

# IP-HE950 HARDWARE 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.

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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 one's own expense.

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## PREFACE

Thank you for purchasing the IP-HE950 (H265/HEVC CODEC).

The IP-HE950 is a video transmission unit with H.265/HEVC encoding technology, which performs at a high compression rate.

This document explains how to use the hardware of the IP-HE950.

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.



### Product operating environment

The IP-HE950 is intended for use with indoor systems.

#### Note

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

## ORGANIZATION AND CONTENTS OF THIS DOCUMENT

This document consists of five chapters, an appendix, and a glossary. Read Chapters 1 and 2 first for information on installing and connecting the IP-HE950. Then, read Chapter 3 for operating instructions. Chapter 4 and subsequent chapters can be read as required.

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

Chapter 2 Installation and Connection This chapter describes IP-HE950 installation conditions and how to connect it to its peripherals.

Chapter 3 Operating Instructions This chapter describes how to turn on/off, set up, and operate this unit.

Chapter 4 Connection Cable Specifications

This chapter describes the scope of IP-HE950 installation work and contains cable connection system diagrams and cable and connector details.

Chapter 5 Troubleshooting

This chapter describes the actions to take if, for example, this unit does not operate normally or if an alarm LED goes on.

Appendix

The appendix contains views of this unit and lists its main specifications. Precautions and other such notes on installation work and on-site tune-up are also covered in this section.

Glossary

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



CAUTION indicates a situation that could lead to minor or moderate injury and/or damage to the IP-HE950 itself or other property if procedures are not followed correctly.

In addition, the following symbols are used together with the above-shown indicators to indicate details of the pertinent risk and/or damage.



Sis the symbol shown to tell the reader about an act that must not be done (prohibited act). Specific warning details ("Prohibited" on the left here) are shown centered under and to the side of the symbol.

() is the symbol shown to tell the reader to be sure to follow instructions. Specific warning details ("Instruction" on the left here) are shown centered under and to the side of the symbol.

#### 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)

## 

Possibility of electric shock, fire, and damage to this unit

Always observe the precautions given below.

There may be a hazardous situation that could lead to electric shock, fire, and damage to this unit.

- Always connect the power cord to a power receptacle for a standard two-prong plug with ground.
- Connect this unit to a power receptacle with a capacity of 1 A or more. When using a power extension cable, be sure that the total power consumption of all equipment connected to the cable does not exceed the rated capacity of the cable. If a power receptacle with a low capacity or capacity below the rated value is used, the power receptacle, extension cable, or power distribution wiring may overheat and start a fire.

Important warning indications are summarized below in "Safety Precautions."

# SAFETY PRECAUTIONS

List of important warnings The following table shows a list of important warnings.

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

Work time	Warning		
Normal use	Possibility of electric shock and fire		
	Ensure that drink containers and metal objects are not placed on or near this		
Prohibited	The presence of foreign matter such as water inside this unit creates a		
	hazardous situation that could lead to electric shock and fire.		
0	Possibility of electric shock and fire		
$\diamond$	Ensure that no liquid is splashed on this unit, making it wet.		
Prohibited	The presence of foreign matter such as water inside this unit creates a hazardous situation that could lead to electric shock and fire.		
0	Possibility of electric shock and fire		
Drohibitod	Ensure that the power cord does not become damaged, and avoid tampering with it		
FIGHIBILED	If the power cord has a heavy object placed on it, is pulled or bent, or becomes		
	entangled, it could be damaged as a result. The power cord could also be		
	damaged if subjected to heat. Damage to the power cord creates a hazardous situation that could lead to electric shock and fire.		
	Possibility of electric shock and fire		
	If excessive heat, smoke, an abnormal odor, or an unusual noise is coming		
Instruction	from this unit, immediately set the power switch to the OFF position and		
	Fuiltsu Service Center.		
	There may be a hazardous situation that could lead to electric shock and fire.		
	Possibility of electric shock and fire		
	If foreign matter (e.g., water, bits of metal, fluid) gets inside this unit,		
Instruction	immediately set the power switch to the OFF position and remove the power		
	There may be a hazardous situation that could lead to electric shock and fire.		
	Possibility of electric shock and fire		
	If this unit has been dropped or otherwise damaged, immediately set the		
Instruction	power switch to the OFF position and remove the power cord plug from the		
	power receptacle. Then, contact a Fujitsu Service Center.		

IP-HE950 Hardware User's Guide

Work time	Warning		
Installation	Possibility of electric shock and fire		
Prohibited	<ul> <li>Do not install this unit in the following places because electric shock and fire may result from operation there:</li> <li>Extremely dusty or dirty location</li> <li>Wet and humid location</li> <li>Hot location, such as a place where this unit is exposed to direct sunlight or is near heating equipment</li> <li>Near products (e.g., speakers) that generate a strong magnetic field</li> <li>Location where the temperature is too hot or cold</li> <li>In an environment with sharp temperature fluctuations</li> <li>Area with poor ventilation</li> <li>Near a fire</li> </ul>		
Instruction	<ul> <li>Possibility of electric shock, fire, and damage to this unit</li> <li>Always observe the precautions given below.</li> <li>There may be a hazardous situation that could lead to electric shock, fire, and damage to this unit.</li> <li>Always connect the power cord plug to a power receptacle for a standard two-prong plug with ground.</li> <li>The AC power cord supplied with the unit supports voltages up to the rated voltage of 125 V. To use the IP-HE950 above the rated voltage of 125 V, refer to "4.2 Cable and Connector Details," and select another power cord.</li> <li>Connect the IP-HE950 to a power receptacle with a capacity of 1 A or more. When using a power extension cable, be sure that the total current consumption of all equipment connected to the cable does not exceed the rated capacity of the cable. If a power receptacle with a low capacity or capacity below the rated value is used, the power receptacle, extension cable, or power wiring may overheat and start a fire.</li> <li>This unit is shut off by pulling out the power cord from the unit's power inlet connector. Please install this unit where you can easily access the power inlet connector.</li> </ul>		

This indicates a situation that could lead to minor or moderate injury and/or damage to this unit itself or other property if procedures are not followed correctly.

Mork times	Dressution		
vvork time	Precaution		
relocation Prohibited	Possibility of serious injury and damage to this unit Do not install this unit in a place where it is exposed to shock and strong vibrations, on an incline, or at an unstable location. Otherwise, there may be a hazardous situation that could lead to serious injury and damage to this unit.		
Instruction	<ul> <li>Possibility of serious injury and damage to this unit</li> <li>When relocating this unit, observe the precautions given below to protect against injury and damage to the unit.</li> <li>Set the power switch to the OFF position, and disconnect all connected cables. Take care to avoid getting your feet entangled in the cables.</li> <li>To prevent serious personal injury when moving the unit, pay special care and attention to your surroundings.</li> </ul>		
Cleaning Prohibited Instruction	<ul> <li>Possibility of fire, serious injury, and damage to this unit</li> <li>When cleaning this unit, observe the precautions given below to protect against fire, serious injury, and damage to the unit.</li> <li>When cleaning the unit, do not use cleaning spray that contains combustible material. Furthermore, do not use such spray around the unit.</li> <li>When cleaning the unit, wipe it with a cloth with the water (or neutral detergent diluted in water) squeezed out.</li> <li>When wiping, be careful to prevent water from entering the IP-HE950 from a button/switch or opening.</li> </ul>		
Maintenance	<ul> <li>Possibility of serious injury and damage to this unit</li> <li>When performing maintenance on this unit, observe the precautions given below to protect against serious injury and damage to the unit.</li> <li>Be sure to turn off the power and then unplug the power cord from the power receptacle before installing or removing an SFP module, which is a hardware option. Furthermore, when connecting this unit with a conversion cable, pay special care and attention to not damage the conversion cable.</li> <li>The SFP module has a lock mechanism. Firmly insert the module until it locks. When removing the Dual 3G-SDI SFP module, hold down the unlock mechanism. When removing the 12G-SDI output SFP module, pull out the pull tab horizontally with respect to the unit. Never forcibly remove the module because that may cause damage.</li> </ul>		

# LABEL

The labels shown below are affixed to this unit.

Never remove the labels. If one becomes dirty and the message becomes difficult to read, contact a Fujitsu Service Center.

- Example of labels shown on the IP-HE950E



IP-HE95	50E
TA2437	2-B10X
<b>፹</b> 01A	00001 17-03



Figure A Labels shown

# PRODUCT HANDLING PRECAUTIONS

### Maintenance

## 

Do not try to repair this equipment yourself. Contact a Fujitsu Service Center.

## 

Read this document thoroughly before attempting to operate this equipment. If you have any questions, contact a Fujitsu Service Center.

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

### Connectable equipment

Only equipment that conforms to the interface specifications of this unit (refer to "A.2.3 Interface specifications") can be connected. If incompatible equipment is connected, the result may be unexpected personal injury and property damage.

#### Disposal

To dispose of this unit, contact a Fujitsu Service Center, or request a specialist to take care of its disposal.

### Modification and rebuild

Do not use this unit if it has been modified or rebuilt, such as by an overhaul with refurbished/used parts. Otherwise, the result may be unexpected personal injury and property damage.

# CONTENTS

	USING IP-HE950 SAFELYi		
	PREFACE		
	ORGANIZATION AND CONTENTS OF THIS DOCUMENT		
	WARNING INDICATIONS		
SAFETY PRECAUTIONS			
	LABEL	······ ×	
	PROD	JCT HANDLING PRECAUTIONSx	
Cha	pter 1 I	Preparations ·······1	
	1.1	Main Features	
	1.2	Components 4	
	1.3	Typical Applications5	
	1.4	Parts Names6	
Cha	oter 2 I	nstallation and Connection9	
	2.1	Installation Conditions 11	
	2.1.	1 Environmental conditions 11	
	2.1.2	2 Installation environment	
	2.1.3	3 Intake and exhaust 21	
	2.1.4	4 Installation space	
	2.2	Power Supply Connections	
	2.2.	1 Connection to ground 22	
	2.2.2	2 Connection to a power source	
	2.3	Connection to SDI Equipment	
	2.3.	1 Connection to SDI output equipment	
	2.3.2	2 Connection to SDI input equipment 27	
	2.4	Connection to External Sync Signals (REF) 28	
	2.5	Connection to DVB-ASI Equipment	
	2.5.	1 Connection to DVB-ASI input equipment 29	
	2.5.	2 Connection to DVB-ASI output equipment 30	
	2.6	Connection to LAN Equipment	
	2.7	Connection to Audio Equipment	
	2.7.	1 Connection to Audio output equipment 33	
	2.7.2	2 Connection to Audio input equipment 34	
	2.8	Connection to Quad Link 3G-SDI Equipment	
	2.9	Connection to SDI Input Equipment (SFP)	
	2.10	Connection to RS-232C/RS-422 Device	
Cha	oter 3 (	Operation Instructions······40	
	3.1	Turning On/Off the IP-HE950 41	

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3.1.1 Turning on the IP-HE950 41
3.1.2 Turning off the IP-HE950 41
3.2 Unit Settings and Operation (WEB) 42
3.3 Unit Settings and Operation (Front panel) 43
3.4 Special Use of the CANCEL Key 44
Chapter 4 Cable Specifications 45
4.1 Installation Preparations 46
4.2 Cable and Connector Details 48
Chapter 5 Troubleshooting 56
5.1 Help Information
5.2 Alarm LED Goes On 64
5.3 Maintenance area 65
Appendix ······66
A.1 Appearance
A.1.1 IP-HE950E
A.1.2 IP-HE950D
A.2 Main Specifications
A.2.1 External specifications
A.2.2 Environmental specifications
A.2.3 Interface specifications70
A.3 Installation Work 77
A.3.1 Installation work scope77
A.3.2 Unpacking and unit check 77
A.3.3 Installation conditions77
A.3.4 Connecting external cables77
A.4 On-Site Tune-Up Work78
Glossary ······81



This chapter describes an overview of IP-HE950 operation.

1.1	Main Features ·····	-2
1.2	Components ·····	•4
1.3	Typical Applications ·····	•5
1.4	Parts Names ······	-6

# 1.1

Main Features

The IP-HE950 is a video transmission unit with H.265/HEVC encoding technology, which performs at a high compression rate.

The IP-HE950 supports H.265/HEVC 4:2:2 10-bit and 4K/2160p, and provides high-quality video encoding. It also supports the H.264 encoding format, ensuring connectivity with existing H.264 units.

The IP-HE950 is equipped with the SFP module interface as well as the SDI input/output interface. Through a combination of option licenses, the unit can be scaled to diverse interface configurations matching operation scenarios.

The encoder can store compressed video and audio in files to fetch and transmit them to decoders at any time. In addition, the decoders that received the files can play them offline. In addition to Fujitsu's high-quality video compression technology, the IP-HE950 inherits powerful fault tolerance technology for IP networks from H.264 units.

The IP-HE950 provides high operability. You can operate the unit from the Web GUI, the front panel, and SNMP.

In order for this unit to operate, you will need to purchase and install a software license. For details, refer to the *IP-HE950 Software User's Guide*.

Product name (Model) Function	IP-HE950E (FC4078FE1 or TA06006-B313)	IP-HE950D (FC4078FD1 or TA06006-B314)	
Video and audio I/F	1 x [BNC]: 12G/3G/HD/SD-SDI input 1 x [D-sub9 female]: AES-EBU 2 stereo input, Analog (Balanced) 1 stereo input [Option] 2 x [SFP]: Dual 3G-SDI input 1 x [SFP]: 12G/3G/HD/SD-SDI output (Through out*1)	1 x [BNC]: 12G/3G/HD/SD-SDI output 1 x [D-sub9 female]: AES-EBU 2 stereo output, Analog (Balanced) 1 stereo output 1 x [BNC]: Reference input 1 x [BNC]: Reference output [Option] 2 x [SFP]: Dual 3G-SDI output 1 x [SFP]: 12G/3G/HD/SD-SDI	
Display part	VED (22 characters x 4 lines)	ouipui	
Operation part	Operation keys ( $\land \forall \triangleleft \triangleright$ , ENTER, CANCEL)		
Network	2 x [RJ45]: 10BASE-T/100BASE-TX/ 1000BASE-T (control shared)	2 x [RJ45]: 10BASE-T/100BASE-TX/ 1000BASE-T (control shared)	
DVB-ASI	2 x [BNC]: DVB-ASI output	1 x [BNC]: DVB-ASI input	
AUX data	1 x [D-sub9 female]: RS-232C/RS-422		
Installation conditions	s Indoor: Desktop installation or rack mounted		
External dimensions	210 (W) x 300 (D) x 43 (H) mm		
Cooling method	Forced air cooling		
Power	100 to 240 VAC		
Weight	Max. 2.5 kg		
Power consumption	126 VA or less	122 VA or less	
Temperature and	-10 to 55°C (except for startup under 0°C) / 20% to 90% RH (no		
humidity conditions	condensation)		

#### **Table 1-1 Specifications**

\*1 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.

Hardware option	Description	
Quad 3G-SDI input option	Supports 3G-SDI x 4 inputs. (For IP-HE950E: Dual 3G-SDI input SFP module x 2)	
Quad 3G-SDI output option	Supports 3G-SDI x 4 outputs. (For IP-HE950D: Dual 3G-SDI output SFP module x 2)	
Quad 3G-SDI conversion cable option	Conversion cable from HD-BNC to BNC (For Quad 3G-SDI input/output option)	
SDI output option	Supports 12G/3G/HD/SD-SDI output. (For IP-HE950E/D: 12G-SDI output SFP module x 1) * IP-HE950E is used as a through out of the input video.	
Rack Mounting Kit Type A1	19" rack mounting kit (for 1 unit)	
Rack Mounting Kit Type C2	19" rack mounting kit (for 2 units)	
Audio adapter cable (for encoder) Type 1	Adapter cable connecting IP-HE950E and Audio output equipment.	
Audio adapter cable (for encoder) Type 3	Adapter cable connecting IP-HE950E and Audio output equipment.	
Audio adapter cable (for decoder) Type 2	Adapter cable connecting IP-HE950D and Audio input equipment.	
Audio adapter cable (for decoder) Type 4	Adapter cable connecting IP-HE950D and Audio input equipment.	

#### Table 1-2 Hardware options

For software options, refer to the *IP-HE950 Software User's Guide*.

## Components 1.2

The IP-HE950 product package consists of the main unit, a safety manual, rubber feet, and a power cord holder (AC cord clamp). In addition, you can procure each of them separately as required. \* Test report is attached with the following components.

#### - IP-HE950 x 1 (Cables for various connections are procured separately.)





Figure 1-1 Component list

# Typical Applications

This section shows IP-HE950 application examples (examples of system configurations using the IP-HE950).

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 1-2 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 1-3 Sample System configuration: SNG

# 1.4 Parts Names

This section describes the name and function of each part of the IP-HE950. The following figures show the layouts of parts on the outside of this unit, and the table underneath lists the names and functions of individual parts. The numbers in the figures correspond to the numbers in the table.



Figure 1-6	Rear view	(IP-HE950D)
------------	-----------	-------------

Table 1-3 Parts names	Table	1-3	Parts	names
-----------------------	-------	-----	-------	-------

No.	Name	Function	
(1)	Maintenance port	Port used by a customer engineer. Normally, it is not used. The	
		cover is fixed in place with a screw.	
(2)	USB port	USB port supported in the future. This is disabled now. The	
		cover is fixed in place with a screw. Never remove the cover.	
(3)	Revision label	The revision number of this hardware is described on the label.	
		The 2-digit number and alphabet (large letter) located right side	
		of 'F' mark at the left bottom of this label is the revision number.	

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(4)	Front panel	Used to display the unit status and make various settings. 22 characters x 4 lines	
(5)			
(6)	Direction keys	Used to operate the Front nanel	
(7)	$( \triangleleft \land \bigtriangledown \triangleright )$	For instructions, refer to the IP-HE950 Software User's Guide	
(8)			
(9)	ENTER key (ENTER)	Used to finalize the displayed data on the Front panel. For instructions, refer to the IP-HE950 Software User's Guide.	
(10)	CANCEL key (CANCEL)	Used to cancel the displayed data on the Front panel. For instructions, refer to the IP-HE950 Software User's Guide	
(11)	Model label	The model name of the main unit is described on the label.	
(12)	Power LED (PWR)	Goes on when this unit is powered on.	
(13)	Status LED (RDY)	LED that shows the operating status of the IP-HE950. The LED light color is green when operation is normal. For details, refer to "Table 5-3 LED indications" in Section 5.2.	
(14)	Video input status LED (INDWN)	Turns on or blinks when input is abnormal (input down/input error).	
		Turne en en blieke when en enstien is showned	
(15)	(ALM)	For details, refer to "Table 5-3 LED indications" in Section 5.2.	
(16)	Power switch	Powers on/off this unit with 100-240 VAC. For instructions, refer to "3.1 Turning On/Off the IP-HE950."	
(17)	AC cord clamp	AC cord clamp for fixing the power cord in place. For instructions, refer to "2.2.2 Connection to a power source."	
(18)	Power inlet connector	Can be connected to a 100-240 VAC commercial power supply by a power cord with a standard two-prong plug with ground. For instructions, refer to "2.2.2 Connection to a power source." For cable connection information, refer to "4.2 Cable and Connector Details."	
(19)	Fan	Maintenance-free fan for cooling the inside of the unit.	
(20)	FG terminal (FG)	Used to connect FG to this unit when required. For instructions, refer to "2.2.1 Connection to ground."	
(21)	ETHERNET port 2 for LAN connection (LAN2)	10BASE-T/100BASE-TX/1000BASE-T communication port. For instructions, refer to "2.6 Connection to LAN Equipment." For cable connection information, refer to "4.2 Cable and Connector Details."	
(22)	Status LED (LINK/ACT)	LED that shows the status of LAN port 2. For details, refer to "Table 5-3 LED indications" in Section 5.2.	
(23)	Speed LED (100/1000M)	LED that shows the speed of LAN port 2. For details, refer to "Table 5-3 LED indications" in Section 5.2.	
(24)	DVB-ASI output (ASI-OUT1)	DVB-ASI output connectors. Output is 75 $\Omega$ unbalanced output. For instructions, refer to "2.5 Connection to DVB-ASI Equipment."	
(25)	DVB-ASI output (ASI-OUT2)	For cable connection information, refer to "4.2 Cable and Connector Details."	

(26)	Analog audio input (AUDIO)	Analog audio input connector. $600\Omega$ balanced. Refer to Section 2.7, "Connection to Audio Equipment," for an explanation on using this connector. Refer to Section 4.2, "Cable and Connector Details," for cable connection information.
(27)	ETHERNET port 1 for LAN connection (LAN1)	10BASE-T/100BASE-TX/1000BASE-T communication port. For instructions, refer to "2.7 Connection to LAN Equipment." For cable connection information, refer to "4.2 Cable and Connector Details."
(28)	Status LED (LINK/ACT)	LED that shows the status of LAN port 1. For details, refer to "Table 5-3 LED indications" in Section 5.2.
(29)	Speed LED (100/1000M)	LED that shows the speed of LAN port 1. For details, refer to "Table 5-3 LED indications" in Section 5.2.
(30)	SDI input (SDI-IN)	Connector for SD-SDI, HD-SDI, 3G-SDI, and 12G-SDI signal input. For cable connection information, refer to "4.2 Cable and Connector Details."
(31)	SFP input (SFP1)	Connector for mounting a SFP module. Designated hardware options are available. For instructions, refer to "2.8 Connection to
(32)	SFP input (SFP2)	Quad Link 3G-SDI Equipment." "2.9 Connection to SDI input Equipment (SFP)." For cable connection information, refer to "4.2 Cable and Connector Details."
(33)	Data port (RS-232C/422)	RS-232C or RS-422 Data communication port. For instructions, refer to "2.10 Connection to RS-232C/RS-422 Devece." For cable connection information, refer to "4.2 Cable and Connector Details."
(34)	DVB-ASI input (ASI-IN)	DVB-ASI input connector. Input is 75 $\Omega$ unbalanced input. For instructions, refer to "2.5 Connection to DVB-ASI Equipment." For cable connection information, refer to "4.2 Cable and Connector Details."
(35)	External sync input (REF-IN)	External sync input connector. Input is 75 $\Omega$ unbalanced inputs. For instructions, refer to "2.4 Connection to External Sync Signals (REF)." For cable connection information, refer to "4.2 Cable and Connector Details."
(36)	External sync output (REF-OUT)	External sync output connector. Output is 75 Ω unbalanced output. For instructions, refer to "2.4 Connection to External Sync Signals (REF)." For cable connection information, refer to "4.2 Cable and Connector Details."
(37)	Analog audio output (AUDIO)	Analog audio output connector. $600\Omega$ balanced. Refer to Section 2.7, "Connection to Audio Equipment," for an explanation on using this connector. Refer to Section 4.2, "Cable and Connector Details," for cable connection information.
(38)	SDI output (SDI-OUT)	Connector for SD-SDI, HD-SDI, 3G-SDI, and 12G-SDI signal output. For cable connection information, refer to "4.2 Cable and Connector Details."



This chapter describes IP-HE950 installation conditions and how to connect it to its peripherals.

2.1	Installation Conditions	· 11
2.2	Power Supply Connections	22
2.3	Connection to SDI Equipment ·····	26
2.4	Connection to External Sync Signals (REF)	28
2.5	Connection to DVB-ASI Equipment ·····	29
2.6	Connection to LAN Equipment	31
2.7	Connection to Audio Equipment	33
2.8	Connection to Quad Link 3G-SDI Equipment	35
2.9	Connection to SDI Input Equipment (SFP)	37



Possibility of serious injury

- The power cord and other cables connected to the IP-HE950 could become tangled with someone walking close to them, possibly leading to serious injury and property damage. Clamp the cables to the rack or floor.

# 2.1

# Installation Conditions

This section describes the installation environment, intake and exhaust, and unit space.

### 2.1.1 Environmental conditions

Use this unit in an environment where the intake temperature and ambient temperature do not exceed 55°C.

When the above conditions are observed, you can stack and operate the IP-HE950. Conversely, in an environment where the above conditions are not observed, any use of the unit is outside the guaranteed operating range, possibly leading to a failure and remarkably shortened product life.

Use this unit in an environment where the concentration of airborne dust is no more than  $0.15 \text{ mg/m}^3$ . (If it is  $0.15 \text{ mg/m}^3$  or higher, use a dust-proof rack.) In addition, clean around the unit to prevent significant amounts of dust from adhering to it. Otherwise, the dust may cause unit errors and failures.

Use this unit in an environment where the corrosive gas concentration is under the allowable level stipulated in IEC 60721-3-3 Class 3C1.

### 2.1.2 Installation environment

#### 1. Mounting in a 19" rack

Use the 19" rack mount kit to mount this unit in an EIA standard 19" rack. We have two types of mount kit: one accommodates a single unit per 1U space, and the other accommodates two units per 1U space.

(The 19" rack mount kit is an optional product.)

If you want to mount the unit in a different form than described in this document, consult a Fujitsu sales representative or your system designer.

# 

Be sure to use those mounting brackets and screws enclosed in the rack mount option to attach to the IP-HE950. In rack mounting, secure the unit tightly to the rack by using the screws that come with the rack mount option or the rack.

If the screws loosen or are not tightened enough, they may lead to a serious accident.



- (2) Confirm that all cables are disconnected.
- (3) Attach rack mounting brackets A and B to the side of the first IP-HE950. Tighten screws (M4) at the six places shown in the following figure.



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(4) Attach rack mounting brackets A and B to the side of the second IP-HE950 too. Tighten screws (M4) at the six places like with the first unit.



(5) Attach rack mounting bracket C to the IP-HE950. Tighten pan head screws (M5) at the two places shown in the following figure.



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(6) Align the units at specific positions in the 19" rack, and firmly secure the units in position with the screws supplied with the rack mount option. Use four pan head screws (M5) to secure them.

To secure the units to a server rack, use the cage nuts (D) and bind head screws (M6) supplied with the rack mount option.



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- Removing the unit
- (1) To remove two units at the same time Remove both units by reversing the installation procedure.
- (2) To remove only one unit Remove screws at the four places shown in the following figure. Remove mounting bracket C, and then remove the unit.



- Mounting one IP-HE950 per 1U (Type: A1) (1) Confirm the components of the rack mount kit.



- (2) Confirm that all cables are disconnected.
- (3) Attach rack mounting bracket E to the side of the IP-HE950. Tighten screws (M4) at the three places shown in the following figure.



(4) Attach rack mounting bracket F to the other side of the IP-HE950. Tighten screws (M4) at the three places shown in the following figure.



(5) Align the unit at a specific position in the 19" rack, and firmly secure the unit in position with the screws supplied with the rack mount option. Use two pan head screws (M5) per mounting bracket (four screws in total).



- Removing the unit Remove the unit by reversing the installation procedure.

#### 2. Desktop installation

Affix the four rubber feet supplied with this unit to the marked places for rubber feet on the bottom of the unit.

For information on the installation space, refer to "2.1.4 Installation space."



Marked place for rubber foot

Figure 2-1 Places for rubber feet



#### 2) Rack mounting

When this unit is mounted and operates in a rack, the ambient temperature of the unit inside the rack may be hotter than the ambient temperature of the room.

Take care that the ambient temperature inside the rack does not exceed the guaranteed operating temperature of this unit. The guaranteed operating temperature of the unit is 55°C.

When mounting this unit to operate in a rack, allocate the intake/exhaust space described in "2.1.4 Installation space."

When mounting this unit in a rack, use the dedicated mount kit to secure it firmly to the rack.

In addition, if mounting the unit in the rack could make the whole rack unstable, do not mount it.

The IP-HE950 weighs 2.5 kg.

When mounting two IP-HE950 per 1U with dedicated mount kit, do not leave one unit after removing another unit. This may cause deformation of mount kit.

Confirm that the power supply capacity of the power strips and service outlets in the rack, which supply power to this unit, exceeds the total power rating of all the equipment connected in the rack. The power rating of this unit is as follows:

- IP-HE950E: 100 to 240 VAC, 50/60 Hz, single-phase, 0.93 to 0.53 A

- IP-HE950D: 100 to 240 VAC, 50/60 Hz, single-phase, 0.89 to 0.51 A

High leakage current may flow through the power strip grounding conductor when the IP-HE950 power cord is connected to the power strip. Be sure to connect to ground before connecting the power supply line. If the power cord is not directly connected to a branch circuit, use a power strip that has an industrial grade plug.

### 2.1.3 Intake and exhaust

The IP-HE950 is a forced air cooled unit. Take care not to block the intake/exhaust vents. Leave an adequate amount of space around the vents.

### 2.1.4 Installation space

Allocate the operation space, cable bundle space, and intake/exhaust space shown as the hatched areas in the following figure. (The space is always required.) This installation space doesn't show maintenance area.



Figure 2-2 Space required for an installation

# Power Supply Connections

This section describes ground and power source connections. The descriptions are common to the IP-HE950E and IP-HE950D.

### 2.2.1 Connection to ground

Use the power cord with a standard three-prong plug to connect FG and external ground (type D (type 3) or better).

You can use the FG terminal for functional grounding to suppress external noise, etc. Connect the FG terminal (M4 screw) to external ground.



Figure 2-3 Ground connection
### 2.2.2 Connection to a power source

Plug the AC power cord into the power inlet connector.

\* Refer to "4.2 Cable and Connector Details," and select power cord. You can procure a power cord separately by specifying the length.



Figure 2-4 Power cord connection

### - Mounting the AC cord clamp

Insert the AC cord clamp into the mounting hole, and secure the power cord to the AC cord clamp, which prevents the power cord from falling out.

- Removing the AC cord clamp To remove the AC cord clamp, squeeze together the tabs of the AC cord clamp between your fingers as indicated by the red arrows, and remove the AC cord clamp.



Figure 2-5 Removing the AC cord clamp

## 

Possibility of electric shock, fire, and damage to this unit Always observe the precautions given below. There may be a hazardous situation that could lead to electric shock, fire, and damage to this unit. Always connect the power cord to a power receptacle for a standard three-prong plug. The AC power cord supplied with the unit for Japan domestic supports voltages up to the rated voltage of 125 V. To use the IP-HE950 outside of Japan, refer to item (6) in "4.2 Cable and Connector Details," and select another power cord. Connect the IP-HE950 to a power receptacle with a capacity of 1 A or more. When using a power extension cable, be sure that the total current consumption of all equipment connected to the cable does not exceed the rated capacity of the cable. If a

equipment connected to the cable does not exceed the rated capacity of the cable. If a power receptacle with a low capacity or capacity below the rated value is used, the power receptacle, extension cable, or power wiring may overheat and start a fire.

## 

Possibility of damage to this unit

Do not turn on the IP-HE950 peripherals have been connected successfully. Otherwise, this unit may be damaged.

## **Connection to SDI Equipment**

This section describes connection to SDI equipment.

## 2.3.1 Connection to SDI output equipment

Connect SDI output equipment to the SDI input of the IP-HE950E (encoder). Connect a BNC cable to the SDI-IN connector of the IP-HE950E. The following figure shows how to connect SDI output.



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



### Figure 2-6 SDI output equipment connection

### 2.3.2 Connection to SDI input equipment

Connect SDI input equipment to the SDI output of the IP-HE950D (decoder). Connect a BNC cable to the SDI-OUT connector of the IP-HE950D. A signal is terminated with 75  $\Omega$ .

The following figure shows how to connect SDI input equipment.



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



### Figure 2-7 SDI input equipment connection



## Connection to External Sync Signals (REF)

The IP-HE950D (decoder) has one input connector and one output connector for connection with external sync signals (REF).

### Sync signal input

Connect a BNC cable to the REF-IN connector of this unit. Enter an external sync signal. The signal is terminated with 75  $\Omega$ .

### Sync signal output

Connect a BNC cable to the REF-OUT connector of this unit. Output an external sync signal. The signal is terminated with 75  $\Omega$ .



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



External sync input/output equipment

Figure 2-8 External sync input/output unit connections



## Connection to DVB-ASI Equipment

This section describes connection to DVB-ASI equipment.

### 2.5.1 Connection to DVB-ASI input equipment

Connect DVB-ASI equipment to the ASI output connector of the IP-HE950E (encoder). Connect a BNC cable to ASI-OUT1 or ASI-OUT2 of the IP-HE950E. The following figure shows how to connect them.

See

For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



DVB-ASI input equipment

### Figure 2-9 DVB-ASI input equipment connections

### 2.5.2 Connection to DVB-ASI output equipment

Connect DVB-ASI output equipment to the ASI input connector of the IP-HE950D (decoder).

Connect a BNC cable to ASI-IN of the IP-HE950D. A signal is terminated with 75  $\Omega$ . The following figure shows how to connect them.

See

For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



Figure 2-10 DVB-ASI output equipment connection

## **Connection to LAN Equipment**

This section describes connection of the IP-HE950 to LAN equipment. The descriptions are common to the IP-HE950E and IP-HE950D.

To connect the IP-HE950 to LAN equipment, prepare a LAN cable to connect to a LAN port (LAN1/LAN2).

The LAN port specifications of the IP-HE950 are 10BASE-T, 100BASE-TX, and 1000BASE-T. This unit has two LAN ports, LAN1 and LAN2. Both are dual-purpose ports for streams and settings.

The following figure shows how to connect them.

See

For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."





## 

Do not set the IP addresses shown below, when setting an IP address.

Setting conditions disabling a LAN port

- Generally unused (disabled) IP address (0.0.0.0, 255.255.255.255, etc.)
- Loopback address (127.xxx.xxx.xxx)
- Class D or Class E IP address
- IP address that conflicts with a LAN port network address

For details, refer to the IP-HE950 Software User's Guide.

## **Connection to Audio Equipment**

This section describes connection to Audio equipment.

### 2.7.1 Connection to Audio output equipment

To connect the IP-HE950E with Audio output equipment, prepare the dedicated audio conversion cable.

The following figure shows how to connect them.

For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



Audio output equipment

Figure 2-12 Analog audio input equipment connections

## 2.7.2 Connection to Audio input equipment

To connect the IP-HE950D with Audio input equipment, prepare the dedicated audio conversion cable.

The following figure shows how to connect them.



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."



Figure 2-13 Analog audio output equipment connections

Connection to Quad Link 3G-SDI Equipment

This section describes connection of the IP-HE950 to 4K video equipment for Quad Link 3G-SDI input and output. The descriptions are common to the IP-HE950E and IP-HE950D.

To connect the IP-HE950 to 4K video equipment, prepare an SFP module (option), a Quad 3G-SDI conversion cable (option), and an SDI cable to connect the equipment to an SFP port (SFP1/SFP2).

\* The Quad 3G-SDI input option and the Quad 3G-SDI conversion cable option need to be procured separately for the IP-HE950E. The Quad 3G-SDI output option and the Quad 3G-SDI conversion cable option need to be procured separately for the IP-HE950D.



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."

 Example of connection of the IP-HE950E to 4K video equipment for Quad Link 3G-SDI output



Figure 2-14 Connections to 4K video output equipment

Be sure to turn off the power and then unplug the power cord before installing or removing an SPF module, which is a hardware option. In addition, when connecting this unit with a conversion cable, pay special care and attention to not damage the conversion cable. The SFP module has a lock mechanism. Firmly insert the module until it locks. When removing the module, hold down the unlock mechanism. Never forcibly remove the module because that may cause damage.

For instructions on configuring and using the SFP module, refer to the IP-HE950 Software User's Guide.

#### - Removing SFP module

When removing the SFP module, press the unlock mechanism in the direction indicated by the red arrow shown in the following figure with the Quad 3G-SDI conversion cable left connected. Keep holding down the unlock mechanism as you pull the SFP module straight out of the unit.

(1) Unlock the lock.



(2) Pull the SFP module straight out of the unit.





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Connection to SDI Input Equipment (SFP)

This section describes the SDI output option inserted in the SFP port of the IP-HE950 and the connection with the SDI input equipment.

The descriptions are common to the IP-HE950E and IP-HE950D.

To connect the SFP port of the IP-HE950 and the SDI input equipment, insert the SDI output option (12 G-SDI output SFP module) into SFP1 and connect it with the SDI cable.

\* The SDI output option is sold separately.

Please note that the SDI output option only works on the SFP1.



For details on connectors and cables, refer to "4.2 Cable and Connector Details." For electrical specifications, refer to "A.2.3 Interface specifications."

- Example of connection of the SDI output option inserted in the SFP port of the IP-HE950 and the connection with the SDI input equipment



Check SFP's direction (up and down), 'QR code label' should be up and '▲ label' should be down.

Be sure to turn off the power and then unplug the power cord before installing or removing an SPF module, which is a hardware option.

The SFP module has a lock mechanism. Firmly insert the module until it locks. When removing the module, pull out the pull tab horizontally with respect to the unit. Never forcibly remove the module because that may cause damage.

\* If you do not pull out the pull tab, the lock mechanism will not be released, so never pull out the SFP module by pulling the BNC cable.

For instructions on configuring and using the SFP module, refer to the IP-HE950 Software User's Guide.

#### - Removing SFP module

When remove the SFP module, grasp the pull tab shown in following figure and pull out the SFP module horizontally with respect to the unit.

(1) Please grasp a pull tab.



(2) pull out the pull tab horizontally with respect to the unit.
 \* When putting the unit on the desk, slow down the body slowly.



Figure 2-17 Removing an SFP module

# **2.10** Connection to RS-232C/RS-422

This section describes connection of the IP-HE950 to Data communication (RS-232C/RS-422) device.

The descriptions are common to the IP-HE950E and IP-HE950D.

The [RS-232C/422] connector of IP-HE950 is the RS-232C or RS-422 communication terminal (switchable). The terminal of IP-HE950 is the D-sub 9 pins (male). The specification of RS-232C operating mode is DTE. Use a cross connection or straight cable corresponding to the connected device. See Section 4.2, "Cable and Connector Details."

The figure below shows the connection method.

NOTE:

For details about connectors and cables, see Section 4.2, "Cable and Connector Details." For electrical specifications, see Appendix 2.3, "Function Specifications."



Figure 2.11 Connection to RS-232C or RS-422 input/output device



This section describes how to operate this unit.

3.1	Turning On/Off the IP-HE950	·41
3.2	Unit Settings and Operation (WEB) ·····	· 42
3.3	Unit Settings and Operation (Front Panel)	· 43
3.4	Special Use of the CANCEL Key	· 44

# Turning On/Off the IP-HE950

This section describes how to turn on and off the IP-HE950. The descriptions are common to the IP-HE950E and IP-HE950D.

### 3.1.1 Turning on the IP-HE950

Set the power switch on the front panel to the [-] position to turn on the power, which turns on the PWR LED.

The RDY LED goes on when the IP-HE950 is ready.



-	Set the switch to this position to turn on the IP-HE950.
0	Set the switch to this position to turn off the IP-HE950.

Figure 3-1 Front view of the unit

## 3.1.2 Turning off the IP-HE950

Set the power switch on the front panel to the [O] position to turn off the power, which turns off the PWR LED.



Unit Settings and Operation (WEB)

#### - Setup procedure

The following figure shows the setup procedure of this unit. The procedure is common to the IP-HE950E and IP-HE950D.

For each setting, refer to the software user's guide.



- Recommended Web browser

About the supported Web browsers, refer to the software user's guide.

# Unit Settings and Operation (Front panel)

This unit is equipped with six operation keys: [  $\triangle$  ], [  $\bigtriangledown$  ], [  $\triangleleft$  ], [  $\triangleright$  ], [ENTER], and [CANCEL]. Use these keys to configure settings.

The front panel has a display of 22 characters x 4 lines.

For front panel operation and display instructions, refer to the IP-HE950 Software User's Guide.



Figure 3-2 Front panel and operation keys

### - Functional description of each key

- [  $\bigtriangleup$  ] and [  $\bigtriangledown$  ] key functions
  - Switches the menu items and setting items displayed on the front panel.
  - Switches the displayed items with each press of a key. [  $\triangle$  ] and [  $\bigtriangledown$  ] switch the displayed items in opposite directions.
- [  $\lhd$  ] and [  $\triangleright$  ] key functions
  - Used to move the cursor displayed on the front panel to the right or left.
  - Moves the cursor by one place with each press of a key.

[ENTER] key

- When the initial maintenance screen is displayed, pressing the [ENTER] key causes a transition to the maintenance menu screen.
- Pressing the [ENTER] key from the maintenance menu screen allows you to display the status and configure the shutdown settings.

[CANCEL] key

- When the maintenance menu screen is displayed, pressing the [CANCEL] key causes a transition to the initial maintenance screen. Pressing the [CANCEL] key from the setting item selection screen causes a transition to the screen immediately before the last [ENTER] key operation.

Other

- In addition, on every screen, if 60 seconds elapse without input from any key, the screen transitions to the initial screen.



Special Use of the CANCEL Key

Start the IP-HE950 by holding down the [CANCEL] key during the power-on operation. When you hold down the key until the RDY LED begins blinking in orange, the IP-HE950 starts with the factory default values for the IP address and subnet mask (LAN1: IP address 10.0.0.1 and subnet mask 255.0.0.0; LAN2: IP address 192.168.255.253 and subnet mask 255.255.255.252).

Use this feature to initialize the unit settings from a control terminal (e.g., PC with a LAN interface).

(Note 1) To operate the IP-HE950 with the default IP address, connect it to a control terminal and configure settings with it disconnected from your network. After configuring settings appropriate to your network, connect it to the network. If connected as is with the factory default settings, the unit may cause an unexpected problem to occur in the network. After starting the IP-HE950 while holding down the [CANCEL] key, set the following IP addresses and subnet masks for the control terminal to be connected:
 LAN1 IP address: 10.xxx.xxx

- (xxx is any number from 0 to 255, except for 10.0.0.0, 10.0.0.1, 10.0.0.2, and 10.255.255.255.)
- LAN1 subnet mask: 255.0.0.0
- LAN2 IP address: 192.168.255.254
- LAN2 subnet mask: 255.255.255.252



This chapter describes the scope of IP-HE950 installation work and contains cable connection system diagrams and cable and connector details.

4.1	Installation Preparations	• 46
4.2	Cable and Connector Details ······	· 48



## **Installation Preparations**

The following figure shows the scope of procurement for IP-HE950 installation work. The indicators for the cables connected to 4K video output equipment are also shown below.



Figure 4-1 Procurement scope for IP-HE950E installation work

#### IP-HE950 Hardware User's Guide



Figure 4-2 Procurement scope for IP-HE950D installation work

In the construction of a system that uses the IP-HE950, the demarcation line between the IP-HE950 and other equipment is generally like that in the above figure. Despite that, in actual construction, procure equipment and perform installation work in consultation with the system designer in charge.

# 4.2 Cable and Connector Details

The following figures show the cables and connectors available for this unit.

### (1) SDI cable



### Figure 4-3 SDI cable



### (2) DVB-ASI cable

Figure 4-4 DVB-ASI cable

### (3) LAN interface connection cable



Figure 4-5 LAN interface connection cable

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### (4) Sync signal (REF) cable





### (5) AC power cord (supplied with the unit for Japan domestic, rated voltage of 125 or less)

The following figure shows the cord for 100 VAC input.



Figure 4-7 AC power cord

\* The AC power cord supplied with the unit supports voltages up to the rated voltage of 125 V. To use the IP-HE950 above the rated voltage of 125 V, refer to (6) and select another power cord.

### (6) AC power cord (rated voltage of 125 V or more)

Use a cord that satisfies the following conditions:

- Meets the following ratings:
  - [Connector] IEC 60320 C-13/15 A/250 V

[Cord] Diameter: 0.75 mm<sup>2</sup> or more; Length: 4.5 m or less; Allowable current: 8 A or more; Rating: 300 V or more

- [Plug] NEMA 6-15P/15 A/250 V
- Certified under the pertinent electrical appliance and material safety law (In Japan, the connector, cord, and plug each has to have the PSE mark.)

### (7) Quad 3G-SDI conversion cable



Figure 4-8 Quad 3G-SDI conversion cable

#### (8) Analog audio cable



Figure 4-9 Analog audio cable

### (9) Audio adapter cable (#1, #3)



Figure 4-10 Audio adapter cable (#1, #3)

### (10) Audio adapter cable (#2, #4)



Figure 4-11 Audio adapter cable (#2, #4)

#### (11) RS-232C / RS-422 cable



Figure 4-12 RS-232C/RS-422 cable



This chapter describes the actions to take if, for example, this unit does not operate normally or if an alarm LED goes on.

5.1	Help Information ·····	57
5.2	Alarm LED Goes On	64
5.3	Maintenance area ·····	65



## Help Information

If you find a problem in unit operation, take the corresponding corrective action in the table below, according to the applicable conditions.

After the installation of software, refer to Table 5.1, "Check details and corrective actions" in the *IP-HE950 Software User's Guide*.

If the problem persists even after you take corrective action, contact a Fujitsu Service Center.

### 

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 (IP-HE950E) \* Default settings

No.	Class	Status	Check	Corrective action
1	☐ The unit cannot be ☐ powered on.	The unit	Is the power cord connected?	Check whether the power cord is properly connected to the outlet.
2		b The unit cannot be powered on.	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.
3	Unit	The ALM LED is on.	A unit error occurred.	Check the alert code from the log information screen for settings on the Web GUI. The code indicates the corrective action.
			E020 FAN error E030 Power supply error E044/E045 Temperature sensor communication error E050-E070 Clock error E090 Memory error	Contact Fujitsu sales or Fujitsu partners. The center may ask you about the alert code. Check the alert code from the log information screen for settings on the Web GUI. If an SFP-type alert code is output, refer to items 32 to 35 below.
			E042/E043 Temperature error	<ul> <li>Check whether the unit installation environment satisfies "2.1 Installation Conditions."</li> <li>Is there enough space around intake/exhaust openings?</li> <li>Is the ambient temperature within the range of environmental conditions?</li> <li>If there is a problem in the above installation conditions, eliminate the problem. Then, reboot the unit.</li> <li>If there is no problem in installation conditions, contact Fujitsu sales or Fujitsu partners because a unit failure may have occurred.</li> </ul>
			An error in unit settings/performance or a part is indicated.	Check the alert code from the log information screen for settings on the Web GUI. The code indicates the corrective action.
4			E010 VFD Device error	Contact Fujitsu sales or Fujitsu partners.
		The ALM LED is blinking.	E040/E041 Temperature warning generated	<ul> <li>Check whether the unit installation environment satisfies "2.1 Installation Condition."</li> <li>Is there enough space around intake/exhaust openings?</li> <li>Is the ambient temperature within the range of environmental conditions?</li> <li>If there is a problem in the above installation conditions, eliminate the problem. Then, reboot the unit.</li> <li>If there is no problem in installation conditions, contact Fujitsu sales or Fujitsu partners because a unit failure may have occurred.</li> </ul>

No.	Class	Status	Check	Recommended action
	-	The INDWN LED lights up in orange.	Is the audio/video output unit selected as input (e.g., camera) operating normally?	Check the power supply and the operation of the audio/video output unit selected as input.
5			Is this unit correctly connected to the audio/video output unit? (Example: Analog signals are connected to the SDI signal input of this unit.)	Confirm that the connection between this unit and the audio/video output unit is correct, and check for problems in the cable.
6			Does the set input audio/video format on this unit match the format of the audio/video output unit (e.g., camera)? (Example: Although 2160p is the input setting on this unit, 1080p signals are input.)	Check whether your preferred audio/video format is set as the format of this unit and the format of the output unit.
7		The INDWN LED is blinking in orange.	Does the set input audio/video format on this unit match the format of the audio/video output unit (e.g., camera)? (Example: Although 59.94 Hz is the input setting on this unit, the output unit is set to 50 Hz.)	Check whether your preferred audio/video format is set as the format of this unit and the format of the output unit.
8			Is the monitor connected to the decoder	Check the operation of the monitor.
9		No video is output at the decoder. (Black screen)	Is the decoder operating normally?	Check the operation of the decoder.
10	60		Is the decoder correctly connected to the monitor?	Check the connection between the decoder and the monitor.
11	Vio		Has an alert been generated on the decoder?	If so, refer to the user's guide of the decoder or other such documents, and take corrective action.
12			Does the decoder display color bars or a gray screen when nothing is input to the video input of this unit? (Note that this operation generates INDVN. Confirm that there will be no operational problems before performing the operation.)	If color bars or a gray screen appears, the network and the decoder seem to be operating normally. Confirm the correct video input to this unit.
13			Is the RDY LED blinking in green?	The unit is booting up. Wait until the RDY LED turns green.
14	-	The monitor of the decoder displays an all blue or gray screen.	Is the RDY LED blinking in orange?	The unit started in maintenance mode. Restart the unit.
15			Is the ALM LED blinking?	The blinking ALM LED may indicate an IP address acquisition failure. Check the IP address setting. (For details, refer to the IP-HE950 Software User's Guide.)
16			Has encoding begun?	Set the encoder to start encoding.
17	-		Can the paired unit (decoder) start encoding?	Set the decoder to start decoding.
18			Are the Stream out settings correct?	Referring to the IP-HE950 Software User's Guide, check whether the Stream out settings are correct on this unit and the encoder.
19			Is the network operating normally?	Refer to the "Network" section in this table.
#### Chapter 5 Troubleshooting

No.	Class	s Status Check		Corrective action	
20		Video/Audio output from the decoder is distorted.		<ul> <li>If you could confirm a packet loss occurrence, check the following issues.</li> <li>Does the system rate setting exceed the transmission capability of the connected network?</li> <li>Is the FEC/ARQ function properly set on both this unit and the decoder?</li> <li>Are the network equipment and LAN port settings (AUTO, fixed mode, etc.) different?</li> </ul>	
21			Is "No audio" selected in the audio format settings of this unit?	Select an option other than "No audio" to set the encoding of audio.	
22		No sound	Is the decoder turned on?	Check the paired unit (decoder) power and operation.	
23		comes out from the decoder.	Is the decoder correctly connected to the audio speaker?	Check the connection between the decoder and the audio speaker.	
24			Has an alert been generated on the decoder?	If so, refer to the user's guide of the paired unit (decoder).	
25	dio		Disconnect the audio input cable from this unit. Does that eliminate the noise?	If noise disappears when the cable is disconnected, the noise seems to be mixed into the audio signal input. Check the audio output equipment.	
26	Au		⊃ ∀ Noise is	Is the decoder operating normally?	If the noise does not disappear even after the network cable is disconnected from the decoder, this unit seems to be operating normally. Check the decoder.
27		generated on the decoder.	Has a packet loss occurred at the decoder?	<ul> <li>If you could confirm a packet loss occurrence, check the following issues.</li> <li>Does the system rate setting exceed the transmission capability of the connected network?</li> <li>Is the FEC/ARQ function properly set on both this unit and the decoder?</li> <li>Are the network equipment and LAN port settings (AUTO, fixed mode, etc.) different?</li> </ul>	

#### Chapter 5 Troubleshooting

No.	Class	Status	Check	Corrective action	
28		The LINK/ACT	Is the connected network equipment (e.g., hub or router) operating normally?	Check the power and operation of the connected network equipment (e.g., hub or router).	
29		LED of a LAN port does not go on.	Is this unit correctly connected to network equipment (e.g., hub or router)?	Confirm that there is no problem with the LAN cable destinations/connection itself (mating defect, or connection mistake) and the LAN cable itself (disconnected, or poorly connected).	
30	~		Is the correct IP address specified in the Web browser?	Set the correct IP address from a Web browser on the control PC.	
31	Network	The unit cannot be set via a	Are network settings (IP address, subnet mask, etc.) correct on the control PC?	Set the correct values. If this unit started with the factory default settings, refer to "3.2 Unit Settings and Operation" for the network settings on the control PC.	
32		LAN.	Issue a PING command to the IP address of this unit. Does it respond?	If there is no response, turn on the IP-HE950E while pressing the CANCEL key for startup in maintenance mode with the factory default IP address (10.0.0.1) setting. If the problem persists, check the operating status on the LAN.	
33		E900/EA00 (SFP1/2 not mounted)	Is the SFP module correctly mounted?	The SFP module may be incorrectly mounted. Firmly insert the SFP module until you hear a click. Even if you confirm the correct mounting, if this alert occurs, the SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.	
34		E910/EA10 (SFP1/2 connection-type error)	Is there a conflict between the SFP module and unit settings?	The functions on the SFP module may not match unit settings. Check the mounted SFP module to confirm that the unit settings match the functions. (Is Dual 3G-SDI output SFP module mis-inserted?) Even if you confirm the correct setting, if this alert occurs, the SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.	
35	SFP	E920/EA20 (Abnormal SFP1/2 temperature)	The surface temperature of the SFP module is higher than the reference value.	The ambient temperature of the unit seems to be higher than the reference value. Cool the ambient temperature to the unit operating conditions. In addition, confirm that the intake space stated in the installation conditions has been allocated. Even if you check the correct ambient temperature condition and the intake space, if this alert occurs, the SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.	
36		E930/EA30 (Abnormal SFP1/2 voltage)	The SFP module voltage is abnormal.	The SFP module voltage is abnormal and an SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.	
37		ष्ट् टommunication ☐ is disabled	Is the data input-output (RS-232C/RS-422) port setting correct?	Check the data input-output (RS-232C/RS-422) port (Serial port) settings. ⇒Refer to Software User's Guide.	
38	Data		Is the data input-output (RS-232C/RS-422) device operating normally?	Check the operation of the data input-output (RS-232C/RS-422) devices.	
39			Are this equipment and the communication destination device correctly connected?	Check cable connections between this equipment and communication destination equipment and the cable pin assignments.	

No.	Class	Status	Check	Corrective action	
1			Is the power cord connected?	Check whether the power cord is properly connected to the outlet.	
2	2 The unit cannot t powered		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.	
			A unit error occurred.	Check the alert code from the log information screen for settings on the Web GUI. The code indicates the corrective action.	
	Unit	The ALM LED is on.	E020 FAN error E030 Power supply error E044/E045 Temperature sensor communication error E050-E070 Clock error E090 Memory error	Contact Fujitsu Sales or a Fujitsu partner. The center may ask you about the alert code. Check the alert code from the log information screen for settings on the Web GUI. If an SFP-type alert code is output, refer to items 26 to 29	
3			E042/E043 Temperature error	Check whether the unit installation environment satisfies "2.1 Installation Conditions." - Is there enough space around intake and exhaust openings? - Is the ambient temperature within the range of	
				environmental condition? If there is a problem in the above installation conditions, eliminate the problem. Then, reboot the unit. If there is no problem in installation conditions, contact Fujitsu sales or Fujitsu partners because a unit failure may have occurred.	
		The ALM LED is blinking.	An error in unit settings/performance or a part is indicated.	Check the alert code from the log information screen for settings on the Web GUI. The code indicates the corrective action.	
			E010 VFD Device error	Contact Fujitsu sales or Fujitsu partners.	
4			E040/E041 Temperature warning generated	Check whether the unit installation environment satisfies "2.1 Installation Conditions." - Is there enough space around intake/exhaust openings? - Is the ambient temperature within the range of environmental conditions? If there is a problem in the above installation conditions	
				eliminate the problem in the above installation conditions, eliminate the problem. Then, reboot the unit. If there is no problem in installation conditions, contact Fujitsu sales or Fujitsu partners because a unit failure may have occurred.	
5			Is the connected monitor operating normally?	Check the operation of the monitor.	
6	1		Is this unit turned on?	Confirm that the PWR LED of this unit is on.	
7			Is this unit correctly connected to the monitor?	Check the connection between this unit and the monitor.	
8	0ê	No video is	Is the correct video output setting specified on this unit?	Confirm that monitor display is enabled in the video output settings of this unit.	
9	Vide	output. (Black screen)	Is the ALM LED on?	Refer to item 3 in this table.	
10	(Black screen)		Are color bars or a gray screen displayed when nothing is input to the video input of the encoder? (Note that this operation generates INDWN on the encoder. Confirm that there will be no operational problems before performing the operation.)	If color bars or a gray screen appears, the network and this unit seem to be operating normally. Confirm the correct video input to the encoder.	

Table 5-2 Check details and corrective actions (IP-HE950D)

No.	Class	Status	Check	Corrective action	
11			Is the RDY LED blinking in green?	This unit is booting up. Wait until the RDY LED turns green.	
12			Is the RDY LED blinking in orange?	This unit started in maintenance mode. Restart the unit.	
13	Video	Only a blue/gray screen appears.	Is the INDWN LED blinking in orange?	An error occurred in the received stream data. Confirm the proper settings/proper operation on the connected network and the encoder. Confirm that the DVB-ASI signal connection is correct, and check for problems in the cables.	
				Check the reference signal output equipment, the reference adapter conversion cable, and the reference signal cable connected to the reference input terminal. Check the format settings of the reference signal output equipment.	
14			Is this unit turned on?	Check the power and operation of this unit.	
15		No sound comes out.	Is "No audio" selected in the audio format settings of the encoder?	Select an option other than "No audio" to set the encoding of audio.	
16			Is this unit correctly connected to the audio speaker?	Check the connection between this unit and the audio speaker.	
17			Is the ALM LED on?	Refer to item 3 in this table.	
18	Audio	Noise is generated.	Disconnect the LAN cable. Does that eliminate the noise?	If the noise does not disappear even after the LAN cable is disconnected from this unit, a failure may have occurred on this unit.	
19			Disconnect the audio input cable from the encoder. Does that eliminate the noise?	If the noise disappears when the cable is disconnected, the noise seems to be mixed into the audio signal input to the encoder. Check the audio output equipment.	
20			Has a packet loss occurred?	Refer to item 13 in this table.	
21		The LINK/ACT	Is the connected network equipment (e.g., hub or router) operating normally?	Check the power and operation of the connected network equipment (e.g., hub or router).	
22		LED of a LAN port does not go on.	Is this unit correctly connected to network equipment (e.g., hub or router)?	Confirm that there is no problem with the LAN cable destinations/connection itself (mating defect, or connection mistake) and the LAN cable itself (disconnected, or poorly connected).	
23	/ork		Is the correct IP address specified in the Web browser?	Set the correct IP address from a Web browser on the control PC.	
24	Netw	The unit cannot be set via a LAN.	Are network settings (IP address, subnet mask, etc.) correct on the control PC?	Set the correct values. If this unit started with the factory default settings, refer to "3.2 Unit Settings and Operation" for the network settings on the control PC.	
25			Issue a PING command to the IP address of this unit. Does it respond?	If there is no response, turn on the IP-HE950D while pressing the CANCEL key for startup in maintenance mode with the factory default IP address (10.0.0.1) setting. If the problem persists, check the operating status on the LAN.	

#### Chapter 5 Troubleshooting

No.	Class	Status	Check	Corrective action
26		E900/EA00 (SFP1/2 not mounted)	Is the SFP module correctly mounted?	The SFP module may be incorrectly mounted. Firmly insert the SFP module until you hear a click. Even if you confirm the correct mounting, if this alert occurs, the SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.
27		E910/EA10 (SFP1/2 connection-type error)	Is there a conflict between the SFP module and unit settings?	The functions on the SFP module may not match unit settings. Check the mounted SFP module to confirm that the unit settings match the functions. (Is Dual 3G-SDI input SFP module mis-inserted?) Even if you confirm the correct setting, if this alert occurs, the SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.
28	SFP	E920/EA20 (Abnormal SFP1/2 temperature)	The surface temperature of the SFP module is higher than the reference value.	The ambient temperature of the unit seems to be higher than the reference value. Cool the ambient temperature to the unit operating conditions. In addition, confirm that the intake space stated in the installation conditions has been allocated. Even if you check the correct ambient temperature condition and the intake space, if this alert occurs, the SFP module failure may have occurred. Contact Fujitsu sales or Fujitsu partners.
29		E930/EA30 (Abnormal SFP1/2 voltage)	The SFP module voltage is abnormal.	The SFP module voltage is abnormal and an SFP module failure may have occurred.Contact Fujitsu sales or Fujitsu partners.
30			Is the data input-output (RS-232C/RS-422) port setting correct?	Check the data input-output (RS-232C/RS-422) port (Serial port) settings. ⇒Refer to Software User's Guide.
31	Data	Data communication is disabled	Is the data input-output (RS-232C/RS-422) device operating normally?	Check the operation of the data input-output (RS-232C/RS-422) devices.
32			Are this equipment and the communication destination device correctly connected?	Check cable connections between this equipment and communication destination equipment and the cable pin assignments.



Alarm LED Goes On

This section describes the corrective actions to take if an alarm LED (ALM or INDWN) goes on. The appropriate corrective action depends on the displayed alert code. For details, refer to the IP-HE950 Software User's Guide.

The following table describes what is indicated by LEDs.

Display	Description			
PWR	Lights up in green when the IP-HE950 is turned on.			
RDY	Blinks in green during preparation for operation, and lights up in green during operation. The LED blinks in orange during preparation to start up in maintenance mode (Power-on while pressing the CANCEL key), and lights up in orange during operation in maintenance mode.			
INDWN	Off during normal operation. The LED lights up or blinks in orange at the time of a signal error or disconnection in the input system or network. You can select to turn on, blink, or turn off this LED as the setting for some alert indications. For alert log check instructions and LED settings, refer to the IP-HE950 Software User's Guide.			
ALM	<ul> <li>Alarm LED. The LED lights up or blinks in orange when a unit alert is occurred.</li> <li>You can select to turn on, blink, or turn off this LED as the setting for some alert indications.</li> <li>For alert log check instructions and LED settings, refer to IP-HE950 Software User's Guide.</li> </ul>			
LINK/ACT	Status LED of the LAN1/2 port. The status LED goes on when a link is established and blinks when a LAN packet is detected. The status LED goes off when the cable link goes down or the cable is disconnected.			
100/1000M	Linked speed indicator LED of the LAN1/2 port. The LED is off in operation with 10BASE, is on in operation with 100BASE, and blinks in operation with 1000BASE.			

#### Table 5-3 LED indications

# 5.3

## Maintenance area

The following figure shows the maintenance area required, in addition to that in "2.1.4 Installation space," for maintenance engineers.

#### Desktop installation

Allocate a maintenance area of more than 1 m at the front or rear.

#### **Rack mounting**

Allocate a maintenance area of more than 1 m at the front and rear.





The appendix contains views of this unit and lists its main specifications. Precautions and other such notes on installation work and on-site tune-up are also covered in this section.

A.1	Appearance	· 67
A.2	Main Specifications ·····	· 69
A.3	Installation Work ·····	· 77
A.4	On-Site Tune-Up Work ······	· 78



## Appearance

## A.1.1 IP-HE950E

The following figure shows the appearance of this unit.



Figure A.1-1 IP-HE950E appearance

### A.1.2 IP-HE950D

The following figure shows the appearance of this unit.



Figure A 1-2 IP-HE950D appearance

# A.2

## Main Specifications

This section lists the external specifications, environmental specifications, and interface specifications of this unit.

## A.2.1 External specifications

This unit has the external specifications shown below.

Table A.2-1 External specifications					
ltem	Specification				
Installation conditions	Indoor: Desktop installation or rack mounting Can be mounted in 1U rack space (excluding rubber feet)				
Dimensions	Width: 210 Height: 43 Depth: 300 (mm) * Excluding protrusions				
Cooling method	Forced air cooling				
Power	100 to 240 VAC				
Weight	Max. 2.5 kg				
Power consumption	IP-HE950E: 126 VA or less, IP-HE950D: 122 VA or less				

#### Table A.2-1 External specifications

## A.2.2 Environmental specifications

This unit has the environmental specifications shown below.

Item	Specification			
Power supply conditions	100 to 240 VAC ±10%, 50/60 Hz ±3 Hz			
Temperature and humidity conditions	Temperature: -10 to 55°C (excluding low-temperature startup under 0°C) Humidity: 20 to 90% (no condensation) (Conditions for guaranteed operation and guaranteed characteristics)			
Dust	Communications equipment room or office environment (0.15 mg/m <sup>3</sup> or			
concentration	less)			
Allowable concentration of corrosive gas	Conforms to IEC 60721-3-3 Class 3C1Sulphur dioxide (SO2): Max 0.037 cm³/m³Hydrogen sulfide (H2S): Max. 0.0071 cm³/m³Chlorine (Cl2): Max. 0.034 cm³/m³Hydrogen chloride (HCI): Max. 0.066 cm³/m³Hydrogen fluoride (HF): Max. 0.0036 cm³/m³Ammonia (NH3): Max. 0.42 cm³/m³Ozone (O3): Max. 0.005 cm³/m³Nitrogen oxide (NO2): Max. 0.052 cm³/m³			
Electromagnetic interference regulations	Class A information technology unit			

#### Table A.2-2 Environmental specifications

## A.2.3 Interface specifications

#### This unit has the interface specifications shown below.

#### Table A.2-3 Signal interface specifications

Name	Specification			Remarks
SDI digital video input	Signal format: NF Input impedance Signal amplitude Maximum amplit	RZI : 75 Ω (unbalanced) : 800 mVp-p ude level: 800 mVp-p	• ±10%	IP-HE950E
Silkscreened name	SDI-IN		BNC	
Pin No.	Signal name	Remarks		
1 2	SIGNAL SG	SMPTE ST 2082-10/424M (Level A)/292M	1—	

Name	Specification			Remarks
SDI digital video output	Signal format: NRZI Output impedance: 75 Ω (unbalanced) Signal amplitude: 800 mVp-p Maximum amplitude level: 800 mVp-p ±10%			IP-HE950D
Silkscreened name	SDI-OUT			BNC
Pin No.	Signal name	Remarks		
1 2	SIGNAL SG	SMPTE ST 2082-10/424M (Level A)/292M	1—	

Name	Specification		Remarks	
DVB-ASI input	Signal format: NRZI Input impedance: 75 Ω (unbalanced) Signal amplitude: 200 mVp-p (D21.5 IDLE pattern) Maximum amplitude level: 880 mVp-p ±10%		IP-HE950D	
Silkscreened name	ASI-IN			BNC
Pin No.	Signal name	Remarks		
1 2	SIGNAL SG		1	

Name	Specification			Remarks
DVB-ASI output	Signal format: NRZI Output impedance: 75 Ω (unbalanced) Signal amplitude: 800 mVp-p Maximum amplitude level: 800 mVp-p ±10%			IP-HE950E
Silkscreened name	ASI-OUT1, 2			BNC
Pin No.	Signal name	Remarks		
1 2	SIGNAL SG		1	

Name		Specification		
Sync signal output	Signal format: NTSC, black level not in SETUP (analog composite, 29.97 frames/second) PAL (analog composite, 25 frames/second) Output impedance: 75 Q (unbalanced)			IP-HE950D
	Signal amplitude			
Silkscreened name	REF-OUT BNC			
Pin No.	Signal name	Remarks		0
1 2	SIGNAL SG			- 2

Name		Specif	ication	Remarks
Sync signal input	Signal format: NTS (an NTS (an PAI HD Input impedance: Signal amplitude:	nal format: NTSC, black level not in SETUP (analog composite, 29.97 frames/second) NTSC, black level in SETUP (analog composite, 29.97 frames/second) PAL (analog composite, 25 frames/second) HD, 3-value sync signal, SYNC (29.97/25 frames/second) ut impedance: 75 Ω (unbalanced) nal amplitude: 1.0 Vp-p (±10%)		
Silkscreened name	REF	-IN	BNC	
Pin No.	Signal name	Remarks		C
1 2	SIGNAL SG			- 2

Name	Specification			Remarks
SFP (3G-SDI IN)	Signal format: NR Input impedance: Signal amplitude: Maximum amplitud	IP-HE950E (option)		
Silkscreened name	SFP1/SFP2		SFP1/2	
Pin No.	Signal name	Remarks	A C	
1-1	SIGNAL	A/C		1-1
1-2 2-1 2-2	SG SIGNAL SG	B/D	1-2 2-1 2-2 B D	1-2 2-1 2-2

Name	Specification			Remarks
SFP (3G-SDI OUT)	Signal format: NR Output impedance Signal amplitude: Maximum amplitu	IP-HE950D (option)		
Silkscreened name	SFP1/SFP2 SFP1/2			
Pin No.	Signal name	Remarks	A C	
1-1	SIGNAL	A/C		1-1
1-2	SG 1-2			1-2
2-1	SIGNAL B/D 2-1			2-1
2-2	SG		2-2	2-2
1			ВС	)

Name		Remarks		
SFP (12G-SDI OUT)	Signal format: NR Input impedance: Signal amplitude: Maximum amplitu	IP-HE950E/D (option)		
Silkscreened name	SFP1 SFP1			
Pin No.	Signal name	Remarks		
1 2	SIGNAL SG	SMPTE ST 2082-10/424M (Level A)/292M	1	2

Name	Specification			Remarks
Data port (RS-232C)	Number of cha Signal format: Connection: D' Bit rate: 1200, Data length: 7/ Parity: NONE/ Stop bit: 1/2 Flow control: N DTR signal mo	nnels: 1ch Start-Stop synchronizati TE 2400, 4800, 9600, 1920 /8 ODD/EVEN lone/RS and CS pnitoring: Yes/No	Common	
Silkscreened name	RS	5-232C/422	o 9 pin (male)	
Pin No.	Signal name	Remarks		
1	CD	Receive Carrier Detect		
2	RD	Receive Data	$\sim V(1)$	(5)
3	SD	Send Data		
4	DTR (ER)	Data Terminal Ready		
5	SG	Common to DI and SG		
6	DSR (DR)	Data Set Ready		
7	RTR (RS)			
8	CTS (CS)	Can Send		
9	RÍ	Ring Indicator		

Name	Specification			Remarks		
Data port (RS-422)	Number of cha Signal format: Connection: D Bit rate: 1200, Data length: 7/ Parity: NONE/0 Stop bit: 1/2	nnels: 1ch Start-Stop synchronizat TE 2400, 4800, 9600, 1920 8 DDD/EVEN	Common			
Silkscreened name	RS-232C/422 D-su		D-sub	o 9 pin (male)		
Pin No.	Signal name	Remarks				
1	RxD_N	Receive data N				
2	RxD_P	Receive data P		(5)		
3	TxD_N	Send data N				
4	TxD_P	Send data P				
5	SG					
6	-					
7	-	-	-			
8	-	-				
9	-	-				

#### IP-HE950 Hardware User's Guide

Name	Specification			Remarks
Analog audio input	Balanced analog audio: Input impedance: 600 Ω (balanced) Maximum level: 0/20 dBm input switching AES/EBU audio: Signal format: Biphase Mismatch attenuation: 25 dB or more (75 Ω: 0.1 to 6.0 MHz) Output signal amplitude: 1.0 Vp-p ±10% Input signal amplitude: 100 mVp-p (min)			IP-HE950E
Silkscreened name	A	AUDIO D-sub 9 p		pin (female)
Pin No.	Signal name	Remarks		
1	AES in1	- (open)		
2	AES in2	- (open)	{ (5)	
3	Audio L(+)	Audio L(+)		
4	Audio L(-)	Audio L(-)		
5	SG	SG		
6	Audio R(+) Audio R(+)			- (6) // 🗸
7	Audio R(-)	Audio R(-)		
8	- (open)	- (open)		
9	SG	SG		

Name	Specification			Remarks
Analog audio output	Balanced analog audio: Output impedance: $600 \Omega$ (balanced) Maximum level: $0/20 \text{ dBm}$ output switching AES/EBU audio: Signal format: Biphase Mismatch attenuation: 25 dB or more (75 $\Omega$ : 0.1 to 6.0 MHz) Output signal amplitude: 1.0 Vp-p ±10% Input signal amplitude: 100 mVp-p (min)			IP-HE950D
Silkscreened name	AUDIO D-sub 9 p		pin (female)	
Pin No.	Signal name	Remarks		
1	AES out1	- (open)		
2	AES out2	- (open)	(15)	
3	Audio L(+)	Audio L(+)		$\sim 2 $
4	Audio L(-)	Audio L(-)	$\int $	
5	SG	SG		
6	Audio R(+)	Audio R(+)	′ ~ `& <i>II</i> ∕∕	
7	Audio R(-)	Audio R(-)	<u> </u>	
8	SG	SG		
9	SG	SG		

Name		Spe		Remarks	
LAN interface	[10BASE-T]	Common			
Silkscreened name		10/100/1000 B/	ASE LAN1, L	AN2	RJ-45
Signal specification	10/1	00 BASE	10	00 BASE	
Pin No.	Signal name	Remarks	Signal name	Remarks	
1 2 3 4 5 6 7 8	TD+ TD- RD+ N.C. N.C. RD- N.C. N.C.	Transmit Data+ Transmit Data- Receive Data+ - - Receive Data- - -	TP0+ TP0- TP1+ TP2+ TP2- TP1- TP3+ TP3-	Pair 0+ Pair 0- Pair 1+ Pair 2+ Pair 2- Pair 1- Pair 3+ Pair 3-	
Specification of connected cable	Cable standa Pin assignme Pin No. 1 T568A W/ T568B W/ [W: White. G	rd: ANSI/TIA/EIA56 ent: Complies with e 2 3 4 G G W/O BI O O W/G BI : Green, O: Orange	BA CAT5 comp either of the follo 5 6 7 W/BI O W/Br W/BI G W/Br e, Bl: Blue, Br: Bl	liance.(Recommende wing arrangements: 8 Br Br rown]	cable is CAT6 or higher)

Name	Specification			Remarks
POWER	Parallel 2 pin with groundInput voltage:100 to 240 VAC ±10%Input connector:InletSwitch:Rocker switchInput protection:Built-in fuse			Common
Silkscreened name		100 to 240 V		
	Signal name	Remarks	3	FG
1 2 3	L1 L2 FG	L1 L2 FG		$\begin{array}{c c} \hline \\ \hline \\ 1 \\ 1 \\ L2 \end{array} - 2$

Table A.2-4 LED interface specifications									
LED name		On	Blinking	Off	Remarks				
PWR	G	Power on		Power off	Hardware operation				
	0	Abnormal unit			Abnormal temperature, power				
					error, or fan error				
RDY	G	Operating normally	Software starting	Software inactive	Blink interval: 0.5 seconds				
			up normally		Maintenance mode				
	0	Maintenance mode	Software starting		(Startup with CANCEL button)				
		LAN1	up in maintenance		LAN1 subnet mask				
		(IP=10.0.0.1)	mode		(255.0.0.0)				
		LAN2			LAN2 subnet mask				
		(IP=192.168.255.253)			(255.255.255.252)				
ALM	0	Unit alert generated	Unit alert	Normal operation	You can change settings for				
			generated		some alerts to turn on, blink, or				
					turn off the LED when a unit alert				
					is generated.				
INDWN	0	Video, audio, or network	Video, audio, or	Normal operation	You can change settings to turn				
		system input down/fault	network system		on, blink, or turn off the LED,				
			input down/fault		except to turn on the LED due to				
					an abnormal temperature.				
LINK/ACT	G	LINK established	LAN packet	Cable link down or					
[LAN1]			detected	cable disconnected					
100/1000M	G	100BASE operation	1000BASE	10BASE operation					
[LAN1]			operation						
LINK/ACT	G	LINK established	LAN packet	Cable link down or					
[LAN2]			detected	cable disconnected					
100/1000M	G	100BASE operation	1000BASE	10BASE operation					
[LAN2]			operation						

G: Green, O: Orange

Name	Switch type	Specification	Behavior
Power	Rocker switch	Turn on (–)/off (O)	



## **Installation Work**

This section describes precautions and check items for installation work.

### A.3.1 Installation work scope

For the installation work scope, refer to "4.1 Installation Preparations."

### A.3.2 Unpacking and unit check

Unpack and check this unit as described below.

- During unpacking, pay special care and attention in handling to avoid unnecessary shock and scratches damaging the appearance.
- Check to ensure that this unit and the accompanying package are not damaged.
- Check to ensure that wiring does not have a short circuit and is not disconnected.
- Check to ensure that the correct screws are included in the package.

## A.3.3 Installation conditions

For the installation work scope, refer to "2.1 Installation Conditions."

The installation method may differ depending on the site for the installation. In principle, the method conforms to the site.

Do not install this unit in the following places:

- Place exposed to direct sunlight or near heating units
- Humid or dusty place
- Place exposing the unit to shock or vibration
- Unstable place, such as a slope, or place with a lot of weight on it
- Place subject to a strong magnetic field or radio waves
- Environment where the unit would be damaged by seawater or corrosive gas

### A.3.4 Connecting external cables

For connection instructions, refer to "Chapter 2 Installation and Connection." For cable specifications, refer to "4.2 Cable and Connector Details." For the connector pin assignments of the unit, refer to "A.2.3 Interface specifications."



This chapter describes the on-site tune-up workflow.



Figure A.4-1 Workflow

Since this unit has a diversity of system configurations depending on the application, this section covers the checking process for the unit alone.

#### (1) Preparations

- 1) Check of the system configuration
  - Check the entire system configuration.
- Check of the equipment and cables to be connected to this unit Check the equipment to be connected to this unit, the cables that must be procured, and installation work conditions.
- 3) Tools and measuring instruments necessary for work:
  - Digital multimeter
  - General-purpose tools

#### (2) Environment check

- 1) Ambient air temperature, humidity, and power supply facilities Confirm that the ambient air temperature, humidity, and power supply facilities satisfy the conditions in "A.2.2 Environmental specifications."
- Ground connection work Confirm that connections to the power supply FG are a D-type (type 3) ground or higher.

#### (3) Visual check of appearance

- 1) Confirm that this unit surface has no damage, such as scratches, dirt, rust, deformation, or peeling coating.
- 2) Confirm that the patent nameplate and unit nameplate are still attached, and that buttons are not damaged.
- 3) Confirm that the connectors are not loose.

#### (4) Cable connection

Confirm that each cable is connected as stipulated in system specifications. For connection instructions, refer to "Chapter 2 Installation and Connection." For cable specifications, refer to "4.2 Cable and Connector Details." For the connector pin assignments of the unit, refer to "A.2.3 Interface specifications." Hardware does need not to be configured for this unit.

#### (5) Input voltage check

Confirm that the voltage of power supplied to this unit is normal.

#### (6) Power-on

- 1) Set the power switch on the front panel to the ON position.
- 2) Confirm that the PWR LED on the front panel goes on.

#### (7) Unit test

- Immediately after being turned on, this unit executes a self-check, and the RDY LED starts blinking. Confirm that the blinking RDY LED stays on after the completion of the unit self-check and system startup.
- 2) If the self-check detects an abnormal situation, the alarm LED (ALM) goes on.

#### (8) System test

1) Setting check

Configure unit operation settings from a control terminal in accordance with system specifications.

2) Input video check

Confirm that video input to this unit is correctly output to a monitor (television). 3) Data communication check

Check for acknowledgement of communication over the network used by the system. 4) Operation status check

When the system is operating after the final settings are done, confirm that the unit status LED (RDY) on the front of the unit lights up in green, and that the alarm LED (ALM) is off.



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## Glossary

#### 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.

#### Alert log

Alert log is obstacle history of unit or network.

#### 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.

#### Browser

General name for programs that support users who want to select desired options from available options. Using a browser, a user can trace links on the Internet to access such multimedia information as text, audio, and video by simply using a pointing device (e.g., mouse) to select items.

DCE (Data Circuit terminating Equipment) DCE is a term from ITU-T. Similar to modems and DSUs, it changes signals to waveforms that are suitable for their transmission routes.

#### Downconverter

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

DTE (Data Terminating Equipment) One kind of terminal unit (e.g., PC). DTE is a term from ITU-T, and it is paired with DCE.

#### 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.

#### Embedded audio

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

FG (Frame Ground) Ground for a cabinet.

#### HD-BNC (High Density BNC)

One of the coaxial cable connectors which have 75 ohms or 50 ohms impedance. About four times smaller than regular BNC connector.

#### 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.

#### 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.

HTTP (Hyper Text Transfer Protocol) Protocol used for sending and receiving files and other data between a Web server and Web browser

#### Hub

#### A concentrator required for using

10BASE-T/100BASE-TX/1000BASE-T as a local area network (LAN) standard. Twisted pair cables are used to connect hubs. Examples include hubs that conform to 1000BASE-T and switching hubs that have switching functions.

#### IP (Internet Protocol)

Protocol used between host computers to transfer packets over all of the Internet. The codes that identify the destinations and senders in packet transfers are called IP addresses. An IP address is a 32-bit code that can identify a network and host in the network. A unique IP address must be assigned to each host that communicates on the Internet.

#### IP address

A code used for identifying a node (e.g., PC) operating using TCP/IP. This 32-bit number is divided into four 8-bit sections. An example of this is 200.10.101.1.

#### IP multicast

Technology for transmitting identical data to multiple remote destinations simultaneously using TCP/IP. An address system called Class D is used for multicasting. In the Class D address system, the first four bits (1110) indicate a multicast, and the remaining 28 bits specify a multicast group. Path control methods for IP multicasting include PIM and DVMRP, but no one method has become the standard yet.

#### LAN (Local Area Network)

A data communication system in a specific area (maximum of 6 miles or about 10 km). It provides moderate to high data transfer speeds.

#### LED (Light-Emitting Diode)

The IP-HE950 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.

#### 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.

#### PING

A command supported by operating systems such as UNIX and Windows 9x/NT. It is used in a TCP/IP network to check whether IP packets can reach or have reached the communication destination.

#### Proxy

A computer or software placed between a company's intranet and the Internet to act as an "intermediary" for intranet computers that cannot connect directly to the Internet. These computers are connected to the Internet by the proxy.

#### PS (Program Stream)

An MPEG2 method of multiplexing audio, video, and data. The PS method is used for transmission and storage in an error-free environment.

#### **RS-232C**

Interface standard that was mainly established by 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

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be strongly resistant to noise, travels on cables as long as 1.2 km, and has a maximum communication speed of 10 Mbps.

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.

SG (Signal Ground) Ground for signals.

#### 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.

#### Subnet mask

Mask value used for obtaining a subnet network address from an IP address. The subnet address is obtained using an AND operation between an IP address and subnet mask.

TCP (Transmission Control Protocol)

A protocol required for direct connection to the Internet. In the OSI reference model, TCP corresponds to the transport layer and IP corresponds to the network layer. TCP has been a global standard protocol supported by the major operating systems, including UNIX, OS/2, and Windows.

#### 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.

#### 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. UDP (User Datagram Protocol)

TCP/IP transaction protocol used for specific applications such as remote network management and naming service access.

#### Unicast

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

#### UTP cable

An unshielded pair of wires twisted together. UTP is an abbreviation for unshielded twisted-pair. These wires are used for Ethernet cabling and other purposes.

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.

#### 10BASE-T

A LAN that uses unshielded twisted-pair (UTP) cables and complies with the IEEE 802.3 standard. A 10BASE-T connection uses a concentrator called a hub. It is widely used because special cabling work is not necessary and wiring can be done easily. The maximum length of cable wiring is 100 m.

#### 100BASE-TX

One of the 100BASE LAN standards (also called Fast Ethernet). It supports a transfer rate of 100 Mbps. Other 100BASE standards are 100BASE-T4 and 100BASE-FX, and the difference is the type of cable used. 100BASE-TX uses unshielded twisted-pair (UTP) cables. It also uses the RJ-45 connector, which is similar to the modular jacks used for telephones.

#### 1000BASE-T

One of the Gigabit Ethernet standards for a communication speed of 1 Gbps. The specifications were standardized as IEEE 802.3ab in 1999. Similar to 100BASE-TX, the standard uses UTP cables, and all four pairs and eight bits of a signal line are used. The maximum transmission distance is 100 m. The network topology is a star-type LAN with a hub at the center. 1000BASE-T is a cable-based standard so if the connected equipment on an existing 100BASE-TX network is exchanged with

100BASE-T-compatible ones, it can support Gigabit Ethernet.The cable corresponding to 1000BASE-T is Enhanced Category 5 (CAT5e) or high.

#### 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.

#### 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  $4096 \times 2160$ .

IP-HE950 Hardware User's Guide

Edition 06 June 2022

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