

HUAWEI IdeaHub Enterprise 21.0

Product Overview

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1 Product Positioning

HUAWEI IdeaHub Enterprise, available in titanium gray and jade white appearance, is the flagship model of the IdeaHub series and integrates a variety of functions such as intelligent handwriting recognition, high-definition projection, video conferencing, and open office applications. It enables cross-network and cross-enterprise communication and collaboration based on its support for hybrid cloud deployment. In addition, it provides Advanced Video Coding (AVC) and Scalable Video Coding (SVC) conferencing modes and abundant AI capabilities.

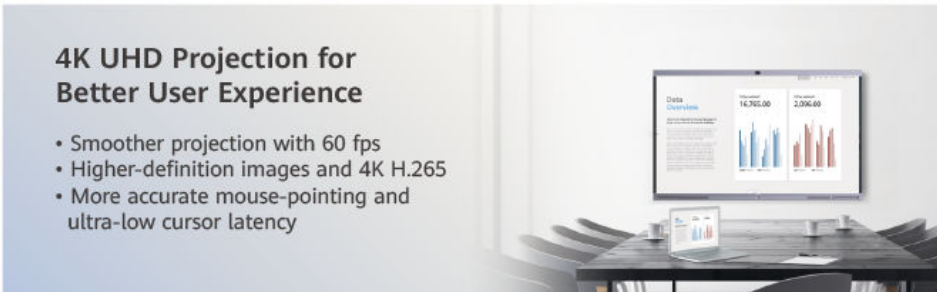
2 Product Highlights

Product Highlights




Elegant Simplicity

- Modern user-centric design
- Luxurious titanium gray color
- Slender artistic stand



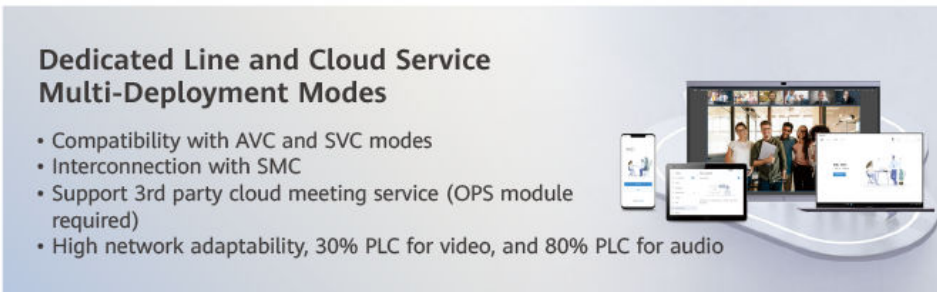
4K UHD Projection for Better User Experience

- Smoother projection with 60 fps
- Higher-definition images and 4K H.265
- More accurate mouse-pointing and ultra-low cursor latency



Superb Interactive Whiteboard with Ultra-low Latency

- Ultra-low writing latency and smooth writing experience
- One tap to send minutes to your mailbox for higher efficiency



Dedicated Line and Cloud Service Multi-Deployment Modes

- Compatibility with AVC and SVC modes
- Interconnection with SMC
- Support 3rd party cloud meeting service (OPS module required)
- High network adaptability, 30% PLC for video, and 80% PLC for audio

Product Highlights



Native 4K & AI for Better Meeting Experience

- H.265 HD video and 4K content sharing
- Flexible layout with SVC multistream
- Auto-Framing
- Speaker tracking: automatically tracks the speaker and displays the close-up shot

Open Ecosystem, Enormous Apps

- Popular apps pre-installed and customizable homepage
- Huawei appGallery with a rich store of HD apps
- Private application portal and web app distribution



Bulletin Board

- Company culture demonstration
- Real-time release of the company internal information in the bulletin
- Hierarchical content management for customization based on scenarios

Open Software and Hardware for Industry Applications

- Windows platform extension, OPS: optional extension module for Windows
- Open SDK: allows 3rd-party to use hardware and audiovisual capability

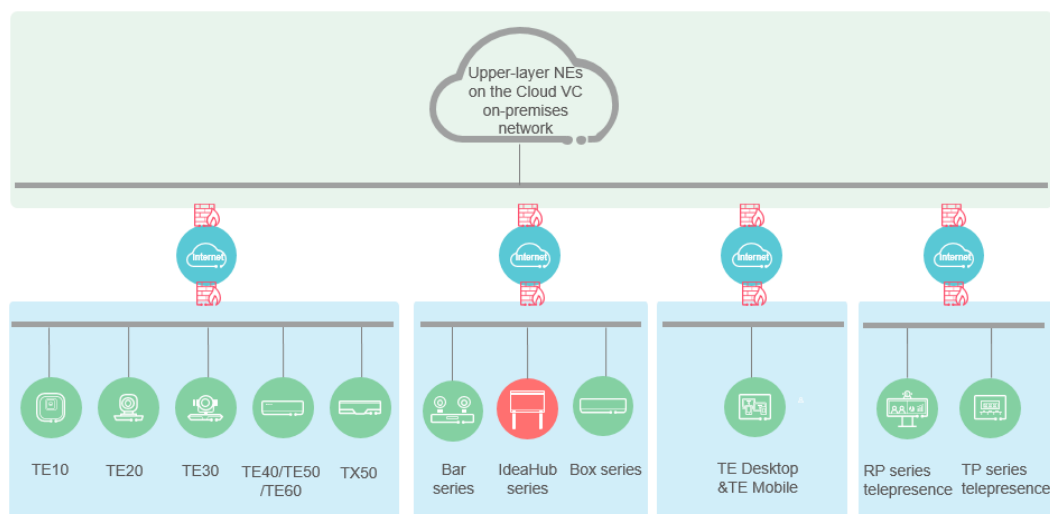


3 Networking Schemes

3.1 CloudVC On-Premises Network

The IdeaHub can be connected to the CloudVC on-premises network to meet video communication requirements of customers.

Figure 3-1 Networking scheme



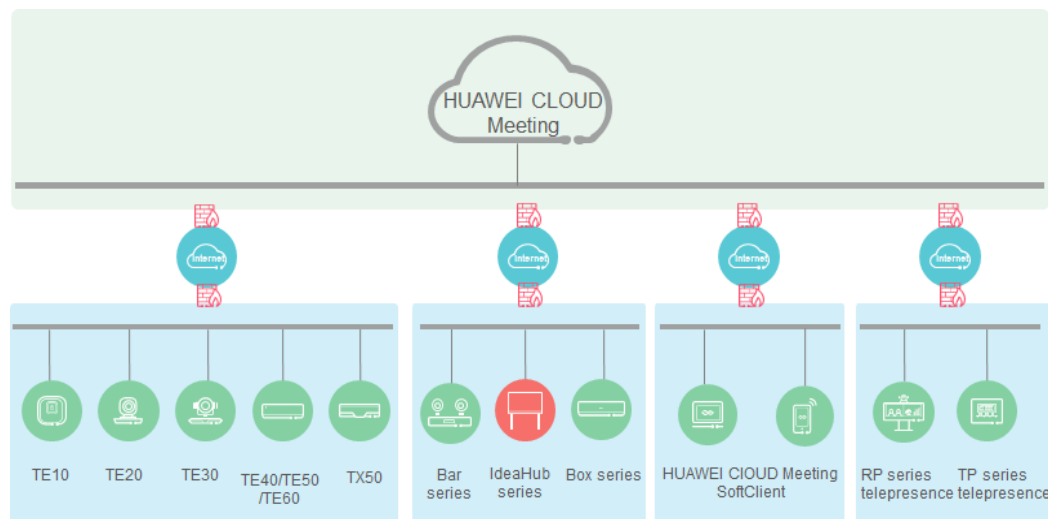
In this networking scheme:

- The IdeaHub connects to the on-premises network through standard H.323 or SIP.
- Audio and video calling, content sharing, and remote collaboration can be implemented between the IdeaHub and conference clients.
- To learn more, visit <http://support.huawei.com/enterprise/en/index.html> or <http://support.huawei.com/carrier/en/hwe/index.html>, search for the solution's product documentation name, and view or download the documentation.

3.2 HUAWEI CLOUD Meeting Networking

Based on a public cloud architecture, HUAWEI CLOUD Meeting provide users with HD audiovisual conferencing and efficient collaboration.

Figure 3-2 HUAWEI CLOUD Meeting networking



In this networking scheme:

- The IdeaHub accesses the HUAWEI CLOUD Meeting service over the Internet through standard SIP, enabling video conferencing and collaboration across branches, enterprises, and countries.
- Endpoints collaborate to extend video conferencing to all office scenarios. Cutting-edge technologies of the IdeaHub make it fit perfectly with various industries.

4 Product Structure

4.1 Appearance

Front view



Rear view (using the IdeaHub Enterprise 65 as an example)



4.2 Ports

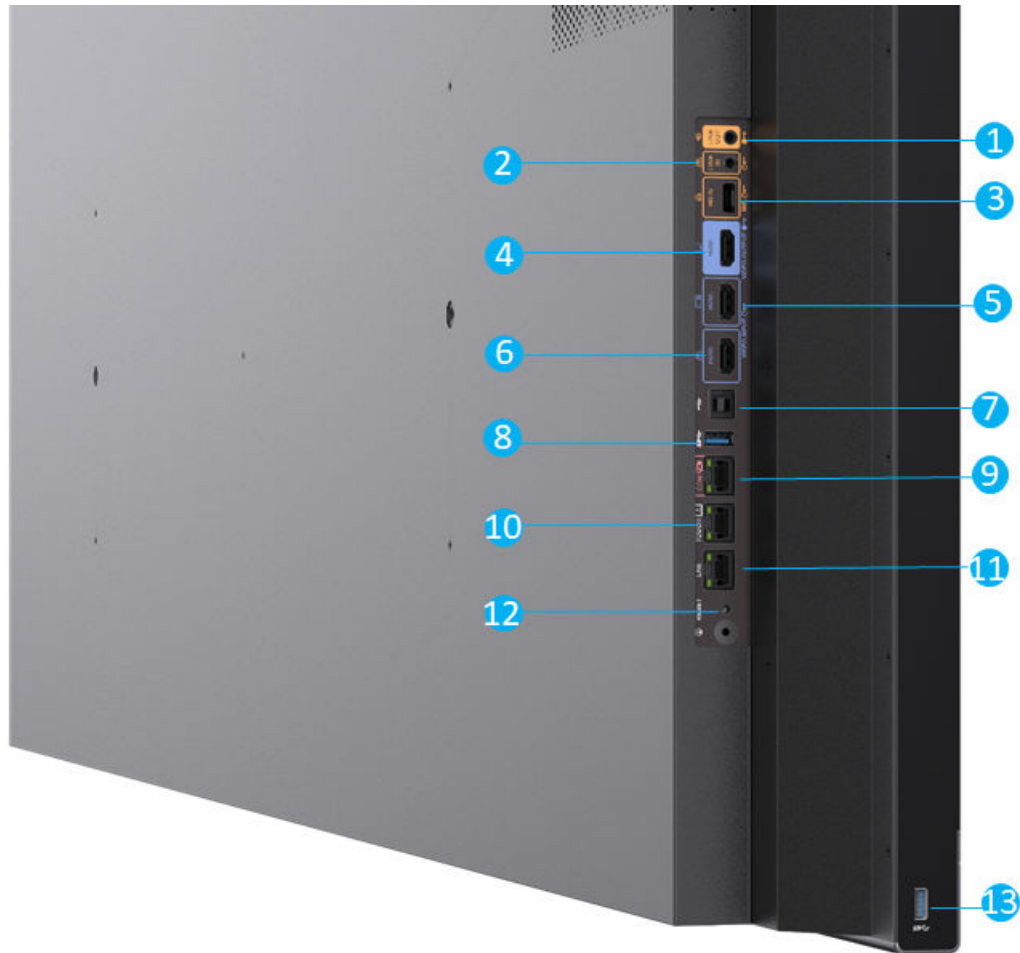


Table 4-1 Component description

Category	No.	Component	Function
Audio output port	1	3.5 mm audio output port	Connects to an audio output device, such as an external speaker.
Audio input port	2	3.5 mm audio input port	Connects to an audio input source such as a computer.
	3	HD-AI audio input port	Connects to a microphone array (VPM220 or Mic 500).
Video output port	4	HDMI HD video output port, which supports a resolution of up to 1080p 60 fps and audio output	Connects to the second display to display the video of the site.
Video input port	5	HDMI HD video input port, which supports a resolution of up to 4K 30 fps	Connects to an external camera.
	6	HDMI HD video input port, which supports a resolution of up to 4K 30 fps and audio input	Content input port, which can connect to devices such as a computer. When the IdeaHub is connected to both the OPS and a computer, you can configure one of them as the presentation input source.
Other components	7	USB Type-B port	Connects to a computer for reverse control over the computer during content sharing over a cable.
	8	USB Type-A port	Connects to a USB device, for example, an IdeaShare Key, USB flash drive, keyboard, or mouse.
	9	COM port	Connects to a camera control cable to control the camera. It can also be used for fault diagnosis and maintenance of the IdeaHub.
	10	Touch port	Connects to the Touch.
	11	Ethernet port (10/100/1000 Mbit/s, full-duplex and half-duplex supported)	Port for connecting to an external service

Category	No.	Component	Function
	12	Reset pin hole	<ul style="list-style-type: none"> During startup, push the pin hole for 10s to restore the backup system. When the IdeaHub is running, push the pin hole for 15s to reset it to factory settings.
	13	USB Type-A port	Connects to a USB device, for example, an IdeaShare Key, USB flash drive, keyboard, or mouse.

4.3 Indicator

By checking the indicator status, you can learn about the running status of the IdeaHub in a timely manner and ensure the normal running of it and its peripheral devices. [Table 4-2](#) describes the indicator status.

Table 4-2 Indicator statuses and corresponding IdeaHub statuses

Indicator Status	IdeaHub Status
Off	Powered off
Blinking green twice per second	Powering on
Blinking green four times per second	Upgrading
Steady green	Working properly
Breathing green (gradually lighting, then dimming)	Sleep
Blinking red once per second	Touchscreen abnormal
Blinking red once every 5s	Faulty hardware
Blinking red four times per second	Faulty software
Blinking red once every 2.5s	Over temperature
Blinking red twice per second	IP address conflict
Steady red	Secure boot verification failed

4.4 Touch

The HUAWEI Touch, an optional 10-inch touch panel, is used for operating the IdeaHub. The Touch provides a user-friendly UI where you can easily use conference functions such as calling a participant and controlling a conference through several taps.

Figure 4-1 Touch



Table 4-3 Component description

No.	Component	Function
1	Power button	Press to lock or wake up the HUAWEI Touch. Press and hold to turn the HUAWEI Touch on or off.
2	Type-C port	Connects to a 5 V power adapter using a Type-C cable to power the Touch. Prepare the Type-C cable and 5 V power adapter separately. The power adapter must pass the China Compulsory Certification (CCC), and its electricity output must be higher than or equal to 2 A.
3	PoE port	<ul style="list-style-type: none"> Connects to the PoE port on the PoE adapter using the Touch network cable. The Touch is powered through the PoE adapter and connects to the IdeaHub over Wi-Fi. Connects to the PoE port on the PoE adapter using the Touch network cable. The Touch is powered through the PoE adapter. The DATA port on the PoE adapter connects to the network where the IdeaHub is located.
4	Kensington security slot	Connects to a Kensington lock to secure the HUAWEI Touch. The Kensington lock should be prepared separately.

To learn more, see the *HUAWEI Touch Quick Start* delivered with the Touch.

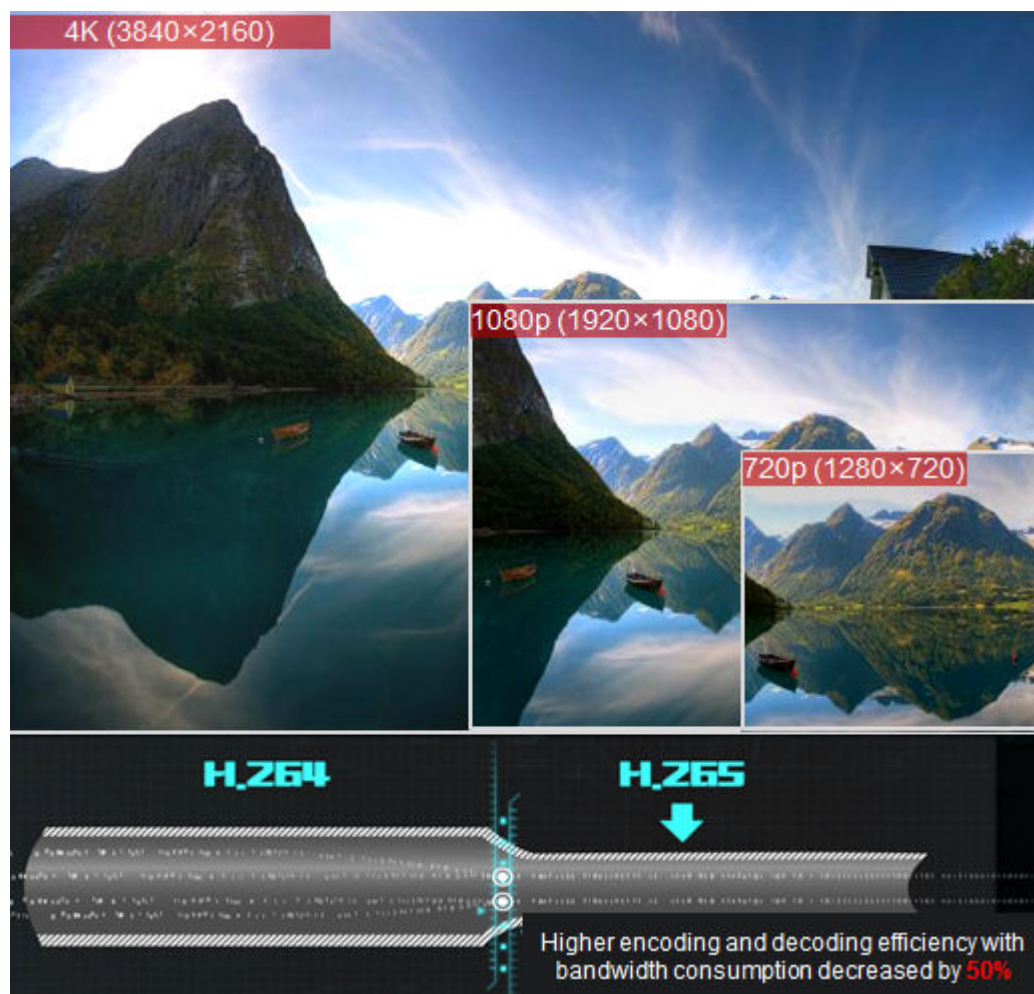
5 Functions and Features

5.1 Ultra-HD Video

The IdeaHub uses H.265 as the encoding and decoding protocol for both video and content, combined with Huawei proprietary Video Motion Enhancement (VME), to deliver 1080p 30 fps video and 4K data conferencing experience.

4K provides the incredible clarity and lifelike detail, with a resolution four times that of 1080p, on a larger screen.

Figure 5-1 H.265 4K ultra-HD video



5.2 Hi-Fi Audio

- Acoustic Echo Cancellation (AEC), Automatic Noise Suppression (ANS), Automatic Gain Control (AGC), VoiceClear, AudioEnhancer, and lip synchronization are supported.
- Opus-related technologies are adopted, including Forward Error Correction (FEC), Backward Error Correction (BEC), Packet Loss Concealment (PLC), Net Automatic Transfer-Enhancement (netATE), and Audio Jitter Buffer (AJB).
- Built-in microphone array, 8-meter sound pickup, and external microphone array for extending pickup distance, to deliver clear, crisp audio of speakers

5.3 Acoustic Baffle

The IdeaHub supports acoustic baffle, a technology that allows users to define the sound pickup scope to eliminate the impact of ambient noise, creating a personal conference space with AI.

Figure 5-2 Acoustic baffle



5.4 Smart Projection

The IdeaHub supports wired and wireless projection, allowing you to easily share audios, videos, images, and files on your mobile device or PC. In addition, it supports reverse control and remote annotation, making projection and information interaction simple and efficient.

Wired Projection

The IdeaHub supports desktop sharing and plug-and-share. If no site is sharing a presentation during a conference, you can share your PC desktop without additional operations. If a site is sharing a presentation in the conference, you need to share the presentation with the remote site as prompted.

Wireless Projection

Wireless projection frees you from complex cable connections and allows you to share your PC and mobile device desktops. When multiple wireless projection sources are connected, you can switch between them. The IdeaHub supports a maximum of 20 projection sources.

Figure 5-3 Wireless projection



- Using the IdeaShare Android client, you can share the screen of a mobile device.
- Using the IdeaShare PC client, you can share your computer desktop with others.
- Using IdeaShare Key, you can share your computer desktop in one click.

Figure 5-4 IdeaShare Key



Reverse Control

When you use wired or wireless projection, you can reversely control the computer desktop on the IdeaHub by performing tap, drag, and double-tap operations on the touchscreen. You can also edit documents on the PC when an external keyboard is connected to the IdeaHub or the soft keyboard is enabled on the PC. When a PPT is in projection mode on the PC, you can turn pages or end the projection using the touchscreen.

When using the IdeaShare mobile client to share content, you can stop sharing using the touchscreen.

5.5 Intelligent Tracking

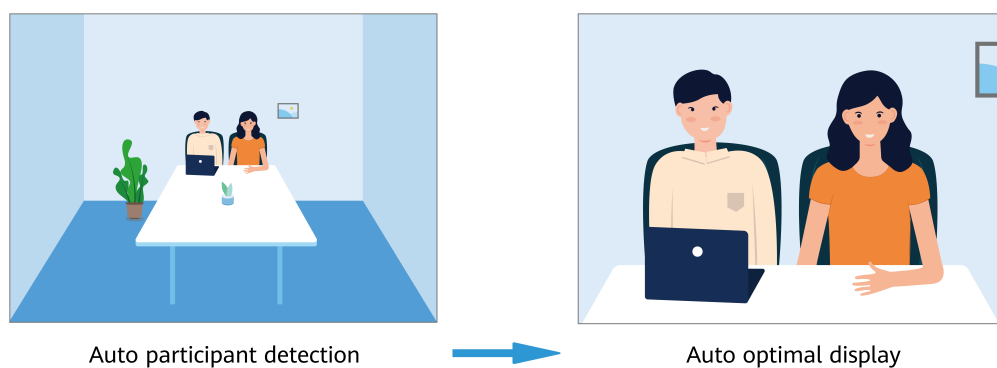
Voice Tracking

The IdeaHub Enterprise supports voice tracking. It uses voice tracking and face detection algorithms to detect and locate the sound source, automatically displays the close-up image of the speaker, and keeps the speaker in the middle of the image.

AutoFrame

With the AutoFrame function, the IdeaHub automatically adjusts its camera based on the number and positions of attendees to take the optimal panoramic view.

Figure 5-5 AutoFrame



5.6 On-Screen Name Tags

With face detection and recognition technologies, the IdeaHub automatically identifies attendees and adds on-screen name tags of attendees to the video for easy communication.

NOTE

On-screen name tags are supported only in the CloudVC on-premises network scenario.

Figure 5-6 On-screen name tags



5.7 Facial Recognition Sign-In

With face detection and recognition technologies, the IdeaHub identifies an attendee before or during a conference and reports the attendee information to the server for sign-in, implementing auto sign-in.

You can view conference sign-in information on the touchscreen and Touch.

NOTE

Facial recognition sign-in is supported only in the CloudVC on-premises network scenario.

Figure 5-7 Facial recognition sign-in



The following facial recognition sign-in modes are provided. The auto sign-in is used by default.

- Background sign-in
The IdeaHub performs facial recognition sign-in in the background and does not display the sign-in window in full screen.
- Auto sign-in
The system automatically enables the full-screen sign-in once the sign-in starts. Then, the system automatically switches to background sign-in after the conference starts.
- Full-screen sign-in
The sign-in window is displayed in full screen.

5.8 Whiteboard Collaboration

The built-in whiteboard of the IdeaHub allows for collaboration between the local and far ends. Users can take away the meeting minutes by scanning QR codes with WeChat and the HUAWEI CLOUD Meeting client.

Figure 5-8 Whiteboard collaboration



Table 5-1 Whiteboard collaboration functions

Function	Description
Creating a whiteboard	Create a maximum of 100 whiteboard pages and set their background color to white, gray, or dark green.

Function	Description
Writing on a whiteboard	<ul style="list-style-type: none"> ● Write with your finger or a stylus pen. ● Supports the writing stroke effect. ● Two persons can write at the same time. ● The IdeaHub supports intelligent writing recognition of graphics and texts. ● You can select, move, zoom in, zoom out, delete, and edit graphics and texts, or cancel the preceding operations.
Operating a whiteboard	<ul style="list-style-type: none"> ● Perform such operations as zooming in, zooming out, erasing, and dragging the canvas by using your finger. ● Circle an area. The content inside the circled area can be moved, deleted, zoomed in, or zoomed out. ● Supports precise erase.
Saving a whiteboard	<ul style="list-style-type: none"> ● Save the whiteboard locally. ● Save the whiteboard to a USB flash drive. ● Send the whiteboard via emails on condition that email accounts have been configured. ● Scan the QR code with WeChat or HUAWEI CLOUD Meeting to save the whiteboard content.
Closing a whiteboard	<p>Before closing a whiteboard, you can choose to save or not to save the whiteboard content.</p>
Deleting a whiteboard	<p>Delete whiteboard pages or files.</p>
Opening a whiteboard	<ul style="list-style-type: none"> ● Open a whiteboard locally. ● Open a whiteboard using a USB flash drive. ● Scan the QR code with WeChat or HUAWEI CLOUD Meeting to open the whiteboard content.
Sharing a whiteboard	<p>Share the whiteboard and enable the annotation function at any time.</p>
Annotation	<ul style="list-style-type: none"> ● Annotate on local applications. ● Allows annotations to be projected. ● Supports global annotation. ● Save annotations to the local PC. ● Open annotation files from the local PC. ● Send annotation content via emails. ● Share annotations in a meeting. ● Edit the annotations of remote shared content in a data meeting.

5.9 Multistream Conferencing

Multistream conferencing leverages Scalable Video Coding (SVC), with which the IdeaHub is responsible for video codec and continuous presence layout and the MCU (CloudMCU or VP9800 series MCU) only forwards video streams at different resolutions or frame rates. In this way, the workload is relieved, the latency is reduced, and access of mass IdeaHubs is made possible.

A maximum of four channels of video streams can be sent from the IdeaHub to the MCU (CloudMCU or VP9800 series MCU). The resolution ranges from 90p to 720p. A maximum of 16 channels of video streams can be forwarded from the MCU to each IdeaHub. The resolution depends on the actual bandwidth (maximum of 720p allowed).

5.10 Multiple Layouts

You can view the composite of video and content on one screen by adjusting the screen layout. In a data collaboration conference, video, content, and whiteboard can be simultaneously displayed on one screen.

The IdeaHub supports dual-screen display. Different images can be displayed on each display at the same time.

Non-Multistream Conferencing

The following layouts are available:

- Full screen
Video, content, or whiteboard is displayed in full-screen mode.
- Picture in Picture (PiP)
The PiP mode includes one full-screen video and a small window that can be located at any of the four corners. By default, the small window lies in the upper right corner. In a video conference, the small window size is about 1/16 of the full screen size.
- Picture out Picture (PoP)
Two or more panes are separately displayed on one screen.

Multistream Conferencing

The following layouts are available:

- Presenter view
 - When content sharing is in progress, shared content is displayed in the large pane.
 - When no content is shared, the large pane presents the speaker. A speaker can be configured to permanently stay in the large pane.
 - If a user chooses to broadcast or view a participant, the participant will be presented in the large pane.

- PiP view
 - When content sharing is in progress, shared content is displayed in the large pane. The small pane presents video of the broadcast participant, speaker, and other participants, in descending order of priority.
 - When no content is shared, the large pane presents the speaker. A speaker can be configured to permanently stay in the large pane. Video of other participants is displayed in the small pane.
 - If a user chooses to broadcast or view a participant, the participant will be presented in the large pane. The small pane presents shared content or video of other participants.
- Gallery view

Video of participants and shared content are displayed in panes (16 at most) equivalently.

Figure 5-9 Multistream conference screen layout



5.11 Dual-Screen

With the dual-screen clone or switching function, the IdeaHub allows you to clone the content on its screen to another screen or switch the content displayed on the two screens simply through GUI operations without modifying the cable connection and configuration.

Figure 5-10 Dual-screen display



5.12 Address Book

The address book stores participant information, with which you can directly start a meeting. The IdeaHub can obtain a participant's information from the corporate directory or LDAP server.

The administrator can perform the following operations:

- Query, edit, and delete contacts on the web interface, sort contacts, add participants to the address book, and add groups. Contacts that are found from the LDAP address book server can be saved to the local address book, but those found from the corporate directory cannot.
- Update contacts in the local address book in batches by importing/exporting their information into/from the web interface.
- Initiate calls to participants or invite new participants to join a meeting on the Touch, touchscreen, or web interface.

5.13 Wireless Connections

The IdeaHub supports 2 x 2 Wi-Fi technology (that is, 2-channel input and 2-channel output of Wi-Fi data), dual antennas, and dual bands (2.4 GHz and 5 GHz). The IdeaHub can serve as a Wi-Fi hotspot and connect to a Wi-Fi network as a client at the same time.

If the IdeaHub is configured as a client, it automatically detects and connects to Wi-Fi networks. You can set the client IP address in DHCP or static mode. This function applies to the scenarios in which no wired network is available and you need to connect the IdeaHub to the network through Wi-Fi.

When the IdeaHub has its Wi-Fi hotspot enabled, it can serve as a hotspot for connecting other devices (such as a PC) to Wi-Fi.

5.14 Strong Network Adaptability and High Security

- Leading technologies, including Super Error Concealment (SEC), Hybrid Automatic Repeat Request (HARQ) retransmission, and automatic deceleration, are utilized to deliver clear and smooth service even when the video packet loss rate reaches 30% and audio packet loss rate reaches 80%.
- The Opus high-quality codec, Net Automatic Transfer-enhancement (netATE), and Audio Jitter Buffer (AJB) are supported to reduce the packet loss rate and improve audio quality.
- Bandwidth sharing is supported among video and content in a conference. This feature improves network utilization and delivers smooth HD video images.
- Huawei's proprietary Intelligent Rate Control (IRC) technology is used to automatically detect network service bandwidth occupation and intelligently select the optimal resolution based on the bandwidth to ensure high conference quality.
- Various encryption measures are taken, such as SRTP, TLS, and HTTPS, ensuring secure and stable running of the video conferencing system.

5.15 Joining or Initiating a Meeting

Joining a Meeting

You can join a meeting from the schedule or by entering the meeting ID. Alternatively, you can scan the QR code with the HUAWEI CLOUD Meeting client.

Initiating a Meeting

A meeting can be arranged using any of the following methods:

- Starting a meeting instantly
You can start a meeting instantly through the Virtual Meeting Room (VMR) in just one click or through SiteCall. This function is applicable to the scenario where you have not scheduled any meetings but need to start a meeting right now. After a meeting is created, you can directly invite participants to the meeting by calling them. Alternatively, send the meeting ID to participants. They can then dial the meeting ID to join the meeting.
- Initiating a multipoint meeting
Select multiple contacts to initiate a meeting and set parameters, such as the chair password and whether to encrypt the meeting.
- Initiating a point-to-point (P2P) meeting
You can directly call a participant number or IP address, or search for or select a participant in the contact list to call.

5.16 Conference Control

Both the chair participant and other participants in a conference can control the conference, but the operations they can perform are different, as listed in [Table 5-2](#).

Table 5-2 Operations the chair and other participants can each perform

Role	Operation
Chair participant	<ul style="list-style-type: none"> ● Inviting a participant ● Deleting a disconnected participant ● Redialing a participant ● Disconnecting a participant ● Muting or unmuting the microphone of a participant ● Turning on or off the local camera ● Exiting or ending a conference ● Extending a conference ● Releasing the chair role ● Setting continuous presence ● Broadcasting or stopping broadcasting a participant or continuous presence ● Viewing a participant or continuous presence ● Giving the floor to a participant or revoking the floor from a participant ● Enabling or disabling voice activation ● Locking/Unlocking a conference ● Broadcasting participants circularly in turn (available only on the web interface) ● Viewing participants circularly in turn (available only on the web interface) ● Locking/Canceling the presentation sharing right for a conference (available only on the web interface)
Other participants	<ul style="list-style-type: none"> ● Leaving a conference ● Viewing a participant or continuous presence ● Applying for the chair role ● Muting or unmuting the local microphone ● Turning on or off the local camera ● Unmuting itself after being muted by the chair ● Requesting the floor ● Revoking the chair role (available only on the web interface)

Figure 5-11 Conference control on the touchscreen



Figure 5-12 Conference control on the Touch

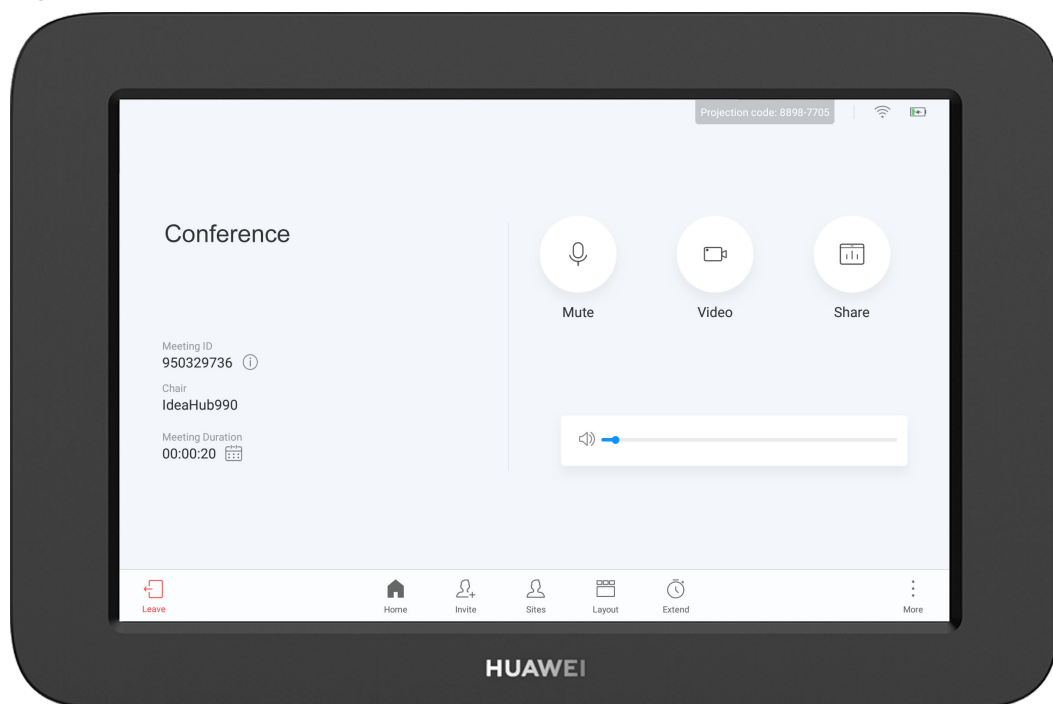
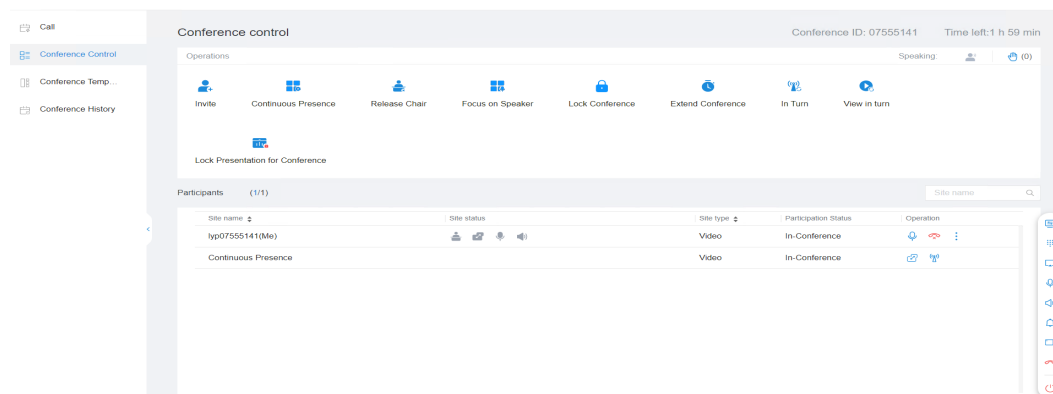


Figure 5-13 Conference control on the web interface



5.17 Bulletin Board

The IdeaHub supports releasing various types of information on the home page, including corporate culture, operation instructions, administrative services, and welcome speeches. Content can be managed by level and can be flexibly defined based on application scenarios.

Figure 5-14 Bulletin board



5.18 HiBoard Welcome Page

The IdeaHub supports the HiBoard welcome page. Three welcome page templates are available and users can customize the content and font of the welcome page.

Figure 5-15 HiBoard



5.19 Apps

The IdeaHub has common office apps pre-installed. You can customize apps on the home page.

For large enterprises, the management platform can push existing web applications to the IdeaHub for unified application distribution and management.

Figure 5-16 Apps



5.20 Globalization

The IdeaHub touchscreen, Touch and web interface support multiple languages and time zone settings. If some countries in the selected time zone use daylight saving time (DST), the IdeaHub automatically enables DST and changes its clock to comply with DST.

All GUIs of the IdeaHub support the following languages: Simplified Chinese, Traditional Chinese, English, Spanish (Europe), French, Russian, Japanese, German, and Portuguese (Brazil).

5.21 OAM

5.21.1 Automatic Configuration

Zero Configuration

The IdeaHub can automatically obtain the server type through the DHCP server. To complete quick configuration, you only need to set the IP address and server IP address of the IdeaHub or enter the activation code.

Configuration Using a USB Device

You can obtain a USB device with a configuration file from the agent or carrier, and then import the configuration file to the IdeaHub through the USB device. In this way, the configuration is automatically completed at a high efficiency.

5.21.2 Customizing a Boot Screen and Changing a Wallpaper

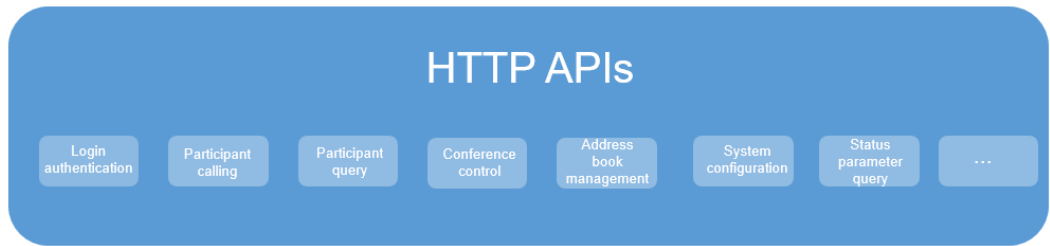
- You can replace the customized boot screen and logo using the upgrade tool to meet personalized requirements.
- You can change the wallpaper on the Touch, web interface, and touchscreen.

5.22 APIs for Third-Party Integration

The IdeaHub provides HTTP-compliant third-party APIs to implement various functions, including login authentication, participant calling, participant query, conference control, address book management, system configuration, and status parameter query, as shown in [Figure 5-17](#).

Users can choose necessary APIs based on their actual needs to develop required functions and integrate functions of the IdeaHub into other products or applications.

Figure 5-17 Functions implemented through HTTP APIs



6 Security and Reliability

6.1 Operating System Security

Security maintenance for the system layer ensures that the operating system runs smoothly and also supports stable services at the application layer. The touchscreen uses a customized Android operating system, which delivers enhanced security and immunity to viruses.

6.2 Network Layer Security

The network layer security policies for the CloudVC on-premises network are as follows:

- The IdeaHub, SMC, and MCU are deployed in the trusted zone, isolated from the Demilitarized Zone (DMZ) and the untrusted zone. Furthermore, firewalls are deployed for security domain division and access control.
- The IdeaHub in the untrusted zone communicates with NEs in the trusted zone through the Switch Center (SC) in the DMZ.

6.3 Firewall Technology (NAT)

The firewall protects your IP network by separating the internal and external network communication data. Using Network Address Translation (NAT) technology and signaling exchange between public network protocols and private network protocols, the firewall enables participants on local area networks (LANs) in different places to use video conferences, implementing zero-distance communication through video conferences. With NAT, a device on a LAN is allocated a dedicated internal IP address that uniquely identifies the device on the LAN, and the device uses an external IP address to communicate with external devices. Through NAT mapping, multiple internal IP addresses are mapped to one external IP address. NAT mapping not only reduces the number of IP addresses that are needed for users on a private network to access the Internet, but also enhances the security of the private network.

6.4 Traversal Between Public and Private Networks

The media latching and standard H.460 traversal technology are used to set up secure video call connections between public and private networks and between private networks through the firewall.

6.5 Email Security

To ensure the security of email accounts and sent emails, the STARTTLS protocol is used by default to authenticate the mail server and send encrypted emails.

6.6 Web Request Authentication

- When a user requests access to a specified web page or submits a Servlet request, the IdeaHub checks whether the user's session identifier is valid and whether the user is authorized to perform the operation.
- The server implements the final authentication on the user.
- Before transmitting user-generated data to clients, the server verifies the data and encodes it using HyperText Markup Language (HTML) to prevent malicious code injection and cross-site scripting attacks.
- Web security software is used to scan the web server and applications to ensure that there are no high-risk vulnerabilities.

6.7 Protocol Anti-Attack Measures

- The communication matrix is provided in the product documentation. Do not enable the services and ports that are not described in the communication matrix.

The communication matrix contains the following information:

- Open ports
- Transport layer protocols used by the ports
- NEs that use the ports to communicate with peer NEs
- Application layer protocols used by the ports and description of the services at the application layer
- Whether services at the application layer can be disabled
- Authentication modes adopted by the ports
- Port functions (such as data traffic control)
- To ensure the security and stability of the video conferencing system, the IdeaHub utilizes multiple encryption measures, including H.235 (for encryption of media and signaling streams), SRTP, TLS, and HTTPS.
- For network management, the IdeaHub supports the SNMP v3 protocol, which features higher adaptability and security. User names and passwords are needed to connect the network management system to the IdeaHub.
- Robustness testing tools are used to scan protocols to ensure that there are no high-risk vulnerabilities.

- By default, the LDAP over SSL (LDAPS) protocol is used to encrypt the address book, ensuring data integrity and preventing data from being stolen.

6.8 Protection of Sensitive Data

- The log, diagnostics, debug, and alarm information do not contain sensitive data such as passwords and ciphering contexts. If sensitive data is included, it is displayed as "****".
- Sensitive data is transmitted only through secure channels or after being encrypted.
- In the collaborative application scenario, the uPortal uses the root certificate for authentication through HTTPS to protect sensitive information such as accounts and passwords.
- The IdeaHub checks the complexity of passwords. When a password is being entered, each stroke is displayed as "." or "*", and the entered password cannot be copied.
- Only standard encryption algorithms and key negotiation mechanisms are used. Proprietary algorithms are not allowed.

6.9 Facial Recognition Privacy Protection

The facial recognition sign-in and on-screen name tag functions of the IdeaHub submit facial data to the server for recognition, but do not save the facial data. After leaving a conference or being restarted, the IdeaHub deletes the facial image obtained from the server to ensure that the facial image is used only for facial recognition sign-in.

6.10 System Management and Maintenance Security

- Software packages (including patches) are released only after they are scanned by at least five types of mainstream antivirus software and no issues are detected. In special cases, explanation is provided for alarms.
- All user operations and system exceptions are logged.
- A two-level certificate chain is supported to ensure the transmission security of confidential data.

6.11 Security Design

- The non-metal parts of the exterior use the V1 flame retardant (FR) materials.
- The component security design meets the requirements of the nine countries in the EU, North America, Australia, Canada, and the Middle East, as well as China. The components of mechanical parts comply with the EU Machinery Directive 2006/42/EC.
- Labels and security tips are used.

6.12 Disaster Recovery

The IdeaHub can simultaneously connect to the active and standby corporate directories or SCs for disaster recovery (DR). When the active corporate directory or SC is faulty, the IdeaHub automatically switches to the standby corporate directory or SC to continue providing services.

6.13 Secure Startup

The IdeaHub supports secure startup. During the startup process, the integrity of the U-Boot, kernel, and application software is verified level by level to ensure that all software running on the IdeaHub is valid, thereby ensuring reliable and secure running of the IdeaHub.

7 Operations and Maintenance

7.1 GUIs

7.1.1 Touchscreen

The IdeaHub uses a new touchable whiteboard collaboration system. You can tap the icon or enable the intelligent voice assistant to perform operations. The system provides the following main functions:

- Projection
- Whiteboard collaboration and sharing
- Call and conference control
- Microphone, camera, and speaker control
- System Settings
- Device diagnostics and wallpaper change
- Application management
- File management

7.1.2 Touch UI

The Touch is optional for the IdeaHub and provides a 10-inch GUI touchscreen. Users can tap icons on it to perform operations. It provides the following functions:

- System configuration
- Call and conference control
- Microphone, speaker, and camera control
- Device diagnostics and wallpaper change

7.1.3 Web Interface

The IdeaHub can be remotely operated by the administrator from its web interface. The web interface allows simultaneous operations from up to 10 users through the same account. However, only the last operation takes effect.

The main functions available on the web interface are as follows:

- Conference
- Application
- Address book configuration
- Device control
- System configuration
- Maintenance

7.1.4 IdeaShare UI

The IdeaShare is a wireless projection client designed for the IdeaHub. It can be installed on a PC or Android mobile device. A maximum of 20 users can be connected at the same time. When one participant is sharing presentation, other participants are still allowed to start sharing, but the existing presentation session will be dropped.

The IdeaShare wireless projection client integrates the remote control function, allowing users to mute or unmute the microphone, turn on or off the camera, adjust the volume, and end a meeting.

Figure 7-1 IdeaShare app UI

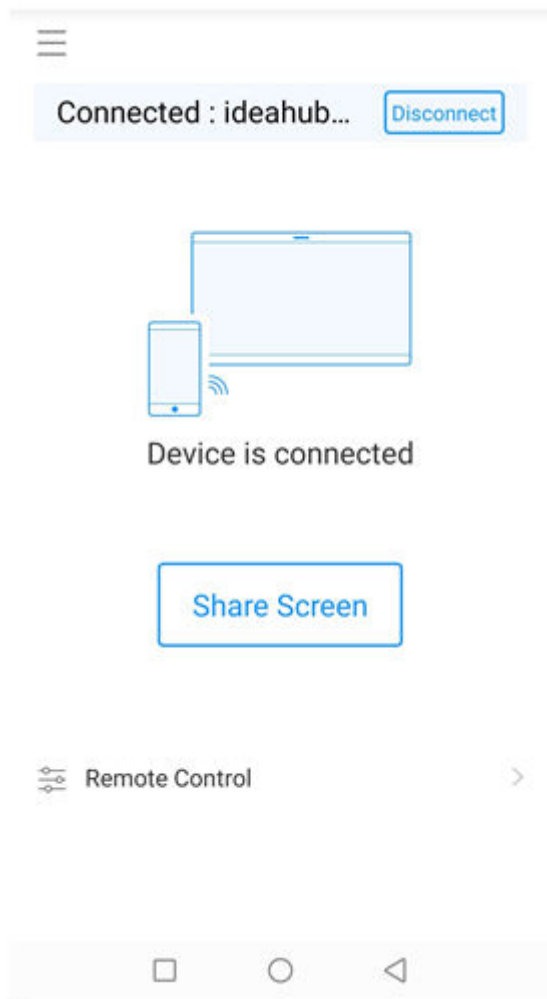
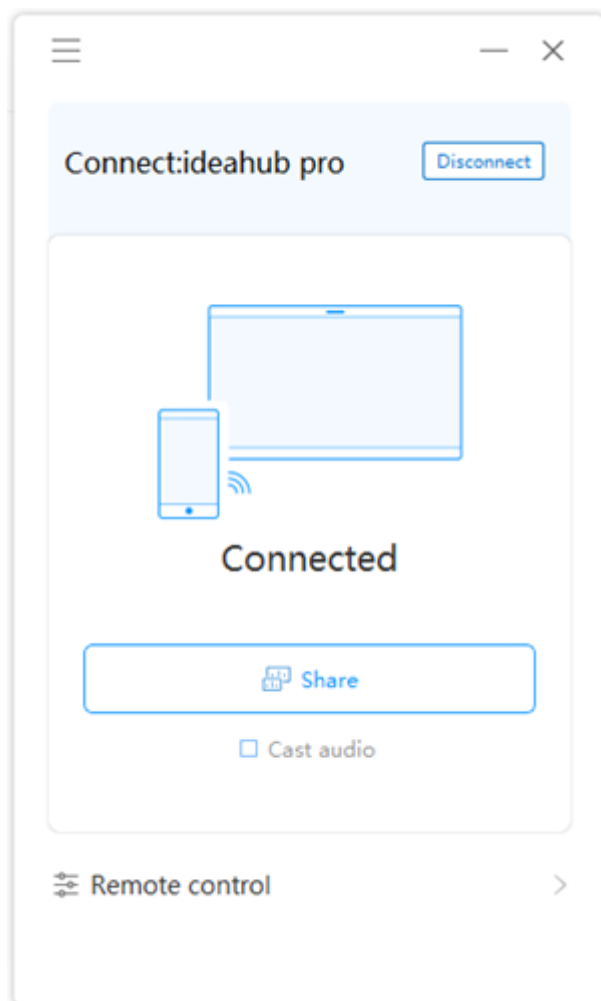


Figure 7-2 IdeaShare PC client UI



7.2 Maintenance and Upgrade

7.2.1 Log Management

The IdeaHub records logs about user operations and system exceptions, helping the administrator maintain the system and locate faults.

Logs are stored as files. On the IdeaHub web interface, the administrator can query, export, or delete all logs.

7.2.2 Device Diagnosis

The IdeaHub can detect the hardware running status, network connections, audio input/output, video input/output, common parameter settings, and server registration status to help users locate faults.

7.2.3 Inspection

SMC can inspect the IdeaHub:

- Check the status of IP lines.
- Check the system software version.
- Check the system performance, including the temperature status.
- Check the H.323 and SIP registration status.
- Check the content source connection status and input port settings.
- Check the video input cable connection status and video input port settings.
- Continue inspection after the IdeaHub restarts or ends a call.
- Receive the inspection status and result.

7.2.4 Upgrade

You can upgrade the IdeaHub to fix vulnerabilities and use new functions. The following upgrade methods are supported:

- You can manually upgrade the IdeaHub using the upgrade tool or web interface.
- The IdeaHub can be first restored to factory defaults and then upgraded.
- You can upgrade the IdeaHub from the SMC or HUAWEI CLOUD.
- The IdeaHub supports silent upgrade mode, in which the IdeaHub is upgraded at a scheduled time without affecting services.
- The IdeaHub can be upgraded in batches.
- The IdeaHub upgrade can be paused and resumed.

8 Technical Specifications

8.1 Physical Specifications

Table 8-1 Physical specifications

Item	Specifications
System	
CPU	Dual-chip, 4-core, 1.5 GHz + 4-core, 1.8 GHz
RAM	12 GB
Flash	64 GB
AI computing power	4 T FLOPS
Screen	
Screen type	<ul style="list-style-type: none"> IdeaHub Enterprise 65: E-LED IdeaHub Enterprise 86: D-LED
Resolution	4K
Refresh rate	60 Hz
Precision	±1mm
Number of touch points	20 points
Anti-reflection and anti-glare	Supported
Automatic screen brightness adjustment	Supported
Camera	

Item	Specifications
Image sensor	8-megapixel, 1/2.8-inch CMOS
Resolution	4K 30 fps
Zoom	2x digital zoom lens
Maximum aperture	F1.8
Maximum horizontal field of view	80°
Maximum vertical field of view	50°
Number of presets	Local camera: 30 at most; remote camera: 6 at most
Anti-fog, dust-proof, and anti-flicker	Supported
PTZ control	ePTZ
Automatic adjustment	Auto white balance (AWB); auto exposure (AE)
Exposure mode	Auto, manual, and shutter priority
White balance mode	Auto, manual, and one-push
Built-in microphone	
Sound pickup distance	8 m
Sound pickup angle	Forward, 180°
Number of microphones	12
Frequency domain	100 Hz to 20 kHz
Enhanced capability	Echo cancellation, noise suppression, and automatic gain control
Built-in speaker	
Frequency domain	100 Hz to 22 kHz
Quantity	6
Stereo	Supported
Maximum sound level	95 dB SPL@1 m
Electricity supply requirements	

Item	Specifications
Rated operating voltage	100-240 V AC
Working frequency	50 Hz to 60 Hz
Maximum power consumption	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: 350 W ● IdeaHub Enterprise 86: 450 W
Environmental requirements (in use)	
Ambient temperature	IdeaHub: 0°C to 40°C Touch: 0°C to 35°C
Relative humidity	10% to 90%
EMC	Class A
Operating altitude	< 5000 m (16404 ft)
Ambient noise	< 46 dBA SPL
Recommended illuminance	> 200 lux
Minimum illuminance	7 lux
Environmental requirements (idle)	
Ambient temperature	-20°C to +60°C
Relative humidity (non-condensing)	5% to 95%
Dimensions and weight	
IdeaHub dimensions (H x W x D)	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: 931.1 mm x 1492.5 mm x 71 mm ● IdeaHub Enterprise 86: 1195.1 mm x 1963.8 mm x 95 mm
IdeaHub packing dimensions (H x W x D)	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: 1114 mm x 1720 mm x 246 mm ● IdeaHub Enterprise 86: 1404 mm x 2236 mm x 356 mm
Wall-mounted bracket dimensions (H x W x D)	210 mm x 1170 mm x 30 mm
Wall-mounted bracket packing dimensions (H x W x D)	300 mm x 1270 mm x 86 mm

Item	Specifications
Rolling stand dimensions (H x W x D)	1581 mm x 1160.5 mm x 780 mm
Rolling stand packing dimensions (H x W x D)	840 mm x 1730 mm x 280 mm
IdeaHub net weight	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: 50 kg ● IdeaHub Enterprise 86: 90 kg
IdeaHub gross weight	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: 63 kg ● IdeaHub Enterprise 86: 110 kg
Wall-mounted bracket net weight	3.6 kg
Wall-mounted bracket gross weight	5.6 kg
Rolling stand net weight	21.5 kg
Rolling stand gross weight	31.5 kg
Wi-Fi	
Frequency bands	2.4 GHz and 5 GHz
Working frequency bands (IdeaHub)	2.4 GHz: 2400 MHz to 2483.5 MHz 5 GHz: 5150 MHz to 5250 MHz
Working frequency bands (Touch)	2.4 GHz: 2400 MHz to 2483.5 MHz 5 GHz: 5150 MHz to 5250 MHz
Maximum transmission power	< 20 dBm
Working range in an environment without barriers	20 m (recommended: 10 m)
Voice tracking	
Distance	2 m
Installation	
Installation modes	<ul style="list-style-type: none"> ● IdeaHub Enterprise 65: wall mount and floor stand ● IdeaHub Enterprise 86: wall mount
Peripherals	

Item	Specifications
Microphones	Two microphone arrays (VPM220 or Mic 500) can be connected.
Wireless mouse and keyboard	Recommended brands: Logitech, Rapoo, and A4Tech

8.2 Performance Specifications

Table 8-2 Performance specifications

Item	Specifications
Call bandwidth	64 kbit/s to 4 Mbit/s
Video capabilities (H.264)	<p>Minimum bandwidth required to deliver video of a specific resolution (without any packet loss):</p> <ul style="list-style-type: none"> ● 512 kbit/s for 1080p 30 fps ● 768 kbit/s for 720p 60 fps ● 384 kbit/s for 720p 30 fps
Video capabilities (H.265)	<p>Minimum bandwidth required to deliver video of a specific resolution (without any packet loss):</p> <ul style="list-style-type: none"> ● 384 kbit/s for 1080p 30 fps ● 512 kbit/s for 720p 60 fps ● 256 kbit/s for 720p 30 fps
Content sharing capabilities	<ul style="list-style-type: none"> ● Content sharing over a wireless connection <ul style="list-style-type: none"> In a meeting: <ul style="list-style-type: none"> – IdeaShare mobile app (Android operating system): up to 1080p 15 fps – IdeaShare PC client (Windows): up to 1080p 15 fps Local view: <ul style="list-style-type: none"> – IdeaShare mobile app (Android operating system): up to 1080p 15 fps – IdeaShare PC client (Windows): up to 4K 15 fps ● Content sharing over a cable connection: <ul style="list-style-type: none"> – Input resolution (HDMI): 3840 x 2160 25/30 fps, 1920 x 1200 60 fps, 1920 x 1080 24/25/30/50/60 fps – Codec resolution: 1080p (1920 x 1080), 1920 x 1200, and 4K (3840 x 2160) – Output resolution: 1920 x 1080, 3840 x 2160

Item	Specifications
Dual-stream capabilities	Video conference: 1080p 30 fps + 1080p 30fps, 1080p 30 fps + 4K 8 fps Data conference: 1080p 30 fps, 4K 8 fps
Operating system and hardware requirements for IdeaShare mobile client installation	Android 5.0 or later, CPU with the ARMv7 Neon chip or above, dominant frequency of 1.5 GHz or above, memory of 1 GB or above
Operating system requirements for IdeaShare PC client installation	32-bit or 64-bit Windows 7, 8, 8.1 or 10

8.3 Ports and Protocols

Table 8-3 Ports and protocols

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Video input port	1 x HDMI (4K 30 fps, audio input supported) 1 x HDMI (4K 30 fps, external camera)	HDMI 1.4b	-
Video output port	1 x HDMI (1080p 60 fps, audio output supported)	HDMI 1.4b	-
Audio input port	<ul style="list-style-type: none"> 1×3.5mm 1 x HD-AI (level 2) 1 x HDMI (audio input supported) 	-	Two microphone arrays (VPM220 or Mic 500) can be connected.
Audio output port	<ul style="list-style-type: none"> 1×3.5mm 1 x HDMI (audio output supported) 	-	-

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
OPS port	1 x OPS (4K 30 fps, audio input supported)	-	-
USB port	<ul style="list-style-type: none"> • 2 x USB Type-A port • 1 x USB Type-B port 	-	-
Network port	<ul style="list-style-type: none"> • 1 x 10/100/1000 Mbit/s LAN port • 1 x RJ45 (without PoE, connected to the Touch) 	-	-
Wireless port	1 x Wi-Fi (built-in)	-	-
Bluetooth port	1 x Bluetooth (built-in, reserved for hardware) NOTE This port is for hardware reservation. The product currently does not support the Bluetooth function.	-	-
Power input port	1 x power input port	-	-
Reset button	1 x reset button	-	-

8.4 Standards Compliance

Table 8-4 Standards compliance

Item	Standards
Video encoding and decoding protocols	H.265, H.264 HP, H.264 BP, H.264 SVC, H.263, and H.263+
Audio encoding and decoding protocols	AAC-LD (mono/stereo), G.711A, G.711U, G.722, G.722.1C, and Opus
Multimedia framework protocols	ITU-T H.323 and IETF SIP
Data conference	Data conference 1.0/2.0
Dual-stream protocols	ITU-T H.239 and Binary Floor Control Protocol (BFCP)
Network transmission protocols	TCP/IP, RTP, RTCP, DHCP, DNS, SMTP, SNMP, SNTP, Telnet, SSH, HTTP, HTTPS, and TR-069

Item	Standards
Other communications protocols	H.225, H.235, H.241, H.245, H.281, H.350, H.460, RFC2833, LDAP, and LDAPS
IP protocol	IPv4 and IPv6 dual stack
Encryption protocols	Embedded encryption chip that supports H.235, STARTTLS, TLS, and SRTP encryption
Wi-Fi standards	IEEE 802.11 a/b/g/n/ac/w, IEEE 802.1x, WPA2, Wi-Fi AP, and station mode

8.5 HEVC Authorization



9 Glossary

Numerics	
4CIF	4 x Common Intermediate Format A video resolution of 704 x 576 pixels.
4SIF	4 x Source Input Format A video format with a resolution of 704 x 480 pixels that uses progressive scanning.
A	
AAC	Advanced Audio Coding
AEC	Acoustic Echo Cancellation
AGC	Automatic Gain Control
AI	Artificial Intelligence
AJB	Audio Jitter Buffer
ANS	Automatic Noise Suppression
API	Application Programming Interface A particular set of rules and specifications that are used for communication between software programs.
AutoFrame	Based on the number, location, and motion of participants, this function automatically adjusts the camera to provide a dynamic overview of the full room.
Address book	Stores the information of remote participants, including the IP address, number, type, and bandwidth.
C	
CHR	Call History Record
CIF	Common Intermediate Format

CPE	Customer Premises Equipment Any associated equipment located at a subscriber's premises and connected with a carrier's telecommunication channel at the demarcation point.
CSCF	Call Session Control Function The core component of the IMS network. It performs the functions such as registration, authentication, session control, service triggering, topology hiding, QoS control, NAT traversal, and security management.
Chair site	A site that has chair control rights.
D	
DMZ	demilitarized zone A buffer area between an insecure system and the secure system and is used to solve the problem of an external network being unable to access an internal network equipped with a firewall. The DMZ is located between the internal network and the external network. The DMZ contains some public server facilities, such as the enterprise Web server and FTP server. The DMZ protects the internal network.
DNS	Domain Name System A mechanism that maps easy-to-remember domain names to IP addresses recognizable for network devices.
DVI	Digital Visual Interface
DVI-I	Digital Visual Interface-Integrated
Dual-stream	During a meeting, two channels of video streams can be sent or received simultaneously. One channel is used for transmitting video (such as the video captured by a camera) and the other channel is used for transmitting presentation (such as a computer desktop).
E	
EUA	Enterprise Unified Address Book A next-generation address book server launched by Huawei. It provides LDAP-based unified address book services for Huawei video conferencing and enterprise communication solutions.
F	
Full HD display	An HD plasma TV that is used to display the video from a telepresence codec
G	

G.722	Audio codec standard that uses adaptive differential pulse-code modulation (ADPCM). Its data rate is 48 kbit/s, 56 kbit/s, or 64 kbit/s.
G.728	Audio codec standard that uses low-delay code excited linear prediction (LD-CELP). Its data rate is 16 kbit/s.
H	
H.239	A standard recommended by ITU-T. It enables a video meeting to simultaneously transmit both video and data content (for example, computer desktop).
H.263	A video codec standard for video meetings at low rates. Five formats are available: SQCIF, QCIF, CIF, 4CIF, and 16CIF.
H.264	Compared with H.263, H.264 can provide the same-quality video at half of the bit rate, with strong error resilience.
HD	High Definition
HDMI	High Definition Multimedia Interface
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol over Secure Sockets Layer An HTTP protocol that runs over transport layer security (TLS) and Secure Sockets Layer (SSL) for secured transactions. It is used to establish a reliable channel for encrypted communication and secure identification of a network web server.
I	
IMS	IP multimedia subsystem
IWB	interactive whiteboard
L	
LAN	Local Area Network
LCD	Liquid Crystal Display
LDAP	Lightweight Directory Access Protocol A network protocol based on TCP/IP, which allows access to a directory system agent (DSA). It involves some reduced functionality from X.500 Directory Access Protocol (DAP) specifications.
Initiate call	To initiate a call is a process where the calling party dials the called party's alias or IP address to set up a call and exchange audiovisual information with the called party.

Loopback test	The endpoint can transmit audio or video data on a channel to simulate the actual application and test whether the output is satisfactory. A user can perform a local loopback test to check the local network connection or a remote loopback test to check the remote network connection. If a remote loopback test is performed, data is transmitted from the local site to a remote site, and then back to the local site.
M	
MediaX	Media Switch Server (in IMS networking)
Media stream	Data stream (such as audio, video and fax) between different bearer networks.
N	
netATE	Net Automatic Transfer-enhancement
P	
PPPoE	Point-to-Point Protocol over Ethernet
Power on	To start up a computer; to begin a cold boot procedure; to turn on the power
R	
RSE	Recording & Streaming Engine
RTCP	Real-Time Transport Control Protocol A protocol used to monitor data delivery. RTCP enables the receiver to detect if there is any packet loss and to compensate for any delay jitter.
S	
SBC	Session Border Control
SEC	Super Error Concealment
SIF	Source Input Format
SIP	Session Initiation Protocol
SMC	Service Management Center A video conferencing service management system that manages video conferencing devices (including GKs, MCUs, and participant endpoints) and allocates video conferencing resources.
SP	service provider A system that provides services to users. In IAM, the SP for federated identity authentication is the public cloud system.

S RTP	Secure Real-time Transport Protocol A real time transport protocol with enhanced security and encryption mechanism-based RTP.
SSH	Secure Shell A network security protocol formulated by the IETF's Network Working Group on the basis of the application layer to implement secure remote login and other secure network services. The use of SSH can effectively prevent information leakage during remote management. It is initially a program in the Unix operating system and adopted by other operating platforms soon. SSH can fix vulnerabilities on the network when it is used correctly. The SSH client is applicable to multiple platforms. SSH can run on almost all UNIX platforms, including HP-UX, Linux, AIX, Solaris, Digital UNIX, Irix, and other platforms.
STG	Security Traversing Gateway
STUN	Simple Traversal of UDP through NAT
SVC	Scalable Video Coding
SVGA	Super Video Graphics Array
Sound pickup distance	The maximum distance within which sounds can be picked up by a microphone.
Switch Center	A Switch Center (SC) is Huawei's new-generation network switch system that provides H.323 GK, SIP server, and media proxy functions.
Schedule meeting	Specify the start time and duration of a meeting. Then the system schedules the meeting automatically.
T	
TCP/IP	Transmission Control Protocol/Internet Protocol
TLS	Transport Layer Security
Telepresence	The Huawei telepresence system provides users with a comfortable video conferencing environment in which they can have true-to-life and face to face remote conferences.
V	
VGA	Video Graphics Array
VMR	Virtual Meeting Room
W	

WPA	Wi-Fi Protected Access A wireless security protocol replacing WEP and aiming to provide stronger security for the IEEE 802.11 WLAN. WPA is a subset of IEEE 802.11i, whose core is IEEE 802.1x and TKIP.
Wi-Fi	Wireless Fidelity A short-distance wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.
X	
XGA	Extended Graphics Array