

**HUAWEI IdeaHub ES2 Plus
25.0**

Product Overview

Issue

04

Date

2025-11-14



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1 Product Highlights

HUAWEI IdeaHub ES2 Plus (IdeaHub or endpoint for short) runs HarmonyOS and a next-generation hardware platform to provide features such as Galileo's eyes, smart office collaboration, and all-scenario intelligent meetings. With upgraded HD audiovisual and intelligent capabilities, the product breaks the boundaries of communication and collaboration, making it an optimal tool for smart office in a wide range of scenarios, such as executive offices and meeting rooms.

- The Galileo's eyes, an intelligent triple-lens camera featuring HD lenses, low-noise micro PTZ, and imperceptible lens rotation, deliver clearer and more accurate images for an immersive meeting experience.
- Intelligent tracking 3.0 identifies and displays speakers in a golden ratio, and provides ultimate in-person experience, such as smooth lens rotation, panoramic view, and two-person conversation on the same screen.
- All-scenario intelligent meetings: 4K professional video meetings are supported; 12-microphone array ensures an immersive meeting experience; BYOM transfers your meetings to the large screen.
- Smart office collaboration: Wi-Fi Direct for smooth projection without password or network connection; intelligent whiteboard, just like writing on paper; open and standard SDKs for fast integration with enterprise office apps.
- Chip-device-pipe-cloud E2E protection and CC EAL6+ high-level security certification for global commercial systems are implemented.

Table 1-1 lists endpoint models.

Table 1-1 Models

Product	IdeaHub ES2 Plus
Model	IHE2-86IA

2 Platform Access

2.1 Networking

SMC2.0

The IdeaHub can be connected to the SMC2.0 platform. Based on the CloudVC network, the IdeaHub meets users' requirements for video communication and centralized O&M management.

Users can manage various functions of the endpoints on the platform, including sites, meetings, configuration delivery, and automatic device inspection.

SMC

The IdeaHub can be connected to the SMC platform. Based on the CloudVC network, the IdeaHub meets users' requirements for video communication and centralized O&M management.

Users can manage various functions of the endpoints on the platform, including meeting management, configuration delivery, certificate management, web app management, and bulletin board management.

Huawei Cloud Meeting

Based on a public cloud architecture, Huawei Cloud Meeting provides users with HD audio and video conferencing and efficient collaboration.

Users can manage various functions of the endpoints on the platform, including configuration delivery, web app management, and bulletin board management.

IdeaManager

The IdeaManager is an integrated endpoint management solution for enterprises and provides E2E endpoint management and O&M capabilities to meet requirements in scenarios where a large number of endpoints are connected. The IdeaManager helps customers improve O&M efficiency and reduce O&M costs. By deployment mode, the IdeaManager can be classified into IdeaManager (cloud service) and IdeaManager (on-premises).

2.2 Capability Comparison

Meeting Quality

Table 2-1 Meeting quality on each platform

Platform	Capability Description
SMC2.0, SMC	- After the 4K 30 fps license is imported, the meeting dual-stream capability can reach up to 4K 30 fps (video) and 4K 30 fps (presentation) in video meetings and up to 4K 30 fps in data meetings. - Supports multiple meeting control operations. - Non-multistream conferencing: Supports the following layouts: full screen, Picture-in-Picture (PiP), and Picture-out-Picture (PoP). - Multistream conferencing: Supports the following layouts: presenter view, PiP view, and gallery view. - Supports T.140 banners and captions. - Allows users to join a meeting from the meeting schedule with one click. - Allows users to initiate a meeting via SiteCall with one click, initiate multipoint or point-to-point meetings, and create scheduled meetings.
Huawei Cloud Meeting	- Supports HD video meetings with a resolution of up to 1080p. - Supports multiple meeting control operations. - Supports the following meeting layouts: presenter view, PiP view, and gallery view. - Allows users to join a meeting from the meeting schedule with one click. - Allows users to initiate a meeting via SiteCall with one click, and initiate multipoint or point-to-point meetings.
IdeaManager	N/A

Client Capabilities

Table 2-2 Client capabilities supported by each platform

Platform	Meeting Scenario	Whiteboard Scenario	Projection Scenario
SMC2.0, SMC	Join a meeting by scanning the QR code using the HW CloudLink soft client (supported only on the SMC).	Use a browser to scan the QR code to transfer the whiteboard content.	Use the IdeaShare client for projection.
Huawei Cloud Meeting	Join a meeting by scanning the QR code using the Huawei Cloud	Use a browser to scan the QR code to transfer the whiteboard content.	- Use the IdeaShare client for projection. - Use the Huawei Cloud Meeting client

Platform	Meeting Scenario	Whiteboard Scenario	Projection Scenario
	Meeting client.	Scan the QR code using the Huawei Cloud Meeting client to transfer the whiteboard content.	for projection.
IdeaManager	The mobile phone client is not involved.	Use a browser to scan the QR code to transfer the whiteboard content.	Use the IdeaShare client for projection.

Access Modes

Table 2-3 Platform access modes

Platform	Access Mode
SMC2.0	Connect to the platform by adding manageable participants or predefined participants.
SMC	Manually enter the activation code to access the platform.
Huawei Cloud Meeting	Manually enter the activation code or scan the QR code to access the platform.
IdeaManager	- IdeaManager (cloud service): Manually enter the access code or scan the QR code to access the platform. - IdeaManager (on-premises): Manually enter the access code to access the platform.

3 Product Structure

3.1 Appearance

Front View

Figure 3-1 Front view of the endpoint

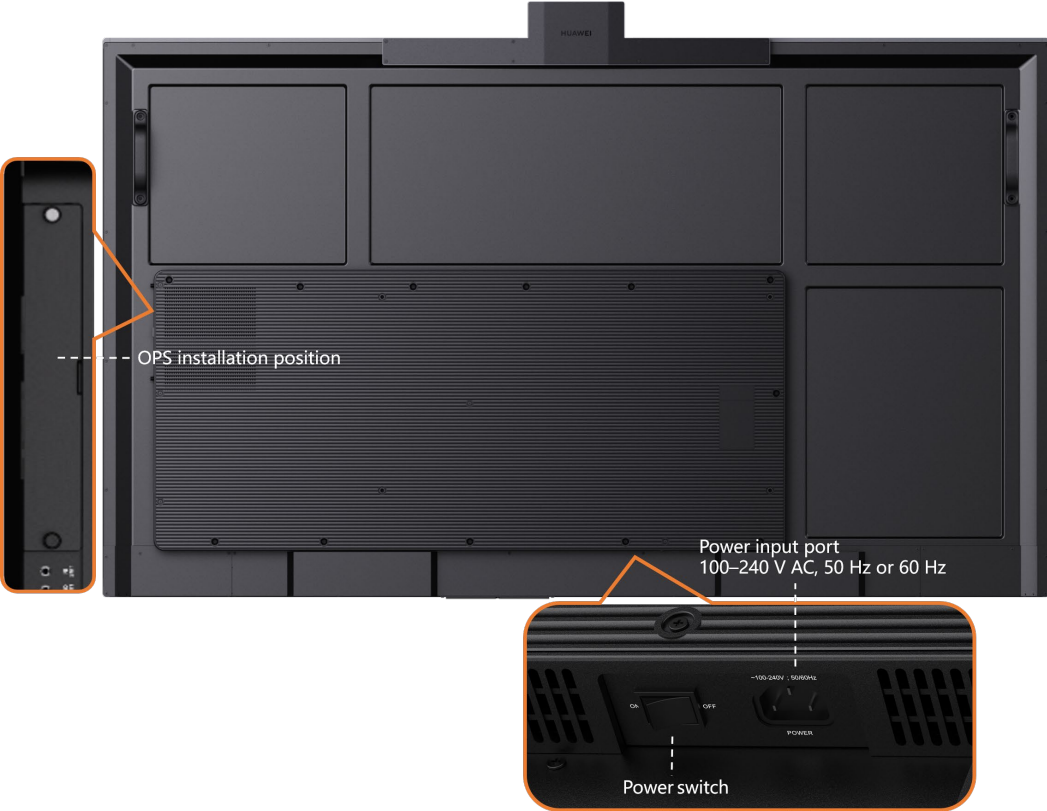


Figure 3-2 Modules in the front view of the endpoint



Rear View

Figure 3-3 Rear view of the endpoint



3.2 Ports and Functional Modules

Figure 3-4 Ports and functional modules

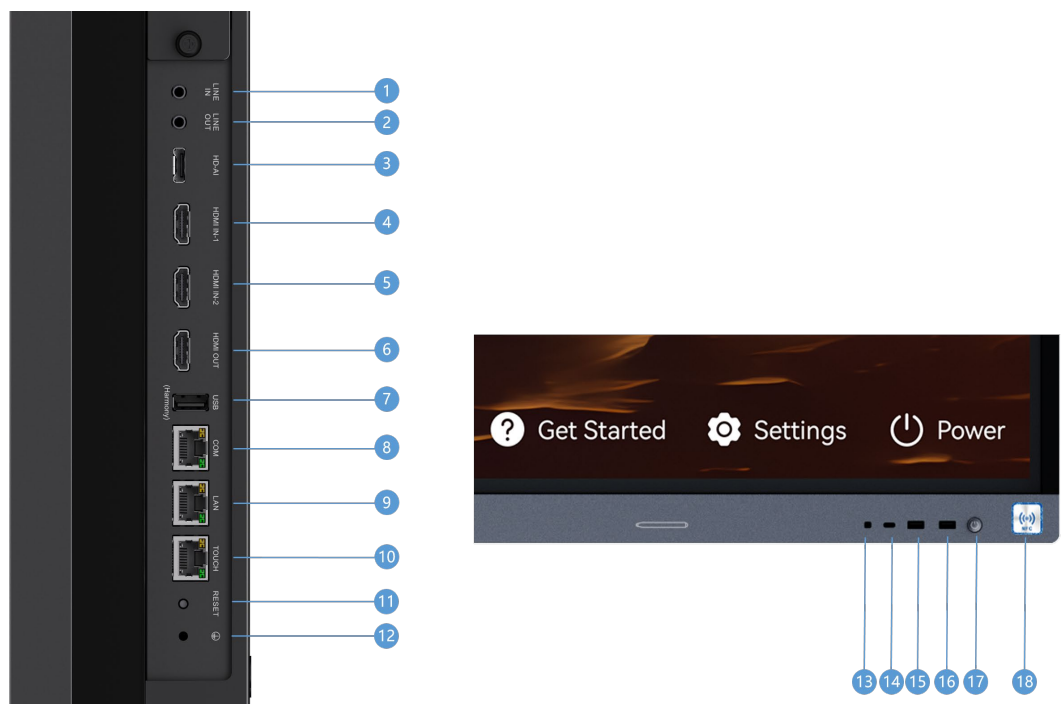


Table 3-1 Description of ports and functional modules

Category	No.	Port Description	Function
Audio input port	1	3.5 mm audio input port	Connects to an audio input source such as a computer.
Audio output port	2	3.5 mm audio output port	Connects to an audio output device, such as an external speaker.
Audio input port	3	HD-AI audio input port	Connects to an array microphone VPM220 or Mic 500. Two microphones can be cascaded.
Video input port	4	HDMI-1 video input port	Connects to an HDMI input device, which can be used as the video source or presentation source.
	5	HDMI-2 video input port	Connects to an HDMI input device, which can be used as the presentation source. NOTE This port cannot be used together with the OPS and USB Type-C port connecting to a presentation source.
Video output	6	HDMI video output port	Connects to the second display to display

Category	No.	Port Description	Function
port			the video of the site.
USB port	7	USB 3.0 Type-A port	Connects to a USB device (applicable to non-OPS scenarios), such as the IdeaShare Key (Type-A), USB flash drive, keyboard, mouse, Controller receiver, microphone, speaker, and camera.
Other ports	8	COM port	Connects to a serial cable to remotely manage the endpoint or connects to a camera control cable to control an external HDMI camera.
	9	Ethernet port (10/100/1000 Mbit/s, full-duplex and half-duplex supported)	Used for external services.
	10	TOUCH port	Connects the endpoint to the Touch.
Button	11	RESET button	- During startup, press and hold this button for 3 to 5 seconds to enter eRecovery mode. - When the endpoint is running, press and hold the button for 13s to reset it to factory settings.
Other ports	12	Ground point	Connects to the ground cable to provide ground protection for the endpoint.
Functional module	13	Intelligent light sensing	Intelligently adjusts the screen brightness based on the ambient light illuminance.
USB port	14	USB 2.0 Type-C port	- Connects to a presentation source such as a computer or mobile device for projection sharing or reversely controls the computer or mobile device. - Connects to an IdeaShare Key (Type-C) for pairing or upgrade. - Connects to another USB device, such as a USB flash drive, microphone, speaker, and camera. NOTE When this port is connected to a presentation source, you cannot use this port together with the HDMI IN-2 port and OPS.
	15	USB 3.0 Type-A port	Connects to a USB device, such as the IdeaShare Key (Type-A), USB flash drive, Controller receiver, keyboard, mouse, microphone, speaker, and camera.
	16	USB 3.0 Type-A port	Connects to a USB device, such as the IdeaShare Key (Type-A), USB flash drive, Controller receiver, keyboard, mouse,

Category	No.	Port Description	Function
			microphone, speaker, and camera.
Button	17	Power button and indicator	- You can put the endpoint into sleep mode or wake it up by pressing the power button. - You can power on the endpoint after soft shutdown by pressing the power button. - You can press and hold the power button for 3 seconds to display the power menu. - The indicator indicates the endpoint running status.
Functional module	18	NFC sensor area	Used for pairing your endpoint with your phone in the NFC OneHop projection scenario.

3.3 Indicators

By checking the indicator status, you can learn about the running status of the endpoint in a timely manner and ensure the normal running of it and its peripheral devices. [Table 3-2](#) describes the indicator status.

Table 3-2 Indicator status information

Indicator Status	Endpoint 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 every 5s	Faulty hardware
Blinking red twice every 5s	Overheated
Blinking red once per second	Touchscreen abnormal
Blinking red twice per second	IP address conflict
Blinking red four times per second	Faulty software

3.4 Touch

As an optional device of the IdeaHub, the Touch features an intuitive graphical touchscreen UI. This allows you to effortlessly control calls and conferences by simply tapping icons.

Figure 3-5 Front and rear appearances of the Touch



NOTE

While there are different Touch models, their software functionalities are identical. The only distinctions are the screen size and the power button's location. The power button might be on the left, right, or top bezel of the screen, so please refer to the actual device for its precise position.

Table 3-3 Component description

No.	Component	Function
1	Power button	Press to put the Touch in sleep mode or wake it up. Press and hold to turn the Touch on or off.
2	Type-C port	Connects to the power adapter using a Type-C cable to supply power to the Touch. You need to buy your own Type-C cable and a 5 V power adapter. The power adapter must have the China Compulsory Certification (CCC) and an output current of at least 2 A.
3	PoE port	- 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 through 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 Touch. The Kensington lock should be prepared separately.

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

3.5 Controller

You can configure the Controller and Controller receiver for the endpoint. The Controller can be used to perform routine operations on multiple types of endpoints and provide convenient control functions.

Figure 3-6 Controller and receiver

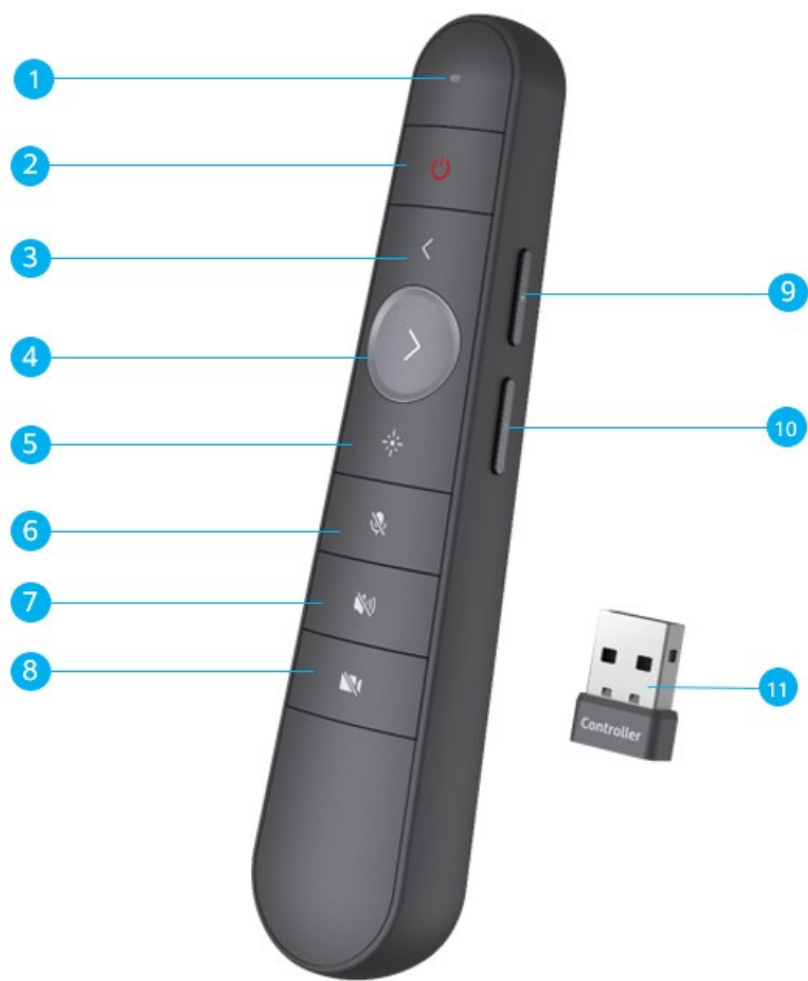


Table 3-4 Functions of the Controller and receiver

No.	Function and Name	Description
1	Indicator	Displays the working status of the Controller.
2	Sleep/Wake up	After you press this button, the endpoint enters or wakes up from the sleep mode.
3	Turn to the	Go back to the previous page on the whiteboard and in

No.	Function and Name	Description
	previous page	presentations and documents.
4	Turn to the next page	Turn to the next page on the whiteboard and in presentations and documents.
5	Laser pointer	Press and hold the button to move the laser pointer icon, and press the button to perform the tap operation.
6	Mute/Unmute the microphone	Press the button to mute or unmute the microphone.
7	Mute/Unmute the speaker	Press the button to mute or unmute the speaker.
8	Enable/Disable the camera	Press the button to turn on or off the camera.
9	Increase the volume	Press or hold the button to increase the volume.
10	Decrease the volume	Press or hold the button to decrease the volume.
11	Controller receiver	Insert the Controller receiver into the USB Type-A port at the lower right corner of the front screen to receive signals from the Controller.

3.6 OPS

The Open Pluggable Specification (OPS) is optional for endpoints. After an OPS is configured, endpoints can run the Windows OS in the OPS to install and run third-party software.

When third-party meeting software is used to hold a meeting in the OPS scenario, the microphone, speaker, and camera of the IdeaHub can be used. In addition, AI functions such as intelligent tracking and voice tracking are supported.

 NOTE

- The OPS must match the product.
- Functions of different third-party meeting apps may vary in the OPS scenario.

Appearance

Table 3-5 Main appearance differences of OPSs

OPS Name & Code	Main Modules on the Front Panel	Appearance
• ICD OPS i5 D (06190009)	Ports:	Figure 3-7

OPS Name & Code	Main Modules on the Front Panel	Appearance
• ICD OPS i7 D (06190010) • ICD OPS i7 Z (06190011) • OPS W021 Z (06190037) • OPS W022 Z (06190034) • OPS W021 D (06190041) • OPS W022 D (06190040)	• 1 x RJ45 network port • 1 x DP display port (only for ICD OPS i5 D, ICD OPS i7 D, ICD OPS i7 Z, OPS W021 Z, and OPS W022 Z) • 1 x HDMI display port • 1 x LINE IN microphone jack • 1 x LINE OUT audio output port • 2 x Wi-Fi antenna port • 3 x USB 2.0 Type-A port • 3 x USB 3.0 Type-A port (only for ICD OPS i5 D, ICD OPS i7 D, ICD OPS i7 Z, OPS W021 Z, and OPS W022 Z) • 3 x USB 3.2 Type-A port (only for OPS W021 D and OPS W022 D) Buttons: • 1 x Power button • 1 x One-click restoration button • 1 x Restart button (only for OPS W021 Z and OPS W022 Z) Indicators: • 1 x Power-on indicator (green) • 1 x Power indicator (red) • 1 x Disk indicator (yellow) Others: 1 x Security lock hole	Figure 3-8 Figure 3-9 Figure 3-10

Figure 3-7 Appearance of the ICD OPS i5 D or ICD OPS i7 D



Figure 3-8 Appearance of the ICD OPS i7 Z



Figure 3-9 Appearance of the OPS W021 Z or OPS W022 Z



Figure 3-10 Appearance of the OPS W021 D or OPS W022 D



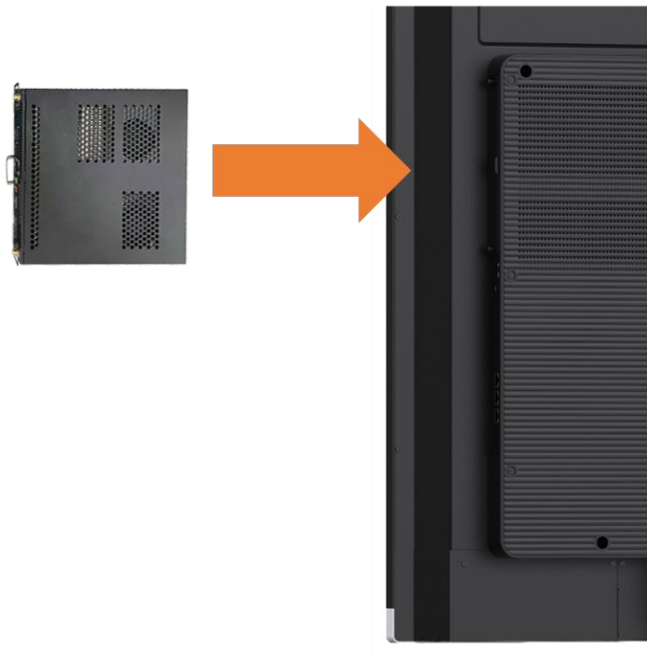
Installation Position

As an embedded computer module, the OPS can be easily installed or removed simply using a screwdriver.

NOTE

- Endpoints of different sizes differ slightly in appearance, but their installation methods are similar. The following uses one endpoint as an example.
- When installing or removing an OPS, ensure that the endpoint is powered off. Otherwise, the OPS may be abnormal.

Figure 3-11 OPS installation position



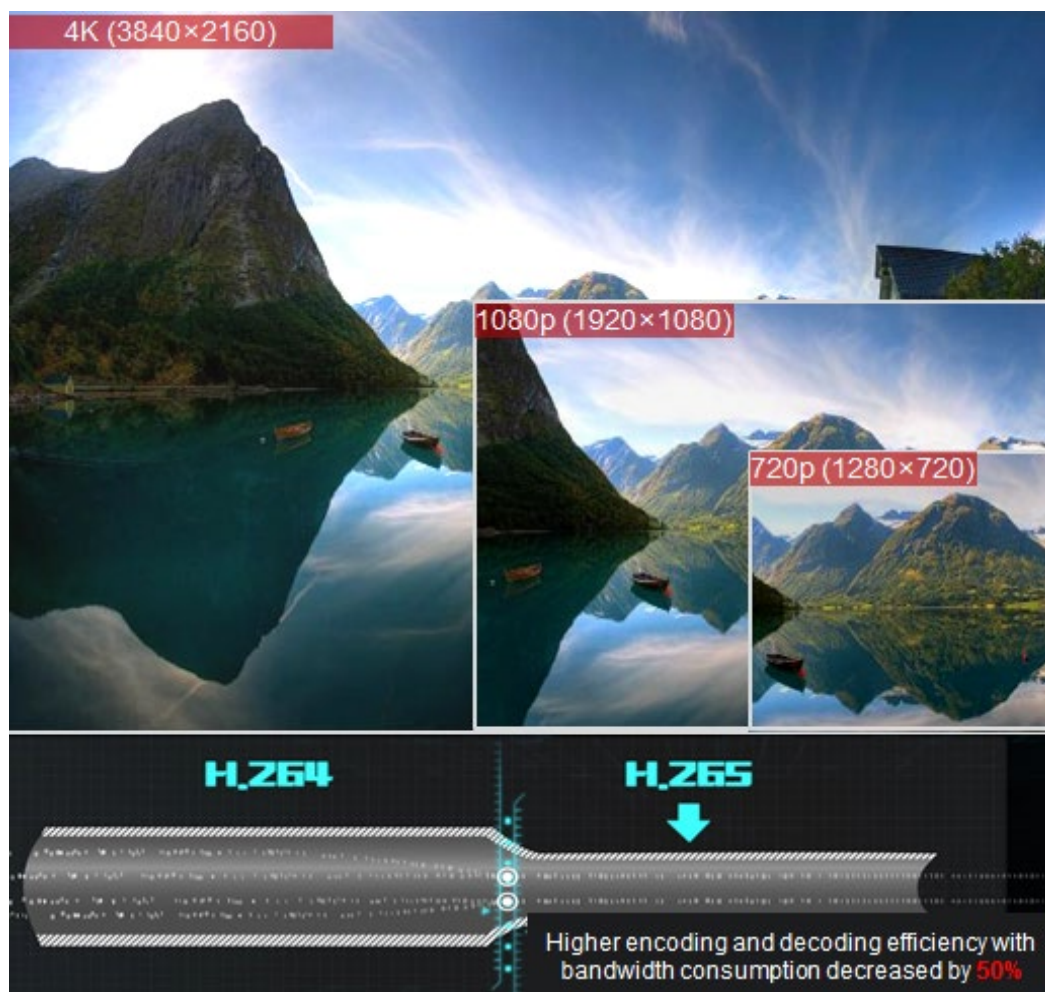
4 Functions and Features

4.1 Ultra-HD Video

The IdeaHub uses H.265 as the encoding and decoding protocol for both video and presentation, together with Huawei proprietary Video Motion Enhancement (VME), to provide 4K video and presentation experience.

4K delivers four times the resolution of 1080p screens, giving incredible clarity and lifelike detail to images on a larger screen.

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



4.2 Hi-Fi Audio

- Supports Acoustic Echo Cancellation (AEC), Automatic Noise Suppression (ANS), and Automatic Gain Control (AGC), as well as VoiceClear, AudioEnhancer, reverberation suppression, and lip synchronization.
- Supports Opus, Forward Error Correction (FEC), Backward Error Correction (BEC), Packet Loss Concealment (PLC), Net Automatic Transfer-Enhancement (netATE), and Audio Jitter Buffer (AJB).
- Leverages the built-in microphone for the clear, crisp audio, and supports an external microphone for extending pickup distance.
- Based on the installation mode of the large screen, you can select the corresponding configuration item on the touchscreen or web interface. For example, you can select **Standard** (floor stand-mounted), **Wall-mounted**, or **Wall-recessed** to achieve better audio and video effects.

4.3 All-Scenario Intelligent Meetings

Full 4K Video Meetings

By using the video conferencing capability provided by the CloudVC network, the IdeaHub works with a 4K professional-grade camera, and supports H.323+SIP dual stack and dual 4K hardware encoding and decoding capabilities. The IdeaHub supports up to 4K 30 fps HD video and 4K 30 fps HD data sharing, delivering clear details in frames.

Multistreaming Conferencing

Multistreaming conferencing leverages Scalable Video Coding (SVC). The IdeaHub is responsible for video codec and the 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. The resolution ranges from 180p to 1080p. A maximum of 25 channels of video streams can be forwarded from the MCU to each IdeaHub. The resolution, up to 1080p allowed, depends on the actual bandwidth.

When multiple audio streams are supported, the IdeaHub sends one channel of audio streams to the MCU. The MCU forwards a maximum of three channels of audio streams to each IdeaHub. An IdeaHub supports a maximum of three channels of decoding, mixing, and local output.

NOTE

- Audio multistreaming is supported only when the CloudVC solution of 23.0 or later is used and the audio protocol is Opus.
- A maximum of 25 video panes are supported only when the CloudVC solution of 24.1 or later is used and the video protocol is H.265.

Adapting to Cloud Meetings

The IdeaHub adapts to the Huawei Cloud Meeting SmartRooms, Tencent Meeting Rooms, and Lark Meetings. Cloud meetings support HD video meetings with a resolution of up to 1080p.

BYOM

The IdeaHub can be connected to mobile devices, computers, or OPS modules. After the connection, the camera, microphone, speaker, and screen of the IdeaHub can be used by the mobile devices, computers, or OPS modules. When you use a computer to project content or use an OPS module and invoke the BYOM capability of the large screen, you can use the image enhancement function to improve the video definition on the large screen.

Participants can enjoy a wide field of view and long-distance sound pickup in professional meeting rooms. More participants at the local site can participate in efficient discussions; the video and audio played at the remote site is clear.

4.4 Smart Projection

The IdeaHub supports wired and wireless projection modes. Both modes provide basically the same functions. You can use either of the two modes based on your needs to easily share audio files, videos, images, and other files on your mobile device or PC. In addition, the IdeaHub supports reverse control and annotation, making projection and information interaction simple and efficient.

Wired Projection

The IdeaHub can be connected to a computer using an HDMI cable or USB Type-C cable to share the computer desktop. The IdeaHub supports plug-and-share. After performing wired projection using a Type-C cable, the computer can directly use the camera, microphone, and speaker of the IdeaHub. In addition, the IdeaHub allows mobile devices to perform projection using a USB Type-C cable.

Wireless Projection

Wireless projection frees you from complex cable connections and allows you to easily share your computer and mobile device screens.

- With Huawei Cloud Meeting and IdeaShare mobile clients, you can share your mobile device screen.
- With Huawei Cloud Meeting and IdeaShare Windows/macOS PC clients, you can share your PC desktop.
- With the IdeaShare Android/HarmonyOS/Windows client, the Wi-Fi P2P connection mode is supported. Projection can be started even if the mobile device and IdeaHub are not on the same network.
- The IdeaShare client supports ultrasonic projection. That is, when the client and endpoint are on the same network, the client can discover nearby endpoints through ultrasonic waves, implementing projection without the need to enter the projection code.
- Simply insert the IdeaShare Key into the IdeaHub for pairing and then into your computer to easily share your desktop with the IdeaHub.
- When using the IdeaShare client or the IdeaShare Key (Type-C) on a Windows or macOS computer, the screen extension feature is supported, allowing the extended screen to be shared to the endpoint.
- A maximum of nine clients or IdeaShare Keys (Type-C) can be used to share content of up to nine devices to one endpoint at the same time. A maximum of six IdeaShare Keys (Type-C) can be connected at the same time.
- With the IdeaShare Windows client or IdeaShare Key (Type-C), which supports BYOM, the camera, microphone, and speaker of the IdeaHub can be used as virtual peripherals for third-party meeting software installed on computers.
- On the large screen and devices with host rights, you can manage screen sharing permissions for the client and IdeaShare Key.

Figure 4-2 IdeaShare Key (Type-A)



Figure 4-3 IdeaShare Key (Type-C)



DLNA Projection

If a third-party audio or video app supports DLNA-based projection, you can project images, music, or videos to the IdeaHub via this app.

Cast+ Wireless Projection

You can use the wireless projection function on the control center of your Huawei phone to quickly project your phone screen to the IdeaHub, without the need to connect cables.

Projection with Miracast

Android phones or Windows computers that support Miracast projection can use the wireless projection function to quickly project content from your phone or computer to the IdeaHub. Your device does not need to be on the same LAN as the endpoint.

NFC OneHop Projection

Enable NFC on your Huawei phone, and place your phone close to the NFC sensor area of the IdeaHub to trigger pairing. Then you can project your phone screen to the IdeaHub.

Reverse Control

The IdeaHub allows you to reversely control the computer desktop from the touchscreen by performing tap, drag, and double-tap operations on the touchscreen. When a PowerPoint presentation is in slide show mode on the computer, you can change slides or end the show using the touchscreen.

4.5 Whiteboard Collaboration

The IdeaHub's built-in whiteboard features ultra-low writing latency and smooth writing. The whiteboard provides multiple writing modes and mistouch prevention to meet the requirements of daily office and education writing scenarios. Whiteboard content can be easily saved and transferred through multiple methods. Users can choose a method as they like.

Table 4-1 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.
Writing on a whiteboard	- Write with your finger or a stylus pen. - Support a handwriting effect for a fountain pen. - Support writing with up to ten fingers at the same time. - Support intelligent writing recognition of shapes and texts. - Select, move, zoom in, zoom out, delete, and edit shapes and texts, or cancel the preceding operations. - Support writing in the highlighter effect. - Support adjustment of line thickness for handwriting (in fountain pen, pencil, and highlighter effects). - Insert shapes such as triangles, quadrilaterals, and circles. - Insert images. - Insert content from the favorites. - Insert notes. - Use the intelligent search function in the whiteboard app and insert the search results into the whiteboard. These functions are available only after an endpoint is connected to the IdeaManager (cloud service) and a large model is configured on the IdeaManager (cloud service).
Operating a whiteboard	- Perform operations such as zooming in, zooming out, erasing, and dragging the canvas by using your finger. - Circle an area. You can move, zoom in/out on, copy, paste, or delete the selected content, add it to favorites, or change the color in the circled area. - Support precise erasing and full screen clearing. - Erase only highlighter strokes. - Crop a single image.

Function	Description
Saving a whiteboard	• Save the whiteboard to a local directory. • Save the whiteboard to a USB flash drive. • Transfer the whiteboard content via emails on condition that email accounts have been configured. • Scan the QR code with the Huawei Cloud Meeting client to save the whiteboard content. • Save whiteboard content to a configured third-party server by scanning the QR code. • Save content by scanning the QR code through the browser. • Share whiteboard files to third-party apps.
Closing a whiteboard	Before closing a whiteboard, you can choose whether to save the whiteboard content.
Deleting a whiteboard	Delete whiteboard pages or files.
Opening a whiteboard	• Open a whiteboard from a local directory. • Open a whiteboard in a USB flash drive. • Scan the QR code with the Huawei Cloud Meeting client to open the whiteboard.
Sharing a whiteboard	• Support whiteboard sharing during meetings. • Support collaboration on the whiteboard shared between local and remote sites in a data meeting.
Annotation	• Annotate on local apps. • Allow annotations to be projected. • Support cross-screen annotation when a PPT file is played in full screen on the IdeaShare Windows client. • Support global annotation. • Save annotations to a local directory of the endpoint. • Open annotation files from a local directory of the endpoint. • Send annotated content via email. • Share annotations in a meeting. • Support collaboration on annotations shared between local and remote sites in a data meeting. • Add content on one split screen to the other, which is the whiteboard, as an image using the annotation function. • Touch and hold the annotation background to enter the editing state and crop the annotation background.

4.6 Instant Writing with Stylus

With Instant Writing with Stylus enabled on the IdeaHub, you can use a new-gen stylus to write on the screen for annotation. When dynamic annotation is enabled, the dynamic display of the screen content is not affected during annotation.

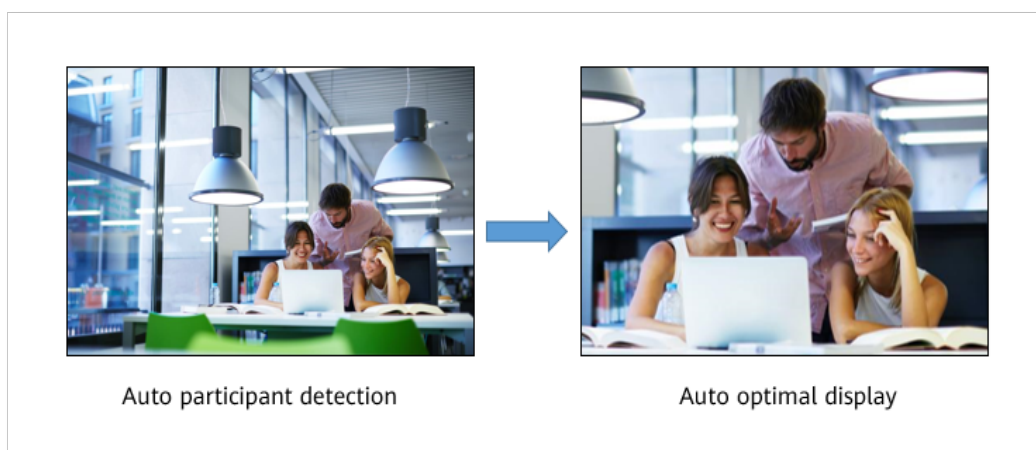
After the writing is complete, the content can be imported to the whiteboard, saved, transferred by QR code scanning, sent by email, or shared to a third-party app.

4.7 Intelligent Tracking

Auto-Framing

A triple-lens camera consisting of a wide-angle lens and two telephoto lenses is used to perform panoramic photography, and the endpoint automatically adjusts its camera based on the number and position of attendees, in order to ensure the optimal panoramic view.

Figure 4-4 Auto-Framing



NOTE

Only the inner camera supports Auto-Framing.

Voice Tracking

The IdeaHub uses voice tracking and face detection algorithms to detect and locate the sound source. Using this information, it automatically displays a close-up image of the speaker.

Voice tracking is applicable to two-person conversations. When two persons speak in turn (such as A-B-A mode), the large screen will trigger a conversation mode and display the speakers in one or two panes based on their distance.

NOTE

Only the inner camera and microphone support voice tracking.

4.8 Acoustic Baffle

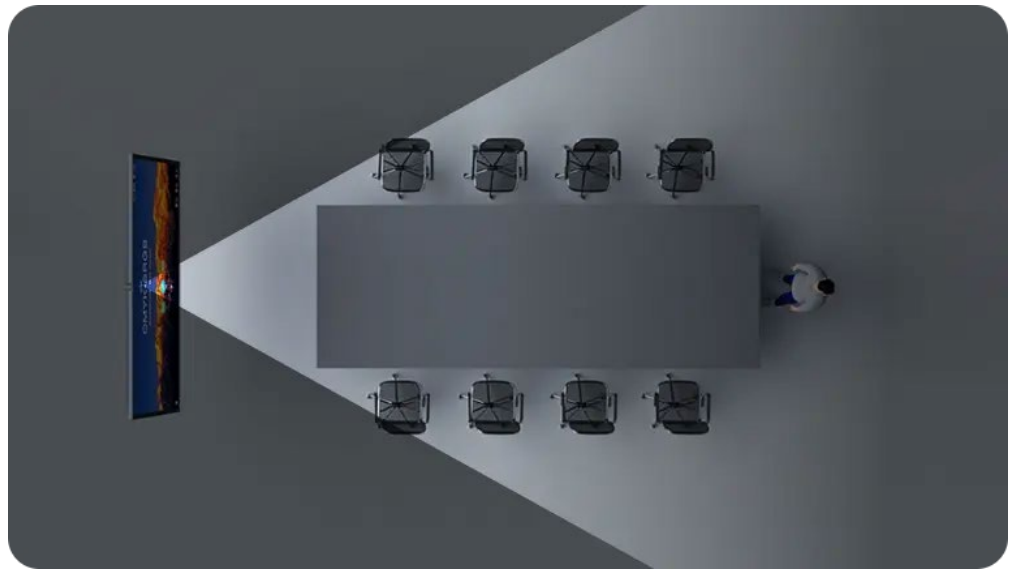
When the acoustic baffle function is enabled on the IdeaHub during a meeting, noise outside the invisible sound wall at the local site can be effectively reduced to prevent impact on remote sites.

The acoustic baffle function supports the following types:

- Sector acoustic baffle

The sound pickup range covers a 60° or 80° sector area directly in front of the large screen, centered on the camera.

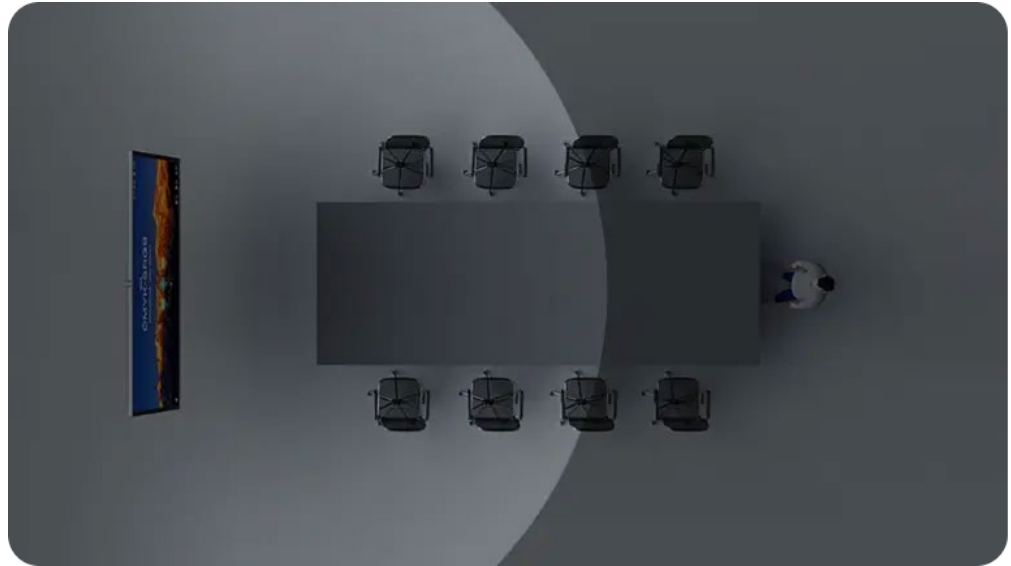
Figure 4-5 Sector acoustic baffle



- Round acoustic baffle

The sound pickup range covers a circular area with a 2 m or 3 m radius centered on the large screen camera.

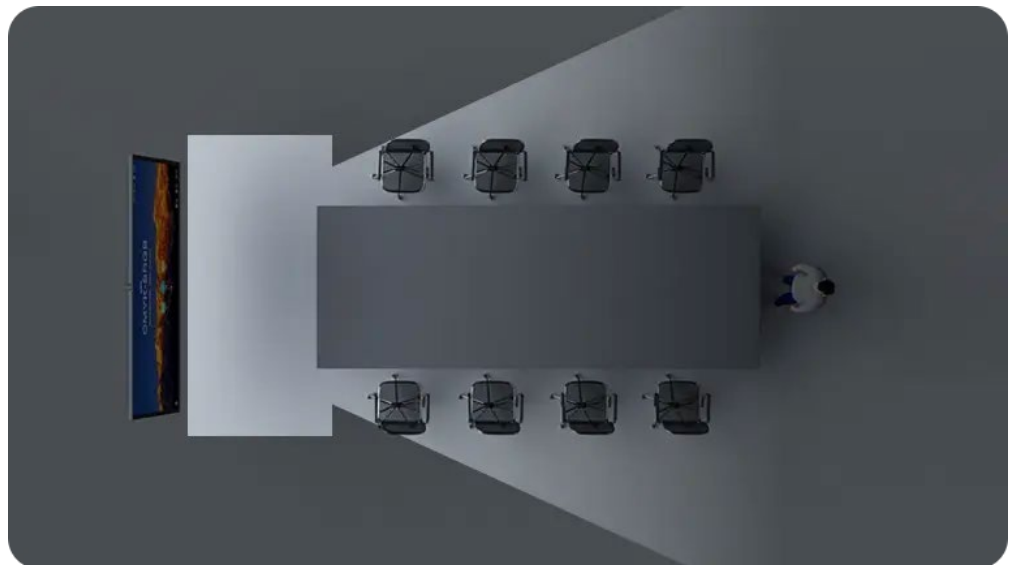
Figure 4-6 Round acoustic baffle



- T-shaped acoustic baffle

The sound pickup range includes a rectangular area measuring 2.6 m × 3 m in front of the large screen, as well as a 60° sector area directly ahead.

Figure 4-7 T-shaped acoustic baffle



4.9 Mirror & Control

After the IdeaShare client, IdeaShare Key (Type-C), or Touch is connected to the IdeaHub, the IdeaHub is mirrored to devices for remote viewing and portable control.

On the large screen and devices with host rights, you can manage mirror & control permissions for the client and IdeaShare Key.

4.10 Dual-Screen Display

The IdeaHub supports dual-screen extension or clone. You can connect an IdeaHub to an external screen using an HDMI cable to display content such as the video and presentation separately on two screens or clone the content on the IdeaHub to another display. Dual-screen extension supports content exchange between the primary and secondary screens.

4.11 App Multiplier

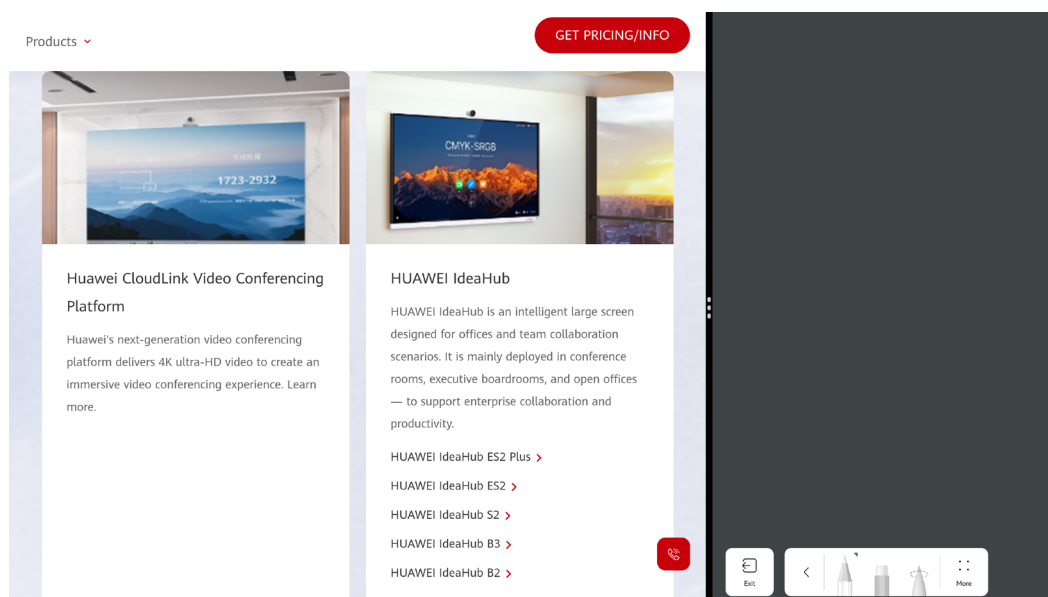
App Multiplier lets you have the same app open in two different windows on one large screen, improving visual perception and user experience. The system automatically selects an appropriate display mode based on the application type. The modes are as follows:

- Navigation mode: You can open the app in two windows, with the left one displaying the app homepage and the right one displaying the newly opened page.
- Shopping mode: You can open the app in two windows, with both displaying the latest two pages, which is perfect for a multi-hierarchy app.
- Single window mode: You can open the app in one window which will be displayed in the center of the screen when you are using the app. This is a minimum guarantee for apps that do not support landscape display.
- EasyGo mode: Third-party app developers can customize the window display mode based on service scenarios.

4.12 Multi-Window

The IdeaHub allows you to open two apps at the same time in split-screen mode, reducing complex operations caused by app switching and improving usage efficiency. You can also adjust the split-screen ratio and switch the left and right split screens of app windows for proper display areas.

Figure 4-8 Multi-Window example



4.13 Barge-in/Forcible Release

After the barge-in/forcible release function is enabled on an endpoint, it is allowed to receive calls from other endpoints or meetings when the endpoint is in an H.323 call. When receiving a call with a higher priority, the endpoint can hold or hang up the current call based on the configuration and automatically answer the new call.

The barge-in/forcible release feature ensures that the endpoint in calling state does not miss other important calls.

4.14 Address Book

After the on-premises meeting function is enabled on an endpoint, the endpoint can use the local address book or LDAP server-based corporate address book to store site information.

- On the touchscreen or web interface, you can edit or delete a site from the local address book.
- On the touchscreen, Touch UI, or web interface, you can query sites in the local address book and corporate address book, initiate calls to these sites, or invite other sites to join a meeting.
- On the web interface, you can export and import the local address book to quickly update records in batches.

4.15 Wireless Connections

The endpoint 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). Both Wi-Fi and hotspot can be enabled at the same time.

If Wi-Fi is enabled, the endpoint automatically detects and connects to Wi-Fi networks. You can set the IP address in DHCP or static mode. This function applies to scenarios in which no wired network is available and you need to connect the endpoint to the network via Wi-Fi.

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

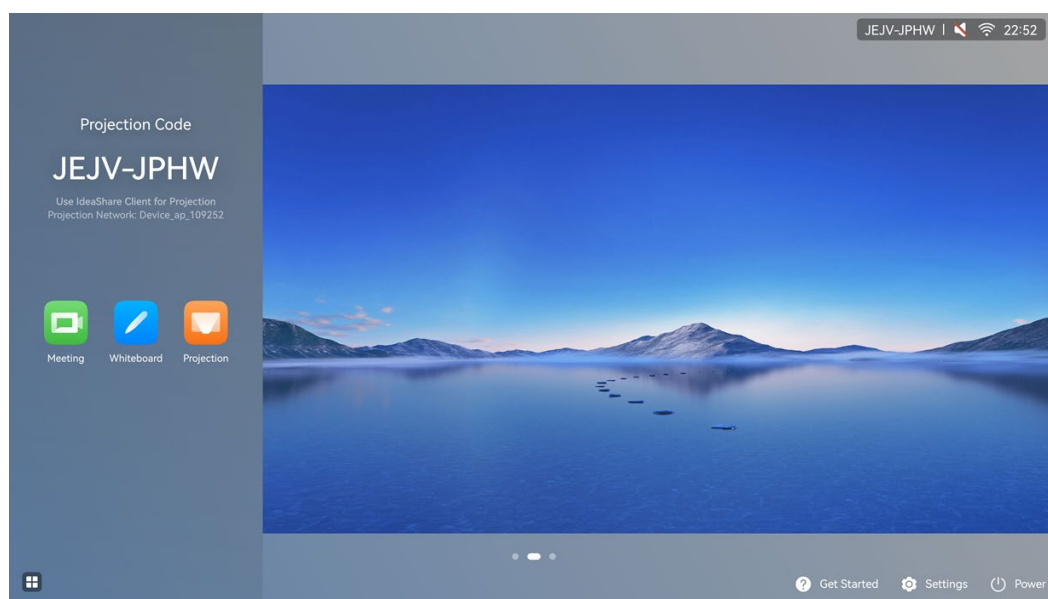
NOTE

This device contains the radio transmission module with the type approval code **CMIIT ID:2022AP2900**.

4.16 Bulletin Board

The IdeaHub supports releasing various types of information on the home screen, including corporate culture, team objectives, administrative services, and guest greetings. Content can be flexibly defined to fit different uses.

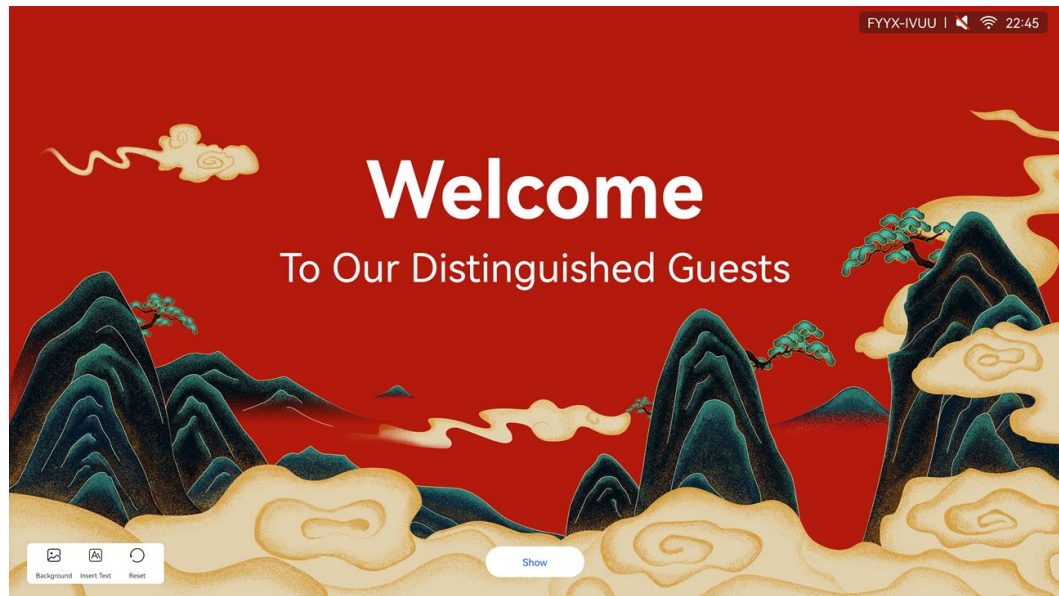
Figure 4-9 Bulletin Board



4.17 HiBoard Welcome Page

The IdeaHub supports the HiBoard welcome page. Three welcome page background images are available by default and users can customize the content and font of the welcome page. You can also upload customized welcome page background images.

Figure 4-10 HiBoard

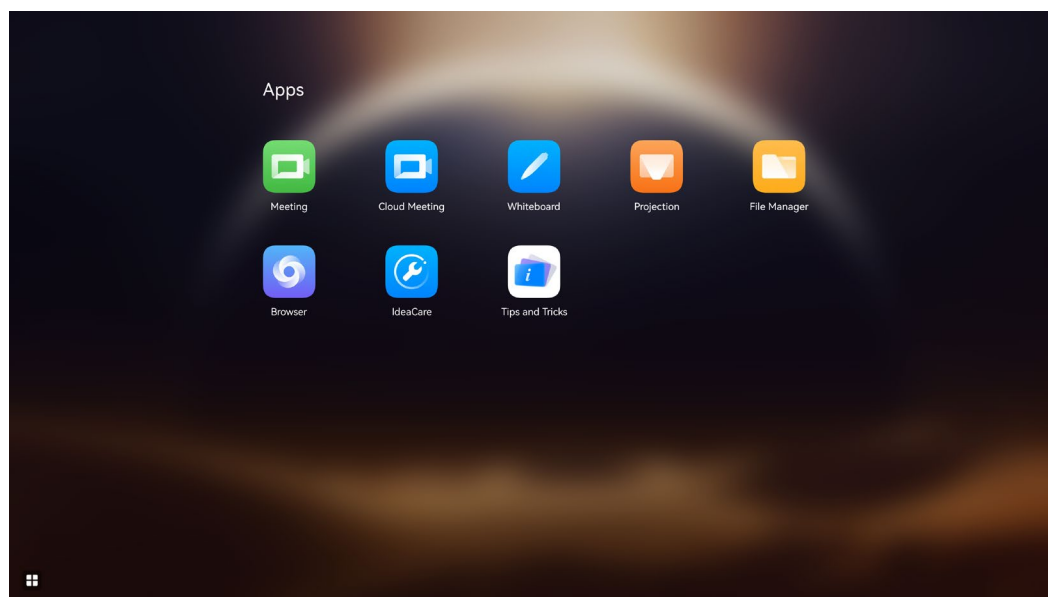


4.18 Apps

The IdeaHub has common enterprise apps pre-installed, covering various office scenarios such as meeting, whiteboard, and projection, satisfying users' requirements for digital office. You can customize the apps on the home screen based on use frequency, in a simple and efficient manner.

You can also download third-party apps in the IdeaHub section from the pre-installed HUAWEI AppGallery on an IdeaHub.

Figure 4-11 Apps



4.19 Globalization

The IdeaHub supports multiple languages and time zone settings. If some countries and regions in the selected time zone use daylight saving time (DST), the IdeaHub automatically enables DST and changes its clock to comply with DST, meeting needs of different users.

The IdeaHub supports the following languages: Simplified Chinese, traditional Chinese, English, Spanish, French, Japanese, Arabic, Italian, Portuguese (Brazil), German, Thai, Türkiye, Korean, Kazakh, Romanian, Bulgarian, Sinhala, Serbian, Hungarian, Greek, and Polish.

NOTE

Portuguese (Brazil) is supported only after the Portuguese license is imported.

4.20 Operations, Administration, and Maintenance

4.20.1 Batch Configuration

The IdeaHub can be connected to enterprise services, and deliver configurations through the management platform (IdeaManager or SMC) to complete key configurations in batches, improving O&M efficiency.

4.20.2 Customizing a Startup Animation and Changing a Wallpaper

- The startup animation can be replaced with a customized animation to meet personalized requirements.

- You can change the wallpaper on the web interface, touchscreen, or Touch.

4.20.3 Resetting the Web Password

If no administrator information is configured for the IdeaHub or you forget the administrator password, you can reset the password in the following ways:

- If the IdeaHub is connected to the IdeaManager (cloud service), click **Forgot Password?** on the web login interface, use your mobile device to scan the QR code, log in to the IdeaManager (cloud service) as prompted, and reset the password.
- If the IdeaHub is connected to the Huawei Cloud Meeting (with the IdeaManager activated), SMC, or IdeaManager, contact the network management platform administrator to log in to the platform and deliver the password again.
- In other scenarios, you are advised to restore factory settings and reset the password.

NOTE

The IdeaManager (cloud service) requires a compatible version of the IdeaManager to use the **Forgot Password** function.

4.21 APIs for Third-Party Integration

The IdeaHub provides APIs for third-party integration and development based on HTTP (Hypertext Transfer Protocol). Users can choose necessary APIs based on their actual needs to develop required functions and integrate functions of the IdeaHub into other products or apps.

4.22 Serial Port Control

The IdeaHub's open RS232 protocol control API enables efficient remote endpoint management.

The API provides the following functions:

- Remote shutdown/startup
- Remote sleep
- Remote wakeup
- Volume adjustment
- Screen brightness adjustment
- Third-party app opening/closing
- Signal source switching
- Operating system switching (HarmonyOS/Windows) after OPS installation
- Key endpoint status query

4.23 Keeping Applications Alive in the Background

The IdeaHub allows users to select applications that need to be kept alive in the background to prevent them from being automatically closed by the system.

4.24 Developer Options

Developer options provide users with in-depth optimization functions. It is recommended that users disable developer options immediately after using them. Developer options of the IdeaHub include:

- **USB Debugging:** When enabled, you can debug the IdeaHub, copy data, and install apps on it using the computer connected to the IdeaHub through a USB port.
- **Revoking USB Debugging Permission:** Revoke the previously granted USB debugging permissions from all the computers. After the permissions are revoked, the current USB debugging stops.
- **Auto System Update:** When enabled, auto update of forcible update packages in **System & Update** is allowed.

5 Security and Reliability

5.1 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 IdeaHub uses HarmonyOS and provides powerful anti-attack capabilities.

5.2 Email Security

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

5.3 Web Login Security Protection

Users can log in to the IdeaHub web interface to remotely manage the IdeaHub. The following protection measures are taken to ensure web login security:

- When a user requests access to a specified web page which requires access authorization or submits an HTTPS request, the endpoint 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 scan software is used to scan the web server and web apps to prevent security vulnerabilities.

5.4 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 endpoint utilizes multiple encryption measures, including H.235 (for encryption of media and signaling streams), SRTP, TLS, and HTTPS.
- Robustness testing tools are used to avoid security 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.
- The endpoint supports anti-brute-force-cracking. When the number of authentication failures reaches the preset value, the IP address or account is locked. You can access the endpoint again only when this duration ends.

5.5 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 can be transmitted through secure channels or after being encrypted.
- The endpoint checks the complexity of passwords. When a password is being entered, each stroke is displayed as "." or "*", and the entered password cannot be copied.
- Sensitive data such as passwords and encrypted contexts must not be recorded in logs. If sensitive data really needs to be recorded, it should be displayed as "****".
- Only standard encryption algorithms and key negotiation mechanisms are used. Proprietary algorithms are not allowed.

5.6 System Management and Maintenance Security

- Software packages (including patches) are released only after they are scanned by at least three types of mainstream antivirus software and no issues are detected. In special cases, an 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.

5.7 Security Design

- Safety labels and tags are attached to the exterior of the product to remind users to avoid high-risk operations.
- The component security design meets the admission requirements of the EU and China.

5.8 DR and Backup

The IdeaHub supports disaster recovery (DR) and backup. When the server device (such as the LDAP server, ACS server, or SC) used with the IdeaHub is faulty, the IdeaHub can switch to the standby device to ensure service continuity.

5.9 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.

5.10 Security Protection for the CloudVC Network

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.

Firewall Technology (NAT)

The firewall protects your IP network by separating the internal and external network communication data. Using the Network Address Translation (NAT) access technology and signaling exchange between public network protocols and private network protocols, the firewall enables zero-distance communication among sites on local area networks (LANs) in different places through video meetings. With NAT, a device on an internal 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. NAT mapping enables the entire private network to connect to the Internet through only a few IP addresses. Through the firewall-port-based control, the private network is more secure.

Network Layer Security

The IdeaHub on the CloudVC network uses the following network layer security policies to effectively prevent external attacks:

- 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.

Strong Network Adaptability and High Security

- Super Error Concealment (SEC) and Hybrid Automatic Repeat Request (HARQ) retransmission are utilized to deliver clear and smooth service even when the audiovisual packet loss rate reaches 30%.
- 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 meeting. This feature improves network utilization and delivers smooth HD video images.
- Various encryption measures are taken, such as SRTP, TLS, and HTTPS, ensuring secure and stable running of the video conferencing system.
- Meetings can be encrypted using the Chinese cryptographic algorithm, enhancing meeting security.

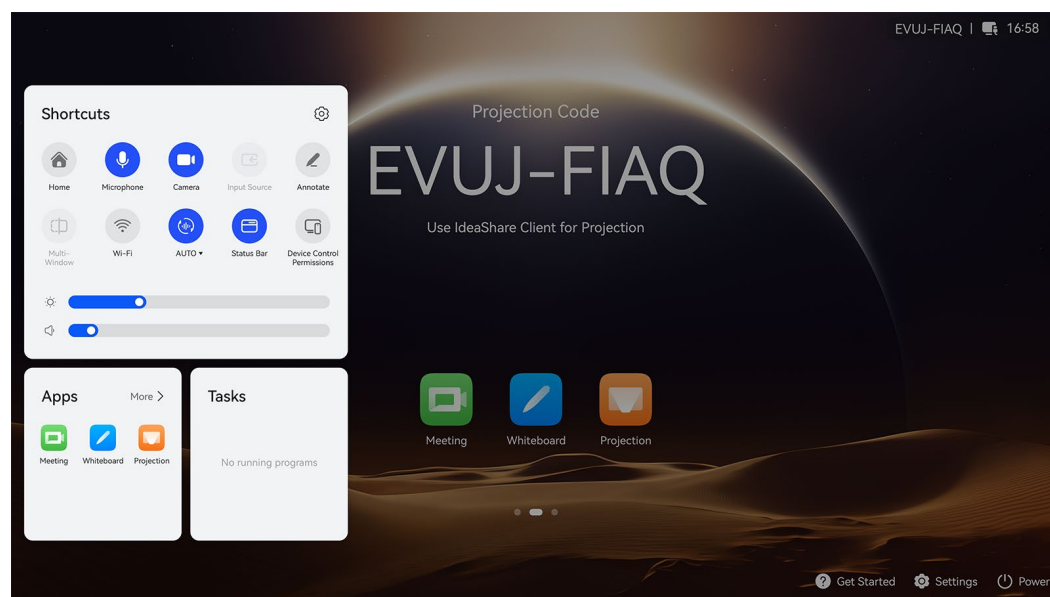
6 Operations and Maintenance

6.1 GUIs

6.1.1 Touchscreen UI

The IdeaHub uses a brand-new touchable collaboration system. You can simply tap icons to perform basic operations, such as to open an app, turn on/off a camera, or adjust the volume.

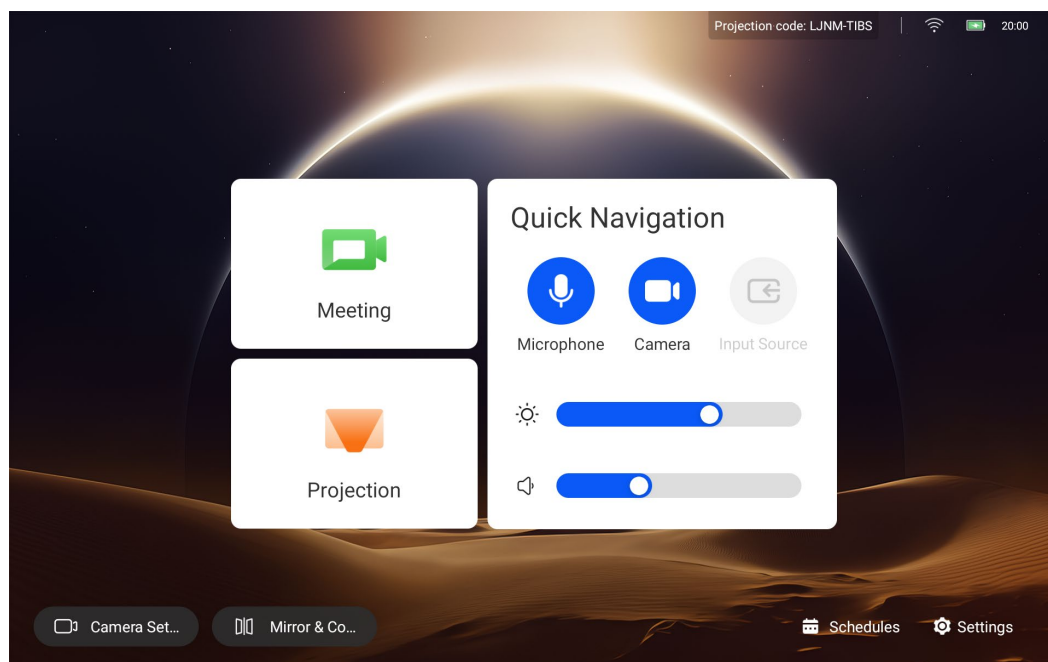
Figure 6-1 Home screen of the touchscreen



6.1.2 Touch UI

The Touch is an optional component of the IdeaHub. It provides a graphical touchscreen. You can easily initiate a call, create a meeting, control a meeting, share content, control the camera, microphone, and speaker, perform mirror & control, and modify other endpoint settings by simply tapping icons.

Figure 6-2 Home screen of the Touch UI

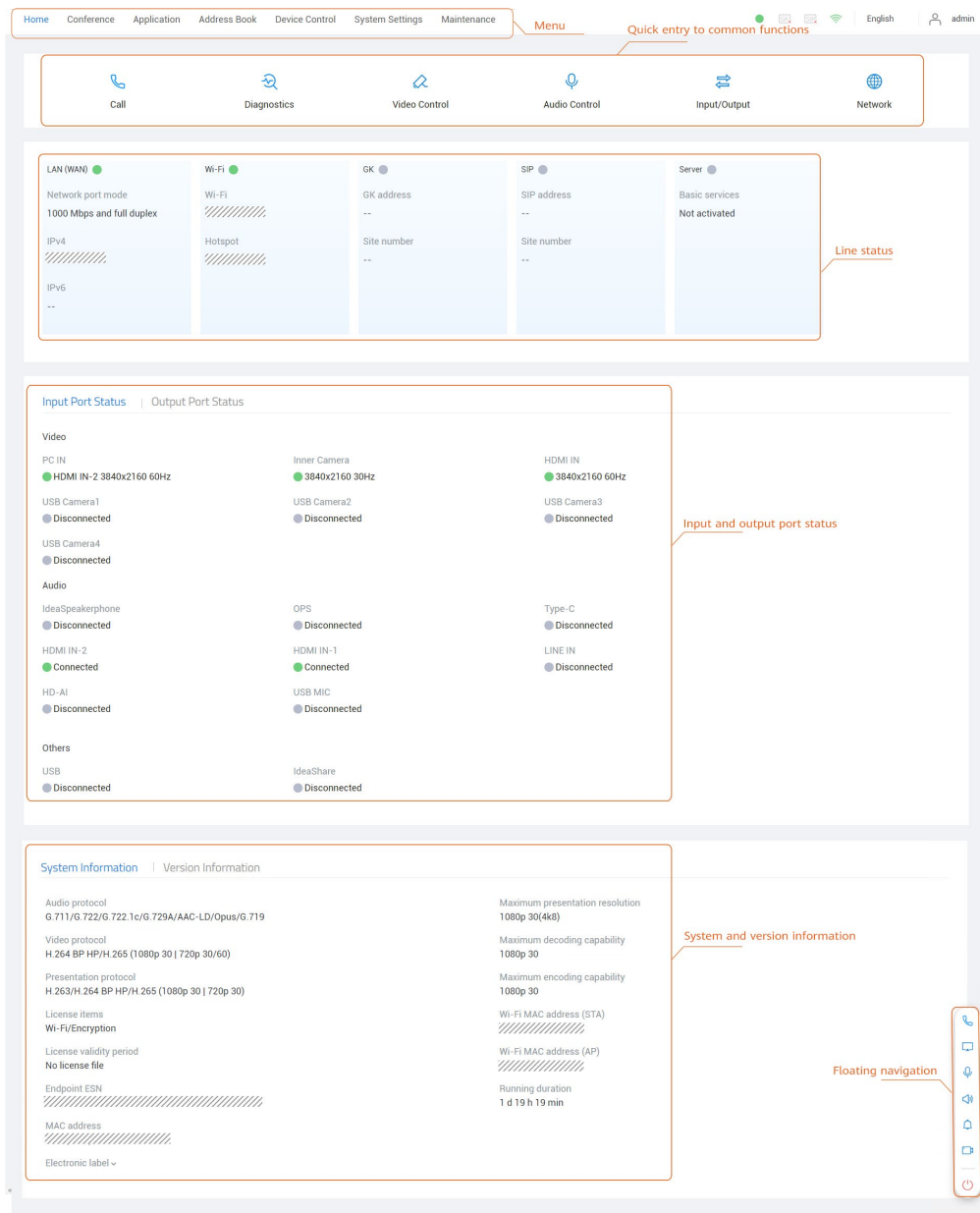


6.1.3 Web Interface

The IdeaHub can be remotely managed by the administrator from the endpoint web interface. The web interface allows simultaneous operations from up to 10 users using the same account. When multiple users log in to the system at the same time, the latest operation of a user takes effect. In addition, the operations of different users can be recorded in logs.

The figure below shows the basic layout of the web interface, which varies depending on the model or license import.

Figure 6-3 Web interface example



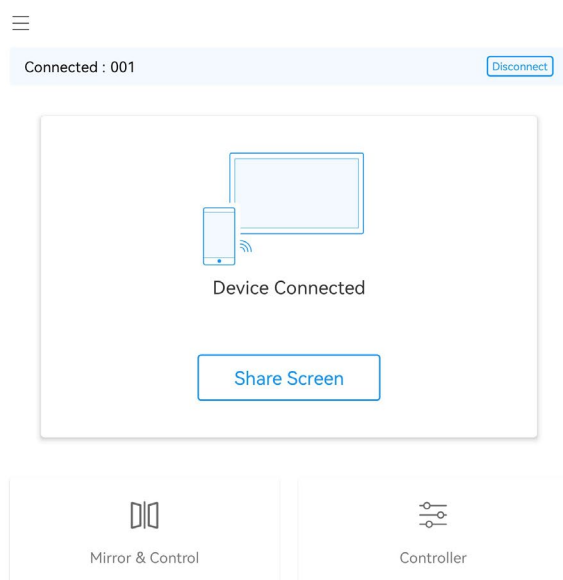
6.1.4 IdeaShare UI

The IdeaShare is a wireless projection client designed for the IdeaHub. It can be installed on an Android/iOS/HarmonyOS mobile device or Windows/macOS computer. A maximum of 50 users can be connected at the same time. When one site is sharing content, other sites can preempt the presentation sharing right.

The IdeaShare wireless projection clients for Android/iOS/HarmonyOS/macOS and Windows integrate the remote control function, allowing users to mute or unmute the microphone, turn on or off the camera, adjust the volume, and leave or end a meeting. In addition, the Android, HarmonyOS, macOS, Windows, and iOS versions of the IdeaShare wireless projection client

is integrated with the mirror & control function, allowing users to remotely view and control the large screen.

Figure 6-4 IdeaShare UI



6.2 Maintenance and Upgrade

6.2.1 Log Management

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

Logs are saved as files. You can view or export logs on the web interface.

6.2.2 Device Diagnostics

The IdeaHub has a built-in IdeaCare app. You can use this app on the touchscreen to perform full diagnostics, quick diagnostics, diagnostics by category, and one-click diagnostics, and export diagnostics reports.

6.2.3 Inspection

The following inspection tasks can be executed on the SMC2.0, SMC, and IdeaManager for 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.
- Collect certificate information. (Only the SMC and IdeaManager support this task.)
- Check whether the SIP transmission type, SSL encryption for the address book, and call encryption are secure (only for the SMC and IdeaManager).
- Check whether the HTTP switch configuration is secure (only for the SMC and IdeaManager).
- Report the inspection status and result to the SMC2.0, SMC, or IdeaManager.

6.2.4 CHR Data Collection

When the IdeaHub is connected to the SMC, call information can be collected to generate call history records (CHRs) for sessions and media streams, which can be periodically reported to the SMC. O&M personnel can obtain the CHR data files from the SMC and import them into IdeaManager for data parsing, enabling rapid fault localization.

6.2.5 Upgrade

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

- Manually upgrade the endpoint on the web interface.
- Upgrade the endpoint by importing the upgrade file from a USB flash drive.
- Upgrade the endpoint in eRecovery mode.
- After the endpoint is connected to the public network, the software version of the endpoint can be automatically updated. You can also manually check for the latest version on the touchscreen and update the software.
- Manually upgrade the endpoint on the SMC interface.
- Manually upgrade the endpoint on the SMC2.0 interface.

The endpoint supports independent version upgrade of the IdeaShare Key software without being released with the endpoint version.

- The IdeaShare Key software version can be manually upgraded on the web interface.
- The IdeaShare Key software version can be upgraded by importing an upgrade file from a USB flash drive.
- The IdeaShare Key software version can be manually upgraded on the SMC.

6.2.6 User Experience Improvement Program

The program helps improve products and services to provide better user experience. With your consent, the device collects personal data, including location, network, device, and

application information. Before joining this program, you are advised to read its related statement and *Personal Data Description* carefully. After joining this program, you can opt out of the program at any time.

7

Technical Specifications

7.1 Physical Specifications

Table 7-1 Physical specifications

Parameter Name	Content
System	
CPU	8 cores
Memory	12 GB
Storage space	64 GB
AI computing power	4T+2T
Operating system	Built-in HarmonyOS, with OPS (optional) support for Windows 10 or Windows 11 Enterprise.
Screen display	
Backlight type	D-LED
Aspect ratio	16:9
Resolution	3840 x 2160
Display area	1895.04 mm x 1065.96 mm
Pixel distance	493.5 μm x 493.5 μm
Pixel defect	The defect standard complies with ISO 9241 Class I.
Refresh rate	60 Hz
Response time	8 ms
Brightness (typical value)	350 nits
Screen brightness uniformity	≥ 70%

Parameter Name	Content
Contrast	1200:1
Viewing angle	$\geq 178^\circ$
Color depth	10 bits (8 bits + FRC)
Hardware-based anti-blue light	Supported
Glass surface treatment	Anti-glare
Screen lamination	Zero-gap bonding
Glass surface hardness	$\geq 7H$
Screen touch control	
Touch control precision	± 1 mm
Maximum number of touch points	20
Touch control type	Infrared touch control
Touch response time	≤ 10 ms
Automatic screen brightness adjustment	Supported
Inner camera	
Lens type	Fixed focus (1W + 2T)
Sensor size	Wide: 1/2.8" Tele: 1/2.7"
Horizontal field of view	Wide: 80° Tele: 30°
Aperture	F1.8
Video resolution	Wide: 4K 30 fps (3840 x 2160) Tele: 2.5K (2880 x 1620)
Zoom	6x zoom (including 3x optical zoom)
Vertical angle of view	Wide: 50° Tele: 18.5°
Lens cap for privacy protection	Supported
TV distortion	$< 2\%$
Shooting distance	Wide: 0.5 m to infinity Tele: 2 m to infinity
PTZ adjustment	Wide: e-PTZ

Parameter Name	Content
	Tele: PTZ + e-PTZ
Automatic exposure (AE)	Supported
Automatic white balance (AWB)	Supported
Camera presets	Local camera: 32 at most; remote camera: 6 at most
Built-in microphone	
Quantity	12
Sampling frequency	48 kHz
Sampling bits	24 bits
Sound pickup distance	12 m
Sound pickup angle	180°
Built-in speaker	
Quantity	2 x (high-frequency speaker + full-frequency speaker)
Total speaker power	2 x 20 W
Sound output mode	Bottom speaker
Frequency response range	100 Hz to 20 kHz
Stereo	Supported
Maximum sound level	95 dB SPL@1 m
Electricity supply requirements	
Rated operating voltage	100–240 V AC
Operating frequency	50 Hz/60 Hz
Maximum power consumption	< 450 W
Typical power (without OPS; brightness of 300 nits)	235 W
Standby power	< 0.5 W
Environmental requirements (in use)	
Ambient temperature	IdeaHub: 0°C to 40°C Touch: 0°C to 35°C
Relative humidity	10% to 95%
Operating altitude	≤ 5000 m

Parameter Name	Content
Operating duration (hour/day)	≤ 16 hours/day
MTBF	> 100,000 hours
Device operating lifespan	5 years
Environmental requirements (idle)	
Ambient temperature	−20°C to +60°C
Relative humidity (non-condensing)	5% to 95%
Physical parameters of the entire system	
Product dimensions ^[1]	1232.8 mm x 1953.0 mm x 91.8 mm
Package dimensions	1330 mm x 2090 mm x 250 mm
Net weight	63.7 kg
Gross weight (including the package)	76.9 kg
(Optional) Floor stand	
Product dimensions	1525.0 mm x 1302.0 mm x 764.0 mm
Package dimensions	180 mm x 1390 mm x 845 mm
Net weight	19.5 kg
Gross weight (including the package)	24.8 kg
(Optional) Wall-mounted bracket	
Product dimensions	34 mm x 1100 mm x 200 mm
Package dimensions	55 mm x 1260 mm x 345 mm
Net weight	4.3 kg
Gross weight (including the package)	5.3 kg
(Mandatory) Stylus pen	
Quantity	2
Wi-Fi	
Wi-Fi protocol	802.11 a/b/g/n/ac/ax
Supported frequency band	2.4 GHz to 2.4835 GHz 5 GHz to 5.85 GHz

Parameter Name	Content
Maximum transmit power	2.4 GHz to 2.4835 GHz: < 20 dBm 5 GHz to 5.85 GHz: < 23 dBm
Voice tracking	
Distance	8 m
Installation	
Installation mode ^[2]	Floor stand-mounted, wall-mounted, or wall-recessed
Peripherals	
Microphone	Two microphone arrays (VPM220 or Mic 500) can be connected.

 NOTE

- Dimensions: H x W x D
- [1]: The height of the product includes the height of the camera.
- [2]: Vertical hanging is required for product usage. Horizontal transport is prohibited.

7.2 Performance Specifications

Table 7-2 Performance specifications

Item	Specifications
Call bandwidth	64 kbit/s to 8 Mbit/s
Video capabilities (H.264 BP)	Minimum bandwidth required to deliver video of a specific resolution (without any packet loss): 1300 kbit/s for 1080p 60 fps (supported only after the 1080p 30 fps to 1080p 60 fps license is imported) 960 kbit/s for 1080p 30 fps 768 kbit/s for 720p 60 fps 590 kbit/s for 720p 30 fps 224 kbit/s for 4CIF 30 fps 64 kbit/s for CIF 30 fps
Video capabilities (H.264 HP)	Minimum bandwidth required to deliver video of a specific resolution (without any packet loss): 912 kbit/s for 1080p 60 fps (supported only after the 1080p 30 fps to 1080p 60 fps license is imported) 423 kbit/s for 1080p 30 fps 666 kbit/s for 720p 60 fps 302 kbit/s for 720p 30 fps

Item	Specifications
	• 224 kbit/s for 4CIF 30 fps • 64 kbit/s for CIF 30 fps
Video capabilities (H.265)	Minimum bandwidth required to deliver video of a specific resolution (without any packet loss): • 1826 kbit/s for 4K 30 fps (supported only after the 4K30 meeting license is imported) • 679 kbit/s for 1080p 60 fps (supported only after the 1080p 30 fps to 1080p 60 fps license is imported) • 310 kbit/s for 1080p 30 fps • 400 kbit/s for 720p 60 fps • 180 kbit/s for 720p 30 fps • 134 kbit/s for 4CIF 30 fps • 64 kbit/s for CIF 30 fps
Content sharing capabilities	• IdeaShare app Sharing in a meeting: – IdeaShare mobile client (Android): up to 1080p 30 fps – IdeaShare mobile client (HarmonyOS): up to 1080p 30 fps – IdeaShare mobile client (iOS): up to 1080p 30 fps – IdeaShare PC client (Windows): up to 4K 30 fps^[1]/1080p 60 fps – IdeaShare PC client (macOS): up to 1080p 30 fps Local projection: – IdeaShare mobile client (Android): up to 1080p 30 fps – IdeaShare mobile client (HarmonyOS): up to 1080p 30 fps – IdeaShare mobile client (iOS): up to 1080p 30 fps – IdeaShare PC client (Windows): up to 4K 30 fps^[2]/1080p 60 fps – IdeaShare PC client (macOS): up to 2K 30 fps • IdeaShare Key: Sharing in a meeting: – IdeaShare Key (Windows): up to 4K 30 fps^[3]/1080p 60 fps^[4] – IdeaShare Key (macOS): up to 1080p 30 fps Local projection: – IdeaShare Key (Windows): up to 4K 30 fps^[5]/1080p 60 fps^[6] – IdeaShare Key (macOS): up to 2K 30 fps • HDMI/Type-C projection Input resolution: 640 x 480 60/72/75/85 fps, 800 x 600 56/60/72/75/85 fps, 1024 x 768 60/70/75/85 fps, 1152 x 864 60/75/85 fps, 1280 x 600 60 fps, 1280 x 720 60/75/85 fps, 1280 x 768 60/75/85 fps, 1280 x 800 60/75/85 fps, 1280 x 960 60/75/85 fps, 1280 x 1024 60/75/85 fps, 1360 x 768 60 fps, 1366 x 768 60 fps, 1440 x 900 60 fps, 1400 x 1050 60 fps, 1600 x 900 60 fps,

Item	Specifications
	1600 x 1200 60 fps, 1680 x 1050 60 fps, 1920 x 1080 24/25/30/50/60 fps, 1920 x 1200 60 fps, 3840 x 2160 25/30/50/60 fps Codec resolution: CIF (352 x 288), 640 x 480, 4CIF (704 x 576), 800 x 600, 1024 x 768, 720p (1280 x 720), 1280 x 1024, 448p (768 x 448), 1080p (1920 x 1080), 1600 x 1200, 1920 x 1200, 1152 x 864, 1280 x 600, 1280 x 768, 1280 x 800, 1280 x 960, 1360 x 768, 1366 x 768, 1440 x 900, 1400 x 1050, 1600 x 900, 1680 x 1050, 2048 x 1152, 2048 x 1236, 2048 x 1536, 2048 x 1556, 2560 x 1440, 2560 x 1600, 2560 x 2048, 2880 x 1620, 2880 x 1800, 3200 x 1800, 4K (3840 x 2160) Output resolution: 1920 x 1080, 3840 x 2160
Dual-stream capabilities	By default, the on-premises meeting function is supported. - Video meeting: 1080p 30 fps (video) + 1080p 30 fps (presentation) and 1080p 30 fps (video) + 4K 8 fps (presentation) are supported. After the 1080p 30 fps to 1080p 60 fps license is imported, 1080p 60 fps (video) + 1080p 30 fps (presentation) and 1080p 60 fps (video) + 4K 8 fps (presentation) are supported. After the 1080p 30 fps to 1080p 60 fps and 1080p 60 fps to 4K 30 fps licenses are imported, 4K 30 fps (video) + 1080p 30 fps (presentation) and 4K 30 fps (video) + 4K 8 fps (presentation) are supported. After a 4K license is imported, 4K 30 fps (video) + 4K 30 fps (presentation) is supported. - Data meeting: 1080p 30 fps and 4K 8 fps are supported. After a 4K license is imported, 4K 30 fps is supported.
Operating system and hardware requirements for IdeaShare mobile client installation	- Android 8.0 or later - iOS 13 or later - HarmonyOS 2.0 to 5.0 (excluding 5.0)
Operating system and hardware requirements for IdeaShare PC client installation	- Windows 7, 8, 8.1, 10, and 11 (32- and 64-bit) - macOS 10.13.6 or later
Operating system requirements for the IdeaShare client to support Wi-Fi Direct	- Android 8.0 or later - Windows 10.0.10240.0 or later - HarmonyOS 2.0 to 5.0 (excluding 5.0)
Operating system requirements for DLNA projection devices	- Android 7.0 or later - iOS 9.0 or later - HarmonyOS 2.0 or later
Operating system requirements for Cast+ manual	- EMUI 10.1.0 or later - HarmonyOS 2.0 or later

Item	Specifications
projection devices	
Operating system requirements for Miracast projection devices	- Windows 10 or later - Android 8.0 or later
Operating system requirements for NFC OneHop projection devices	- EMUI 11.0.0.150 or later - HarmonyOS 2.0 or later
Operating system requirements for the IdeaShare client to support mirror & control	- Android 8.0 or later - iOS 13 or later - HarmonyOS 2.0 to 5.0 (excluding 5.0) - Windows 10 or 11 (32-bit and 64-bit) - macOS 10.15 or later
Operating system requirements that support mirror & control using an IdeaShare Key (Type-C)	- Windows 10 or 11 (32-bit and 64-bit) - macOS 10.15 or later
Operating system requirements for the IdeaShare client to support cross-screen annotation	Windows 10 or 11 (32-bit and 64-bit)
Operating system requirements for the IdeaShare client to support ultrasonic projection	- Android 8.0 or later - iOS 13 or later - HarmonyOS 2.0 to 5.0 (excluding 5.0) - Laptop running Windows 7, 8, 8.1, 10, and 11 (32- and 64-bit) - Laptop running macOS 10.13.6 or later
Operating system requirements for the IdeaShare Key (Type-C) in app mode and IdeaShare client to support screen extension	- Windows 10 1607 or later - macOS 10.14 or later
Recommended client and IdeaShare Key versions for device control permissions	- IdeaShare client: - Android/HarmonyOS/Windows: V7.06.1.50 or later - macOS: V7.06.1.70 or later - iOS: V2.3.1 or later

Item	Specifications
(screen sharing and mirror & control)	- IdeaShare Key (Type-C): - Windows: V7.06.1.50 or later - macOS: V7.06.1.70 or later

 NOTE

- The specifications are obtained from lab tests. The actual specifications may vary depending on the environment and devices.
- [1], [2], [3], and [5]: Hardware requirements: Intel Core i7-6600 or later (the first two digits of the version number are greater than 6) and driver version 26.20.100.6861 (April 2019) or later
- [4] and [6]: The IdeaShare Key (Type-C) supports up to 1080p 60 fps in DP mode.

7.3 Protocol and Standards Compliance

Table 7-3 Protocol and standards compliance

Item	Protocol/Standard
Video encoding and decoding protocols	H.265, H.264 HP, H.264 BP, H.263 (presentation only), H.263+ (presentation only), H.265 SVC, and H.264 SVC
Audio encoding and decoding protocols	AAC-LD (mono/stereo), G.711A, G.711U, G.722, G.722.1C, G.729A, G.719, and Opus
Data meeting	Data meeting 2.0
Presentation transmission protocols	H.239 and BFCP
Network transmission protocols	TCP/IP, RTP, DHCP, DNS, SNTP, SSH, HTTP, HTTPS, TR069, 802.1X, and 802.1P/Q
Other communications protocols	H.225, H.235, H.241, H.245, H.460, RFC2833, LDAP, LDAPS, UVC, and UAC
IP protocols	IPv4 and IPv6
Encryption protocols	H.235, TLS, and SRTP encryption, and Chinese cryptographic algorithms
Wi-Fi standards	802.11 a/b/g/n/ac/ax are supported. - The AP, STA, and P2P modes can coexist. - Wi-Fi supports the following authentication modes: OPEN, SHARE, WPA-PSK, WPA2-PSK, WPA3-Personal, and 802.1x EAP. - Wi-Fi supports the following encryption modes: NONE, WEP, TKIP, and AES. - The Wi-Fi server supports the following authentication mode: WPA2-PSK. - The Wi-Fi server supports the following encryption mode:

Item	Protocol/Standard
	AES.

7.4 HEVC Authorization



8 Glossary

Table 8-1 Glossary

Numerics	
4CIF	4 x Common Intermediate Format A video resolution of 704 x 576 pixels.
802.11	Wireless local area network (WLAN) standard defined by the Institute of Electrical and Electronics Engineers (IEEE) for wireless network communication.
802.1P/Q	A VLAN tag contains a 12-bit VLAN ID and a 3-bit priority code point (PCP). The 802.1Q standard defines the tag added to the Ethernet MAC data frame, but the 802.1Q VLAN standard does not define or use the PCP. The 802.1P standard defines the PCP. 802.1P is an extended protocol of 802.1Q. 802.1P and 802.1Q work together to enable Layer 2 network switches to provide traffic priority and dynamic multicast filtering services.
802.1X	Client/Server-based access control and authentication protocol. It prevents unauthorized users or devices from accessing the LAN/WLAN through an access port. After a client associates with an AP, the 802.1X authentication result determines whether the client can use the wireless services provided by the AP. The client can access WLAN resources only after being authenticated.
A	
AAC-LD	Advanced Audio Coding With Low Delay
address book	Users can save the information about the IP address, number, type, and bandwidth of a remote site to a contact in the address book.
AEC	Acoustic Echo Cancellation
AES	Advanced Encryption Standard
AGC	Automatic Gain Control
AJB	Audio Jitter Buffer
ANS	Automatic Noise Suppression

AP	Access Point
API	Application Programming Interface A particular set of rules and specifications that are used for communication between software programs.
Auto-Framing	Based on the number, location, and motion of participants, this function automatically adjusts the camera to provide a dynamic overview of the full room.
B	
BEC	Backward Error Correction
BFCP	Binary Floor Control Protocol
C	
CHR	Call History Record
CIF	Common Intermediate Format
D	
DHCP	Dynamic Host Configuration Protocol A LAN network protocol that uses UDP to automatically assign IP addresses to internal networks or network service providers and centrally manage all computers for users or internal network administrators. For details, see "RFC 2131".
DLNA	Abbreviation of the Digital Living Network Alliance, which is an organization of consumer electronics, mobile phones, and computer manufacturers. The organization aims at defining a set of interoperability guidelines for sharing digital data between multimedia devices from different manufacturers.
DMZ	Demilitarized Zone A buffer area between an insecure system and the secure system and is used to solve the problem that the external network cannot access the internal network equipped with a firewall. The DMZ is located between the internal network and the external network. In the DMZ, some public server facilities, such as the enterprise web server and FTP server, can be located. The DMZ protects the internal network.
DNS	Domain Name System A mechanism that maps easy-to-remember domain names to IP addresses recognizable to network devices.
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 content (such as a computer desktop).
E	
EAP	Extensible Authentication Protocol
F	

FEC	Forward Error Correction
G	
G.711	A voice codec standard that uses pulse code modulation (PCM). The data rate is 64 kbit/s. The standard is classified into A-law (G.711A) and U-law (G.711U).
G.719	A low-complexity full-band audio coding standard. Its data rate ranges from 32 kbit/s to 128 kbit/s.
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.722.1C	An audio codec standard based on transform domain coding. The audio spectrum bandwidth is twice that of G.722.1. Mono audio and stereo audio are supported. The bit rates of mono audio are 24 kbit/s, 32 kbit/s, and 48 kbit/s, and the bit rates of stereo audio are 48 kbit/s, 64 kbit/s, and 96 kbit/s.
G.729A	An audio encoding algorithm defined by the ITU-T. It is based on the CELP mode and uses the Conjugate-Structure Algebraic Code Excited Linear Prediction (CS-ACELP) method to encode voice at a baud rate of 8 kbit/s.
H	
H.225	A major protocol in the H.323 VoIP architecture defined by the ITU-T. It is a standard for the narrowband video call service contained in H.200/AV.120-Series Recommendations. H.225 describes how audio, video, data, and control information in a network packet can be managed to provide conversational services in H.323 equipment. H.225 consists of two parts: call signaling and Registration Admission and Status (RAS).
H.235	A protocol, formulated by the ITU-T, that defines security and encryption features for H.323 and H.245 endpoints.
H.239	A standard recommended by the ITU-T. It enables a video meeting to simultaneously transmit both video and data content (for example, computer desktop).
H.241	A protocol defined by the ITU-T for control signaling in multimedia communication systems. It defines a communication control protocol for session control and media stream transmission between multimedia endpoints.
H.245	A control signaling protocol in the H.323 multimedia communication system. It is used for end-to-end H.245 information exchange between H.323 receiving ends or between endpoints.
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. H.264 has four image quality levels: Baseline Profile (BP), Extended Profile (EP), Main

	Profile (MP), and High Profile (HP).
H.265	H.265 can achieve the same image quality as H.264 when the bit rate is reduced by half.
H.460	A network communication protocol used for audio and video network traversal.
HARQ	Hybrid Automatic Repeat Request
HD	High Definition
HDMI	High Definition Multimedia Interface
HTML	Hypertext Markup Language
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	
initiate a call	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.
L	
LAN	Local Area Network
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.
LDAPS	LDAP over SSL (LDAPS) is an extended Lightweight Directory Access Protocol (LDAP) that supports encryption protocols of Transport Layer Security (TLS) and Secure Sockets Layer (SSL).
M	
MCU	Multipoint Control Unit The MCU consists of two parts: multipoint controller (MC) and multipoint processor (MP). The MC is responsible for internal control and call management, and the MP is responsible for handling media streams.
media stream	Data stream (such as audio, video, and fax) between different bearer networks.
Miracast	A wireless display standard based on Wi-Fi Direct and formulated by the Wi-Fi Alliance in 2012. 3C devices that support this standard can share video images in wireless mode without any cable or wireless hotspot.

MTBF	Mean Time Between Failures A key metric for device operational reliability and stability.
N	
NetATE	Net Automatic Transfer-Enhancement
NFC	Near Field Communication
O	
OPS	Open Pluggable Specification
Opus	A digital audio coding format for lossy audio compression, developed by the Xiph.Org Foundation and then standardized by the Internet Engineering Task Force (IETF), with the goal of efficiently encoding speech and general audio in a single format. It ensures sound quality while maintaining a low enough delay to implement instant interactive communication, has a low enough complexity for a low-end embedded processor, and is applicable to instant sound transmission with a low delay on a network.
P	
P2P	Peer-to-Peer
PLC	Packet Loss Concealment
R	
RFC2833	An inband transmission mode, in which DTMF digits are combined into a data packet according to a rule and format, and then the data packet is encapsulated in RTP for transmission. After receiving the data packet, the receiving end parses the data and restores it to the corresponding DTMF signals.
RS232	A commonly used serial communication interface standard between data terminal equipment (DTE) and data communications equipment (DCE) for serial binary data exchange. It was jointly formulated by the Electronic Industry Association (EIA), Bell System, modem manufacturers, and computer manufacturers in 1970.
RTP	Real-time Transport Protocol A protocol for transmitting audio and video streams. RTP is based on UDP. In the RTP header, a timestamp is defined to ensure that audio and video data can be transmitted and synchronized in real time.
S	
SC	Switch Center Huawei's next-generation network switch system that provides H.323 GK, SIP server, and media proxy functions.
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 site endpoints) and allocates video conferencing resources.
SNTP	Simple Network Time Protocol This protocol is adapted from Network Time Protocol (NTP) for clock synchronization between computers on the Internet.
sound pickup distance	The maximum distance within which sounds can be picked up by a microphone.
SRTP	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 was initially a program in the Unix operating system and then adopted by other operating platforms. 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.
SSL	Secure Sockets Layer SSL is an encryption protocol used to protect information security on the Internet. It establishes an encrypted connection between the client and server to ensure confidentiality, integrity, and reliability during data transmission.
STA	Station
SVC	Scalable Video Coding
T	
TCP/IP	Transmission Control Protocol/Internet Protocol
TKIP	Temporal Key Integrity Protocol An alternative security protocol used in the IEEE 802.11 wireless network standard.
TLS	Transport Layer Security
TR069	A communication protocol between the customer premises equipment (CPE) and the auto configuration server (ACS). The CPE can use this protocol to complete necessary actions of initialization and operations management, such as service provisioning, function setting, file upload and download, and system detection.
U	

UAC	USB Audio Class A basic standard for audio communication between USB devices. It defines the communication mode between USB audio devices and the host computer.
U-Boot	A boot loader for embedded systems.
USB	Universal Serial Bus A public interface that implements communication between the equipment and the host controller.
UVC	USB Video Class A protocol standard defined for USB video capture devices.
V	
VME	Video Motion Enhancement
W	
WEP	Wired Equivalent Privacy A method of encrypting data transmitted between two devices to prevent unauthorized users from eavesdropping on or intruding into a wireless network.
Wi-Fi	Wireless Fidelity A short-distant wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.
Wi-Fi P2P	Wi-Fi Peer-to-Peer, also called Wi-Fi Direct, is a technology developed by the Wi-Fi Alliance to directly connect devices. It enables users to perform one-to-one or one-to-many communication without using a LAN or AP.
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.
WPA2-PSK	An enhanced version of WPA-PSK. It applies to individual or common home networks. It uses a pre-shared key and supports TKIP and AES encryption modes.
WPA3-Personal	WPA3-Personal uses the 192-bit security protocol and provides higher encryption strength than WPA2. It introduces the Simultaneous Authentication of Equals (SAE) algorithm to prevent brute force cracking attacks on Wi-Fi passwords and uses the forward secrecy mechanism, providing better data protection.
WPA-PSK	WPA-Preshared Key A WEP pre-shared key authentication mode. Compared with the encryption mode and key authentication mode, the mode is more secure.