FUJITSU

Fujitsu
Real-time Video Transmisson Gear IP-HE950
SOFTWARE USER'S GUIDE

USING IP-HE950 SAFELY

Handling of This Document

This document contains important information regarding the safe use of the IP-HE950. Read it thoroughly before operating this unit. Make sure that users of this equipment read and understand thoroughly all safety precautions contained in the document. Keep the document in a safe and convenient location for quick reference.
Fujitsu makes every effort to prevent users and bystanders from being injured and to prevent property damage. Be sure to use this unit in accordance with instructions in the document.

Warning on Electromagnetic Interference

The following notice is for USA users only.
The IP-HE950 has been tested and found to comply with the limits for a Class A digital unit, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction document, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The following notice is for Canada users only.
This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

The following notice is for EU (European Union) users only.
This is a Class A product of Electromagnetic Interference (EMI) standard. In a domestic environment this product may cause radio interference in which case the user may be required to make adequate measures.

This document includes technology controlled under the Foreign Exchange and Foreign Trade Control Law. The document or a portion thereof must not be exported (or re-exported) without authorization from the appropriate governmental authorities in accordance with the above law.

The IP-HE950 is designed and manufactured for use in standard applications such as office work, personal units, and household appliances. The product is not intended for special uses (such as nuclear-reactor control in atomic energy facilities, aeronautics and space systems, air traffic control, operation control in mass transit systems, medical units for life support, and missile firing controls in weapons facilities) where particularly high reliability requirements exist, where the pertinent levels of safety are not guaranteed, or where a failure or operational error could threaten a life or cause physical injury (hereafter referred to as "mission-critical" use). Customers considering use of this product for mission-critical applications must have safety-assurance measures in place beforehand. Moreover, they are requested to consult our sales representative before embarking on such specialized use.

PREFACE

This document explains how to use software for the IP-HE950.
For information on how to install the IP-HE950, connect cables, and use buttons and LEDs, refer to the following document:

- IP-HE950 Hardware User's Guide

This document is intended for system designers and administrators who use the IP-HE950.
Readers are assumed to have a basic understanding of networks and video distribution.

Edition 09
Dec. 2022

Note

The contents of this document are subject to change without notice.

ORGANIZATION AND CONTENTS OF THIS DOCUMENT

This document consists of five chapters and an appendix.

Chapter 1 gives an overview of the IP-HE950.
Before starting to use the IP-HE950, read Chapter 2 and configure the initial settings.
Read Chapters 3 and 4 for operating instructions.

Chapter 1 Preparations
This chapter describes the checks required before the start of IP-HE950 operation.

Chapter 2 Initial Configuration
This chapter describes how to configure the initial settings of the IP-HE950.

Chapter 3 Web Operations
This chapter describes how to operate each function from a Web browser.

Chapter 4 Front Panel Operations
This chapter describes settings and operations from the front panel.

Chapter 5 Troubleshooting
This chapter describes the actions to take if, for example, audio/video is not output or an alarm LED goes on.

Appendix
The appendix shows alert information, a list of the IP port numbers used, and how to apply an option license. Also, a glossary describes the technical terms that readers of this document need to know.

WARNING INDICATIONS

This document uses warning indications to warn of conditions in order to prevent serious injury and property damage. Warning indications consist of warning markings of specific levels and warning messages. The warning markings are shown below along with their definitions.

⚠WARNING WARNING indicates a situation that could lead to serious injury or loss of life if procedures are not followed correctly.

⚠CAUTION CAUTION indicates a situation that could lead to minor or moderate injury and/or damage to this equipment itself if procedures are not followed correctly.

Warning indications within text

Warning markings are followed by warning messages. Every warning marking is centered on a line. Left and right indents are set for warning messages to differentiate them from ordinary text. Furthermore, the lines immediately before and after warning indications are left blank.

(Example)

⚠WARNING

Possibility of electric shock
Contact your system administrator before checking the voltage of a power outlet.
Otherwise, electric shock may occur.

PRODUCT HANDLING PRECAUTIONS

Maintenance

⚠WARNING

Do not try to repair this equipment yourself. Contact Fujitsu sales or Fujitsu partners.

⚠CAUTION

Read this document thoroughly before attempting to operate this equipment. If you have any questions, contact Fujitsu sales or Fujitsu partners.

If a problem occurs, contact Fujitsu sales or Fujitsu partners.
They will ask you to describe the problem, the lamp display status of alarm LEDs, and other details. Check the system for this information.

CONTENTS

USING IP-HE950 SAFELY I

PREFACE III

ORGANIZATION AND CONTENTS OF THIS DOCUMENT IV

WARNING INDICATIONS V

PRODUCT HANDLING PRECAUTIONS VI

Chapter 1 Preparations 1

1.1 Main Features 2

1.1.1 Features 2

1.1.2 Software options 2

1.1.3 Specifications 4

1.2 Typical Applications 9

1.2.1 Application examples 9

1.2.2 Interoperability with existing IP series 10

1.2.3 Unit control 10

Chapter 2 Initial Configuration 11

2.1 Configuration Preparations 12

2.1.1 Web access 12

2.1.2 LAN settings 14

2.1.3 Time settings 17

2.2 Check Software 18

2.2.1 Check the software version and options 18

Chapter 3 Web Operations 19

3.1 Activating the Web GUI 20

3.1.1 Displaying the Web GUI 20

3.1.2 Basic configuration of the Web GUI 21

3.2 Home 23

3.2.1 Home screen 23

3.3 Setup 28

3.3.1 Network settings 30

3.3.2 Management 35

3.3.3 Configuration file 37

3.3.4 Maintenance 39

3.3.5 Stream output 41
3.3.6 Stream input 57

3.4 Status 65
3.4.1 Operation & status 67
3.4.2 Alert 71
3.4.3 Log 71
3.4.4 Performance statistics 72

Chapter 4 Front Panel Operations 74

4.1 Overview 75
4.1.1 Front panel 75

4.2 Operations 76
4.2.1 Operation key 76

4.3 Front Panel Display 77
4.3.1 Screen types 77
4.3.2 Screen transitions 78
4.3.3 Screen layout 78
4.3.4 Screen menus 79
4.3.5 TOP screen 81
4.3.6 Operation details 81

4.4 Special Operations 96
4.4.1 Shutdown 96
4.4.2 Unit reboot 96

Chapter 5 Troubleshooting 97

5.1 Troubleshooting 98

5.2 Alarm LED Goes On 101
5.2.1 Checking an Alert 101
5.2.2 LED indications 102

Appendix 103

Setting and Condition Tables 104
A.1 Alert/Log List 104
A.2 Port Numbers Used 116
A.3 Applying an Option License 117

Glossary 118

Release Notes 125

Chapter 1 Preparations

This chapter describes the overview of IP-HE950.

1.1 Main Features 2
1.2 Typical Applications 9

1.1 Main Features

1.1.1 Features

The IP-HE950 is a video transmission unit that uses the latest video encoding technology, H.265/HEVC (below called H.265). As the successor to the video compression technology of H.264/MPEG-4 AVC (below called H.264), H.265 doubles the compression rate of H.264. H.265 has been adopted for 4K broadcasting such as "Channel 4K," with high-definition video including 8K as a target.

The IP-HE950 has the following features:

- Support for H.265, the latest video encoding technology
- Small chassis that is half the 1U rack size
- Operations from the front panel
- Support for a wide range of resolutions, SD/HD/4K
- Equipped with IP interfaces and DVB-ASI to support various transmission scenarios
- Error correction function using FEC/ARQ and SMPTE 2022-1
- SFP adopted to support diverse input and output interfaces
- Support of multi-channel (8ch) audio

1.1.2 Software options

The IP-HE950 has basic functions and optional functions. You can enable an optional function with the license key provided in a software option.

Table 1-1 Software options lists the software options currently available and their functions. For example, with the IP-HE950 4K encoder option, you can add the 4K video encoding function to the IP-HE950E. More will be added to the lineup in the future.

For instructions to install a license key, refer to "**Chapter 2 Initial Configuration**".

If the IP-HE950D or IP-HE950E has been purchased together with a software option for pre-installation, the unit is shipped with the license key installed.

Table 1-1 Software options

Name	Function
IP-HE950 4K encoder option	4K video encoding function
IP-HE950 4K decoder option	4K video decoding function
IP-HE950 contribution-plus encoder option	422/ancillary/8ch audio/multi channnel encoding function
IP-HE950 contribution-plus decoder option	422/ancillary/8ch audio/multi channel decoding function
IP-HE950 BISS scramble option	BISS encryption function (for encoder)*1
IP-HE950 IP redundancy decoder option	IP network redundancy function (for decoder)*2

*1 IP-HE950D has BISS decryption function as a standard.
*2 IP-HE950E has IP redundancy function as a standard.

For hardware options, refer to the *IP-HE950 Hardware User's Guide*.

1.1.3 Specifications

The IP-HE950E is the encoder unit, and the IP-HE950D is the decoder unit. Their respective functions are shown in **Table 1-2 IP-HE950E specifications** and **Table 1-3 IP-HE950D specifications**.

Table 1-2 IP-HE950E specifications

Item			Specification
Video		Input	12G-SDI[*1] / 3G-SDI / HD-SDI / SD-SDI Quad 3G/HD-SDI (2-Sample Interleave/Square Division)[*3] HD(1080i) x 4ch[*2,3]
		SDI active through(SFP)[*4]	12G-SDI[*1] / 3G-SDI / HD-SDI / SD-SDI
	Encoder 1	Encoding format and profile	H.265 Main 4:2:2 10 (4:2:2 10bit)[*2] Main 10 (4:2:0 10bit) Main (4:2:0 8bit)
		Resolution and bit rate	2160p x 3840 (50/59.94Hz)[*1] : 8 to 68 Mbps 2160p x 3840 (29.97Hz)[*1,3] : 2 to 68 Mbps 1080p x 1920 (50/59.94Hz) : 2 to 68 Mbps 1080i x 1920/1440 (50/59.94Hz) : 0.5 to 68 Mbps 720p x 1280 (50/59.94Hz) : 0.5 to 68 Mbps 480i x 720 (59.94Hz) : 0.5 to 68Mbps 576i x 720 (50Hz) : 0.5 to 68Mbps
		Performance	High resolution : [Progressive] B3 level, [Interlaced] B2 level Standard : [Progressive] B2 level, [Interlaced] B1 level Low latency : IBBB Low latency(ALL P) : PPPP Ultra low latency(ALL P) : PPPP
		Pre-filter	OFF/LIGHT/MEDIUM/HEAVY
		GOP	Open Adaptive/Fixed Cycle: 1cycle/2cycle
		Video PES	1 Field/1PES
		Encoding format and profile	H.264 High 422 (4:2:2 10bit)[*2] High 422 (4:2:2 8bit)[*2] High (4:2:0 8bit) Main (4:2:0 8bit)
		Resolution and bit rate	1080p x 1920 (50/59.94Hz) : 2 to 68 Mbps 1080i x 1920/1440 (50/59.94Hz) : 2 to 68 Mbps 720p x 1280 (50/59.94Hz) : 2 to 68 Mbps 480i x 720 (59.94Hz) : 0.5 to 65 Mbps 576i x 720 (50Hz) : 0.5 to 65 Mbps
		Performance	Best quality : IBBP Standard quality : IBBP Low latency : IPPP
		Pre-filter	OFF/LIGHT/MEDIUM/HEAVY
		GOP	Open Adaptive/Fixed Cycle: 1cycle/2cycle

Item			Specification
		Video PES	1 Field/1PES
	Encoder 2	Encoding format and profile	H.264 High (4:2:0 8bit) Main (4:2:0 8bit)
		Resolution and bit rate	1080i x 1920/1440 (50/59.94Hz) : 2 to 27 Mbps
		Performance	Best quality : IBBP Standard quality : IBBP Low latency : IPPP
		Pre-filter	OFF/LIGHT/MEDIUM/HEAVY
		GOP	Open Fixed Cycle: 1cycle/2cycle
		Video PES	1 Field/1PES
Audio		Input	SDI embedded, Analog(Balanced)
		SDI active through(SFP)[*4]	SDI embedded
	Encoder1	Encoding and bit rate	MPEG-1 Layer2 Stereo (2/0): 128/256/384 kbps MPEG-2 AAC LC[*5] Dual monaural (1/0 + 1/0) : 64/128/256 kbps Stereo (2/0) : 64/128/256 kbps 4ch (2/2) : 256/512 kbps 4ch (3/1) : 256/512 kbps 5.1ch : 512 kbps MPEG-4 AAC LC[*6] Dual monaural (1/0 + 1/0) : 128/256 kbps Stereo (2/0) : 128/256 kbps 4ch (2/2) : 256/512 kbps 4ch (3/1) : 256/512 kbps 5.1ch : 512 kbps MPEG-4 AAC ELD[*6] Stereo (2/0) :128/256 kbps Pass-thru (SMPTE 302M) 16bit : 1920 kbps 20bit : 2340 kbps 24bit : 2688 kbps[*7]
		Sampling frequency	48 kHz
		Quantization bit	MPEG-1 Layer2 : 16bit MPEG-2 AAC LC : 16bit MPEG-4 AAC LC : 16bit MPEG-4 AAC ELD : 16bit Pass-thru (SMPTE 302M) : 16bit, 20bit, 24bit
		Channel	4ch/8ch[*2]

Item			Specification
	Encoder2	Encoding and bit rate	MPEG-1 Layer2 Stereo (2/0) : 128/256/384 kbps MPEG-2 AAC LC Stereo (2/0) : 64/128/256 kbps
		Sampling frequency	48 kHz
		Quantization bit	MPEG-1 Layer2 : 16bit MPEG-2 AAC LC: 16bit
		Channel	2ch
Ancillary(Encoder 1)*2		Ancillary data format	SMPTE2038/ARIB STD-B40
Multiplexing method			MPEG-2 TS / TTS(H.264 only)
Serial port			1port, RS-232C/RS-422 switching
Controls			Web GUI, Front panel, SNMP
IP network		IP version	IPv4/IPv6
		LAN1 (control/ streaming)	10Base-T/100Base-TX/1000Base-T (Auto) IPv4: Static IP/DHCP/PPPoE, IPv6: Static IP/Stateless
		LAN2 (control/ streaming)	10Base-T/100Base-TX/1000Base-T (Auto) IPv4: Static IP, IPv6: Static IP
		Protocol	HTTP, SNMP v1/v2c, SNTP, RTP, UDP, Unicast/Multicast
		Error correction	SMPTE 2022-1 FEC, Fujitsu FEC & ARQ
		Redundancy	LAN1/LAN2 simultaneously streaming (Encoder1 only)
DVB-ASI		Streaming	DVB-ASI output x 2
		TS transmission format	Packet mode
		TS packet length	188Bytes/204Bytes
Encryption			BISS-1/E*8

*1 The IP-HE950 4K encoder option is required.
*2 The IP-HE950 contribution-plus encoder option is required.
*3 The Quad 3G-SDI input option is required.
*4 The SDI output option is required.
*5 ADTS is only supported for MPEG-2 AAC.
*6 LOAS is only supported for MPEG-4 AAC.
*7 When audio encoding is set to Pass-thru (SMPTE 302M) and sampling bit to 24 bit, audio data is passed through, while VUCP is not.
*8 The BISS scramble option is required.

When the frame rate of the video input signal matches the video input setting, it is output through. The 12G-SDI signal is output as a through signal with or without the 4K encoder option.

* Encoder2 is available when video input format is 1080i.

Table 1-3 IP-HE950D specifications

Item		Specification
Video	Output	12G-SDI[*9] / 3G-SDI / HD-SDI / SD-SDI Quad 3G-SDI / HD-SDI (2-Sample Interleave/Square Division) [*11] HD(1080i) x 4ch*[10,11]
	SFP Output[*12]	12G-SDI[*9] / 3G-SDI / HD-SDI / SD-SDI
	Encoding format and profile	H.265 Main 4:2:2 10 (4:2:2 10bit)[*10] Main 10 (4:2:0 10bit) Main (4:2:0 8bit) H.264 High 422 (4:2:2 10bit)[*10] High 422 (4:2:2 8bit)[*10] High (4:2:0 8bit) Main (4:2:0 8bit) MPEG-2 Main (4:2:0 8bit)
	Resolution and bit rate	H.265 2160p x 3840 (50/59.94Hz)[*9] : Up to 68 Mbps 2160p x 3840 (29.97Hz)[*9,11] : Up to 68 Mbps 1080p x 1920 (50/59.94Hz) : Up to 68 Mbps 1080i x 1920/1440 (50/59.94Hz) : Up to 68 Mbps 720p x 1280 (50/59.94Hz) : Up to 68 Mbps 480i x 720 (59.94Hz) : Up to 68 Mbps 576i x 720 (50Hz) : Up to 68 Mbps H.264 1080p x 1920 (50/59.94Hz) : Up to 68 Mbps 1080i x 1920/1440 (50/59.94Hz) : Up to 68 Mbps 720p x 1280 (50/59.94Hz) : Up to 68 Mbps 480i x 720 (59.94Hz) : Up to 65 Mbps 576i x 720 (50Hz) : Up to 65 Mbps MPEG-2 1080i x 1920/1440 (50/59.94Hz) : Up to 58 Mbps 720p x 1280 (50/59.94Hz) : Up to 58 Mbps
Audio	Output	SDI(Onboard) : Embedded SFP Output[*12] : Embedded SFP Quad-link[*9,11] : Embedded Analog(Balanced)
	Encoding and bit rate	MPEG-1 Layer2 Stereo (2/0) : 128/256/384 kbps MPEG-2 AAC LC[*13] Dual monaural (1/0 + 1/0) : 64/128/256 kbps Stereo (2/0) : 64/128/256 kbps 4ch (2/2) : 256/512 kbps 4ch (3/1) : 256/512 kbps 5.1ch : 512 kbps MPEG-4 AAC LC[*14] Dual monaural (1/0 + 1/0) : 128/256 kbps Stereo (2/0) : 128/256 kbps

Item		Specification
		4ch (2/2) : 256/512 kbps 4ch (3/1) : 256/512 kbps 5.1ch : 512 kbps MPEG-4 AAC ELD*14 Stereo (2/0) : 128/256 kbps Pass-thru (SMPTE 302M) 16bit : 1920 kbps 20bit : 2340 kbps 24bit : 2688 kbps*15
	Sampling frequency	48 kHz
	Quantization bit	MPEG-1 Layer2 : 16bit MPEG-2 AAC LC : 16bit MPEG-4 AAC LC : 16bit MPEG-4 AAC ELD : 16bit Pass-thru (SMPTE 302M) : 16bit, 20bit, 24bit
	Channel	4ch/8ch*10
Ancillary *10	Ancillary data format	SMPTE2038/ARIB STD-B40
Multiplexing method		MPEG-2 TS / TTS(H.264 only)
Serial port		1port, RS-232C/RS-422 switching
Controls		Web GUI, front panel, SNMP
IP network	IP version	IPv4/IPv6
	LAN1 (control/ streaming)	10Base-T/100Base-TX/1000Base-T (Auto) IPv4: Static IP/DHCP/PPPoE, IPv6: Static IP/Stateless
	LAN2 (control/ streaming)	10Base-T/100Base-TX/1000Base-T (Auto) IPv4: Static IP, IPv6: Static IP
	Protocol	HTTP, SNMP v1/v2c, SNTP, RTP, UDP, Unicast/Multicast (IGMPv2/v3, MLDv1/v2)
	Error correction	SMPTE 2022-1 FEC, Fujitsu FEC & ARQ
	Redundancy*16	LAN1/LAN2 simultaneously receiving/complementary (unicast/multicast)
DVB-ASI	Streaming	DVB-ASI input x 1
	TS transmission format	Packet mode/Burst mode
	TS packet length	188 bytes/204 bytes
Encryption		BISS-1/E
Reference	Input	BB/Tri-sync/PCR/Internal
	Output	BB/No output

*9 The IP-HE950 4K decoder option is required.
*10 The IP-HE950 contribution-plus decoder option is required.
*11 The Quad 3G-SDI output option is required.
*12 The SDI output option is required.
*13 ADTS is only supported for MPEG-2 AAC.
*14 LOAS is only supported for MPEG-4 AAC.
*15 When audio encoding is set to Pass-thru (SMPTE 302M) and sampling bit to 24 bit, audio data is passed through, while VUCP is not.
*16 The IP redundancy decoder option is required.

1.2 Typical Applications

1.2.1 Application examples

This section shows system application examples.

The basic configuration is for video transfer over point-to-point connections.
Here, a camera is connected to the encoder, and video is transferred to the decoder via the Internet and output to the monitor.

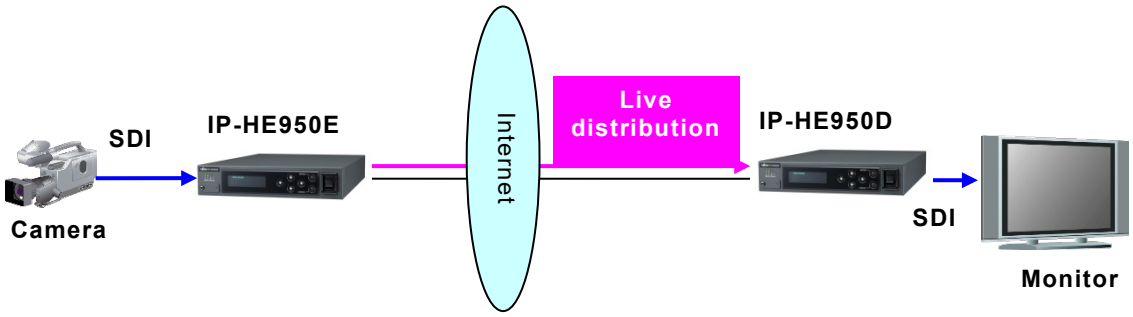


Figure 1-1 Sample System configuration: Broadcast Contents transmission and live coverage

By using the DVB-ASI interface provided as a standard function, the IP-HE950 can transmit video via SNG (Satellite News Gathering) and FPUs (Field Pickup Units).

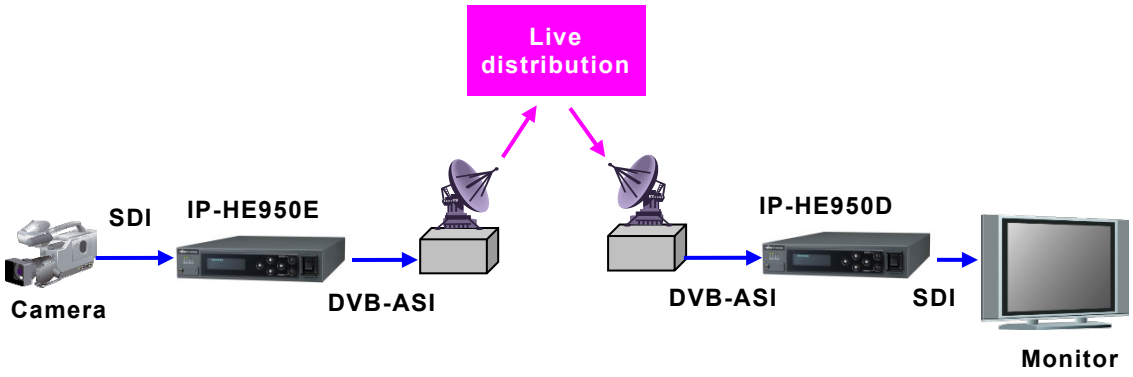


Figure 1-2 Sample System configuration: SNG

1.2.2 Interoperability with existing IP series

IP-HE950E V01L030 or later supports H.264. The existing IP series decoder can receive the H.264 stream from IP-HE950E. IP-HE950D can receive the stream from the existing IP series within the range shown in Table 1-3. Other resolutions will be added in a future enhancement.
IP-HE950 software is provided from Fujitsu official website, in the same way as for the existing IP series.

1.2.3 Unit control

You can control the IP-HE950 from a Web browser, such as on a PC, and the front panel from the front of the unit. The next chapters describe these operations. The IP-HE950 supports standard MIB, extended MIB and extended SNMP traps, which you can monitor and control from an SNMP manager. The five types of supported extended traps are as follows:

- Major alert occurred
- Major alert recovery
- Minor alert occurred
- Minor alert recovery
- Notification occurred

The MIB file is in the unit. Please download it from the Web GUI when you need it.

Chapter 2
Initial Configuration

This chapter describes how to configure the initial settings of the IP-HE950.

2.1 Configuration Preparations 12
2.2 Check Software 18

2.1 Configuration Preparations

2.1.1 Web access

Configure the IP-HE950 settings via the LAN1 or LAN2 port. Disconnect the unit from your network and connect either of these LAN ports to your PC via a hub or with a direct connection.
Start the IP-HE950 by turning on the power, and confirm that the RDY lamp is on.
Enter the following IP address into the Web browser address bar to access the Web GUI of the unit. For access, disable the proxy and compatibility view settings of the Web browser.

* Factory default IP address settings of the IP-HE950

LAN1:	IP address	10.0.0.1
	Subnet mask	255.0.0.0
LAN2:	IP address	192.168.255.253
	Subnet mask	255.255.255.252

* The supported Web browsers are Internet Explorer, Microsoft Edge, Chrome, and Safari.
Operation has been confirmed in the following browsers: Internet Explorer 11.0, Microsoft Edge 104.0, Chrome85.0, and Safari 14.0.

If the unit is not accessible with the above IP addresses, you can confirm and set IP addresses from the front panel. For information on front panel operations, refer to "**Chapter 4 Front Panel Operations**". Also refer to "**5.1 Troubleshooting**".

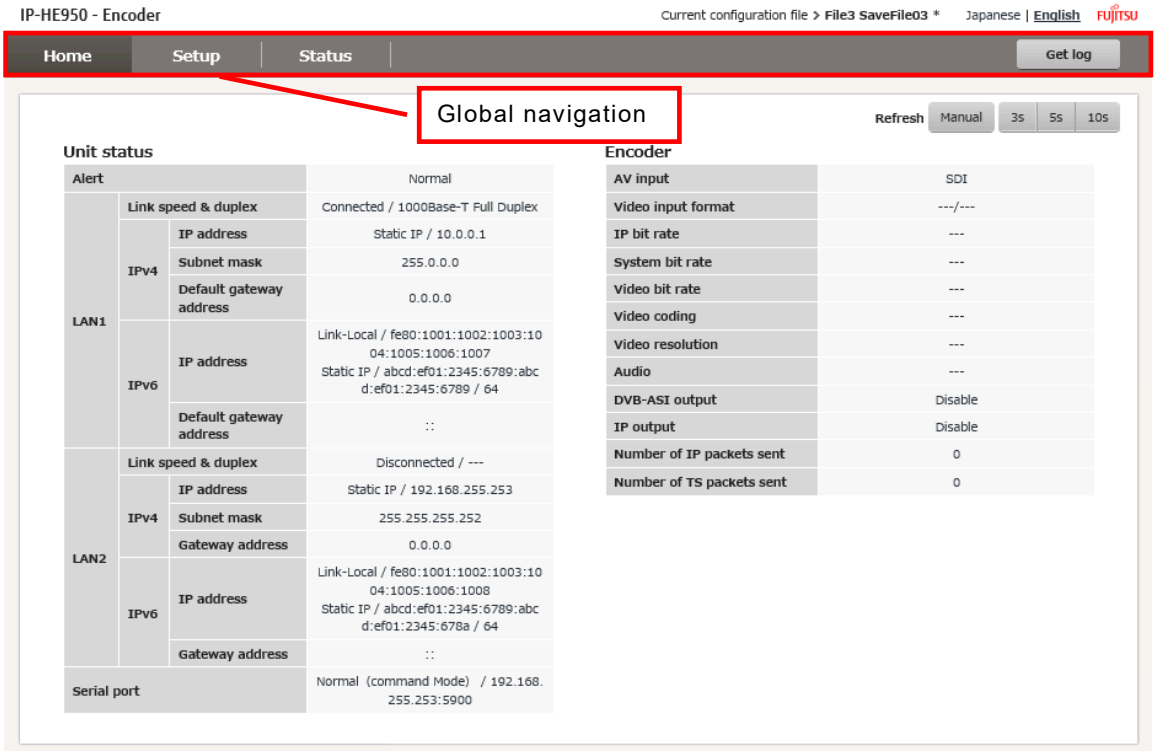


Figure 2-1 IP-HE950 Sample Web GUI (Encoder home screen)

⚠CAUTION

When operating the IP-HE950 with the default IP address, keep it disconnected from your network. Connect it to your PC via a hub or with a direct connection. Before connecting to the network, configure the unit with the appropriate settings for the network. If connected as is with the default setting, the unit may cause an unexpected failure to occur in your network.

2.1.2 LAN settings

From the settings menu list on [Setup] in global navigation, click [Network settings] to display the following screen.

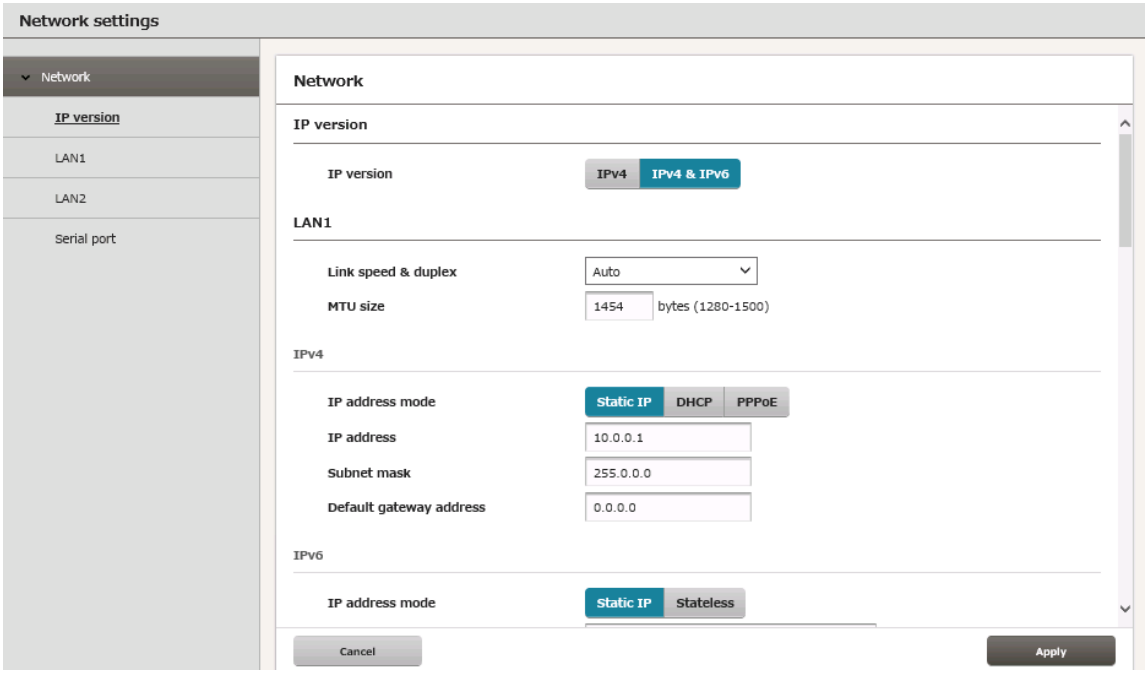


Figure 2-2 Sample screen of Network settings

Set each item in **Table 2-1 Network settings** for one or both of LAN1 and LAN2. Be sure to set the port for connecting to the network. After setting the items, click the **Apply** button.

Table 2-1 Network settings

Item	Setting		Selection/Setting values	Remarks
IP version	IP version		{IPv4 / IPv4 & IPv6}	
LAN1	Link speed & duplex		{Auto / Auto(Max 100Mbps) / Auto(Max 10Mbps) / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-TX Full Duplex / 10Base-TX Half Duplex}	
	MTU size		1280 to 1500 (Bytes)	
	IP v4	IP address mode	{Static IP / DHCP / PPPoE}	
		IP address	xxx. xxx. xxx. xxx	When IP address mode is Static IP
		Subnet mask	xxx. xxx. xxx. xxx	
		Default gateway address	xxx. xxx. xxx. xxx	
		PPPoE user ID	Up to 64 alphanumeric characters	When IP address mode is PPPoE
		PPPoE password	Up to 64 alphanumeric characters	
	IP v6	IP address mode	{Static IP / Stateless}	
		IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	When IP address mode is Static IP
		Prefix	3 to 128	
		Default gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
LAN2	Link speed & duplex		{Auto / Auto(Max 100Mbps) / Auto(Max 10Mbps) / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-TX Full Duplex / 10Base-TX Half Duplex}	
	MTU size		1280 to 1500 (bytes)	
	IP v4	IP address mode	{Static IP}	
		IP address	xxx. xxx. xxx. xxx	
		Subnet mask	xxx. xxx. xxx. xxx	
		Gateway address	xxx. xxx. xxx. xxx	
	IP v6	IP address mode	{Static IP}	
		IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
		Prefix	3 to 128	
		Gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
	Static network 1 to 5			External network address for communication
		IP version	{IPv4 / IPv6}	

Item	Setting			Selection/Setting values	Remarks
		IP v4	Network address	xxx. xxx. xxx. xxx	Ex) 172.16.xxx.xxx
			Subnet mask	xxx. xxx. xxx. xxx	Ex) 255.255.0.0
		IP v6	Network address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
			Prefix	3 to 128	

Enter the set IP address again for the Web browser address to confirm that you can access the IP-HE950 Web GUI.

2.1.3 Time settings

From the settings menu list on [Setup] in global navigation, click [Maintenance] to display the following screen.

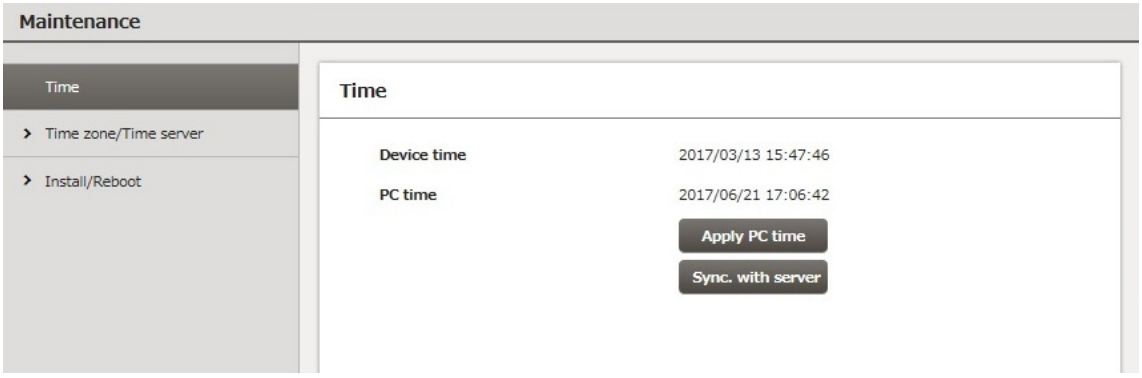


Figure 2-3 Screenshot of performing unit maintenance

Click the **Apply PC time** button to set the unit time to the PC time.

2.2 Check Software

2.2.1 Check the software version and options

Here, check the version of software installed on the IP-HE950 and the installation status of options.

After selecting [Setup] in global navigation, select [Maintenance] - [Install/Reboot] to display the following screen. Check the software version and installation status of optional license. The software version is always displayed at the bottom right of the Web GUI.

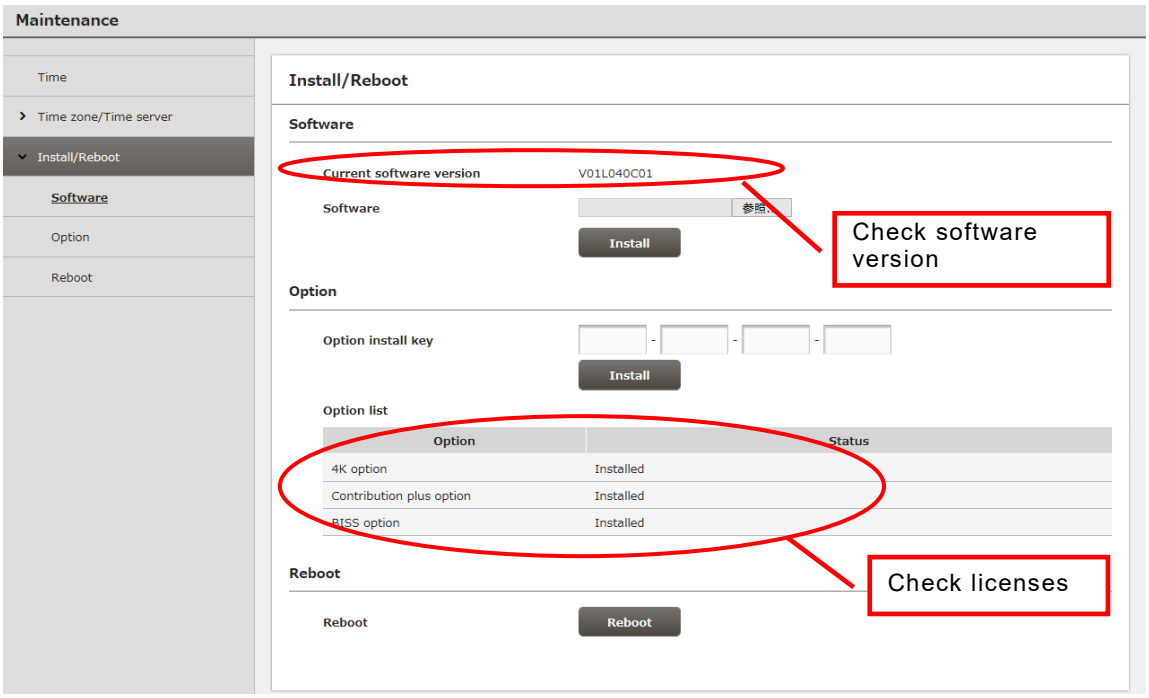


Figure 2-4 Install/Reboot screen

Confirm that the software version is the latest. Fujitsu official website publishes information on the latest software.
IP series webpage
http://www.fujitsu.com/global/products/computing/peripheral/video/download/

Confirm that the options of the license agreements that came with the IP-HE950 are already installed.
If they are (it is) not installed, install them (it) by following "Installing an option" in "**3.3.4 Maintenance**".

Chapter 3
Web Operations

This chapter describes how to operate each function from a Web browser.

3.1 Activating the Web GUI 20
3.2 Home 23
3.3 Setup 28
3.4 Status 65

3.1 Activating the Web GUI

3.1.1 Displaying the Web GUI

Enter the IP address of the IP-HE950 in a Web browser to display the Web GUI (home screen).

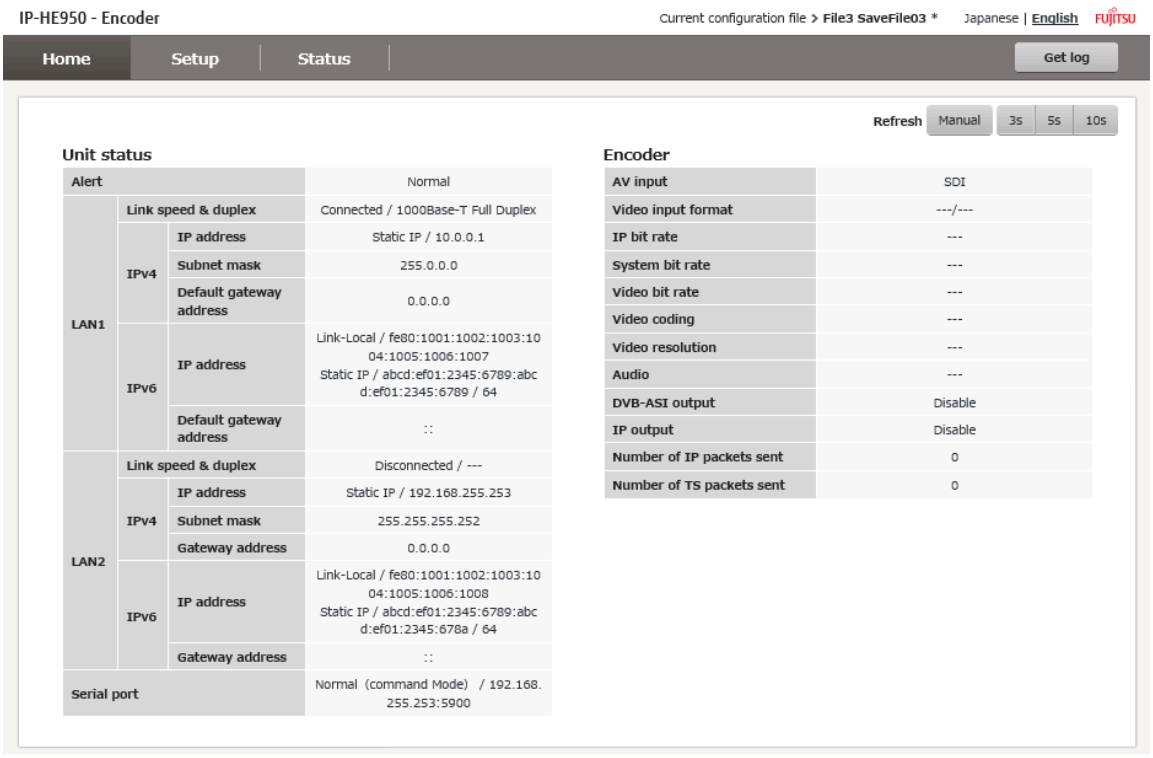


Figure 3-1 IP-HE950 Sample Web GUI (Encoder home screen)

If the user authentication function is enabled, a user authentication message appears. Enter your user name and password. The user authentication function is disabled by default. For the user authentication function settings, refer to "**3.3.2 Management.**"

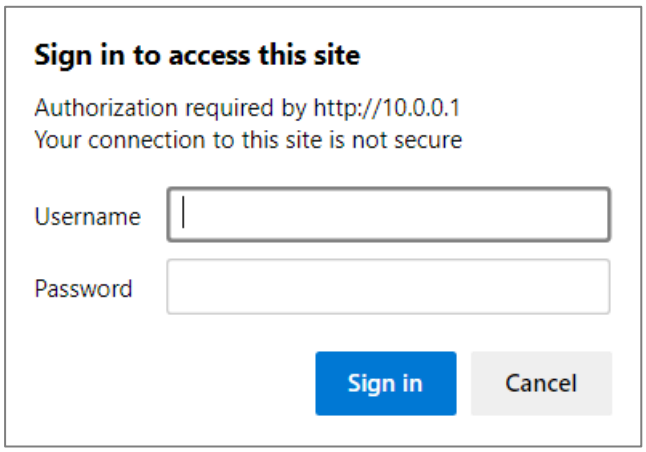


Figure 3-2 User authentication message

* Immediately after the unit is powered on or rebooted, the Web GUI may be inaccessible. Wait for a while before attempting access.

3.1.2 Basic configuration of the Web GUI

The IP-HE950 Web GUI consists of three functions: Home, Setup, and Status. They are selected and displayed from global navigation at the top of the screen.

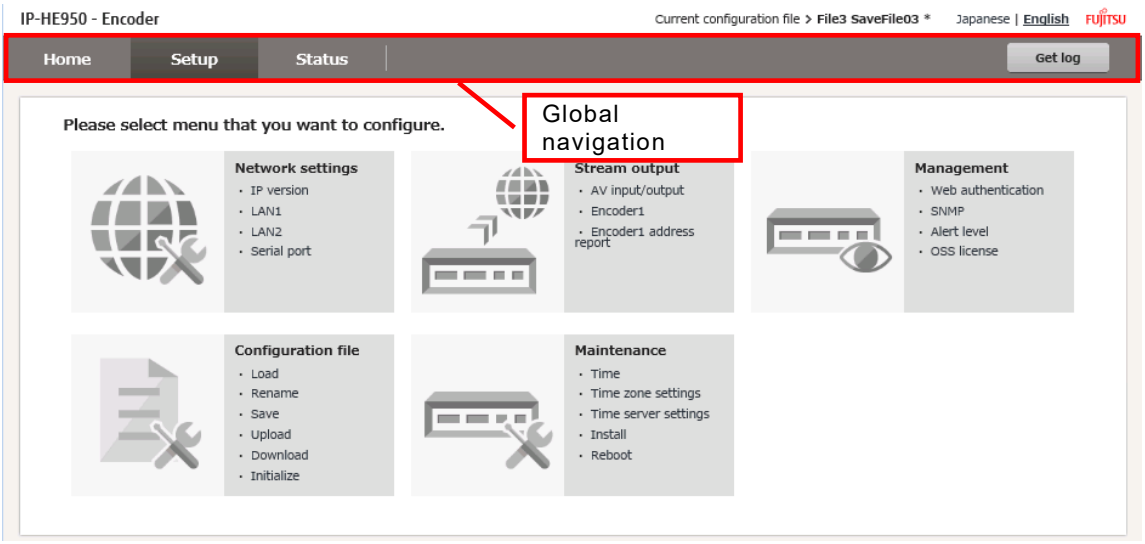


Figure 3-3 IP-HE950 Web GUI configuration (example of the encoder setup screen)

After selecting items and entering setting values on one of the setting screens, click the **Apply** button to reflect the changed settings. Clicking the **Cancel** button will return items to the pre-input state. An item shown in red means that the content of the setting is outside the operating range of the unit or that the setting cannot be

configured because of another setting. In such cases, review and reconfigure the setting contents.

3.2 Home

3.2.1 Home screen

The IP-HE950 home screen appears at initial access to the IP-HE950 Web GUI or when [Home] in global navigation is clicked. In addition to the network status, you can check the unit operating status, including the encoding status and sending statistics on the IP-HE950E and the decoding status and receiving statistics on the IP-HE950D.

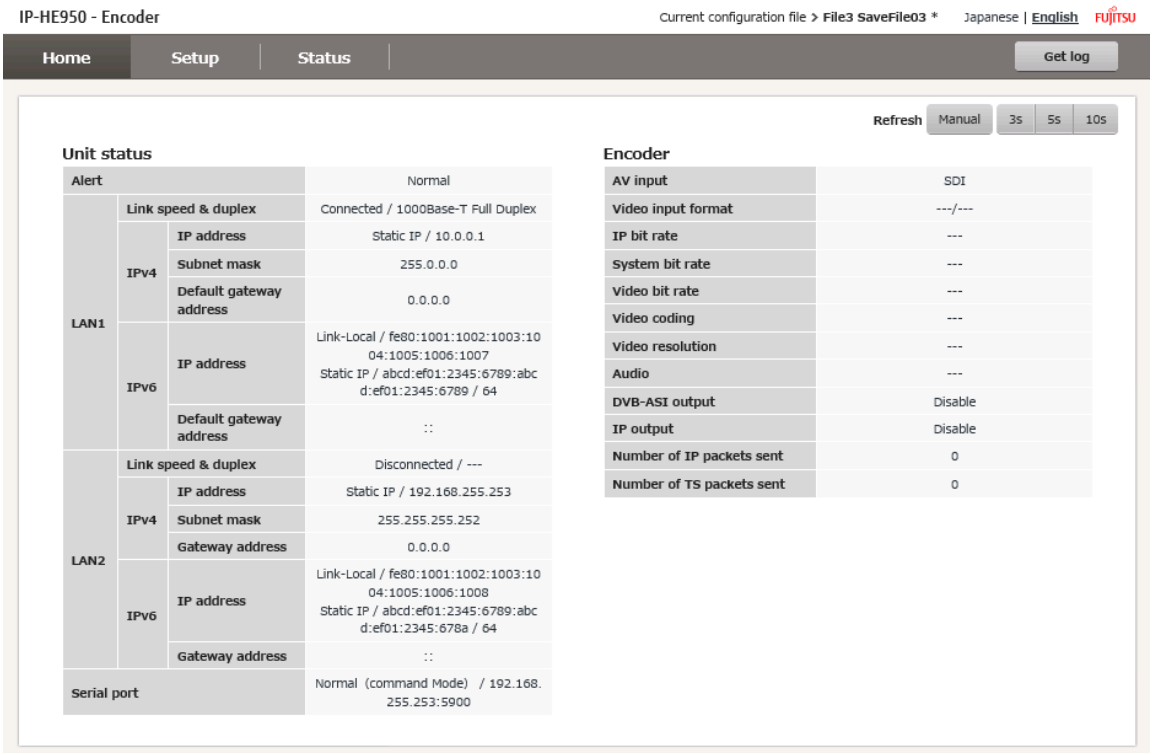


Figure 3-4 IP-HE950 home screen (Single Encoder)

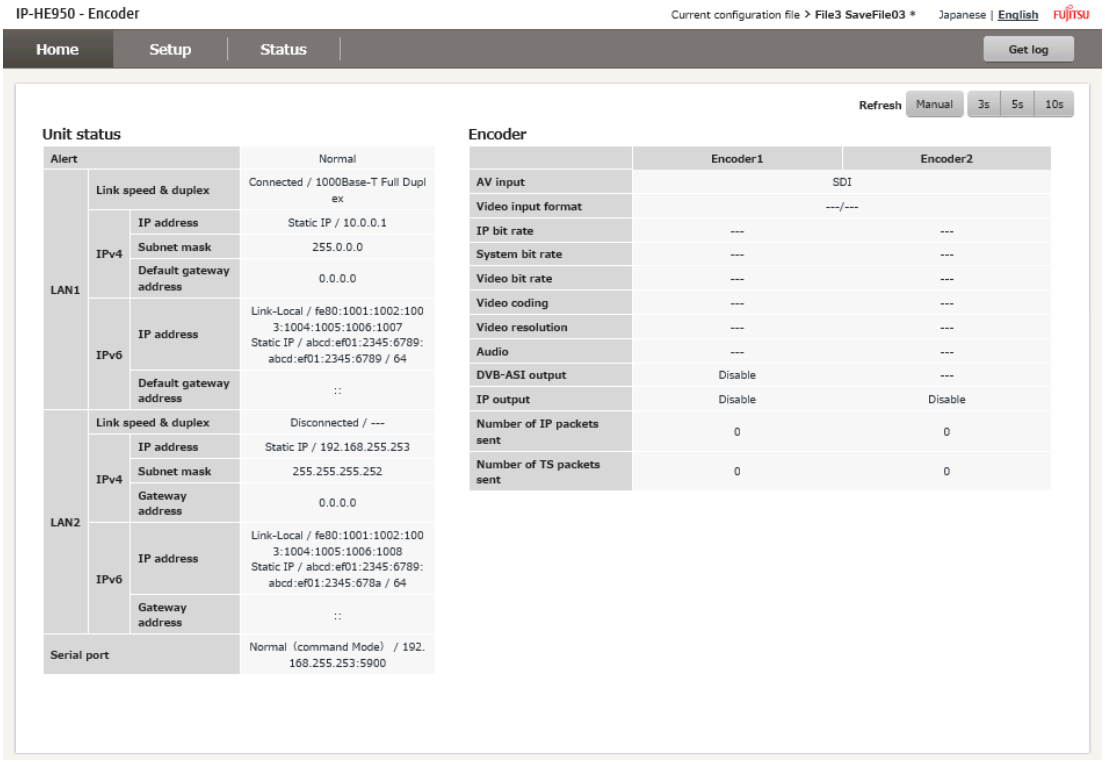


Figure 3-5 IP-HE950 home screen (Dual Encoder)

Select a refresh interval from {3s / 5s / 10s} at the top right to automatically refresh the displayed information at the specified interval. Select {Manual} to suspend automatic refresh.
You can download log information by clicking the **Get log** button to the right of global navigation.

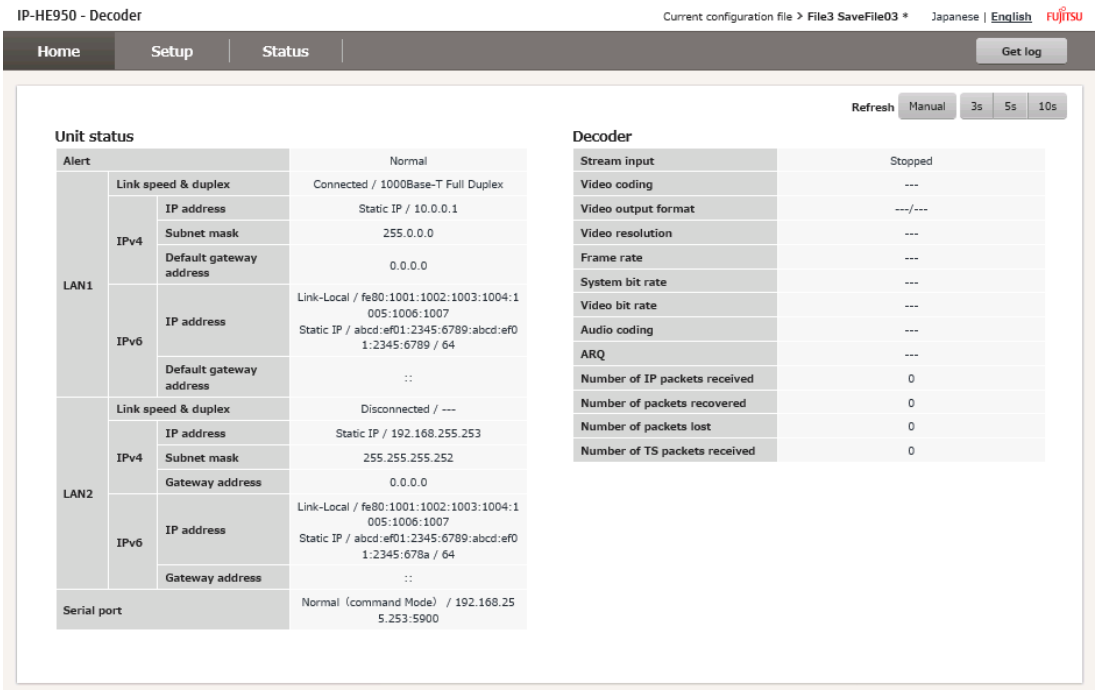


Figure 3-6 IP-HE950 home screen (Decoder)

Table 3-1 List of home screen display items shows what appears on the home screen.

Table 3-1 List of home screen display items

	Item		Displayed contents
Unit status	Alert		{Normal / Generated}
	LAN1	Link speed & duplex	{Connected / Disconnected} / {1000Base-T Full Duplex / 1000Base-T Half Duplex / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-T Full Duplex / 10Base-T Half Duplex}
		IPv4 IP address	{Static IP / DHCP / PPPoE} / xxx. xxx. xxx. xxx
		IPv4 Subnet mask	xxx. xxx. xxx. xxx
		IPv4 Default gateway address	xxx. xxx. xxx. xxx
		IPv6 IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx
		IPv6 Default gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx
	LAN2	Link speed & duplex	{Connected / Disconnected} / {1000Base-T Full Duplex/1000Base-T Half Duplex / 100Base-TX Full Duplex/100Base-TX Half Duplex / 10Base-T Full Duplex / 10Base-T Half Duplex}

	Item			Displayed contents
		IP v4	IP address	{Static IP} / xxx. xxx. xxx. xxx
			Subnet mask	xxx. xxx. xxx. xxx
			Gateway address	xxx. xxx. xxx. xxx
		IP v6	IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx
			Gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx
	Serial port			{Normal / Normal（command Mode）/ Normal（escape Mode）/ Normal（DTR OFF）/ Error} / Destination IP address:Port Number
Encoder	AV input			{SDI / SFP1 & SFP2}
	Video input format			{2160p/59.94 / 2160p/50 / 2160p/29.97 / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50 / 1080i/59.94x4 / 1080i/50x4 / ---/---}
Encoder 1	IP bit rate			xx.x Mbps
	System bit rate			xx.x Mbps
	Video bit rate			xx.x Mbps
	Video coding			{H.265/HEVC / H.264/AVC}
	Video resolution			{3840x2160 / 1920x1080 / 1440x1080 / 1280x720 / 720x480 / 720x576}
	Audio			{MPEG-1 Layer2 / MPEG-2 AAC LC / MPEG-4 AAC LC / MPEG-4 AAC ELD / Pass-thru(SMPTE302M) / ---} / xxx kbps
	DVB-ASI output			{Enable / Disable}
	IP output			{RTP/UDP} Destination IP address / port number
	Number of IP packets sent			Counts up from 0 to 4294967295
	Number of TS packets sent			Counts up from 0 to 4294967295
Encoder 2	IP bit rate			xx.x Mbps
	System bit rate			xx.x Mbps
	Video bit rate			xx.x Mbps
	Video coding			H.264/AVC
	Video resolution			{1920x1080 / 1440x1080}
	Audio			{MPEG-1 Layer2 / MPEG-2 AAC LC / ---} / xxx kbps
	IP output			{RTP/UDP} Destination IP address / port number
	Number of IP packets sent			Counts up from 0 to 4294967295
	Number of TS packets sent			Counts up from 0 to 4294967295
Decoder	Stream input			{RTP/UDP / Started(Receiving) / Started(Not received) / Stopped} / For IP interface input {Source IP address:Port number}
	Video coding			H.265/HEVC / H.264/AVC / MPEG-2
	Video output format			{2160p/59.94 / 2160p/50 / 2160p/29.97 / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50 / 1080i/59.94x4 / 1080i/50x4 / ---/---}

	Item	Displayed contents
	Video resolution	{3840x2160 / 1920x1080 / 1440x1080 / 1280x720 / 720x480 / 720x576}
	Frame rate	xx.xx fps
	System bit rate	xx.x Mbps
	Video bit rate	xx.x Mbps
	Audio coding	{MPEG-1 Layer2 / MPEG-2 AAC LC / MPEG-4 AAC LC / MPEG-4 AAC ELD / Pass-thru(SMPTE302M) / ---} / xxx kbps
	ARQ	{Enable(RTT=xx.x ms) / ---} ARQ will be shown for each port when IP redundancy function is enabled.
	Number of IP packets received	Counts up from 0 to 4294967295
	Number of packets recovered	Counts up from 0 to 4294967295
	Number of packets lost	Counts up from 0 to 4294967295
	Number of TS packets received	Counts up from 0 to 4294967295

* Encoder2 is displayed only when Encoding mode is Dual encoder.

3.3 Setup

Click [Setup] in global navigation to display the following screen with the settings menu list.

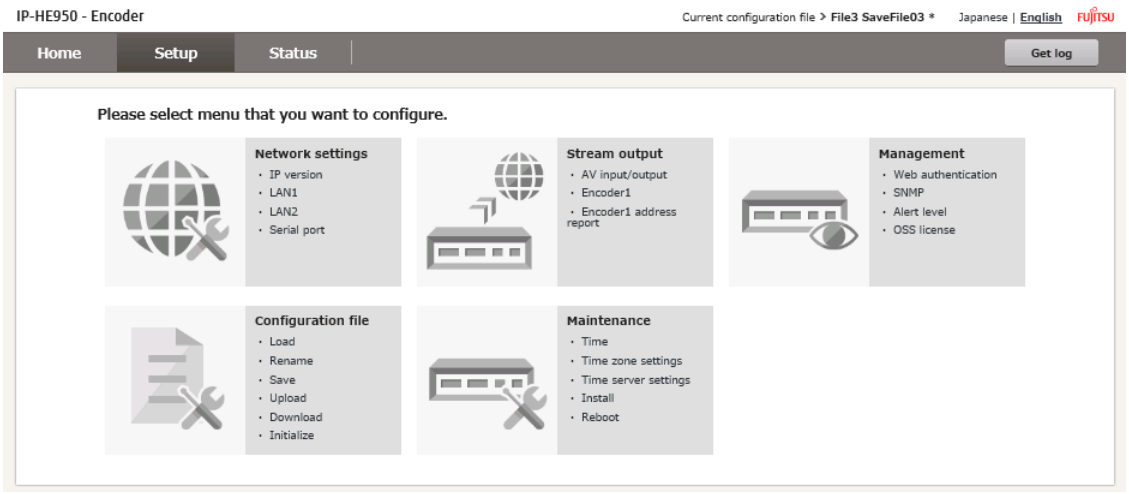


Figure 3-7 Sample encoder setup screen

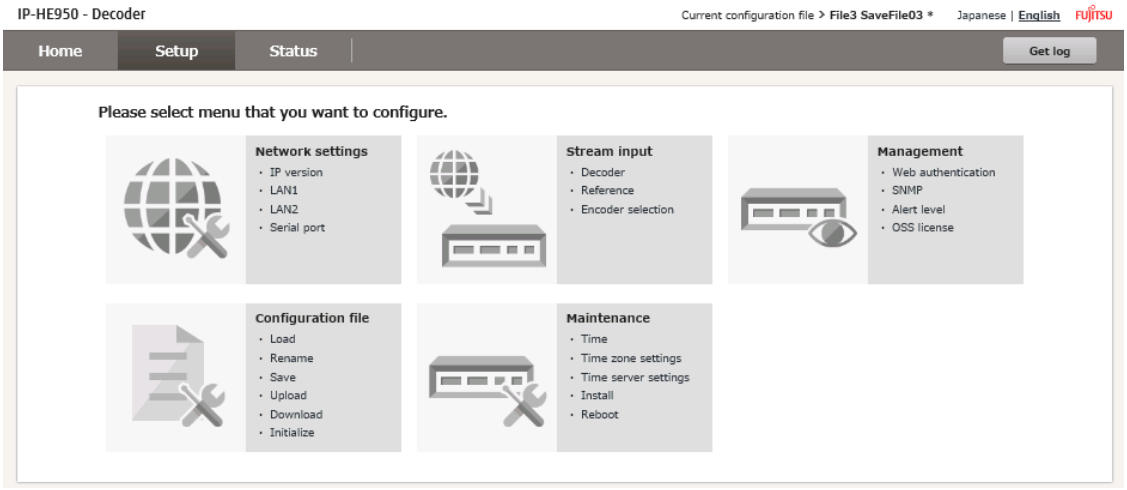


Figure 3-8 Sample decoder setup screen

Table 3-2 Settings menu shows the settings menu and items for each unit.

Table 3-2 Settings menu

Unit	Menu	Item
Common	Network settings	IP version
		LAN1
		LAN2
		Serial port
	Management	Web authorization
		SNMP
		Alert level
		OSS license
	Configuration File	Load
		Rename
		Save
		Upload
		Download
		Initialize
	Maintenance	Time
		Time zone settings
		Time server settings
		Install
		Reboot
IP-HE950E (Encoder)	Stream output	AV input
		Encoder1
		Encoder1 address report
		Encoder2*1
		Encoder2 address report*1
IP-HE950D (Decoder)	Stream input	Decoder
		Reference
		Encoder selection

*1 Displayed only when Encoding mode is Dual encoder.

The next sections contain lists of setting items in each menu.

3.3.1 Network settings

Click [Network settings] from the settings menu list to display the following screen.

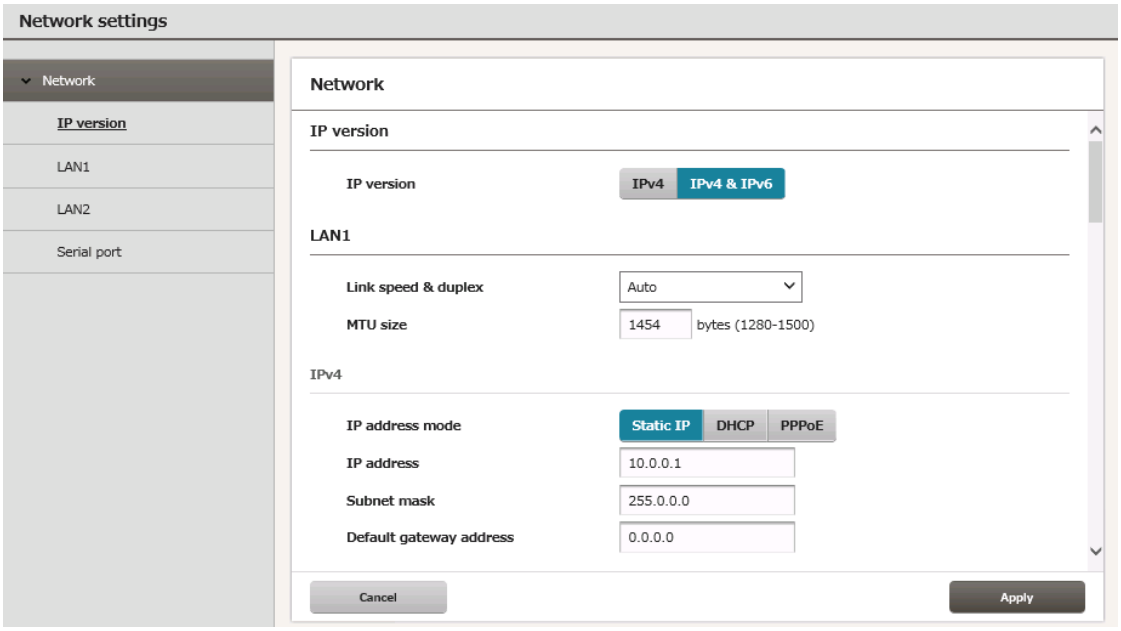


Figure 3-9 Sample screenshot of Network settings

Table 3-3 Network settings shows each setting item and setting details. IP-HE950 has LAN1 and LAN2, and both can be used for streaming and control. LAN2 must be connected to static network. When the network is not static, LAN1 must be used. These settings are used for data communication with other equipments. The communication is performed through connection between the Serial port (RS-232C/RS-422, D-sub 9 pin connector) on IP-HE950 and eternal equipment.
The equipment supports the operation modes below.

-Server mode: The equipment waits, at the specified port number.
-Client mode: The equipment initiates connection with the specified port of the equipment with the specified IP address.
-Client mode(Modem): AT command are used to connect with the equipment whose IP address is reported. **Table 3-4 AT commands supported by this equipment** shows AT commands supported by IP-HE950. **Table 3-5 Message returned by this equipment** shows message returned by IP-HE950.

Table 3-3 Network settings

Item	Setting		Selection/Setting values	Remarks
IP version	IP version		{IPv4 / IPv4 & IPv6}	
LAN1	Link speed & duplex		{Auto / Auto(Max 100Mbps) / Auto(Max 10Mbps) / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-TX Full Duplex / 10Base-TX Half Duplex}	
	MTU size		1280 to 1500 (Bytes)	
	IP v4	IP address mode	{Static IP / DHCP / PPPoE}	
		IP address	xxx. xxx. xxx. xxx	When IP address mode is Static IP
		Subnet mask	xxx. xxx. xxx. xxx	
		Default gateway address	xxx. xxx. xxx. xxx	
		PPPoE user ID	Up to 64 alphanumeric characters	When IP address mode is PPPoE
		PPPoE password	Up to 64 alphanumeric characters	
	IP v6	IP address mode	{Static IP / Stateless}	
		IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	When IP address mode is Static IP
		Prefix	3 to 128	
		Default gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
LAN2	Link speed & duplex		{Auto / Auto(Max 100Mbps) / Auto(Max 10Mbps) / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-TX Full Duplex / 10Base-TX Half Duplex}	
	MTU size		1280 to 1500 (Bytes)	
	IP v4	IP address mode	{Static IP}	
		IP address	xxx. xxx. xxx. xxx	
		Subnet mask	xxx. xxx. xxx. xxx	
		Gateway address	xxx. xxx. xxx. xxx	
	IP v6	IP address mode	{Static IP}	
		IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
		Prefix	3 to 128	
		Gateway address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
	Static networks 1 to 5			External network address for communication
	IP version		{IPv4 / IPv6}	
	IP v4	Network address	xxx. xxx. xxx. xxx	Ex) 172.16.xxx.xxx
		Subnet mask	xxx. xxx. xxx. xxx	Ex) 255.255.0.0

Item	Setting			Selection/Setting values	Remarks
		IP v6	Network address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
			Prefix	3 to 128	
Serial port	Serial port			{Enable / Disable}	
	Transmission setting				
		Serial mode		{Sever mode / Client mode / Client mode(Modem)}	
		Synchronize with		{Disable / Enable}	When Serial mode is Client mode(Modem)
		IP version		{IPv4 / IPv6}	
		IP v4	Destination IP address	xxx. xxx. xxx. xxx	When Serial mode is Client mode
		IP v6	Destination IP address	xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx	
		Port Number(Local)		1024-64000	When Serial mode is Server mode
		Port Number(Local)		0,1024-64000	When Serial mode is Client mode or Client mode(Modem). 0 is automatically assigned
		Port Number (Destination port)		1024-64000	When Serial mode is Client mode or Client mode(Modem).
	Serial port settings				
		type		{RS-232C / RS-422}	
		Timeout		20-200ms	
		Delimiter code 1 Delimiter code 2		0-0ff,blank	blank:When Serial mode is Client mode(Modem)
		Baud rate		{1200bps / 2400bps / 4800bps / 9600bps / 19200bps / 38400bps}	
		Bit length		{7bits / 8bits}	
		Parity		{None / Odd / Even}	
		Stop bits		{1bit / 2bits}	
		Flow control		{None / RS/CS}	
		DTR signal monitoring		{Disable / Enable}	When Serial mode is Client mode(Modem).

Table 3-4 AT commands supported by this equipment

Command	Description	Remarks
Dn	Connects to the remote equipment to be connected through the serial port. For n, specify the IPv4 address of the remote equipment to connect to. Any characters in n that are not a number from 0 to 9 are ignored. [Example] ATD192.168.001.001 Connects the equipment with the address "192.168.1.1" through the serial port. - When the remote equipment is connected, the command returns "CONNECT" and sets the CD signal ON. - If the remote equipment cannot be connected even after a certain period of time (approximately 50 seconds), the command returns "NO CARRIER" and terminates.	- This command is valid in Client mode (Modem). - Specify an IPv4 address in the format of 3 digits + 3 digits + 3digits + 3 digits (total of 12 digits). "ERROR" is returned for any specification that does not consist of 12 digits (0 is not omitted). [Example]"ATD010-000-000-001<CR>", "ATD010.000.000.001<CR>" - Specify an IPv4 unicast address other than the address of the local equipment. "ERROR" is returned for any other specification. - For a decoder, when Synchronize with" set to “Enable”, the command connects to the equipment with the specified address through the serial port and, at the same time, requests streaming. - If data is received form the connection equipment (DTE) before "CONNECT" is returned, the command cancels the connection processing and returns "NO CARRIER" and then terminates.
Hn	Disconnects the data port connection, and sets the CD signal OFF. This command is valid only when n=0.	- This command is valid in escape mode.
On	Switches from escape mode to the communication-in-progress state. This command is valid only when n=0.	- This command is valid in escape mode.
+++	Switches from the communication-in-progress state to escape mode.	- Enter "+" three times in a row within one second to enter this command. - If another character is entered one second before or after the input of "+++", the command does not enter escape mode. - If "DTR signal monitoring" is set to "Enable," the command disables the escape code and does not enter escape mode.

- An AT command starts with "AT" and ends with CR code (or CR code + LF code).
- The format of the AT commands that can be used for IP-HE950 is as follows:
  AT+<command>+<parameter>+<CR>
- The <command>+<parameter> part of an AT command consists of up to 32 characters(ASCII).
- Only one AT command can be specified in a line.
- As for the letters used in an AT command, either only uppercase letters or only lowercase letters must be used.
  ([Example] "ATD192.168.001.001" can be used, but "atD192.168.001.001" cannot.)

Table 3-5 Message returned by this equipment

Result code	Description	Remarks
OK	Normal end of the command.	
CONNECT	Serial port connection with the remote equipment is established.	Communication speed is not displayed (equivalent to ATX0).
NO CARRIER	Line disconnection (no carrier detected/lost carrier during communication).	
ERROR	Command error (execution of a command that is not defined in the specification).	

- Characters are returned for the result code (equivalent to ATV1).
- The format of the results returned by IP-HE950 is as follows:
  <CR>+<LF>+<result-code>+<CR>+<LF>

3.3.2 Management

Click [Management] from the settings menu list to display the following screen.

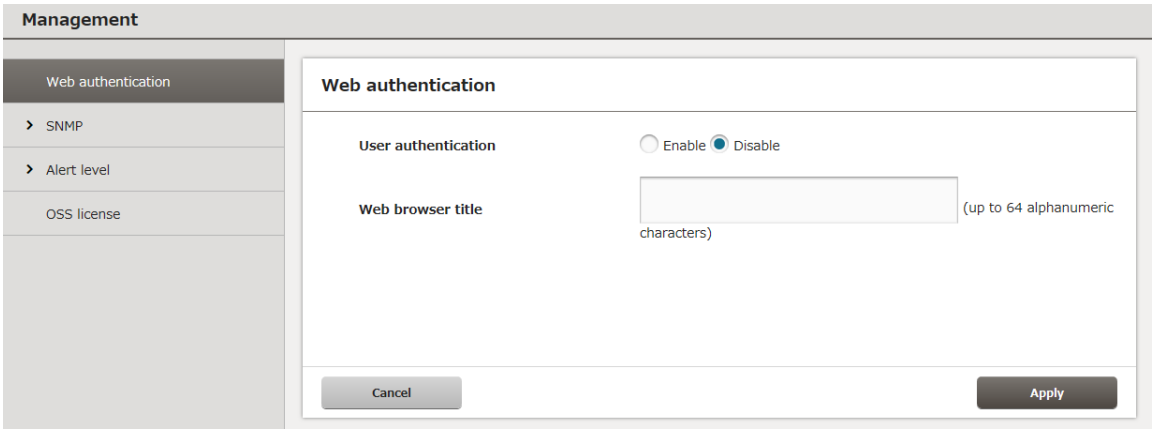


Figure 3-10 Sample screenshot of Management

Table 3-6 Management settings shows each setting item and setting details.

Table 3-6 Management settings

Item	Setting	Selection/Setting values	Remarks
Web authentication	User authentication	{Enable / Disable}	When you ensure the security, enable the user authentication.
	User ID	Up to 16 alphanumeric characters	When User authorization is Enable
	Password	Up to 16 alphanumeric characters	
	Web browser title	Up to 64 alphanumeric characters	
SNMP	Agent settings		
	Communities 1 to 5	Up to 16 alphanumeric characters	
	Trap settings Manager 1 to 5		
	Trap	{Send / Do not send}	
	SNMP version	{SNMPv1 / SNMPv2c}	When Trap transmission is Send
	IP version	{IPv4 / IPv6}	
	IP address	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Community	Up to 16 alphanumeric characters	
	MIB		
	MIB file	Download	
Alert level	Unit status (E0000 to EFFF)	{Off / Major / Minor / Warning}	A.1 Alert/Log List shows list of alert codes
	AV/Stream input (I000 to IFFF)	{Off / Major / Minor / Warning}	
	Network status (L000 to LFFF)	{Off / Major / Minor / Warning}	
	Information (0000 to 0FFF)	{Off / Notification / Warning}	

Table 3-7 Alert level and operation shows each alert level and operation details.

Table 3-7 Alert level and operation

alert level	ALM LED or INDOWN LED	log	alert	SNMP Trap
Major	Orange on	On	On	On
Minor	Orange blinking	On	On	On
Warning	No effect	On	On	Off
Notice	No effect	On	Off	On
Off	No effect	On	Off	Off

When you want to download the MIB file to the PC, select [SNMP] > [MIB] in this menu and click the **Download** button.

3.3.3 Configuration file

Click [Configuration File] from the settings menu list to display the following screen.

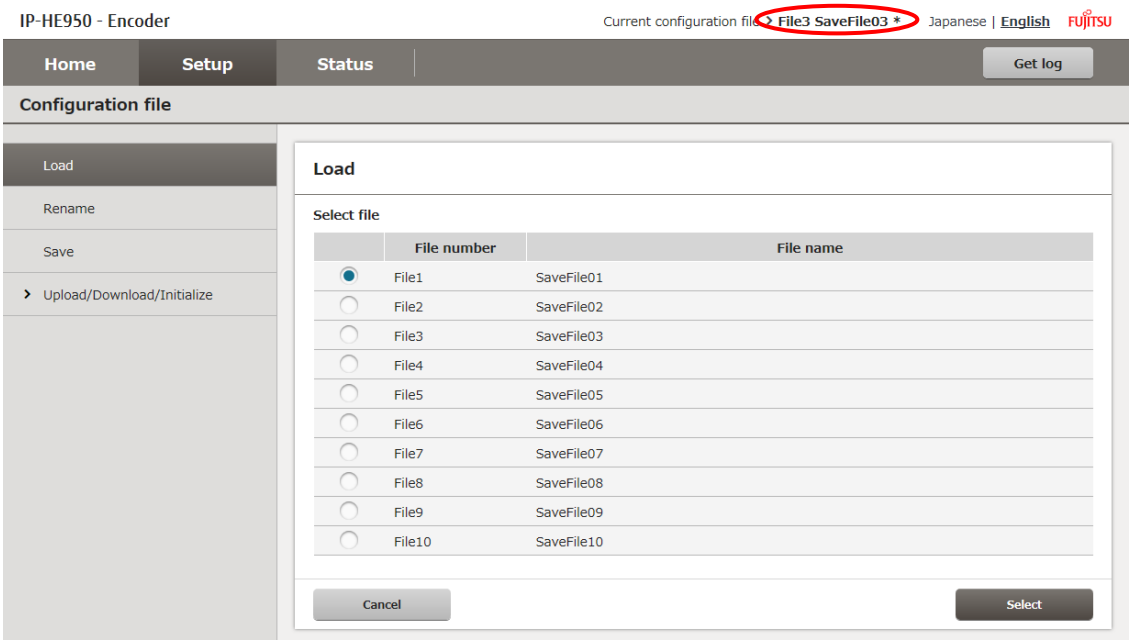


Figure 3-11 Sample screenshot of Configuration file

You can save up to 10 files on the unit as configuration information.
Use the save menu to save the currently used configuration information to any of files 1 to 10. Use the load menu to load the contents of a configuration file into the current unit settings. You can save a configuration file with an arbitrary name of up to 16 alphanumeric characters. You can likewise rename the file too.
The top right of the Web GUI displays the number and the name of the currently used configuration file. Also, when you change settings after loading or saving a file, an asterisk (*) appears after the file name to show that settings are changed.

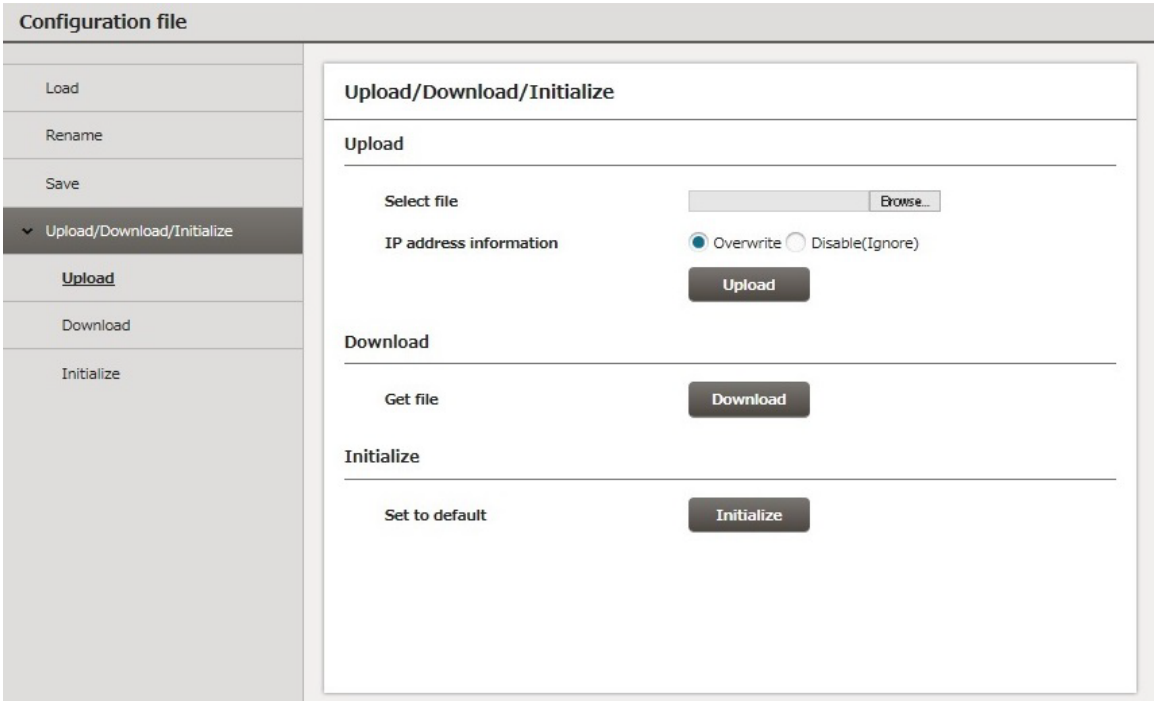


Figure 3-12 Sample screenshot of Upload / Download / Initialize

You can back up the currently used configuration information to a PC, or load a file from a PC to configure the unit.

- Upload
  Select a file on the PC and click the **Upload** button to configure the unit with the contents of the file. You can select whether to update the IP address of the unit. This is useful for copying information other than an IP address from another unit.

- Download
  Click the **Download** button to save the contents of settings to the PC.

- Initialize
  Click the **Initialize** button to initialize the configuration information.

3.3.4 Maintenance

Click [Maintenance] from the settings menu list to display the following screen.

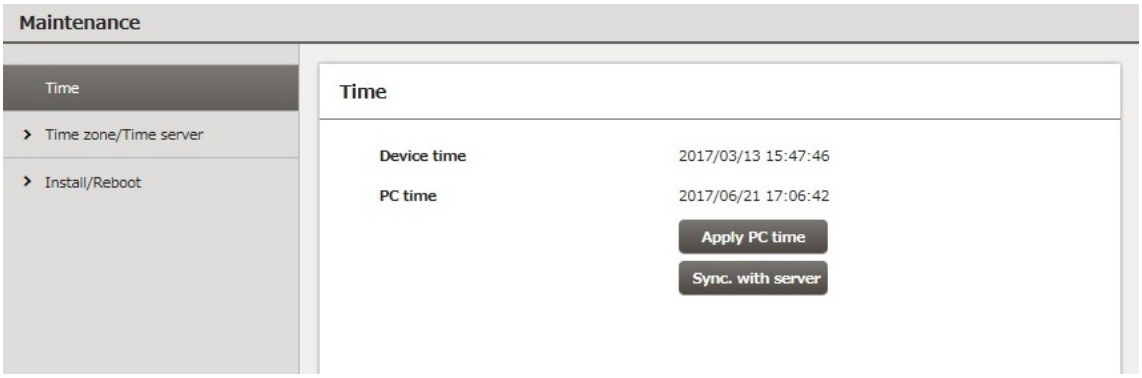


Figure 3-13 Sample screenshot of Maintenance

(1) Time

You can set the unit time to the PC time by clicking the **Apply PC time** button. Set the time in this operation at initial startup of the unit or at startup of the unit powered off for a long time. With a time server configured, clicking the **Sync. with server** button will immediately synchronize the unit with the time server.

(2) Time zone/Time server

The time zone is set with a UTC offset. For Japan, select [+9 hours] since the offset is UTC + 9 hours. When using the unit outside Japan, set the time zone appropriate to the location.

To synchronize with a time server, set the synchronization interval and the IP address of the time server. You can set any period from 1 to 65535 minutes for the synchronization interval.

(3) Install/Reboot

- Installing software

  The latest software for the IP-HE950 is provided from Fujitsu official website. You can download the software to a PC and install it on the unit by following the procedure below.

  Select [Install/Reboot] from the Maintenance screen to display the screen shown in **Figure 3-14 Software installation screen**. Click the browse button for software, and specify the file for the software to be updated. Then, click the **Install** button to start installation. The unit is rebooted once the installation ends.

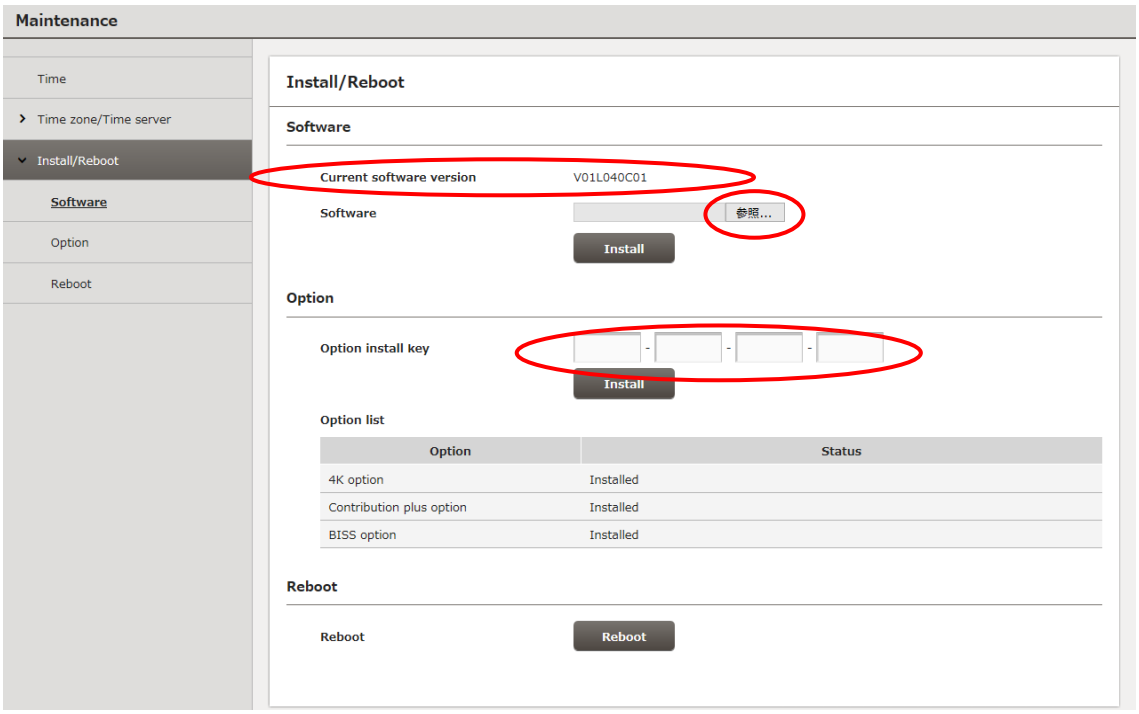


Figure 3-14 Software installation screen

After the installation completes, confirm the software version from a Web browser.

⚠CAUTION

Do not power off or operate the front panel buttons during installation. Otherwise, you may prevent the IP-HE950 from starting.

Do not access another webpage during installation. Otherwise, you may lose information on the progress.

Installation takes about 15 minutes.

- Installing a software option
  If a software option license was purchased separately from the IP-HE950, the corresponding optional function will need to be enabled. After the license has been applied to acquire a key code, enter the key code in the option installation key fields on the screen shown in **Figure 3-14 Software installation screen**. Then, click the **Install** button.
  The software must be updated to the latest version, depending on the option. Check the software version. If required, install the software first.
  "A.3 Applying an Option License" contains instructions to apply the license.

- Reboot
  Click the **Reboot** button to restart the unit.

3.3.5 Stream output

Click [Stream output] from the settings menu list of the IP-HE950E (encoder) to display the following screen.

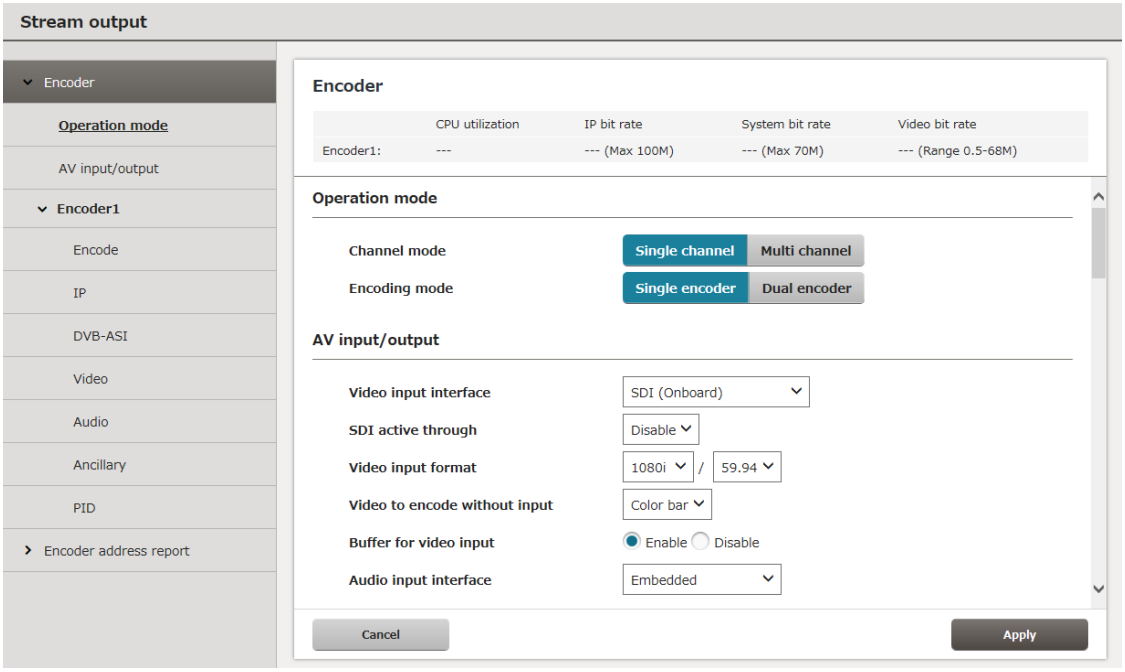


Figure 3-15 Sample Screenshot of Stream output

You can check the bit rate set for streams in the encoder on this screen.

(1) Encoder settings

First, select Channel mode and Encoding mode. Single channel is a basic mode encoding single video input, and Multi channel is an optional mode encoding up to four video inputs (1080i only). In Multi channel mode, only Single encoder mode can be selected. To operate the encoder in Multi channel mode, the Contribution-plus Encoder option is required, and the Quad 3G-SDI input option with SFP is required for input interface. Multi channel mode encodes 4-channel video (1080i) as 1-channel video (2160p). Therefore, the video image in the adjacent channel may appear as color bleeding at the video (1080i) border. This can be improved by setting Profile to Main 4:2:2 10.

There is no limitation about AV input in case of Single encoder and Single channel mode. Only 1080i video format can be selected in case of Dual encoder mode.

Stream for Encoder1 can be output from both LAN port and DVB-ASI, Stream for Encoder2 can be output from LAN port only.

Ancillary works only at Single channel mode. Arbitrary data packets can be transmitted by specifying DID/SDID. However, because packets for video format information, audio data and control data etc. are generated at the decoder in accordance with the status, the error may occur in the decoder when ancillary described above are set in the encoder.

Table 3-8 Encoder settings (Single channel) and **Table 3-9 Encoder settings (Multi channel)** show the setting items and setting details of video and audio input and encoding.

Table 3-8 Encoder settings (Single channel)

Item	Setting	Selection/Setting values	Remarks
Operation mode	Encoding mode	{Single encoder / Dual encoder}	
AV input/output	Video input interface	{SDI(Onboard) / SFP1 & SFP2(Quad-link)[*1]}	
	SDI active through	{Disable / SFP1}	When Video input interface is set to SDI(Onboard), SFP1 can be selected.
	SFP1	3G-SDI INx2 12G-SDI OUT	When Video input interface is set to SFP1 & SFP2(Quad-link), 3G-SDI INx2 can be selected. When SDI active through is set to SFP1, 12G-SDI OUT can be selected.
	SFP2	3G-SDI INx2	When Video input interface is set to SFP1 & SFP2(Quad-link), 3G-SDI INx2 can be selected.
	Video input format	{2160p/59.94[*1] / 2160p/50[*1] / 2160p/29.97[*1] / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50}	When Video input interface is set to SFP1 & SFP2(Quad-link), 2160p/29.97 can be selected.
	4K video division method	{2 sample Interleave / Square-division}[*1]	When Video input format is set to 2160p, this item can be set. When Video input. interface is set to SFP1 & SFP2(Quad-link), Square-division can be selected.
	Video to encode without input	{Color bar / Gray / Black}	Encode one of three patterns on left
	Buffer for video input	{Enable / Disable}	
	Audio input interface	{Embedded / Embedded & Analog}	

Item	Setting	Selection/Setting values	Remarks
	Analog audio input level	{-20dBm(Max.0dBm) / 0dBm(Max.20dbm)}	When Audio input interface is set to Embedded & Analog, this item can be set.

Item	Setting		Selection/Setting values	Remarks
Encoder 1				
Encode	Video coding method		{H.265/HEVC / H.264/AVC}	When Video input format is set to 2160p, H.265 can be selected.
	Video coding format		{2160p/59.94*1 / 2160p/50*1 / 2160p/29.97*1 / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50}	Same as Video input format
	Bit rate setting		{IP bit rate / System bit rate / Video bit rate}	
	IP bit rate		Up to 100.000 Mbps	Limit of setting value depends on video coding format
	System bit rate		Up to 70.000 Mbps	
	Video bit rate		Up to 68.000 Mbps	
IP	IP output		{Enable / Disable}	*2
	IP redundancy		{Enable / Disable}	
	Streaming mode		{Unicast (Simplex) / Unicast / Multicast / Unicast (Simplex) & Multicast}	**Table 3-10 Encoder IP settings** (IP redundancy disabled) and **Table 3-11 Encoder IP settings** (IP redundancy enabled) lists setting items of every mode. When IP redundancy is set to Enable, Unicast (Simplex) & Multicast can be selected
	IP version		{IPv4 / IPv6}	
	TTL		1 to 255	
	TOS		0 to ff	
	TS format		{TS / TTS}	When Video coding method is set to H.264, TTS can be selected.
	Streaming port	Local	0, 1024 to 64000	0 is automatically assigned
		Destination	1024 to 64000	
DVB-ASI	DVB-ASI output		{Enable / Disable}	*2
	TS packet size		{188 bytes / 204 bytes}	
BISS	IP		{Enable / Disable}	Detail settings are in **Table 3-13 BISS settings**
	DVB-ASI		{Enable / Disable}	

Item	Setting	Selection/Setting values	Remarks
Video	Profile	H.265 {Main / Main10 / Main4:2:2 10[*5]}	
		H.264 {Main4:2:0 8bit / High4:2:0 8bit / High4:2:2 8bit[*5] / High4:2:2 10bit[*5]}	
	Resolution	H.265 {3840x2160 / 1920x1080 / 1440x1080 / 1280x720 / 720x480 / 720x576}	When Video coding format is set to 1080i, 1920 or 1440 can be selected. In other cases, this item is automatically set.
		H.264 {1920x1080 / 1440x1080 / 1280x720 / 1280x720 / 720x480 / 720x576}	
	Performance	H.265 {Ultra low latency(ALL P) / Low latency(ALL P) / Low latency / Standard quality / Best quality}	When Profile is set to Main4:2:2 10 or Resolution is set to SD, Ultra low latency(ALL P)/Low latency(ALL P) cannot be selected.
		H.264 {Low latency / Standard quality / Best quality}	
	Prefilter	{OFF / LIGHT / MEDIUM / HEAVY}	
	Adaptive GOP	{Enable / Disable}	When Video coding format is 1080i and Performance is set to Low latency, Standard quality, or Best quality, Enable can be selected. Enabled in scene changes
	IRAP picture interval	{1cycle / 2cycle}	*3
	Picture mode	H.265 {Normal / Dynamic texture}	When Performance is set to Standard quality or Best quality, Dynamic texture can be selected.
		H.264 {Normal}	

Item	Setting	Selection/Setting values	Remarks
Audio 1-4[*4]	Coding method	{MPEG-1 Layer2 / MPEG-2 AAC LC / MPEG-4 AAC LC / MPEG-4 AAC ELD / Pass-thru(SMPTE302M) / None}	MPEG-4 AAC ELD can be selected only for Audio 1 and 2.
	MPEG-1 Layer2		
	Channel mode	{Stereo}	
	Bit rate	{128 / 256 / 384kbps}	
	MPEG-2 AAC LC		
	Channel mode	{Dual monaural / Stereo / 4ch(2/2) / 4ch(3/1) / 5.1ch[*6]}	**Table 3-14 MPEG-2 AAC LC / MPEG-4 AAC LC** lists detailed settings items.
	Bit rate	{64 / 128 / 256 / 512kbps}	
	MPEG-4 AAC LC		
	Channel mode	{Dual monaural / Stereo / 4ch(2/2) / 4ch(3/1) / 5.1ch[*6]}	**Table 3-14 MPEG-2 AAC LC / MPEG-4 AAC LC** lists detailed settings items.
	Bit rate	{128 / 256 / 512kbps}	
	MPEG-4 AAC ELD[*7]		
	Channel mode	{Stereo}	
	Bit rate	{128 / 256kbps}	
	Pass-thru (SMPTE 302M)		
	Quantization bit	{16bit / 20bit / 24bit}	
	Bit rate	16bit: 1920kbps / 20bit: 2304kbps / 24bit: 2688kbps	When Resolution is set to SD, 24bit cannot be selected.
	Input source	Embedded 1 to 8 / Analog	When Audio input interface is set to Embedded & Analog, Analog can be selected.
	Language	3 alphanumeric characters	Listed in **Table 3-15 Major ISO 639-2 language code**
Ancillary	Ancillary	{Enable[*5] / Disable}	When Resolution is set to SD, Disable is automatically set.
	Ancillary data format	SMPTE2038/ARIB STD-B40	
	DID/SDID1-6	DID: 1 to ff SDID: 0 to ff	Lower 8bit out of 10bit data is set. e.g. In case of 0x1xx, xx is set as DID/SDID. In case of 0x2YY, YY is set as DID/SDID.

Item			Setting		Selection/Setting values	Remarks
	PID		Transport stream ID		0 to ffff	
			Program Number/Service ID		1 to ffff	
			PMT PID		10 to 1ffe	PCR PID can be set the same value as Video PID, Audio1-4 PID, and Ancillary PID. Video PID, Audio1-4 PID, and Ancillary PID can't be set the same value each other.
			PCR PID		10 to 1fff	
			Video PID		10 to 1ffe	
			Audio1-4 PID*4		10 to 1ffe	
			Ancillary PID*5		10 to 1ffe	
			PCR interval		30 to 100 ms	Every 10 ms
			PSI interval		100 ms	
Encoder 2						
	Encode		Video coding method		H.264/AVC	
			Video coding format		{1080i/59.94 / 1080i/50}	
			Bit rate setting		{IP bit rate / System bit rate / Video bit rate}	
			IP bit rate		Up to 100.000 Mbps	Lower limit of setting value depends on video coding format
			System bit rate		Up to 30.000 Mbps	
			Video bit rate		Up to 27.000 Mbps	
	IP		IP output		{Enable / Disable}	*2
			Streaming mode		{Unicast (Simplex) / Unicast / Multicast}	**Table 3-10 Encoder IP settings** (IP redundancy disabled) lists setting items of every mode
			TTL		1 to 255	
			TOS		0 to ff	
			TS format		TS / TTS	
			Streaming port	Local	0, 1024 to 64000	0 is automatically assigned
				Destination	1024 to 64000	
	Video		Profile		{High / Main}	
			Resolution		{1920x1080 / 1440x1080}	
			Performance		{Low latency / Standard quality / Best quality}	
			Prefilter		{OFF / LIGHT / MEDIUM / HEAVY}	
			IRAP picture interval		{1cycle / 2cycle}	*3
	Audio		Coding method		{MPEG-1 Layer2 / MPEG-2 AAC LC / None}	
			MPEG-1 Layer2			
				Channel mode	{Stereo}	
				Bit rate	{128 / 256 / 384kbps}	
			MPEG-2 AAC LC			
				Channel mode	{Stereo}	
				Bit rate	{64 / 128 / 256kbps}	

Item		Setting	Selection/Setting values	Remarks
		Input source	Embedded 1 to 8 / Analog	When Audio input interface is set to Embedded & Analog, Analog can be selected.
		Language	3 alphanumeric characters	Listed in **Table 3-15 Major ISO 639-2 language code**
	PID	Transport stream ID	0 to ffff	
		Program Number/Service ID	1 to ffff	
		PMT PID	10 to 1ffe	Same value can't be set
		PCR PID	10 to 1fff	
		Video PID	10 to 1ffe	
		Audio1 PID	10 to 1ffe	
		PCR interval	30 to 100 ms	Every 10 ms
		PSI interval	100 ms	

*1 This can be selected only if the 4K encoder option is installed.
*2 Simultaneous output and independent configuration are possible for IP and DVB-ASI.
*3 A longer cycle improves encoding efficiency, but it may delay loading of the stream at the receiving end.
*4 Audio3,4 can be selected only if the contribution-plus encoder option is installed and Performance is set to Low latency, Standard quality, or Best quality.
*5 This can be selected only if the contribution-plus encoder option is installed.
*6 This can be selected if Performance is set to Low latency or Standard quality or Best quality.
*7 This can be selected if Performance is set to Ultra low latency (ALL P) or Low latency (ALL P) or Low latency.

Table 3-9 Encoder settings (Multi channel)

Item	Setting		Selection/Setting values	Remarks
Operation mode	Encoding mode		{Single encoder}	
AV input/output	Video input interface		{SFP1 & SFP2(Quad-link)*5}	
	SDI active through		{Disable}	
	SFP1		3G-SDI INx2	
	SFP2		3G-SDI INx2	
	Video input format		{1080i/59.94 / 1080i/50}x4	
	4K video division method		{Square-division}	
	Video to encode without input		{Color bar / Gray / Black}	Encode one of three patterns on left
	Buffer for video input		{Enable}	
	Audio input interface		{Embedded}	
Encoder 1				
Encode	Video coding method		{H.265/HEVC}	
	Video coding format		{2160p/59.94*1 / 2160p/50*1}	
	Bit rate setting		{IP bit rate / System bit rate / Video bit rate}	
	IP bit rate		Up to 100.000 Mbps	
	System bit rate		Up to 70.000 Mbps	
	Video bit rate		8 to 68.000 Mbps	
IP	IP output		{Enable / Disable}	*2
	IP redundancy		{Enable / Disable}	
	Streaming mode		{Unicast (Simplex) / Unicast / Multicast / Unicast (Simplex) & Multicast }	**Table 3-10 Encoder IP settings** (IP redundancy disabled) and **Table 3-11 Encoder IP settings** (IP redundancy enabled) lists setting items of every mode. When IP redundancy is set to Enable, Unicast (Simplex) & Multicast can be selected.
	TTL		1 to 255	
	TOS		0 to ff	
	TS format		{TS}	
	Streaming port	Local	0, 1024 to 64000	0 is automatically assigned
		Destination	1024 to 64000	
DVB-ASI	DVB-ASI output		{Enable / Disable}	*2
	TS packet length		{188 Bytes / 204 Bytes}	
BISS	IP		{Enable / Disable}	Detail settings are in **Table 3-13 BISS settings**
	DVB-ASI		{Enable / Disable}	

Item	Setting	Selection/Setting values	Remarks
Video	Profile	{Main / Main10 / Main4:2:2 10[*5]}	
	Resolution	{3840x2160}	
	Performance	{Low latency / Standard quality / Best quality}	
	Prefilter	{OFF / LIGHT / MEDIUM / HEAVY}	
	Adaptive GOP	{Enable / Disable}	
	IRAP picture interval	{1cycle / 2cycle}	*3
	Picture mode	H.265 {Normal / Dynamic texture}	When Performance is set to Standard quality or Best quality, Dynamic texture can be selected.
		H.264 {Normal}	
Audio 1-4[*4]	Coding method	{MPEG-1 Layer2 / MPEG-2 AAC LC / MPEG-4 AAC LC / Pass-thru(SMPTE302M) / None}	
	MPEG-1 Layer2		
	Channel mode	{Stereo}	
	Bit rate	{128 / 256 / 384kbps}	
	MPEG-2 AAC LC		
	Channel mode	{Dual monaural / Stereo}	64kbps can be selected at only Audio1.
	Bit rate	{64 / 128 / 256kbps}	
	MPEG-4 AAC LC		
	Channel mode	{Dual monaural / Stereo}	
	Bit rate	{128 / 256kbps}	
	MPEG-4 AAC ELD		
	Channel mode	{Stereo}	
	Bit rate	{128 / 256kbps}	
	Pass-thru (SMPTE 302M)		
	Quantization bit	{16bit / 20bit / 24bit}	
	Bit rate	16bit: 1920kbps / 20bit: 2304kbps / 24bit: 2688kbps	
	Input SFP	{SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2}}	
	Input source	Embedded 1 to 8	
	Language	3 alphanumeric characters	Listed in **Table 3-15 Major ISO 639-2 language code**.
Ancillary	Ancillary	{Disable}	

Item		Setting	Selection/Setting values	Remarks
	PID	Transport stream ID	0	
		Program Number/Service ID	1	
		PMT PID	100	Each PID is set specific value.
		PCR PID	1001	
		Video PID	1011	
		Audio 1 PID Audio 2 PID Audio 3 PID Audio 4 PID	1100 1101 1102 1103	
		PCR interval	30 to 100ms	Every 10ms
		PSI interval	100ms	

The three streaming modes are "Unicast (Simplex)," "Unicast," and "Multicast." They operate as described below.
"Unicast (Simplex)" distributes the stream to each specified IP address.
"Unicast" receives a unicast request packet from the decoder and distributes the stream. If the decoder is disconnected from the network, such as because it is powered off, unnecessary IP packets are not sent to the network. Thus, this mode makes the load of the network lessen. This function is unique to the Fujitsu IP series.
"Multicast" makes it possible for one stream from the encoder to be received by multiple decoders with the network function. Network support of multicast is a prerequisite.
The encoder outputs the same streams from both LAN1 and LAN2 when using IP redundancy function. The decoder will receive both streams and complement packet losses. Static network must be set for LAN2 when using unicast or unicast(Simplex) and streaming interfaces must be set differently for LAN1 and LAN2 when using multicast so that paths are different.
The upper limit on the IP bit rate is 100Mbps which is total of Encoder 1 and Encoder 2. When outputting multiple streams in unicast, the upper limit is calculated so that the total of the each IP bit rate multiplied by the number of streams is less than or equal to 100Mbps. When IP redundancy is enabled with two streams output, the upper limit is 50Mbps per stream including error correction packets.
Table 3-10 Encoder IP settings and **Table 3-12 Error correction settings** list setting items that support streaming mode. The error correction functions that can be selected depend on the streaming mode. **Table 3-12 Error correction settings** lists setting items for every error correction function.

Table 3-10 Encoder IP settings (IP redundancy disabled)

Live distribution	Setting	Selection/Setting values	Remarks
Unicast (Simplex)	Acceptable stream number	1 to 4	Setting range depends on IP bit rate
	Unicast addresses 1 to 4	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	ARP auto update	{Enable / Disable}	
	Error correction	{Disable / FEC / SMPTE2022 FEC (single) / SMPTE2022 FEC (dual)}	
	Protocol	{RTP / UDP}	RTP for error correction
Unicast	Acceptable stream number	1 to 4	Setting range depends on IP bit rate
	ARP auto update	{ Enable }	
	Error correction	{Disable / FEC / ARQ / FEC & ARQ}	
	Protocol	RTP	
	Unicast request port (Local)	1024 to 64000	
Multicast	Acceptable stream number	1	
	Multicast address1	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Streaming interface	{LAN1 / LAN2}	
	Error correction	{Disable / FEC / SMPTE2022 FEC(single) / SMPTE2022 FEC(dual)}	
	Protocol	{RTP / UDP}	RTP for error correction

Table 3-11 Encoder IP settings (IP redundancy enabled)

Live distribution	Setting	Selection/Setting values	Remarks
Unicast (Simplex)	Acceptable stream number	2	
	Unicast addresses 1 and 2	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	ARP auto update	{Enable / Disable}	
	Error correction	{Disable / FEC / SMPTE2022 FEC (single) / SMPTE2022 FEC (dual)}	
	Protocol	{RTP}	
Unicast	Acceptable stream number	2	
	ARP auto update	{Enable}	
	Error correction	{Disable / FEC / ARQ / FEC & ARQ}	
	Protocol	{RTP}	
	Unicast request port (Local)	1024 to 64000	
Multicast	Acceptable stream number	2	
	Multicast addresses 1 and 2	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Streaming interface	{LAN1 / LAN2}	
	ARP auto update	{Enable / Disable}	
	Error correction	{Disable / SMPTE2022 FEC (single) / SMPTE2022 FEC (dual)}	
	Protocol	{RTP}	
Unicast (Simplex)& Multicast	Acceptable stream number	2	
	Unicast addresses 1	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Multicast addresses 1	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Streaming interface	{LAN1 / LAN2}	
	ARP auto update	{Enable / Disable}	
	Error correction	{Disable / SMPTE2022 FEC (single) / SMPTE2022 FEC (dual)}	
	Protocol	{RTP}	

Among the error correction functions, FEC, ARQ, and FEC & ARQ are functions unique to the Fujitsu IP series. FEC & ARQ especially does not increase the bandwidth for the error correction function, and it achieves robust error correction. However, ARQ requires a network connection that allows bidirectional communication. If any part of the path will be unidirectional communication only, select another error correction function.

Table 3-12 Error correction settings

Error correction	Setting	Selection/Setting values	Remarks
FEC	FEC interval	4 to 24	
ARQ	ARQ control port (Local)	Streaming port + 1	This value is automatically set.
SMPTE 2022 FEC (single)	SMPTE 2022 FEC matrix	[4 to 20] x [4 to 20]	Total of matrix multiplication needs to be less than or equal to 100
	SMPTE 2022 FEC port (Destination)	Streaming port + 2	This value is automatically set.
SMPTE 2022 FEC (dual)	SMPTE 2022 FEC matrix	[4 to 20] x [4 to 20]	Total of matrix multiplication needs to be less than or equal to 100
	SMPTE 2022 FEC port (Destination)	Streaming destination port + 2 Streaming destination port + 4	This value is automatically set.

The stream form Encoder1 can be BISS encrypted. It can be set to IP and DVB-ASI individually. The Injected ID for Mode E is common in IP and DVB-ASI.

Table 3-13 BISS settings

BISS mode	Setting	Setting values	Remarks
Mode 1	Session word	12 digit hexadecimal	
Mode E	Encrypted session word	16 digit hexadecimal	
	Injected ID	14 digit hexadecimal	Common in IP and DVB-ASI

Table 3-14 MPEG-2 AAC LC / MPEG-4 AAC LC

Format	Channel mode	Bit rate	Audio1	Audio2	Audio3	Audio4
MPEG-2 AAC LC	Dual mono	64kbps	○	×	×	×
		128kbps	○	○	○	○
		256kbps	○	○	○	○
	Stereo	64kbps	○	×	×	×
		128kbps	○	○	○	○
		256kbps	○	○	○	○
	4ch(2/2)	256kbps	○	×	×	×
		512kbps	○	×	×	×
	4ch(3/1)	256kbps	○	×	×	×
		512kbps	○	×	×	×
	5.1ch	512kbps	○	×	×	×
MPEG-4 AAC LC	Dual mono	128kbps	○	○	○	○
		256kbps	○	○	○	○
	Stereo	128kbps	○	○	○	○
		256kbps	○	○	○	○
	4ch(2/2)	256kbps	○	×	×	×
		512kbps	○	×	×	×
	4ch(3/1)	256kbps	○	×	×	×
		512kbps	○	×	×	×
	5.1ch	512kbps	○	×	×	×

Table 3-15 Major ISO 639-2 language codes

Language	Language (3-character code)
Danish	dan
Dutch	dut/nld*6
English	eng
Finnish	fin
French	fre/fra*6
German	ger/deu*6
Italian	ita
Japanese	jpn
Norwegian	nor
Portuguese	por
Spanish	spa
Swedish	swe
Not configured	Blank

*6 Two codes are assigned to one language.

(2) Encoder address report

This function notifies the receiving terminal, such as a decoder, of the IP address of the encoder. If the IP address of the encoder is not a static IP address, the decoder is notified of the IP address so that the encoder selection function of the decoder can select and receive from the preferred encoder. In this case, the IP address of the decoder must be a static IP address. This function is unique to the Fujitsu IP series.

This function does not work when IP redundancy function is enabled.

Table 3-16 Encoder address report settings

Item	Setting		Selection/Setting values	Remarks
Encoder information	Encoder name		Up to 16 alphanumeric characters	
	Local port		0, 1024 to 64000	0 is automatically assigned
Destination settings	IP version		{IPv4 / IPv6}	
	Destination 1 to 10	IP address	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
		Destination port	1024 to 64000	

3.3.6 Stream input

Click [Stream input] from the settings menu list of the IP-HE950D (decoder) to display the following screen.

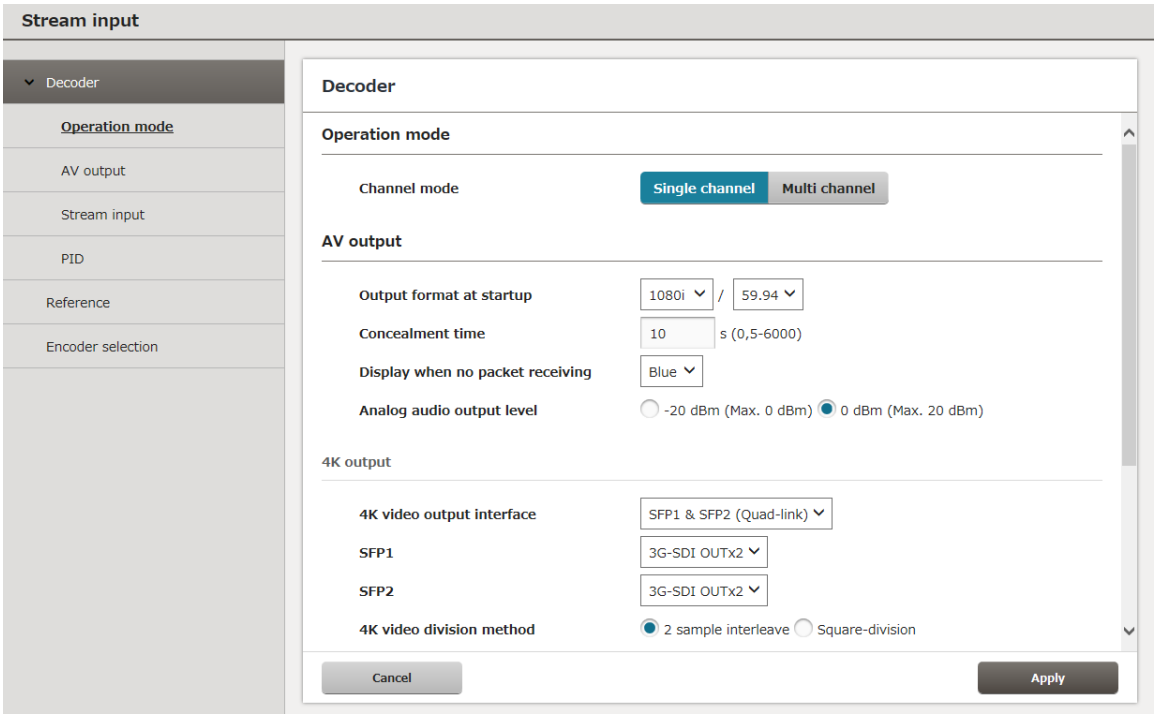


Figure 3-16 Sample screenshot of Stream input

(1) Decoder settings

First, select Channel mode. Single channel is a basic mode decoding one stream for single video output, and Multi channel is an optional mode decoding one stream for up to four video outputs. In Multi channel mode, the decoder receives a 4K (2160p) stream and outputs 1080i video by four channels. To operate the decoder in Multi channel mode, the Contribution-plus Decoder option is required, and the Quad 3G-SDI output option with SFP is required for output interface. Besides, Multi cannel mode is assumed to be used in the same operation mode between IP-HE950E and IP-HE950D.

Table 3-17 Decoder settings and **Table 3-18 Decoder settings (Multi channel)** show the setting items and setting details of video and audio output and decoding. Audio1 is always output from analog audio interface without any settings.

Table 3-17 Decoder settings (Single channel)

Item	Setting	Selection/Setting values	Remarks
AV output	Output format at startup	{2160p/59.94[*1] / 2160p/50[*1] / 2160p/29.97[*1] / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50}	When 2160p/29.97 is selected, 4K video output interface is automatically set to SFP1 & SFP2(Quad-link).
	Concealment time	0, 5 to 6000 s	0 disables setting below, so nothing is done when no data packet is received
	Display when no packet receiving	{Blue / Gray}	Video output of pattern on left, inside of unit
	Analog audio output level	{-20dBm(Max.0dBm) / 0dBm(Max.20dbm)}	
	Video output interface	{SDI(Onboard) / SDI(Onboard) & SFP1	When 4K decoder option is not installed, this item can be set.
	4K video output interface[*1]	{SDI(Onboard) / SDI(Onboard) & SFP1 / SFP1 & SFP2(Quad-link)}	
	SFP1	3G-SDI OUT x 2 12G-SDI OUT	When 4K video output interface is set to SFP1 & SFP2(Quad-link),3G-SDI OUTx2 can be selected. When video output interface or 4K video output interface is set to SDI(Onboard) & SFP1, 12G-SDI OUT can be selected.
	SFP2	3G-SDI OUT x 2	When 4K video output interface is set to SFP1 & SFP2(Quad-link),3G-SDI OUTx2 can be selected.
	4K video division method[*1]	{2 sample Interleave / Square-division}	When 4K video output interface is set to SFP1 & SFP2(Quad-link), Square-division can be selected.
Stream input	Interface	{IP / DVB-ASI / Disable}	
	IP redundancy[*4]	{Enable / Disable}	

Item	Setting	Selection/Setting values	Remarks
	Streaming mode	{Unicast (Simplex) / Unicast / Multicast / Unicast (Simplex) & Multicast}	When Interface is IP. **Table 3-19 Decoder IP settings(IP redundancy disabled)** and **Table 3-20 Decoder IP settings (IP redundancy enabled)** list detailed settings items. When IP redundancy is set to Enable, Unicast (Simplex) & Multicast can be selected.
	IP version	{IPv4 / IPv6}	When Interface is IP.
	Jitter buffer size	1 to 150 ms	When Interface is IP.
BISS	BISS	{Enable / Disable}	
	BISS mode	{Mode 1 / Mode E}	
	Session word	12 digit hexadecimal	For Mode 1
	Encrypted session word	16 digit hexadecimal	For Mode E
	Injected ID	14 digit hexadecimal	For Mode E
PID	PID mode	{AUTO / Program number / PMT / Manual}	How to specify decoding program
	Program number/Service ID	1 to ffff	When Program Number is specified
	PMT PID	10 to 1ffe	When PMT is specified
	PCR PID	10 to 1fff	When individually specified
	Video PID	10 to 1fff	
	Audio1-4 PID*2	10 to 1fff	
	Ancillary PID*3	10 to 1fff	

*1 This can be selected only if the 4K decoder option is installed.
*2 Audio3,4 can be selected only if the contribution-plus decoder option is installed.
*3 This can be selected only if the contribution-plus decoder option is installed.
*4 This can be selected only if the IP redundancy decoder option is installed.

Table 3-18 Decoder settings (Multi channel)

Item	Setting	Selection/Setting values	Remarks
AV output	Output format at startup	{1080i/59.94 / 1080i/50}x4	
	Concealment time	0, 5 to 6000 s	0 disables setting below, so nothing is done when no data packet is received
	Display when no packet receiving	{Blue / Gray}	Video output of pattern on left, inside of unit
	Analog audio output level	{-20dBm(Max.0dBm) / 0dBm(Max.20dbm)}	
	4K video output interface*1	{SFP1 & SFP2(Quad-link)}	
	SFP1	3G-SDI OUT x 2	
	SFP2	3G-SDI OUT x 2	

Item	Setting	Selection/Setting values	Remarks
	4K video division method[*1]	{Square-division}	
	Audio1	{SFP1-1 /SFP1-2 / SFP2-1 / SFP2-2}	
	Audio2	{SFP1-1 /SFP1-2 / SFP2-1 / SFP2-2}	
	Audio3	{SFP1-1 /SFP1-2 / SFP2-1 / SFP2-2}	
	Audio4	{SFP1-1 /SFP1-2 / SFP2-1 / SFP2-2}	
Stream input	Interface	{IP / DVB-ASI / Disable}	
	IP redundancy[*4]	{Enable / Disable}	
	Streaming mode	{Unicast (Simplex) / Unicast / Multicast / Unicast (Simplex) & Multicast }	When Interface is IP. **Table 3-19 Decoder IP settings(IP redundancy disabled)** and **Table 3-20 Decoder IP settings (IP redundancy enabled)**list detailed settings items. When IP redundancy is set to Enable, Unicast (Simplex) & Multicast can be selected.
	IP version	{IPv4 / IPv6}	When Interface is IP.
	Jitter buffer size	1 to 150 ms	When Interface is IP.
BISS	BISS	{Enable / Disable}	
	BISS mode	{Mode 1 / Mode E}	
	Session word	12 digit hexadecimal	For Mode 1
	Encrypted session word	16 digit hexadecimal	For Mode E
	Injected ID	14 digit hexadecimal	For Mode E
	PID mode	{Manual}	
	PCR PID	1001	
	Video PID	1011	
	Audio 1 PID[*2] Audio 2 PID[*2] Audio 3 PID[*2] Audio 4 PID[*2]	1100 1101 1102 1103	
	Ancillary PID[*3]	1fff	

The decoder receives the same streams from both LAN1 and LAN2 and complement packet losses when using IP redundancy function. The source IP address and the static network for LAN2 must be set independently so that paths for LAN1 and LAN2 are different.

Table 3-19 Decoder IP settings (IP redundancy disabled)

Live distribution	Setting		Selection/Setting values	Remarks
Unicast (Simplex)	SMPTE 2022 FEC		{Enable / Disable}	
	Streaming port (local)		1024 to 64000	Each port number needs to be set such that none are duplicated
	Encoder address report port (local)		1024 to 64000	
Unicast	Source IP address1		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	Unicast request cycle		3 to 30s	
	ARQ		{Enable / Disable}	
	ARQ buffering time		40 to 2000ms	
	Streaming port (Local)		1024 to 64000	Each port number needs to be set such that none are duplicated; 0 is automatically assigned
	Unicast request port	Local	0, 1024 to 64000	
		Destination	1024 to 64000	
	ARQ control port		Streaming port + 1	This value is automatically set.
	Encoder address report port (Local)		1024 to 64000	
Multicast	Multicast address1		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	IPv4			
		IGMP version	{Version 2 / Version 3}	
		IGMPv3 source IP address	xxx. xxx. xxx. xxx	For IGMPv3
	IPv6			
		MLD version	{Version 1 / Version 2}	
		MLDv2 source IP address	xxxx:xxxx:xxxx:xxxx:xxxx: xxxx:xxxx:xxxx	For MLDv2
	SMPTE 2022 FEC		{Enable / Disable}	
	Streaming port (Local)		1024 to 64000	Each port number needs to be set such that none are duplicated
	Encoder address report port (Local)		1024 to 64000	

Table 3-20 Decoder IP settings (IP redundancy enabled)

Live distribution	Setting	Selection/Setting values	Remarks
Unicast (Simplex)	Source IP address 1 and 2	IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	When "0.0.0.0" is set to IPv4 address or "::" to IPv6 address, the source IP address is not specified.
	IP buffering time	1 to 1500ms	
	SMPTE 2022 FEC	{Enable / Disable}	
	Streaming port (Local)	1024 to 64000	

Live distribution	Setting		Selection/Setting values	Remarks
	SMPTE 2022 FEC port (Local)		Streaming port + 2, +4	This value is automatically set.
Unicast	Source IP address 1 and 2		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	IP buffering time		1 to 1500ms	
	Unicast request cycle		3 to 30s	
	ARQ		{Enable / Disable}	
	ARQ buffering time		40 to 2000ms	
	Streaming port (Local)		1024 to 64000	Each port number needs to be set such that none are duplicated; 0 is automatically assigned
	Unicast request port	Local	0, 1024 to 64000	
		Destination	1024 to 64000	
	ARQ control port		Streaming port + 1	This value is automatically set.
Multicast	Multicast address1 and 2		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	IPv4			
		IGMP version	{Version 2 / Version 3}	
		IGMPv3 source IP address	xxx. xxx. xxx. xxx	For IGMPv3
	IPv6			
		MLD version	{Version 1 / Version 2}	
		MLDv2 source IP address	xxxx:xxxx:xxxx:xxxx:xxxx: xxxx:xxxx:xxxx	For MLDv2
	IP buffering time		1 to 1500ms	
	SMPTE 2022 FEC		{Enable / Disable}	
	Streaming port (Local)		1024 to 64000	
	SMPTE 2022 FEC port (Local)		Streaming port + 2, +4	This value is automatically set.
Unicast (Simplex)& Multicast	Source IP address1		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	When "0.0.0.0" is set to IPv4 address or "::" to IPv6 address, the source IP address is not specified.
	Multicast address1		IPv4: xxx. xxx. xxx. xxx IPv6: xxxx:xxxx:xxxx:xxxx :xxxx:xxxx:xxxx:xxxx	
	IPv4			
		IGMP version	{Version 2 / Version 3}	
		IGMPv3 source IP address	xxx. xxx. xxx. xxx	For IGMPv3
	IPv6			
		MLD version	{Version 1 / Version 2}	
		MLDv2 source IP address	xxxx:xxxx:xxxx:xxxx:xxxx: xxxx:xxxx:xxxx	For MLDv2
	IP buffering time		1 to 1500ms	

Live distribution	Setting	Selection/Setting values	Remarks
	SMPTE 2022 FEC	{Enable / Disable}	
	Streaming port (Local)	1024 to 64000	
	SMPTE 2022 FEC port (Local)	Streaming port + 2, +4	This value is automatically set.

(2) Reference

Select a reference (video output standard) from the following:

- PCR
  Video signals are output based on the PCR of the stream that will be received. This is the recommended setting when the unit is connected to a TV monitor or the like.
- Internal
  Video signals are output based on the internal clock of the unit. Use this setting when the stream is not stable, such as when the distribution path of the stream has a wireless section.
- BB
  Video signals are output synchronized with externally input BB signals. Use this setting when synchronizing video output of multiple units.
- Tri-sync
  Video signals are output synchronized with externally input Tri-sync signals. Use this setting when synchronizing video output of multiple units.

If Reference is BB or Tri-sync, you can set a phase shift within the range of -500000 to 500000 ns.
If Reference is PCR, BB signals can be output. Video can be output where multiple decoders are connected in cascade and synchronized.
If Reference is BB, input signals can be passed throughout as is.

(3) Encoder selection

The encoder selection displays a list of encoders if decoder is set as a destination at Encoder address report in encoder. To receive a stream from an encoder from an IP interface, select one of encoders on the encoder selection list.

This function does not work when IP redundancy function is enabled.

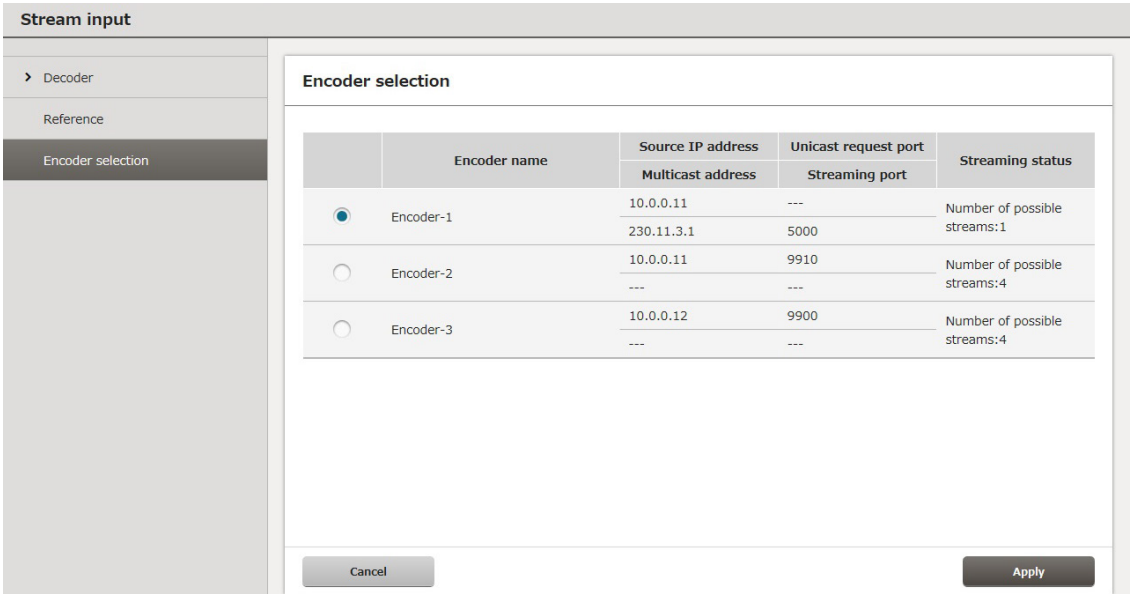


Figure 3-17 Sample screen of Encoder selection

3.4 Status

Click [Status] in global navigation to display the following status screen that shows the operating status of the IP-HE950E (encoder) or the IP-HE950D (decoder). You can check the unit operating status in more detail than on the home screen.

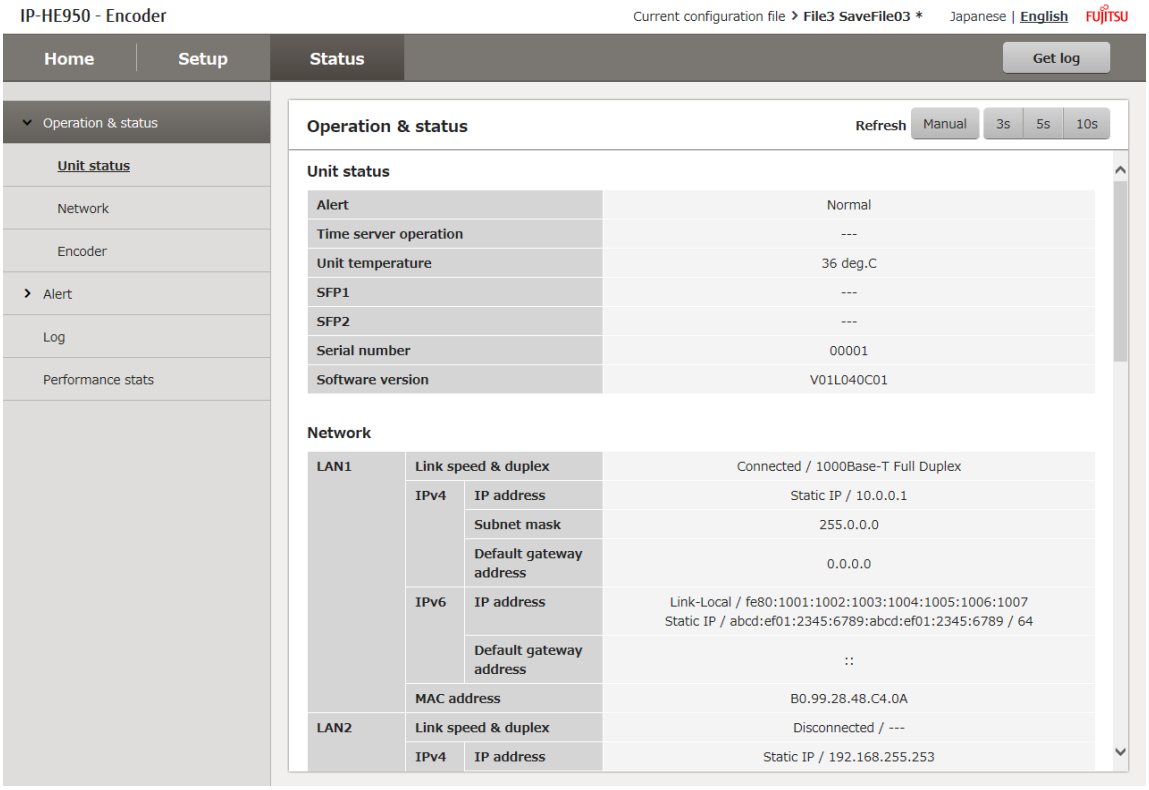


Figure 3-18 Sample screen of Status for encoder

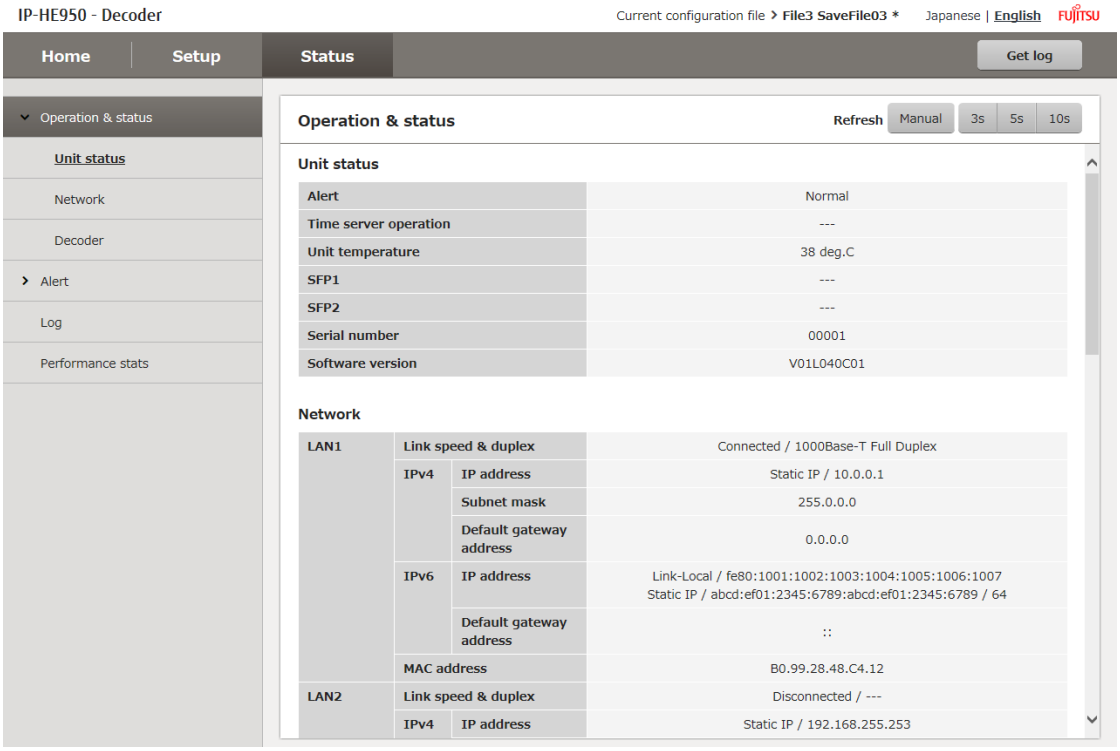


Figure 3-19 Sample screen of Status for decoder

Select a refresh interval from {3s / 5s / 10s} at the top right to automatically refresh the displayed information at the specified interval. Select {Manual} to suspend automatic refresh.

3.4.1 Operation & status

(1) Unit status

The following table shows items common to the IP-HE950E and the IP-HE950D.

Table 3-21 List of unit status display items

	Item	Displayed contents
Unit status	Alert	{Normal / Occurred}
	Time server operation	{Normal / Not synchronized / Error / ---}
	Unit temperature	xx°C
	SFP1	{3G-SDI INx2 / 3G-SDI OUTx2 / 12G-SDI OUT / ---}
	SFP2	{3G-SDI INx2 / 3G-SDI OUTx2 / ---}
	Serial number	xxxxx
	Software version	VxxLxxxCxx

(2) Network

The following table shows items common to the IP-HE950E and the IP-HE950D.

Table 3-22 List of network display items

Item			Displayed contents
LAN1	Link speed & duplex		{Connected / Disconnected} / {1000Base-T Full Duplex / 1000Base-T Half Duplex / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-T Full Duplex / 10Base-T Half Duplex}
	IPv4	IP address	{Static IP / DHCP / PPPoE} / { xxx. xxx. xxx. xxx }
		Subnet mask	{ xxx. xxx. xxx. xxx }
		Default gateway address	{ xxx. xxx. xxx. xxx }
	IPv6	IP address	Link-local / xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx {Static IP / Stateless} / { xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx / xx }
		Default gateway address	{ xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx }
	MAC address		xx.xx.xx.xx.xx.xx
LAN2	Link speed & duplex		{Connected / Not connected} / {1000Base-T Full Duplex / 1000Base-T Half Duplex / 100Base-TX Full Duplex / 100Base-TX Half Duplex / 10Base-T Full Duplex / 10Base-T Half Duplex}
	IPv4	IP address	{Static IP} / { xxx. xxx. xxx. xxx }
		Subnet mask	{ xxx. xxx. xxx. xxx }
		Gateway address	{ xxx. xxx. xxx. xxx }
	IPv6	IP address	{Static IP} / { xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx / xx }
		Gateway address	{ xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx }
	MAC address		xx.xx.xx.xx.xx.xx

Item	Displayed contents
Serial port	{Normal / Normal（command Mode）/ Normal（escape Mode）/ Normal（DTR OFF）/ Error} / Destination IP address:Port Number

(3) Encoder

The IP-HE950E displays the following encoder status. When encoding mode is “Single encoder”, only encoder 1 status is displayed. When “Dual encoder”, both of encoder 1 and encoder 2 status are displayed.

Table 3-23 Encoder 1 status

Item		Displayed contents
AV input		{SDI / SFP1 & SFP2}
Video input format		{2160p/59.94 / 2160p/50 / 2160p/29.97 / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50 / 1080i/59.94x4 / 1080i/50x4 /---/---}
IP bit rate		xx.x Mbps / ---
System bit rate		xx.x Mbps / ---
Video	Coding method	{H.265/HEVC / H.264/AVC / ---}
	Profile	H.265/HEVC {Main / Main10 / Main4:2:2 10 / ---} H.264/AVC {Main 4:2:0 8bit / High 4:2:0 8bit / High 4:2:2 8bit / High 4:2:2 10bit}
	Resolution	{3840x2160 / 1920x1080 / 1440x1080 / 1280x720 / 720x480 / 720x576 / ---}
	Bit rate	xx.x Mbps / ---
Audio 1-4	Coding method	{MPEG-1 Layer2 / MPEG-2 AAC LC / MPEG-4 AAC LC / MPEG-4 AAC ELD / Pass-thru(SMPTE302M) / ---}
	Bit rate	xxx kbps / ---
	Language	xxx / ---
DVB-ASI output		{Enable / Disable}
IP output		{Enable / Disable}
Destination IP address1-4		{RTP / UDP} IP streaming destination IP address:Port number
Transport stream ID		0 to ffff / ---
Program Number/Service ID		1 to ffff / ---
PMT PID		10 to 1ffe / ---
PCR PID		10 to 1fff / ---
Video PID		10 to 1ffe / ---
Audio1-4 PID		10 to 1ffe / ---
Ancillary PID		10 to 1ffe / ---

Table 3-24 Encoder 2 status

Item		Displayed contents
AV input		Common with Encoder 1. It is available when AV input is SDI and Video input format is 1080i.
Video input format		
IP bit rate		xx.x Mbps / ---
System bit rate		xx.x Mbps / ---
Video	Coding method	H.264/AVC / ---
	Profile	{High / Main / ---}
	Resolution	{1920x1080 / 1440x1080 / ---}
	Bit rate	xx.x Mbps / ---
Audio 1	Coding method	{MPEG-1 Layer2 / MPEG-2 AAC LC / ---}
	Bit rate	xxx kbps / ---
	Language	xxx / ---
DVB-ASI output		---
IP output		{Enable / Disable}
Destination IP address1-4		{RTP / UDP} IP streaming destination IP address:Port number
Transport stream ID		0 to ffff / ---
Program Number/Service ID		1 to ffff / ---
PMT PID		10 to 1ffe / ---
PCR PID		10 to 1fff / ---
Video PID		10 to 1ffe / ---
Audio1 PID		10 to 1ffe / ---

(4) Decoder

The IP-HE950D displays the following decoder status.

Table 3-25 Decoder status

Item		Displayed contents
Stream input		{Started(Receiving) / Started(Not received) / Stopped} / For IP interface input {RTP / UDP} Distribution source IP address:Port number
System bit rate		{xx.x Mbps / ---}
Video	Coding method	{H.265/HEVC / H.264/AVC / MPEG-2}
	Output format	{2160p/59.94 / 2160p/50 / 2160p/29.97 / 1080p/59.94 / 1080p/50 / 1080i/59.94 / 1080i/50 / 720p/59.94 / 720p/50 / 480i/59.94 / 576i/50 / 1080i/59.94x4 / 1080i/50x4 / ---/---}
	Resolution	{3840x2160 / 1920x1080 / 1440x1080 / 1280x720 / 720x480 / 720x576 / ---}
	Frame rate	{xx.xx fps / ---}
	Bit rate	{xx.x Mbps / ---}
Audio 1-4	Coding method	{MPEG-1 Layer2 / MPEG-2 AAC LC*1 / MPEG-4 AAC LC / MPEG-4 AAC ELD / Pass-thru(SMPTE302M) / ---}
	Bit rate	{xxx kbps / ---}
	Language	{xxx / ---}
Ancillary bit rate		{Avg. xxx.x kbps / Max. xxx.x kbps / ---}
Difference time of the IP redundancy		{Avg. xxxms / Max. xxxms / ---}
ARQ		{Enable (RTT=xx.xms) / ---} ARQ will be shown for each port when IP redundancy function is enabled.
TS packet size		{188 bytes / 204 bytes / ---}
Transport stream ID		{0 to ffff / ---}
Program number/Service ID		{1 to ffff / ---}
PMT PID		{10 to 1ffe / ---}
PCR PID		{10 to 1fff / ---}
Video PID		{10 to 1ffe / ---}
Audio1-4 PID		{10 to 1ffe / ---}
Ancillary PID		{10 to 1ffe / ---}

*1 When decoder receives MPEG-4 AAC ADTS, it decodes the audio as MPEG-2 AAC.

3.4.2 Alert

The displayed information on current alerts generated in the unit is divided by level. The levels are: major, minor, and warning. For the codes displayed and their descriptions, refer to "**A.1 Alert/Log List**".

3.4.3 Log

Information on up to 250 alerts generated in the unit is saved together with timestamp information. For descriptions of the alerts, refer to "**A.1 Alert/Log List**". Clicking the **Delete all** button clears the log information.

3.4.4 Performance statistics

The displayed statistical information relates to sending/receiving streams. Select the display target and display unit and click the **Display** button to display the target data. The following tables show the items displayed depending on the selected target.

Table 3-26 List of display items for IP-HE950E statistics

Display target	Item
Encoder 1 (IP)	Number of IP packets sent
	Number of FEC packets sent
	Number of ARQ request received
	Number of ARQ packets resent
	Number of ancillary data input
	Number of ancillary data input errors
	Number of ancillary data input exceeded capacity
Encoder 1 (DVB-ASI)	Number of TS packets sent
	Number of ancillary data input
	Number of ancillary data input errors
	Number of ancillary data input exceeded capacity
Encoder 2 (IP)	Number of IP packets sent
	Number of FEC packets sent
	Number of ARQ request received
	Number of ARQ packets resent
Serial port	Data received in byte on serial port
	Data sent in byte on serial port
	Data received in byte on LAN port
	Data sent in byte on LAN port

Table 3-27 List of display items for IP-HE950D statistics

Display target	Item
Decoder (IP)	Number of IP packets received
	Number of IP packets received (IP redundant stream1)
	Number of IP packets received (IP redundant stream2)
	Number of IP packets recovered
	Number of packets lost
	Number of FEC packets received
	Number of resent packets received
	Number of packets recovered by FEC
	Number of ARQ request sent
	Number of packets recovered by ARQ
	Number of data losses exceeding concealment time
	Number of reloading TS streams
	Number of BISS decrypted
	Number of BISS decryption errors(unsupported TSC)
	Number of BISS decryption errors(unused)

Display target	Item
	Number of discontinuous PCR
	Number of jitter control buffer exceeded capacity
	Number of video decoding errors
	Number of audio decoding errors
	Number of ancillary data received
	Number of ancillary data decoding errors
Decoder (DVB-ASI)	Number of TS packets received
	Number of data losses exceeding concealment time
	Number of BISS decrypted
	Number of BISS decryption errors(unsupported TSC)
	Number of BISS decryption errors(unused)
	Number of discontinuous PCR
	Number of video decoding errors
	Number of audio decoding errors
	Number of ancillary data received
	Number of ancillary data decoding errors
Serial port	Data received in byte on serial port
	Data sent in byte on serial port
	Data received in byte on LAN port
	Data sent in byte on LAN port

For the display unit, select from "All," "1 Hour," "1 Day," "1 Week," and "1 Month".

Clicking the **Delete** button clears all the information.

Chapter 4
Front Panel Operations

This chapter describes settings and operations from the front panel.

4.1 Overview 75
4.2 Operations 76
4.3 Front Panel Display 77
4.4 Special Operations 96

4.1 Overview

4.1.1 Front panel

The front panel of the unit has a display (VFD) and operation keys, and provides some of the Web GUI functions.

Figure 4-1 Front panel on the IP-HE950E

The front panel display has a size of 22 characters x 4 lines. Abbreviated expressions may be displayed (e.g., ENCODER1 -> ENC1) because of this defined number of characters per line. If not operated for 60 seconds, the display moves to the TOP screen, and the brightness of the front panel decreases (100% -> 25%).

Refer to "**4.2.1 Operation key**" for detail key operations. Refer to "**4.3.1 Screen type**" for detail display contents.

Figure 4-2 Front panel display and operation keys

4.2 Operations

4.2.1 Operation key

Table 4-1 Operation key descriptions describes about each key.

Table 4-1 Operation key descriptions

Operation key		Description
ENTER		Moves from the TOP screen to a menu screen. Moves from an item screen to a settings screen. Moves from a settings screen to a processing screen.
CANCEL		Moves to the screen that is one level higher.
Cursor key		
	Up 	Moves from a menu screen or item screen to the screen that is one level higher. Used on a settings screen to select an arbitrary value.
	Down 	Moves from a menu screen to the screen that is one level lower. Used on a settings screen to select an arbitrary value.
	Left 	Moves from a menu screen to another menu screen at the same level. Used on a settings screen (value entry) to move the cursor to any position.
	Right 	Moves from a menu screen to another menu screen at the same level. Used on a settings screen (value entry) to move the cursor to any position.

Long press of cursor key makes continuous transition enable.

4.3 Front Panel Display

4.3.1 Screen types

Table 4-2 Screen types outlines the types of screens displayed by the front panel.

Table 4-2 Screen types

Screen type	Description	Screen transition
TOP screen	The screen displays the status during operation. It appears when the unit is restarted or 60 seconds have passed without an operation being done.	Use the ENTER key or Down key to move to a menu screen.
Menu screen	The screen displays a menu (item).	Use the cursor keys to move to a menu screen or item screen. Use the CANCEL key or Up key to move to the screen that is one level higher.
Item screen	The screen displays items and their current values.	Use the Left and Right keys to move to an adjacent item screen in the same menu. Use the ENTER key to move to a settings screen. Use the CANCEL key or Up key to move to the screen that is one level higher.
Settings screen	The screen is used to change and set the values of items. Depending on the item, either select a setting value from a list (value selection) or enter a setting value directly (value setting) on the screen. The cursor (blinking) appears at the beginning of the setting value. An asterisk (*) is displayed (only for value selection) next to the current value. Arrows are displayed to represent the cursor keys that can be used.	After changing any value, use the ENTER key to move to a processing screen and proceed with the update processing. Use the CANCEL key to move to the screen that is one level higher.
Processing screen	The screen displays the update processing in progress.	The screen transition varies depending on the update processing result. OK/NG: Moves to an item screen. Busy: Moves to the Busy screen.
Busy screen	The screen appears when the unit is in the Busy state (processing).	Use the ENTER key to move back to the screen where an update is in progress, and proceed with the update processing. Use the CANCEL key to move to an item screen without proceeding with the update processing.

4.3.2 Screen transitions

The following figure shows the relationship between screens.

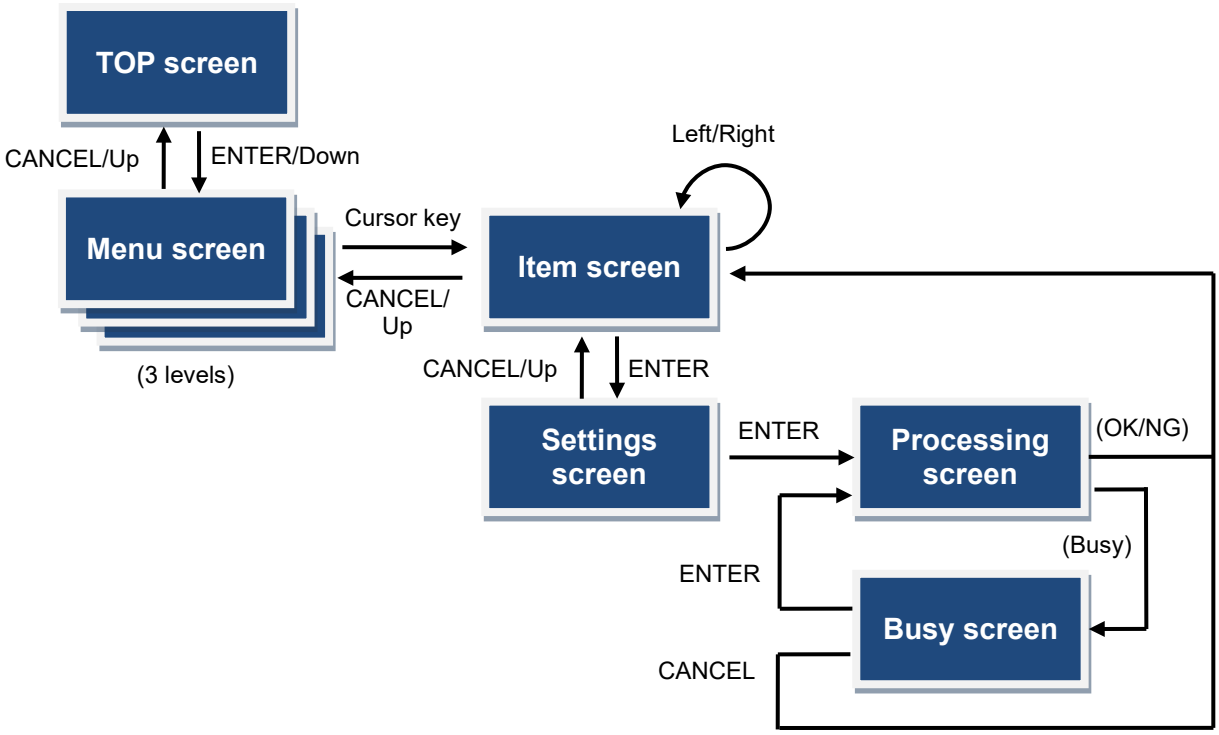


Figure 4-3 Front panel screen transitions

4.3.3 Screen layout

The front panel displays the menu hierarchy on the first line, an item name on the second line, and a setting value on the third line.
The panel displays an asterisk (*) next to the current setting value (for a selection item), and arrows representing the cursor keys that can be used.

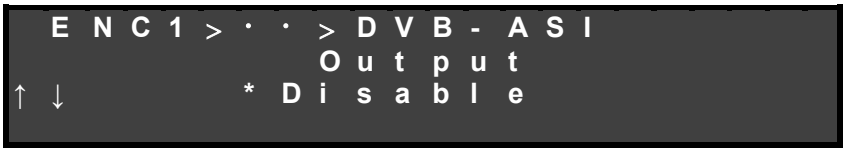


Figure 4-4 Front panel screen layout

4.3.4 Screen menus

This section shows the main contents displayed on the front panel.
The figures contain menus up to the second level. For details, refer to **Table 4-3 List of operation items**. For information on special operations (shutdown and unit reboot) that can be executed from the front panel, refer to "**4.4 Special Operations**."

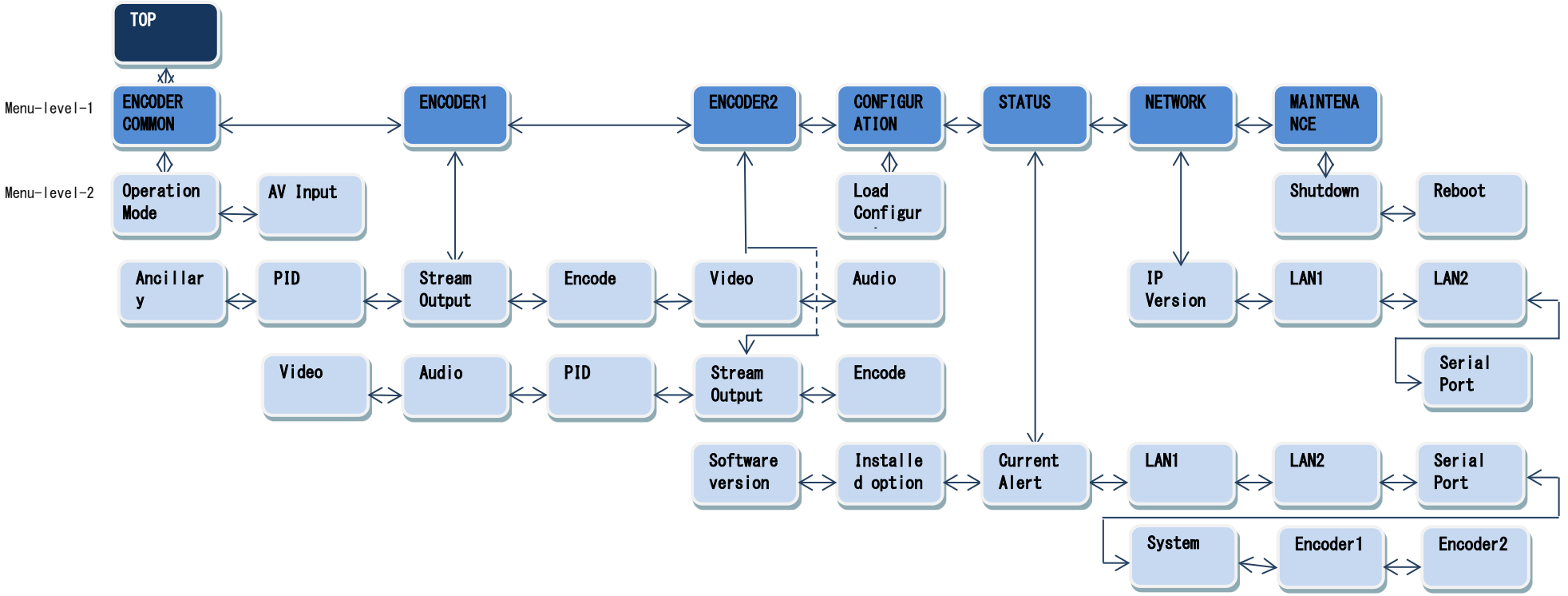


Figure 4-5 IP-HE950E Front panel display menus

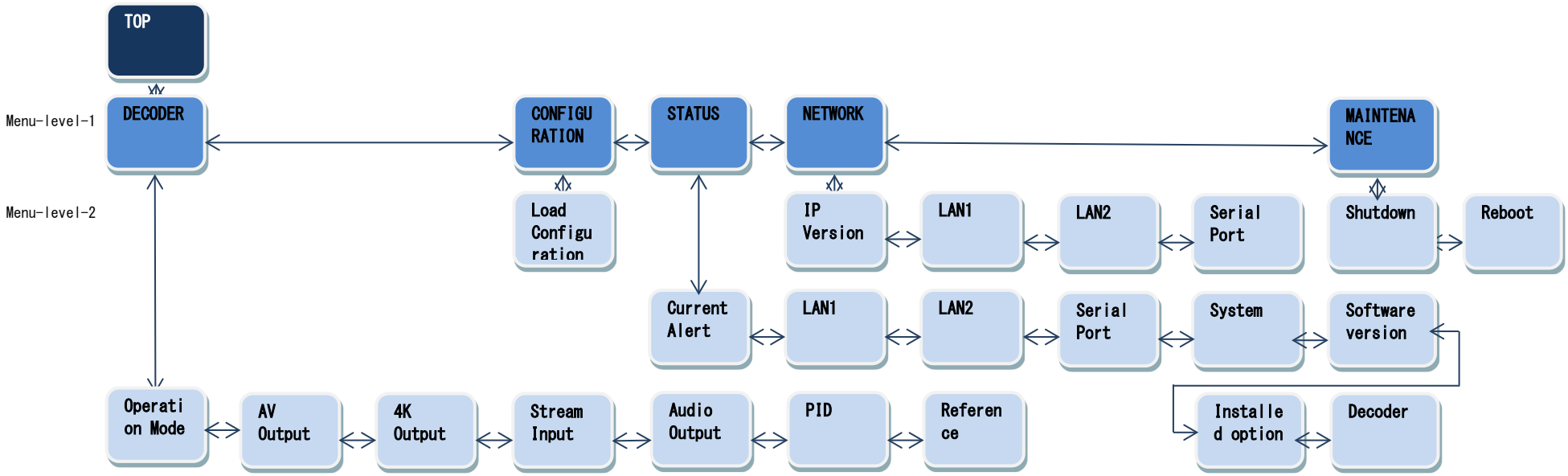


Figure 4-6 IP-HE950D Front panel display menus

4.3.5 TOP screen

The TOP screen of the IP-HE950E displays the operating status of the encoder. The screen displays the encoding setting, transmission system rate, and transmission counter. When the IP output and the DVB-ASI output are set to enable, IP output status is displayed on the TOP screen.

Figure 4-7 TOP screen display on the IP-HE950E

The TOP screen of the IP-HE950D displays the operating status of the decoder. The screen displays the video coding method, output format, receiving system rate, reception counter, packet loss counter, and error correction counter. The status is refreshed at an interval of three seconds.

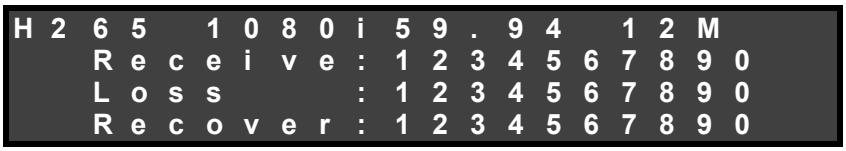


Figure 4-8 TOP screen display on the IP-HE950D

4.3.6 Operation details

You can operate and check the following items from the front panel.

Table 4-3 List of operation items

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
ENCODER COMMON	Operation Mode	Mode settings	Channel mode	Single channel / Multi channel
			Encoding mode	Single encoder/ Dual encoder
	AV Input	AV settings	Input interface	SDI/SFP1 & SFP2
			SDI active through	SFP1/Disable
			SFP1	3G-SDI INx2/ 12G-SDI OUT
			SFP2	3G-SDI INx2
			Input format	2160p/1080p/1080i/ 720p/480i/576i/ 1080ix4
			Input frequency	59.94/50/29.97/

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			4K division method	2 sample/ Square-division
			Video input buffer	Enable/Disable
			Input signal loss	Color bar/Gray/Black
			Audio interface	Embedded/ Embedded & Analog
			Audio input level	-20dbm(Max. 0dBm)/ 0dbm(Max. 20dBm)
ENCODER1	Stream Output	DVB-ASI settings	Output	Enable/Disable
			TS packet size	188 byte/204 byte
		IP settings	Output	Enable/Disable
			IP redundancy	Enable/Disable
			Streaming mode	Unicast(Simplex)/ Unicast/Multicast/ Uni(Simplex)&Multi
			Stream number	1/2/3/4
			IP version	IPv4/IPv6
			IPv4 Uni addr1	xxx.xxx.xxx.xxx
			IPv4 Uni addr2	xxx.xxx.xxx.xxx
			IPv4 Uni addr3	xxx.xxx.xxx.xxx
			IPv4 Uni addr4	xxx.xxx.xxx.xxx
			IPv4 Multi addr1	xxx.xxx.xxx.xxx
			IPv4 Multi addr2	xxx.xxx.xxx.xxx
			IPv6 Uni addr1	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr2	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr3	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr4	xxx:xxx:xxx:xxx:xxx
			IPv6 Multi addr1	xxx:xxx:xxx:xxx:xxx
			IPv6 Multi addr2	xxx:xxx:xxx:xxx:xxx
			Streaming I/F1	LAN1/LAN2
			Streaming I/F2	LAN1/LAN2
			TTL	xxx
			ARP auto update	Enable/Disable
			TOS	xx
			Error correction	Disable/FEC/ARQ/ FEC & ARQ/ SMPTE2022(Single)/ SMPTE2022(Dual)
			FEC interval	xx
			SMPTE matrix col	xx
			SMPTE matrix row	xx
			Protocol	RTP/UDP
			TS format	TS

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			Streaming port SA	xxxxx
			Streaming port DA	xxxxx
			Unicast req port	xxxxx
	Encode	Encode settings	Coding method	H.265/HEVC / H.264/AVC
			Encode format	2160p/1080p/1080i/ 720p/480i/576i
			Encode frequency	59.94/50/29.97
			Bit rate setting	IP bit rate/ System bit rate/ Video bit rate
			IP bit rate	xxxxxx kbps
			System bit rate	xxxxx kbps
			Video bit rate	xxxxx kbps
	Video	Video settings	Profile	Main/Main10/ Main4:2:2 10 / Main 4:2:0 8/ High 4:2:0 8/ High 4:2:2 8/ High 4:2:2 10
			Resolution	3840x2160/ 1920x1080/ 1440x1080/ 1280x720/ 720x480/720x576
			Performance	Ultra low latency/ Low latency(ALL P)/ Low latency/ Standard quality/ Best quality
			Prefilter	Off/Light/Medium/ Heavy
			Adaptive GOP	Enable/Disable
			IRAP interval	1cycle/2cycle
			Picture mode	Nomal/ Dynamic texture
	Audio	Audio1 settings	Coding method	Non/ MPEG-1 Layer2/ MPEG-2 AAC LC/ SMPTE302M/ MPEG-4 AAC LC/ MPEG-4 AAC ELD/
			Channel mode	Dual mono/Stereo/ 4ch(2/2)/4ch(3/1)/ 5.1ch

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			Input SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
			Input source	Embedded 1/ Embedded 2/ Embedded 3/ Embedded 4/ Embedded 5/ Embedded 6/ Embedded 7/ Embedded 8/ Embedded1-2/ Embedded2-3/ Embedded3-4/ Embedded4-5/ Embedded5-6/ Embedded6-7/ Embedded7-8/ Embedded1-3/ Embedded2-4/ Embedded3-5/ Embedded4-6/ Embedded5-7/ Embedded6-8/ Analog
			Quantization bit	16bit/20bit/24bit
			Bit rate	xxxx kbps
			Language	xxx
		Audio2 settings	Coding method	Non/ MPEG-1 Layer2/ MPEG-2 AAC LC/ SMPTE302M/ MPEG-4 AAC LC/ MPEG-4 AAC ELD
			Input source	Embedded 1/ Embedded 2/ Embedded 3/ Embedded 4/ Embedded 5/ Embedded 6/ Embedded 7/ Embedded 8/ Analog
			Channel mode	Dual mono/Stereo
			Input SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
			Quantization bit	16bit/20bit/24bit
			Bit rate	xxxx kbps
			Language	xxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
		Audio3 settings	Coding method	Non/ MPEG-1 Layer2/ MPEG-2 AAC LC/ SMPTE302M/ MPEG-4 AAC LC
			Input source	Embedded 1/ Embedded 2/ Embedded 3/ Embedded 4/ Embedded 5/ Embedded 6/ Embedded 7/ Embedded 8/ Analog
			Channel mode	Dual mono/Stereo
			Input SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
			Quantization bit	16bit/20bit/24bit
			Bit rate	xxxx kbps
			Language	xxx
		Audio4 settings	Coding method	Non/ MPEG-1 Layer2/ MPEG-2 AAC LC/ SMPTE302M/ MPEG-4 AAC LC
			Input source	Embedded 1/ Embedded 2/ Embedded 3/ Embedded 4/ Embedded 5/ Embedded 6/ Embedded 7/ Embedded 8/ Analog
			Channel mode	Dual mono/Stereo
			Input SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
			Quantization bit	16bit/20bit/24bit
			Bit rate	xxxx kbps
			Language	xxx
	Ancillary	Ancillary settings	Ancillary	Enable/Disable
			Data format	ST 2038/ARIB B40
			DID/SDID 1	xx / xx
			DID/SDID 2	xx / xx
			DID/SDID 3	xx / xx
			DID/SDID 4	xx / xx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			DID/SDID 5	xx / xx
			DID/SDID 6	xx / xx
	PID	PID settings	Transport stream ID	xxxx
			Program number	xxxx
			PMT PID	xxxx
			PCR PID	xxxx
			Video PID	xxxx
			Audio1 PID	xxxx
			Audio2 PID	xxxx
			Audio3 PID	xxxx
			Audio4 PID	xxxx
			Ancillary PID	xxxx
			PCR interval	30ms/40ms/50ms/ 60ms/70ms/80ms/ 90ms/100ms
			PSI interval	100ms
ENCODER2 (Displayed when Dual encoding)	Stream Output	IP settings	Output	Enable/Disable
			Streaming mode	Unicast(Simplex)/ Unicast/Multicast
			Stream number	1/2/3/4
			IP version	IPv4/IPv6
			IPv4 Uni addr1	xxx.xxx.xxx.xxx
			IPv4 Uni addr2	xxx.xxx.xxx.xxx
			IPv4 Uni addr3	xxx.xxx.xxx.xxx
			IPv4 Uni addr4	xxx.xxx.xxx.xxx
			IPv4 Multi addr1	xxx.xxx.xxx.xxx
			IPv6 Uni addr1	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr2	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr3	xxx:xxx:xxx:xxx:xxx
			IPv6 Uni addr4	xxx:xxx:xxx:xxx:xxx
			IPv6 Multi addr1	xxx:xxx:xxx:xxx:xxx
			Streaming I/F1	LAN1/LAN2
			TTL	xxx
			ARP auto update	Enable/Disable
			TOS	xx
			Error correction	Disable/FEC/ARQ/ FEC & ARQ/ SMPTE2022(Single)/ SMPTE2022(Dual)
			FEC interval	xx
			SMPTE matrix col	xx
			SMPTE matrix row	xx
			Protocol	RTP/UDP

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			TS format	TS/TTS
			Streaming port SA	xxxxx
			Streaming port DA	xxxxx
			Unicast req port	xxxxx
	Encode	Encode settings	Coding method	H.264/AVC
			Encode format	1080i
			Encode frequency	59.94/50
			Bit rate setting	IP bit rate/ System bit rate/ Video bit rate
			IP bit rate	xxxxxx kbps
			System bit rate	xxxxx kbps
			Video bit rate	xxxxx kbps
	Video	Video settings	Profile	Main 4:2:0 8/ High 4:2:0 8
			Resolution	1920x1080/ 1440x1080
			Performance	Low latency/ Standard quality/ Best quality
			Prefilter	Off/Light/Medium/ Heavy
			IRAP interval	1cycle/2cycle
	Audio	Audio1 settings	Coding method	Non/MPEG-1 Layer2/ MPEG-2 AAC LC
			Channel mode	Stereo
			Input source	Embedded 1/ Embedded 2/ Embedded 3/ Embedded 4/ Embedded 5/ Embedded 6/ Embedded 7/ Embedded 8/ Analog
			Bit rate	xxxx kbps
			Language	xxx
	PID	PID settings	Transport stream ID	xxxx
			Program number	xxxx
			PMT PID	xxxx
			PCR PID	xxxx
			Video PID	xxxx
			Audio1 PID	xxxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			PCR interval	30ms/40ms/50ms/ 60ms/70ms/80ms/ 90ms/100ms
			PSI interval	100ms
DECODER	Operation Mode	Mode settings	Channel mode	Single channel/ Multi channel
	AV Output	AV settings	Startup format	2160p/1080p/1080i/ 720p/480i/576i/ 1080ix4
			Startup frequency	59.94/50/29.97
			Concealment time	xxxx
			No packet receiving	Blue/Gray
			Audio output level	-20dbm(Max. 0dBm)/ 0dbm(Max. 20dBm)
			Output interface	SDI/SDI & SFP1
			SFP1	12G-SDI OUT
	4K Output	4K settings	Output interface	SDI/SDI & SFP1/ SFP1 & SFP2
			SFP1	3G-SDI OUTx2/ 12G-SDI OUT
			SFP2	3G-SDI OUTx2
			Division method	2 sample/ Square-division
	Audio Output	Audio1 setting	Output SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
		Audio2 setting	Output SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
		Audio3 setting	Output SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
		Audio4 setting	Output SFP	SFP1-1 / SFP1-2 / SFP2-1 / SFP2-2
	Stream Input	Stream settings	Interface	Disable/DVB-ASI/IP
			IP redundancy	Enable/Disable
			Streaming mode	Unicast (Simplex)/ Unicast/Multicast/ Uni(Simplex)&Multi
			IP version	IPv4/IPv6
			IGMP version set1	Version2/Version3
			MLD version set1	Version1/Version2
			IPv4 sourceIP addr1	xxx.xxx.xxx.xxx
			IPv4 sourceIP addr2	xxx.xxx.xxx.xxx
			IPv4 Multi addr1	xxx.xxx.xxx.xxx
			IPv4 Multi addr2	xxx.xxx.xxx.xxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			IPv6 sourceIP addr1	xxx:xxx:xxx:xxx:xxx
			IPv6 sourceIP addr2	xxx:xxx:xxx:xxx:xxx
			IPv6 Multi addr1	xxx:xxx:xxx:xxx:xxx
			IPv6 Multi addr2	xxx:xxx:xxx:xxx:xxx
			IGMPv3 sourceIP1	xxx.xxx.xxx.xxx
			IGMPv3 sourceIP2	xxx.xxx.xxx.xxx
			MLDv2 sourceIP1	xxx:xxx:xxx:xxx:xxx
			MLDv2 sourceIP2	xxx:xxx:xxx:xxx:xxx
			Unicast req cycle	xx
			Jitter buffer size	xxx
			IP buffering time	xxxx
			ARQ	Enable/Disable
			ARQ buffering time	xxxx
			SMPTE2022 FEC	Enable/Disable
			Streaming port	xxxxx
			Unicast req port SA	xxxxx
			Unicast req port DA	xxxxx
			ENC addr rep port	xxxxx
	PID	PID settings	Mode	Auto/ Program number/ PMT/Manual
			Program number	xxxx
			PMT PID	xxxx
			PCR PID	xxxx
			Video PID	xxxx
			Audio1 PID	xxxx
			Audio2 PID	xxxx
			Audio3 PID	xxxx
			Audio4 PID	xxxx
			Ancillary PID	xxxx
	Reference	Reference settings	Reference	PCR/Internal/ BB/Tri-sync
			Phase adjustment	-xxxxxx/xxxxxx
			Ref clock output	Disable/BB/ Through out
CONFIGURATION	Load configuration			Config number for loading
STATUS	Current Alert	Major		Alert code name
		Minor		Same as above
		Warning		Same as above
	LAN1	IPv4 address		xxx.xxx.xxx.xxx *1

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
		IPv4 subnetmask		xxx.xxx.xxx.xxx *1
		IPv4 default-gw		xxx.xxx.xxx.xxx *1
		IPv6 linklocal addr		xxx:xxx:xxx:xxx:xxx
		IPv6 address		xxx:xxx:xxx:xxx:xxx *2
		IPv6 prefix		xxx *2
		IPv6 default-gw		xxx:xxx:xxx:xxx:xxx *2
		MAC address		xx.xx.xx.xx.xx.xx
		Speed & Duplex		Transmission rate & duplex
	LAN2	IPv4 address		xxx.xxx.xxx.xxx
		IPv4 subnetmask		xxx.xxx.xxx.xxx
		IPv4 gateway		xxx.xxx.xxx.xxx
		IPv6 linklocal addr	xxx:xxx:xxx:xxx:xxx	IPv6 linklocal addr
		IPv6 address	xxx:xxx:xxx:xxx:xxx	IPv6 address
		IPv6 prefix	xxx	IPv6 prefix
		IPv6 gateway	xxx:xxx:xxx:xxx:xxx	IPv6 gateway
		MAC address		xx.xx.xx.xx.xx.xx
		Speed & Duplex		Transmission rate & duplex
	Serial port	Connection		Normal / Normal Command mode / Normal Escape mode / Normal DSR off / Fault / ---
		Destination IP		xxx.xxx.xxx.xxx / xxx:xxx:xxx:xxx:xxx
		Destination port		xxxxx
	System	SFP1		Displays installation status and type
		SFP2		Displays installation status and type
		Serial number		Serial number
		Temperature		Unit temperature
	Encoder1	AV input		SDI/SFP1 & SFP2
		Video input format		2160p/59.94, 2160p/50, 2160p/29.97, 1080p/59.94, 1080p/50, 1080i/59.94, 1080i/50,720p/59.9, 720p/50,480i/59.94,576 i/50, 1080i/59.94x4, 1080i/50x4

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
		IP bit rate		xxxxxx.xMbps
		System bit rate		xxxxx.xMbps
		Video coding method		H.265/HEVC / H.264/AVC
		Profile		Main/Main 10/ Main4:2:2 10/ Main 4:2:0 8/ High 4:2:0 8/ High 4:2:2 8/ High 4:2:2 10
		Resolution		3840x2160/ 1920x1080/ 1440x1080/ 1280x720 / 720x480/ 720x576
		Video bit rate		xxxxx.xMbps
		Audio1		Coding & rate & lang
		Audio2		Coding & rate & lang
		Audio3		Coding & rate & lang
		Audio4		Coding & rate & lang
		DVB-ASI output		Disable/Enable
		IP output		Disable/Enable
		Protocol1		RTP/UDP
		Destination IP 1		xxx.xxx.xxx.xxx
		Destination port1		xxxxx
		Protocol2		RTP/UDP
		Destination IP 2		xxx.xxx.xxx.xxx
		Destination port2		xxxxx
		Protocol3		RTP/UDP
		Destination IP 3		xxx.xxx.xxx.xxx
		Destination port3		xxxxx
		Protocol4		RTP/UDP
		Destination IP 4		xxx.xxx.xxx.xxx
		Destination port4		xxxxx
		Transport stream ID		xxxx
		Program number		xxxx
		PMT PID		xxxx
		PCR PID		xxxx
		Video PID		xxxx
		Audio1 PID		xxxx
		Audio2 PID		xxxx
		Audio3 PID		xxxx
		Audio4 PID		xxxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
		Ancillary PID		xxxx
	Encoder2	AV input		SDI
		Video input format		1080i/59.94
		IP bit rate		xxxxxx.x Mbps
		System bit rate		xxxxx.x Mbps
		Video coding method		H.264/AVC
		Profile		Main 4:2:0 8/ High 4:2:0 8
		Resolution		1920x1080/ 1440x1080
		Video bit rate		xxxxx.x Mbps
		Audio1		Coding & rate & lang
		IP output		Disable/Enable/
		Protocol1		RTP/UDP
		Destination IP 1		xxx.xxx.xxx.xxx
		Destination port1		xxxxx
		Protocol2		RTP/UDP
		Destination IP 2		xxx.xxx.xxx.xxx
		Destination port2		xxxxx
		Protocol3		RTP/UDP
		Destination IP 3		xxx.xxx.xxx.xxx
		Destination port3		xxxxx
		Protocol4		RTP/UDP
		Destination IP 4		xxx.xxx.xxx.xxx
		Destination port4		xxxxx
		Transport stream ID		xxxx
		Program number		xxxx
		PMT PID		xxxx
		PCR PID		xxxx
		Video PID		xxxx
		Audio1 PID		xxxx
	Decoder	Stream input		Stopped/ No receiving/ Receiving
		Protocol1		RTP/UDP
		Stream input IP1		xxx.xxx.xxx.xxx
		Stream input port1		xxxx
		Protocol2		RTP/UDP
		Stream input IP2		xxx.xxx.xxx.xxx
		Stream input port2		xxxx
		System bit rate		xxxxx.x Mbps

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
		Video coding method		H.265/HEVC/ H.264/AVC/ MPEG-2
		Output format		2160p/59.94 2160p/50 2160p/29.97 1080p/59.94 1080p/50 1080i/59.94 1080i/50 720p/59.94/ 720p/50 480i/59.94/ 576i/50 1080i/59.94x4 1080i/50x4
		Resolution		3840x2160/ 1920x1080/ 1440x1080/ 1280x720/ 720x480/720x576
		Frame rate		59.94/50/29.97 fps
		Video bit rate		xxxxx.x Mbps
		Audio1		Coding & rate & lang
		Audio2		Coding & rate & lang
		Audio3		Coding & rate & lang
		Audio4		Coding & rate & lang
		Ancillary		Avg. xx.xkbps / Max. xx.xkbps
		ARQ		Operating(RTT=xx.x ms)
		RTT1		xxxxxx.x ms / ---
		RTT2		xxxxxx.x ms / ---
		IP redundancy lag		Avg. xxxxx ms / Max. xxxxx ms / ---
		TS packet size		188bytes/ 204bytes
		Transport steam ID		xxxx
		Program number		xxxx
		PMT PID		xxxx
		PCR PID		xxxx
		Video PID		xxxx
		Audio1 PID		xxxx
		Audio2 PID		xxxx
		Audio3 PID		xxxx
		Audio4 PID		xxxx
		Ancillary PID		xxxx
	Software Version	Software version		VxxLxxxCxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
	Installed Option	4K		Installed/ Not Installed
		Contribution +		Installed/ Not Installed
		BISS		Installed/ Not Installed
		IP redundancy		Installed/ Not Installed
NETWORK	IP Version	IP version setting	IP version	IPv4/IPv4&IPv6
	LAN1	LAN1 settings	IPv4 address mode	Static IP/ DHCP/PPPoE
			IPv4 address	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv4 default-gw	xxx.xxx.xxx.xxx
			IPv6 address mode	Static IP/Stateless
			IPv6 address	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
			IPv6 default-gw	xxx:xxx:xxx:xxx:xxx
			Speed & Duplex	Transmission rate & duplex
	LAN2	LAN2 settings	IPv4 address mode	Static IP
			IPv4 address	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv4 gateway	xxx.xxx.xxx.xxx
			IPv6 address mode	Static IP
			IPv6 address	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
			IPv6 default-gw	xxx:xxx:xxx:xxx:xxx
			Speed & Duplex	Transmission rate & duplex
		Static network 1	IP version	IPv4/IPv6
			IPv4 network addr	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv6 network addr	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
		Static network 2	IP version	IPv4/IPv6
			IPv4 network addr	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv6 network addr	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
		Static network 3	IP version	IPv4/IPv6
			IPv4 network addr	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv6 network addr	xxx:xxx:xxx:xxx:xxx

Level 1	Level 2	Level 3	Level 4	Setting/ Display value
			IPv6 prefix	xxx
		Static network 4	IP version	IPv4/IPv6
			IPv4 network addr	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv6 network addr	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
		Static network 5	IP version	IPv4/IPv6
			IPv4 network addr	xxx.xxx.xxx.xxx
			IPv4 subnetmask	xxx.xxx.xxx.xxx
			IPv6 network addr	xxx:xxx:xxx:xxx:xxx
			IPv6 prefix	xxx
	Serial port	Serial port	Serial port	Enable / Disable
		Transmission settings	Serial mode	Server / Client mode / Client mode(Modem)
			Syncronize with	Enable / Disable
			IP version	IPv4 / IPv6
			IPv4 dest addr	xxx.xxx.xxx.xxx
			IPv6 dest addr	xxx:xxx:xxx:xxx:xxx
			Client port SA	xxxxx
			Client port DA	xxxxx
			Server port SA	xxxxx
		Serial port settings	Type	RS-232C / RS-422
			Timeout	xxx ms
			Delimiter code1	xx
			Delimiter code2	xx
			Baud rate	1200bps / 2400bps / 4800bps / 9600bps / 19200bps / 38400bps
			Bit length	7bits / 8bits
			Parity	None / Odd / Even
			Stop bits	1bit / 2bits
			Flow control	None / RS/CS
			DTR signal monitor	Enable / Disable
MAINTENANCE	Shutdown			Executes shutdown
	Reboot			Executes reboot

*1 If the IPv4 address mode is DHCP or PPPoE and an address failed to be obtained, "---" is displayed.

*2 If the IPv6 address mode is stateless and an address failed to be obtained, "---" is displayed.

The items not displayed and the ranges of values or choices of some items are depending on other settings.

4.4 Special Operations

4.4.1 Shutdown

You can shut down the unit by operating the keys on the front panel. You can safely power off the unit by shutting it down before powering it off.
If the unit is powered off while it has an active PPPoE connection, it might take time extra to establish next connection. When the unit has an active PPPoE connection, we recommend shutting down the unit before powering it off.
To shut down, display the Shutdown item on the MAINTENANCE menu, and press the ENTER key.

Figure 4-9 Shutdown screen

4.4.2 Unit reboot

You can reboot the unit by operating the keys on the front panel.
Set the unit to reboot from the Reboot item on the MAINTENANCE menu.

Figure 4-10 Reboot screen

Chapter 5 Troubleshooting

This chapter describes the actions to take if, for example, audio/video is not output or an alarm LED goes on.

5.1 Troubleshooting 98
5.2 Alarm LED Goes On 101

5.1 Troubleshooting

If you think your IP-HE950 is malfunctioning, take the corresponding corrective action in the table below, according to the applicable conditions.
If a problem persists, contact Fujitsu sales or Fujitsu partners. Before handing over the unit to them, initialize it as instructed in "**3.3.3 Configuration file**" to delete your confidential data.

⚠WARNING

Possibility of electric shock
Contact your system administrator before checking the voltage of a power outlet. Otherwise, electric shock may occur.

Table 5-1 Check details and corrective actions

Classification	Symptom	Check	Corrective action
Power/ Startup	The unit cannot be powered on.	Is the power code connected?	Confirm that the power code is properly connected to the outlet.
		Is the outlet voltage normal?	Measure the voltage with a tester to confirm that the voltage is normal. If another unit is connected to the same outlet, check the operation of the unit.
Hardware	The ALM LED is on.	The IP-HE950 is faulty.	Check the details of the error from the Web GUI or the front panel.
	The PWR LED lights up in orange.	Is the ambient temperature of the IP-HE950 higher than that in the specifications?	Adjust the temperature conditions so that the ambient temperature of the IP-HE950 meets the specifications.
		Is there any shielding material in the installation area?	Remove the shielding material.
Operation	Commands cannot be used via a LAN. (The Web GUI cannot be displayed.)	Is the RDY LED blinking?	The hardware system is operating while the RDY LED is blinking. Wait until the LED stays on.
		Is the IP address of the unit correct? You can check the IP address of the unit from the front panel.	Check [STATUS] - [LAN1,2] - [IPv4 address] - [default-gw].
		Is the correct IP address displayed on the front panel?	Automatic acquisition of the IP address possibly failed. Check and set the address from the [NETWORK] - [LAN1,2] - [LAN1,2 settings] menu on the front panel.
		Are the LINK LEDs on the IP-HE950 and hub on?	If they are not, The LAN connection is not established. Check the connection.

Classification	Symptom	Check	Corrective action
Operation	Commands cannot be used via a LAN. (The Web GUI cannot be displayed.)	Issue a PING command to the IP address of the IP-HE950. Does it respond?	If not: - Check the network settings on the PC (to check whether the net mask and gateway address are valid).
		Is a valid browser with valid settings being used?	- Confirm that a supported browser is used. - Disable the proxy and compatibility view settings of the browser, and retry the operation.
Video	No video is output. (Black screen)	Is the monitor turned on?	Check the monitor power and operation.
		Is the IP-HE950 turned on?	Confirm that the PWR LED is on.
		Is the IP-HE950D correctly connected to the monitor?	Check the connection between the IP-HE950D and monitor.
	A blue/gray screen is output.	Has decoding started?	Confirm that the decoder is running and receiving stream input. Confirm the settings for receiving streams as described in "**3.3.6 Stream input**".
		Is the setup normal?	Check the streaming format, streaming address, and port number settings of the encoder and decoder as described in "**3.3.5 Stream output**" and "**3.3.6 Stream input**".
		Is "Running" shown for the encoder output settings?	Check the encoder operating status to confirm that "Running" is shown for DVB-ASI output and IP output.
	Only color bars are displayed.	Is the video input of the encoder normal?	If there is no video input, the encoder outputs color bars or a gray view according to the "Display when video input disconnected" setting on the AV input setup screen. Check video input.
		Is the video input of the encoder correctly configured?	Confirm that the video input interface and video input format settings in "**3.3.5 Stream output**" match video input signals.
	The received video sometimes stops, or the video is distorted.	Is there a receiving error?	Check the number of data packets received, in the decoder statistics described in "**3.4.4 Performance statistics**". Display the performance statistics several times. If the number of data packets lost is incrementing, the network load may be high or there may be a problem with a setting. Consult your network administrator.
		Is the MTU size too small?	Use the size recommended for the network used.

Classification	Symptom	Check	Corrective action
Audio	No sound comes out.	Is the IP-HE950 turned on?	Confirm that the PWR LED is on.
		Is the IP-HE950 correctly connected to the speaker?	Check the connection between the IP-HE950 and the speaker.
		Is the volume of the speaker too low?	Check the volume of the speaker.
		Has an alert been generated on the distribution source unit?	If an alert was generated, refer to the operating manual of the distribution source unit.
		Is the distribution source unit correctly connected to the audio source?	Check the connection of the audio cable.
		Is the encoder audio format set to "No audio"?	Confirm that the audio format is correctly set as described in "**3.3.5 Stream output**".
	Noise is generated.	Disconnect the audio output cable from the IP-HE950. Does that eliminate the noise?	If the noise does not disappear even after the cable is disconnected, check the audio cable and audio output equipment.
		Is there a receiving error?	Check the number of data packets received, in the decoder statistics described in "**3.4.4 Performance statistics**". Display the performance statistics several times. If the number of data packets lost is incrementing, the network load may be high or there may be a problem with a setting. Consult your network administrator.
Data	Data communication is desabled	Are port settings correct? Do the local and remote equipments have matching port setting?	Check them by referring to "**3.3.1 Network settings**".
		Is the operation mode consistent between the local and remote equipments?	Check them by referring to "**3.3.1 Network settings**".
		Do the equipment and the data input/output device have matching serial port settings?	Check them by referring to "**3.3.1 Network settings**".
		Is the data input/output device operating normally?	Confirm the operation of the data input/output device.
Maintenance	Software cannot be installed.	Is the file specification valid? Has the license key been correctly entered?	If the message "Software installation failed. (Data error)" appears, the file specification is invalid or the license key was entered incorrectly.

5.2 Alarm LED Goes On

An alarm LED (ALM or IN DWN) goes on when the IP-HE950 detects an alert. After the alarm LED goes on, check the generated alert, from the Web GUI or front panel of the IP-HE950.

5.2.1 Checking an Alert

For instructions to check an alert from the Web GUI, refer to **"3.4.2 Alert**." For instructions to operate the front panel, refer to "**4.2.1 Operation key**." For information on alert codes displayed on the front panel, refer to "**Table A.1-1 Alert/Log list**."
For instructions to check a log, refer to "**3.4.3 Log**."

Table 5-2 Main types of alerts and corrective actions lists the main types of alerts and their corrective actions. Take appropriate action according to the details of the generated alert.

Table 5-2 Main types of alerts and corrective actions

Alert type	Corrective action
Network status (L000 to LFFF)	Check for an error in the network and linked unit. If no error can be identified, contact your system administrator.
Unit status (E000 to EFFF)	Power off the unit and power it on again once. If the unit is still operating abnormally after being powered on, contact maintenance personnel. The personnel may ask for the alert code.
AV/stream input (I000 to IFFF)	Check for an error in input signals, such as video input and reference input. Check the video output equipment and video cable connected to the video input terminal.

5.2.2 LED indications

Table 5-3 LED indications lists what is indicated by the LEDs on the IP-HE950. The display state of an alarm LED (ALM or IN DWN) varies depending on the alert level. For the alert level setting, refer to "**3.3.2 Management**".

Table 5-3 LED indications

LED type		On	Blinking	Off
PWR	Green	Power on	-	Power OFF
	Orange	Temperature shutdown	-	-
RDY	Green	Normal operation	Operating normally	Shutdown status
IN DWN	Orange	Major alert of network/input error	Minor alert of network/input error	No alert
ALM	Orange	Major alert of unit error	Minor alert of unit error	No alert
LINK/ACT	Green	LINK established	Ether frame detected	LINK not established
100/1000M	Green	100M operation	1000M operation	10M operation

Appendix

Setting and Condition Tables 104
Glossary 118
Release Notes 125

Setting and Condition Tables

A.1 Alert/Log List

The following table is an alert/log list.

LED indication symbols -: No effect, ON: On; B: Blinking, OFF: Off, L: On/Blinking/Off depending on the alert level

Table A.1-1 Alert/Log list

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
								Power off							
0001	Notification					D	OK	Boot (Power on)	VxxLxxxCxx ConfigName [Cancel] pressed at maintenance start, Maintenance [Down] key pressed at bundle start, Factory Firmware	ON	-	-	-	-	-
0002	Notification					D	OK	Boot (Reset)	VxxLxxxCxx ConfigName [Cancel] pressed at maintenance start, Maintenance [Down] key pressed at bundle start, Factory Firmware	-	-	-	-	-	-
0003	Notification					D	OK	Boot (Restart)	VxxLxxxCxx ConfigName [Cancel] pressed at maintenance start, Maintenance [Down] key pressed at bundle start, Factory Firmware	-	-	-	-	-	-
0004	Notification					D	OK	Boot (Other)	VxxLxxxCxx ConfigName [Cancel] pressed at maintenance start, Maintenance [Down] key pressed at bundle start, Factory Firmware	-	-	-	-	-	-
0005	Notification off					OK	D	Shutdown		-	OFF	-	-	-	-

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
0010	Notification off					OK	D	Software update	"V01L001C01 -> V01L002C01" etc.	-	-	-	-	-	-
0011	Notification					D	OK	Option update	"4K" etc.	-	-	-	-	-	-
0012	Notification					D	OK	Configuration file update		-	-	-	-	-	-
0013	Notification					D	OK	Configuration information update		-	-	-	-	-	-
0014	Notification					D	OK	Configuration file loading	"Configuration1 ConfigName1" etc.	-	-	-	-	-	-
0015	Notification					D	OK	Configuration file initialization		-	-	-	-	-	-
0A00	Notification off					OK	D	RTC initialization		-	-	-	-	-	-
0B00	Warning			D				Unit time error		-	-	-	-	-	L
E000	Warning			D				FlashROM error	"/dev/mtd0" etc.	-	-	-	-	-	L
E001	Warning			D				Flash checksum error	"software" or "configuration" or "running configuration" "configuration #1 to 10" or "option"	-	-	-	-	-	L
E010	Minor		D					VFD device error		-	-	-	-	-	L
E020	Major	D	OK	OK	OK			FAN error	100RPS	-	-	-	-	-	L
*E020	Major	D	OK	OK	OK			FAN error restoration	100RPS	-	-	-	-	-	OFF
E030	Major	D						Power error #1		-	-	-	-	-	ON
E040	Minor	OK	D	OK	OK			Temperature warning #1	TEMP1=60 TEMP2=50 FAN=100RPS	-	-	-	-	-	L
*E040	Minor	OK	D	OK	OK			Temperature warning restoration #1	TEMP1=60 TEMP2=50 FAN=100RPS	-	-	-	-	-	OFF

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
E041	Minor	OK	D	OK	OK			Temperature warning #2	TEMP1=60 TEMP2=50 FAN=100RPS	-	-	-	-	-	L
*E041	Minor	OK	D	OK	OK			Temperature warning restoration #2	TEMP1=60 TEMP2=50 FAN=100RPS	-	-	-	-	-	OFF
E042	Major	D						Temperature error #1	TEMP1=60 TEMP2=50 FAN=100RPS	ON*4	-	-	-	-	-
E043	Major	D						Temperature error #2	TEMP1=60 TEMP2=50 FAN=100RPS	ON*4	-	-	-	-	-
E044	Major	D						Temperature sensor communication error #1		-	-	-	-	-	ON
E045	Major	D						Temperature sensor communication error #2		-	-	-	-	-	ON
E050	Major	D						Clock error #1		-	-	-	-	-	ON
E051	Major	D						Clock error #2		-	-	-	-	-	ON
E052	Major	D						Clock error #3		-	-	-	-	-	ON
E060	Major	D						Clock error #7		-	-	-	-	-	ON
E061	Major	D						Clock error #8		-	-	-	-	-	ON
E062	Major	D						Clock error #9		-	-	-	-	-	ON
E063	Major	D						Clock error #10		-	-	-	-	-	ON
E064	Major	D						Clock error #11		-	-	-	-	-	ON
E065	Major	D						Clock error #12		-	-	-	-	-	ON
E066	Major	D						Clock error #13		-	-	-	-	-	ON

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
E067	Major	D						Clock error #14		-	-	-	-	-	ON
E068	Major	D						Clock error #15		-	-	-	-	-	ON
E069	Major	D						Clock error #16		-	-	-	-	-	ON
E06A	Major	D						Clock error #17		-	-	-	-	-	ON
E06B	Major	D						Clock error #18		-	-	-	-	-	ON
E070	Major	D						Clock error #19		-	-	-	-	-	ON
E090	Major	D						Memory error #1		-	-	-	-	-	ON
E093	Off				D			FPGA#1 memory error	AVFPGA CRAM	-	-	-	-	-	-
E094	Off				D			FPGA#2 memory error	SFPGA CRAM	-	-	-	-	-	-
E0B0	Warning			D				RTC device access error		-	-	-	-	-	L
E300	Off	OK	OK	OK	D			ENCODER1: Hardware error		-	-	-	-	-	L
*E300	Off	OK	OK	OK	D			ENCODER1: Hardware error restoration		-	-	-	-	-	OFF
E400	Off	OK	OK	OK	D			ENCODER1: Software error		-	-	-	-	-	L
*E400	Off	OK	OK	OK	D			ENCODER1: Software error restoration		-	-	-	-	-	OFF
E410	Minor	OK	D	OK	OK			ENCODER1: Send buffer overflow		-	-	-	-	-	L
*E410	Minor	OK	D	OK	OK			ENCODER1: Send buffer overflow restoration		-	-	-	-	-	OFF

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
E600	Off	OK	OK	OK	D			ENCODER2: Hardware error		-	-	-	-	-	L
*E600	Off	OK	OK	OK	D			ENCODER2: Hardware error restoration		-	-	-	-	-	OFF
E700	Off	OK	OK	OK	D			ENCODER2: Software error		-	-	-	-	-	L
*E700	Off	OK	OK	OK	D			ENCODER2: Software error restoration		-	-	-	-	-	OFF
E710	Minor	OK	D	OK	OK			ENCODER2: Send buffer overflow		-	-	-	-	-	L
*E710	Minor	OK	D	OK	OK			ENCODER2: Send buffer overflow restoration		-	-	-	-	-	OFF
E700	Off	OK	OK	OK	D			DECODER: Hardware error		-	-	-	-	-	L
*E700	Off	OK	OK	OK	D			DECODER: Hardware error restoration		-	-	-	-	-	OFF
E800	Off	OK	OK	OK	D			DECODER: Software error		-	-	-	-	-	L
*E800	Off	OK	OK	OK	D			DECODER: Software error restoration		-	-	-	-	-	OFF
E900	Major	D	OK	OK	OK			SFP1: Unimplemented		-	-	-	-	-	B or L
*E900	Major	D	OK	OK	OK			SFP1: Restoration for unimplementation		-	-	-	-	-	OFF
E910	Major	D	OK	OK	OK			SFP1: Connection type error		-	-	-	-	-	B or L
*E910	Major	D	OK	OK	OK			SFP1: Connection type error restoration		-	-	-	-	-	OFF
E920	Major	D						SFP1: Temperature error		-	-	-	-	-	B
*E920	Major	D						SFP1: Temperature error restoration		-	-	-	-	-	OFF

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
E930	Major	D						SFP1: Voltage error		-	-	-	-	-	B
EA00	Major	D	OK	OK	OK			SFP2: Unimplemented		-	-	-	-	-	B or L
*EA00	Major	D	OK	OK	OK			SFP2: Restoration for unimplementation		-	-	-	-	-	OFF
EA10	Major	D	OK	OK	OK			SFP2: Connection type error		-	-	-	-	-	B or L
*EA10	Major	D	OK	OK	OK			SFP2: Connection type error restoration		-	-	-	-	-	OFF
EA20	Major	D						SFP2: Temperature error		-	-	-	-	-	B
*EA20	Major	D						SFP2: Temperature error restoration		-	-	-	-	-	OFF
EA30	Major	D						SFP2: Voltage error		-	-	-	-	-	B
EC00	Warning	OK	OK	D	OK			4K decoder option uninstallation		-	-	-	-	-	L
*EC00	Warning	OK	OK	D	OK			Restoration for 4K decoder option uninstallation		-	-	-	-	-	OFF
EC10	Warning	OK	OK	D	OK			Contents transmission decoder option uninstallation		-	-	-	-	-	L
*EC10	Warning	OK	OK	D	OK			Restoration for contents transmission decoder option uninstallation		-	-	-	-	-	OFF
EF00	Major	D						SFPGA configuration error		-	-	-	-	-	ON
EF01	Major	D						AVFPGA configuration error		-	-	-	-	-	ON
EF10	Major	D						Device access error #1		-	-	-	-	-	ON
EF11	Major	D						Device access error #2		-	-	-	-	-	ON

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
L000	Warning	OK	OK	D	OK			LINK alert generated (LAN1)		-	-	OFF	OFF	L	-
*L000	Warning	OK	OK	D	OK			LINK alert restoration (LAN1)	"100BaseTX_HD" etc.	-	-	ON	ON	OFF	-
L010	Warning	OK	OK	D	OK			DHCP connection error (LAN1)		-	-	-	-	L	-
*L010	Warning	OK	OK	D	OK			DHCP connection error restoration (LAN1)	10.0.0.1/24,10.0.0.254	-	-	-	-	OFF	-
L011	Notification					D	OK	DHCP connection update (LAN1)	10.0.0.1/24,10.0.0.254 -> 10.0.0.100/24,10.0.0.254	-	-	-	-	-	-
L020	Warning	OK	OK	D	OK			PPPoE connection error (LAN1)		-	-	-	-	L	-
*L020	Warning	OK	OK	D	OK			PPPoE connection error restoration (LAN1)	10.0.0.1/24,10.0.0.254	-	-	-	-	OFF	-
L021	Notification					D	OK	PPPoE connection update (LAN1)	10.0.0.1/24,10.0.0.254 -> 10.0.0.100/24,10.0.0.254	-	-	-	-	-	-
L030	Warming	OK	OK	D	OK			Stateless address acquisition error (LAN1)						L	
*L030	Warming	OK	OK	D	OK			Stateless address acquisition error restoration (LAN1)	2000::1/64					OFF	
L031	Notification					D	OK	Stateless address update (LAN1)	2000::1/64 -> ::/0						
L100	Warning	OK	OK	D	OK			LINK alert generated (LAN2)		-	-	OFF	OFF	L	-
*L100	Warning	OK	OK	D	OK			LINK alert restoration (LAN2)	"100BaseTX_HD" etc.	-	-	ON	ON	OFF	-
L200	Warning	OK	OK	D	OK			Time server synchronization error		-	-	-	-	L	-
*L200	Warning	OK	OK	D	OK			Time server synchronization error restoration		-	-	-	-	OFF	-
I300	Minor	OK	D	OK	OK			SDI: Input down		-	-	-	-	L	-

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
*I300	Minor	OK	D	OK	OK			SDI: Input restoration		-	-	-	-	OFF	-
I310	Minor	OK	D	OK	OK			SDI: Video input synchronization error		-	-	-	-	L	-
*I310	Minor	OK	D	OK	OK			SDI: Video input synchronization error restoration		-	-	-	-	OFF	-
I400	Minor	OK	D	OK	OK			SFP1-1: Input down		-	-	-	-	L	-
*I400	Minor	OK	D	OK	OK			SFP1-1: Input restoration		-	-	-	-	OFF	-
I401	Minor	OK	D	OK	OK			SFP1-2: Input down		-	-	-	-	L	-
*I401	Minor	OK	D	OK	OK			SFP1-2: Input restoration		-	-	-	-	OFF	-
I410	Minor	OK	D	OK	OK			SFP1-1: Video input synchronization error		-	-	-	-	L	-
*I410	Minor	OK	D	OK	OK			SFP1-1: Video input synchronization error restoration		-	-	-	-	OFF	-
I411	Minor	OK	D	OK	OK			SFP1-2: Video input synchronization error		-	-	-	-	L	-
*I411	Minor	OK	D	OK	OK			SFP1-2: Video input synchronization error restoration		-	-	-	-	OFF	-
I600	Minor	OK	D	OK	OK			SFP2-1: Input down		-	-	-	-	L	-
*I600	Minor	OK	D	OK	OK			SFP2-1: Input restoration		-	-	-	-	OFF	-
I601	Minor	OK	D	OK	OK			SFP2-2: Input down		-	-	-	-	L	-
*I601	Minor	OK	D	OK	OK			SFP2-2: Input restoration		-	-	-	-	OFF	-
I610	Minor	OK	D	OK	OK			SFP2-1: Video input synchronization error		-	-	-	-	L	-

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
*I610	Minor	OK	D	OK	OK			SFP2-1: Video input synchronization error restoration		-	-	-	-	OFF	-
I611	Minor	OK	D	OK	OK			SFP2-2: Video input synchronization error		-	-	-	-	L	-
*I611	Minor	OK	D	OK	OK			SFP2-2: Video input synchronization error restoration		-	-	-	-	OFF	-
I800	Minor	OK	D	OK	OK			DVB-ASI input down		-	-	-	-	L	
*I800	Minor	OK	D	OK	OK			DVB-ASI input restoration		-	-	-	-	OFF	
I810	Minor	OK	D	OK	OK			DVB-ASI synchronization error		-	-	-	-	L	
*I810	Minor	OK	D	OK	OK			DVB-ASI synchronization error restoration		-	-	-	-	OFF	
I900	Minor	OK	D	OK	OK			Reference: Input down		-	-	-	-	L	-
*I900	Minor	OK	D	OK	OK			Reference: Input restoration		-	-	-	-	OFF	-
I910	Minor	OK	D	OK	OK			Reference: Clock synchronization error		-	-	-	-	L	-
*I910	Minor	OK	D	OK	OK			Reference: Clock synchronization error restoration		-	-	-	-	OFF	-
IB00	Minor	OK	D	OK	OK			ENCODER1: Input data error	#XXXXXXXXXXXXXXXX (For details of X, refer to the " Target counters of Encoder input data error alerts and bits supported" sheet)					L	-
*IB00	Minor	OK	D	OK	OK			ENCODER1: Input data error	#XXXXXXXXXXXXXXXX (For details of X, refer to the " Target counters of Encoder input data error alerts and bits supported" sheet)					OFF	-
IB80	Minor	OK	D	OK	OK			DECODER: Input data error	#XXXXXXXXXXXXXXXX (For details of X, refer to the " Target counters of Decoder input data error alerts and bits supported" sheet)	-	-	-	-	L	-
*IB80	Minor	OK	D	OK	OK			DECODER: Input data error restoration	#XXXXXXXXXXXXXXXX (For details of x, refer to the " Target counters of Decoder input data error alerts and bits supported" sheet)	-	-	-	-	OFF	-

ALMCODE	Default level	Variable level (OK: Variable, D: Default)						Alert name (translated from Japanese version)	Detailed parameter (example)	LED					
		Major	Minor	Warning	Off	Notification	Notification off			PWR	RDY *3	LINK/ACT *1	100/1000M *2	IN_DWN	ALM
ID80	Minor	OK	D	OK	OK			DECODER: Multi channel data format error						L	
*ID80	Minor	OK	D	OK	OK			DECODER: Multi channel data format error restoration						OFF	

*1 LINK established: On, Ether frame detected: Blinking, LINK not determined: Off

*2 10M: Off, 100M: On, 1000M: Blinking

*3 Green: On (running normally), Blinking (software loading/shutdown in progress), Off (software not running), Green/Orange: Blinking alternatingly (card starting/running)

*4 The POWER LED lights up in orange during a temperature shutdown. Power off/on for recovery

Table A.1-2 Target counters of Encoder input data error alerts and bits supported

Bit	1	2	3 to 6	7	8	9 to 64
Interface	IP	IP	Undefined	DVB-ASI	DVB-ASI	Undefined
Error item	Number of ancillary data input errors	Number of ancillary data input exceeded capacity		Number of ancillary data input errors	Number of ancillary data input exceeded capacity	

Table A.1-3 Target counters of Decoder input data error alerts and bits supported

Bit	1	2	3	4	5	6	7	8	9	10	11	12	13	14 to 64
Interface	IP	IP	IP	IP	IP	DVB-ASI	DVB-ASI	DVB-ASI	DVB-ASI	DVB-ASI	DVB-ASI	IP	IP	Undefined
Error item	Number of reloading TS streams	Number of discontinuous PCR values	Number of video 1 decoding errors	Number of audio decoding errors	Number of ancillary data decoding errors	Number of discontinuous PCR values	Number of video 1 decoding errors	Number of audio decoding errors	Number of ancillary data decoding errors	Number of BISS decryption errors(unsupported TSC)	Number of BISS decryption errors(unused)	Number of BISS decryption errors(unsupported TSC)	Number of BISS decryption errors(unused)s	

A.2 Port Numbers Used

Table A.2-1 List of port numbers used

Description			TCP/UDP	Port number (initial value)	Remarks
Encoder	Streaming port	Local port (source)	UDP	0, 1024 to 64000 (0) *2	*1
		Destination port (destination)	UDP	1024 to 64000 (5000)	
	ARQ control port	Local port (source)	UDP	[Streaming, local port number] + 1 (Automatically set)	
		Destination port (destination)	UDP	[Streaming, destination port number] + 1 (Automatically set)	
	SMPTE 2022 FEC distribution port	Local port (source)	UDP	Same as [Streaming, local port number]	
		Destination port (destination)	UDP	[Streaming, destination port number] + 2 (Automatically set) [Streaming, destination port number] + 4 (Automatically set)	
	Distribution request port	Local port (receiving)	UDP	1024 to 64000 (9900)	
	Encoder information notification	Local port (source)	UDP	0, 1024 to 64000 (0) *2	
		Notification port (destination)	UDP	1024 to 64000	
Decoder	Streaming port	Local port (receiving)	UDP	1024 to 64000 (5000)	
	ARQ control port	Local port (receiving)	UDP	[Streaming port number] + 1 (Automatically set)	
	SMPTE 2022 FEC streaming port	Local port (receiving)	UDP	[Streaming, local port number] + 2 (Automatically set) [Streaming, local port number] + 4 (Automatically set)	
	Distribution request port	Local port (source)	UDP	0, 1024 to 64000 (0) *2	
		Destination port (destination)	UDP	1024 to 64000 (9900)	
Serial port	Server mode	Local port(receiving)	TCP	1024-6400 (0)	
	Client mode	Local port(source)	TCP	0,1024-64000 (0) *2	
	Client mode(Modem)	Destination port(destination)	TCP	1024-6400 (0)	
HTTP	Web GUI access port		TCP	80	
DHCP (Client)	Port for IP address acquisition with DHCP		UDP	68	
NTP	Port for time synchronization with time server		UDP	123	
SNMP	SNMP MIB reception port		UDP	161	
SNMP (TRAP)	SNMP trap destination port		UDP	162	

*1 The value depends on the setting. You can set a value within the listed range.

*2 If 0 is specified for the port number, a port number within the range of 64100 to 65000 is automatically set.

A.3 Applying an Option License

If you purchased an option license separately from the IP-HE950, you will need to apply for an installation key to activate function.

To apply, fill in the necessary information on the application form in IP-HE950_LicenseRequestSheet.txt, which is on Fujitsu official website. Then, send the form as a file attachment in an e-mail to fj-ss_nw_ipinskey@dl.jp.fujitsu.com. The necessary information includes the serial number of your IP-HE950, where you will be installing the optional function. You can check for the unit serial number on the label on the front/bottom of the IP-HE950, from global navigation on the Web GUI by selecting [Status] - [Unit status], and from [STATUS] - [System] - [Serial number] on the front panel.
After you send the license application form, you will be notified by e-mail within two business days about the installation key issued.

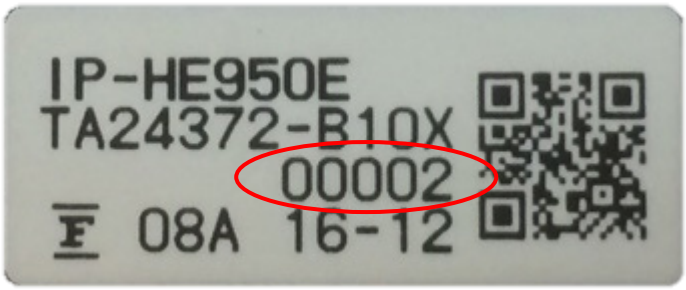


Figure A.3-1 Example of a front/bottom label on the IP-HE950

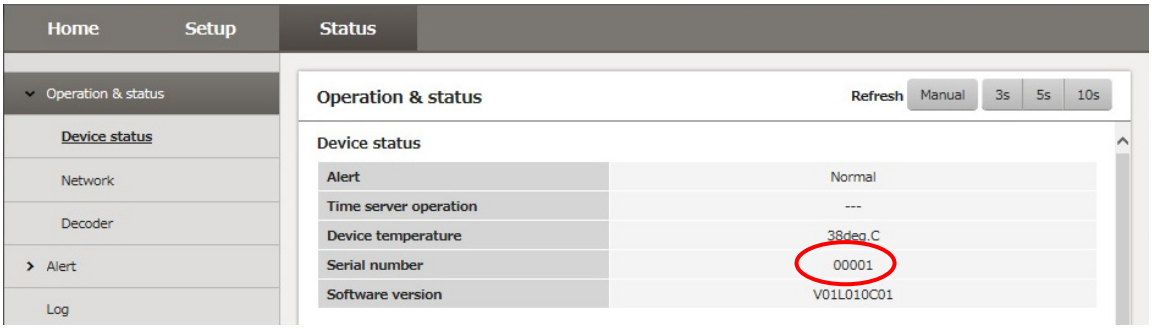


Figure A.3-2 Example of the Web GUI displaying an IP-HE950 serial number

Glossary

AAC (Advanced Audio Coding)
Audio compression technology used with the video compression standards MPEG-2 and MPEG-4. AAC was standardized as ISO 13818-7 in April 1997. It has a high compression rate, supporting maximum sampling frequencies of up to 96 kHz, according to the standard.

AC-3
Audio encoding technology developed by Dolby Laboratories in the U.S. The format consists of five independent channels of sound plus one channel for low-frequency playback, so it is also called 5.1 Channel Surround.

AES/EBU
AES (Audio Engineering Society) and EBU (European Broadcasting Union) standardized for professional digital audio I/O (IEC-60958 TYPE-1). It was applied to ANSI (American National Standard Institute) too.

ARP (Address Resolution Protocol)
A protocol that is used to acquire the MAC address of the transmission destination of Ethernet frames. This protocol uses an IP address to acquire the MAC address. If the MAC address of the transmission destination of IP packets is unknown, an ARP packet requesting the MAC address is broadcast. The MAC address is acquired using the response to this request.

ARQ (Automatic Repeat reQuest)
An error correcting method in which error packet will be retransmitted automatically when a packet error is detected at the receiver (decoder). The IP-HE950 has a real-time high error-control ability, equipped with the original FEC + ARQ hybrid method.

BISS (Basic Interoperable Scrambling System)
A scrambling system formulated by the EBU in May 2002. This system has three modes: MODE 0, MODE 1 and MODE E. In MODE 1, a 12-character (48-bit) session word is used for encryption and decryption. In MODE E, a 16-character (64-bit) encrypted session word and 14-character (56-bit) injected ID are used for encryption and decryption. In MODE 0, encryption is not used.

BB (Black Burst)
Sync signal of the black level's video signal which is used to synchronize.

BNC (Bayonet Neill Concelman)
One of the coaxial cable connectors which have 75 ohms or 50 ohms impedance. It uses the lock called Bayonet Lock and is very easy and compact to use. It is used for test gear and digital audio because it supports high frequencies of up to 4 GHz.

CAT (Conditional Access Table)
An information table to support the limited receiving.

CC (Closed Captioning)
Data for broadcast captioning. It is multiplexed at an Ancillary data area, a virtual or horizontal blanking area of a video signal, in an HD/SD-SHI signal.

DHCP (Dynamic Host Configuration Protocol)
Protocol that automatically assigns the required information, such as the IP address needed by a computer to connect to a network.

DID/SDID
DID (Data IDentifier word of Ancillary data) and SDID (Secondary Data IDentifier word) indicates the type of user data transmitted in an Ancillary data packet.

DVB-ASI (Digital Video Broadcasting - Asynchronous Serial Interface)
Standard interface in DVB (Digital Video Broadcasting: European Digital Broadcasting standardization organization) and used in MPEG CODEC most commonly. It is an asynchronous serial interface and standardized in ETSI TR 101 891.

Dual-Link SDI
Video transmission format with a bit rate of 2.970 Gbps through a pair of coaxial cables.

Encrypted session word
16-character (64-bit) word specified by the user in BISS MODE E. A session word is derived from the specified encrypted session word (and injected ID). Then, encryption or decryption in BISS MODE E is performed.

FEC (Forward Error Correction)
A method in which the sender transmits a redundant packet to the receiver for error correction in addition to the sending packet. It enables the receiver to correct errors without the need to request the sender for retransmission.

GOP (Group Of Pictures)
The smallest of the structural units composing a video. A GOP consists of three types of frames: I frame, P frame, and B frame.

HD-BNC (High Density BNC)
One of the coaxial cable connectors which have 75 ohms characteristic impedance. It is smaller than the standard BNC, and its implementation rate is four times higher.

HD-SDI (High Definition television - Serial Digital Interface)
HD-SDI is the serial digital interface to transmit HD (High Definition) video signals, whose transmission rate is 1.485 Gbps. It can transmit a multiplexing HD video signal, PCM audio signal, and data signal like a timestamp.

HE-AAC (High-Efficiency Advanced Audio Coding)
Extended format of MPEG-4 AAC. It greatly improves the sound quality at low bit rates, such as below 64 kbps.

H.264
One of the video compression coding systems standardized, in May 2003 in this case, by the ITU (International Telecommunication Union). It is also standardized as a part of MPEG-4 (MPEG-4 part 10 Advanced Video Coding) by the ISO (International Organization for Standardization). Therefore, it is commonly called H.264/MPEG-4 AVC or H.264/AVC, showing both parties.
This technology is used for various applications from those with low bit rates and low resolutions like mobile TV to those with high bit rates and high resolutions like HDTV. It is improved so that the data capacity is half that of MPEG-2, which is in widespread use.

H.265
One of the video compression coding systems standardized, in January 2013 in this case, by the ITU (International Telecommunication Union). From the study phase of the research and development team JCT-VC (Joint Collaborative Team on Video Coding), it has also been called HEVC (High Efficiency Video Coding) by VCEG (Video Coding Experts Group) of the ITU and MPEG of the ISO (International Organization for Standardization).
H.265 has a high compression rate due to optimization of the block size and other reasons, and achieved compression performance that is almost twice that of H.264. It will be used for 4K and other high-resolution video, and video distribution for mobile terminals.

IBBP/IBP/IPPP/PPPP
Video encoding structure with the I, P, and B frames.
I frame: Intra frame. Frame encoded using internal video information.
P frame: Prediction Picture frame. Frame encoded using correlation with a previous frame.
B frame: Bi-directional Inter frame. Frame encoded using the previous and coming I frames or P frames.

IGMPv2
Protocol defined in RFC 2236 for receiving IPv4 multicast datagrams. IGMPv2 includes functions for participating in and leaving IPv4 multicast groups, and so on.

IGMPv3
Protocol defined in RFC 3376. In addition to the IGMPv2 function, the information source filtering function that can be specified to receive multicast datagrams transmitted from a dedicated IPv4 address has been added.

Injected ID
14-character (56-bit) ID specified by the user in BISS MODE E. A session word is derived from the specified injected ID and encrypted session word. Then, encryption or decryption in BISS MODE E is performed.

IPv4 (Internet Protocol version 4)
Internet protocol that is currently the dominant version on the Internet. The network address length is 32 bit, and it is anticipated that address space will be exhausted due to the growing use of the Internet.

IPv6 (Internet Protocol version 6)
Internet protocol that is the successor to IPv4, which is currently the dominant IP protocol version on the Internet. The network address length is extended from 32 bits in IPv4 to 128 bits to solve the address space exhaustion problem that is worsening with the growing use of the Internet. IPv6 also provides stateless address auto-configuration that allows an IPv6 address to be automatically generated based on the information from the router and the MAC address of the IP-HE950.

LED (Light-Emitting Diode)
This unit has power LED and alarm LED lamps. The power LED lamp lights up in green to indicate that the power is on. The alarm LED lamp lights up in orange to indicate that an alert has been generated.

MLD v1 (Multicast Listener Discovery version 1)
Protocol defined in RFC 2710. It is used to detect the multicast listeners receiving a multicast datagram.

MLD v2 (Multicast Listener Discovery version 2)
Protocol defined in RFC 3810. In addition to the MLD v1 support function, it has an information source filtering function, which enables specification for receiving only the packets sent from a specific source address (or any address except that specific source address).

MPEG-4
A video data compression method that is a part of the MPEG standard. MPEG-4 was designed to distribute video images of low picture quality (due to a high compression ratio) over slow communication lines (e.g., cellular phone and telephone lines). MPEG-4 was also designed to transmit video together with audio at about 64 kilobits per second. The name of this standard comes from the name of the organization promoting standardization of color video compression encoding formats. MPEG-4 defines a framework for an object encoding format that can be flexibly extended comprehensively, including not only natural images and audio but also various media such as computer graphics and text. It covers a wide range of transmission speeds from a low bit rate of several kbps to several Mbps. The aim is to become the multimedia encoding format that can be practical to use from mobile terminals and other applications with low bit rates.

NTSC (National Television Standards Committee)
Standard established by a U.S. standardization body for analog television systems.
NTSC images are made of 29.97 interlaced frames per second, each of which is composed of 525 scan lines in total.

NIT (Network Information Table)
Physical network information for sending streams is stored in this table.

NTP (Network Time Protocol)
·····Communication protocol to synchronize the clocks of the network-connected equipment with the correct time of a time server.

PAL (Phase Alternating Line)
·Standard developed in Germany for analog color television broadcasting. PAL images are made of 25 interlaced frames per second, each of which is composed of 625 scan lines in total.

PAT (Program Association Table)
The table and list of programs of a TS (Transport Stream) are described with PMT PIDs. The PID of the PAT is 0.

PCR (Program Clock Reference)
Standard clock for synchronizing the time of the transmitter (encoding) and receiver (decoding) in an MPEG-2 TS.

PES (Packetized Elementary Stream)
A packetized method provided by MPEG-2 Systems. Encoded video or audio bit streams are called "elementary streams." Each of these streams are packetized following a standard and called "PES."

PID
A packet identifier, which has 13-bit information, included in a TS packet. It is used to indicate the information transmitted in each TS packet.

PMT (Program Map Table)
ID table which identifies audio, video, and so on.

PPPoE (Point-to-Point Protocol over Ethernet)
Communication protocol defined in RFC 2516 and mainly used to connect to Internet connection services such as DSL, CATV, and FFTH.

PPS (Picture Parameter Set)
A header in NAL (Network Abstraction Layer) of H.264/AVC and H.265/HEVC, in which information on encoding the whole picture is written.

Pro-MPEG FEC
FEC method standardized by Pro-MPEG Forum (Professional-MPEG Forum). It generates and sends 2-dimensional (columns x rows) redundant packets. It is now standardized as SMPTE 2022-1.

PS (Program Stream)
An MPEG-2 method for multiplexing video, audio, and data, the PS method is used for transmission and storage in an error-free environment.

PSI (Program Specific Information)
This is the information on the program to which each ES in a TS packet belongs (e.g., PAT, PMT, and CAT).

RS-232C
Interface standard that was mainly established by the Electronics Industry Association (EIA) for communication between data terminals and data communications equipment.

RS-422
One of the standards for serial communication standardized by the Electronics Industries Association (EIA). RS-422 data transmission can be strongly resistant to noise, travels on cables as long as 1.2 km, and has a maximum communication speed of 10 Mbps.

RTP
Abbreviation of real-time transport protocol. This transport protocol is for transferring image data or voice data in real time.

SD-SDI (Standard Definition television - Serial Digital Interface)
Standard definition digital video interface standardized in SMPTE 259M.

SFP (Small Form-factor Pluggable)
Module that can connect various interfaces to FPGA and other such devices, when inserted into a generic SFP cage and connector.

SDT (Service Description Table)
Detailed descriptions such as the service names of the system and service providers are stored in this table.

Session word
12-character (48-bit) word specified by the user in BISS MODE 1. The specified session word is used for encryption or decryption in BISS MODE 1.

SMPTE 2022-1 FEC
Same FEC method as the above-mentioned Pro-MPEG FEC. It generates and sends 2-dimensional (columns x rows) redundant packets.

SNMP v1 (Simple Network Management Protocol version 1)
Communication protocol defined in RFC 1065, RFC 1066, and RFC 1213 for monitoring and controlling network equipment. The protocol defines a framework for network management protocols and other protocols. This framework is used for SNMP v2c, SNMP v3, etc.

SNMP v2c (Simple Network Management Protocol version 2c)
Communication protocol defined in RFC 1901 and RFC 1908 for monitoring and controlling network equipment. The protocol enables communications using v2, which has higher communication security and performance, on a community basis similar to communications using v1.

TOS (Type Of Service)
Type of service that can be added within IP packets. It is used for controlling the order of priority of packets in a router, etc.

TS (Transport Stream)
Abbreviation of Transport Stream, which is in MPEG-2 Systems for multiplexing video, audio, and data. The TS method is used for transmission in an environment, such as ATM communication or digital broadcasting, where errors may occur.

TSC (Transport Scrambling Control)
A field in MPEG-2 TS header information, which indicates the scrambling mode of a stream. The TSC of a stream that is encrypted with the BISS method is defined as 2.

TTL (Time To Live)
Abbreviation of Time To Live, which indicates the survival time of a packet on a network. If a packet sent to a network happens to enter a loop because of a setting error on a router, it will not survive forever but will be discarded when the specified survival time is reached.

UTC (Coordinated Universal Time)
International standard time. The UTC is calculated based on the time measured by an atomic clock, which uses the second in the SI unit system as a reference value, making adjustments that insert leap seconds to compensate for the time difference from Greenwich Mean Time (GMT).

VFD (Vacuum Fluorescent Display)
Also called a fluorescent display tube. Unlike a liquid crystal display, the displayed content itself emits light, so the contrast is clearer than on an LCD. Other features of a VFD are operability over a wide temperature range and less influence on function by the temperature gradient.

VITC (Vertical Interval Time Code)
Time code signal embedded in the vertical blanking area of a video sync signal.

VUCP
Validity flag, User data, Channel status, and Parity bit of the audio signal format as defined in IEC 60958.

Alert log
A record of errors that occurred on units and communication lines.

Embedded audio
A method to embed AES/EBU digital audio signal into the blanking area of an SDI (Serial Digital Interface) signal.

Original network ID
ID for identifying a transport stream. Each transport stream is identified by the combination of an original network ID and a transport stream ID.

Auto sensing
Function to automatically detect input signals and track encoding. The IP-HE950 supports Auto sensing for 3G-SDI/HD-SDI/SD-SDI at 50/59.94 Hz.

Language code
Code to identify the language of the audio stream to transmit. The language is written with a three-character code defined in ISO 639 part 2.

Center Cut
Method to down-convert the video source from, for example, the 16:9 screen size ratio (aspect ratio) to 4:3. When selected, this method trims the right and left sides of the video.

System rate
Data amount per second of encoding data including that up to MPEG-2 Systems. The data for the network packets and FEC packets is not included.

Symbol rate
Symbol transmission speed defined by the number of symbols sent to the transmission line per second. The unit of measurement is symbol/s.

Squeeze
One method of down-converting from the 16:9 screen size ratio (aspect ratio) of an HD video source to the 4:3 screen size ratio of SD video.

Square division
One method used to divide the screen to transmit 4K video to quad-link 3G-SDI. 4K video is transmitted divided into four full-HD videos.

IP satellite mode
A function used in transmission using IP satellite connection. It distributes streams that inhibit the bit stuffing function of the HDLC procedure, which is used in IP satellite connection. (This function inserts 0 after five consecutive 1's.)

TTS (Time stamped Transport Stream)
A 192-byte packet consisting of a basic 188-byte MPEG TS and a 4-byte timestamp counted by a 27-MHz clock.

Downconverter
Converting from an HD-SDI signal to an SD-SDI signal.

Pre-Filter
Filter that works before encoding of a video signal for an improvement in video quality with rough movement at low encoding rates.

Private PES
Packetized elementary stream standardized by MPEG-2 Systems that users can use for any data transmission.

Program Number/Service ID
ID for identifying a channel (service) provided by a broadcasting company. By specifying a Program Number/service ID, you can select an arbitrary transport stream from multiple transport streams.

Profile
This defines various encoding formats used for compressing an image. The profile can be changed, depending on the use of the compressed image.

Ancillary data
Transmitted kind of data located in the blanking area of a digital video interface (e.g., audio data and time code data).

Multicast
Method to send packet (data) to the specified multiple network terminals concurrently.

Unicast
Communication with a station at a single address (that is, most general one-to-one communication).

Refresh Cycle
GOP cycle from one I frame to the next I frame in the GOP that contains the I frames. In a GOP that does not contain I frames, the frame cycle is the cycle until one whole screen is updated using intra-slices.
The longer the cycle, the more improved the video quality. However, the recovery time from a video error caused by a data receiving error at the decoder is also longer.

Letterbox
One method of down-converting from the 16:9 screen size ratio (aspect ratio) of an HD video source to the 4:3 screen size ratio of SD video. The resulting image has black bars at top and bottom of the video.

12G-SDI
Interface that supports the transmission speed of 12 Gbps, which allows uncompressed transmission of 4K video. A 3840/60p signal can be transmitted through a single BNC cable.

2 Sample Interleave
One method used to divide the screen to transmit 4K video to quad-link 3G-SDI, with horizontal sampling every 2 pixels on every other line (interleaving). Any link can be used for HD monitor video.

3G-SDI
Interface that achieves the high-resolution video transmission required for 1080p and digital cinema. The transmission capacity is 3 Gbps, and a 1080/60p signal can be transmitted through a single BNC cable.

Tri-sync
Sync signal used for High Definition TV. One characteristic is that no phase gap is generated even if the sync signal shrinks due to signal attenuation.

4K video
General term for video with supported horizontal and vertical resolutions of about 4,000 x 2,000, respectively. The resolution adopted by TV broadcasts is 3840 x 2160 and by digital cinema is 4096 x 2160.

4:2:0
One of the video formats. In this format, the number of pixels for the color-difference components (Pb and Pr) is half the number of pixels for the brightness component (Y) in the horizontal and vertical directions.

4:2:2
One of the video formats. In this format, the number of pixels for the color-difference components (Pb and Pr) is half the number of pixels for the brightness component (Y) in only the horizontal direction.

Release Notes

- Software version V01L050
- Release (2020/11/6)
- Additional Audio input/output SFP selective function
- Additional serial communication function
- The 4K Encoder option is not required in Multi channel mode

- Software version V01L040
- Release (2019/4/30)
- Additional IP redundancy function
  Multicast
  SMPTE2022-1 FEC
- Picture mode dynamic texture for primary codec

- Software version V01L030
- Release (2018/10/15)
- Video coding H.264/AVC for primary codec
- Additional resolutions
  SD(480i, 576i)
  H.265 : 1080ix1440
- Enhanced prefilter
  Improved performance of prefilter
  Removed limitation of prefilter
- Additional audio codec as below
  MPEG-4 AAC LC
  MPEG-4 AAC ELD
  Channel mode: 5.1ch/4ch(2/2)/4ch(3/1) added
- Expansion of maximum encoding rate
  Video bit rate: 58Mbps(V01L001 through V01L020) -> 68Mbps
  System bit rate: 60Mbps(V01L001 through V01L020) -> 70Mbps
- IPv6
- IP redundancy function
- HD(1080i) x 4ch Multi channel mode

- Software version V01L020
- Release (2017/11/30)
- Expansion of number of audio channels
  contribution-plus option is installed : 8ch
  contribution-plus option is not installed : 4ch
- Ancillary function
- Additional video performance : Ultra low latency(ALL P), Low latency(ALL P)
- Additional SDI output option
- Analog audio function
- Additional video decode : H.264/AVC, MPEG-2

- Software version V01L010
- Release (2017/7/18)
- Additional video frequency
  2160p x 3840 / 29.97Hz
  All resolutions / 50Hz

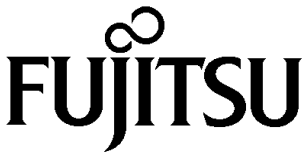
- Additional audio codec : MPEG-1 Layer 2
- Encoder 2 (H.264/AVC) function
- BISS function
- English WEB-GUI
- SNMP control with extended MIB
- Prefilter for video input 1080i
- Releasing of the following limitations
  Main 4:2:2 10 on 2160p
  SMPTE302M 20bit/24bit

- Software version V01L001

- Initial release (2017/3/10)

Fujitsu Real-time Video Transmisson Gear IP-HE950
Software User's Guide

Edition 09 December 2022


FUJITSU