UScale S132/S196/S1224 OIAD User Manual

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Welcome

Thank you for choosing the UScale OIAD Gateway! We hope you can make full use of this feature-rich gateway. If you need any technical support, please contact us at +86-755-66630978.

About this manual

This manual provides an introduction to the UScale OIAD analog gateway and information on how to configure or use it. Please read this manual carefully before configuring any functions.

Statement

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1 Documentation Package Information

Introduction to UScale S132/S196/S1224 OIAD product documentation package basic information, including document reader information and revision records.

Introduction to the main content of all documents in the documentation package and corresponding reader objects, and definition of reader objects.

Introduction to general conventions in the documentation.

1.1 Documentation Package Overview

Introduction to the main content of all documents in the documentation package and corresponding reader objects, and definition of reader objects.

Documentation Package Structure

All documents in the documentation package are shown in Table 1.

Category	Section	Content
Safety	-	Introduces safety precautions for product use and maintenance.
Description	-	Introduces product positioning, networking, appearance, functions, technical specifications, etc.
Installation	-	Introduces device installation methods and cascaded installation examples.
Status	Web Method	Introduces how to view various device statuses based on Web, such as system information, network status, interface board status, port status, CDR, etc.
Configuration	Web Method	Introduces data configuration methods based on Web, including typical scenario applications and advanced parameter configuration.
Maintenance	-	Introduces common maintenance items and methods for UScale S132/S196/S1224 OIAD products, including saving or restoring data, how to view system information, etc.

Reader Objects

Documents in the documentation package are applicable to different engineers, as shown in Table 2.

Reader Object	Responsibility Definition
System Engineer	System engineers are business design experts responsible for designing overall business solutions and network planning for business.
Maintenance Engineer	Maintenance engineers have extensive telecommunications and database experience, responsible for network maintenance and troubleshooting.

Reader Object	Responsibility Definition
Field Engineer	Field engineers are system experts in the network construction phase, responsible for site preparation, hardware installation, software installation and debugging, data configuration, functional acceptance testing, etc.

1.2 General Conventions

Introduction to general conventions in the documentation.

Symbol Conventions

The following symbols may appear in this document, and their meanings are as follows:

Symbol	Description
 danger	Text beginning with this symbol indicates high potential danger. If not avoided, may result in death or serious injury.
 warn	Text beginning with this symbol indicates medium or low potential danger. If not avoided, may result in minor or moderate injury.
 notice	Text beginning with this symbol indicates potential risk. If ignored, may result in device damage, data loss, device performance degradation, or unpredictable results.
 knack	Text beginning with this symbol can help you solve a problem or save your time.
 note	Text beginning with this symbol is supplementary information to the main text, emphasis and supplement to the main text.

General Format Conventions

Format	Description
Song Font	Regular text uses Song font.
Bold Font	First, second, and third-level titles use bold font.
Kai Font	Warning, tips, and other content use Kai font, with lines added before and after the content to separate from the main text.

Graphical Interface Element Reference Conventions

Format	Meaning
""	Format with double quotes "" indicates various interface control names and data tables, such as clicking "OK".
>	Multi-level menus use ">" to separate. For example, selecting "File > New > Folder" means selecting the "Folder" menu item under the "New" submenu under the "File" menu.

Keyboard Operation Conventions

Format	Meaning
Characters with ""	Indicates key names. Such as "Enter", "Tab", "Backspace", "a" respectively represent return, tab, backspace, lowercase letter a.
"Key 1 + Key 2"	Indicates pressing multiple keys on the keyboard simultaneously. For example, Ctrl+Alt+A means pressing "Ctrl", "Alt", "A" three keys simultaneously.
"Key 1, Key 2"	Indicates pressing the first key first, releasing, then pressing the second key. For example, "Alt， F" means pressing "Alt" key first, then pressing "F" key after release.
Click	Quickly press and release a mouse button.
Double-click	Quickly press and release a mouse button twice in succession.
Drag	Hold down a mouse button without releasing and move the mouse.

2 Safety

Please pay attention to the following matters when installing and using the device.

Basic Requirements

- Please strictly follow the manufacturer's instructions for device installation.
- Do not disassemble the device yourself. If the device malfunctions, please contact an authorized service center.
- Without authorization, no unit or individual shall modify the device in terms of structure, safety, and performance design.
- When using this device, you should comply with relevant laws and regulations and respect the legal rights of others.

Usage Instructions

- Device power supply voltage must meet the device's input voltage requirements.
- Both the device and the cabinet where the device is installed must have proper grounding.
- Keep the power plug clean and dry to avoid electric shock or other hazards.
- Before touching the device or holding the board, wear antistatic gloves or an antistatic wrist strap to prevent static electricity from damaging sensitive components. The other end of the antistatic wrist strap must be properly grounded.
- Before unplugging device cables, stop using the device and disconnect the power.
- If the device has multiple power inputs, disconnect all power inputs when the device is powered off.
- When installing and maintaining, do not wear loose clothing, do not wear jewelry (including rings and necklaces) or other items that may get caught in the chassis.
- If abnormal phenomena occur, such as device smoking, abnormal sounds, strange smells, etc., immediately stop using the device and disconnect the power. Remove all cables connected to the device, such as power lines and network cables. If the device malfunctions, please contact an authorized service center.

Cleaning Instructions

- Before cleaning, stop using the device, disconnect the power, and remove all cables connected to the device such as power lines and network cables.
- When cleaning, do not use cleaning liquid or spray-type cleaner to clean the device shell. Use soft cloth to wipe the device shell.

Network Security

- It is recommended not to use unsafe protocols such as Telnet, FTP, HTTP, SNMPv2, TFTP in non-secure networks. Instead use secure protocols such as SSH, FTPS, HTTPS, SNMPv3. UScale S132/S196/S1224 OIAD products support SSH, FTPS, HTTPS, SNMPv3 and other secure protocols.

Privacy Statement

- In order to locate the cause of faults, necessary business logs may be collected, which may involve user numbers and other information. Please comply with local legal requirements and prohibit transmitting

these log information and other content outside the enterprise network. Delete them promptly after the problem is located.

- Any maintenance operations performed by service provider engineers must be authorized by the customer and are prohibited from exceeding the scope of customer approval. If it is necessary to transmit problem location data outside the customer network, customer authorization must be obtained.

3 Description

The OpenVox UScale S132/S196/S1224 OIAD comprehensive access device is based on IP voice/fax media access gateway, providing efficient and high-quality voice services based on the Internet or enterprise intranet.

Product Description

UScale S132/S196/S1224 OIAD products function as VoIP (Voice over IP)/FoIP (Fax over IP) media access gateways, applied in NGN (Next Generation Network) networks to complete conversion between analog voice data and IP data, and transmit data through IP networks.

Functions and Features

UScale S132/S196/S1224 OIAD products provide rich voice and data services.

Device Appearance

UScale S132/S196 OIAD products adopt 1U=44.45mm standard chassis, with width 442mm, depth 310mm, height 44mm, while S1224 products adopt 2U (1U=44.45mm) standard chassis, with width 442mm, depth 310mm, height 86.1mm. S196 and S1224 can be installed in 19-inch cabinets complying with IEC (International Electrotechnical Commission) standards.

Boards

UScale S196/S1224 OIAD products can accommodate two types of boards: CVP (Control & Voice Process) board and ASI (Analog Subscriber Interface) board.

Power Module

UScale S1224 OIAD products adopt hot-swappable dual power modules, serving as primary and backup to each other. Supports AC or DC power supply.

Fan Box

The fan box provides heat dissipation protection for system operation.

Technical Specifications and Environmental Requirements

UScale S132/S196/S1224 OIAD products require meeting power supply, temperature, and humidity conditions for normal operation.

3.1 Product Description

UScale S132/S196/S1224 OIAD products function as VoIP (Voice over IP)/FoIP (Fax over IP) media access gateways, applied in NGN (Next Generation Network) networks to complete conversion between analog voice data and IP data, and transmit data through IP networks.

UScale S132/S196/S1224 OIAD products access NGN through SIP (Session Initiation Protocol) protocol. Under control of MGC (Media Gateway Control) or SIP Server, they complete call routing between calling and called parties.

UScale S132/S196/S1224 OIAD products support multiple methods to access IP networks, such as xDSL (x Digital Subscriber Line) access, switch access, GPON (Gigabit-capable Passive Optical Network)/EPON (Ethernet Passive Optical Network) access.

UScale S132/S196/S1224 OIAD products can integrate voice and data signals into NGN through the following methods:

1. Access DSLAM through RTU, using xDSL method to access IP network. This method is mainly used for mature xDSL copper cable networks.
2. Access IP network through Switch method. This method is widely applied in residential, office buildings, and enterprise users.
3. Access IP network through xPON method to achieve high-speed uplink. This method is suitable for scenarios where fiber has been deployed to communities and corridors.

UScale S132/S196/S1224 OIAD products have 2 FE ports. FE1 port serves as uplink port, FE2 port serves as cascading port. These two ports work simultaneously, not in primary-backup relationship.

3.2 Functions and Features

UScale S132/S196/S1224 OIAD products provide rich voice and data services.

UScale S132/S196/S1224 OIAD products support the following features:

Feature Category	Detailed Description
Protocols/Standards	SIP (Session Initiation Protocol), RTP/RTCP (Real-time Transport Protocol/Control Protocol), DHCP (Dynamic Host Configuration Protocol) client, DNS (Domain Name Server) client, TFTP (Trivial File Transfer Protocol) client, FTP (File Transfer Protocol) client, TELNET, SNMP V2/V3 (Simple Network Management Protocol), SNTP (Simple Network Time Protocol) client, ARP (Address Resolution Protocol)/RARP (Reverse Address Resolution Protocol), ICMP (Internet Control Messages Protocol)
Voice Features	Static JB (Jitter Buffer), Echo cancellation EC (echo cancellation), DTMF (Dual Tone Multiple Frequency) detection and generation, RFC2833, Local mixing three-way calling, Jitter resistance (>80ms), G.711/G.729, Compatible with SoftSwitch and NGN, Packet loss compensation, Adjustable packetization duration, Gain adjustment, Voice codec switching time <60ms, Long duration calls, Local self-switching and network-down self-switching, Multi-SIP Server registration, calling, and voicemail notification
Fax Features	T.30 pass-through fax, T.38 fax
Data Features	Static/DHCP IP acquisition, Voice priority data forwarding, IEEE 802.1P/Q, Precedence/DSCP tagging, Internal Layer 2 switching function, 10M/100M network port auto-adaptation, LAN port supports PC connection, VLAN (Virtual Local Area Network) function with media/signaling/network management message separation
Reliability	Traffic control, IP breakout escape, S1224 supports dual power supply

Feature Category	Detailed Description
Maintenance Management	Window maintenance, Web configuration management, Web help information embedded, One-click information collection (Web), Web-based version upgrade (HTTP), Remote maintenance, Remote upgrade, Configuration file import/export, Hierarchical user management, Alarms, Auto-configuration (DHCP method/network status detection)

3.3 Device Appearance

3.3.1 UScale S132

UScale S132 OIAD products adopt 1U (1U=44.45mm) standard chassis, with width 442mm, depth 310mm, height 44.4mm. They can be installed in 19-inch cabinets complying with IEC (International Electrotechnical Commission) standards.

Appearance

S132 devices provide 16/32 FXS port density configuration. Interface type is RJ45 physical interface format. For network connection, devices are equipped with 1 WAN port and 3 LAN ports, all supporting 10/100/1000 Mbps adaptive Ethernet. Additionally, an RS-232 serial interface is provided for management.

3.3.2 UScale S196

UScale S196 OIAD products adopt 1U (1U=44.45mm) standard chassis, with width 442mm, depth 310mm, height 44.4mm. They can be installed in 19-inch cabinets complying with IEC (International Electrotechnical Commission) standards.

Appearance

UScale S196 OIAD product front panel appearance is shown in Figure 1.

Slot Description

Slots are located on the front of the chassis, with specific positions shown in Figure 1. UScale S196 OIAD products provide 1 main control board slot, 3 interface board slots, 1 power supply slot, and 1 fan box slot:

- Slot 3 is the main control board slot, used for installing the CVP main control board.
- Slots 0-2 are service board slots, used for installing ASI (32FXS) user interface boards. UScale S196 OIAD product slot distribution is shown in Figure 2.

Figure 2: UScale S196 OIAD Product Slot Distribution

Fan Box	0 (I/F)	2 (I/F)	Power Supply 1
	1 (I/F)	3 (I/F)	

3.3.3 UScale S1224

UScale S1224 OIAD products adopt 2U (1U=44.45mm) standard chassis, with width 442mm, depth 310mm, height 86.1mm. They can be installed in 19-inch cabinets complying with IEC (International Electrotechnical Commission) standards.

Appearance

UScale S1224 OIAD product front panel appearance is shown in Figure 1.

Slot Description

Slots are located on the front of the chassis, with specific positions shown in Figure 1. UScale S1224 OIAD products provide 1 main control board slot, 7 interface board slots, 2 power supply slots, and 1 fan box slot:

- Slot 7 is the main control board slot, used for installing the CVP main control board.
- Slots 0-6 are service board slots, used for installing ASI (32FXS) user interface boards. UScale S132/S196/S1224 OIAD product slot distribution is shown in Figure 2.

Figure 2: UScale S1224 OIAD Product Slot Distribution

Fan Box	0 (I/F)	4 (I/F)	Power Supply 1
	1 (I/F)	5 (I/F)	Power Supply 1
	2 (I/F)	6 (I/F)	Power Supply 1
	3 (I/F)	7 (I/F)	Power Supply 1

Generally, UScale S1224 OIAD products can operate with 1 main control board and 1 service board configured. Other service boards can be optionally configured according to system capacity. Empty slots without configured boards require installation of dummy panels.

3.4 Boards

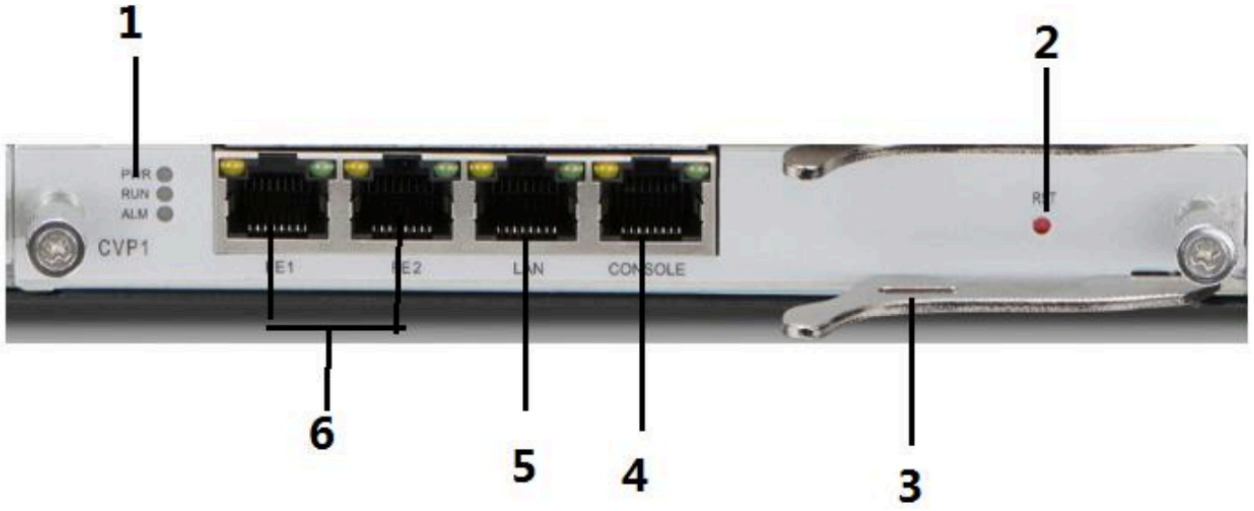
UScale S132/S196/S1224 OIAD products can accommodate two types of boards: CVP (Control & Voice Process) board and ASI (Analog Subscriber Interface) board.

CVP Board

The CVP board serves as the main control board, primarily providing device management, call control, media processing, narrowband switching, and internal/external Ethernet switching functions.

Panel

CVP board panel is shown in Figure 1. **Figure 1: CVP Panel**



 attention

Reset button is used to restart the board. Do not randomly press the reset button. When the system is running normally, pressing the reset button will cause the board to restart, interrupting ongoing services on the board.

Interface Description

The CVP board has 2 service network ports, 1 management network port, and 1 debug serial port. Specific descriptions are shown in Table 1.

Name	Label	Quantity	Main Function
Service Network Port	FE1/FE2	2	FE1 and FE2 ports are standard network ports. FE1 and FE2 ports have the same function and can work simultaneously. It is recommended to prioritize using FE1 port. FE2 port is mainly used for cascading.
Management Network Port	LAN	1	Used for device configuration and debugging.
Debug Serial Port	CONSOLE	1	Used for board configuration and debugging.

Indicator Light Description

The CVP board has PWR, RUN, and ALM indicator lights. Indicator light status descriptions are shown in Table 2.

Indicator Type	Label	Color	Status Description
Power Indicator	PWR	Green	- Constantly lit indicates power is present. - Constantly off indicates no power.
Running Indicator	RUN	Green	- Blinking at 1Hz indicates board is starting up. - Blinking at 2Hz indicates system startup or board writing FLASH. - Blinking at 0.5Hz indicates board is running normally. - Constantly off indicates no power or board operation failure.
Alarm Indicator	ALM	Red	- Blinking at 2Hz indicates alarm exists. - Blinking at 4Hz indicates severe alarm exists. - Constantly off indicates no alarm.

Note: Blinking at 0.5Hz means indicator lights up once every 2 seconds. 1Hz means lights up once per second, and so on.

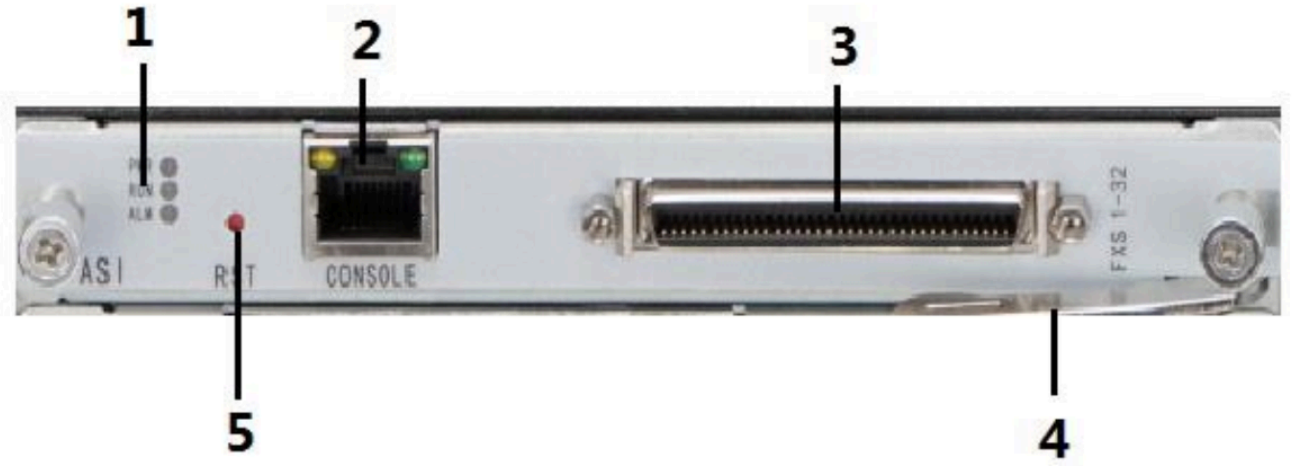
ASI (Service Board)

Service board includes ASI board, specifically as follows:

> ASI board is a POTS interface board providing 32-channel POTS user interface. Connect the DB-68 male connector end of the user cable to the FXS interface of the ASI board, and connect the FXS wire pair at the other end of the cable to the POTS phone. The correspondence between wire pair colors and port types as well as port numbers can be found in the user cable wiring sequence reference.

Panel

ASI service board panel is shown in Figure 2.



Reset button is used to restart the board. Do not randomly press the reset button. When the system is running normally, pressing the reset button will cause the board to restart, interrupting ongoing services on the board.

Interface Description

The ASI service board has 1 management serial port and 1 user interface. Specific descriptions are shown in Table 3.

Name	Label	Quantity	Main Function
User Interface (ASI Board)	FXS 1-32 (FXS Interface)	1	Used for connecting POTS phones. Total of 32 phones can be connected.
Debug Serial Port	CONSOLE	1	This serial port has no configuration function, only for printing board operation logs.

Indicator Light Description

The panel has 3 indicator lights: PWR, RUN, and ALM. Indicator light status descriptions are shown in Table 4.

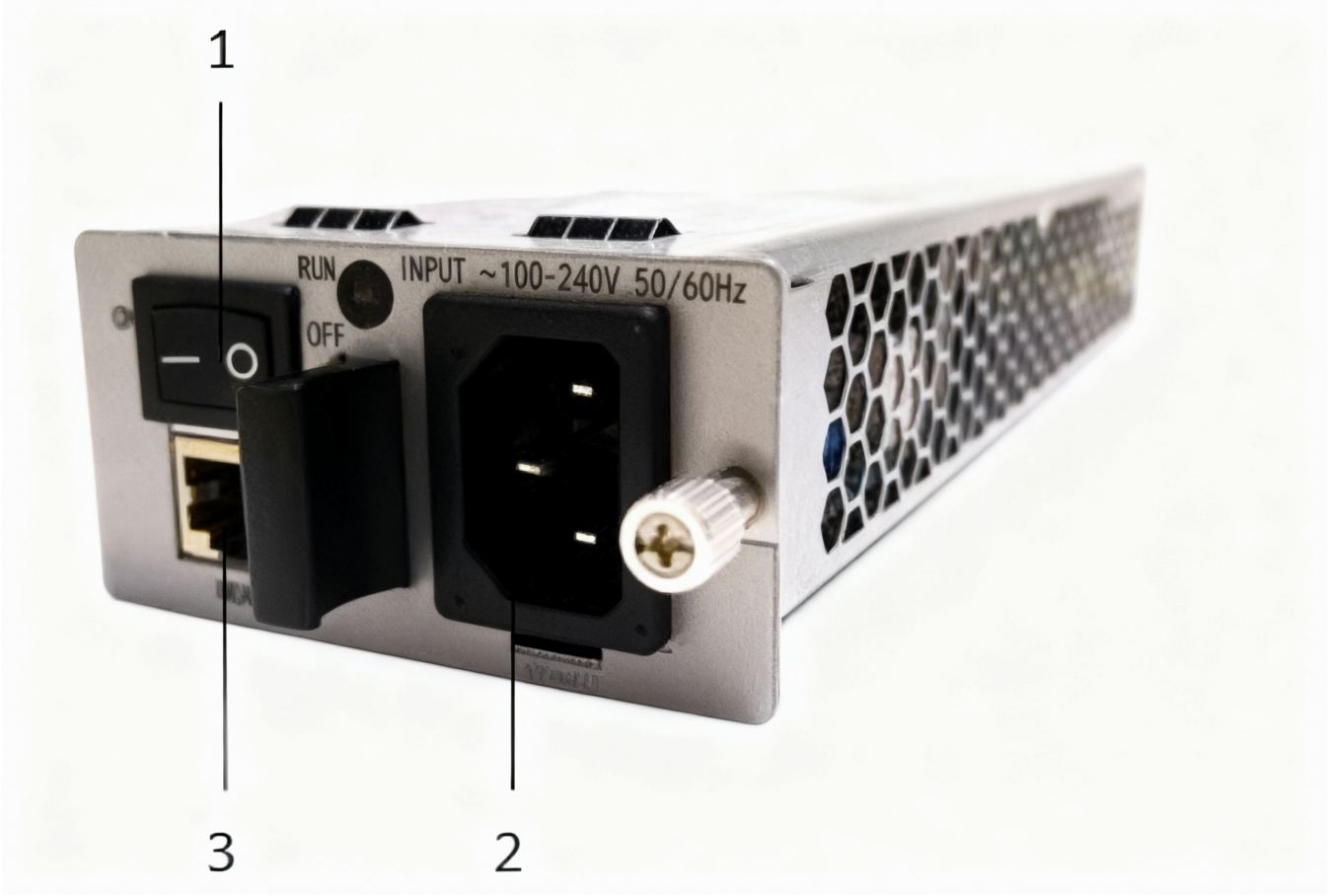
Indicator Type	Label	Color	Main Function
Power Indicator	PWR	Green	1. Constantly lit indicates power is present. 2. Constantly off indicates no power.
Running Indicator	RUN	Green	1. Blinking at 4Hz indicates board is loading software. 2. Blinking at 2Hz indicates user off-hook state. 3. Blinking at 0.5Hz indicates board is running normally in idle state. 4. Constantly off indicates no power or board operation failure.
Alarm Indicator	ALM	Red	1. Blinking at 2Hz indicates alarm exists. 2. Blinking at 4Hz indicates severe alarm exists. 3. Constantly off indicates no alarm.

Note: Blinking at 0.5Hz means indicator lights up once every 2 seconds. 1Hz means lights up once per second, and so on.

3.5 Power Module

UScale S1224 OIAD products adopt hot-swappable dual power modules, serving as primary and backup to each other. They support AC power supply. AC power module appearance is shown in Figure 1.

Figure 1: UScale S196/S1224 OIAD Product AC Power Module Appearance



1. Power Switch
2. AC Power Interface
3. Invalid, not enabled (cannot perform any operations through RJ45 port)

Power Module Functions

- Supports Load Balancing and Backup

UScale S132/S196/S1224 OIAD products are configured with a single power module by default, located at slot 0. When configured with two power modules, the system can achieve power load balancing and backup. During normal operation, the two power modules can each output current to share the load. When one power module fails, the other power module serves as backup, assuming normal power supply duties.

- Supports Hot-Swapping

Without shutting down the entire device power, power modules can be directly added to empty slots in the power distribution frame. Under power redundancy and backup conditions, power modules can be directly removed without affecting normal device operation.

3.6 Fan Box

The fan box provides heat dissipation protection for system operation.

UScale S1224 OIAD products' fan box is located on the left side of the device, featuring a vertical insertion design with three fans installed internally, as shown in Figure 1.

Figure 1: UScale S1224 OIAD Product Fan Box Appearance

During system operation, the fan runs to provide heat dissipation for the device. Cold air enters from the left side of the device, and hot air exits from the right side. The fan provides strong heat dissipation protection for device operation, enhancing device stability.

3.7 Technical Specifications and Environmental Requirements

UScale S132/S196/S1224 OIAD products require meeting power supply, temperature, and humidity conditions for normal operation.

Parameter Category	Technical Specifications	S132	S196	S1224
Physical Specifications	Number of Ports	32 FXS Ports	96 FXS Ports	224 FXS Ports
	Interface Type	RJ45	DB68B	DB68B
	Network Interfaces	1×WAN, 3×LAN (10/100/1000M)		
	Management Interface	1×RS232 (RJ45)		
	Dimensions	440x44.4x318mm	440x44.4x317mm	440x86x317mm
	Weight	2.44kg	6kg	10kg
	Power Consumption	52W	150W	250W
Power and Environment	Power Input	100-240V AC dual power supported or -48 to -60V DC	100-240V AC or -48 to -60V DC	100-240V AC dual power supported or -48 to -60V DC
	Operating Temperature	0°C to 45°C		
	Operating Humidity	10% to 90% RH (non-condensing)		
	Storage Temperature	-20°C to 70°C		
	Compliance / Certification	CE		

Parameter Category	Technical Specifications	S132	S196	S1224
Voice Processing	Codecs	G.711A, G.729A, G.722, G.726, G.711U, iLBC		
	Echo Cancellation	ITU-T G.168, tail length up to 128ms		
	Voice Gain	Programmable TX/RX gain control, ±12dB adjustment range		
	Jitter Buffer	Adaptive dynamic jitter buffer, 20–200ms		
	Line Drive Capability	Maximum line length 3km, 2 REN drive capability		
Fax Features	Fax Protocols	T.38 and G.711 pass-through modes		
	Fax Rate	Up to 14.4kbps		
	Modulation Standards	V.17, V.21, V.27ter, V.29		
	ECM Support	Error Correction Mode supported		
Call Handling	Dialing Modes	DTMF, pulse dialing (10/20 PPS)		
	Caller ID	DTMF / FSK standards		
	DTMF Transmission	SIP INFO, RFC4733, inband		
	Call Features	Call waiting, transfer, hold, three-way calling, DND		
Network Protocols	SIP Protocol	SIP v2.0 RFC 3261, UDP/TCP/TLS		
	Media Protocols	RTP/RTCP (RFC 2833, RFC 1889)		
	Network Protocols	IPv4 / IPv6 dual stack		
	QoS Support	DiffServ, ToS, 802.1P / 802.1Q		
	NAT Traversal	STUN, rport (RFC 3581)		
	Security Protocols	TLS, SRTP, HTTPS, 802.1x		

Parameter Category	Technical Specifications	S132	S196	S1224
Management and Maintenance	Management Interfaces	Web (HTTP/HTTPS), SSH		
	Monitoring Protocols	SNMP v1/v2c		
	Logging System	8-level logs (EMERG–DEBUG)		
	Time Synchronization	NTP client, daylight saving time supported		
	Configuration Backup	Configuration import/export supported		
	Firmware Upgrade	Web online upgrade, TFTP/HTTP		
Service Features	Concurrent Calls	All ports concurrent supported		
	Ring Groups	Ring group configuration supported		
	CDR Call Detail Records	Detailed call records, export supported		
	Auto Provisioning	DHCP Option 66, TR-069		
	VPN Support	OpenVPN client		
Compatibility	IP-PBX	Asterisk, Issabel, 3CX, FreeSWITCH, BroadSoft, VOS		
	Special Devices	Compatible with modems and POS terminals		
	Telephones	Standard analog telephones and fax machines		

4 Installation

This document uses OpenVox cabinet as an example to illustrate the installation process of UScale S132/S196/S1224 OIAD comprehensive access devices (hereinafter referred to as UScale S132/S196/S1224 OIAD product S1224).

Installation Process

Introduces the installation process of UScale S132/S196/S1224 OIAD products.

Pre-Installation Preparation

Introduces work and precautions before installing UScale S132/S196/S1224 OIAD products. Installing the chassis introduces the steps for installing the chassis.

Installing Grounding Cable

Introduces the steps for installing grounding cables.

Installing Boards

Introduces the steps for installing boards.

Installing Signal Cables

Introduces how to install signal cables.

Installing Power Lines

Introduces how to install power lines.

Post-Installation Inspection

Introduces how to inspect the device installation and confirm correct installation.

Device Power-On

Introduces the steps for powering on the device.

Cascaded Installation Examples

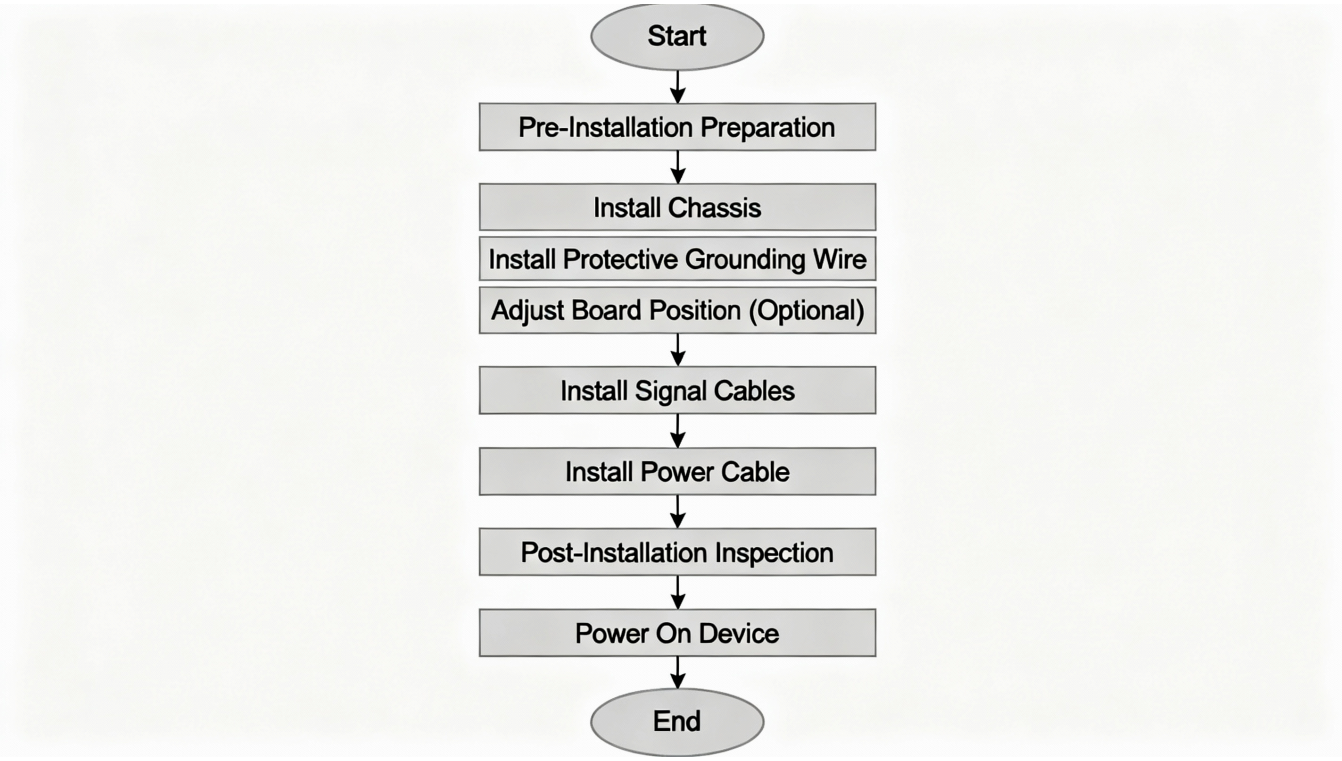
UScale S132/S196/S1224 OIAD products support multi-level device cascaded installation (maximum 3-level cascading supported).

4.1 Installation Process

Introduces the installation process of UScale S132/S196/S1224 OIAD products.

The installation process of UScale S1224 OIAD products is shown in Figure 1.

Figure 1: UScale S1224 OIAD Product Installation Process



4.2 Pre-Installation Preparation

Introduces work and precautions before installing UScale S132/S196/S1224 OIAD products.

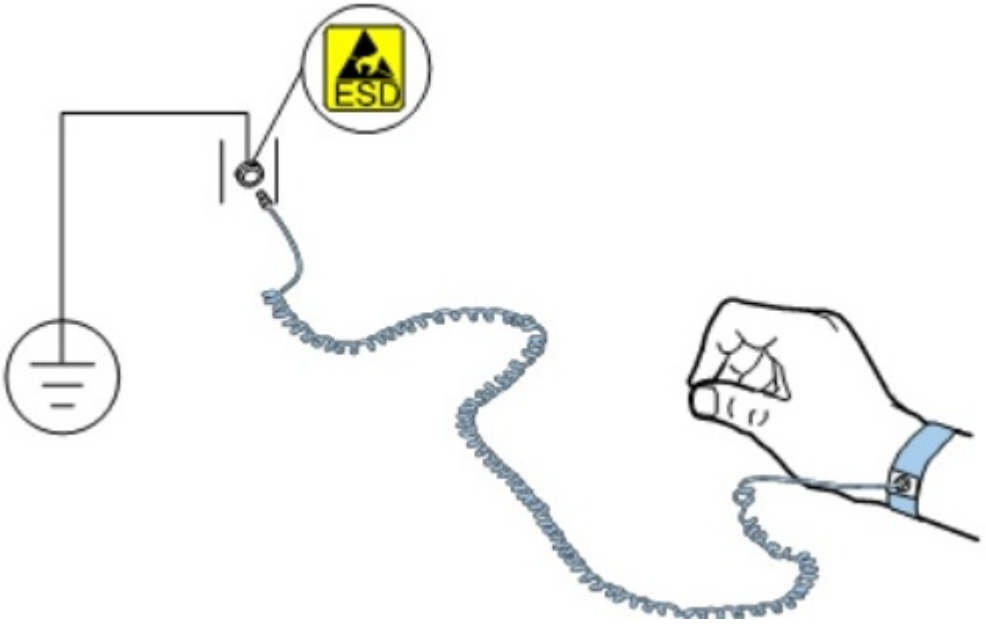
Preparing Tools and Instruments

Installation tools and instruments are not provided with the device. Please prepare them yourself.

Tool Category	Tool Name
Tools	Cross-head screwdriver, adjustable wrench, needle-nose pliers, diagonal cutting pliers, installation strips, wire strippers, wire crimpers, crystal head crimpers, punchdown tool, antistatic wrist straps, antistatic gloves, flat-head screwdriver (for removing dummy panels)
Instruments	Multimeter, 500V megohmmeter (for measuring insulation resistance), ground resistance meter

Precautions

- Before touching the device or handling boards, wear antistatic gloves or an antistatic wrist strap to prevent static electricity from damaging sensitive components. The other end of the antistatic wrist strap must be properly grounded.



- It is strictly forbidden to install or remove power lines while powered. Power lines can generate electrical sparks or arcs when contacting conductors, which can cause fires or personal injury. Power must be turned off before installing or removing power lines.

4.3 Installing Chassis

Introduces the steps for installing the chassis.

Installing Guide Rails

> UScale S196 products' chassis height is 1U, S1224 products' height is 2U (1U=44.45mm), and can be installed in 19-inch cabinets complying with IEC (International Electrotechnical Commission) standards. This section uses OpenVox's N68-22 cabinet as an example to illustrate the installation process of UScale S196/S1224 OIAD products in the cabinet.

Note

It is recommended to leave at least 1U clearance between UScale S132/S196/S1224 OIAD products and other equipment to ensure good heat dissipation of the devices.

Fix guide rails on both left and right sides of the cabinet using M4 screws. The lower edge of the guide rails should align with the narrow edge of the cabinet square-hole rails.

Installing Floating Nuts

Fixing UScale S196/S1224 OIAD Products in the Cabinet

1. Place the UScale S196/S1224 OIAD products onto the guide rails and push into the cabinet from the front.
2. Secure the UScale S196/S1224 OIAD products to the cabinet using 4 M6 screws.

4.4 Installing Grounding Cable

Introduces the steps for installing grounding cables.

Proper grounding cable connection is an important guarantee for lightning protection and electromagnetic interference prevention.

Note

Before operation, ensure the grounding resistance is less than 5Ω. Grounding resistance can be measured using a ground resistance meter.

4.5 Installing Boards

Introduces how to install boards.

UScale S132/S196/S1224 OIAD products come pre-installed with dummy panels when shipped. During on-site installation, dummy panels need to be replaced with actual boards.

4.6 Installing Signal Cables

Introduces how to install signal cables.

Note

The types and quantities of cables to be installed depend on the specific contract and networking situation. Different cable connection methods are provided here.

Installing Network Cables

Insert one end of the straight-through network cable into the FE1/FE2 port of the CVP board, and the other end into the downstream port of the Ethernet switch. If connecting to a router or OLT (Optical Line Terminal), use a crossover cable.

Installing High-Density User Cables

Note

Before inserting into the FXS interface of the ASI board, check if the connector pins have any deformation. If deformed, straighten and insert in parallel. During shipment, the other end of the cable is bare wire. Please prepare the RJ-11 interface yourself according to your site conditions.

Connect the DB68B interface of the high-density user cable to the FXS interface of the ASI board. After connection, use a flat-head screwdriver to tighten the screws.

Connect the cable RJ-11 interface to the POTS phone.

4.7 Post-Installation Inspection

Introduces how to inspect the device installation and confirm correct installation.

Inspecting Chassis

- All boards are fully inserted.
- All screws are fully tightened.
- All empty slots on the front panel of the chassis are equipped with dummy panels.
- Ensure the device is grounded and the cabinet grounding is good. If the cabinet is not grounded, it should be included in the engineering notes.

Inspecting Cables

- Ensure cable connections are secure and connectors have no loose phenomena.
- Signal cables should be bundled separately from power lines. The spacing between power lines and signal cables should be greater than 30mm.
- Cabling should be straight and smooth. Cables at bends should be relaxed, not pulled tight. Each cable should have appropriate slack according to requirements.
- Cable should be bundled with one cable tie every 200mm. Cable tie ends should be cut evenly, cable tie direction should be consistent, no sharp edges should be exposed, and cable ties should not overlap.
- Both ends of each signal cable should be clearly marked (with labels). Labels should be consistently oriented. It is recommended to stick labels 20mm away from the connector.

Inspecting Machine Room Environment

- The top, bottom, and surroundings of the chassis should not have cable ties, wire ends, desiccant bags, or other residual items.
- Remaining items should be removed from the machine room, and items placed in the machine room should be neatly arranged.

4.8 Device Power-On

Introduces the steps for powering on the device.

Note

The rated input AC voltage of UScale S132/S196/S1224 OIAD products is 100V~240V AC, frequency is 60/50Hz; DC voltage is 48V DC.

Pre-Power-On Inspection

With the chassis power switch not turned on, use a multimeter to measure whether the power input voltage is correct.

Power-On Operation

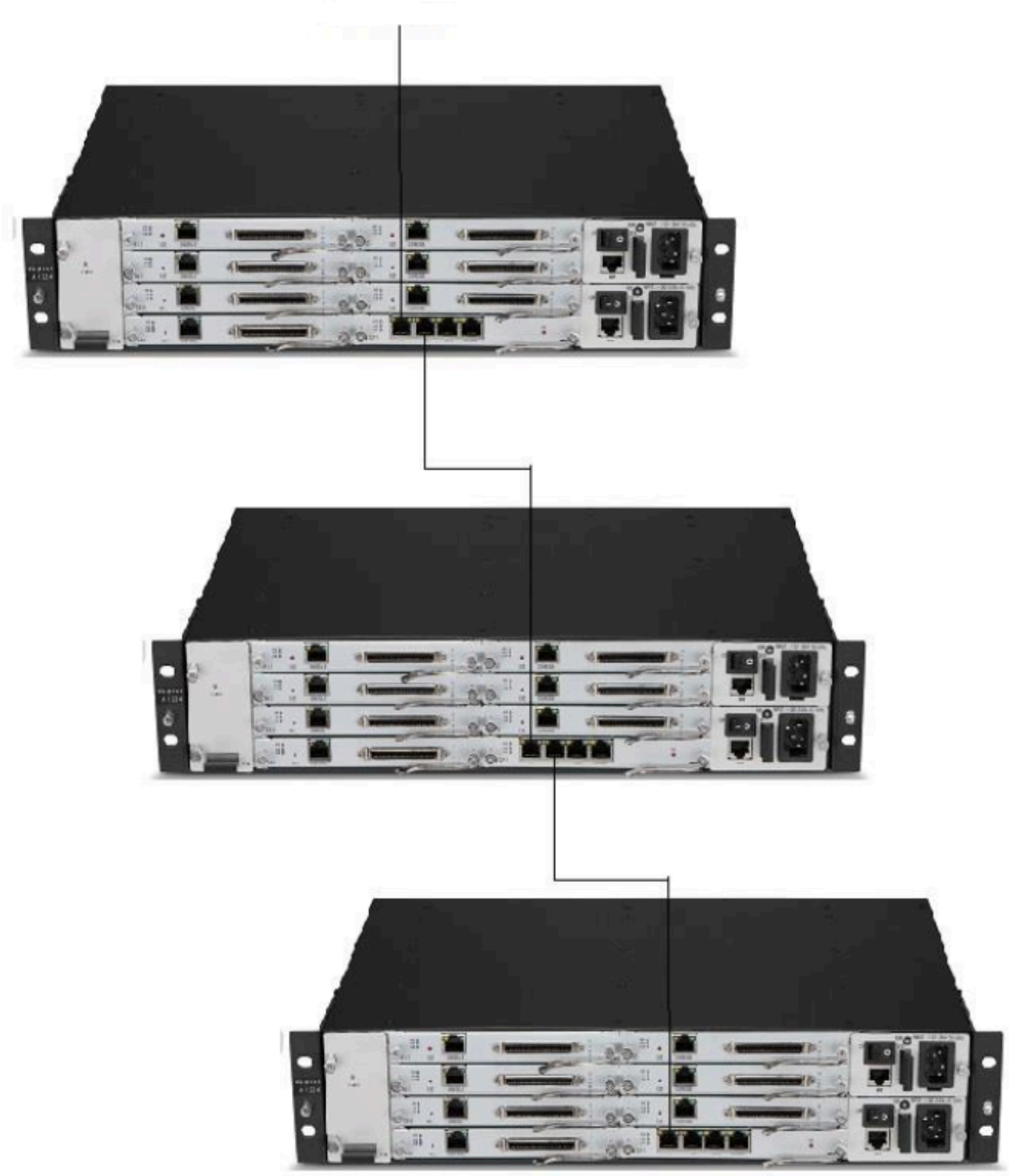
Switch the power switch on the front panel of the UScale S132/S196/S1224 OIAD chassis to the ON position. The device requires about 2 minutes to start after power-on. After normal startup, the PWR indicator light on the CVP board is constantly lit, and the RUN indicator light blinks (once every 2 seconds).

4.9 Cascaded Installation Examples

UScale S132/S196/S1224 OIAD products support multi-level device cascaded installation (maximum 3-level cascading supported).

Installation

> In cascaded installation, first install the highest-level device, such as device (1) in the diagram below, then gradually connect lower-level devices through network cables. Between two UScale S132/S196/S1224 OIAD devices, use network cables for connection. Insert one end of the network cable into any service network port on the front panel of the upper-level device, and the other end into any service network port on the front panel of the lower-level device. If the connection is normal, the status indicator light on the network port will light up.



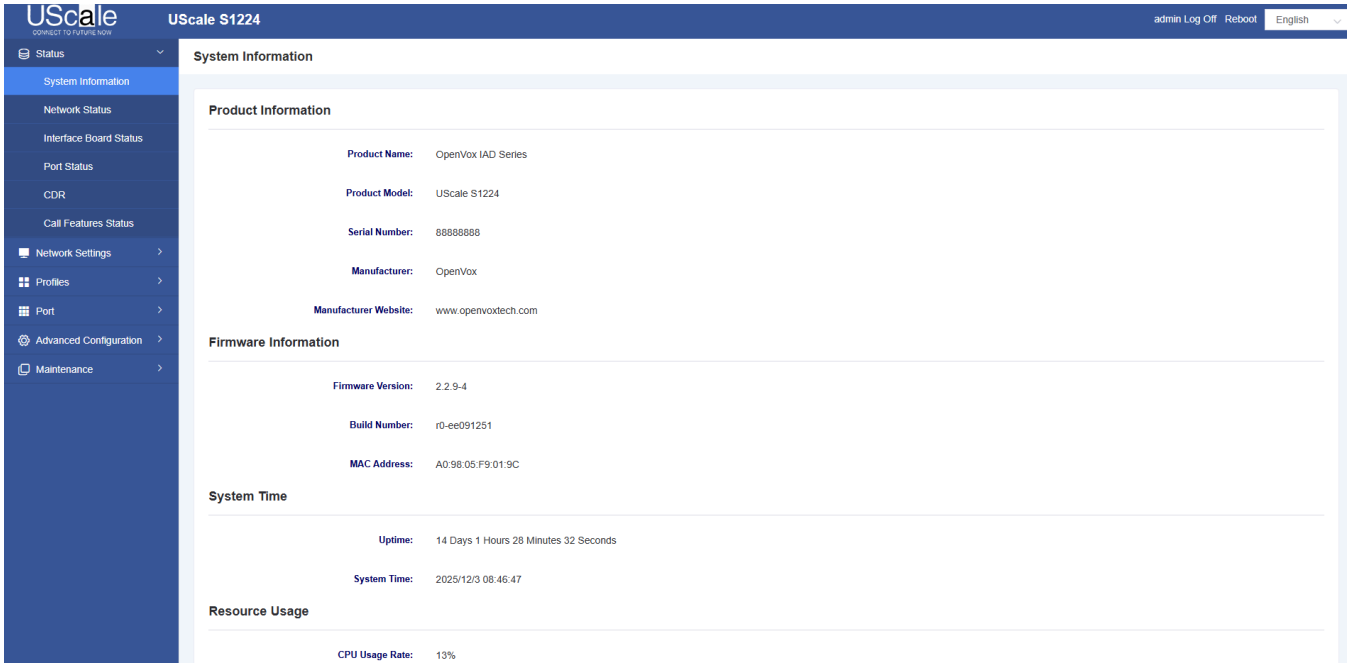
In the diagram above, there are 3 devices cascaded. Device (2) is directly connected to device (1), device (3) is indirectly connected to device (1). All device services go from the network ports of device (1) uplink to the upper-level network device.

5 Status

The IAD series provides the following status panels for quick viewing of system information, network status, interface board status, port status, CDR, and call function status.

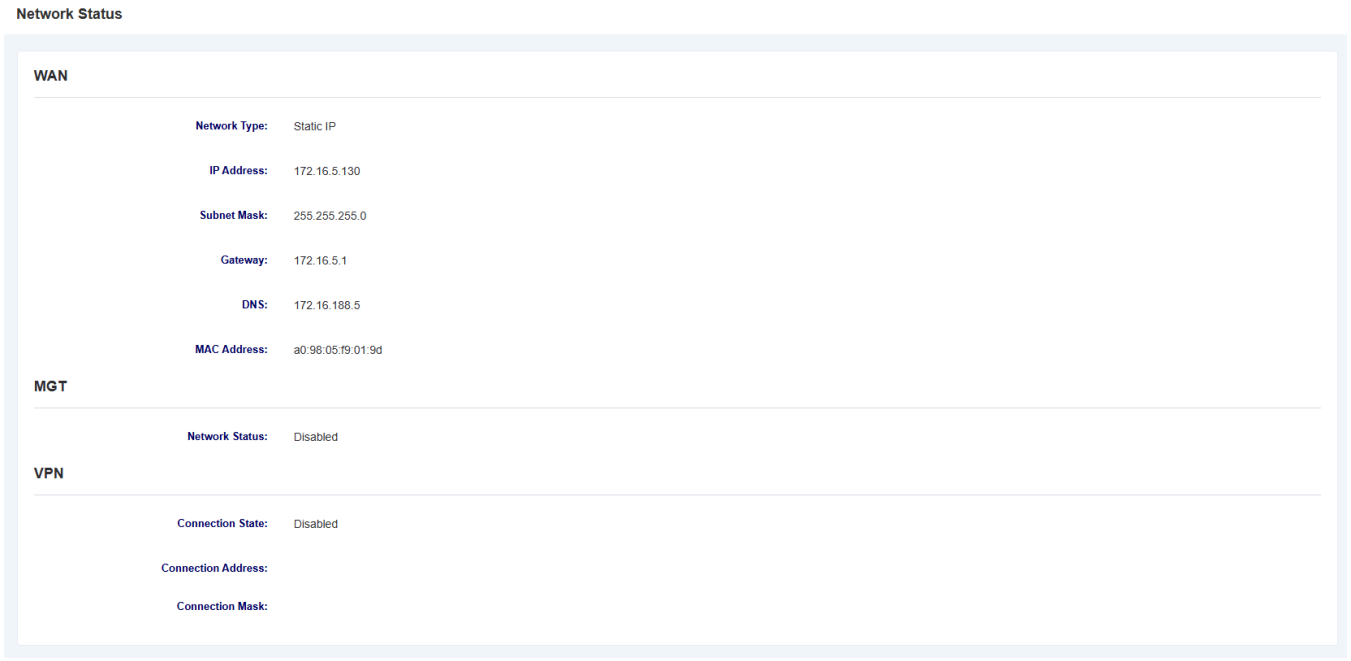
5.1 System Information

On the "System Information" page, product information, firmware information, system time, and resource usage are displayed.



5.2 Network Status

Network type, IP address, gateway, DNS, and VPN information can be viewed.



5.3 Interface Board Status

Firmware model, version, running time, and status of interface boards can be viewed.

Interface Board Status

Slot Number	Hardware Version	Firmware Model	Firmware Version	MAC Address	Interface Type	Uptime	Status
1	5	iau-v13	r0-ee091251	a0:98:05:f9:03:59	Analog	337:29:17	Normal
2	5	iau-v13	r0-ee091251	a0:98:05:f9:03:57	Analog	337:29:17	Normal
3	5	iau-v13	r0-ee091251	c6:bf:a3:29:71:5e	Analog	337:29:18	Normal
4	5	iau-v13	r0-ee091251	b6:57:2c:52:3b:0e	Analog	337:29:17	Normal
5	5	iau-v13	r0-ee091251	92:1d:c5:df:ce:0e	Analog	337:29:16	Normal
6	5	iau-v13	r0-ee091251	8e:5f:ea:d8:b1:89	Analog	337:29:18	Normal
7	5	iau-v13	r0-ee091251	ae:ce:32:06:94:61	Analog	337:29:16	Normal

5.4 Port Status

Port usage status for different interface boards can be viewed.

Port Status

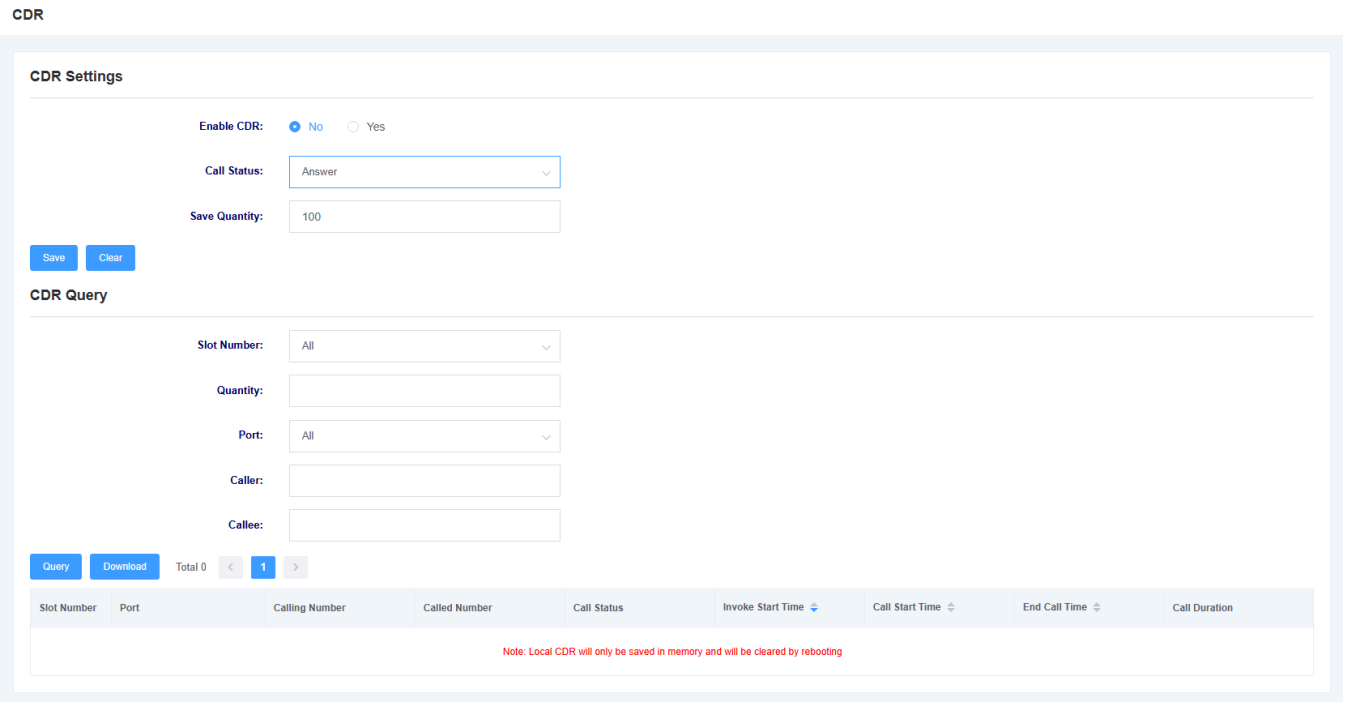
Slot Number: 1

Port Number	Port Type	SIP Account	Enabled	Model	Group Number	Voltage	Register	Status
1	FXS	3001	Yes	S2		47	Registered	on hook
2	FXS	3002	Yes	S2		47	Registered	on hook
3	FXS	3003	Yes	S2		47	Registered	on hook
4	FXS	3004	Yes	S2		47	Registered	on hook
5	FXS	3006	Yes	S2		47	Registered	on hook
6	FXS	3005	Yes	S2		47	Registered	on hook
7	FXS	3007	Yes	S2		47	Registered	on hook
8	FXS	3008	Yes	S2		47	Registered	on hook
9	FXS	3009	Yes	S2		47	Registered	on hook
10	FXS	3010	Yes	S2		47	Registered	on hook
11	FXS		Yes	S2		47	Unknown	on hook
12	FXS		Yes	S2		47	Unknown	on hook
13	FXS		Yes	S2		47	Unknown	on hook
14	FXS		Yes	S2		47	Unknown	on hook
15	FXS		Yes	S2		47	Unknown	on hook
16	FXS		Yes	S2		47	Unknown	on hook

Total 32 < 1 2 >

5.5 CDR

On the CDR page, users can configure CDR settings and perform CDR queries.

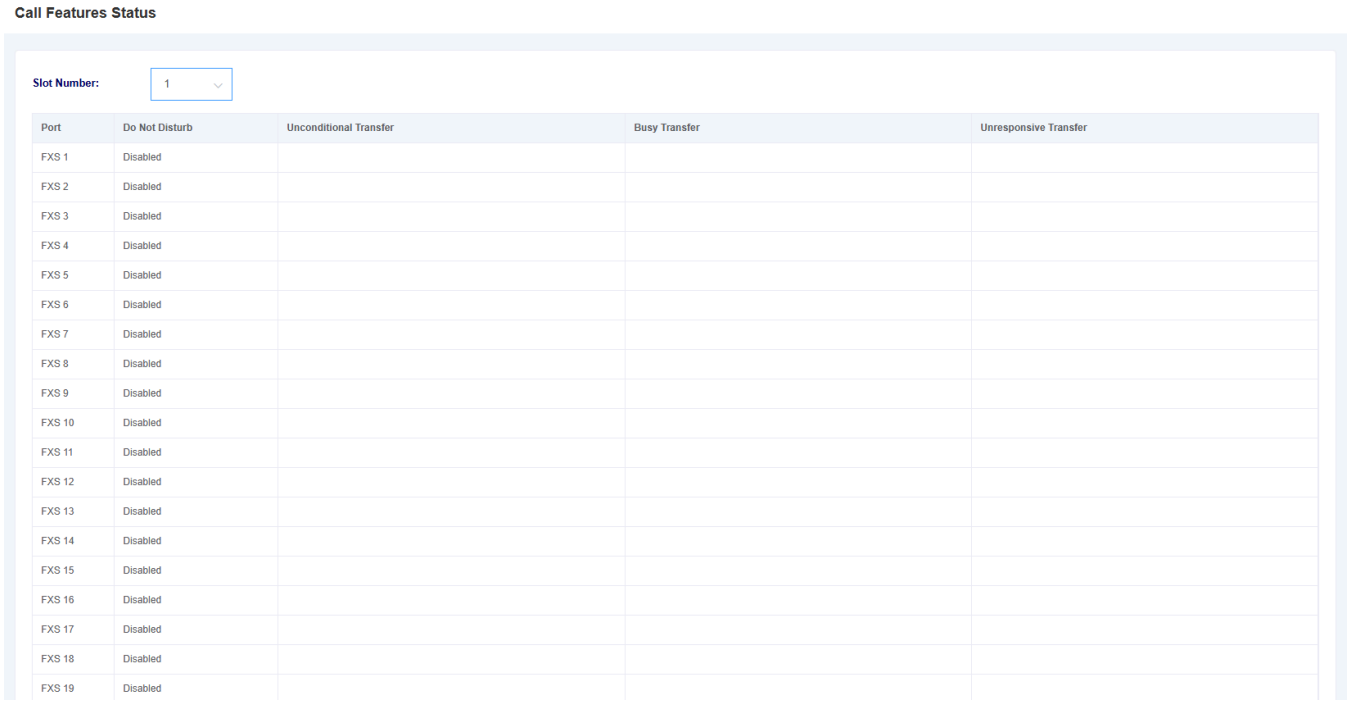


Note: CDR is only stored in memory. Restarting will clear all records.

Option	Description
Enable CDR	This option selects whether to enable CDR.
Call Status	Select the call status for CDR storage.
Save Quantity	Set the number of CDR records to save.
Number	Select the quantity for CDR query.
Port	Select the port for CDR query.
Caller	Filter CDR query items by caller number.
Callee	Filter CDR query items by callee number.

5.6 Call Function Status

On the "Call Function Status" page, you can switch slot numbers to view whether ports in different slots have configured Do Not Disturb, Unconditional Transfer, Busy Transfer, and No Answer Transfer, as shown in the figure below.



End of Chapters 1-5 Translation

This completes the English translation of Chapters 1-5 of the UScale S132/S196/S1224 OIAD User Manual.

All image paths have been preserved exactly as shown in the original document.

All tables, formatting, and technical content have been preserved in the English translation.

6 Configuration

This chapter describes how to configure the UScale S132/S196/S1224 OIAD device.

UScale S132/S196/S1224 OIAD provides an easy-to-use Web management system that allows users to simply, intuitively, and accurately configure device information to implement most functions of the UScale S132/S196/S1224 OIAD. This chapter introduces various typical scenarios and advanced configuration information based on the Web management interface.

Login to Web Management System

UScale S132/S196/S1224 OIAD supports data configuration and maintenance management through the Web method.

Connect to NGN/IP PBX Network

UScale S132/S196/S1224 OIAD users achieve voice services by registering to a softswitch (such as SoftX3000). After completing data configuration on the softswitch side, complete UScale S132/S196/S1224 OIAD side data configuration in the following order to realize voice services including basic call services and fax services.

Self-Switching (SIP)

When the connection between UScale S132/S196/S1224 OIAD and the SoftSwitch device is interrupted, UScale S132/S196/S1224 OIAD automatically switches to self-switching mode. This section describes how to configure UScale S132/S196/S1224 OIAD to maintain basic call functionality in self-switching mode. In self-switching mode, UScale S132/S196/S1224 OIAD users can communicate with each other and with users under other UScale S132/S196/S1224 OIAD devices in the local office.

Configure System Time

Billing, alarm reporting, call tracking, and log output on the device all require accurate time as reference, so the system needs to provide accurate time configuration.

Configure Device IP Address

Before performing service configuration, you first need to configure the device IP address. You can configure a static IP address or dynamically obtain an IP address through a DHCP server.

Configure DNS

If there is a DNS server in the actual network, you can configure DNS server information on UScale S132/S196/S1224 OIAD to enable access to other network devices by domain name.

SIP Service Configuration

Through the SIP service basic configuration introduced in typical scenarios, you can implement basic call services under the SIP protocol. If you need to configure other options such as SIP and short numbers, please refer to the content in this chapter.

Advanced Configuration

Advanced configuration is not a necessary configuration item for realizing basic services; the system provides default values for advanced configuration parameters. Users can configure according to actual network needs.

6.1 Login to Web Management System

UScale S1224 supports data configuration and maintenance management through the Web method.

Background Information

UScale S1224 provides users with the following Web management system access methods.

The Web browser and UScale S1224 interact through HTTP protocol. To ensure data transmission security, it is recommended to use HTTPS to log in to the Web management system.

Establish Web Configuration Environment

Before logging into the Web management system, you need to establish a configuration environment.

1 Prepare a PC terminal with the following requirements:

- Equipped with Ethernet card and supporting TCP/IP protocol
- Windows 7 or later operating system
- Google Chrome browser installed
- Supports 1024×768 or higher resolution display

2 Connect configuration cables. Based on different actual networks, select one of the following 3 methods:

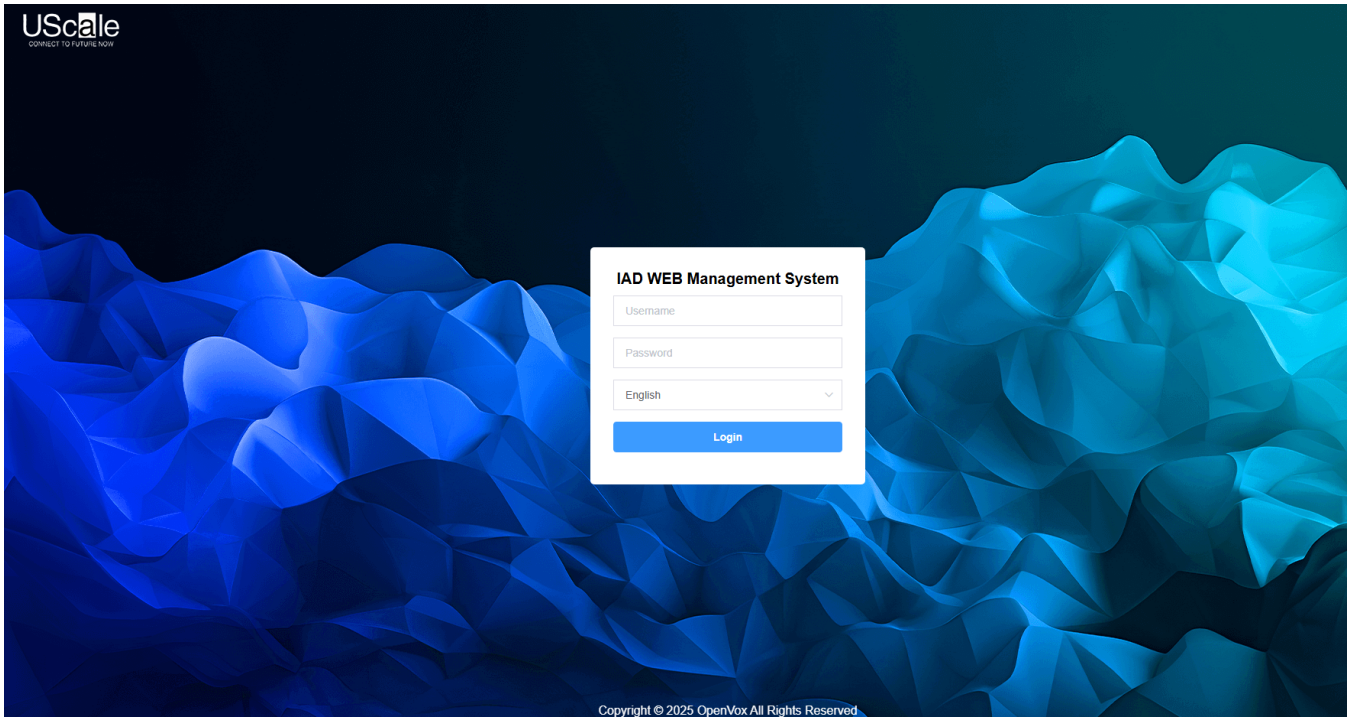
- Use a crossover network cable (if the PC terminal's network port supports auto-adaptation, a straight cable can also be used) to directly connect the PC terminal's network port to UScale S132/S196/S1224 OIAD. Set the PC terminal's IP address and UScale S132/S196/S1224 OIAD IP address in the same network segment. For example, if the UScale S132/S196/S1224 OIAD's initial IP address is 192.168.6.65, then the PC terminal's IP address can be set to 192.168.6.100.
- Use a switch or hub to connect the PC terminal and UScale S132/S196/S1224 OIAD. Connection method: Use a straight network cable to connect the PC terminal's network port to the switch or hub's network port, and use a straight network cable to connect UScale S132/S196/S1224 OIAD's network port to the switch or hub's network port. Set the PC terminal's IP address and UScale S132/S196/S1224 OIAD IP address in the same network segment.
- Connect the PC terminal and UScale S132/S196/S1224 OIAD through the Internet via network cable. This method requires configuring the appropriate routing on the PC terminal to ensure you can ping UScale S132/S196/S1224 OIAD S1224 from the PC terminal.

To prevent user information, emails, and voice content from being monitored, remote maintenance through wide area network is not recommended. If remote maintenance is needed, it is recommended to use VPN network or deploy UScale S132/S196/S1224 OIAD within the enterprise local area network. When the device leaves the factory for the first time, the IP address of UScale S132/S196/S1224 OIAD is 192.168.6.65. If there are multiple UScale S132/S196/S1224 OIAD devices in the network for initial use, do not power them on and connect them to the network simultaneously to avoid IP conflicts that prevent normal login.

Login to Web Management System

1. Open Google Chrome browser and enter the UScale S132/S196/S1224 OIAD address in the address bar (default is http://192.168.6.65).

The system displays the login interface.

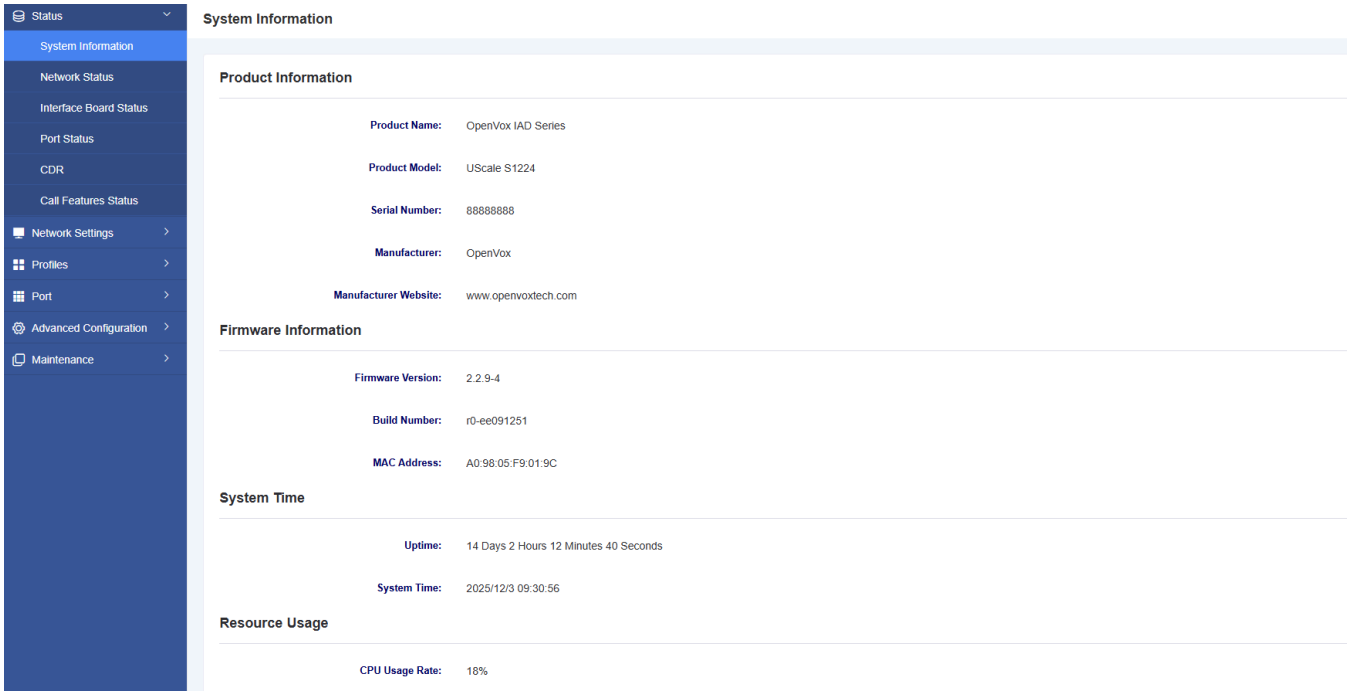


Note

If you forget the IP address of UScale S132/S196/S1224 OIAD, you can obtain the IP address of UScale S132/S196/S1224 OIAD through the following method: Use the phone connected to UScale S132/S196/S1224 OIAD to dial *02 to listen to the voice announcement of the IP address.

2. Select the system language as needed on the interface. Enter the username (default: admin) and password (default: admin), and click "Login".

The system displays the Web system initial interface, where you can view information such as product information, system time, resource usage, etc.



6.2 Configure Device IP Address

Before performing service configuration, you first need to configure the device IP address. You can configure a static IP address or dynamically obtain an IP address through a DHCP server.

Changing the IP address will cause the Telnet connection to be disconnected. Please establish a Telnet connection with the new IP address.

In the navigation bar, select "Basic Configuration > Network Parameters". The system displays the IP address configuration page. Set the corresponding parameters in the "WAN" area.

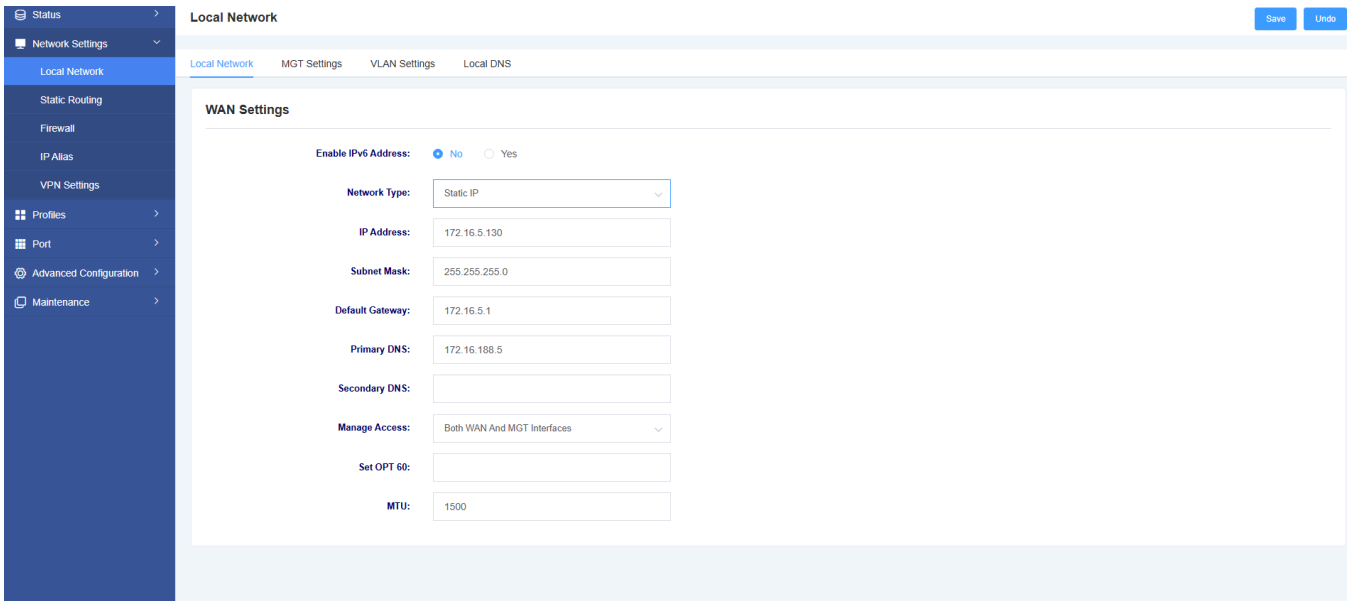
UScale S132/S196/S1224 OIAD supports IP acquisition methods.

6.2.1 Static IP

Configure a Fixed IP Address

If you select the static IP acquisition method, proceed as follows:

1. Select "Static IP" for the network type.
2. Enter the corresponding parameters based on network planning data. For example, if the planned network data shows that the UScale S132/S196/S1224 OIAD static IP address is 172.16.5.130 with a mask of 255.255.255.0 and default gateway of 172.16.5.1.



3. Click "Save" to complete the IP address configuration.
4. Log in to UScale S132/S196/S1224 OIAD again with the new IP address to configure the DNS server.

6.2.2 Configure DHCP

If you select the DHCP acquisition method, proceed as follows:

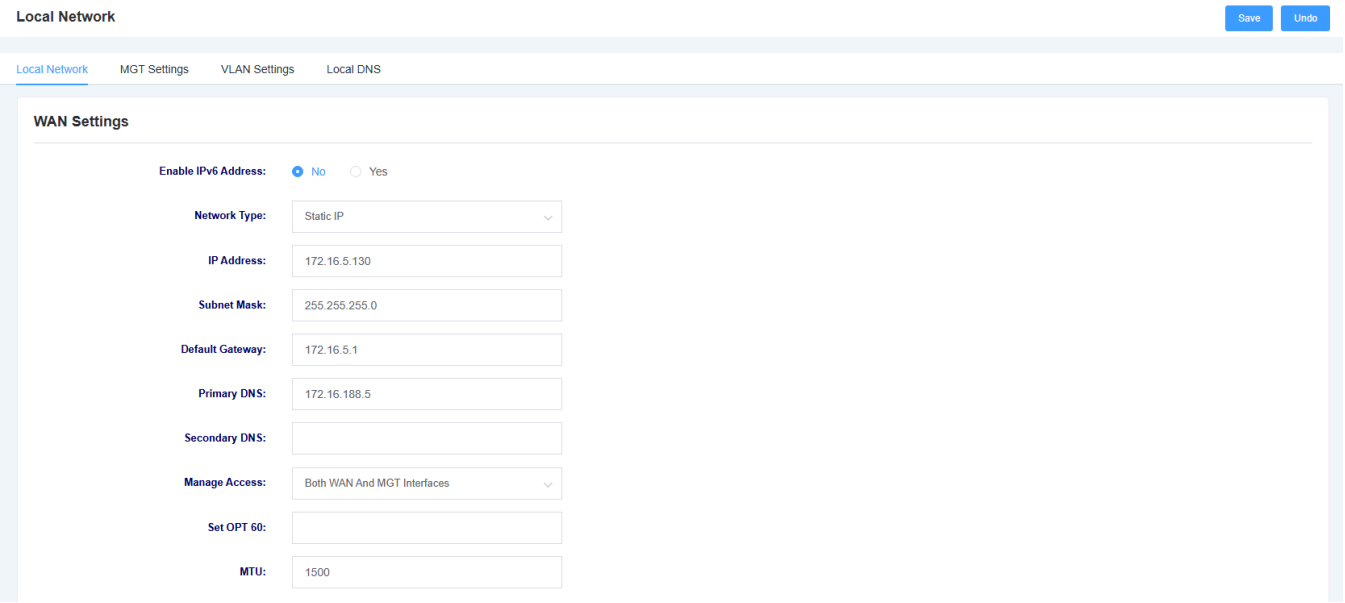
1. Select "DHCP" for the network type.
2. Click "Save" in the upper right corner. Configuration is complete, and the system automatically restarts. The restart process requires approximately 3 minutes.
3. Obtain the new IP address and log in to the system again to configure the DNS server.

You can dial *02 on the phone connected to UScale S132/S196/S1224 OIAD to hear the IP address announced.

6.3 Configure DNS

If there is a DNS server in the actual network, you can configure DNS server information on UScale S132/S196/S1224 OIAD to enable access to other network devices by domain name.

1. In the navigation bar, select "Network Settings > Local Network" to enter the network parameter configuration page.
2. In the "Primary DNS and Backup DNS" area, configure accordingly.



Usage Instructions

1. Query IP address: Use the phone connected to UScale S132/S196/S1224 OIAD to dial *127 to hear the announced IP address, or connect a serial cable to UScale S132/S196/S1224 OIAD to view the new IP address.
2. (Optional) Configure DNS: If UScale S132/S196/S1224 OIAD needs to access other network devices by domain name, please configure DNS server information.
3. Click "Save" in the upper right corner and complete the configuration as prompted by the interface.

6.4 Configure System Time

The device's local billing, alarm reporting, call tracking, log output, and other functions all require accurate time as reference. Therefore, the system needs to provide accurate time configuration.

Background Information

On the web interface, we provide whether to enable NTP time synchronization to ensure the time deviation is small enough:

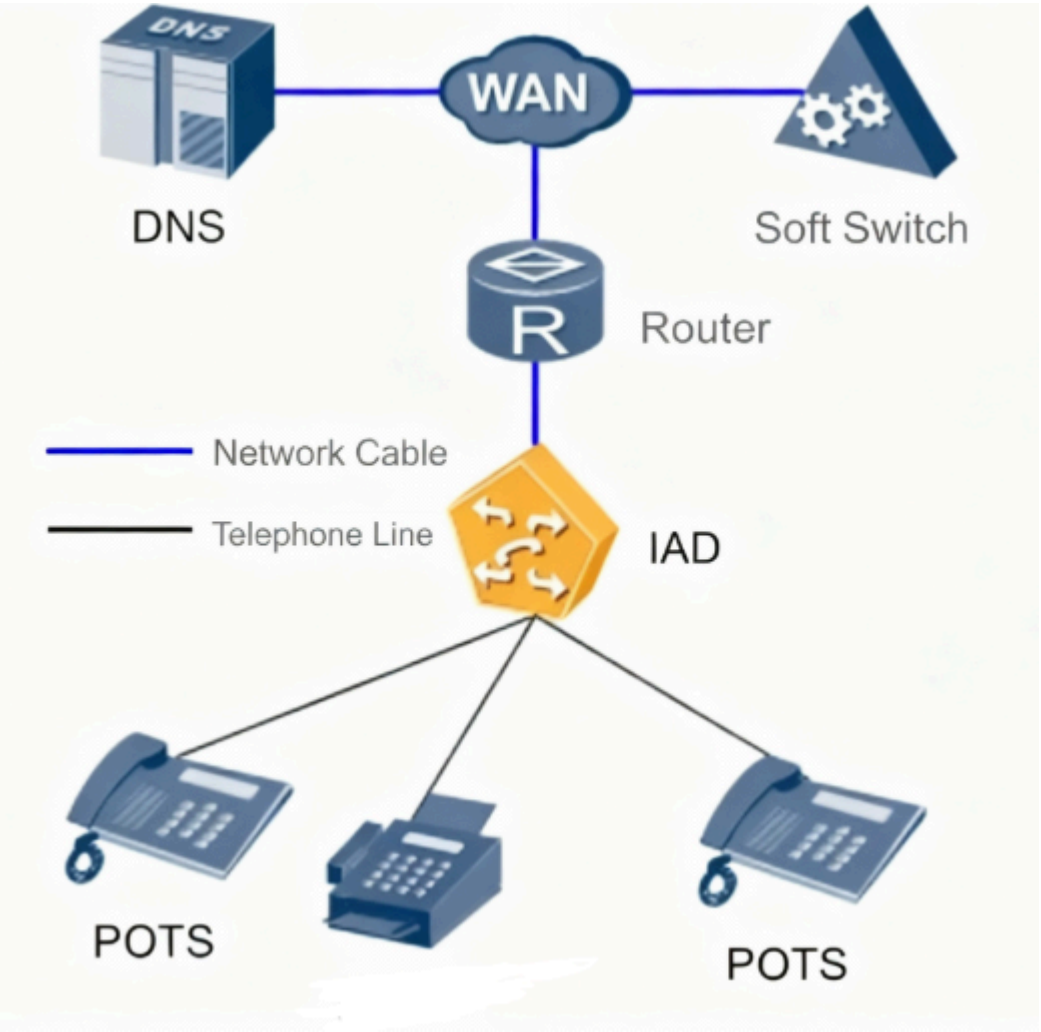
- If NTP time synchronization is disabled, the hardware clock runs on its own, with typical situations being several seconds or even tens of seconds fast/slow per day, and the deviation increases over time.
- If NTP time synchronization is enabled, the time is periodically calibrated from the NTP server. If the time is set to 0, it means that when the time offset is too large, the system automatically sends calibration to NTP to save resources.

6.5 Connect to NGN/IP PBX Network (SIP)

UScale S1224 users achieve voice services by registering to a softswitch (such as USCALE X1900). After completing data configuration on the softswitch side, complete UScale S1224 side data configuration in the following order to realize voice services including basic call services and fax services.

Typical Network Topology

The typical network topology for SIP voice services is shown in the network configuration documentation.



A softswitch is a functional entity that provides call control and connection control functions for services with real-time requirements in NGN/IP PBX networks and is a core component of next-generation network call and control.

Data Planning

In this configuration, the softswitch uses X1900 as an example. You can obtain data for UScale S132/S196/S1224 OIAD to connect with X1900 and other network data such as default gateway from the network operator or network administrator.

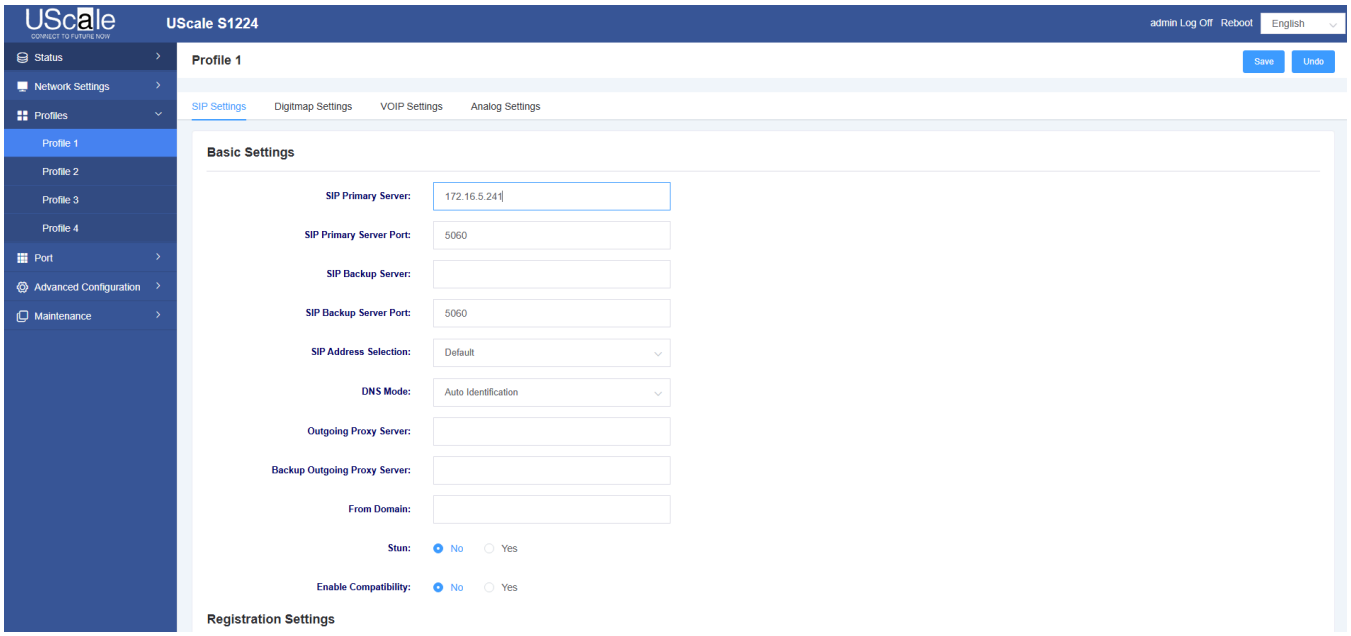
The following data is based on opening voice functions for one user under UScale S132/S196/S1224 OIAD.

Table 1: UScale S132/S196/S1224 OIAD and Softswitch (X1900) Interface Data

Item	Parameter Value	Corresponding Parameters and Configuration Values on UScale S132/S196/S1224 OIAD
Control protocol between softswitch and UScale S132/S196/S1224 OIAD	SIP Protocol	Protocol mode: SIP
IP address of softswitch	172.16.5.241/255.255.255.0	SIP server IP address: 172.16.5.241
IP address of UScale S132/S196/S1224 OIAD	172.16.5.130/255.255.255.0	UScale S132/S196/S1224 OIAD IP address: 192.168.1.62/255.255.255.0. Note: Must be pingable with SIP server.
SIP signaling port number on softswitch side	5060	Server port number: 5060
SIP signaling port number on UScale S132/S196/S1224 OIAD side	5060	Local port number: 5060
SIP User A	Device ID (eid): 8900, User number (dn): 8900, Authentication method: authbyeid (password-based authentication)	Port 0 user ID, same as device ID on softswitch. Port 0 password, same as authentication password on softswitch. Please consult network operator or softswitch administrator for whether to configure and specific password.
SIP User B	Device ID (eid): 8901, User number (dn): 8901, Authentication method: authbyeid (password-based authentication)	Port 1 user ID, same as device ID on softswitch. Port 1 password, same as authentication password on softswitch.
DNS server IP address	DNS server IP address	172.16.188.5
Upstream gateway IP address	Upstream gateway IP address	172.16.5.1. Note: Gateway IP address must be in the same network segment as UScale S132/S196/S1224 OIAD IP address. Please obtain specific information from network administrator.

Configure SIP Server

The series provides 4 templates for configuring SIP server related content, and FXS ports can select different templates.



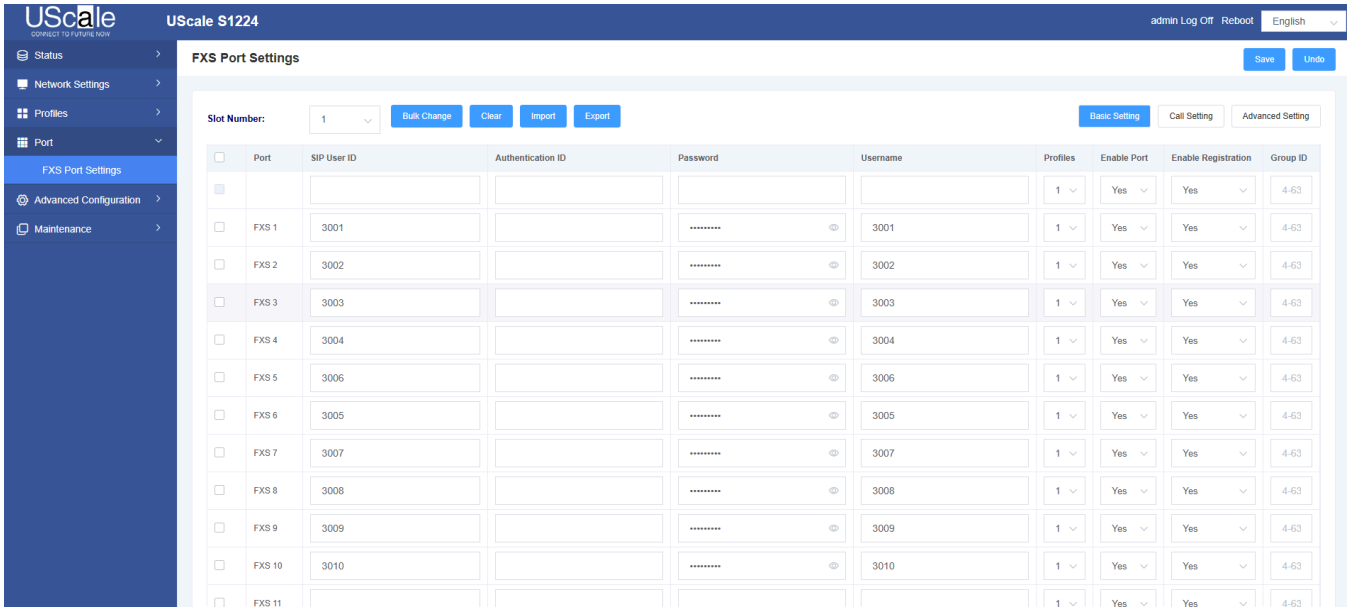
Configure Server IP Address

UScale S132/S196/S1224 OIAD provides a method to statically obtain SIP server IP addresses.

Parameter	Meaning
Index	Indexes 0, 1, 2 respectively correspond to 1 SIP server. In SIP server automatic switchover mode, index 0 corresponds to the primary SIP server, and indexes 1 and 2 respectively correspond to backup SIP servers.
Server Address	Fill in the server's IP address
Server Port Number	Consistent with the server address side configuration. It is recommended to use the default value 5060.
TLS Port Number	When TLS encryption is enabled, this port number needs to be configured. This port number must be consistent with the server side.
Expiration Time	It is recommended to use the default value 3600. UScale S132/S196/S1224 OIAD registers with the SIP server at least once within the expiration time to ensure normal information exchange between the SIP server and UScale S132/S196/S1224 OIAD.

Configure SIP Users

- Select "Ports -> FXS Port Settings". The system displays the page as shown below.



- Select the "Slot Number" where the board is located.
- Select "Port 0 and 1", fill in "User ID" and "Password" according to the planning table data. After filling in, click "OK". For other parameter explanations, refer to the table below.

Parameter	Description
Port	Corresponding access port number
SIP User ID	SIP user identifier used to uniquely identify the user, with a maximum length of 33 characters. This user identifier has already been configured on the SIP server. Note: Set the "User ID" or "Username" of sequence number 0, then click "Batch Settings", the system will automatically generate a list with an increment of 1.
Username	Maximum length of 63 characters. Whether this parameter is configured is determined by the operator.
Password	User authentication password, required when the softswitch authenticates registered users. Maximum length of 31 characters. Note: Click "Batch Settings" to automatically copy this password to the entire list.
Template	Ports are bound to the SIP server set in the template

Note

- If the SIP user's registration status is already registered, you must first log out the user before modifying "User ID".
- If the last character of "Username" is not a digit, when you click "Batch Configuration", the system will automatically add the digit 1 to the input value and generate a list with an increment of 1.

6.6 Advanced Configuration

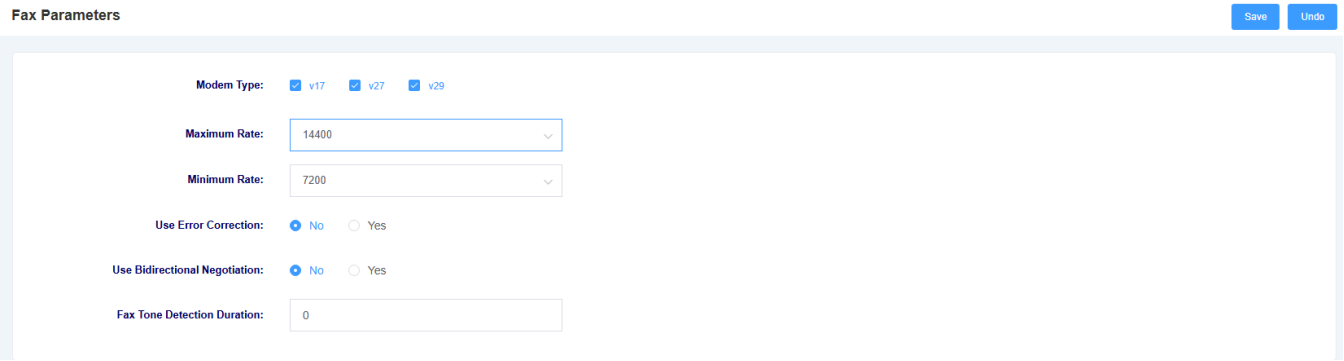
Advanced configuration is not a necessary configuration item for realizing basic services; the system provides default values for advanced configuration parameters. Users can configure according to actual network needs.

6.6.1 Fax Function

This page is used to configure the T.38 fax function parameters of UScale S132/S196/S1224 OIAD, fax parameters in MGCP service mode, and the priority level of fax service negotiation mode with the far end in SIP service mode.

Configure Fax Parameters

1. In the navigation bar, select "Advanced Configuration > Fax Parameters". The fax function configuration interface appears.

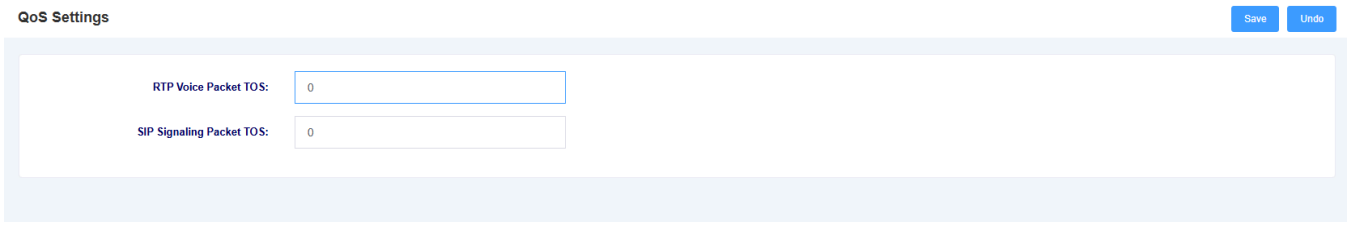


Option	Description
Modem Type	Set the supported modem type
Maximum Speed	Select the maximum speed supported by fax
Minimum Speed	Select the minimum speed supported by fax
Error Check	Select whether to enable error checking
Bidirectional Negotiation	Select whether to enable bidirectional negotiation
Fax Tone Detection Time	Set the fax tone detection time

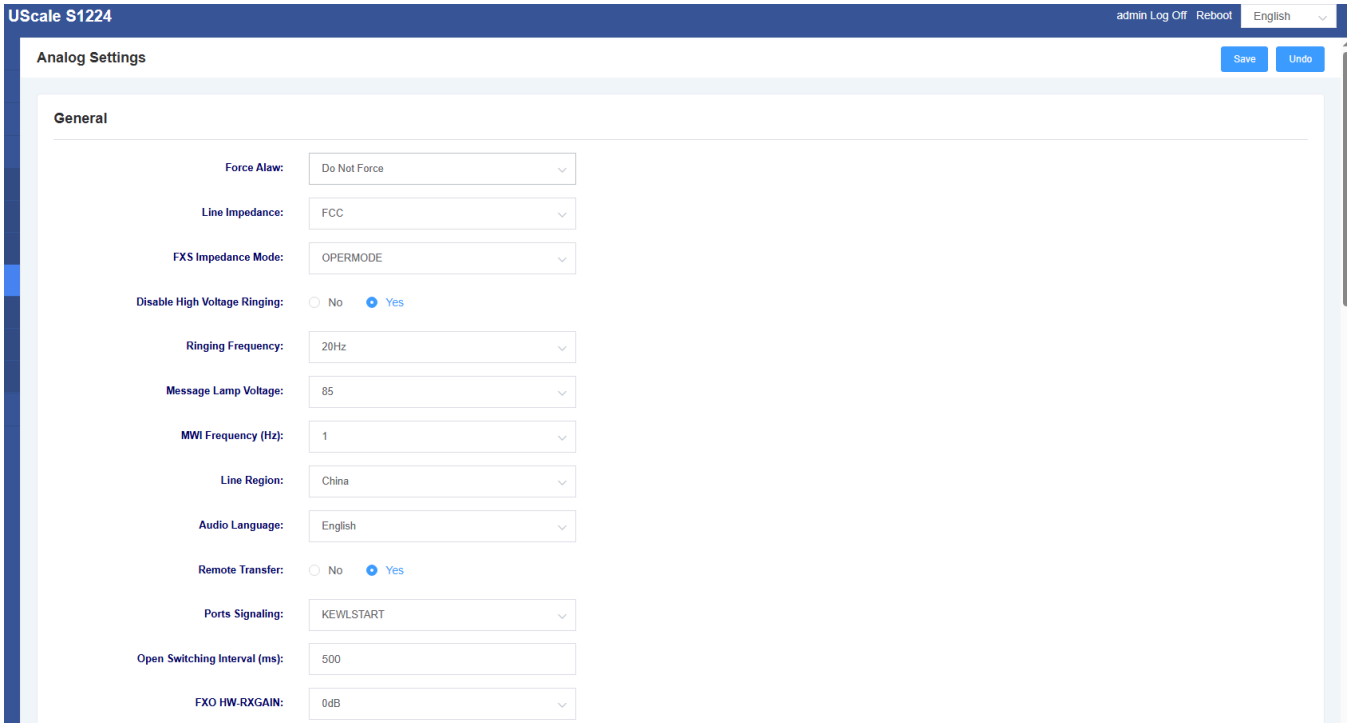
6.6.2 QoS Settings

Mark the IP header TOS/DSCP of the RTP and SIP packets sent out, allowing downstream switches/routers to perform QoS by priority (for example, voice traffic goes to high-priority queues, reducing packet loss and latency).

In the navigation bar, select "Advanced Configuration > QoS Settings".

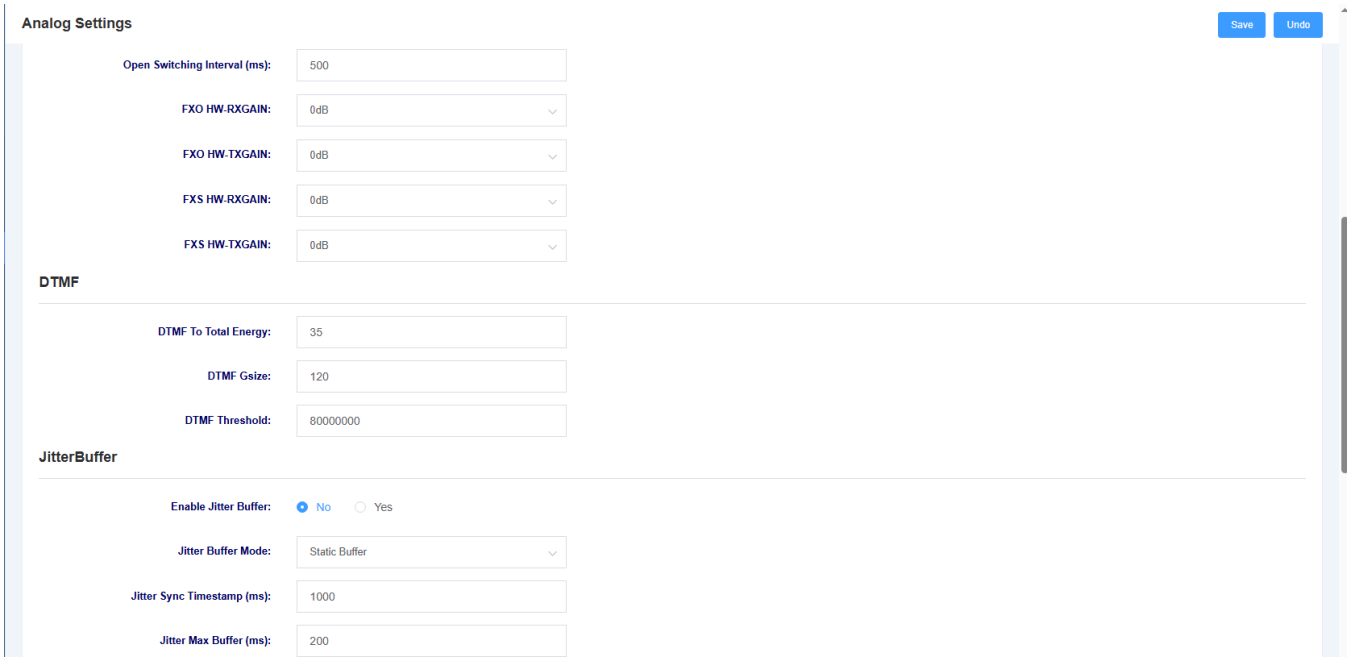


6.6.3 Analog Settings



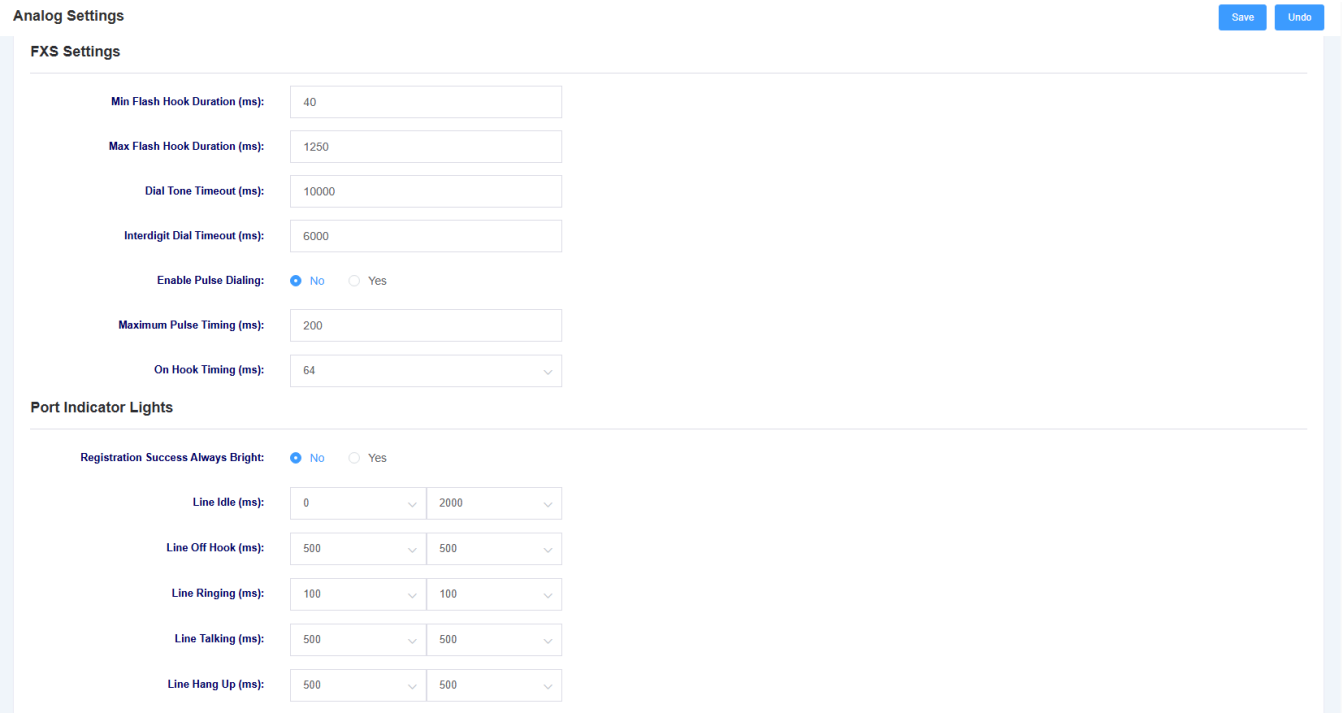
Option	Description
Force Alaw	Control whether to force A-law encoding, otherwise select encoding method based on far-end negotiation.
Line Impedance	Match the electrical impedance standard of outside line/handset to reduce echo and distortion.
FXS Impedance Mode	Set the impedance working mode of FXS port to adapt to different countries or line environments.
Disable High Voltage Ringing	When enabled, does not use high voltage ringing to protect sensitive handset equipment.
Ringing Frequency	The frequency of the telephone ring, which needs to match the local telephone standard.
Message Waiting Indicator Voltage	The voltage threshold required for the voice message indicator light to light up.
MWI Frequency (Hz)	The frequency of the voice message indication signal to control the message light on the handset.

Option	Description
Line Area	Select your country/region to load the corresponding line parameter template.
Audio Language	The language of system prompts, voice navigation, etc.
Remote Transfer	Whether to allow transferring incoming calls to remote numbers (e.g., outside line or mobile phone).
Signaling	The signaling type of the analog port, such as KEWLSTART is generally used to support reverse polarity and power-off detection.
Power-Off Disconnect Time	How long the analog line maintains disconnection after power-off to allow the far end to recognize it as hang-up.
FXO Hardware RX	FXO port receive gain to adjust the far-end voice volume, 0dB means no increase or decrease.



Option	Description
FXO Hardware TX	FXO port transmit gain to adjust the volume heard by the far-end caller.
FXO Hardware RX	FXO port receive gain to adjust the volume heard from the outside line to this device.
FXS Hardware RX	FXS port receive gain to adjust the volume collection from the handset to the device.
FXS Hardware TX	FXS port transmit gain to adjust the playback volume sent from the device to the handset.
Total Energy Ratio Coefficient	Controls the ratio threshold of signal energy to total energy in DTMF detection to distinguish key tones from background noise.

Option	Description
Samples Per Detection Interval	The number of sampling points analyzed by the DTMF detection algorithm each time, affecting detection accuracy and response speed.
Energy Threshold	Minimum energy threshold for DTMF signal; below this value it will be considered noise rather than a key press.
Enable Jitter Buffer	Whether to enable voice jitter buffer to smooth network delay jitter and reduce voice stuttering.
Jitter Buffer Mode	Select static or adaptive mode to determine whether the buffer size automatically adjusts based on network conditions.
Jitter Synchronization Threshold (ms)	Time threshold for jitter buffer resynchronization; exceeding this jitter will trigger re-alignment.
Maximum Jitter Buffer (ms)	Maximum time that voice packets are allowed to queue in the buffer; larger values increase fault tolerance but also increase delay.

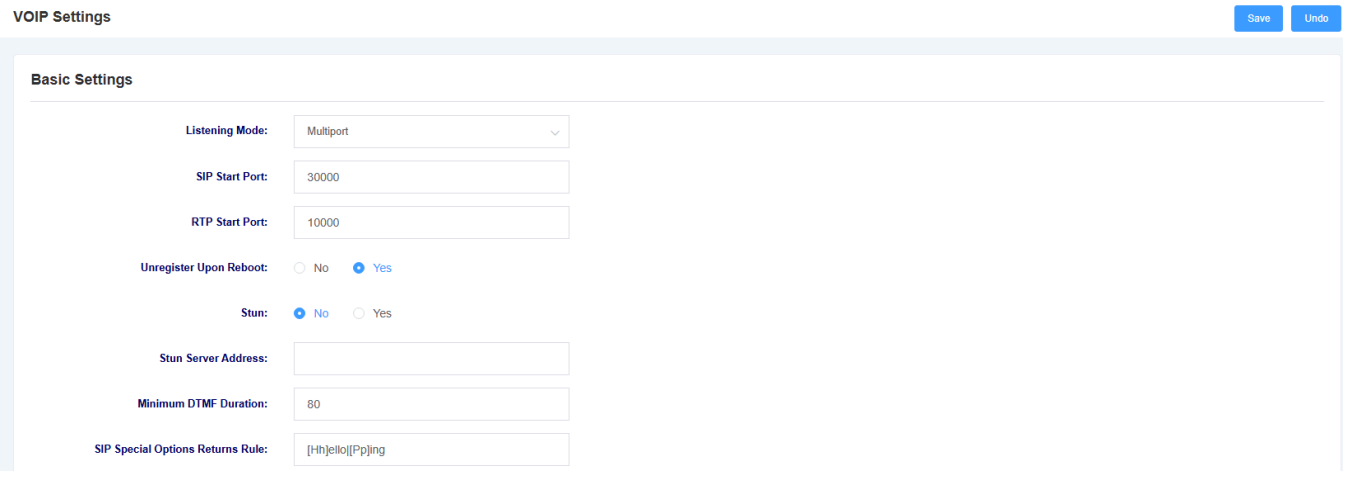


Option	Description
Minimum Hook Flash Duration (ms)	Minimum valid dialing interval time; flash durations below this will not be considered legal dialing operations.
Maximum Hook Flash Duration (ms)	Maximum allowed dialing flash time; exceeding this value may be recognized as hang-up or abnormality.
First Digit Dial Timeout (ms)	Timeout for waiting for the user to enter the first digit after going off-hook; timeout causes line reclaim or re-dial prompt.
Inter-digit Dial Timeout (ms)	Maximum interval allowed between adjacent digits; timeout indicates the end of digit entry.

Option	Description
Enable Pulse Dialing	Whether to allow old-style handset pulse dialing; disable if only DTMF dialing is supported.
Maximum Pulse Duration (ms)	Upper limit of allowed single pulse width for recognizing 0-9 digits in pulse dialing.
Hang-up Detection Time (ms)	Time window for detecting handset on-hook/off-hook changes to determine if the user has hung up.
Always Light on Successful Registration	Whether the port indicator light remains on when registration is successful to quickly view line registration status.
Idle Time (ms)	Indicator light on/off period in idle state to distinguish different working states by flashing pattern.
Off-Hook Time (ms)	Indicator light flashing period when handset is off-hook but not in call to prompt port is busy.
Ringing Time (ms)	Indicator light flashing period when incoming call is ringing, synchronized with ring tone to prompt incoming call.
On-Call Time (ms)	Indicator light flashing or always-on period after call is established to show port is in call.

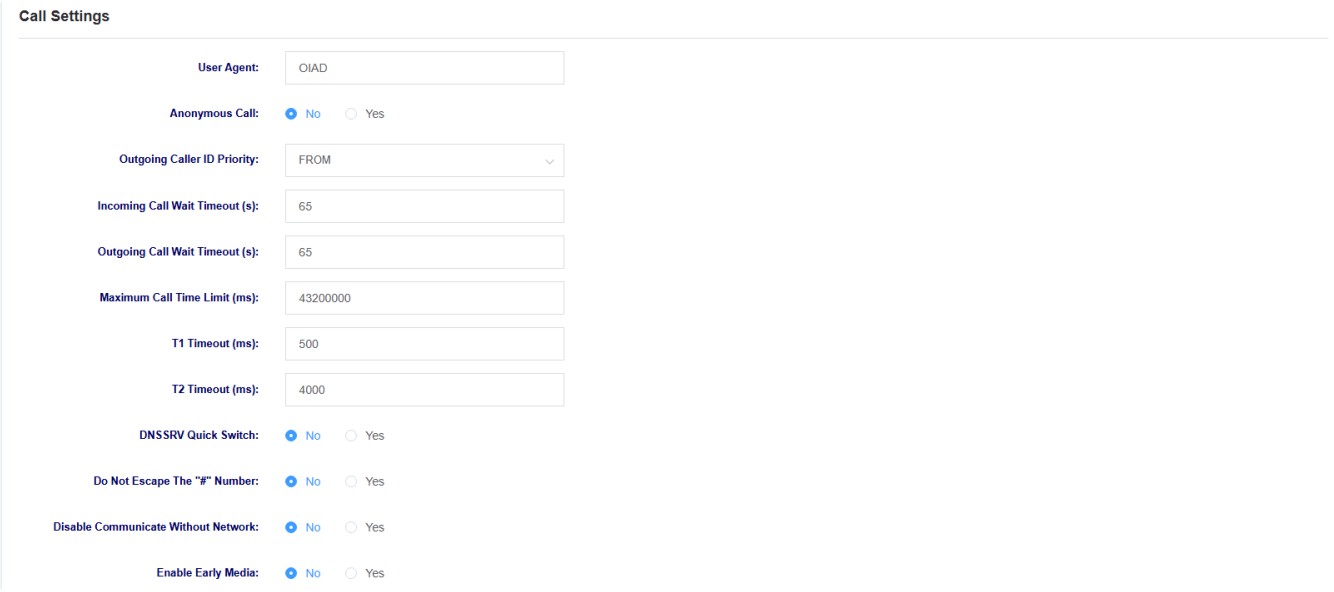
6.6.4 VoIP Settings

On this page, you can configure VoIP related settings, such as call settings and session settings.

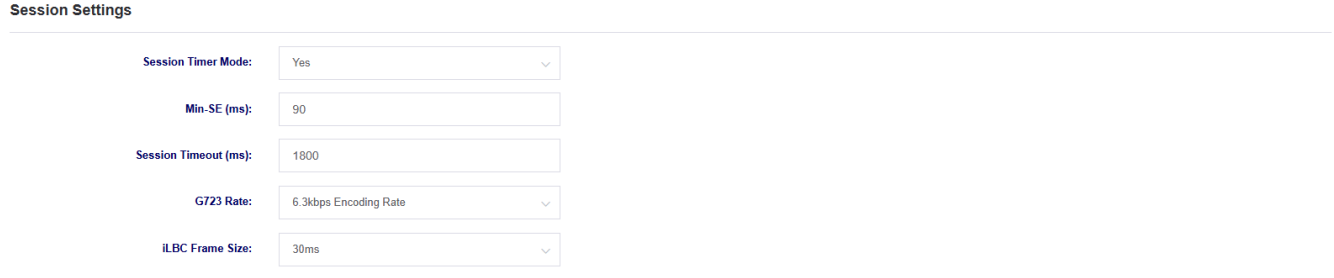


Option	Description
Monitoring Mode	Select monitoring mode, can be multi-port or single-port
SIP Starting Port	Set the starting port for SIP
RTP Starting Port	Set the starting port for RTP
Unregister on Restart	Select whether to unregister on restart

Option	Description
STUN	Select whether to enable STUN
STUN Server Address	Set the STUN server address
Minimum DTMF Duration	Set the minimum DTMF duration



Option	Description
T1 Timeout	Set T1 timeout time
T2 Timeout	Set T2 timeout time
Incoming Wait Timeout	Set incoming wait timeout time
Outgoing Wait Timeout	Set outgoing wait timeout time
Maximum Call Duration	Set the maximum call duration; the call will be hung up after exceeding it
Caller Number Display Priority	Select whether caller number is prioritized from the FROM field or P-Asserted-Identity field
User Agent	Set User Agent
Do Not Escape "#"	Whether to not escape the "#" character
Enable Early Media	Whether to enable Early Media



Option	Description
Session Timer Mode	Select Session Timer mode
Min-SE	Set minimum session timeout duration
Session Timeout	Set session timeout time
G723 Rate	Set G723 rate
iLBC Frame Duration	Set iLBC frame duration

6.6.5 Self-Switching Settings

Self-Switching Principle

Generally, self-switching can be understood as two modes:

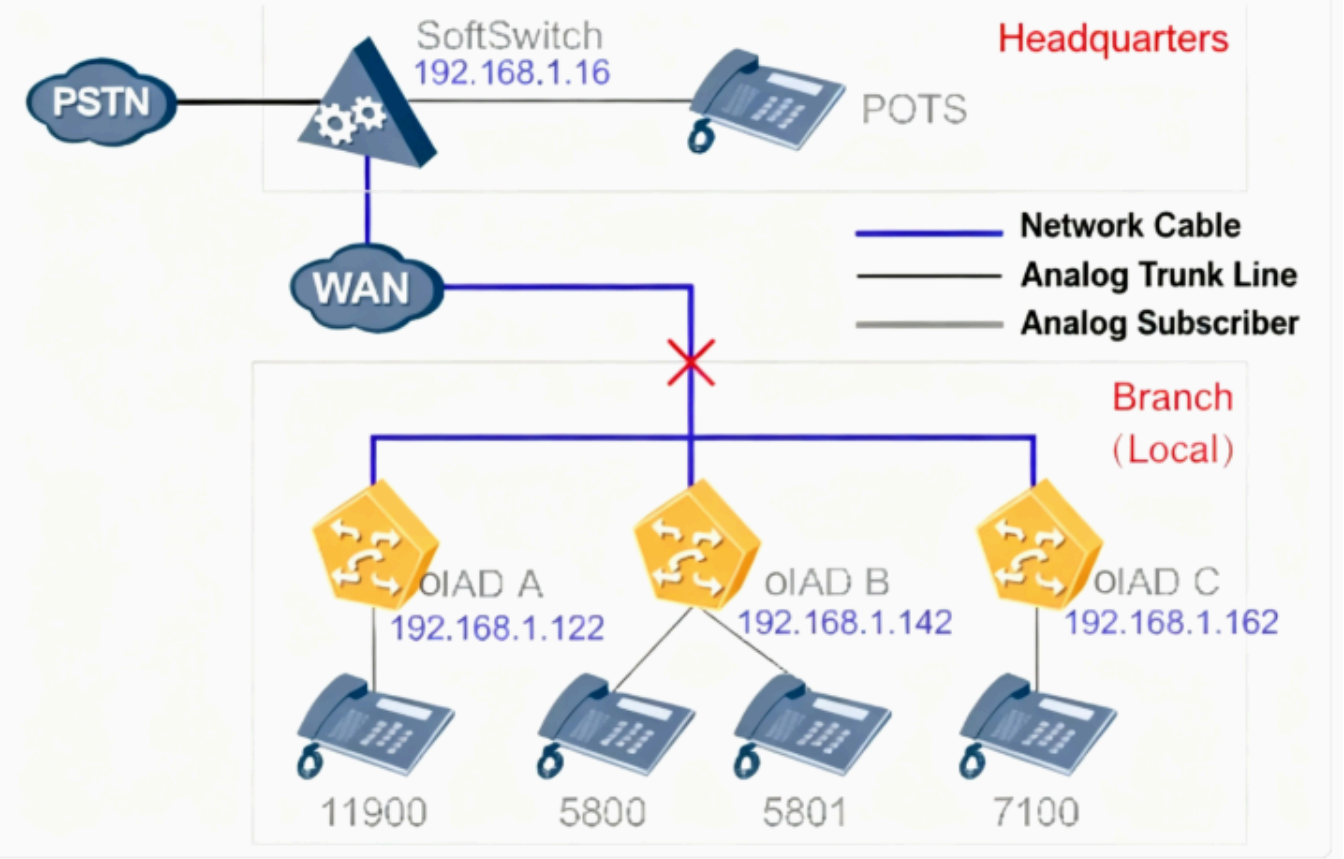
- **Offline local switching (offline self-switching)**
  - When the upstream IP-PBX/network is interrupted, only local extensions can call each other
  - Both the call source and destination are on the gateway's local FXS port or locally registered SIP extension
- **Local self-switching**
  - In addition to local extensions calling each other, the outside lines connected to the gateway can continue to work.
  - Incoming calls on outside lines: The gateway locally directly transfers the outside line incoming call to the specified extension or ring group.
  - Extension outgoing calls: When an extension dials an outside line number, the gateway locally selects an available outside line port to initiate the call.

Prerequisites

When selecting the static IP address method, self-switching between this OIAD or multiple OIADs is supported. However, when selecting the DHCP method, only user self-switching under this device is supported.

Typical Network Topology

Typical network topology and related data planning are shown in the figure below.



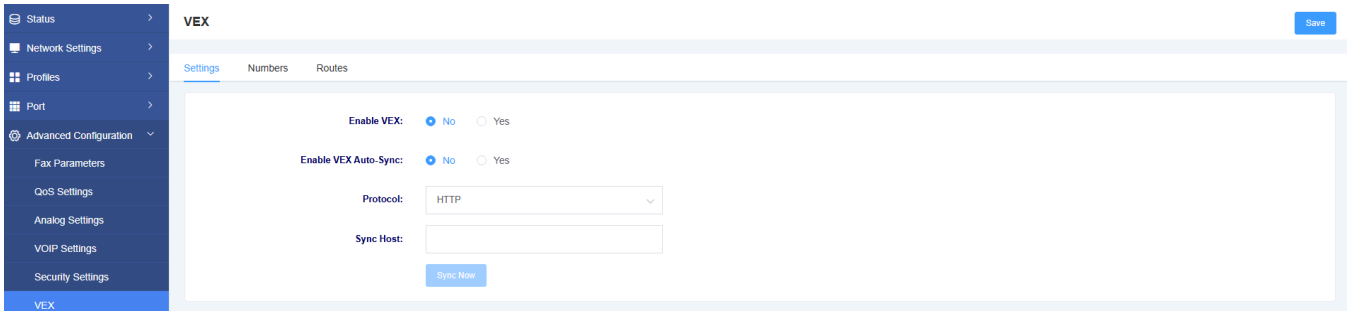
6.6.5.1 Local Self-Switching

Self-Switching Configuration

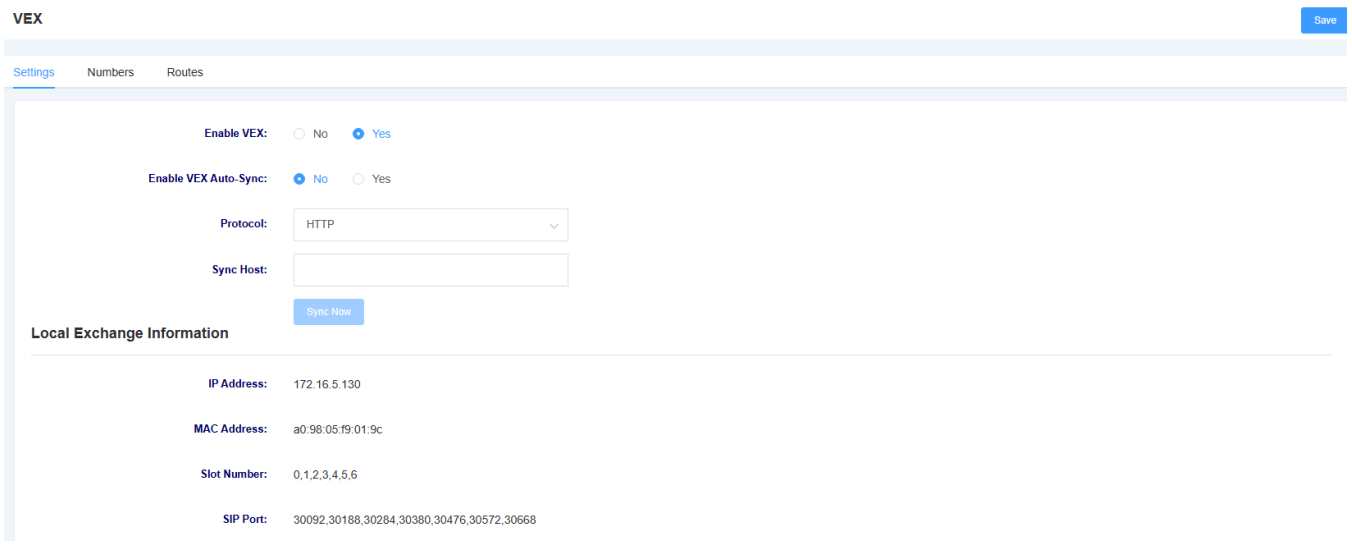
Through the navigation bar "Advanced Configuration -> Self-Switching", the specific configuration interface is shown. Generally, self-switching configuration is divided into primary and secondary OIAD configuration.

- Gateway A's FXO port connects to an outside line, FXS port connects to analog phone 1001
- Gateway B's port 1 connects to an analog phone, with extension number registered as 1002

Primary Device Configuration

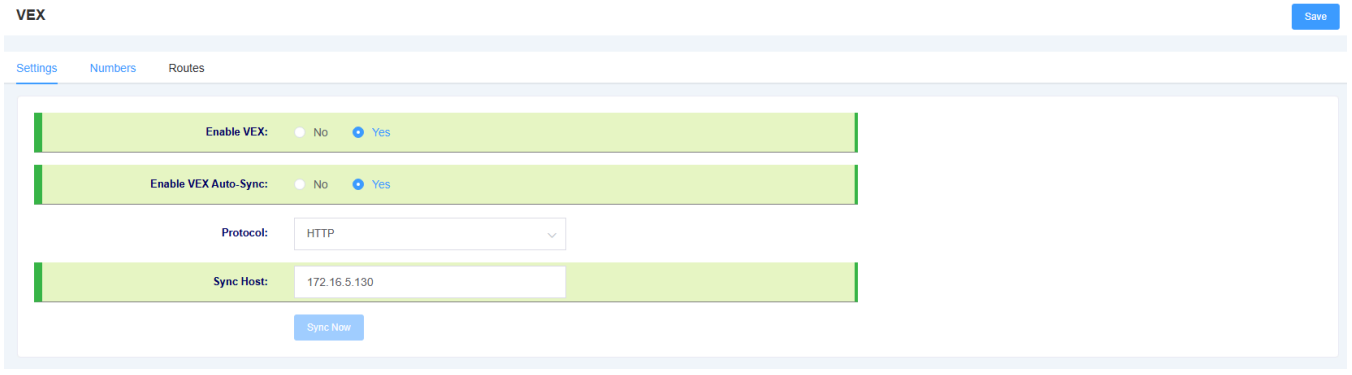


1. Click to enable self-switching and save. The page will display the device's local self-switching information. Different slots correspond to different ports.

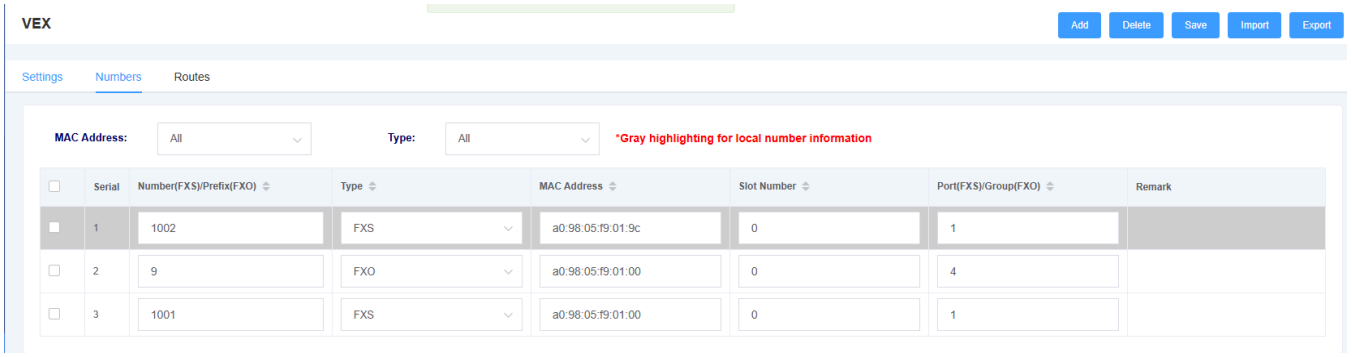


2. Configure the number table and routing table for all devices, click Add
    - If you want to configure extensions for this device, you must first check "This Device".
    - Select to configure FXS or FXO.
    - The number is the starting extension number. If configuring FXO type, enter the prefix.
    - The MAC address is the MAC address of the device to be configured. When "This Device" is checked, the MAC address does not need to be filled in.
    - Pay attention to the slot number to know which slot is being configured.
    - The port number is the starting port number for your configuration. For this device, ports 5-8 are FXS ports, so enter 5. If it is FXO type, enter the FXO group number.
    - If the creation quantity is 4, it will sequentially increment from the starting extension number.
3. After creating extensions, click Save, then click Auto-Generate in the routing table.

Secondary Device Configuration



And click Sync Now to see the corresponding new entries in the number table of the secondary device.

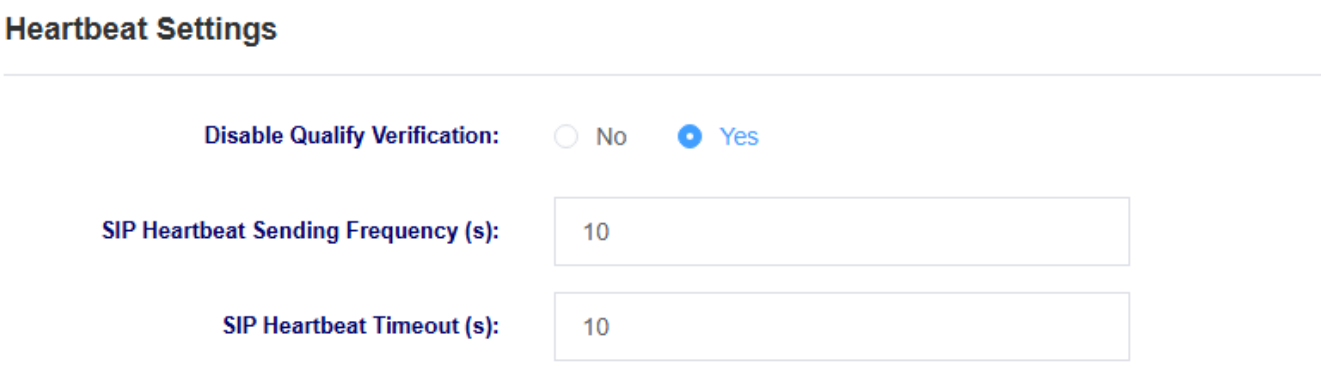


After synchronization is complete, according to the number table, you can interoperate between any two different ports.

6.6.5.2 Offline Self-Switching

After the server disconnects, if the called number is an extension of our gateway, the call will directly reach the extension.

The configuration is as follows. Through "Template", select any template. Make sure the port uses this template and set the heartbeat mechanism accordingly.



This will enable the following scenario:

1. When the PBX is online, FXS ports on the same interface board that are bound to SIP extensions can call each other, FXS ports on different interface boards that are bound to SIP extensions can also call each other, and calls are normal.
2. Disconnect the PBX network cable, after approximately 10 seconds, FXS ports on the same interface board that are bound to SIP extensions can call each other, FXS ports on different interface boards that are bound to SIP extensions can also call each other.
3. Reconnect the PBX network cable, after approximately 10 seconds, FXS ports on the same interface board that are bound to SIP extensions can call each other, FXS ports on different interface boards that are bound to SIP extensions can also call each other, and calls are normal, with calls routing through the PBX side.
4. If SIP heartbeat transmission frequency is set to 0 (heartbeat detection disabled), repeat the above test. If the PBX network cable is disconnected, port-to-port calls will fail. If the PBX network cable is reconnected, normal operation can be restored.

7 Maintenance

Backup Data Files

This section describes how to backup data files. Data files include UScale S132/S196/S1224 OIAD system configuration files, SIP user information files, and self-switching routing information files.

Tools Required

Describes the tools or software that enterprise administrators need to use when performing daily operations and maintenance of this business system.

Check Device Operating Status

Maintenance personnel can judge whether the device's operating status is normal by observing the indicator lights.

Observe Indicator Lights

From the indicator lights, you can understand the operating status of UScale S132/S196/S1224 OIAD.

Check Machine Room Temperature

You can check the machine room temperature using a thermometer.

Check Machine Room Humidity

You can check the machine room humidity using a hygrometer. Appropriate machine room humidity can ensure normal device operation.

Device Dust Removal and Maintenance

Device dust removal and maintenance includes board dust removal and fan box dust removal.

Check Spare Parts Inventory

Check the quantity of spare parts to ensure sufficient spare parts are available.

How to View System Information

The system information of UScale S132/S196/S1224 OIAD mainly includes device version information, IP address, interface status, and RTP statistics.

Configure System Time

Alarm reporting, call tracking, and log output on UScale S132/S196/S1224 OIAD all require accurate time as reference.

Modify IP Address

When the network environment changes or the network is not connected, you may need to modify the device's IP address. This section describes how to modify the IP address of UScale S132/S196/S1224 OIAD.

Configure IP Whitelist

The IP whitelist function authenticates the user IP address logging into UScale S132/S196/S1224 OIAD. If the whitelist function is set, when your IP address is within the whitelist range, you can access the UScale S132/S196/S1224 OIAD management system through the Web or Telnet method. If your IP address is not within the whitelist range, please log into the UScale S132/S196/S1224 OIAD management system through the serial port method.

Restore Factory or Operator Configuration

This chapter describes how to restore factory or operator configuration data.

Backup and Load Configuration Information

This section describes how to backup and load configuration information.

Manually Load Data Files

This section describes how to manually load data files. Data files include UScale S132/S196/S1224 OIAD system configuration files, SIP user information files, and self-switching routing information files.

Backup and Load SIP User Information

This section describes how to backup and load SIP user information.

Backup and Load Self-Switching Routing Information

This section describes how to backup and load self-switching routing information.

Control Terminal Information Output

Terminal information output control management includes: setting the information output switch and information output level for each terminal. Upgrade UScale S132/S196/S1224 OIAD software when obtaining the latest version software to update the software version.

Reboot

When the system is abnormal, you can try to reset the system by rebooting the device, or for configuration operations that require reboot to take effect, please reboot the device.

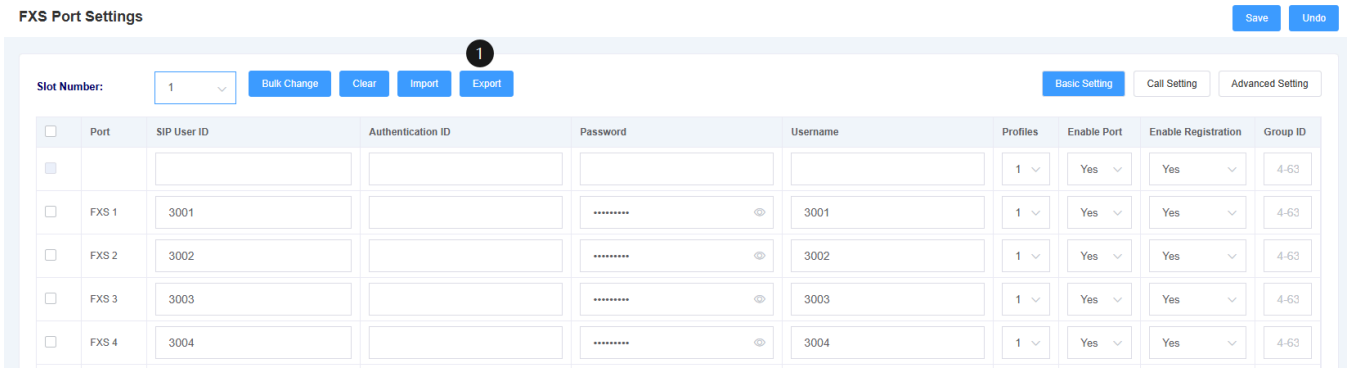
Security Maintenance

This chapter describes the security maintenance concepts and methods for UScale S132/S196/S1224 OIAD products.

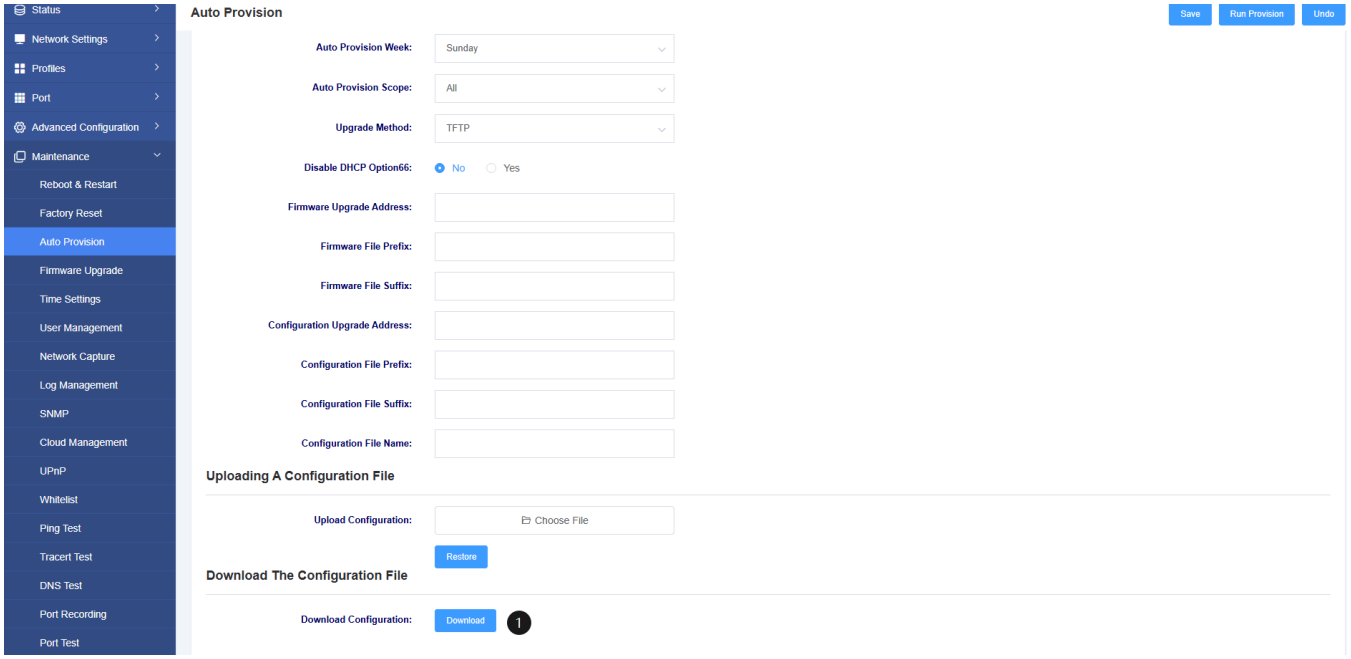
7.1 Backup and Recovery

This section describes how to backup data files. Data files include UScale S132/S196/S1224 OIAD system configuration files, SIP user information files, and self-switching routing information files.

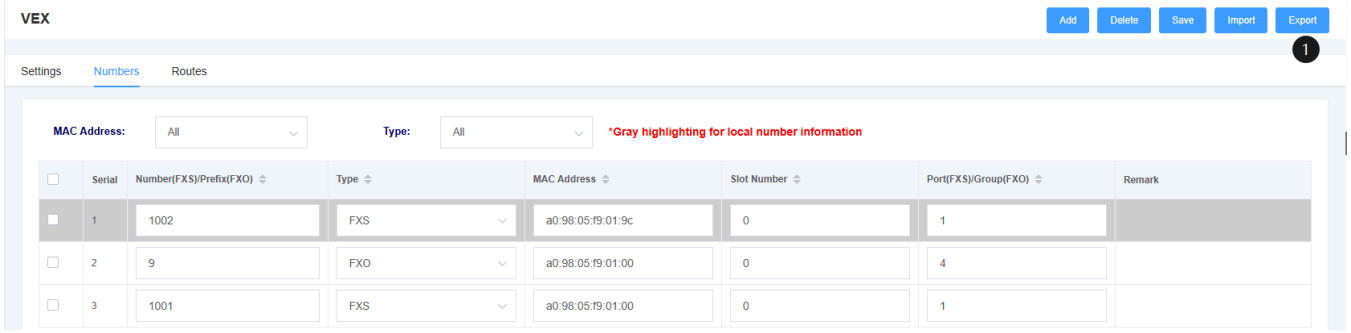
(1) Backup SIP extension information. Through "Ports -> FXS Port Settings", click the export button as shown below.



(2) Backup system files. Through "Maintenance -> Auto Deployment", click Download Configuration File.



(3) Through "Advanced Configuration -> VEX", on this interface, click the "Export" button.



7.2 Check Machine Room Temperature

You can check the machine room temperature using a thermometer.

NOTICE

Appropriate machine room temperature can ensure normal device operation. Excessively high temperatures are very harmful. Prolonged high temperatures will accelerate the aging process of insulation materials, greatly reducing device reliability and seriously affecting its lifespan.

Reference Standards

Machine room temperature needs to be controlled between 0ºC and 45ºC.

Operation Steps

Observe the indication of the thermometer in the machine room.

Abnormal Handling

Control room temperature through air conditioning. If the air conditioning fails, please repair or replace it promptly.

7.3 Check Machine Room Humidity

You can check the machine room humidity using a hygrometer. Appropriate machine room humidity can ensure normal device operation.

Machine room relative humidity should be controlled at 5% to 95% RH, without condensation.

Operation Steps

Observe the indication of the hygrometer in the machine room.

Abnormal Handling

- If the machine room's relative humidity is too high, consider installing dehumidification equipment for the machine room.
- If the machine room's relative humidity is too low, consider installing humidification equipment for the machine room.

7.4 Check Device Grounding

Reference Standards

- All connection points should have good contact, with no looseness or corrosion defects.
- Grounding resistance ≤ 5Ω

Check Grounding System

Operation Steps

1. Check whether the device's grounding wire has damage, aging, corrosion, or arc burn defects or hazards.
2. Check whether the connection terminals and fastening bolts of the device's grounding wire make good contact, and whether there are obvious looseness or corrosion defects.
3. Use a multimeter to check the grounding condition of the device.

   a. Set the multimeter to the resistance range, connect one test lead to a fixed grounding point in the machine room (the test lead may need to be extended), then use the other test lead to measure the grounding point of the device. Considering the measurement accuracy of the multimeter, the measured resistance value of the grounding point should be around 5Ω.

   b. If the measured resistance value of the grounding point is significantly greater than 5Ω, maintenance

personnel should immediately check the grounding wire, connection terminals, and fastening bolts of the grounding point, and take appropriate measures to rectify them.

4. Use a ground resistance meter to measure the grounding resistance of the machine room grounding network, which should be ≤ 5Ω.

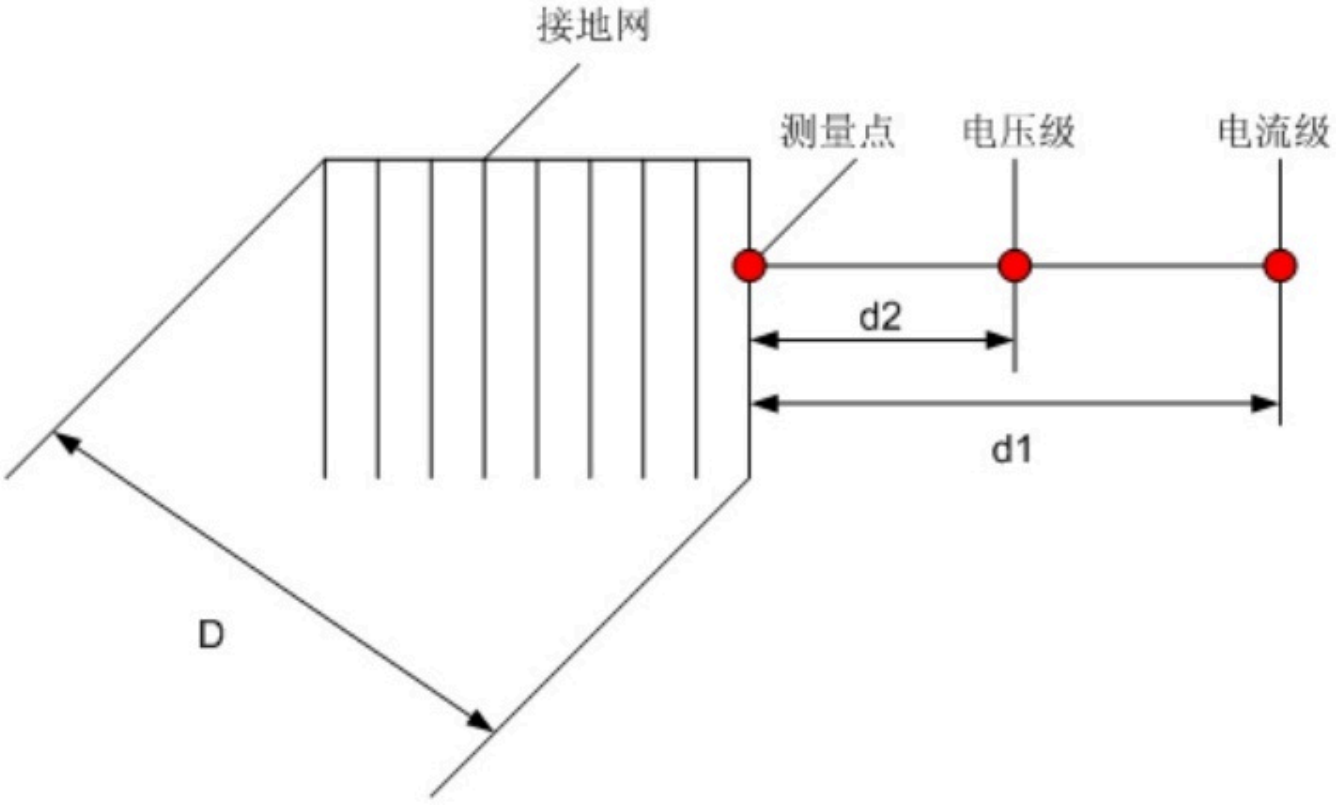
Abnormal Handling

- If the connection wire is loose or has poor contact, tighten it.
- If the connection wire is corroded, replace the connection wire.
- If the grounding resistance does not meet requirements, improve the grounding environment.

Measure Grounding Resistance

Operation Steps

It is recommended to use a ground resistance meter to measure the grounding resistance of the machine room grounding network. When measuring, the voltage pole and current pole arrangement of the ground resistance meter is as follows:



1. The distance between the current pole and the grounding network edge is d1, which is generally 4 to 5 times the maximum diagonal length D of the grounding network, so that a gentle area appears in the potential distribution between them.
2. The distance between the voltage pole and the grounding network edge is d2, which is generally 50-60% of the distance d1 from the current pole to the grounding network.
3. When measuring, move the voltage pole three times along the line connecting the grounding network and the current pole, with each movement approximately 5% of d1. If the three measured resistance values are relatively close, you can take the average of the three as the grounding resistance of the grounding network.
4. If d1 of 4D to 5D is difficult, then in areas with relatively uniform soil resistivity, d1 can be 2 times D, and

d2 can be D; in areas with non-uniform soil resistivity, d1 can be 3 times D, and d2 can be 1.7 times D.

The current pole and voltage pole should be arranged in a direction perpendicular to the line or underground metal pipeline. Avoid measuring grounding resistance immediately after rain.

Abnormal Handling

If grounding resistance does not meet requirements, improve the grounding environment.

7.5 Device Dust Removal Maintenance

Device dust removal maintenance includes board dust removal and fan box dust removal.

Board Dust Removal

Describes how to perform dust removal maintenance on all boards inside the chassis.

Fan Box Dust Removal

If the fan box has excessive dust, dust removal of the fan box on the left side of the chassis rear panel is needed.

7.5.1 Board Dust Removal

Describes how to perform dust removal maintenance on all boards inside the chassis.

Reference Standards

Boards should have no dust attached.

- All operations must strictly use anti-static measures, such as operating on an anti-static workbench, maintenance personnel wearing anti-static clothing, anti-static wristband, and anti-static gloves.
- To reduce maintenance risk, board dust removal operations should be performed during periods of low system traffic, such as 2:00 AM to 4:00 AM.
- The selection of cleaning agents must strictly comply with national relevant standards, otherwise it will cause unpredictable damage to boards.

Operation Steps

1. Prepare a spare board

When maintenance personnel decide to perform dust removal maintenance on all boards in the chassis, they should first prepare a spare board for each type of board in the chassis.

2. Replace the board to be dust-cleaned

To reduce maintenance risk, maintenance personnel must strictly follow the board replacement procedure by first using a spare board to replace the board to be dust-cleaned. After ensuring the new board operates normally, then proceed to the next step of dust removal operation. Board replacement must strictly follow operational procedures.

3. Perform dust removal on the board

There are many methods for board dust removal. The general principle is not to damage the physical and electrical characteristics of the board. Two commonly used dust removal methods are:

- Vacuum cleaner method

Use a clean and dry anti-static soft brush to gently brush away dust from the board surface, while pointing the vacuum cleaner nozzle at the brush, brushing and vacuuming simultaneously.

The vacuum cleaner method has the advantage of simple operation and low cost; the disadvantage is that dust removal is not thorough and cannot remove harmful gases attached to the board surface.

- Cleaning agent method

Use special anhydrous, non-corrosive, non-conductive, and highly volatile board cleaning agents for dust removal, such as isopropanol (IPA).

 **Note**

When using IPA and other cleaning agents, please wear a mask during operation to avoid inhaling large amounts of cleaning agent.

The cleaning agent method has the advantage of more thorough dust removal and can remove most harmful gases attached to the board surface; the disadvantage is that operation is relatively complex and the cost is higher.

4. Cyclical replacement dust removal operation

Due to the limitation of spare parts quantity, it is not possible to replace all boards to be dust-cleaned at once with spare boards. However, you can recycle already dust-cleaned boards to replace other boards of the same type to be dust-cleaned to achieve safe maintenance.

Abnormal Handling

If the board has excessive dust, perform board dust removal operation. Please refer to the operation steps for detailed operation methods.

7.5.2 Fan Box Dust Removal

If the fan box has excessive dust, dust removal of the fan box on the left side of the chassis rear panel is needed.

Reference Standards

Fan box should have no dust attached.

NOTICE

- The entire disassembly, cleaning, and installation process should not exceed 60 minutes, otherwise it will seriously threaten the safe and stable operation of equipment inside the chassis.
- If there is a spare fan box, please first clean the spare fan box, then use the spare fan box to replace the fan box to be dust-cleaned.

Operation Steps

1. Disassemble the fan box.

   a. Use a Phillips screwdriver to remove the two bolts fixing the fan box.

   b. Slowly pull the fan box outward until you completely remove it from the chassis.

2. Clean the fan box.

Use clean cotton cloth, anti-static soft brush, or vacuum cleaner and other tools to remove dust from the fan blades and other parts of the fan box.

3. Install the fan box

Quickly install the dust-removed fan box into the chassis, then use a Phillips screwdriver to tighten the two bolts fixing the fan box.

7.6 Check Spare Parts Inventory

Check the quantity of spare parts to ensure sufficient spare parts are available.

Reference Standards

- According to the hardware configuration of the device, each type of board should have at least one spare board; at least one spare fan box.
- All spare parts should be stored well, with no damage, cracks, corrosion, or other defects.

Operation Steps

- Check by counting whether there are sufficient spare parts.
- Check whether the condition of spare parts is well preserved.

Abnormal Handling

- Damaged spare parts or replaced components should be returned for repair promptly.
- If there are no spare parts or insufficient quantity, you can contact the service provider to purchase. When purchasing, you need to provide the SN number of the spare part.

7.7 Check Storage Environment

You can check the storage environment of spare parts through thermometer and hygrometer.

Reference Standards

- Warehouse temperature needs to be controlled between -40°C and 70°C.

- Warehouse relative humidity needs to be controlled between 5% and 95% RH, without condensation.

Operation Steps

- Observe the indication of the thermometer in the machine room.
- Observe the indication of the hygrometer in the machine room.

Abnormal Handling

- Control warehouse temperature through air conditioning. If the air conditioning fails, please repair or replace it promptly.
- Control warehouse humidity by installing dehumidification equipment or humidification equipment.

7.8 Configure IP Whitelist

IP whitelist function authenticates the user IP address logging into UScale S132/S196/S1224 OIAD. If the whitelist function is set, when your IP address is within the whitelist range, you can access the UScale S132/S196/S1224 OIAD management system through the Web or Telnet method. If your IP address is not within the whitelist range, please log into the UScale S132/S196/S1224 OIAD management system through the serial port method.

If in a special scenario, UScale S132/S196/S1224 OIAD must be deployed on the Internet, please configure an IP whitelist on UScale S132/S196/S1224 OIAD to avoid the risk of malicious users on the Internet scanning and probing the management plane of UScale S132/S196/S1224 OIAD. If the whitelist is not set, any PC that can ping this UScale S132/S196/S1224 OIAD can log into it.

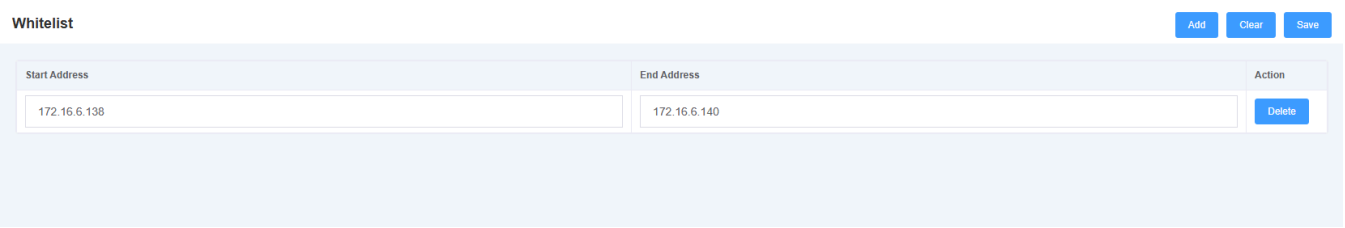
Configuration Example

Allow users with the following IP addresses to access this UScale S132/S196/S1224 OIAD via Telnet or Web method:

- 172.16.6.138 - 172.16.6.140

Web Method

1. In the navigation bar, select "Maintenance > Whitelist", the interface appears as shown in Figure 1, and add the above address range.



2. Use a device not in this network segment to log in, displaying restricted access message.

Note

The IP address of the PC currently logging into UScale S132/S196/S1224 OIAD should be in the first whitelist record, otherwise the current PC will not be able to access UScale S132/S196/S1224 OIAD via Telnet or Web method for configuration.

Abnormal Handling

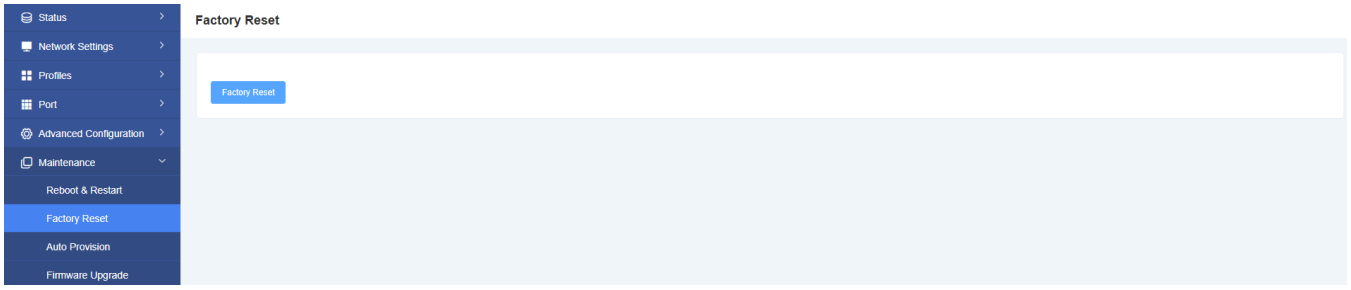
If the IP address of the PC currently logging into UScale S132/S196/S1224 OIAD is not within the whitelist range, you can log into UScale S132/S196/S1224 OIAD through the serial port method to modify the configuration.

7.9 Restore to Factory Settings

This chapter describes how to restore factory or operator configuration data.

Web Method

In the navigation bar, select "Maintenance > Restore to Factory", the data recovery interface appears, select one of them, click "OK". After performing the recovery operation, the system needs to be restarted for the configuration to take effect.



Note

After restarting, the configuration data is restored to factory configuration, so please use address 192.168.6.65, username admin, and password admin to log in to the Web management system again. When the device leaves the factory for the first time, the IP address of UScale S132/S196/S1224 OIAD is 192.168.6.65.

7.10 Upgrade Product Software

When obtaining the latest version software, you can update the software version.

Background Information

For the latest software version acquisition path and upgrade details, please refer to the UScale S132/S196/S1224 OIAD product upgrade guide.

The upgrade guide can be obtained from the OpenVox technical support website https://www.openvox.com.cn/. Access path: "Technical Support > Firmware Download". On this page, select the main control/interface board for download and upgrade according to the help of technical support engineers.

模拟网关 系统固件

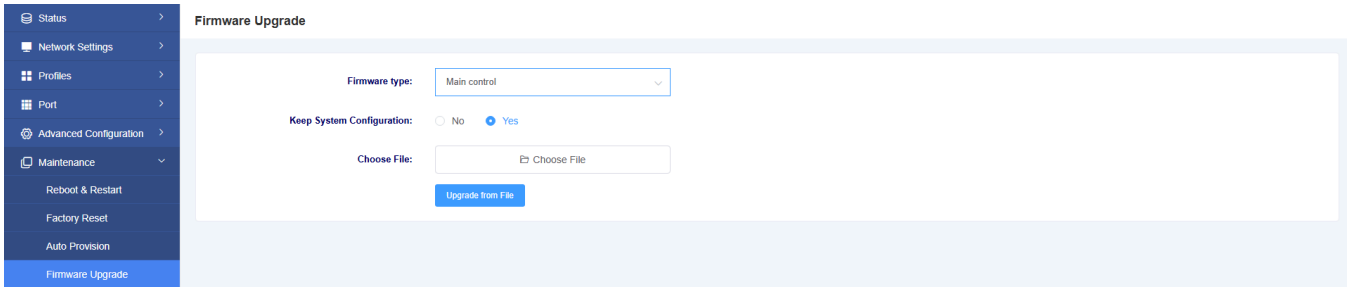
模拟网关 OIAD系统固件

⚠ 不同机型的固件互不兼容。请选择正确的固件来更新对应型号的模拟网关设备。

版本	型号	日期	说明	文件
2.2.9	iAG200/400	2025-10-17	版本说明	BIN
2.2.9	GWM801	2025-10-17	版本说明	BIN
2.2.9	MAG1000/iAG801	2025-10-17	版本说明	ZIP
2.2.9	MAG1100 主控	2025-10-17	版本说明	ZIP
2.2.9	MAG1100 接口板	2025-10-17	版本说明	BIN
2.2.9	iAG800	2025-10-17	版本说明	BIN
2.2.9	iAG802/MAG2000	2025-10-17	版本说明	ZIP
2.2.9	NX32	2025-10-17	版本说明	ZIP
2.2.9	MAG2100主控	2025-10-17	版本说明	ZIP
2.2.9	MAG2100接口板	2025-08-27	版本说明	BIN
2.2.9	S196&S1224主控	2025-08-27	版本说明	ZIP
2.2.9	S196&S1224接口板	2025-08-27	版本说明	ZIP

Upgrade Method Introduction

Through the navigation bar "Maintenance > Firmware Upgrade", select the firmware type (main control/interface), whether to retain system configuration, and select the firmware file for upgrade.

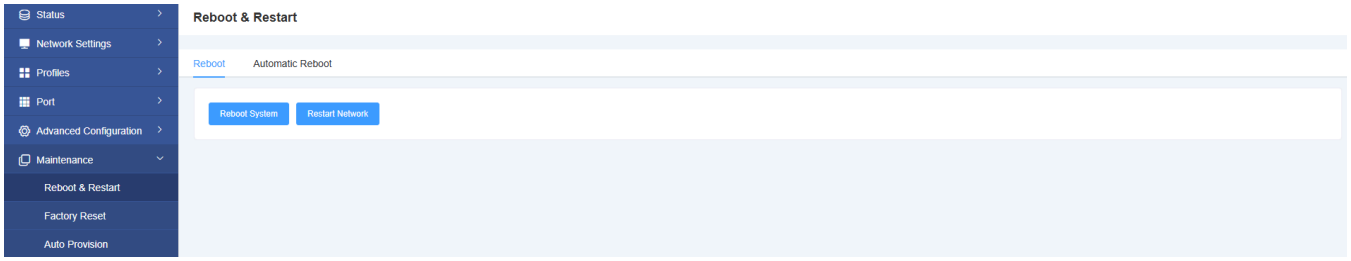


7.11 Reboot

When the system is abnormal, you can try to reset the system by rebooting the device, or for configuration operations that require reboot to take effect, please reboot the device.

Web Method

In the navigation bar, select "Maintenance > Reboot", click "Reboot System". Rebooting the device takes approximately a few minutes; please wait patiently.



7.12 Security Maintenance

This chapter describes the security maintenance concepts and methods for UScale S132/S196/S1224 OIAD products.

7.12.1 Security Maintenance Overview

7.12.1.1 Purpose of Security Maintenance

Currently, application systems face increasingly serious security threats. Once problems occur, they may face business interruption, reduced revenue, or even system collapse. Therefore, operators need to build and maintain a complete security barrier for the entire application system from multiple levels and identify and resolve various potential security issues in advance.

Additionally, due to the constant emergence of security vulnerabilities, relying entirely on technology is difficult to fully ensure application system security. Therefore, operators need to establish security management systems based on security maintenance recommendations and problems discovered daily to ensure secure and normal system operation.

7.12.1.2 What is Layered Security Maintenance

Based on the objects and purposes of security maintenance, maintenance personnel need to perform security maintenance on business systems from different levels.

Application Layer

The purpose of application layer security maintenance is to ensure from a security perspective that UScale S132/S196/S1224 OIAD products and supporting Web management systems can operate normally and provide services externally.

System Layer

The purpose of system layer security maintenance is to ensure that the operating system can operate normally to support the operation of various application software at the application layer.

System layer security maintenance is generally implemented based on the maintenance terminal or maintenance tools corresponding to the maintenance object.

Network Layer

The purpose of network layer security maintenance is to ensure that network devices such as switches, routers, and firewalls operate normally and ensure that network layer security policies are implemented.

Network layer security maintenance is generally implemented based on the maintenance terminal or maintenance tools corresponding to the maintenance object.

Management Layer

The purpose of management layer security maintenance is to strengthen human management and prevent problems before they occur. Management layer maintenance involves all the above aspects.

7.12.1.3 UScale S132/S196/S1224 OIAD Product Security Overview

Based on the physical network topology of UScale S132/S196/S1224 OIAD products, perform layered security protection to ensure secure operation of the application system.

UScale S132/S196/S1224 OIAD Layered Security Protection

The security of UScale S132/S196/S1224 OIAD products can be divided into four levels, each providing different security solutions and security services.

- **Application Layer Security**
  - Password policy, authentication, alarms, data protection, log management, etc.
- **System Layer Security**
  - System layer security solutions protect operating systems and services that applications depend on.
- **Network Layer Security**
  - Based on NAT (Network Address Translation) technology, hide local LAN users from outside, improving the security of internal hosts.
  - Separate different VLANs
- **Management Layer Security**
  - Avoid the risk of system attacks through comprehensive and correct security policies, standards, operating procedures, guides, etc.
  - It is also important to manage system administrators, including management of their responsibilities and some "soft controls". These "soft controls" include developing and issuing security policies, standards, operating procedures, and guides; selecting personnel, training security awareness, monitoring system behavior, controlling change processes, etc.

7.12.2 Replace Security Certificates

7.12.2.1 Replace HTTPS Digital Certificate

Describes how to replace the HTTPS digital certificate of UScale S132/S196/S1224 OIAD to ensure communication security.

Background Information

UScale S132/S196/S1224 OIAD comes pre-loaded with the default HTTPS digital certificate provided by OpenVox Communications before delivery for accessing UScale S132/S196/S1224 OIAD.

The HTTPS digital certificates of UScale S132/S196/S1224 OIAD include:

- webrootcert: HTTPS root certificate, certificate name is sslservercert.cer
- webservercert: HTTPS server certificate, certificate name is sslservercert.pem
- webserverkey: HTTPS server key, certificate name is sslservercertkey.pem

For security reasons, it is recommended that customers remove the default certificate and replace the default certificate with one generated by themselves or obtained from official institutions, and update it regularly.

Prerequisites

- HTTPS certificates have been generated by yourself or obtained from official institutions and saved.

Operation Steps

UScale S132/S196/S1224 OIAD supports loading HTTPS digital certificates from FTP/TFTP/FTPS servers. The operation steps are as follows:

Note

Please first save the root certificate on the FTP/TFTP server and ensure that UScale S132/S196/S1224 OIAD is network connected with the FTP/TFTP server and FTP/TFTP service is enabled on the FTP/TFTP server. For FTP/TFTP server operation, please refer to how to use FTP/TFTP tools.

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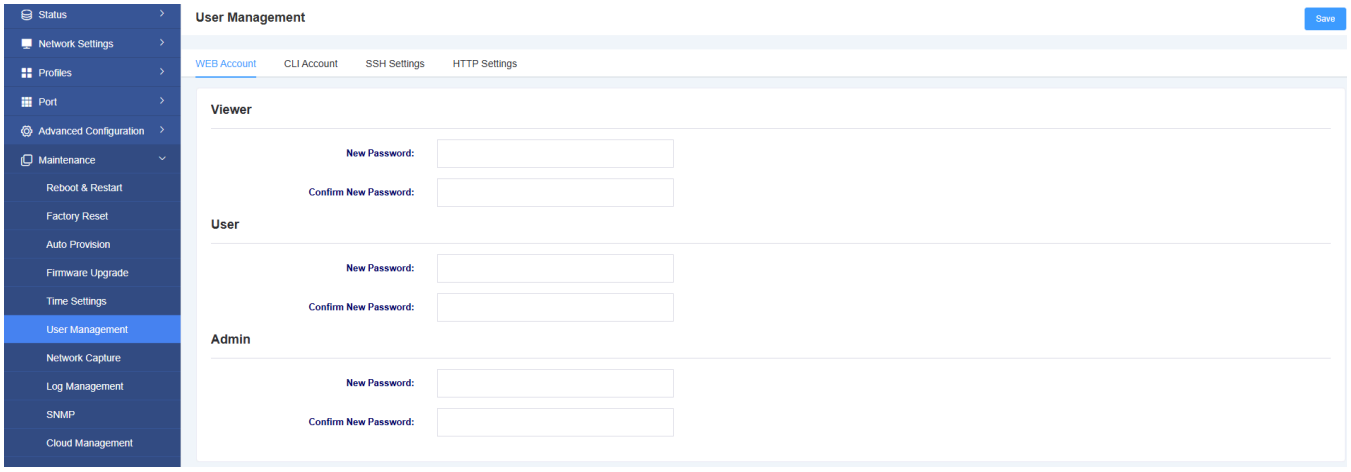
1. Load HTTPS root certificate webrootcert. For example, load HTTPS root certificate from a TFTP server with IP address 192.168.1.200.
2. Load HTTPS server certificate webservercert. For example, load from a TFTP server with IP address 192.168.1.200.

7.12.3 Application Layer Security

Change Account Password

1. Log in to UScale S132/S196/S1224 OIAD Web management system with the username admin and default password admin. Through the navigation bar "Maintenance > User Management", you can change the account password.



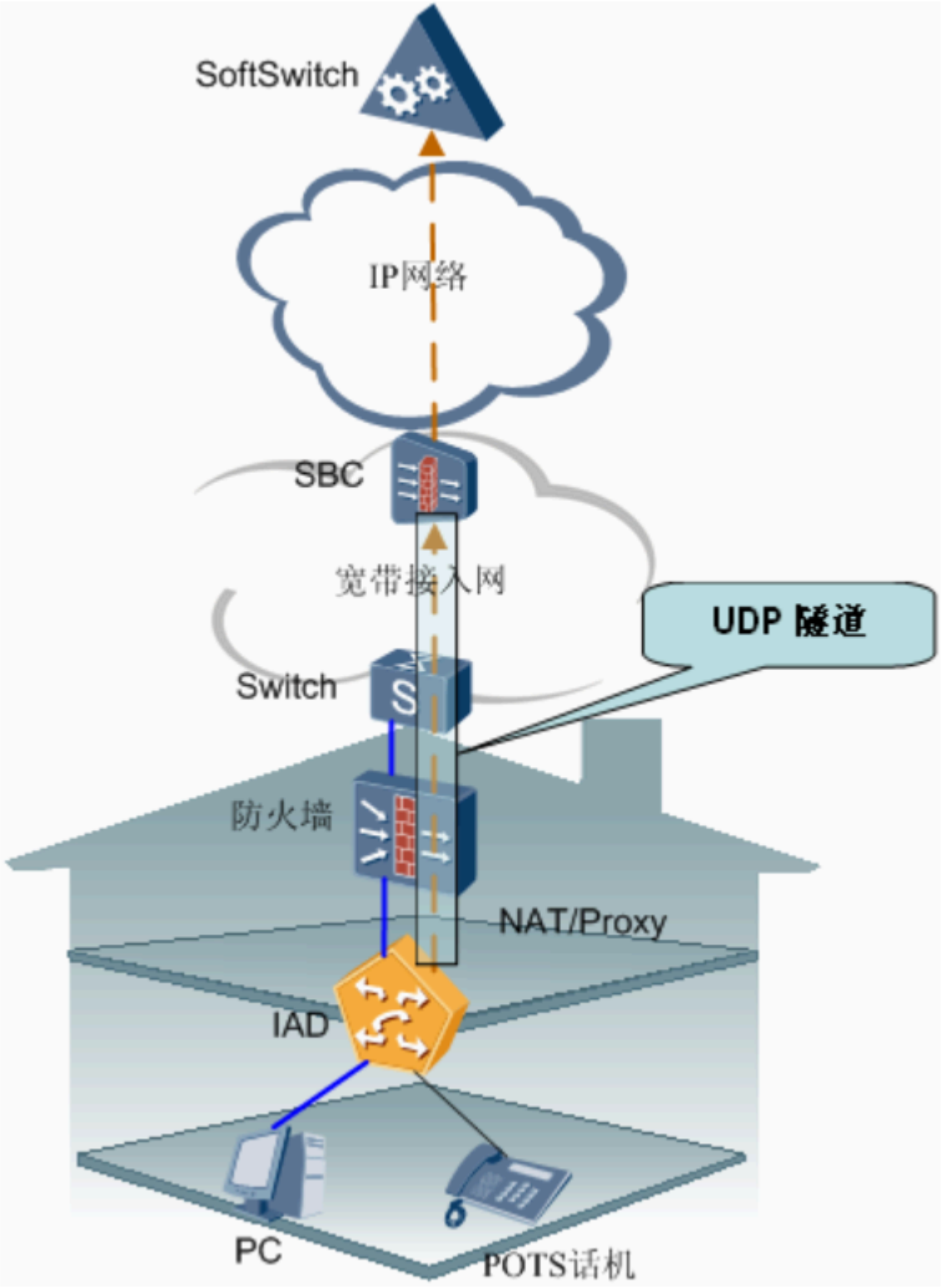
7.12.4 System Layer

UScale S132/S196/S1224 OIAD adopts embedded Linux operating system, providing higher security and virus immunity than Windows operating systems.

7.12.5 Network Layer Security

7.12.5.1 Secure Network Topology

The safe network planning of UScale S132/S196/S1224 OIAD is as follows:



- Deploy SBC device on the public network, SBC realizes NAT traversal through Proxy function.
- UScale S132/S196/S1224 OIAD automatically sets the address of SoftSwitch to the address of SBC and establishes UDP tunnel with SBC to achieve firewall traversal.

- When UScale S132/S196/S1224 OIAD registers to SoftSwitch, SBC creates a mapping between UScale S132/S196/S1224 OIAD's outbound public network address and UScale S132/S196/S1224 OIAD.

All IAD uses the same UDP port number to register with SoftSwitch, so it is necessary to enable "ISMUDP UDP port reuse" function on the SBC. Please refer to the SBC related chapter for specific operations.

- When UScale S132/S196/S1224 OIAD starts a call, SBC modifies the corresponding address information and sends the message to the real SoftSwitch.
- Signaling flow and media flow will be forwarded through SBC to achieve NAT traversal while protecting the security of the core network. At the same time, media flow between UScale S132/S196/S1224 OIAD under the same NAT device can be forwarded without going through SBC.

7.12.5.2 VLAN Inspection

VLAN (Virtual Local Area Network) logically divides a physical LAN into multiple broadcast domains. Hosts within a VLAN can communicate directly, while VLANs cannot directly interoperate, thus limiting broadcast messages to a VLAN. Since VLANs cannot directly access each other, this improves network security.

Please check whether VLAN configuration information and related IP addresses are abnormal. If abnormality is found, handle it promptly.

- View VLAN enable status

This section describes how to view the VLAN enable status.

- View VLAN configuration information

This section describes how to view configured VLAN information.

7.12.6 Management Layer Security

This section provides management suggestions for operators' daily security maintenance to be used by operators when formulating security management systems and implement them to ensure system security.

7.12.6.1 System Maintenance Security Principles

Principle of Least Functionality

- Least services and components.
- Distinguish the purpose and role of servers, and prohibit installation of unnecessary services and components.
- The internal components of services should also adopt the above principles for reduction.

Principle of Least Accounts

- Implement strict account management and enforce strict account policies.
- Strictly control the addition, modification, and deletion of accounts in the system.

Principle of Least Privilege

- Reduce the privileges of system services and accounts as much as possible.
- Strictly control authorization on the operating system.
- Prohibit unnecessary account access to unnecessary resources.

Principle of Specialization

- Avoid using one host for multiple service roles.
- Partition specialization, isolate system, application, and data partitions.

Principle of Audit

- Monitor operating system behavior through logs and other feasible methods.
- Implement audit on failed access to important system resources.
- Implement audit on successful access to critical system resources.
- Implement audit on both successful and failed cases of modifying access control policies.

7.12.6.2 Account and Password Maintenance Recommendations

User identity authentication is the gateway of the application system. The complexity and validity period of user accounts and passwords need to be configured according to the security requirements of the operator.

Maintenance recommendations for passwords are as follows:

- Dedicated personnel manage host passwords.
- Use encryption when transferring passwords; avoid transmitting passwords via email.
- Passwords need to be encrypted for storage.

7.12.6.3 Log Maintenance Recommendations

Use log records to help discover suspicious activities. The system should record logs for important operations (including system parameters, tariff configuration and release, etc.). Protect log files through system hardening.

 **Note**

- The system only records non-query class operation logs.
- The system preserves a maximum of 512 logs. When the log space is full and new logs are generated, the system automatically deletes old logs.

Regularly Check Logs

Regularly view system logs, application logs, and security logs. If abnormal logs are found, report promptly to the superior department. If you cannot determine the cause or cannot resolve it yourself, seek help from the local branch or call 800 or 400 to contact OpenVox Communications.

Regularly Backup Logs

Logs should be backed up regularly, and backup files should be archived on external media (disks, tapes, optical disks, etc.). Logs should be deleted promptly after backup to free up log space.

7.12.6.4 Backup Recommendations

For security protection purposes, please backup in the following scenarios:

- Perform full system data backup before and after hardening.
- Backup before and after daily security configuration maintenance and troubleshooting.
- Backup during patch installation and upgrades. Please refer to the corresponding guide.

For detailed backup and recovery operations, please refer to product documentation.

7.12.6.5 Defect Report Recommendations

If an operator reports to OpenVox that the system has been attacked, OpenVox will adopt one of the following two handling methods depending on the specific circumstances of the attack:

- If a security incident occurs on site, OpenVox technical support engineers will provide remote or on-site support, work with operator personnel to mitigate the impact of system attacks, and improve the handling process of on-site incident reports.
- If no security incident has occurred, OpenVox technical support engineers will record the issue in the database and forward it to the R&D team. After the R&D team identifies a solution, technical support engineers will analyze the impact of implementing the solution on on-site operations and provide recommended remediation methods.

7.12.6.6 Security Emergency Response Mechanism

Operators need to establish an emergency response and handling mechanism for security incidents to ensure that when a security incident occurs, production can be recovered and problems solved quickly, minimizing losses.