

OIP-D50E/D50D

AVoIP Encoder / AVoIP Decoder

User Manual - English



[Important]

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Chapter 1 Package Contents

1.1 OIP-D50E Encoder

OIP-D50E Encoder



Foot mats



(A set of four)

5 V/2.6 A Power supply
(including a multinational adapter)



3.5mm to infrared emitter



3.5mm to infrared extender



1.2 OIP-D50D Decoder

OIP-D50D Decoder



Foot mats

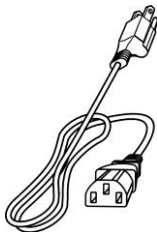


(A set of four)

5V/4A Power supply



Power Cord



3.5mm to infrared emitter



3.5mm to infrared extender



Chapter 2 Product Overview

2.1 Overview

This product is a multifunctional VoIP encoder/decoder. It can extend HDMI or VGA signals and connect KVM remote control through Cat.5e/6/7 cable under TCP/IP protocol. This product supports ultra HD images (4K@30 Hz YUV 4:4:4 or 4K@60 Hz YUV 4:2:0), digital or analog sound and USB data, and the transmission distance can reach 100 meters. If it is equipped with a Gigabit network switch, it can not only extend the transmission distance (up to 100 meters for each connection), but also receive VoIP signals without loss or delay.

This product supports Multicast of VoIP signals, which can send audio-visual signals of one encoder to multiple decoders in the same local network. In addition, VoIP signals with multicast can also be used to build a large video wall composed of multiple displays, which is perfectly suitable for home use and commercial audio-visual installation environments.

In addition to supporting IR and RS-232 bidirectional transmission, this product also has analog line-level sound input or output and microphone audio input (in the decoder), providing more sound effect options. In addition, it supports USB function to combine with VGA signals, allowing you to use this product as a remote USB hub and provide easy KVM switch. This product has a screen display function to quickly check setting information. The control interface includes WebGI, Telnet and front panel buttons.

2.2 Product Applications

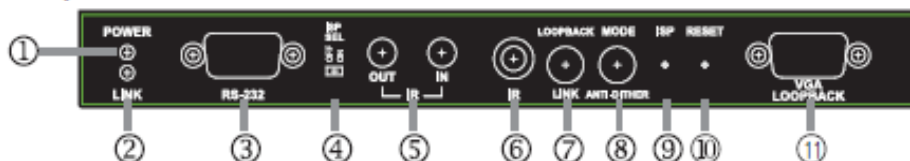
- HDMI or VGA audio/video, USB, audio, IR and RS-232 signal extension
- Use one Cat.5e/6/7 network cable to broadcast the audio-visual system
- Play multimedia on multiple displays with multicasting
- Multi-screen broadcast displays in restaurants or conference centers
- Use connection to long-distance transmit data and images
- Matrix image distribution system
- Video wall image distribution system
- Keyboard, displays and mouse remote control

2.3 System Requirements

- HDMI or VGA audio-visual source devices, such as digital media players, video game consoles, PCs or set-top boxes.
- An HDMI or VGA audio-visual equipment, such as a HD TV, screen or audio-visual amplifier.
- Analog audio equipments, such as headphones, audio-visual amplifiers, or power-supplied speakers.
- A Gigabit network switch supports Jumbo Frame (at least 8K Jumbo Frames).
- A Gigabit network switch supports Internet Group Management Protocol (IGMP) Snooping.

2.4 I/O Functions Introduction

2.4.1 OIP-D50E Encoder - Front Panel



NO	Item	Function Descriptions
①	Power Indicator	Display the status of the device. Please refer to 2.5 Description of Indicator Display .
②	Connection Indicator	Display the status of connection. Please refer to 2.5 Description of Indicator Display .
③	RS-232 Port	Connect to a computer to issue RS-232 commands to RS-232 controlled devices. The default baud rate is 115200 bps, which can be set by users. <Remark> With Multicast, the encoder can send RS-232 commands to all decoders, and individual decoders can send RS-232 commands to the encoder.
④	ISP SEL On/Off	For manufacturers only. The default position of this switch is OFF, which can perform normal RS-232 transmission function. If the switch is on, the ISP engineering mode will be activated.
⑤	IR Output Port	After connecting to IR emitter, aim at the controlled device to send the received IR signals from the remote control to the controlled device.
⑥	IR Input Port	After connecting to IR extender, aim at the remote control to extend the IR control range of the remote control to the far ends. <Remark> With Multicast, the encoder can send IR signals to all decoders.
⑦	IR Receive Window	It can receive IR signals from any standard remote control and send the received IR signals to the IR output port on the decoder. <Remark> With Multicast, the encoder can send IR signals to all decoders.
⑧	Loopback or Link Button	<p>(1) Image Loopback: Press this button to enable or disable the VGA loopback output, which can be used to locally monitor the current VGA or HDMI signal source (non-HDCP encryption and resolution is 1080p or below) for troubleshooting.</p> <p>(2) Image Connection: Press this button for 3 seconds to enable or disable image connection. When the video connection is disabled, the display connected to the receiver will show the current IP address and firmware version of the system.</p> <p>(3) Resume the factory default setting: In the unplugged state, press and hold this button, and then insert the power. When the POWER and LINK indicators flash at the same time, it means the factory settings have been restored (it takes 15~30 seconds). Then, release the button, and restart the device.(including restoring the IP mode to Auto, the broadcast channel to 0, and the cast mode to Multicast). The IP address of this device will also automatically assign. The new address range is 169.254.XXX.XXX.</p>
⑨	Image Stream and Anti-dither Button	<p>(1) Image Stream: Press this button to select the image stream, you can switch between Graphic and Video image processing modes. Graphic mode: Optimizing high-resolution static images. Video mode: Optimizing full motion images.</p> <p>(2) Anti-dither: Press this button for 3 seconds to enable anti-dither. You can switch between 1-bit, 2-bit, or Off processing modes. Some display adapters adopt dithering technology to simulate more colors, but</p>

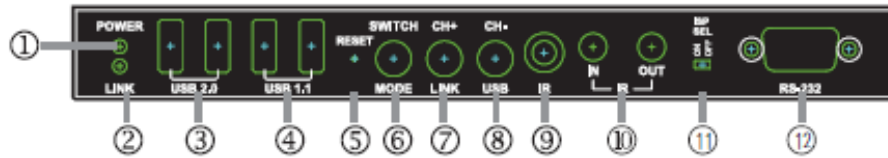
NO	Item	Function Descriptions
		dithering processing make low-broadband signals difficult to save, when processing live image compression. This function will remove the dithering processing and then compress and transmit signals. If the signal source has not been dithered, do not enable this function. <Remark> Anti-dither is off by default (Off mode).
⑩	ISP Button	For manufacturers only.
⑪	Reset Button	Press this button to restart the device (all settings will be retained).
⑫	VGA Loopback Output Port	Connect to a VGA display to output analog images, which can be used to locally monitor the current VGA or HDMI signal sources (non-HDCP encryption, and the resolution is 1080p or below).

2.4.2 OIP-D50E Encoder - Rear Panel



NO	Item	Function Descriptions
①	Power Port	Plug in the 5V DC power supply and connect to an AC outlet (or choose to supply power via PoE).
②	USB Port	Connect to a computer and expand its USB function to the USB port of a compatible decoder.
③	OIP LAN Port	Connect to a network switch to serially connect a compatible decoder to transmit data, or connect to a computer to use WebGUI to operate the device. <Remark> If the network switch adopts PoE (IEEE 802.3af) technology, power can be obtained directly from the network switch.
④	VGA input port	Connect to a VGA source device, such as a desktop computer or laptop. <Remark> When sending 4K@60 Hz (YUV 4:2:0) images from a computer, image signals may have artifacts.
⑤	HDMI Input Port	Connect to HDMI source devices, such as digital media players, video game consoles or set-top boxes, and HD cameras.
⑥	LINE Input Port	Connect to a CD player or computer to input analog audio. <Remark> When this input port has a signal source, this device will embed the audio into signals to be transmitted, and the original HDMI audio will be replaced completely.
⑦	LINE Output Port	Connect to a power-supplied speaker or AV amplifier to output analog audio, which can only play the microphone signal sources from the decoder (limited to unicast mode). <Remark> The LINE input port on the encoder must be connected to a signal source to enable the microphone on the decoder.

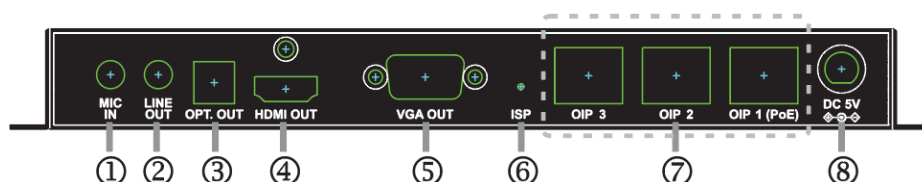
2.4.3 OIP-D50D Decoder - Front Panel



NO	Item	Function Descriptions
①	Power Indicator	Display the status of the device. Please refer to 2.5 Description of Indicator Display .
②	Connection Indicator	Display the status of connection. Please refer to 2.5 Description of Indicator Display .
③	USB 2.0 port	Connect to High Speed USB peripherals, such as USB disk. <Remark> This does not support isochronous transmission of USB access devices, such as digital cameras and external hard drives.
④	USB 1.1 port	Connect to Full Speed USB peripherals, such as a keyboard or a mouse. <Remark> This does not support isochronous transmission of USB access devices, such as digital cameras and external hard drives.
⑤	Reset Button	Press this button to restart the device (all settings will be retained).
⑥	Signal Source and Image Stream button	<p>(1) Signal source: Press this button to select the signal source. You can switch between HDMI and VGA image signals. <Remark> Due to the requirements of streaming image and HDCP encryption, the switching time will be at least 6 - 10 seconds.</p> <p>(2) Image Stream: Press this button for 3 seconds to select the image stream. You can switch between Graphic and Video image processing modes. Graphic mode: Optimizing high-resolution static images Video mode: Optimizing full motion images</p>
⑦	Channel or Link button	<p>(1) Channel +: Press this button to switch to the next available streaming channel in the local network. <Remark> If the device does not detect an available streaming channel, its channel number will not be changed.</p> <p>(2) Image Connection: Press this button for 3 seconds to enable or disable image connection. When the video connection is disabled, the display connected to the receiver will show the current IP address and firmware version of the system.</p> <p>(3) Resume the factory default setting: In the unplugged state, press and hold this button, and then insert the power. When the POWER and LINK indicators flash at the same time, it means the factory settings have been restored (it takes 15~30 seconds). Then, release the button, and restart the device.(including restoring the IP mode to Auto, the broadcast channel to 0, and the cast mode to Multicast). The IP address of this device will also automatically assign. The new address range is 169.254.XXX.XXX.</p>
⑧	Channel or USB Button	<p>(1) Channel -: Press this button to switch to the previous available streaming channel in the local network. <Remark> If the device does not detect an available streaming channel, its channel number will not be changed.</p> <p>(2) USB Connection: Press this button for 3 seconds to enable or disable the USB connection between the encoder and decoder (limited to multicast). <Remark> With multicast, only one decoder can enable the USB connection with the encoder at a time, and other decoders on the same</p>

NO	Item	Function Descriptions
		channel will not be able to enable their USB connection.
⑨	IR Receive Window	It can receive IR signals from any standard remote control and send the received IR signals to the IR output port on the encoder.
⑩	IR Input Port	After connecting to IR extender, aim at the remote control to extend the IR control range of the remote control to the far ends.
⑪	IR Output Port	After connecting to IR emitter, aim at the controlled device to send the received IR signals from the remote control to the controlled device.
⑫	ISP SEL On/Off	For manufacturers only. The default position of this switch is OFF, which can perform normal RS-232 transmission function. If the switch is on, the ISP engineering mode will be activated.
⑬	RS-232 Port	Connect to the RS-232 controlled device to execute RS-232 commands of the computer. The default baud rate is 115200 bps, which can be set by users. <Remark> With Multicast, the encoder can send RS-232 commands to all decoders, and individual decoders can send RS-232 commands to the encoder.

2.4.4 OIP-D50D Decoder - Rear Panel

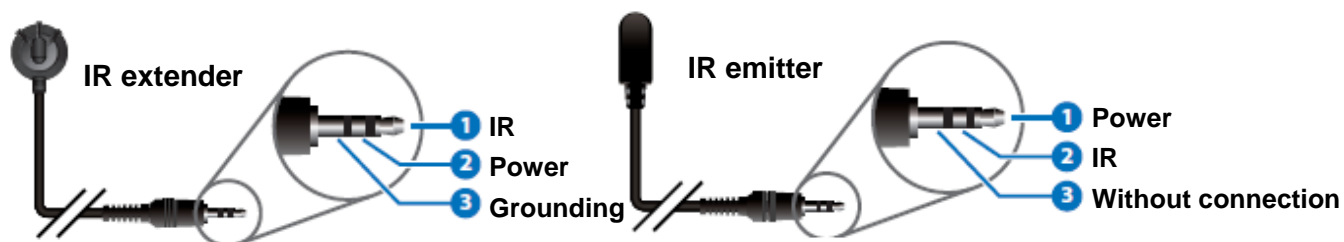


NO	Item	Function Descriptions
①	Microphone Input Port	Connect to a microphone to input analog audio, which is played by the LINE output port on the encoder (limited to unicast mode). <Remark> The LINE input port on the encoder must be connected to a signal source to enable the microphone on the decoder.
②	LINE Output Port	Connect to a power-supplied speaker or AV amplifier to output analog audio, which can play HDMI or Line-level signal source from the encoder, and support LPCM 2.0 sound effect.
③	Optical output port	Connect to a power-supplied speaker or AV amplifier to output digital audio, which can play HDMI or Line-level signal source from the encoder, and support LPCM 2.0 & Bitstream sound effect.
④	HDMI output port	Connect to HDMI display or audio-visual amplifier to output digital images and audio.
⑤	VGA output port	Connect to a VGA display to output analog images (limited to VGA or non-HDCP encrypted HDMI signal source). <Remark> When sending 4K@60 Hz (YUV 4:2:0) images from a computer, image signals may have artifacts.
⑥	ISP Button	For manufacturers only.
⑦	OIP LAN Port	Connect to a network switch to serially connect a compatible encoder to transmit data, or connect to a computer to use WebGUI to operate the device. <Remark> If the network switch adopts PoE (IEEE 802.3af) technology, power can be obtained directly from the network switch. For PoE power supply, please connect to OIP1. For serial connection, please use any port.
⑧	Power Port	Plug in the 5V DC power supply and connect to an AC outlet (or choose to supply power via PoE).

2.5 Description of Indicator Display

Name	Indicator Status
Power Indicator	Flickering: Receiving power Stays On: Ready
Connection Indicator	Off: No internet connection Flickering: Connecting Stays On: Connection is stable

2.6 IR Pin Assignment Configuration

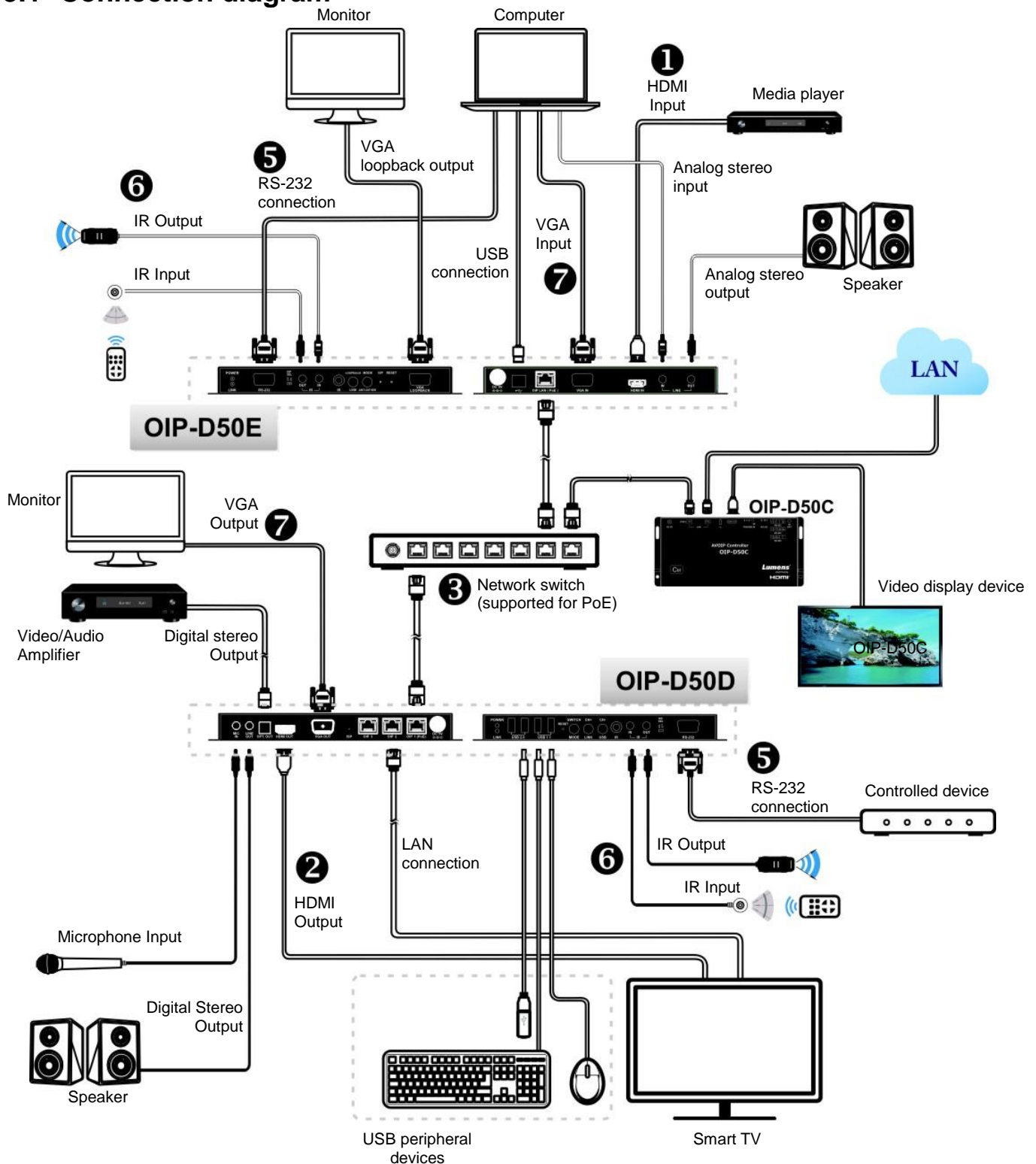


2.7 RS-232 Communication Protocol

Encoder		▶ ◀	Decoder	
Pin	Configuration		Pin	Configuration
1	NC		1	NC
2	Tx		2	Rx
3	Rx		3	Tx
4	NC		4	NC
5	GND		5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

Chapter 3 Installation and Connections

3.1 Connection diagram



3.2 Connection Setting

- ① Use an HDMI cable to connect the video source device to the HDMI input port on the D50E encoder.
 - ② Use an HDMI cable to connect the video display device to the HDMI output port on the D50D decoder.
 - ③ Use the network cable to connect the OIP network ports in the D50E encoder, D50D decoder, and D50C controller to the network switch of the same domain, so that all OIP devices are in the same local network.
 - ④ Insert the transformer into the power ports of D50E encoder, D50D decoder, and D50C controller and connect to the power. (If the network switch supports PoE (IEEE 802.3af) technology, power can be obtained directly from the network switch.)
- ※ Steps ①-④ can extend the signal. You can enter the IP address of the encoder or decoder on the browser to control the encoder or decoder individually. Or use the WebGUI operation interface to control the video display device connected to the D50C controller, which can simultaneously control all encoders and decoders currently connected to the same local network.

You can also connect to other devices. Please refer to the following steps:

- ⑤ Connect the computer to the D50E encoder, and the controlled device to the RS-232 port of the D50D decoder. The computer can issue RS-232 commands to the controlled device, and the controlled device will execute those commands.
- ⑥ Connect the IR emitter/receiver to the D50E encoder and D50D decoder to receive IR signals from the remote control, and use the remote control to control the controlled device.
- ⑦ The VGA source device can connect to D50E encoder and connect VGA display to D50D decoder to output analog image and audio.

Chapter 4 Start Using

VoIP transmission will consume a lot of bandwidth (especially at higher resolutions), and it needs to be paired with a Gigabit network switch that supports Jumbo Frame and IGMP Snooping. It is strongly recommended to be equipped with a switch which includes VLAN (Virtual Local Area Network) professional network management.

4.1 Network Switch Setting

■ Notes

Most consumer-grade routers cannot handle the high traffic flow generated by multicast, so it is not recommended to directly use the router as your network switch. It is strongly recommended to avoid mixing your commonly used network traffic with VoIP streaming flow. VoIP streaming flow should at least use a separate subnet.

■ Setting Suggestions

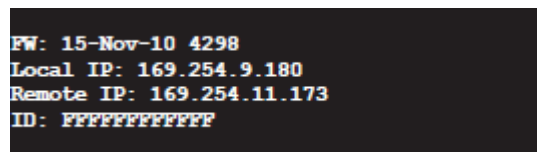
- Please set Port Frame Size (Jumbo Frame) to 8000.
- Please set IGMP Snooping and relevant settings (Port, VLAN, Fast Leave, Querier) to **[Enable]**

4.2 WebGUI Control Methods

4.2.1 WebGUI Control via D50E encoder/D50D decoder

The encoder and decoder have their own WebGUI interface. Open a standard web page browser, enter the IP address of the device, and log in to the WebGUI interface to connect to the encoder or decoder you'd like to operate. If you don't know the IP address, temporarily stop the VoIP streaming connection between the encoder and the decoder first. Please press the LINK button on the front panel of the decoder or encoder for 3 seconds (the LINK indicator flickers quickly and then is off), and check the IP address on the display connected to the decoder.

Once the VoIP streaming is disconnected, the decoder will output a 640 x 480 black screen, and a set of local (equal to the decoder) IP address will be showed at the bottom of the screen, and a set of remote (equal to encoder) IP address sharing the same VoIP transmission channel (the channel number is preset to 0). After obtaining the IP address, please press the LINK button again for 3 seconds to restore the original operating state of the device (the LINK indicator lights up first and then stays on).



```
FW: 15-Nov-10 4298
Local IP: 169.254.9.180
Remote IP: 169.254.11.173
ID: FFFFFFFFFF
```

After logging in to the WebGUI interface, you will see a window composed of several tabs. Please click the button at the top of the window to check the content of each tab. For each tab and its function, please refer to [5.1 WebGUI Control Menu Descriptions](#).

4.2.2 WebGUI control via the D50C controller

To activate the WebGUI connection of D50C controller, please open a web page browser, and enter the IP address of the CTRL LAN port of D50C controller, or connect the display to the HDMI output port, and connect the keyboard and mouse to the USB port for easy operation. Whether it is controlled on a web page browser or on a display, all encoders and decoders connected to the same local network can be controlled on the control page at the same time. For the description of the D50C WebGUI control menu, please refer to the [OIP-D50C User Manual](#).

Chapter 5 WebGUI Control Menu

5.1 WebGUI Control Menu Descriptions

This chapter describes the WebGUI control menu of D50E encoder/D50D decoder. To use the WebGUI control page of D50C controller to control the device, please refer to [OIP-D50C User Manual](#).

5.1.1 System - Version Information

System

Video Wall

Network

Functions

About

Dencoder

Version Information :

Wed, 02 Sep 2020 20:40:44 +0800
782043459 190176 u-boot_h.bin
2367476749 2594640 uulmage
3150232223 17080320 initrd2m
Kernel Version : A7.3.1
Application Version : V3.31L

Update Firmware :

Utilities :

Statistics :

Description

This window will show detailed information about the current firmware version of the device.

5.1.2 System - Upgrade Firmware

System

Video Wall

Network

Functions

About

Dencoder

Version Information :

Update Firmware :

Choose File

No file Chosen

Upload

Warning : Stop any service by disconnecting from the peer before you proceed to upgrade firmware.

Utilities :

Statistics :

Description

To upgrade the firmware of device, please press [Choose File], select the update file (*.bin format) from your computer, and then press [Upload] to start the update.

5.1.3 System - Utility Program

No	Item	Description
1	Commands	To restore the factory default settings of the device, please press [Factory Default]. If you only need to restart the device (settings will not be reset), please press [Reboot].
2	Reset EDID to Default Value	<p>If the EDID data from the decoder is not compatible with the HDMI/VGA signal source, please select the built-in HDMI EDID setting of the encoder (support 4K30 resolution, including audio) or VGA EDID (support WUXGA resolution, excluding audio) setting to solve the compatibility problem. Then, press [Apply].</p> <p><Remark> If restart the device, the EDID setting will be reset.</p> <p>* The decoder operation interface does not have this function.</p>
3	Console API Command	<p>To send a Telnet command to the device, enter the Telnet command in the Command field, and then press [Apply]. The device's response to the command will be showed on the Output field.</p> <p><Remark> To check Telnet commands, please refer to OIP-D50E. D50D Telnet Command List.</p>

5.1.4 System - Statistics

SystemVideo WallNetworkFunctionsAboutDencoder

> Version Information :

> Update Firmware :

> Utilities :

Statistics :

State Machine	Network
State : s_srv_on	ID (Host Name) : 3
	IP Address : 169.254.2.75
	Subnet Mask : 255.255.0.0
	Default Gateway : 169.254.0.254
	MAC Address : DCE2AC020002
	Casting Mode : Multicast Mode
	Link Status : on
	Link Mode : 1G
	S/N : O03A00003

Description

This window will display the current operating status of the device, including host name, network information, MAC address, unicast or multicast, and connection status and mode.

5.1.5 Video Wall - Bezel and Gap Compensation

The video wall page can design, edit and operate a video wall built by displays connected with multiple decoders. In the same video wall system, you can choose to control any decoder on any encoder (as long as the channel number is shared), or you can choose to access the video wall settings on the encoder and decoder. Some of the changed video wall settings can only be applied to the decoder. After saving the new video wall settings, please set Apply To to select the applied target and then press [Apply].

<Remark> Although it is feasible to build a small video wall with the unicast mode, it is strongly recommended to give priority to adopt the multicast mode when building a video wall so that the network bandwidth can be used more effectively.

SystemVideo WallNetworkFunctionsAboutDencoder

Bezel and Gap Compensation

1

OW :

1

2

OH :

1

3

VW :

1

4

VH :

1

5

Apply To : "All" device(s) in the list

All

Apply

Description		
It provides the actual size setting of the display of the video wall. Various measurement units (inches, millimeters, centimeters) will do, as long as all measurements are in the same unit and the numbers are integers.		
<Remark> Video walls usually use the same type of displays in the same size. It is also feasible to use displays in different sizes, as long as each display is measured in the same unit Video wall is laid out in the most common rectangular pattern, and the bezels of each display are aligned with the center of the video wall.		
No	Item	Description
1	OW	(OW) The horizontal size of the display.
2	OH	(OH) The vertical size of the display.
3	VW	(VW) The horizontal size of the signal source screen.
4	VH	(VH) The vertical size of the signal source screen.
5	Apply your settings.	Set the device which you want to apply the changes to, and then press [Apply] Select All: Apply the changes to all encoders and decoders in the current video wall. Select This: Apply the changes to this device which is currently connecting to WebGUI. Select a set of IP address on the Hosts end: Apply the changes to the encoder connected to this address. Select a set of IP address on the Clients end: Apply the changes to the decoder connected to this address.

5.1.6 Video Wall - Wall Size and Position Layout

Description		
Provide the amount of displays in the video wall and the position settings of displays. Typical video walls consist of the same amount of displays in both horizontal and vertical directions (for example: 2 x 2 or 3 x 3). Through this setting, you can build video walls in various rectangular pattern (for example: 5 x 1 or 2 x 3).		
<Remark> The maximum amount of displays for both the horizontal and vertical directions is 8.		
No	Item	Description
1	Vertical Monitor Amount	Set the amount of displays in the vertical direction of the video wall (up to 8).
2	Horizontal Monitor Amount	Set the amount of displays in the horizontal direction of the video wall (up to 8).
3	Row Position	Set the vertical position of the displays currently under control (from top to bottom, ranges from 0 to 7).
4	Column Position	Set the horizontal position of the displays currently under control (from left to right, ranges from 0 to 7).

5.1.7 Video Wall - Preference

Preferences

1 Stretch Type : Fit In

2 Clockwise Rotate : 0

3 Apply To : 0 : 169.254.2.130

4 Show OSD

Apply

Description

It provides additional control to the video wall, including the screen display settings, and changes to applied settings of the video wall.

No	Item	Description
1	Stretch Out	Set the stretch out mode of the screen. - Fit In mode: The original aspect ratio of the image signal will be ignored, and the aspect will be stretched to fit the size of the video wall. - Stretch Out mode: The original aspect ratio of the image signal will be maintained, and the screen will be zoomed in/out until it stretches for the four sides of the video wall.
2	Clockwise Rotation	Set the rotation degree of the screen, which can be 0°, 180°, or 270°.
3	Apply your settings	Set the encoder or decoder you want to apply the changes to, and then press [Apply] Select All: Apply the changes to all encoders and decoders in the current video wall. Select This: Apply the changes to this device which is currently connecting to WebGUI. Select a set of IP address on the Hosts end: Apply the changes to the encoder connected to this address. Select a set of IP address on the Clients end: Apply the changes to the decoder connected to this address.
4	Show OSD (On Screen Display)	Enable or disable the OSD of the currently selected channel.

5.1.8 Network

System Video Wall **Network** Functions About **Dencoder**

1 Channel Setup

Channel Selection : 3

Apply

2 IP Setup

IP Mode : Auto IP DHCP Static

IP Address : 169.254.2.75

Subnet Mask : 255.255.0.0

Default Gateway : 169.254.0.254

3 Find Your Device : Hide Me Show Me

Apply

4 Casting Mode

Multicast Unicast

Apply

5 Reboot

Description		
Set the network control. After changing any settings, please press [Apply] and follow the instructions to restart the device. <Remark> If the IP address is changed, the IP address used to log in WebGUI must also be changed. If a new IP address is assigned through Auto IP or DHCP, stop the image connection between the encoder and the decoder to view the new IP address on the display connected to the decoder.		
No	Item	Description
1	Channel Setting	Select the broadcast channel of this device from the drop-down menu. As long as the decoder channel is the same as the encoder in the same local area network, the encoder signal can be received. There are a total of 0 to 255 channel numbers. <Remark> Encoders in the same local area network must have different channel numbers to avoid conflicts with each other.
2	IP Address Setting	Select the IP mode and configuration of the device, and quickly search for the device. - Auto IP mode: Automatically assign a set of APIPA address (169.254.XXX.XXX) to itself. - DHCP mode: Automatically obtain a set of address from the DHCP server. - Static mode: Manually set the IP address, subnet mask, and default gateway. Press [Apply] to save the new settings. <Remark> The pre-set internet is Auto IP mode.
3	Search Your Device	After pressing [Show Me], the indicators on the front panel of the device will flash immediately for quick notice of the device. After pressing [Hide Me], the indicators will back to normal. It is very helpful for troubleshooting when a large number of devices are installed in the cabinet.
4	Broadcasting Mode	Click the button to select broadcast mode, and press [Apply] to save the new settings. <Remark> The broadcast mode of the decoder must be the same as that of the encoder to receive the signal. - Multicast: Transfer the image stream of the encoder to multiple decoders at the same time without increasing the bandwidth consumption. This mode is suitable for video wall or matrix audio-visual distribution. It must be paired with a network switch that supports IGMP Snooping. <Remark> The built-in 3-port network switch in the decoder supports IGMP Snooping, which can be used to distribute multicast VoIP streaming. - Unicast: Transfer the image stream of the encoder to each decoder individually, so the bandwidth consumption will be quite heavy. This mode is suitable for establishing simple peer-to-peer streaming, and does not necessarily need to be paired with a network switch that supports IGMP Snooping.
5	Restart	Press this button to restart the device.

5.1.9 Functions - Image/Audio/USB/ Serial extension over IP (Encoder)

Dencoder

System Video Wall Network **Functions** About

Video over IP

1 ☒ Enable Auto Scan

HDMI VGA

2 Maximum Bit Rate : Unlimited

3 Maximum Frame Rate : Capture up to 100% of frames

Audio over IP

4 Auto HDMI Line In

USB over IP

5 Operation Mode :

- ☒ Auto select mode (Recommended, choose per network casting mode)
- ☐ Active on link (Unicast network's default mode)
- ☐ Active per request (Multicast network's default mode)

6 Compatibility Mode :

- ☐ Mouse not responding well (Check when USB mouse responding is slow and queer)
- ☒ K/M over IP (Uncheck when mouse/keyboard/touch panel not working as expected)

Apply

Serial over IP

7 Baudrate : 115200

Data bits : 8

Parity : None

Stop bits : 1

Apply

8 Reboot

Image extension over IP

No	Item	Description
1	Select HDMI or VGA Image	Switch to select HDMI or VGA input signal. * The decoder does not support this function.
2	Maximum Bit Rate	Set the maximum bit rate of the image stream. There are five options: Unlimited, 400 Mbps, 200 Mbps, 100 Mbps, and 50 Mbps. Selecting Unlimited will use the maximum bit rate of the bandwidth to keep the update frequency of the image stream intact. <Remark> It is recommended to select Unlimited to transmit 4K image streams. Bandwidth requirements will become very large, and the amount of image streams will be limited.
3	Maximum Frame Rate	Setting the encoding percentage of the image source (2% ~ 100%) can effectively reduce the bandwidth requirement of high-resolution images. It is suitable for Power Point presentations or digital signage displays, but not suitable for dynamic image displays. <Remark> If the frame rate of the dynamic images is too low, the frame will be intermittent.

Audio extension over IP

No	Item	Description
4	Audio Mode	Extend the Audio signal over IP. There are three options: Auto, HDMI, and Line IN.

USB extension over IP		
No	Item	Description
5	Operation Mode	Select the required USB operation mode to extend the USB signals. There are three options: Auto select mode (automatic), Active on link (suitable for unicast), and Active per request (suitable for multicast). The default is Auto select mode, which can automatically select the correct USB operation mode according to the broadcast mode of the encoder.
6	Compatibility Mode	Select the required USB compatibility mode to enable the special optimization function to solve the abnormal response of the mouse or touch screen. Do not check this checkbox unless necessary.
Serial extension over IP		
No	Item	Description
7	Serial communication settings	Manually set the baud rate, data bits, parity, and stop bits you need to extend RS-232 signals. <Remark> The serial communication settings of the encoder and decoder must be the same.
8	Restart	Press this button to restart the device.

5.1.10 Functions - Image Signals /USB/Serial extension over IP (Decoder)

The screenshot shows the 'Encoder' web interface with the 'Functions' tab selected. The interface is divided into three main sections: Video over IP, USB over IP, and Serial over IP. Red circles 1 through 11 highlight specific settings and buttons:

- 1: Enable Video over IP checkbox
- 2: Copy EDID from this Video Output checkbox
- 3: Timeout for Detecting Video Lost dropdown menu (set to 10 seconds)
- 4: Scaler Output Mode dropdown menu (set to HD(1080p)@30)
- 5: Video Select Lock for Device Button (Lock/Unlock buttons)
- 6: Video Channel Lock for Device Button (Lock/Unlock buttons)
- 7: Enable USB over IP checkbox
- 8: Operation Mode radio buttons (Auto select mode, Active on link, Active per request)
- 9: Compatibility Mode checkbox (K/M over IP)
- 10: Serial over IP settings (Enable Serial over IP checkbox, Baudrate, Data bits, Parity, Stop bits)
- 11: Reboot button

Image extension over IP		
No	Item	Description

1	Enable image extension over IP	Uncheck to disable image signal extension over IP. Unless troubleshooting is in progress, please check this checkbox.
2	Copy EDID data	After checking this checkbox with multicast, the EDID data of the device will be sent to the connected encoder. <Remark> This function can only be used in multicast mode.
3	Reminder for disconnection timeout	Select the waiting time when the signal source is lost from the drop-down menu, and a Link Lost message will appear on the screen. There are seven options: 3 seconds, 5 seconds, 10 seconds, 20 seconds, 30 seconds, 60 seconds, or Never Timeout. If you check and select Turn off screen, the device will stop sending any signal from the HDMI output port after the waiting time expires.
4	Scaler output mode	Select the output resolution from the drop-down menu. Select one, and the output resolution will become the one you selected. Select Pass-Through, the output resolution will be the signal source resolution. Select Native, the output resolution will be up-converted to the connected display resolution.
5	Video (VGA/HDMI) Select Lock for Device Button	After pressing [Lock], the video input selection button will be locked and cannot be used.
6	Video channel lock (CH+/-) for device button	After pressing [Lock], the video channel selection button will be locked and cannot be used.
USB extension over IP		
No	Item	Description
7	Enable USB over IP	Uncheck to disable USB over IP. Unless you do not use USB support, please check this checkbox. Disabling this function can save a small amount of bandwidth.
8	Operation Mode	Select the required USB operation mode to extend the USB signals. There are three options: Auto select mode (automatic), Active on link (suitable for unicast), and Active per request (suitable for multicast). The default is Auto select mode, which can automatically select the correct USB operation mode according to the broadcast mode of the encoder.
9	Compatibility Mode	Select the required USB compatibility mode to enable the special optimization function to solve the abnormal response of the mouse or touch screen. Do not check this checkbox unless necessary.
Serial extension over IP		
No	Item	Description
10	Serial communication settings	Uncheck to disable Serial extension over IP. Unless you do not use serial support, please check this checkbox. Disabling this function can save a small amount of bandwidth. Manually set the baud rate, data bits, parity, and stop bits you need to extend RS-232 signals. <Remark> The serial communication settings of the encoder and decoder must be the same.
11	Restart	Press this button to restart the device.

Chapter 6 KVM Function

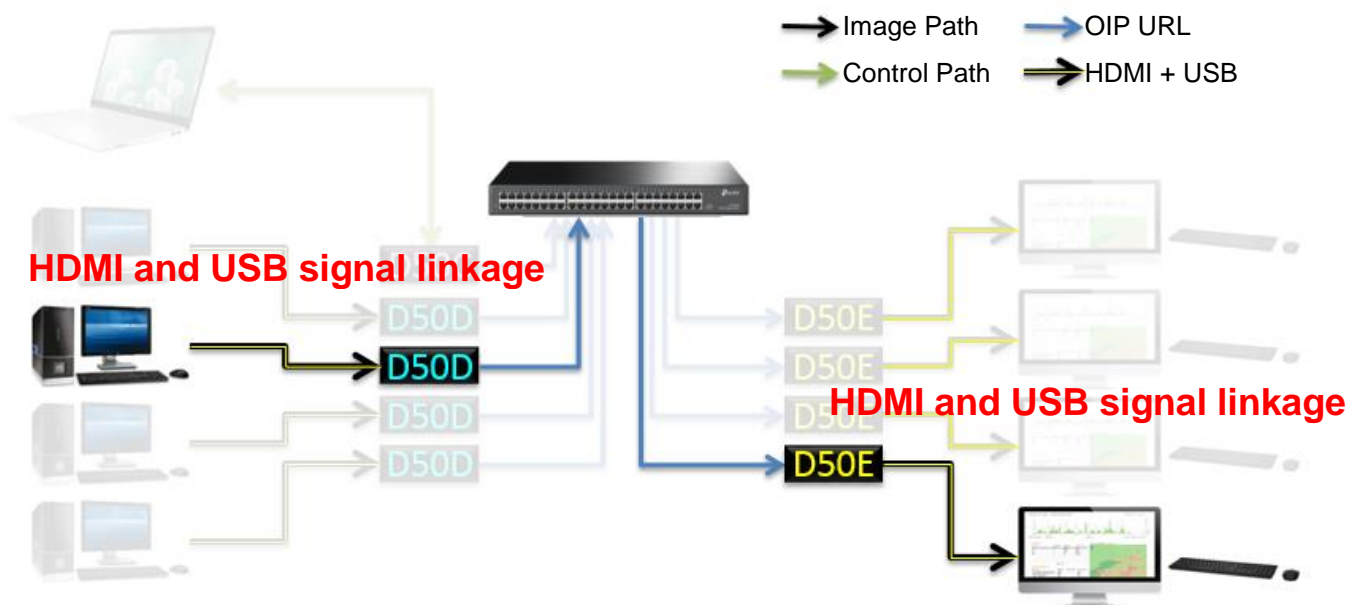
6.1 KVM Descriptions

D50E encoder/D50D decoder provides the KVM function, which links HDMI signals with USB signals through IP technology, and operates and controls remotely the keyboard, screen image, displayed image, and mouse, making management and operation more convenient.

6.2 KVM Operation

6.2.1 HDMI and USB need to be linked

When D50D decoder selects D50E encoder images on any node, connect the USB signals between encoder/decoder at the same time



6.2.2 D50D decoder has a UI interface for easily operating KVM

Method 1: Use the keyboard connected to the D50E encoder to control KVM OSD



- [Scroll Lock] key to enable KVM OSD
- When OSD appears, lock the arrow keys [↑] [↓] [←] [→] to operate the OSD
- When OSD appears, use [↑] [↓] keys to operate OSD up/down and select the signal source
- When OSD appears, switch the signal source 3 seconds after the up/down operation stops or by pressing [→] key
- When OSD appears, press [Scroll Lock] key or shut down KVM OSD after idling for 15 seconds and release the [↑] [↓] [←] [→] arrow keys to be regular keys

Method 2: Use the CH +/- buttons on the front panel of the D50D decoder host to select the remote D50E encoder KVM (HDMI + USB)



- Use (CH +) (CH -) buttons to enable KVM OSD
- When OSD appears, use (CH +) (CH -) button to control OSD and select the signal source
- When OSD appears, switch the signal source 3 seconds after (CH +) (CH -) key operation stops
- When OSD appears, shut down the KVM OSD after idling for 15 seconds

Chapter 7 Product Specification

7.1 Technical Specification

Item	Description of Specifications	
	D50E Encoder	D50D Decoder
HDMI Bandwidth	340MHz/10.2Gbps	
Audio-visual Input Port	1x HDMI terminal 1x VGA terminal 1x 3.5 mm analog audio terminal	3x RJ-45 LAN terminal 1x 3.5mm microphone audio terminal
Audio-visual Output Port	1x RJ-45 LAN terminal 1x 3.5mm analog audio terminal	1x HDMI terminal 1x VGA terminal 1x optical digital audio terminal 1x 3.5mm analog audio terminal
Data Transmission Port	1x IR extender [3.5mm terminal] 1x IR emitter [3.5mm terminal] 1 x RS-232 port [9-pin D-sub terminal] 1x USB Port [Type-B terminal]	1x IR extender [3.5mm terminal] 1x IR emitter [3.5mm terminal] 1 x RS-232 port [9-pin D-sub terminal] 4x USB Port [Type-A terminal]
IR Frequency	30-50 kHz (30-60 kHz ideally)	
Power	5 V/2.6 A DC (US/EU standards and CE/FCC/UL Certifications)	5 V/4 A DC (US/EU standards and CE/FCC/UL Certifications)
Statics protection	Human Body Model: ±12 kV (Air Discharge) ±8 kV (Contact Discharge)	
Size	231.5mm×25mm×108mm (W×H×D) [without parts] 231.5mm×25mm×120mm (W×H×D) [with parts]	
Weight	660 g	666 g
Case material	Metal	
Case color	Black	
Operation temperature	0°C - 40°C / 32°F - 104°F	
Storage temperature	- 20°C - 60°C / - 4°F - 140°F	
Relative humidity	20 - 90% RH (Non-condensing)	
Power consumption	7.15 W	17.68 W

7.2 Image Specification

Supported Resolutions (Hz)	Input Terminal		Output Terminal	
	HDMI	VGA	HDMI	VGA
640x480p@60	✓	✓	✓	✓
720x480p@59/60	✓		✓	
720x576p@50	✓	✓	✓	✓
800x600p@60	✓	✓	✓	✓
1024x768p@60	✓	✓	✓	✓
1280x720p@50/59/60	✓	✓	✓	✓
1280x768p@60	✓		✓	
1280x960p@60	✓	✓	✓	✓
1280x1024p@60	✓	✓	✓	✓
1440x480p@60	✓		✓	
1440x576p@50	✓		✓	
1366x768p@60	✓	✓	✓	✓
1600x1200p@60 (RB)	✓	✓	✓	✓
1920x1080p@24/25	✓		✓	
1920x1080p@50/59/60	✓	✓	✓	✓
1920x1200p@60 (RB)	✓	✓	✓	✓
1920x1080i@50/59/60	✓		✓	
3840x2160p@24/25/30	✓		✓	
3840x2160p@50/60 (YUV 4:2:0)	✓		✓	
4096x2160p@24/25/30	✓		✓	

Note 1: HDMI input resolution can reach 4096 x 2160p@60 Hz (YUV 4:2:0).

Note 2: HDMI input resolution 4K@60 Hz (YUV 4:2:0) will be converted into 4K@30 Hz (RGB) output resolution.

Note 3: VGA input and output resolution can reach 1920 x 1200@60 Hz (clock tick less than 150 MHz).

7.3 Audio Specification

Sound Effect Supported (kHz)	Input Terminal	Output Terminal
	HDMI	HDMI
LPCM 2.0/5.1/7.1 @44.1/88.2/176.4	✓	✓
LPCM 2.0/5.1/7.1 @32/48/96/192	✓	✓
Standard Bitstream	✓	✓

■ Unicast Audio Transmission

Input Terminal			Output Terminal		
HDMI IN (EX)	LINE IN (EX)	MIC IN (DX)	HDMI OUT(DX)	LINE OUT (EX)	LINE OUT (DX)
●			●		●
	■		■		■
●	■		■		■
		▲			
	■	▲	■	▲	■
●	■	▲	■	▲	■

Note: ● = HDMI digital audio. ■ = LINE analog audio. ▲ = microphone analog audio.

■ Multicast Audio Transmission

Input Terminal			Output Terminal		
HDMI IN (EX)	LINE IN (DX)	MIC IN (DX)	HDMI OUT(DX)	LINE OUT (EX)	LINE OUT (DX)
●			●		●
	■		■		■
●	■		■		■
		▲			
	■	▲	■		■
●	■	▲	■		■

Note: ● = HDMI digital audio. ■ = LINE analog audio. ▲ = microphone analog audio.

Chapter 8 Troubleshooting

This chapter describes problems you may encounter while using OIP-D50E/D50D. If you have questions, please refer to related chapters and follow all the suggested solutions. If the problem still occurred, please contact your distributor or the service center.

No.	Problems	Solutions
1.	The signal source screen is not shown on the display-end	<ol style="list-style-type: none">1. Please check whether the Multicast of the encoder and decoder is enabled: (1) Enter the WebGUI control interface of the encoder and decoder, and check whether the Casting Mode is Multicast on the Network tab. (2) Enter the WebGUI control interface of the D50C controller, then click Device - [Settings] on the Encoder tab and Decoder tab to check whether Multicast is enabled.2. Make sure the source is set to HDMI or VGA: (1) Enter the WebGUI control interface of the D50C controller, and click Device - [Settings] on the encoder tab to check that the Video type is set to HDMI or VGA (2) On the front panel of the decoder host, press the Mode button to switch between HDMI and VGA signal sources. <Remark> You must choose the same signal source for the encoder and decoder as HDMI or VGA. If they are not consistent, the signal source screen will not be displayed.
2.	Image delay on the display-end	<ol style="list-style-type: none">1. Check whether the MTU of the encoder and decoder is enabled (default is Enable): Enter "GET_JUMBO_MTU" in the Command field in the WebGUI interface system - Utility Program tab, and the Output below will show whether the status of jumbo frame MTU is enabled or disabled. If it is disabled, please enter "SET_JUMBO_MTU 1" in the Command field to enable it, and follow the instructions to restart the device to implement the changes.2. The streaming mode may be Graphic Mode: On the front panel of the decoder host, press the Mode button to switch between the Video/Graphic modes. Please switch to the Video mode.
3.	The image on the display-end is broken or black	<p>Check that the Jumbo Frame of the switch is set to above 8000; Please make sure that IGMP Snooping of the switch and relevant settings (Port, VLAN, Fast Leave, Querier) has been set to "Enable".</p>

Chapter 9 Safety Instructions

Always follow these safety instructions when setting up and using this product:

1 Operation

- 1.1 Please use the product in the recommended operating environment, away from water or source of heat
- 1.2 Do not place the product on a tilted or unstable trolley, stand or table.
- 1.3 Please clean the dust on the power plug prior to usage. Do not insert the product's power plug into a multiplug to prevent sparks or a fire.
- 1.4 Do not block the slots and openings in the case of the product. They provide ventilation and prevent the product from overheating.
- 1.5 Do not open or remove covers, otherwise it may expose you to dangerous voltages and other hazards. Refer all servicing to licensed service personnel.
- 1.6 Unplug the product from the wall outlet and refer servicing to licensed service personnel when the following situations happen:
 - If the power cords are damaged or frayed.
 - If liquid is spilled into the product or the product has been exposed to rain or water.

2 Installation

- 2.1 For security considerations, please make sure the standard hanging rack you bought is in line with UL or CE safety approbations and installed by technician personnel approved by agents.

3 Storage

- 3.1 Do not place the product where the cord can be stepped on as this may result in fraying or damage to the lead or the plug.
- 3.2 Unplug this product during thunderstorms or if it is not going to be used for an extended period.
- 3.3 Do not place this product or accessories on top of vibrating equipment or heated objects.



4 Cleaning

- 4.1 Disconnect all the cables prior to cleaning and wipe the surface with a dry cloth. Do not use alcohol or volatile solvents for cleaning.

5 Batteries (for products or accessories with batteries)

- 5.1 When replacing batteries, please only use similar or the same type of batteries
- 5.2 When disposing of batteries or products, please adhere to the relevant instructions in your country or region for disposing of batteries or products

■ Precautions

	This symbol indicates that this equipment may contain dangerous voltage which could cause electric shock. Do not remove the cover (or back). No user-serviceable parts inside. Refer servicing to licensed service personnel.		This symbol indicates that there are important operating and maintenance instructions in this User Manual with this unit.
---	---	--	---

■ FCC Warning

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice :

The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are to provide reasonable protection from harmful interference in residential installations.

■ IC Warning

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of Industry Canada.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par l'Industrie.

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