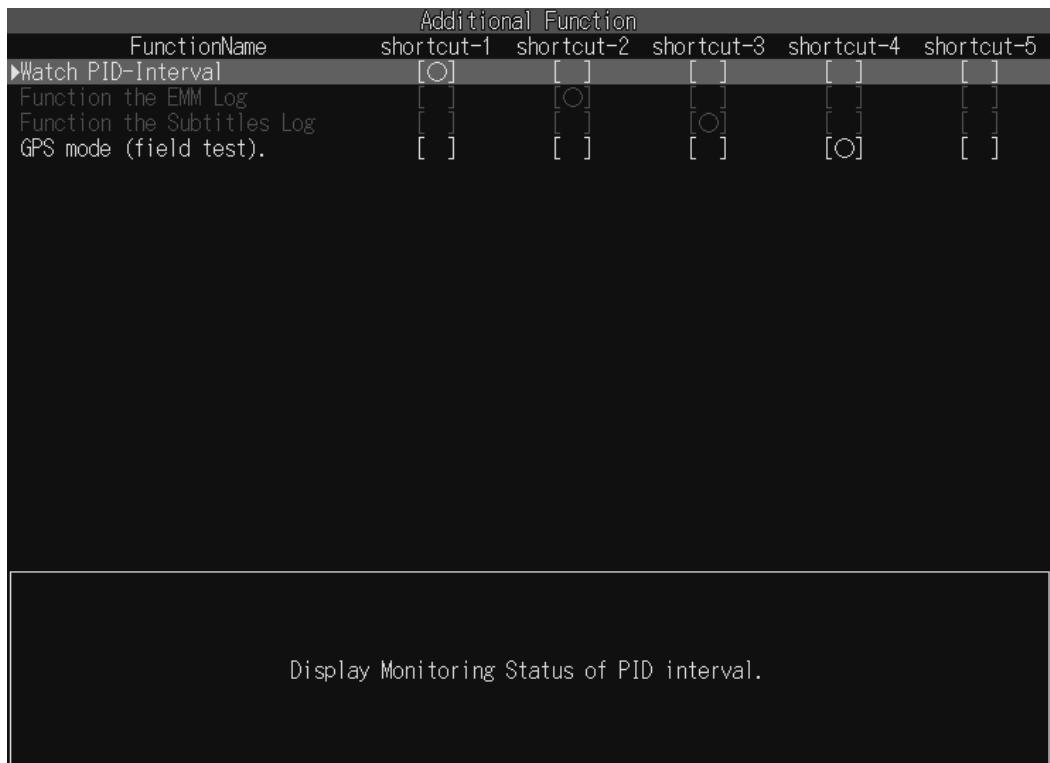
- Maximum of 1024 PTS.

11. Quick Menu

Press MENU button for Quick Menu items display.

11.1. Extensions

HACOBE2 has additional functions (optional) and can be added to Quick Menu. Licensed features are displayed in white characters, while unlicensed are displayed in gray.



11.1.1. Screen items

Item Name	Description
Function Name	Name of additional features (optional).
Shortcut 1 – 5	Assign the mark [○] to the corresponding shortcut space this feature should be displayed.
Bottom screen	Description of additional features (optional).

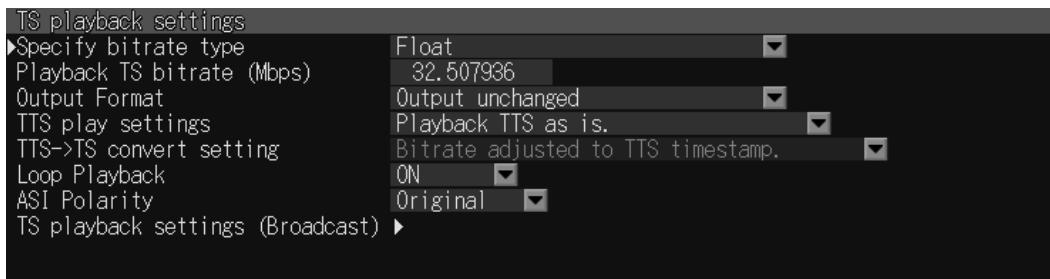
*See section **12. Additional Functions** for more information.

11.2. Start/Stop Broadcasting

“Stop broadcast” will be displayed if TS is being recorded and “Start broadcast” if no TS is being recorded.

11.3. Playback Settings

Stop playback if current TS enables function. During LIVE analysis, grayed items cannot be selected, but in case of playing control mode it's possible to configure TS reproduction.



11.3.1. Screen Items

Item Name	Description
Specify bitrate type	<p>Specify TS-RAW data bitrate playback in decimal or fraction.</p> <p>Decimal specification Set playback bitrate as "xx.xxxx Mbps". Accuracy will be reduced due to truncated decimal display.</p> <p>Fractional specification Set playback bitrate as "xxxx/ xxxx Mbps". Accuracy will be increased due to no decimal error conversion.</p>
Playback TS bitrate (Mbps)	Specify TS-RAW data playback speed (transmission bitrate). Set between 0.1 (100kbps) and 199.999999 (200Mbps) when in decimal settings, and 1 / 1-99999 / 99999 when in fractional settings.
Output Format	Convert TS-RAW data to TS broadcast format.
TTS play settings	<p>Specify whether play remains TTS or convert to TS.</p> <p>TTS play Play TTS according to TTS time stamp. In this case, TS reproduction bitrate is preset by the network and TS playback ignored.</p> <p>Convert TS inserting NULL packet to TTS Playback, based on TTS time stamp, during conversion of TTS to TS. Network TS bitrate reproduction preset and TS playback match TTS time stamp by inserting NULL packets.</p>
TTS → TS conversion setting	<p>Specifies the action, in case of reproduction converting TTS into TS, of changing playback bitrate and TTS time stamp.</p> <p>Playback bitrate Priority for set playback bitrate. Ignore the difference between playback bitrate and TTS time stamp.</p> <p>Match playback bitrate and TTS time stamp Match progress in TTS time stamp of playback while fine-tuning the bit rate.</p>
Loop playback	Loop setting during playback.

Item Name	Description
ASI polarity	<p>Specify ASI output polarity.</p> <p>Maintain output polarity Maintain recorded ASI output polarity</p> <p>Output positive polarity Regardless of input, it will output positive polarity.</p> <p>Output negative polarity Regardless of input, it will output negative polarity.</p>
TS playback settings (Broadcast)	Transition setting screen of TMCC information in the case of broadcast TS format conversion.

11.3.2. Others

- **Set TS play**
Direct output

Enable TS (broadcast and archive), on internal storage, to play according to recorded data timing.

Converted broadcast TS output

Digital terrestrial TS recorded on HACOBE is converted and outputted. (Hierarchy information, IIP and appended RS)

TS packet ending in 16 bytes hierarchy information and Reed-Solomon is added. Change Reed-Solomon settings ON/OFF (without multiple padded 0)

Hierarchy information defined in ARIB STD-B31 is multiplexed on dummy byte data but AC data will not.

IIP sent as the last packet of ISDB-T frame. IIP packet defined by ARIB STD-B31, "next" settings is disabled.

```
IIP_branch_number
last_IIP_branch_number
network_synchronization_information_length
```

All above data set with "0" will be filled with 0xFF.

To playback "Converted Broadcast TS output" set the modulation mode in pre-broadcast TS playback settings. Generated pattern from this ISDB-T frame setting will attempt to match the TS trying to play. Playback will start if match is successful, but if set modulation mode of recording TS does not match, playback will not be available.

Converted broadcasting TS (BS) output

TS stored in HACOBE is outputted after converting to BS digital broadcasting TS by ARIB STD-B20 (Format for uplink station to satellite).

Because TS recorded in HACOBE have 1TS in one transponder in case of play a dummy TS is added. Acquire necessary number of slots for recording TS, modulation scheme · TSID from arrangement and bit rate of TS data included in HACOBE.

TS with less than 48 slots is filled with dummy TS in the following format:

- All NULL packets
- TSID recorded TSID + 1 (if TSID recorded was 0xFFFFE, it will change to 0xFFFFD)

Dummy TS are filled from the beginning of the slot as TC8PSK.

Therefore, 2TS are multiplexed on output; first is dummy TS and the second recorded on HACOBE.

TMCC multiplexed have the following specifications:

- relative TS and slot information as described above
- change instruction = 0
- start-up control signal = 0
- uplink control information = 0

11.4. Log

Log is displayed on the screen bottom center or on expanded view on the main window. Usually only the latest 10 log are displayed, Log mode can refer to all logs in HACOBE2. It can hold up to 10,000 logs.

Date	Input	Contents
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x04F0)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x01F0)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x03F0)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x04F0)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0162)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0110)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0140)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0163)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0162)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0160)
▶ 15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0581)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0110)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0901)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0140)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x1C61)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0024)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0900)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0160)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0161)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0583)
15/08/07 16:02:02	RF (UHF)	[occurred] PCR Jitter(+) (PID=0x01FF 5097msec)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0902)
15/08/07 16:02:02	RF (UHF)	[occurred] Continuous indicator error (PID=0x0164)
15/08/07 16:02:02	RF (UHF)	[occurred] PCR Jitter(+) (PID=0x05FF 5097msec)
15/08/07 16:02:02	RF (UHF)	[occurred] CRC error (PID=0x0162 table_id=0xC3 CRC(OK)=58EE818)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0583)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0164)
15/08/07 16:02:02	RF (UHF)	[recover] Continuous indicator error (PID=0x0900)
15/08/07 16:02:02	RF (UHF)	[occurred] CRC error (PID=0x1D74 table_id=0x3C CRC(OK)=6AEFC02)

11.4.1. Screen Items

Item Name	Description
Date and time	Display log generated time. However, logs occurred during TS playback will be displayed in recorded time and date.
Log Number	Display log number determined for each log content.
Content	Display contents of generated log. Text color changes according to warning level. Red: error log Yellow: alert log White: information log <i>*Logs containing warning (character color) can be set by monitoring settings regardless of content. Display color can be customized.</i>

11.4.2. Functions

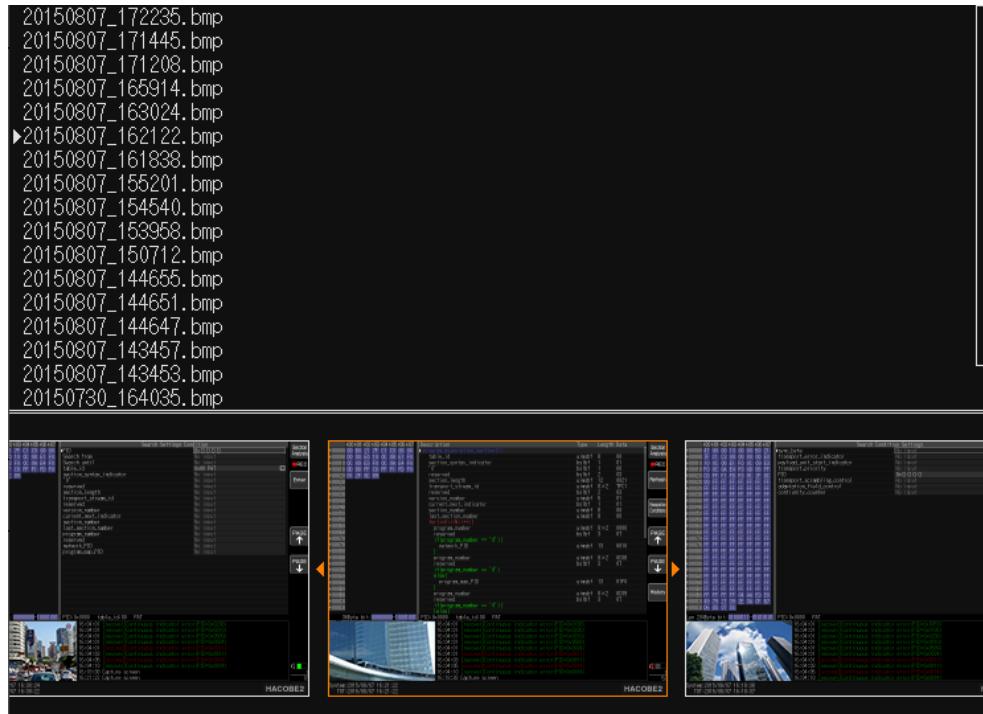
Object	Content
SELECT dial (Push)	Start TS playback from selected date and time of log occurrence.
F1 	Move up the screen.
F2 	Move down the screen.
F3  	Move cursor to top or bottom of log list.
F4   	Switch ascending/descending log order. <i>*Log is usually sorted by date and time.</i>
F5 	Playback selected log broadcast data. <i>* Same operation as playback by specific date and time.</i> <i>* Archive, TS-Raw or Together data log will playback broadcast.</i>
F6 	Delete all currently saved logs.
F7 	Expand log window.

11.4.3. Others

- As TS-RAW data does not contain date and time information, during its playback log will be added as current date and time.
- During LIVE analysis, when an error occurs pressing F5 button (date and time log playback) playback will start immediately. Log playback of archive data, TS-RAW or Together might play unintended date and time.

11.5. Screenshot

Review and manage captured screen shot.



11.5.1. Screen Items

Item Name	Description
Upper screen	List of screenshots.
Lower screen	Screenshots thumbnails.

11.5.2. Functions

Object	Content
SELECT dial (Push)	Display full-screen of selected screenshot. <i>*Press BACK key to return to list of screenshots.</i>
F1	Update screenshot list.
F2	Select multiple items.
F3	Display full-screen of selected screenshot.
F4	No assigned function.
F5	Delete selected screenshot.
F6	No assigned function.
F7	No assigned function.

11.5.3. Multiple Selection

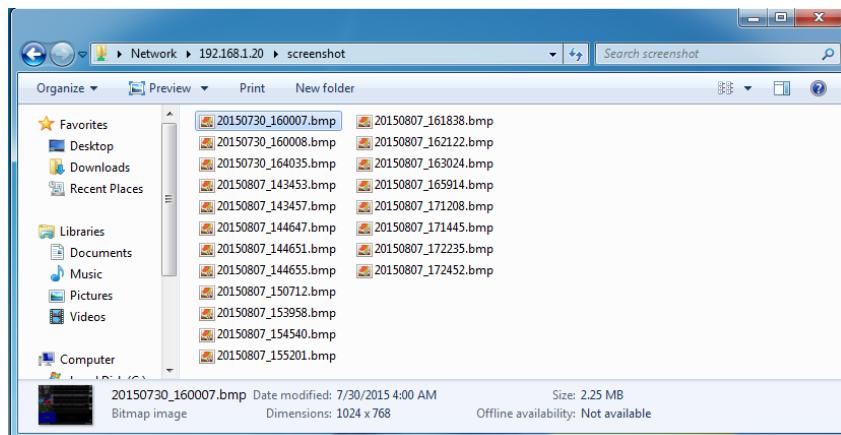
Select multiple items for copy or erase in bulk.



Object	Content
SELECT dial (Push)	Check or uncheck selection of each item box.
F1	Check all item box.
F2	Cancel multiple selection and return to normal screenshot screen.
F3	No assigned function.
F4	Copy selected items to external USB. <i>*Not available if external USB is not connected.</i>
F5	Delete selected items.
F6	No assigned function.
F7	No assigned function.

11.5.4. Others

- Get screenshots from shared folder.



11.6. Report Output

Some analysis mode can output results as a report file in addition to screen shot in html or csv format. To output a report an external USB must be connected.



11.6.1. Others

Analysis mode report can be outputted as follows:

Mode Name	Directory Name	Output Content
PID List	pidlist	<ul style="list-style-type: none"> PID List HTML file
Packet Cycle	packetcycle	<ul style="list-style-type: none"> Packet Cycle HTML file
PI Tree	pidtree	<ul style="list-style-type: none"> PID Tree HTML file
PCR Jitter	pcrjitter	<ul style="list-style-type: none"> Jitter Amount CSV file
RF/BSIF Information	rfsif	<ul style="list-style-type: none"> Viewed graph CSV file
Packet Analysis	packetanalyze	<ul style="list-style-type: none"> Binary Packet Data Data table HTML file
Section Analysis	sectionanalyze	<ul style="list-style-type: none"> Binary Section Data Data table HTML file
Channel Search	chsearch	<ul style="list-style-type: none"> Search Result HTML file
Log	log	<ul style="list-style-type: none"> Log CSV file
Connection Settings List (together)	-	<ul style="list-style-type: none"> Connection Settings CSV file
GPS	gps	<ul style="list-style-type: none"> Every hour GPX file CSV file, such as BER data

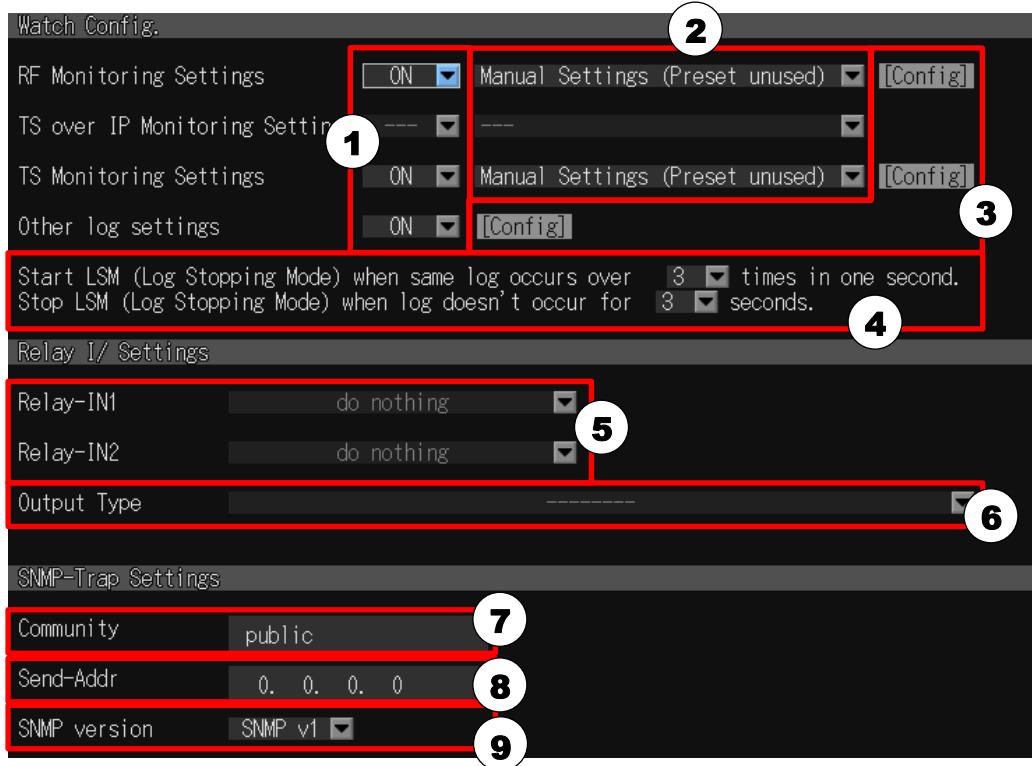
11.7. Enable/Disable Functions

Same action if selected 'System Settings > Function Settings > Enabling/Disabling'.

*See section 11.10.12. **Enable Disable Function** for more information.

11.8. Monitoring Settings

Set alarm log and RF/IP/TS monitoring parameters.



11.8.1. Screen Items

Item No.	Description
1	Switch monitoring ON/OFF. *OFF monitoring is temporary. Once the device is restarted it becomes ON automatically.
2	Change monitoring settings preset. *Existing monitoring and adapting preset setting will be overwritten.
3	Switch to corresponding monitoring item Setting screen.
4	Log Stopping Mode Settings. *In case of repeat occurrences during very short time this function will suppress the amount of log displayed according to preset.
5	Set operation at time of input contact.
6	Set release condition of output contact.
7	Set community name of SNMP-Trap.
8	Set destination of SNMP-Trap.
9	Set version of SNMP-Trap.

11.8.2. Monitoring Settings Screen

RF Monitoring Settings						
	ON	Kind	Ctrl	Rel.	SNMP	Setting
►CN decline error	[○]	[Err.]	[]	[]	[]	[25.0]
BER(A) error	[]	[Err.]	[]	[]	[]	[2.0E-04]
BER(B) error	[○]	[Err.]	[]	[]	[]	[2.0E-04]
BER(C) error	[○]	[Err.]	[]	[]	[]	[2.0E-04]
MER error	[]	[Err.]	[]	[]	[]	[20.0]
Level(dBm) under threshold error	[○]	[Err.]	[]	[]	[]	[-88.0]
Level(dBm) over threshold error	[○]	[Err.]	[]	[]	[]	[-20.0]

Item No.	Description
1	Switch monitoring ON/OFF.
2	Set type of case occurred (color text). *Error: red Warning: yellow Information: white
3	Set whether to adapt log suppression.
4	Set whether increase contact alarm when event occurs. *Contact Board Option is required.
5	Set whether increase SNMP-Trap when event occurs. *SNMP-Trap Option is required.
6	Set log threshold for monitoring.

Functions

Object	Content
F1 Enable/ Disable	Set ON/OFF monitor and log.
F2 Status kind	Select type of monitoring from "Information", "Warning" or "Error". The color changes according to the selected type.
F3 Control	Specify suppression of logs based on "log suppression count / log depression timeout" frequency.
F4 Relay	Set whether to use contacts 1-4 for each item. Change as " " → "1" → "2" → "3" → "4" → "5" → "6" → "7" → " " → "1" → ...
F5 SNMP	Set whether to use SNMP-Trap 1-4 for each item. Change as " " → "1" → "2" → "3" → ... → "14" → "15" → "16" → " " → "1" → ...
F6	No assigned function.
F7	No assigned function.

11.8.3. Others

See section **15. Monitoring Settings List** for more information.

11.9. License

Check extensions and licenses of HACOBE 2. Add functions entering license code, issued according to "individual identification code".

Device Identification Code		
XXXX-XXXX-XXXX-XXXX		
License List		
CODE	LICENSE NAME	Enable/Disable
►TSA1200-S0239	: 1.6TB TS-Recording License	= Disable
TSA1200-S0238	: 400GB TS-Recording License	= Enable
TSA1200-S0231	: ISDB-T/Tb Receiving License	= Enable
TSA1200-S0232	: Japanese BS Receiving License	= Disable
TSA1200-S0233	: Japanese CS(ND) Receiving License	= Disable
DIAL/OK	Cancel	Display

Item Name	Description
Identification Code	Unit identification code. *Necessary to issue licenses.
License Code	License number.
License Name	License name.
Enable/Disable	Display license status (enabled/disabled).

11.9.1. Functions

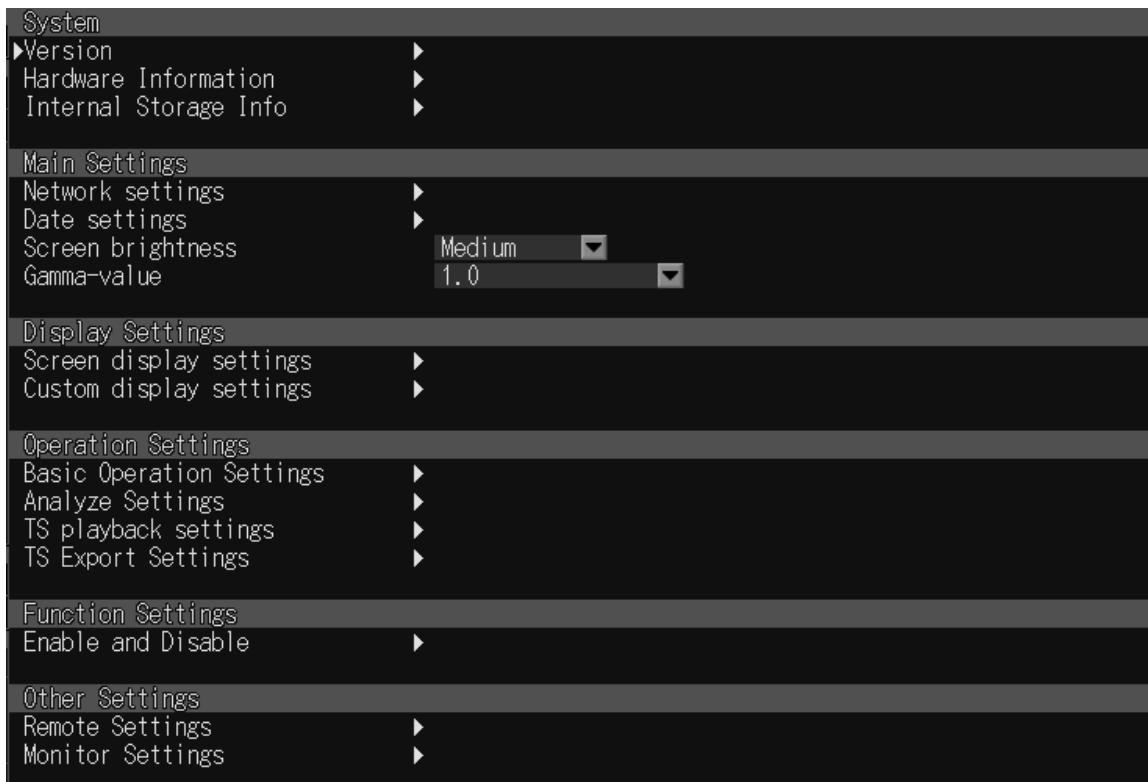
Object	Content
DIAL encoder (Push)	Start selected license authentication.
F1 	Update status license display list.
F2	No assigned function.
F3	No assigned function.
F4 	Start selected license authentication.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

11.9.2. Others

- License authentication is also available on HACOBE 2's web screen.

11.10. System

Set system configuration. Settings of initialization, recorded data, version information and firmware updates are controlled in this mode.



System

Item Name	Description
Version	Display version information.
Hardware Information	Display hardware (optional) configuration of HACOBE 2.
Internal Storage Info	Display built-in storage (HDD) information.

Main Settings

Item Name	Description
Network Settings	Adjust device IP address settings.
Date Settings	Adjust date and time setting screen.
Screen Brightness	Adjust backlight of LCD panel.
Gamma-value	Specify display gamma value.

Display Settings

Item Name	Description
PID Notation	Specify hexadecimal and decimal notation of PID (Packet ID).
SID Notation	Specify hexadecimal and decimal notation of SID (Service ID).
Service	Display PMT settings not included in PAT.
Custom display Settings	Display screen settings customization.

Operation Settings

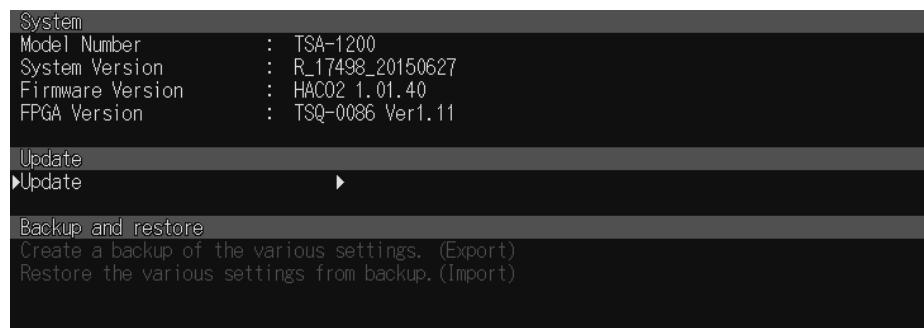
Item Name	Description
Basic Operation Settings	Performance settings during operation.
TS Playback Settings	Adjust playback settings for recording/ archive/ TS-RAW/ Together data.
TS Export Settings	Adjust settings for broadcast conversion to TS-RAW data.

Function Settings

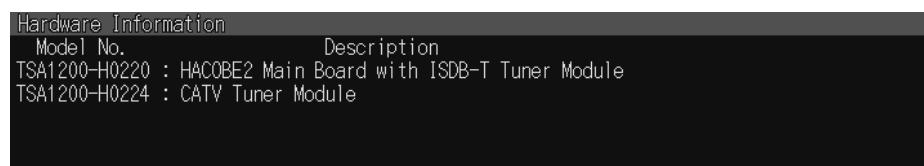
Item Name	Description
Enable and Disable	Enable/Disable broadcast analysis function.

Other Settings

Item Name	Description
Remote Settings	Adjust remote console connection/VNC remote access settings.
Monitor Settings	Adjust VGA or HDMI terminal display connection settings.

11.10.1. Version Information

Item Name	Description
Model Number	Display model name and number.
System Version	Display software version.
Firmware Version	Display firmware version.
FPGA Version	Display RF Board firmware version.
Update	Update HACOBE 2.

11.10.2. Hardware Information

Item Name	Description
Model Number	Display model name and number of hardware options installed on HACOBE 2.
Name	Display hardware option name.

11.10.3. Built-in Storage information



Disk Size

Item Name	Description
System area capacity	OS and system file free space area.
Data area capacity	TS recording and screenshot shared folder storage capacity.
Recorded data usage	Data size area used in TS recording.
Archive data usage	Data size area used by Shared folder.
TS-RAW Data Usage	Data size area used by TS-RAW storage.
Other data usage	Data size area used for non-TS data files, such as Webpages, screenshots.
Free Space	Free HDD space remaining.

Data Initialization

Item Name	Description
Erase All Recorded Data	Erase all TS recording. <i>*TS data in the Shared Folder will not be deleted.</i>

Recording Settings

Item Name	Description
Padding (Without input status)	Set recorded data minimum number of bytes per second. <i>*Small value increases recording period and disk burden. High value reduces recording period and disk burden.</i>
Automatic recording Pause	Automatically stop recording if TS input is lost in case frequency stops. <i>*Once input is resumed recording will as well, automatically.</i>

11.10.4. Network Settings

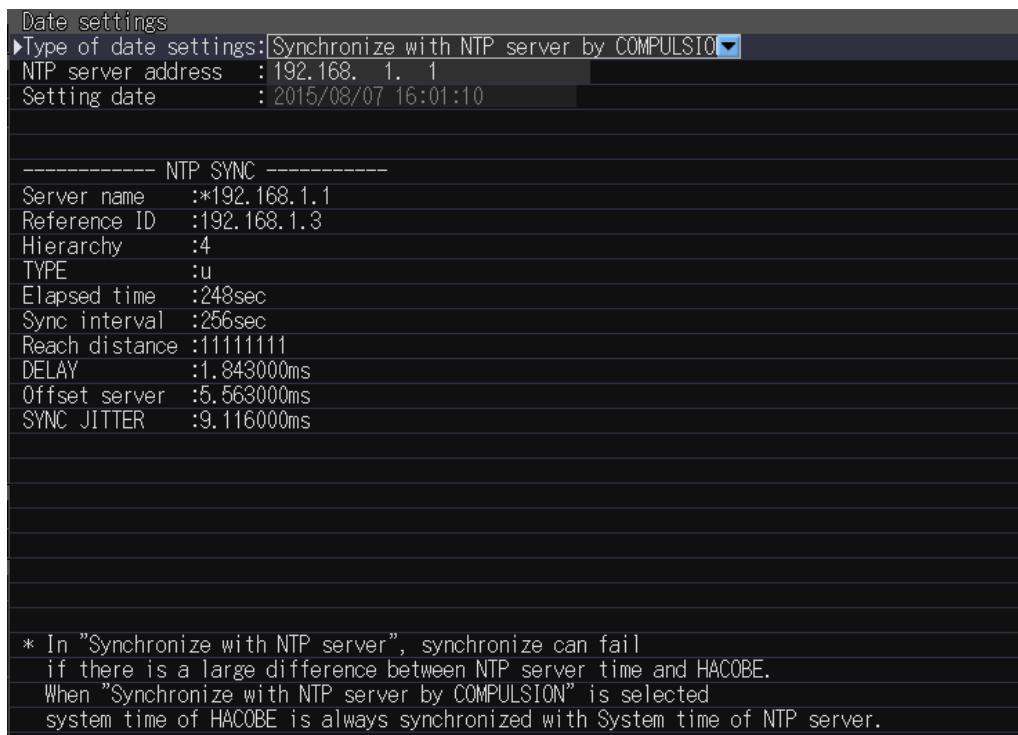
Network settings	
IPv6 config.	Auto
LAN1	
IPv4 address / mask	: 192.168. 0. 20/22
IPv6 address / mask	: -----:-----:-----:-----:-----:-----
IPv4 Default gateway	: 192.168. 1. 1
MAC address	: "00:04:5F:05:37:DC"
LAN2	
IPv4 address / mask	: 0. 0. 0. 0/ 0
IPv6 address / mask	: -----:-----:-----:-----:-----:-----
MAC address	: "00:04:5F:05:37:DD"

Item Name	Description
IPv6 configuration	Automatic configuration of IP Address on IPv6, ON/OFF.
IPv4 address/mask	Adjust IP address and subnet mask of IPv4. Adjust Subnet mask using valid bit number (255.255.255.0 ⇒ 24bit, 255.255.240 ⇒ 20bit).
IPv6 address/mask	Adjust IP address and subnet mask of IPv6. Adjust Subnet mask using valid bit number.
IPv4 Default Gateway	Adjust default gateway.
MAC Address	Display LAN port MAC address.

Functions

Object	Content
F1 	Update network settings. <i>*Not available during unit updates.</i>
F2	No assigned function.
F3	No assigned function.
F4	No assigned function.
F5	No assigned function.
F6	No assigned function.
F7	No assigned function.

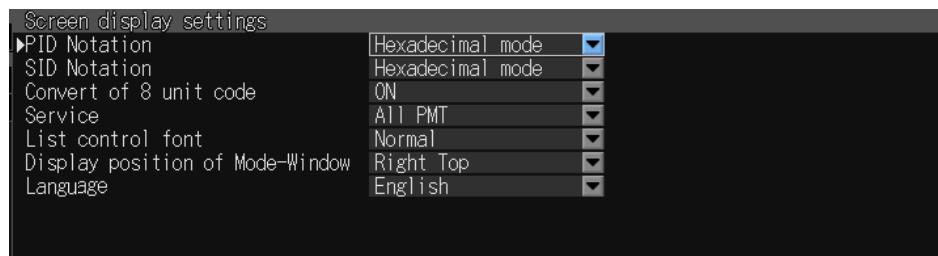
11.10.5. Date Settings



Item Name	Description
Type of date settings	Adjust date and time setting method: "Synchronize with NTP Server"/ "Synchronize with NTP server by Compulsion" / "Set date manually" or "Setting TOT time".
NTP server address	Specify NTP server IP to perform synchronization.
Setting date	In case of manual setting, adjust date and time setting. In case of TOT synchronization time is displayed in TOT.

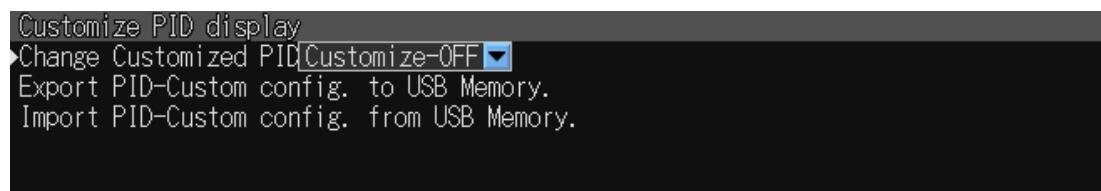
- "Synchronize with NTP server by Compulsion" selected and F1 (update) button pressed will discard current system time and time obtained from NTP server forced to set. For subsequent operations perform same operation as "Synchronize with NTP server."
- Select "Setting TOT time" during TOT time synchronization update, on manual settings.
- If time is adjusted towards past time, there is a possibility TS data already recorded will not be read accordingly or new data be recorded.

11.10.6. Screen Display Settings



Item Name	Description
PID Notation	Specify display of PID (packet ID) in hexadecimal or decimal notation.
SID Notation	Specify display of SID (packet ID) in hexadecimal or decimal notation.
Convert of 8 unit code	Set 8 unit decoding code for character string such as service name.
Service	PMT display settings not included in PAT.
List control font	Set control box display character size.
Display position of Mode-Window	Set Mode Window position display.
Language	Set displayed language.

11.10.7. Custom Display Settings



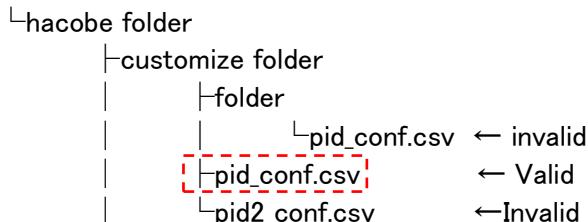
Item Name	Description
PID Custom display	Customize each packet display method of Packet Analysis Screen.
USB Output of PID Setting	Output current custom display settings to USB memory.
Import PID Settings	Import custom display settings from USB memory.

Custom PID display settings file (pid_conf.csv)

In PID custom display function file on USB storage will be adapted as customized setting.

[Image]

USB Memory

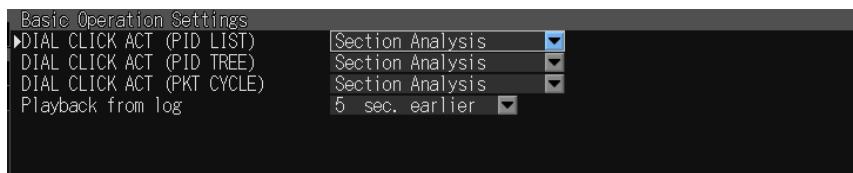


#PID, TID, Strings
0x0000, 0x00, Program Association Table(PAT)
0x0001, 0x01, Conditional Access Table(CAT)
0x0010, 0x40, Network Information Table(NIT)-Own network
0x0010, 0x41, Network Information Table(NIT)-Other network
0x0011, 0x42, Service Description Table(SDT)-Own stream
0x0011, 0x46, Service Description Table(SDT)-Own stream
0x0011, 0x4A, Bouquet Association Table
0x0012, 0x4E, Event Information Table(EIT)-Own stream p/f
.
.

Description rules of pid.conf.csv file is as follows:

- The items order is "PID", "Table_id", "character column display".
- Annotations (comment) are indicated with "#" in the beginning of line.
- If there is no PID the line is ignored.
- table_id is optional. It is treated as omitted and 0x00 ~ 0xFF.
- table_id is specified in either a single fixed value (0xXX) or single range value (0xXX-0xXX).
- PID or table_id can overlap.
- If PID, table_id are the same on import it will be error.
- Character code is SJIS.
- Up to 20 double-byte characters, subsequents are not displayed.

11.10.8. Basic Operation Display Settings



Item Name	Description
DIAL click Act (PID List)	Set action when SELECT dial is pressed on PID List Mode.
DIAL click Act (PID Tree)	Set action when SELECT dial is pressed on PID Tree Mode.
DIAL click Act (packet period)	Set action when SELECT dial is pressed on Packet Cycle Mode.
Playback from log	Set playback from log date and time offset time on Log Mode.

11.10.9. Analyze Settings



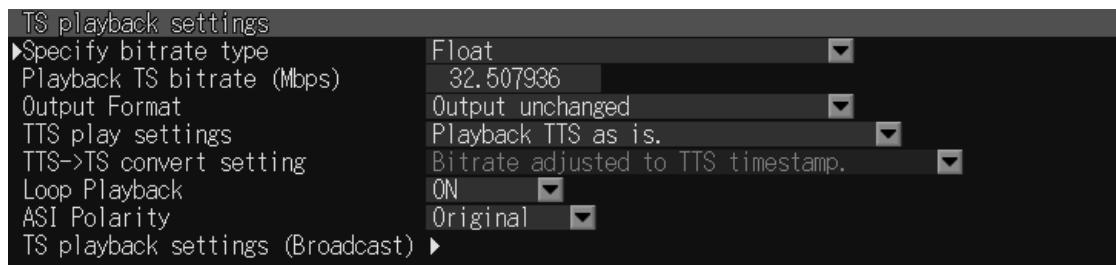
Item Name	Description
Analyze Mode	Set TS Analysis standard. <i>*ARIB/JCTEA for Japanese language and ARIB/NBR for English.</i>
TSMF Separate	Set TSMF input operation. <i>*Only set for JCTEA analysis.</i>

11.10.10. TS Export Settings



Item Name	Description
File Divide Size	Set TS data size limit on TS-Raw conversion.
Saving Priority	Set whether begins TS-Raw conversion from begin or middle of the packet. <ul style="list-style-type: none"> • Start point output as is Even if there is broken data (TS packets fragments) on the beginning of conversion source it will convert directly. • Start point output as first received packet Even if there is broken data (TS packets fragments) on the beginning of conversion source it will convert from the start of TS packet.

11.10.11. TS Playback Settings

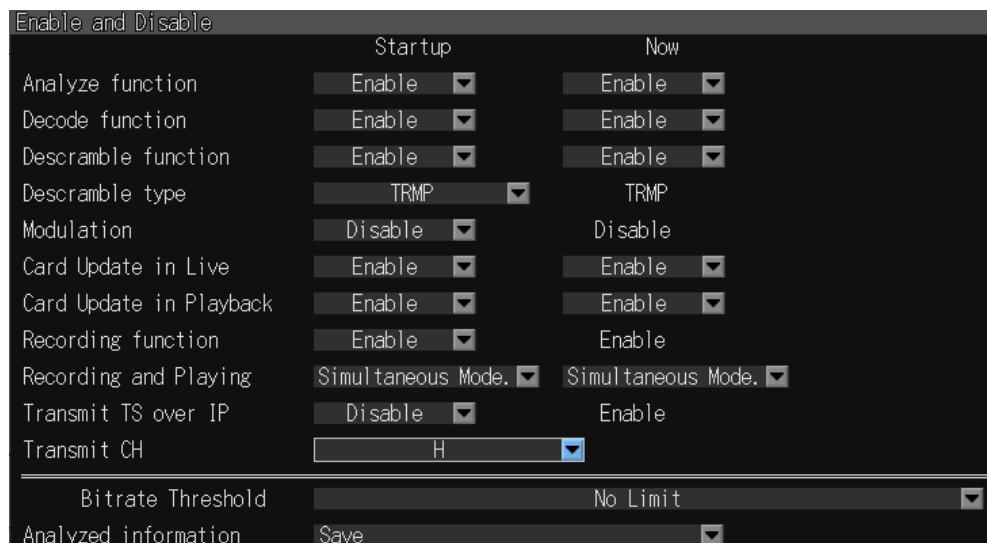


On recording MAP and Playback Mode the option “TS-Play Config” will be displayed on Quick Menu or on System Config screen.

*See section **11.3 Playback Settings** for more information.

11.10.12. Enable Disable Function

Enable or disable analysis, recording, modulation settings. Set ON/OFF for startup and current settings.

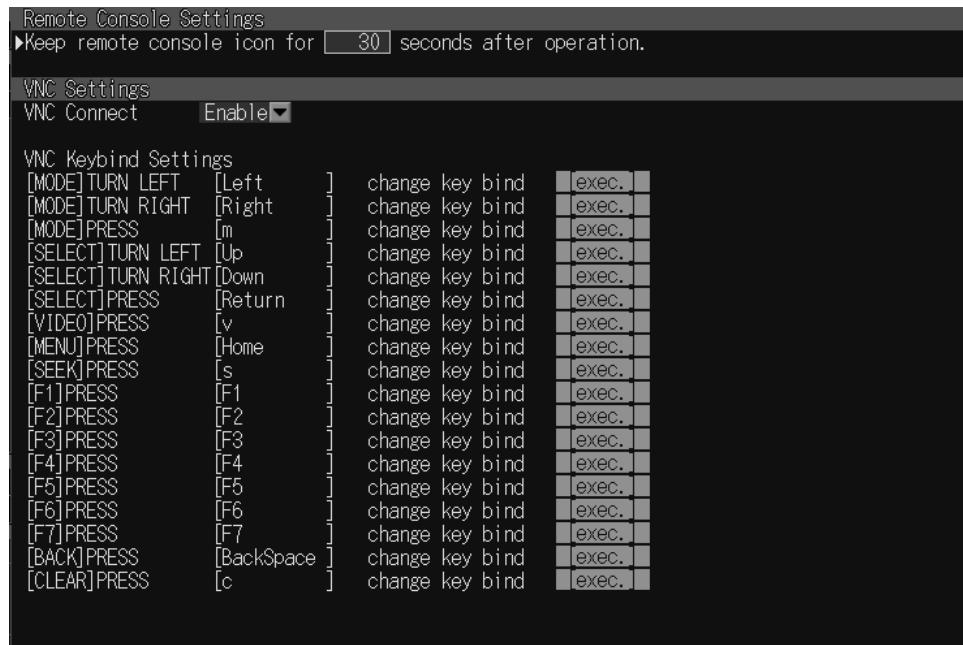


Item Name	Description
Analyze function	Disable TS analysis. Operate on recording function only.
Decode function	Enable/Disable decoding (playback of EON) function.
Descramble function	Enable/Disable TS packet descrambling. <i>*Descrambling option license is required.</i>
Descramble type	Select descrambling method between CAS card/ TRMP/ AES128. <i>*TRMP and AES128 descrambling requires license.</i>
Modulation	Enable/Disable RF modulated output. <i>*Modulated output option license is required.</i>

Item Name	Description
Receive EMM in Real-time	Set whether to send IC card EMM received during real-time analysis.
Receive EMM in Playback	Set whether to send IC card EMM received during broadcast playback.
Recording function	Enable/Disable TS broadcast recording. <i>*TS recording option license is required.</i>
Recording and Playing	“Simultaneous Mode” allows recording and reproducing data simultaneously. “Exclusive Mode” allows either record or play. <i>*For “Exclusive Mode” is necessary TS exceeding 60Mbps. Operation is not guaranteed if TS exceeds 60Mbps in “Simultaneous Mode”.</i>
Transmit TS over IP	Enable/Disable TS over IP output function.
Transmit CH	IP Output Settings.
Bitrate Threshold	If input data rate becomes higher than specified value it automatically stops TS recording. Select "no limit" to disable.
Analyzed information	Set whether to automatically perform clear analysis in case of TS input switch or ASI reconnection.

11.10.13. Remote Settings

Use Remote Console or Remote Desktop Connection (VNC) to remotely control the body of HACOBE 2. Adjust settings for remote operation.

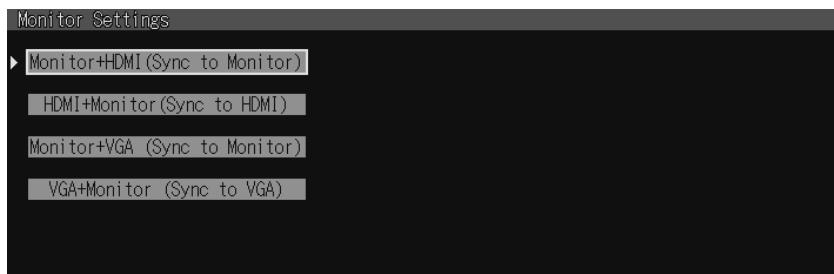


Item Name	Description
Remote Console Settings	
Operation icon display time	Set amount of time remote console icon will be displayed on HACOBE2 screen.
VNC Settings	
VNC Connection	Enable/Disable VNC Connection.
Key Assignment	Assign keyboard buttons to each operation. Push SELECT dial to execute and Run button to assign a new keyboard operation.

- **VNC Connection**
HACOBE2 supports (Virtual Network Computing) connection via IP address to Windows free software "UltraVNC".

**Ultra VNC is free software not developed by Traffic Sim Co., Ltd., therefore, we take no responsibility of any kind on usability and/or product behavior, including but not limited to virus infection on any system.*

11.10.14. Monitor Settings



Item Name	Description
Monitor + HDMI (Sync to Monitor)	Set according to HACOBE2 monitor to display the image on both HACOBE2 and HDMI monitor.
HDMI + Monitor (Sync to HDMI)	Set according to HDMI monitor to display the image on both HACOBE2 and HDMI monitor.
Monitor + VGA (Sync to Monitor)	Set according to HACOBE2 monitor to display the image on both HACOBE2 and VGA monitor.
VGA + Monitor (Sync to VGA)	Set according to VGA monitor to display the image on both HACOBE2 and VGA monitor.

*It's not possible to connect to VGA and HDMI monitor at the same time.

12. Additional functions

12.1. Overview

In addition to basic functions of HACOBE2, various optional additional/extension functions are available. To add extensions press the MENU button, followed by F7 button.

12.2. PID Interval Monitoring

Monitors reception cycle of each packet included in the inputted TS and sounds an alarm in case it becomes off the proper period. PID Interval Monitoring displays log and whether the period of any PID had an error.

P I D	name	ave./conf.	Last Received
0' 0 0 0 1		10.0s/	1.0s (3') 09:19:10
0' 0 0 0 1		10.0s/	1.0s (3') 09:19:10
0' 7 PES(Subtitle)		3.7s/	5.3s (3') 09:19:19
0' 7 PES(Subtitle)		3.7s/	4.9s (3') 09:19:19
0' 0 0 0 0		99.9ms/	1.0s (3') 09:19:19
0' 0 0 0 0		99.9ms/	1.0s (3') 09:19:19
0' 0 0 1 0		1.1s/	1.3s (3') 09:19:19
0' 0 0 1 0		1.1s/	1.2s (3') 09:19:19
0' 0 0 1 1		2.0s/	2.4s (3') 09:19:19
0' 0 0 1 1		2.0s/	2.2s (3') 09:19:19
0' 2 0 0 1 2		11.6ms/	1.0s (3') 09:19:19
0' 2 0 0 1 2		11.6ms/	1.0s (3') 09:19:19
0' 4 0 0 1 4		5.0s/	6.0s (3') 09:19:17
0' 4 0 0 1 4		5.0s/	5.5s (3') 09:19:17
0' 3 SDTT		3.4s/	4.0s (3') 09:19:19
0' 3 SDTT		3.4s/	3.7s (3') 09:19:19
0' 4 0 0 2 4		1.1s/	1.3s (3') 09:19:19
0' 4 0 0 2 4		1.1s/	1.2s (3') 09:19:19
0' 7 0 0 2 7		330.1ms/	1.0s (3') 09:19:19
0' 7 0 0 2 7		330.1ms/	1.0s (3') 09:19:19
0' 9 CDT		13.4s/	16.0s (3') 09:19:19
0' 9 CDT		13.4s/	14.6s (3') 09:19:19
0' ECM, ECM-S		100.1ms/	120ms (3') 09:19:19
0' ECM, ECM-S		100.1ms/	110ms (3') 09:19:19
0' ECM, ECM-S		100.0ms/	120ms (3') 09:19:19
0' ECM, ECM-S		100.0ms/	110ms (3') 09:19:19
0' EMM, EMM-S		25.3ms/	1.2s (3') 09:19:19
0' EMM, EMM-S		25.3ms/	1.1s (3') 09:19:19
0' PCR		57.9ms/	100ms (3') 09:19:19

*TS Monitoring option license is required.

12.2.1. Screen Items

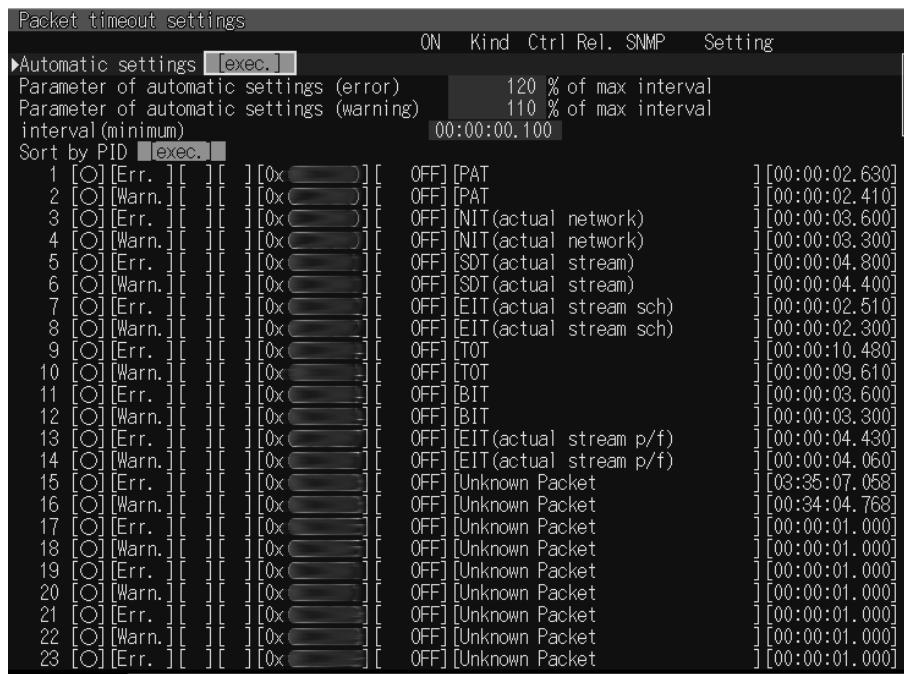
Item Name	Description
PID	Current packet error state (alarm status). Normal status (green), warning (yellow) and error (red). To confirm alarm status press F2 button. Left edge of the status will turn green.  Green left edge will be maintained until packet status changes.
Name	Packet name.
Ave./Conf.	Average packet and alarm set value of received interval.
Last Received	Latest date and time of received packet.

12.2.2. Functions

Object	Content
DIAL encoder (Push)	No assigned function.
F1  	Sort display of PID alarm condition.
F2 	Confirm PID alarm status (left marker will be displayed in green).
F3	No assigned function.
F4	No assigned function.
F5	No assigned function.
F6 	Switch display in the following order: Detail View → PID List → Name List.
F7 	PID timeout settings.

12.2.3. PID Interval Monitoring Settings

Adjust PID Interval Monitoring settings pressing F7 (Set) button on PID Interval Monitoring screen or select MENU → monitoring settings → TS monitoring settings → PID timeout settings.



Item Name	Description
Automatic settings	Based on analyzed content, set appropriate monitoring items and automatic intervals.
Parameter of automatic settings (error)	Set automatic settings, whether to have any error threshold margin (error tolerance range).
Parameter of automatic settings (warning)	Set automatic setting, whether to have any warning threshold margin (error tolerance range).
Sort by PID	Rearrange in ascending order of PID. <i>*Original sort order does not return after using this function.</i>
Number	Monitoring set number of PID Interval Monitoring. Set number of PID can be up to 200 items.
ON	Enable/Disable monitoring.
Type	Time alarm status. Choose from "Information/ Warning/ Error".
Contact	Set whether output contact when alarm occurs. <i>*This function requires license.</i>
SNMP	Set whether to send SNMP-Trap when alarm occurs. <i>*This function requires license.</i>
PID	Monitoring PID interval packets.
PMT Reference	Whether there are packets included on the monitored PMT. When setting is enabled and PMT exceeds PID threshold, packet will be ignored.
Name	PID displayed on the monitor screen name.
Period	Threshold of packet interval monitoring. It becomes an alarm status when exceeds threshold.

Functions

Object	Content
DIAL encoder (Push)	Set packet threshold value periodically monitored.
F1 	Enable/Disable monitoring.
F2 	Switch type of alarm.
F3 	Switch contact number to issue alarm. <i>*Contact Output option license is required.</i>
F4 	Switch Trap number of SNMP-Trap send. <i>*SNMP-Trap option license is required.</i>
F5 	Set PID packet periodically monitored.
F6 	Set whether to include the subject of periodic monitoring on packets not included in the PMT.
F7 	Set display name of PID Interval Monitoring.

12.3. EMM Log

Check whether card update information by EMM is flowing properly, from ID card output a log for each packet reception timing.

***Option currently not available outside Japan.*

CompatibleCard B-CAS	Filter	Enable EMM-Type	CardID
Logging Type Ctrl/IndivMsg	EMM1	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 1234 5678 8882 3352
	EMM2	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM3	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM4	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM5	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM6	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM7	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM8	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM9	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
	EMM10	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg	0000 0000 0000 0000 0000
Receive Time	EMM-Type	CardID	Match. Interval (s)
▶2015/11/16 10:34:31	Started.		
2015/11/16 10:36:08	Finished.		
2015/11/16 10:36:09	Started.		
2015/11/16 10:36:10	Finished.		

**EMM Logging Option License is required.*

12.3.1. Screen items

Item Name	Description
Corresponding card	Specify type of card currently receiving TS EMM, B-CAS or C-CAS.
Logging EMM	Select EMM logging with control, individual message, and simple message. Control/individual message: Log control and individual message at the same time. Simple message: Does not log.
EMM 1- 10	Specify Card ID of control/ individual messages logging. Filter flag: Enable/Disable Card ID setting. EMM Type: Extract EMM of control, individual messages or both. Card number: Set extracted ID card number from EMM.
Reception time	Date and time received appropriate card ID EMM packet.
EMM Type	EMM control/ EMM individual message/ EMM common message display.
Card Number	Display extracted EMM packets card ID.
Filter	Display whether EMM1 ~ 10 has matches in any setting.
Reception interval	Display Card ID EMM packet interval settings in minutes/ seconds/ milliseconds. Packet received first after logging start will be ----.

12.3.2. Functions

Object	Content
DIAL encoder (Push)	No assigned function.
F1  	Start/stop EMM logging currently displayed.
F2 	Change EMM logging Settings.
F3 	Automatic screen list scroll. <i>*Available when function is OFF.</i>
F4 	Switch unit reception display to minutes – seconds – milliseconds.
F5	No assigned function.
F6 	Clear currently displayed log.
F7 	Clear currently displayed log and EMM. <i>*Action cannot be undone.</i>

12.3.3. Add and Edit Settings

CompatibleCard B-CAS	Filter	Enable EMM-Type	CardID		
	EMM1	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 1234 5678 8882 3352		
	EMM2	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM3	Enable <input checked="" type="checkbox"/> IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM4	Disable <input checked="" type="checkbox"/> IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM5	IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM6	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM7	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM8	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM9	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
	EMM10	Enable <input checked="" type="checkbox"/> Ctrl+IndivMsg <input checked="" type="checkbox"/>	0000 0000 0000 0000 0000		
Logging Type Ctrl/IndivMsg	Receive Time	EMM-Type	CardID	Match.	Interval (s)

Object	Content
DIAL encoder (Push)	No assigned function.
F1 	Update EMM logging settings currently displayed.
F2	No assigned function.
F3 	Change EMM corresponding and logging. <i>*Change modified content display of matching EMM 1-10, corresponding log card and changing EMM log.</i>
F4	No assigned function.
F5  	Select and edit EMM 1-10. Row selection: Select button Item selection: Edit button
F6	No assigned function.
F7	No assigned function.

12.3.4. Others

- Measure, separately, receiving control interval and individual messages setting different EMM type with same card ID.
- If there is more than one EMM condition setting corresponding amount of log will be outputted. Check filter for log settings.
- On B-CAS, EMM card number has 20 digits; the last 5 digits are different to each card. If the top 15-digit card number matches it will be logged.
- On B-CAS, first 4 card number digits is always zero making unnecessary the card number input.
- Automatic scrolling is enabled by default, to pause move DIAL cursor. It will resume automatic scrolling once F3 button is pressed.
- EMM common message, control, individual message logging, card settings and initialization will all be erased when ALL CLEAR button is pressed.
- USB memory output reception interval report CSV file will depend on the currently displayed interval.
- Maximum log of 10,000. Over 10,000 logging stops automatically and restart after clear.

12.4. Subtitle Logging

During TS analysis, HACOBE2 extracts caption information from PES packet of specified PID. Analyze presence or absence of caption contents and clear packet in time log.

***Option currently not available outside Japan.*

Caption Log					
Receive Time	Time Kind	Data Kind	Clear packet presence	Contents	
► 2015/10/07 14:10:12.000	TOT			Started. PID:0x0130	
2015/10/07 14:11:24.762	TOT			Finished. PID:0x0130	
2015/10/07 14:11:57.000	TOT			Started. PID:0x0430	
2015/10/07 14:11:57.219	TOT	A:M	-		
2015/10/07 14:11:57.351	TOT	A:CC	-		
2015/10/07 14:11:58.187	TOT	A:M	-		
2015/10/07 14:11:59.154	TOT	A:M	-		
2015/10/07 14:11:59.821	TOT	A:M	-		
2015/10/07 14:11:59.972	TOT	A:CC	-		
2015/10/07 14:12:00.789	TOT	A:M	-		
2015/10/07 14:12:01.756	TOT	A:M	-		
2015/10/07 14:12:02.724	TOT	A:M	-		
2015/10/07 14:12:03.692	TOT	A:M	-		
2015/10/07 14:12:04.326	TOT	A:M	-		
2015/10/07 14:12:04.459	TOT	A:CC	-		
2015/10/07 14:12:05.293	TOT	A:M	-		
2015/10/07 14:12:06.260	TOT	A:M	-		
2015/10/07 14:12:07.229	TOT	A:M	-		
2015/10/07 14:12:08.196	TOT	A:M	-		

**Closed Caption Logging Option License is required.*

12.4.1. Screen Items

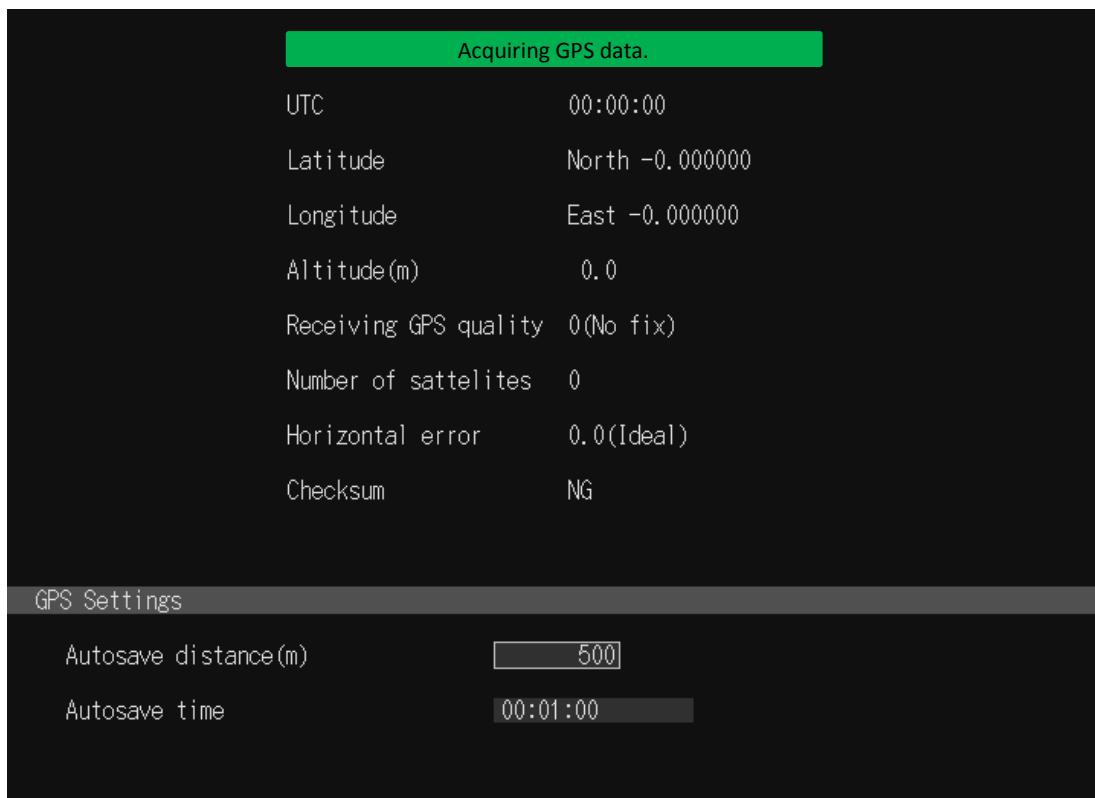
Item Name	Description
PID Logging	Specify Closed Caption extracted from PID PES packet.
Measurement Time	Set start and end logging time (measuring). Settable range is from 1 second to 12 hours.
Logging display	Display "Currently Logging" in green during process.
Receive Time	Date and time subtitle PES packet received.
Time Kind	Log reception time display either system time or TOT time. SYS: system time (current time). TOT: TOT time (TS data time).
Data kind	Type of data included in the subtitle PES packet in one data character. Sometimes multiple data is stored into one subtitle PES packet, and displays up to 10 characters. Type of character data: 'M' - management data 'C' - text data 'G' - geometric (graphic) 'A' - additional sound (audio data not in the built-in sound receiver) 'd' - 1 byte DRCS (external character data) 'D' - 2 byte DRCS (external character data) 'P' - color map (palette) 'B' - bitmap (actual PNG data) '.' - Exceeds maximum number of list (*cannot display 11 or over)
Clear packet presence	Display presence or absence of clear packet with symbols "O" and "X".
Contents	Display subtitles string.

12.4.2. Functions

Object	Content
DIAL encoder (Push)	No assigned function.
F1  	Start/Stop Closed Caption logging currently displayed.
F2	No assigned function.
F3 	Move cursor one page up.
F4 	Move cursor one page down.
F5  	Filtering settings when not logging. During logging activate automatic scrolling. <i>*Auto scroll icon appears only when function is OFF.</i>
F6 	Selection of subtitle PES packets contents received log time.
F7 	Switch log display to narrow display. <i>*Narrow view show only containing log of clear packet and subtitle character.</i>

12.5. GPS function (Field Test)

Combine RF reception and positional information, from GPS module, and to perform reception tests outdoors. What is the adequate strength of broadcast wave (radio waves) to be received anywhere? How does it affect watching television? The RF reception intensity, along with TS data is recorded under the same circumstances as received by an actual television.



**GPS (Field Test) Option License is required.*

12.5.1. Screen Items

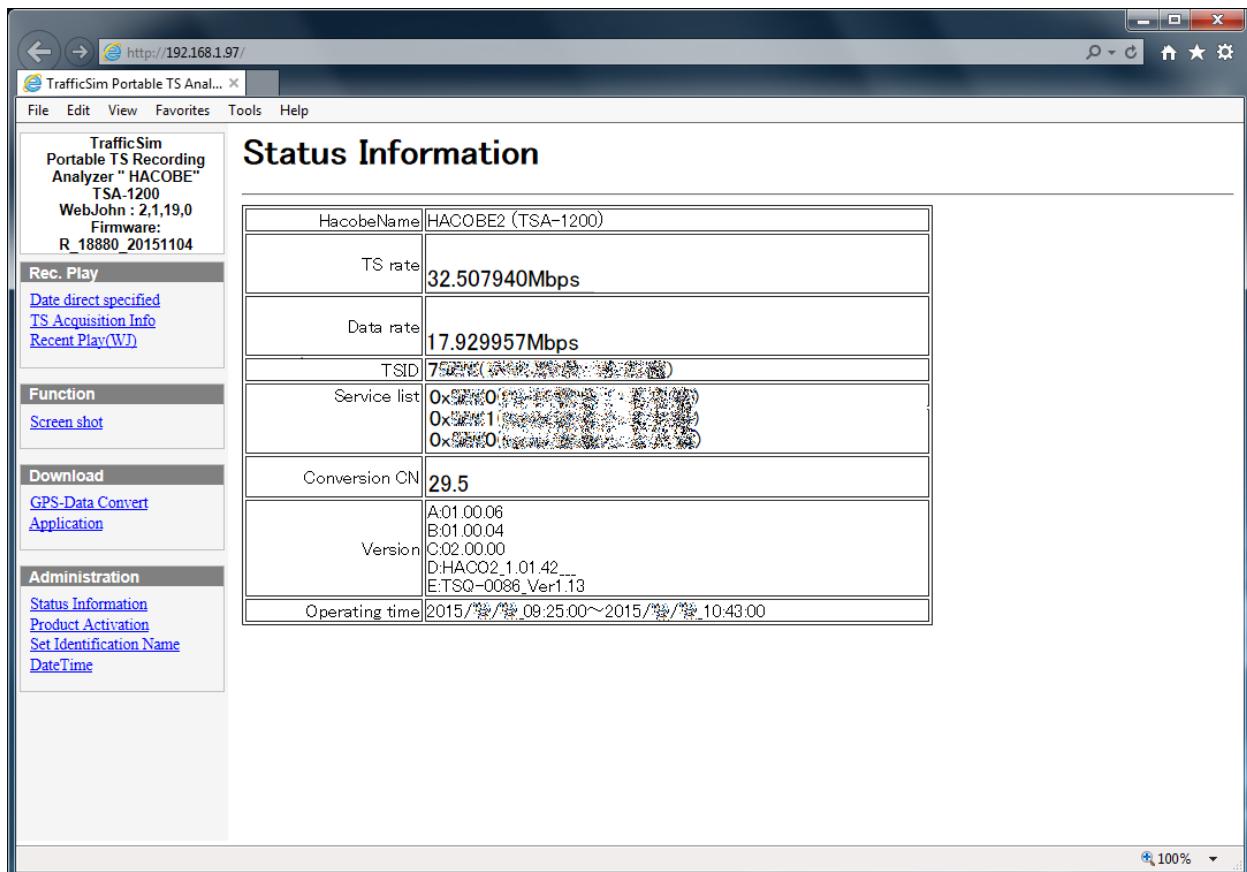
Item Name	Description
Acquisition	Display as "Acquiring GPS data" or "No GPS connected."
UTC Time	Display UTC time.
Latitude	Display north, south latitude.
Longitude	Display west, east longitude.
Altitude (m)	Display current altitude.
Receiving GPS quality	Represent reception quality from 1 to 9.
Number of satellites	Display valid numbers of satellites currently connected.
Horizontal error	Display magnitude error.
Checksum	Display checksum status.
GPS auto save Distance (m)	HACOBE auto save according to set distance.
GPS auto save Time	HACOBE auto save according to set time, regardless of movement.

12.5.2. Functions

Object	Content
DIAL encoder (Turn)	No assigned function.
DIAL encoder (Push)	No assigned function.
F1	No assigned function.
F2	No assigned function.
F3	No assigned function.
F4	No assigned function.
F5  	Switch display and edit ON/OFF GPS settings.
F6	No assigned function.

13. Browser information

13.1. Screen Display



Access HACOBE's web browser to check current TS recording conditions and screenshot images. Additionally, "WebJohn", network TS player, is available to playback TS recorded on HACOBE.

HACOBE's webpage address is: http://aaa.bbb.ccc.ddd/*.

*Use the device's IP address.

Top page displays device status connection.

**The above image is a full option device (all licenses included). Depending on your device configuration the image may differ.*

13.1.1. Screen items

Item Name	Description
Rec. Play	
Date direct specified	Specify date and time to check broadcast TS. John or WebJohn required.
TS acquisition info	Display broadcast status. John is required for Recording Map playback.
Recent play (WJ)	Check the latest broadcast TS on the browser. <i>*WebJohn license is required.</i> <i>** 2 scramble TS must be descrambled by WebJohn.</i>
Function	
Screenshot	Display images captured in HACOBE 2.
Download	
GPS-data Convert application	Download KML conversion software for GPS function. <i>*GPS option is required.</i>
Administration	
Status information	Display status information of HACOBE 2.
Product Activation	Display license management of HACOBE 2.
Setting Identification Name	Set a name (label) for Web access.
Date Time	Configure system time of HACOBE 2.

13.1.2. kml conversion tool

Download the software to create kml file from the GPS function. Please use the instruction manual for kml conversion tool.

13.1.3. Others

- TS player WebJohn license is required to use TS with Multi-player TS John.
- Maximum storage for screenshots is 100. When over oldest files will be replaced.

14. License Option

14.1. License Option List

License No.	Name of License	Description
TSA1200-S0238	1.6TB TS-Recording License	Receive Broadcast TS. Regardless of HDD capacity, recording will be 1.6TB maximum.
TSA1200-S0239	400GB TS-Recording License	Receive Broadcast TS. Regardless of HDD capacity, recording will be 400GB maximum.
TSA1200-S0231	ISDB-T/Tb Receiving License	Terrestrial digital broadcast (VHF/UHF/CATV).
TSA1200-S0232	Japanese BS Receiving License	BS Broadcast.
TSA1200-S0233	Japanese CS (ND) Receiving License	CS110° Broadcast.
TSA1200-S0235	CATV (J.83 Annex C) Receiving License	64/128/256QAM Broadcast.
TSA1200-S0236	TS over IP Receiving License	TS over IP Broadcast.
TSA1200-S0248	B-CAS Descramble License	Descramble TS by inserting B-CAS card into the card slot. <i>*ASI output and recorded TS will be not descrambled.</i>
TSA1200-S0249	C-CAS Descramble License	Descramble TS by inserting C-CAS card into the card slot. <i>*ASI output and recorded TS will be not descrambled.</i>
TSA1200-S0251	TRMP Descramble License	Descramble TS without CAS card. <i>*TS that do not correspond to TRMP will not be descrambled.</i> <i>*ASI output and recorded TS will be not descrambled.</i>
TSA1200-S0253	AES128 Descramble License	Descramble TS in AES128 system. <i>*ASI output and recorded TS will be not descrambled.</i>
TSA1200-S0255	RF Monitoring License	RF input monitoring.
TSA1200-S0256	TS Monitoring License	TS monitoring.
TSA1200-S0257	IP Monitoring License	TS over IP monitoring.
TSA1200-S0258	ISDB-T/Tb Monitoring Preset	Setting preset for Digital Terrestrial Broadcast monitoring.
TSA1200-S0259	Japanese BS Monitoring Preset	Setting preset for BS Broadcast monitoring.
TSA1200-S0260	Japanese CS (ND) Monitoring Preset	Setting preset for CS Broadcast monitoring.
TSA1200-S0261	CATV (J.83 Annex C) Monitoring Preset	Setting preset for CATV Broadcast monitoring.
TSA1200-S0264	SNMP-Trap License	Send SNMP-Trap when alarm occurs.
TSA1200-S0279	Contact Relay Output License	Send output contact when alarm occurs. <i>*HACOBE 2 contact board option is required.</i>
TSA1200-S0241	ISDB-T/Tb Modulation License	RF Modulation of TS data. <i>*VHF/ UHF/ CATV modulation board option is required.</i>
TSA1200-S0243	BS Modulation License	RF Modulation of TS data. <i>*L-Band modulation board option is required.</i>
TSA1200-S0244	CS Modulation License	RF Modulation of TS data. <i>*L-Band modulation board option is required.</i>

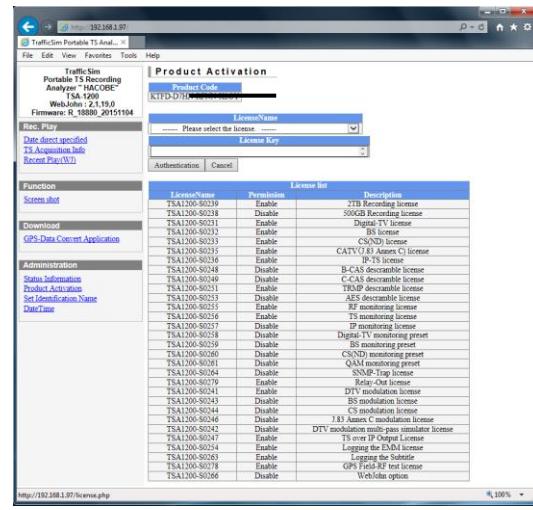
License No.	Name of License	Description
TSA1200-S0246	J.83 Annex C Modulation License	RF Modulation of TS data. <i>*VHF/ UHF/ CATV modulation board option is required.</i>
TSA1200-S0242	ISDB-T/Tb Multi-path Simulator License	Multipath filter for Digital Terrestrial Modulation output. <i>*Does not include ISDB-T/Tb Modulation License.</i> <i>*VHF/ UHF/ CATV modulation board option is required.</i>
TSA1200-S0254	EMM Logging License	EMM card packet logging research.
TSA1200-S0263	Closed Caption Logging License	Logging and analysis of subtitles packet.
TSA1200-S0278	GPS Field RF Test License	RF receiving field test with GPS. <i>*GPS module is required.</i>

14.2. License Authentication

License authentication can be made directly on the body of HACOBE 2 or on web screen, connecting it to the network.

Device Identification Code	LICENSE NAME	Enable/Disable
TSA1200-S0239	: 1.6TB TS-Recording License	= Disable
TSA1200-S0238	: 400GB TS-Recording License	= Enable
TSA1200-S0231	: ISDB-T/Tb Receiving License	= Enable
TSA1200-S0232	: Japanese BS Receiving License	= Enable
TSA1200-S0233	: Japanese CS(ND) Receiving License	= Enable
TSA1200-S0235	: CATV(J,83 Annex C) Receiving License	= Disable
TSA1200-S0236	: TS over IP Receiving License	= Enable
TSA1200-S0248	: B-CAS Descramble License	= Enable
TSA1200-S0249	: C-CAS Descramble License	= Enable
TSA1200-S0251	: TRMP Descramble License	= Enable
TSA1200-S0253	: AES128 Descramble License	= Enable
TSA1200-S0255	: RF Monitoring License	= Disable
TSA1200-S0256	: TS Monitoring License	= Enable
TSA1200-S0257	: IP Monitoring License	= Disable
TSA1200-S0258	: ISDB-T/Tb Monitoring Preset	= Disable
TSA1200-S0259	: Japanese BS Monitoring Preset	= Disable
TSA1200-S0260	: Japanese CS(ND) Monitoring Preset	= Disable
TSA1200-S0261	: CATV(J,83 Annex C)Monitoring Preset	= Disable
TSA1200-S0264	: SNMP-Trap License	= Enable
TSA1200-S0279	: Contact Relay Output License	= Disable
TSA1200-S0241	: ISDB-T/Tb Modulation License	= Enable
TSA1200-S0242	: ISDB-T/Tb Multi-path Simulator License	= Enable
TSA1200-S0243	: BS Modulation License	= Disable
TSA1200-S0244	: CS Modulation License	= Disable
TSA1200-S0246	: J,83 Annex C Modulation License	= Enable

Authentication by HACOBE2 body



Authentication by HACOBE2 webpage

To add new license, check the device “Identification Code”, displayed on License Authentication screen and contact us.

Traffic Sim Co., Ltd.
 Email: winfo@trafficsim.co.jp

15. Monitoring Settings List

RF Monitoring Settings

Item Name	Occurrence	Log	Remarks
CN decline error	C/N value is lower than set value.	CN decline error	
BER (A) error	BER (A) value exceeds set value.	BER (A) error	
BER (B) error	BER (B) value exceeds set value.	BER (B) error	
BER (C) error	BER (C) value exceeds set value.	BER (C) error	
MER error	MER value is lower than set value.	MER decline error	
CN reduced error	C/N is less than set value.	CN reduced error	
BER (A) error	BER (A) is equal or greater than set value.	BER (A) error	
BER (B) error	BER (B) is equal or greater than set value.	BER (B) error	
BER (C) error	BER (C) is equal or greater than set value.	BER (C) error	
MER error	MER is less than set value.	MER reduced error	
Reception level decrease error	Reception level is equal or less than set value.	Reception level decrease error	
Reception level exceeded error	Reception level is equal or greater than set value.	Reception level exceeded error	

TS Monitoring Settings (1/2)

Item Name	Occurrence	Log	Remarks
Sync lost	TS is not in sync	Synchronization lost	ETR290 1.1
Sync byte error	Synchronous byte is not "0x47"	Synchronous byte error	ETR290 1.2
transport indicator error	transport_error_indicator is '1'	Transport indicator error	ETR290 2.1
continuity counter error	continuity_counter is not continued	Continuous indicator error	ETR290 1.4
discontinuity indicator	discontinuity_indicator is '1'	discontinuity_indicator = '1'	
Scramble bit changed	PID scrambling changed	Scramble bit changed	
Wrong length of adaptation field	Long length of adaptation field	Wrong length of adaptation field	
Renewal of descramble key failed	Failed to update key of B-CAS	Renewal of descramble key failed	
Descramble failed	Failed to descrambled with key missing	Descramble failed	
No ECM found	Associated ECM not found	No ECM found	
CRC error	CRC value is different	CRC error	
Section length error [Max Length]	- Section length is under 4 bytes - Section length is over 4096 bytes	Section length error [Max Length]	
Section length error [Not Enough]	Section length is less than setting length	Section length error [Not Enough]	
Section length error [Not Matching]	Section length doesn't match setting length	Section length error [Not Matching]	
Descriptor not suitable	Configuration descriptor inconsistent	Descriptor is not suitable	
PCR Jitter(+)	PCR jitter exceeds threshold to +	PCR Jitter(+)	
PCR Jitter(-)	PCR jitter exceeds threshold to -	PCR Jitter(-)	
PCRPTS reverse	During PTS receiving its clock becomes earlier than PCR.	PCRPTS reverse	
PAT error	•PID 0x0000 not detected every 0.5 seconds •PID 0x0000 doesn't include PAT •PID 0x0000 transport_scrambling_control is not 00	PAT error	ETR290 1.3
PMT error	•PID of PMT (table_id=0x02) specified in PAT not detected every 0.5 seconds •PID transport_scrambling_control including table_id=0x02 is not 00	PMT error	ETR290 1.5

TS Monitoring Settings (2/2)

Item Name	Occurrence	Log	Remarks
PCR error	•PCR discontinuity of 100ms or more occur without specific instructions •The difference of two consecutive PCR values is 40ms or more	PCR error	ETR290 2.3
PCR error	PCR accuracy is not within ± 500ns	PCR error	ETR290 2.4
PTS error	PTS cycle is 700ms or more	PTS error	ETR290 2.5
CAT error	•Contents of the section is CAT, when transport_scrambling_control is not '00', •Table_id other than 0x01 is found at PID=0x0001.	CAT error	ETR290 2.6
NIT error	•Table_id other than 0x40, 0x41, or 0x72 is found at PID=0x0010. •Table_id=0x40 or 0x41 is not detected 10 seconds or more at PID=0x0010.	NIT error	ETR290 3.1
SDT error	•Table_id=0x42(SDT) is not detect 2 seconds or more at PID=0x0011 •table_id other than 0x42, 0x46, 0x4A, or 0x72 is found at PID=0x0011.	SDT error	ETR290 3.5
EIT error	•table_id=0x4E(EIT[p/f] actual TS) is not detected 2 seconds or more at PID=0x0012.	EIT error	ETR290 3.6
RST error	•table_id other than 0x71 or 0x72 is found at PID=0x0013	RST error	ETR290 3.7
TDT error	•table_id=0x70(TDT) is not detected 30 seconds or more at PID=0x0014. •table_id other than 0x70, 0x72 or 0x73 is found at PID=0x0014.	TDT error	ETR290 3.8
TS data rate over	TS rate exceeds set value.	TS data rate over	
TS data rate decline	TS rate is lower than set value.	TS data rate decline	
Data rate over	Data rate exceeds set value.	Data rate over	
Data rate decline	Data rate is lower than set value.	Data rate decline	
Section timeout setting	Appropriate section is not detected between set time.	Section timeout	

System Monitoring Settings (1/1)

Item Name	Occurrence	Log	Remarks
USB storage	Connect or disconnect USB storage	USB Storage	
IC card reply	Response from IC Card during descrambling	Receive card reply	
Start TS Recording	Start TS recording	TS Recording	
Archive related	Copy or erase archive	Archive	
Start TS Analyze	Start TS Analyzing	TS Analyze	
Screenshot	Screenshots taken	Screen capture	
Output report	Output report	Report output	
Key Lock	Use of LOCK switch	Key Lock [ON] Key Lock [OFF]	
CLEAR button	When CLEAR button is pressed	Analysis/Monitoring cleared	
Start Play	Starts reproduction	Play Start	
Stop Play	Return to LIVE analysis and stop reproduction	Play Stop	

**TSA-1200 Portable TS Recording Analyzer “HACOBE2”
Instruction Manual**

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