

# HUAWEI Board V600R019C00 Product Description

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# About This Document

## Purpose

This document describes the positioning, highlights, networking schemes, structure, features and functions, security and reliability, operations, administration, and maintenance (OAM), and technical specifications of HUAWEI Board (abbreviated as "the Board" or "the endpoint" in this document).






## Intended Audience

This document is intended for:

- Enterprise customers
- Agents
- Huawei sales engineers
- Huawei technical support engineers

## Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 <b>NOTE</b>	Calls attention to important information, best practices and tips.

Symbol	Description
	NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

## Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

### Issue 02 (2018-10-22)

This issue is the second official release.

Modified 5.2 Intelligent Voice Assistant.

Modified 7.1.1 Touchscreen.

Modified 7.1.2 Touch.

Modified 7.2.4 Upgrade.

### Issue 01 (2018-08-31)

This issue is the first official release.

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# 1 Product Positioning

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The Board is Huawei's next-generation ultra-HD video conferencing endpoint that facilitates collaboration through integrated whiteboarding, content sharing, and audio and video functions. The Board supports collaborative sharing of local and remote whiteboards, allows content sharing and reverse control over the content source from the Board, and features a built-in intelligent camera for close-up of focus areas and speakers. These functions can be accessed through the Board's touchscreen or voice commands recognized by its AI voice assistant. In summary, the Board is an ideal solution for a collaborative office.

The Board can be deployed in meeting rooms smaller than 30 m<sup>2</sup> that accommodate 10 people, such as, small- and medium-sized meeting rooms, open office areas, and senior executives' offices.

The Board has two models Board-65A (capacitive touchscreen) and Board-65 (infrared touchscreen). In this document, "the Board" alone refers to both models unless otherwise specified.

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# 2 Product Highlights

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This chapter describes the highlights of the Board.

## All-in-One Device for All Conference Types

- All-in-one built-in 65-inch touchscreen, 5K ultra-HD camera, microphone array, codec, speakers, and pens, for easier collaboration in meeting rooms
- 65-inch touchscreen, satisfying requirements for presentations, local discussions, and remote interaction and collaboration in small- and medium-sized meeting rooms and spaces
- Built-in microphone array, picking up sounds within six meters
- Quick wireless content sharing using the AirPresence or AirPresence Key

## Powerful AI Engine

- Intelligent voice conference assistant: allows users to manage meetings through voice interaction, including setting up a meeting, joining a meeting, calling a site, viewing a site, and sharing content
- Intelligent speaker tracking: detects active speakers in real time and automatically provides close-up images of the speakers

## Core Audio and Video Capabilities for Optimal Collaboration in Meetings

- New H.265 core codec capability: provides 1080p 30 fps video and 4K 30 fps data for clearer content display
- New beam sound pickup technology: uses the built-in microphone array to pick up sounds, presenting speakers' voices using an intelligent algorithm
- Huawei's next-generation Video Motion Enhancement (VME) technology: guarantees clear images even if the bandwidth is low

## Simple and User-Friendly UI

- Lightweight interactive UI: displays core functions directly on the UI with others displayed under lower-level menus
- Hardware buttons for key functions, ensuring convenient operations
- Pens: automatically displays a whiteboard when a user takes a pen from its dock

Split-screen mode: displays content sources in two windows and supports simultaneous operations and annotations

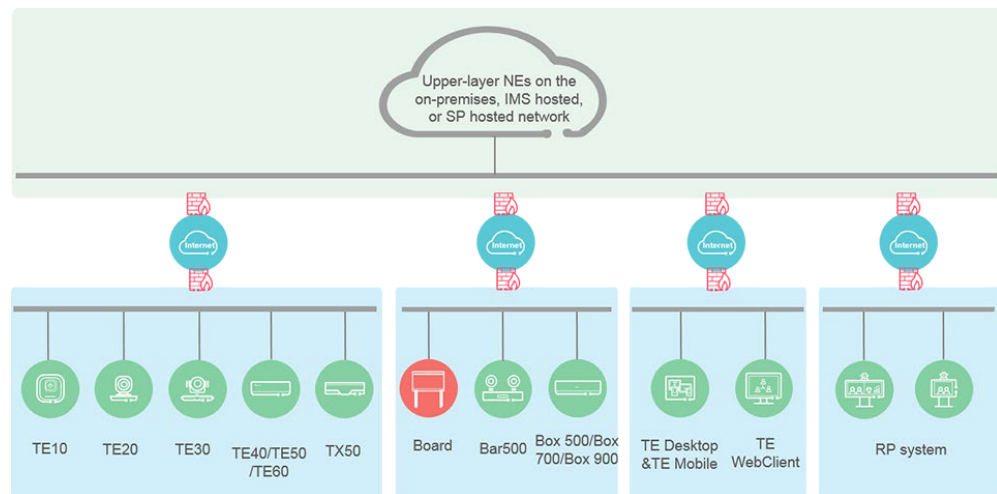


# 3 Networking Schemes

## 3.1 On-Premises/IMS Hosted/SP Hosted Networking Scheme

The Board connects to on-premises, IMS hosted, or SP hosted CloudEC networks, enabling video communication for enterprises and carriers.

Figure 3-1 Networking scheme



In this networking scheme:

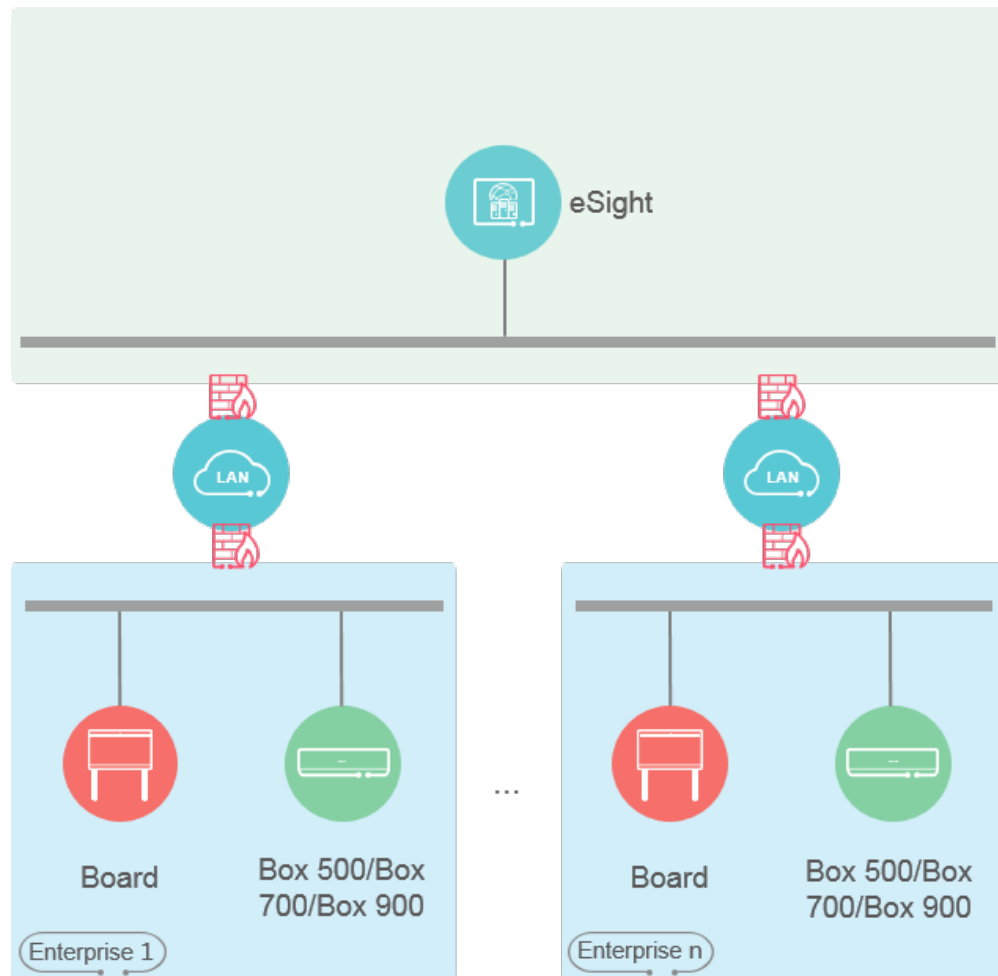
- The Board connects to an on-premises network through the H.323 or SIP protocol, or connects to an IMS hosted or SP hosted network through the SIP protocol.
- Audio and video calling, content sharing, and data collaboration can be implemented between the Board and various types of terminals and conference clients.
- To learn more, visit <http://support.huawei.com/enterprise/en/index.html> or <http://support.huawei.com/carrier/en/hwe/index.html> and search for the solution's product documentation name (for example, **CloudEC V600R019C00 Product Documentation**).

## 3.2 eSight-based Networking Scheme

Technical Report 069 (TR-069) is a standard device management protocol developed from the CPE WAN Management Protocol (CWMP) published by the Broadband Forum. Through the TR-069 protocol, eSight can remotely manage the connected Board.

Figure 3-2 shows a Board connecting to eSight.

**Figure 3-2** Connecting to eSight



In this networking scheme:

- eSight integrates the profile server and Simple Traversal of UDP through NAT (STUN) server.
- The profile server enables the Board to upload and download configuration files and upgrade software packages through HTTPS.
- The STUN server is used for traversal between public and private networks to ensure that eSight manages all devices on both networks.
- The Board can report session Call History Record (CHR) and media CHR data files to eSight.

# 4 Product Structure

## 4.1 Appearance

The Board features a 6-in-1 design that integrates the codec, intelligent tracking camera, microphone, speaker, touchscreen, and pen.

As shown in Figure 4-1, the Board comes in two models: Board-65A and Board-65. The Board-65A has a capacitive touchscreen and the Board-65 has an infrared touchscreen.

**Figure 4-1** Appearance of the Board

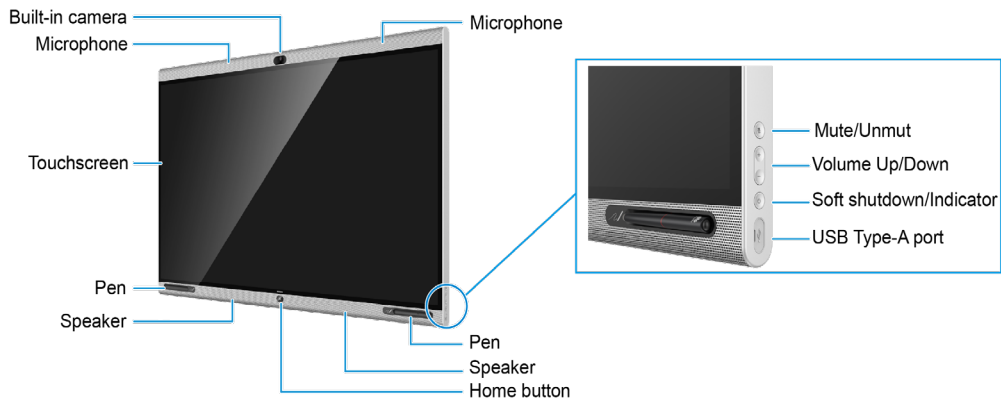


## 4.2 Front Panel and Rear Panel

### Front Panel

Figure 4-2 shows the components on the Board's front panel and lower-right side panel, and Table 4-1 describes the functions of each component.

**Figure 4-2** Components on the Board's front panel and lower-right side panel



**Table 4-1** Function description

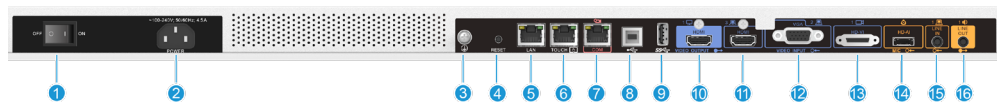
No.	Component	Function
<b>Front Panel</b>		
1	Built-in camera	<ul style="list-style-type: none"> <li>• 3x digital zoom and ultra-wide angle</li> <li>• Image capture for local participants with voice tracking and face detection</li> </ul>
2	Microphones	<ul style="list-style-type: none"> <li>• Local sound pickup within a 180-degree pattern at a maximum distance of 6 meters</li> <li>• Located on the left and right sides of the camera</li> </ul>
3	Touchscreen	<ul style="list-style-type: none"> <li>• 65-inch Liquid Crystal Display (LCD) with a resolution of up to 4K 60 fps</li> <li>• Capacitive or infrared touchscreen with multi-touch supported</li> </ul>
4	Pens	<ul style="list-style-type: none"> <li>• Used for whiteboard writing and drawing</li> <li>• Two pens, placed on two docks under the touchscreen</li> </ul> <p>When you take a pen from its dock for the first time, the touchscreen automatically displays a whiteboard. After you put the pen back to its dock, you must wait for at least 10s before using it again.</p>
5	Speakers	<ul style="list-style-type: none"> <li>• Audio output with a maximum distance of 6 meters</li> <li>• Located on the left and right sides of the Home button</li> </ul>
6	Home button	Tap the Home button to return to the home screen.
<b>Components on the lower-right side panel</b>		
1	Mute button	Mutes or unmutes the microphone.
2	Volume Up/Down button	Increases or decreases the speaker volume.
3	Soft power button	<ul style="list-style-type: none"> <li>• Press and hold the button to put the Board in sleep</li> </ul>

No.	Component	Function
	and indicator	<p>mode, restart it, or shut it down.</p> <ul style="list-style-type: none"> <li>Press the button to put the Board in sleep mode or wake it up.</li> </ul> <p>The indicator, located at the center of the button, shows whether the Board is running, sleeping, faulty, or upgrading.</p>
4	USB Type-A port	Connects to a USB device, such as a USB flash drive or a wireless keyboard.

## Rear Panel

Figure 4-3 shows the components on the Board's rear panel, and Table 4-2 describes the functions of each component.

**Figure 4-3** Components on the Board's rear panel



**Table 4-2** Function description

No.	Component	Function
1	Power switch	<p>Powers the Board on or off.</p> <p><b>NOTICE</b> Connect all necessary cables before powering on the Board.</p>
2	Power input port (100-240 V AC, 50/60 Hz, 4.5 A)	Connects to a power supply.
3	Ground stud	Connects to a ground cable.
4	RESET button	<ul style="list-style-type: none"> <li>During startup, press and hold this button for 10s to restore the A/B system.</li> <li>When the Board is running, press and hold this button for 10s to reset it to factory settings.</li> </ul>
5	LAN port	Ethernet port, which supports 10/100/1000 Mbit/s full duplex and half duplex
6	Touch port	Connects to the Touch and supplies power to it.
7	COM port (dual-mode serial communication port)	<p>Connects to a camera control cable and can be used for diagnostics and maintenance.</p> <p>A camera connected to the Board can be upgraded through this port or the HD-VI port.</p>

No.	Component	Function
8	USB Type-B port	Connects to a computer and controls it during content sharing.
9	USB Type-A port	Connects to a USB device, such as a USB flash drive or a wireless keyboard.
10	HDMI port (HD video output port)	Connects to another screen to display the whiteboard content or local site image at a resolution of up to 4K x 2K 60 fps.
11	HDMI port (HD video input port)	Connects to a local computer or an external camera as the third video input at a resolution of up to 4K x 2K 30 fps. This is the default port used for input of shared content.
12	VGA port	Connects to a content source, such as a local computer, as the second input at a resolution of up to 1080p 60 fps.
13	HD-VI port	Connects to a HUAWEI VPC620/VPC600/VPC800 HD camera or HUAWEI VPT300 intelligent camera as the first input, at a resolution of up to 4K x 2K 30 fps. This port supports video input, power supply, and infrared control and also functions as a serial port.  A camera connected to the Board can be upgraded through this port or the COM port.
14	HD-AI port (audio input port)	Connects to a microphone array, such as the HUAWEI VPM220. Only one VPM220 can be connected.
15	3.5 mm audio input port	Connects to an audio input source such as a computer.
16	3.5 mm audio output port	Connects to a headset or speaker for audio output.

## 4.3 Indicator

By checking the status of the indicator on a Board, you can determine its operating status and ensure that it is working properly with other videoconferencing devices.

Table 4-3 shows the Board status corresponding to each indicator status.

**Table 4-3** Indicator statuses and corresponding Board statuses

Indicator Status	Board Status
Off	Powered off
Blinking green twice per second	Powering on

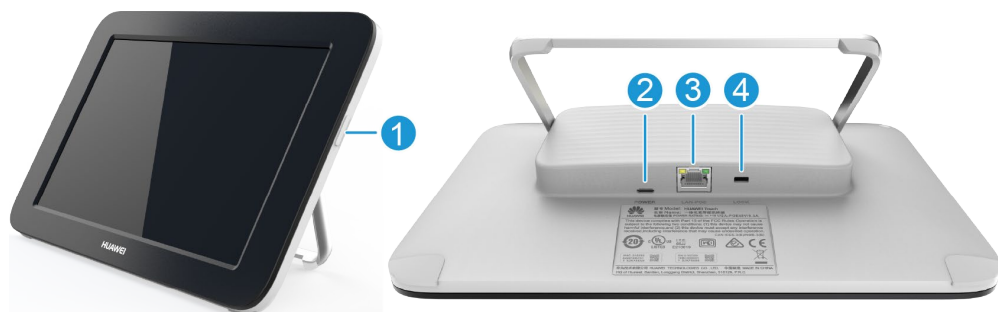
Indicator Status	Board Status
Blinking green four times per second	Upgrading
Steadily lit (green)	Working properly
Blinking green (on for 1s, off for 2s, fading in and out)	On standby
Blinking red once every 5s	Faulty hardware
Blinking red four times per second	Faulty software
Blinking red once every 2.5s	Overheated
Blinking red once per second	Faulty touchscreen

## 4.4 HUAWEI Touch

The Touch is an optional component for the Board. Featuring an all-new UI, the Touch runs the Huawei Telepresence system. The calling and conference control functions are easy to use and can be accessed with just a tap.

Figure 4-4 shows the appearance of the Touch and its rear components. Table 4-4 describes the function of each component.

**Figure 4-4** Front and rear appearance of the Touch



**Table 4-4** Functions of the Touch's power button and rear components

No.	Component	Function
1	Power button	<ul style="list-style-type: none"> <li>Press to lock or wake up the screen.</li> <li>Press and hold to turn the Touch on or off.</li> </ul>
2	USB Type-C port	Connects to the power adapter that comes with the Touch to power the Touch.
3	PoE port	<ul style="list-style-type: none"> <li>Connects to the Touch port on a Board.</li> <li>Connects to the PoE or common network port on a switch.</li> <li>Connects to the PoE port on a Board or a switch to power</li> </ul>

No.	Component	Function
		the Touch.
4	Kensington lock hole	Connects to a Kensington lock (not included with the Touch) to secure the Touch.

## 4.5 Microphone Array

The Board can connect to the HUAWEI VPM220 microphone array shown in Figure 4-5. The VPM220 provides dual-channel wideband audio, delivering a superior audio experience.

**Figure 4-5** VPM220



- **High-quality audio**

The VPM220 supports a sampling rate of up to 48 kHz and a full frequency range. It is able to sample sound at rates lower than 22 kHz, which means that it can completely pick up any sound recognized by human ears. The VPM220 significantly reduces signal loss caused by analog transmission cables, while offering a hi-fi stereo experience. These capabilities are made possible through the integrated digital signal processing and transmission technology and the Acoustic Echo Cancellation (AEC), Automatic Gain Control (AGC), and Automatic Noise Suppression (ANS) functions.
- **Superior sound experience**

Embedded with three heart-shaped microphones, a single VPM220 supports 360-degree sound pickup with an optimal range of six meters. This allows participants at the local site to hear every sound nuance coming from participants at the remote site.
- **Power saving**

Highly energy-efficient, the VPM220 requires no more than 2.5 W of power when running.



# 5 Functions and Features

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## 5.1 Connections and Convergence

### 5.1.1 Connecting to the Huawei Cloud Video Conferencing Service

To connect a Board to the Huawei cloud video conferencing service, configure the Board on the uPortal. The uPortal will then generate an activation code and send the code by SMS or email. After the Board is powered on for the first time, you can activate and access the Huawei cloud video conferencing service by entering the activation code on the touchscreen or on the Touch.

### 5.1.2 Hardware-Software Synergy

The Board works with the AirPresence client (software) or AirPresence Key (hardware) that allows you to collaborate with your teams via content sharing any time, anywhere.

About the AirPresence client and AirPresence Key:

- The AirPresence client is a wireless content sharing client that works with the Board and can run on a mobile device or PC.
  - AirPresence mobile client: runs on an Android or iOS mobile device. To download this client, you can scan the QR code on the touchscreen or Touch.
  - AirPresence PC client: runs on a Windows or Mac PC. You can download this client from the Board web interface.
- The AirPresence Key is a wireless content sharing device.

Hardware-software synergy functions as follows:

- You can pair an AirPresence client with a Board using the following methods:
  - Entering the projection code on the client (for the AirPresence mobile or PC client)
  - Scanning the QR code on the touchscreen or Touch (for the AirPresence mobile client only)

No pairing from the AirPresence client is allowed when DND is enabled for the Board.

- After the pairing succeeds, you can initiate calls and join meetings through the AirPresence mobile client, touchscreen, or Touch.

- Using the AirPresence mobile client, you can initiate calls, join meetings, and control the Board. Board control operations include adjusting the speaker volume, turning on or off the microphone, and adjusting the camera angle.
- Use the AirPresence mobile or PC client or AirPresence Key for content sharing.

## 5.2 Intelligent Voice Assistant

You can say "Hi, Scotty" or "Hey, Scotty" to the Board or its connected microphone to wake up "Scotty", the intelligent voice assistant, and then operate the Board using voice commands.



### NOTE

You can determine whether to enable the intelligent voice assistant function on the Board. By default, this function is disabled.

After the intelligent voice assistant wakes up, you will see the screen shown in Figure 5-1.

**Figure 5-1** Intelligent voice assistant wakes up



You can then perform the following operations using voice commands:

- Initiating or canceling a call
- Creating a meeting
- Joining a scheduled meeting
- Extending a meeting
- Adding participants to a meeting
- Viewing participants or continuous presence
- Sharing or stopping content sharing over a cable
- Adjusting the speaker volume at your site
- Muting or unmuting the microphones of other sites

- Starting device diagnostics

## 5.3 Joining or Initiating a Meeting

### Joining a Meeting

You can join a meeting from the **Next Meeting** popup box or by entering the meeting ID.

### Initiating a Meeting

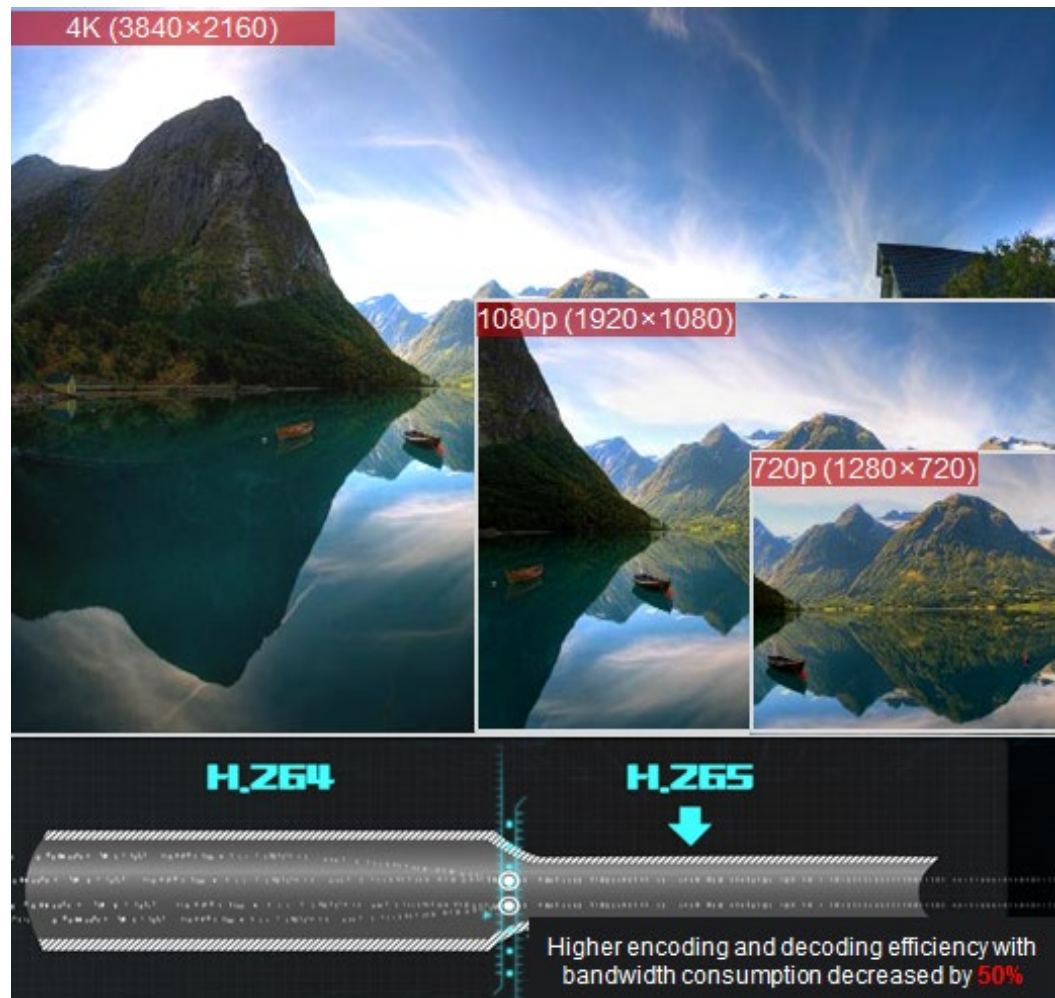
A meeting can be arranged using any of the following methods:

- **Creating a meeting:** Create a meeting and invite participants to the meeting. Alternatively, send the meeting ID to participants. They can then dial the meeting ID to join the meeting.
- **Starting a multipoint meeting:** On the touchscreen or Touch, select multiple contacts to start a meeting. Set the meeting parameters, such as the chair password and whether to encrypt the meeting.
- **Starting a point-to-point (P2P) meeting:** On the touchscreen or Touch, you can search for a participant by keyword and initiate a call, call a participant by entering its number or IP address, or directly select a participant to make a call.

## 5.4 H.265 4K Ultra-HD Video

4K provides excellent clarity and lifelike detail, with a resolution four times that of 1080p, on a larger screen. The Board supports H.265-based encoding and decoding for both video and content, and can deliver 4K ultra-HD video through Huawei's VME technology.

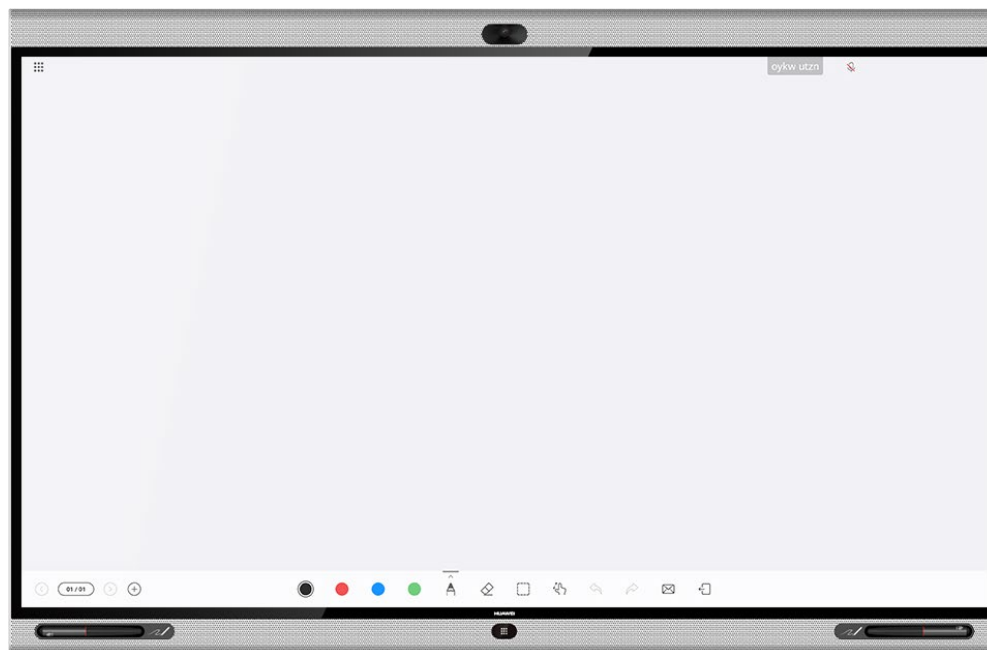
Figure 5-2 H.265 4K ultra-HD video



## 5.5 Collaboration with Data Conferencing

The Board supports local and remote whiteboarding, including whiteboard writing, annotation, and sharing. Figure 5-3 shows the whiteboard screen. Table 5-1 describes the whiteboarding functions.

**Figure 5-3** Whiteboard screen



**Table 5-1** Whiteboarding functions

Function	Description
Creating a whiteboard	Create a maximum of 100 whiteboard pages and set their background color to white or grey.
Writing on a whiteboard	<p>Wake up the Board by picking up the pen from the dock.</p> <ul style="list-style-type: none"> <li>• Write using your finger or the pen. <ul style="list-style-type: none"> <li>– Black, red, blue, and green available in a white background; white, red, blue, and green available in a grey background</li> <li>– Three types of pens: pencil, marker, and brush</li> </ul> </li> <li>• Resize the canvas or lock it. <ul style="list-style-type: none"> <li>– Drag, move, and zoom in or out on the canvas using your fingers.</li> <li>– Disable the canvas resizing function. Then two people can write on the canvas at the same time.</li> </ul> </li> <li>• Circle an area. The content inside the circled area can be moved, deleted, or resized.</li> <li>• Erase content using your palm or the eraser. Or you can directly clear the whiteboard page to erase all content.</li> <li>• Undo the previous operation and redo it.</li> </ul>
Closing a whiteboard	Close a whiteboard with or without saving its content.
Emailing a whiteboard	<p>Send a whiteboard to an email address. A whiteboard with a large amount of content will be split into multiple emails.</p> <p>The email account used to send whiteboards can be configured on the</p>

Function	Description
	Touch, touchscreen, or web interface.
Deleting a whiteboard	Delete whiteboard pages or files.
Annotating a whiteboard	Annotate the shared computer desktop or content and edit or delete annotations.
Sharing a whiteboard	In a remote collaborative meeting, the local and remote participants can write on the shared whiteboard simultaneously.

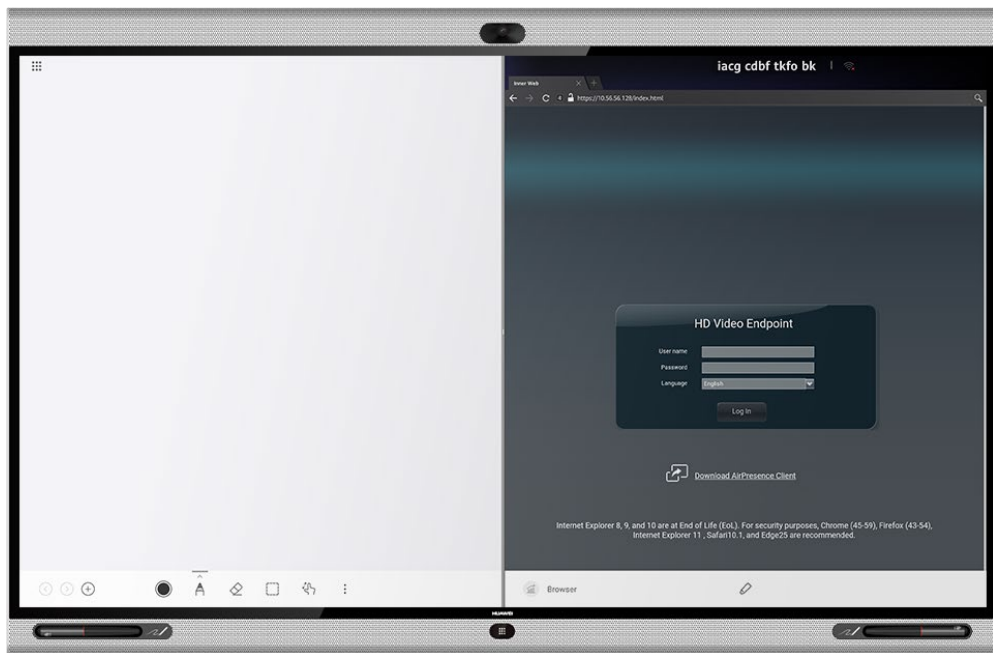
## 5.6 Split-Screen Display

The Board can present the whiteboard, application, and presentation shared by the local or remote participants in split-screen mode. This mode provides two equally sized windows. The content shared first appears in the left window, and the content shared next appears in the right window.

The content displayed in the two windows can be exchanged and edited. When a whiteboard is displayed in one window, the content displayed in the other window can be clipped and then copied to the whiteboard. The content in both windows can be shared with other participants.

Figure 5-4 shows an example of a split-screen display. On this screen, a whiteboard is displayed in the left window and an application in the right window.

**Figure 5-4** Example of a split-screen display



## 5.7 Interoperability Between Data Collaboration and Content Sharing

If the Cloud Multipoint Control Unit (CloudMCU) is available for data conferencing, the Board supports interoperability between whiteboard or annotation sharing and content or data sharing.

- Users of video conferencing endpoints and telepresence systems with only the content sharing capability view the whiteboards and annotations shared by the Board as shared content. Board users directly view the shared content of the video conferencing endpoints and telepresence systems.
- Users of the TE WebClient and other soft clients that support data conferencing view the whiteboards and annotations shared by the Board. The Board users can also view the shared desktops, documents, whiteboards, programs, and media of the TE WebClient and other data conferencing soft clients.

## 5.8 Controlling Meetings

Both the chair and other participants in a meeting can control the meeting, 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	<ul style="list-style-type: none"> <li>• Inviting a participant to a meeting</li> <li>• Deleting a disconnected participant</li> <li>• Calling an unconnected participant</li> <li>• Disconnecting a participant</li> <li>• Turning on or off the microphone of a participant</li> <li>• Extending or ending a meeting</li> <li>• Releasing the chair role</li> <li>• Setting the layout (only on the Touch)</li> <li>• Broadcasting or stopping broadcasting of a participant or continuous presence</li> <li>• Viewing a participant or continuous presence</li> <li>• Enabling Focus on Speaker</li> <li>• Performing secondary dial</li> <li>• Locking or unlocking a meeting (only on an IMS or SP hosted network)</li> </ul> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• The operation of locking or unlocking a meeting is allowed only on the IMS or SP hosted network.</li> <li>• In a locked meeting, the computer desktops, whiteboards, and annotations cannot be shared.</li> </ul>
Other participants	<ul style="list-style-type: none"> <li>• Leaving a meeting</li> <li>• Viewing a participant or continuous presence</li> </ul>

Role	Operation
	<ul style="list-style-type: none"> <li>• Applying for the chair role</li> <li>• Turning the local microphone on or off</li> <li>• Calling an unconnected participant</li> <li>• Inviting a participant to a meeting</li> <li>• Extending a meeting</li> <li>• Performing secondary dial</li> </ul> <p><b>NOTE</b> A participant can call an unconnected site, invite a site, or extend a meeting only when the service platform on the network supports specific meeting control by participants or after the participant obtains chair control.</p>

Figure 5-5 shows how the Board's screen appears when the chair is controlling a meeting.

**Figure 5-5** Controlling a meeting as the chair on the Board



Figure 5-6 shows how the Touch's screen appears when the chair is controlling a meeting.



**Figure 5-6** Controlling a meeting as the chair on the Touch

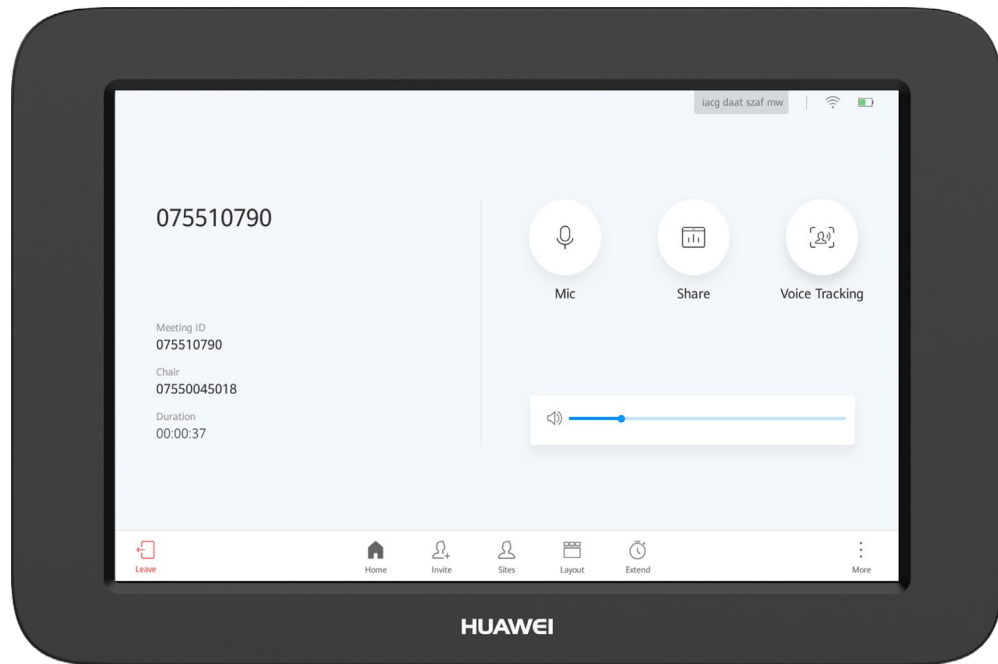
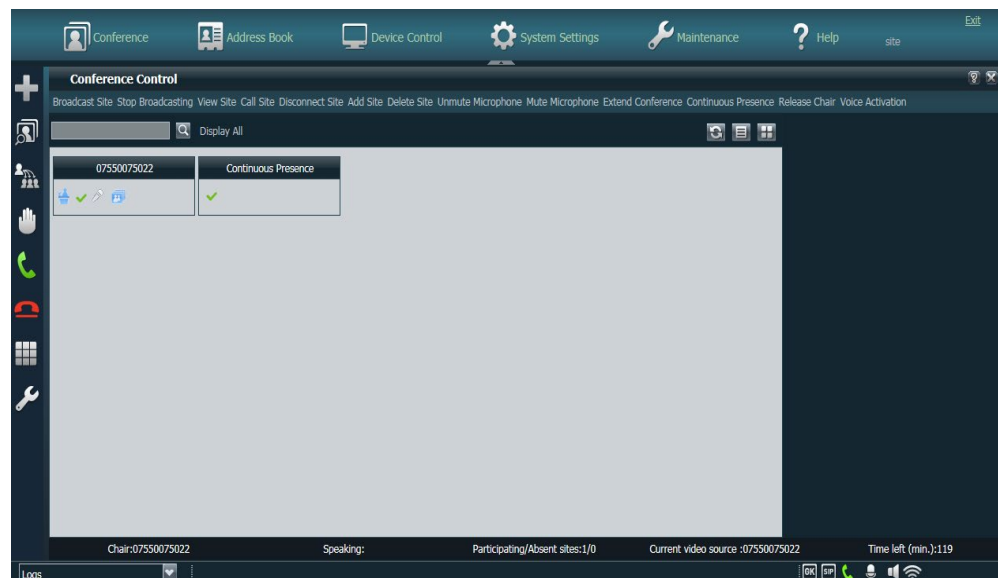


Figure 5-7 shows how the Board's web interface appears when the chair is controlling a meeting.

**Figure 5-7** Controlling a meeting as the chair on the web interface



## 5.9 Network Address Book

The network address book stores participant information. The Board can quickly obtain your desired participant information from the network address book on 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.



### NOTE

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.
- View the status of each participant in the corporate directory on the web interface and initiate calls to participants or invite new participants to a meeting on the Touch, touchscreen, or web interface.

## 5.10 Globalization

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

Table 5-3 lists the languages supported by the web interface, touchscreen, and connected Touch of the Board.

**Table 5-3** Supported languages

User Interface	Simple Chinese	Traditional Chinese	English	French	Spanish (Europe)	German	Portuguese (Brazil)	Russian	Japanese
Touchscreen	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Touch	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported
Web interface	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported	Supported

## 5.11 High-Quality Audio and Video

### 5.11.1 Intelligent Navigation

The built-in camera of the Board provides the following intelligent navigation functions:

- Uses voice tracking and facial recognition algorithms for sound detection and localization and collects images for facial recognition to achieve accurate and flexible tracking.
- Automatically presents the optimal view of participants in a meeting room, without requiring any manual intervention.
  - The camera automatically identifies whether only one participant is speaking or two participants are having a conversation, and then presents the most suitable close-up of the speaker/speakers.
  - When no one is speaking, the camera automatically adjusts its lens to provide a dynamic overview of the entire meeting room based on the number and location of participants.

### 5.11.2 Hi-Fi Audio

The Board provides hi-fi, full-duplex digital audio, bringing superior voice quality to meetings. The Board supports the following audio technologies:

- Acoustic Echo Cancellation (AEC), Automatic Noise Suppression (ANS), Automatic Gain Control (AGC), VoiceClear, AudioEnhancer, and lip synchronization
- Opus-related technologies, including Forward Error Correction (FEC), Backward Error Correction (BEC), Packet Loss Concealment (PLC), Net Automatic Transfer-Enhancement (netATE), and Audio Jitter Buffer (AJB)

### 5.11.3 Multiple Layouts

You can select a layout and view the composite of the participant video and shared content on one screen after defining necessary settings on the Touch.

Available layouts include:

- Full screen: displays the participant video or shared content in full-screen mode.
- PiP: 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.

### 5.11.4 Network Adaptability

With strong network adaptability, the Board is able to provide high-quality HD images even when the bandwidth is low or the network is unstable.

- The Board utilizes Super Error Concealment (SEC), Hybrid Automatic Repeat Request (HARQ), and automatic deceleration to deliver clear and smooth video even when the packet loss rate reaches 30%.
- The Opus high-quality codec, netATE, and AJB are supported to reduce the packet loss rate and improve audio quality.

## 5.12 Wireless Connections

The Board 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 Board can serve as a Wi-Fi hotspot or connect to a Wi-Fi network as a client.

If the Board is configured as a client, it automatically detects and connects to Wi-Fi networks. You can set the Board 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 Board to the Internet through Wi-Fi.

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

## 5.13 Content Sharing

### AirPresence Mobile/PC Client

You can use either of the following clients for content sharing:

- AirPresence mobile client: enables document and image sharing, and supports screen sharing when running on Android 5.0 or later.
  - Supported formats of shared files on Android: PDF, PNG, JPG, and BMP
  - Supported formats of shared files on iOS: PDF, DOC/DOCX, XLS/XLSX, PPT, PNG, JPG, and BMP
  - Maximum size of each shared file: 30 MB for documents; 8 MB for images
- AirPresence PC client: enables desktop sharing, including played audio and video files and shared documents and images.

### AirPresence Key

The AirPresence Key shown in Figure 5-8 also supports desktop sharing.

- Plug the AirPresence Key into the USB port on the Board to automatically pair the two devices over Wi-Fi. Then plug the AirPresence Key into the USB port on a computer and press the button on the AirPresence Key to start sharing the desktop, including played audio and video files and shared documents and images.

Both the AirPresence client and the AirPresence Key can share content in a meeting. When one of them is sharing content and the other starts sharing content, the original content sharing will stop. A maximum of three users can connect to a Board at the same time.

- The AirPresence Key can be automatically upgraded when pairing with the Board. The AirPresence Key has two types of software packages: software packages for upgrades by end users and software packages for upgrades by engineers at the production line. Both end users and engineers can upgrade the Board software package using a PC. Upgrading using a PC is applicable only to the production and depot repair scenarios.

**Figure 5-8** AirPresence Key



## Content Sharing over a Cable Connection

You can connect your Board to a computer through the HDMI or VGA port to share the computer desktop. If no participants are sharing content in a meeting, your Board starts sharing content after the computer is connected. If someone is sharing content when your Board and computer are connected, you will be asked to confirm whether to start sharing content.

## Reverse Control

When a PPT file is shared through the AirPresence PC client or AirPresence Key, you can turn pages in the document from the Board's touchscreen.

## 5.14 OAM

### 5.14.1 Quick Setup

The Board automatically determines which cloud platform or server to connect to through the Touch, touchscreen, or web interface. Only the IP addresses of the Board and its connected cloud platform or server need to be manually set. On the touchscreen or Touch, you can also set mail server parameters, test audio, and adjust the camera.

### 5.14.2 Connection to eSight

The Board can connect to eSight and be managed by eSight through TR-069. The following management functions are available on eSight:

- Querying and setting the Board parameters
- Uploading and downloading configuration files
- Upgrading and restarting the Board

- Managing private and public network configurations
- Collecting the Board's logs
- Uploading CHR data files

During the connection between the Board and eSight, they are mutually authenticated through HTTPS. To ensure security in subsequent communications, the connection can be set up only after their identities are accepted by each other.

## 5.15 Remote Video Monitoring

During a meeting, you can log in to the web interface of the Board and select video sources to view local and remote video in real time. This function is shown in Figure 5-9. The remote video monitoring function can be enabled through the touchscreen or Touch.

**Figure 5-9** Viewing local and remote video



### **CAUTION**

This function is related to personal privacy. Ensure that your usage of it complies with local laws and regulations.

## 5.16 APIs for Third-Party Integration

The Board provides HTTP-compliant APIs for integration with third-party systems to implement various functions, including the following:

- Login authentication
- P2P calling
- Participant querying
- Meeting control
- Address book management

- System configuration
- Status parameter querying

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

# 6 Security and Reliability

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## 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 of the Board uses a custom Android operating system, which provides higher security and virus immunity than the Windows operating system.

## 6.2 Network Layer Security

On-premises, IMS hosted, and SP hosted networks each comply with different network layer security policies.

- On-premises networks:
  - The Board, SMC2.0, and MCU are deployed in the trusted zone, isolated from the Demilitarized Zone (DMZ) and the untrusted zone. Firewalls are deployed for security domain division and access control.
  - Terminals (such as TE Desktop and TE Mobile) in the untrusted zone communicate with NEs in the trusted zone through the Session Border Controller (SBC) or Switch Center (SC) in the DMZ.
- IMS hosted and SP hosted networks:
  - The Board is deployed in the untrusted zone, isolated from the DMZ and the trusted zone through the SBC or the extranet firewall.
  - If a DMZ is deployed, you need to install the SBC, SC, USM Proxy, and MediaX Proxy in the DMZ for the Board to establish connections.
  - If no DMZ is deployed, the Board connects to the trusted zone through the SBC. The USM Proxy and MediaX Proxy are not required.
  - On network borders between the DMZ and the trusted and untrusted zones, firewalls are deployed to implement security domain division and access control.

## 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 make use of 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 standard H.460 and Security Traversing Gateway (STG) traversal technologies are used to set up secure connections between the public and 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 Board 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 Board utilizes multiple encryption measures, including H.235 (for encryption of media and signaling streams), SRTP, TLS, and HTTPS.
- For network management, the Board 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 Board.
- 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

Sensitive data is protected in the following ways:

- 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 Board 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 Protection of AI Voice Commands

The Board collects voice commands that users give to the AI voice assistant and transmits the commands to the AI server through the TLS1.2 secure channel for parsing. After being transmitted to the AI server, the voice commands are immediately deleted from the Board, and cannot be obtained through any method.

## 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.

## 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

On IMS and SP hosted networks, the Board supports active/standby backup of the corporate directory. Upon failure to connect to the active corporate directory through its IP address or domain name, the Board automatically switches to the standby corporate directory for connections, ensuring service continuity.

# 7 Operations and Maintenance

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## 7.1 UIs

### 7.1.1 Touchscreen

The Board provides an all-new touchable collaborative whiteboard system. You can tap icons on the Board's touchscreen or speak to its intelligent voice assistant to start meetings with ease.

On the touchscreen, you can execute various types of tasks, including the following:

- Joining scheduled meetings
- Creating P2P or multipoint meetings
- Sharing collaborative whiteboards
- Managing meetings
- Controlling microphones, speakers, and cameras
- Enabling voice tracking for cameras
- Starting system diagnostics

Figure 7-1 shows the home screen of the Board.

**Figure 7-1** Home screen of the Board



## 7.1.2 Touch

The Touch is a simple, intuitive touch control system newly developed by Huawei. On the Touch, you can easily set up meetings with just a few taps.

With the Touch, you can execute various types of tasks, including the following:

- Joining scheduled meetings
- Creating P2P or multipoint meetings
- Sharing content
- Setting continuous presence
- Managing meetings
- Setting system parameters
- Controlling microphones, speakers, and cameras



### **NOTE**

Remote cameras can be controlled if they have the Far-End Camera Control (FECC) function enabled during a meeting.

- Enabling voice tracking for cameras
- Starting system diagnostics

Figure 7-2 shows the home screen of the Touch.

**Figure 7-2** Home screen of the Touch



### 7.1.3 AirPresence Mobile/PC Client

Both the AirPresence mobile client and the AirPresence PC client can be used for content sharing, but some functions supported by the AirPresence mobile client are unavailable on the AirPresence PC client, including placing a P2P call, joining a meeting, and controlling the camera.

Figure 7-3 shows the UI that appears when the AirPresence mobile client running on an Android smartphone connects to a Board.

Figure 7-3 AirPresence mobile client

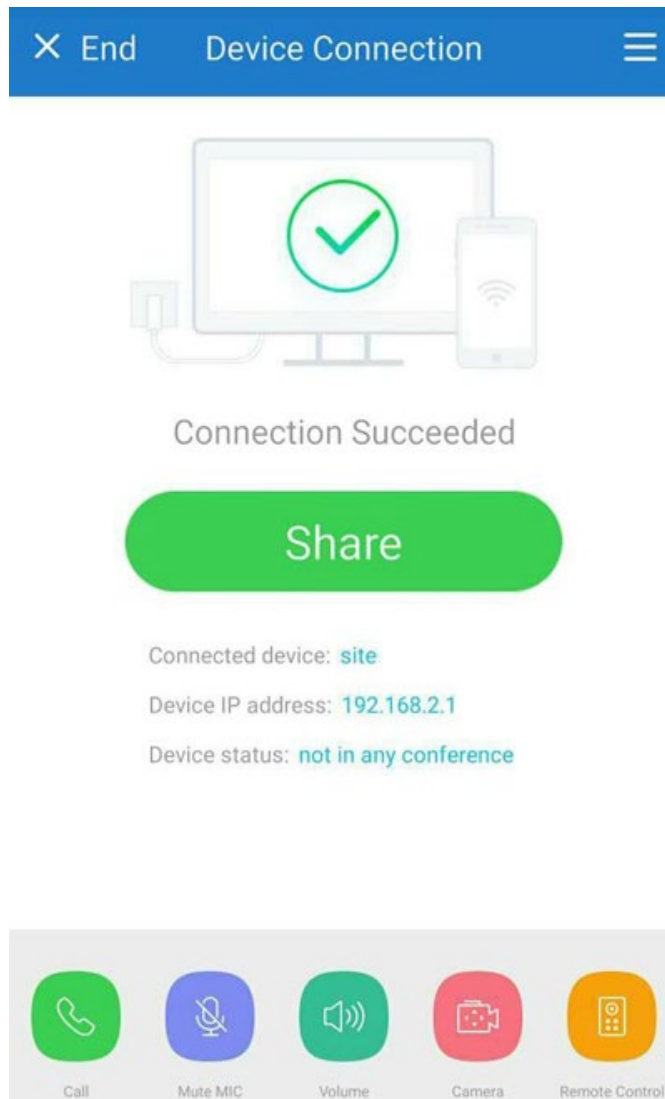
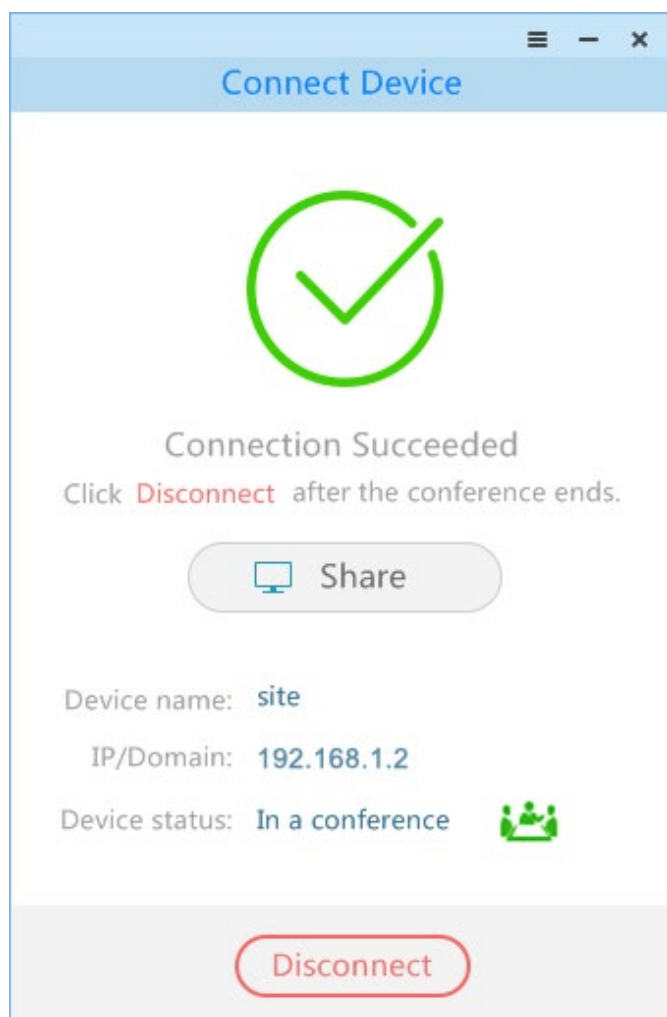


Figure 7-4 shows the UI that appears when the AirPresence PC client connects to a Board.

Figure 7-4 AirPresence PC client



## 7.1.4 Web Interface

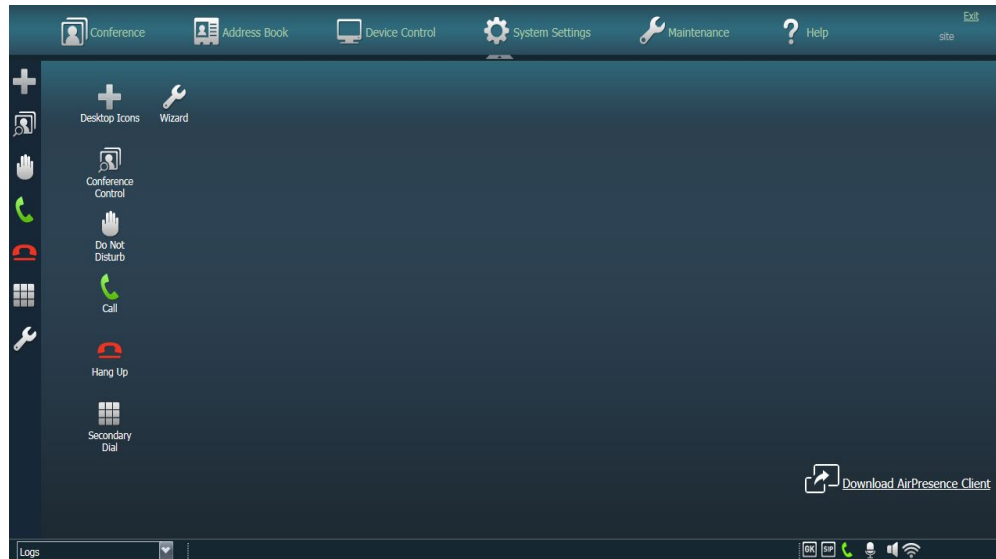
The Board supports web-based management that allows the administrator to execute various types of tasks, including the following:

- Remotely operating the Board
- Configuring the address book
- Modifying system settings
- Configuring the intelligent voice assistant
- Configuring voice tracking for the camera
- Performing system maintenance
- Starting and control meetings

The web interface can be operated by a maximum of 10 users at a time, but only the latest operation takes effect. These users can log in to the web interface using the same account and password. Figure 7-5 shows the web interface of the Board.



**Figure 7-5** Web interface of the Board



## 7.2 Maintenance and Upgrade

The Board can record system logs and perform system diagnostics. The SMC2.0 can be used for automatic inspection on the Board. In addition, the SMC2.0 can be used to upgrade the Board software.

### 7.2.1 Log Management

The Board records logs about operations on the Touch or touchscreen, whiteboard, and system errors, helping the administrator maintain the system and locate faults.

Logs are stored as files. On the web interface of the Board, the administrator can query, export, or delete logs of a specified time frame or all logs.

### 7.2.2 System Diagnostics

On the touchscreen or Touch of the Board, you can perform intelligent diagnostics to check:

- Hardware operating status
- Network connection status
- Audio input and output status
- Video input and output status
- Settings of frequently used parameters
- Server registration status

Based on the check results, you can easily locate any faults that have occurred.

Figure 7-6 System Diagnostics module on the touchscreen

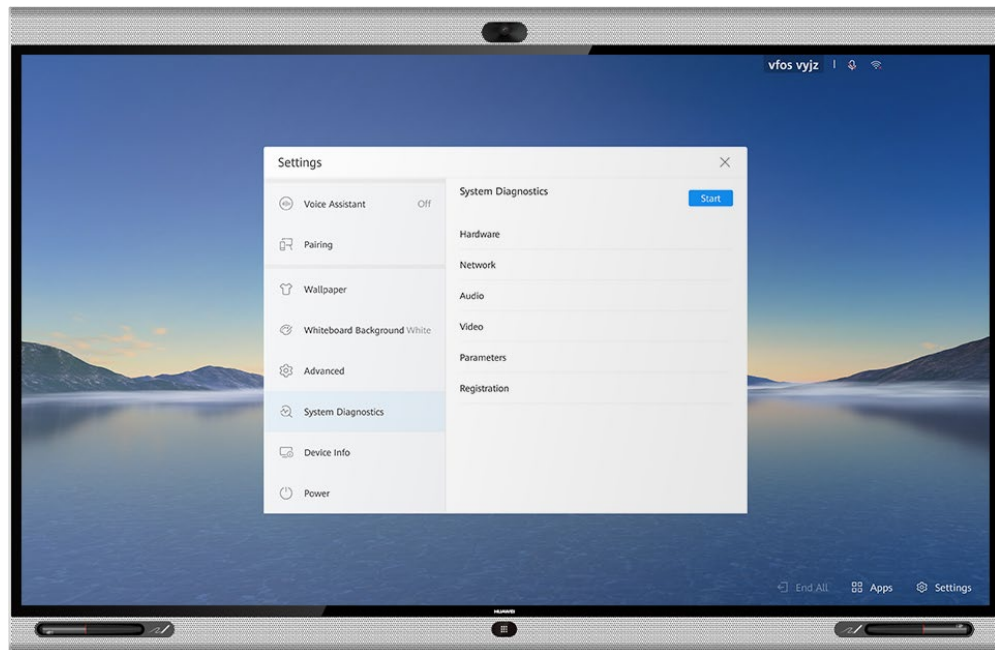
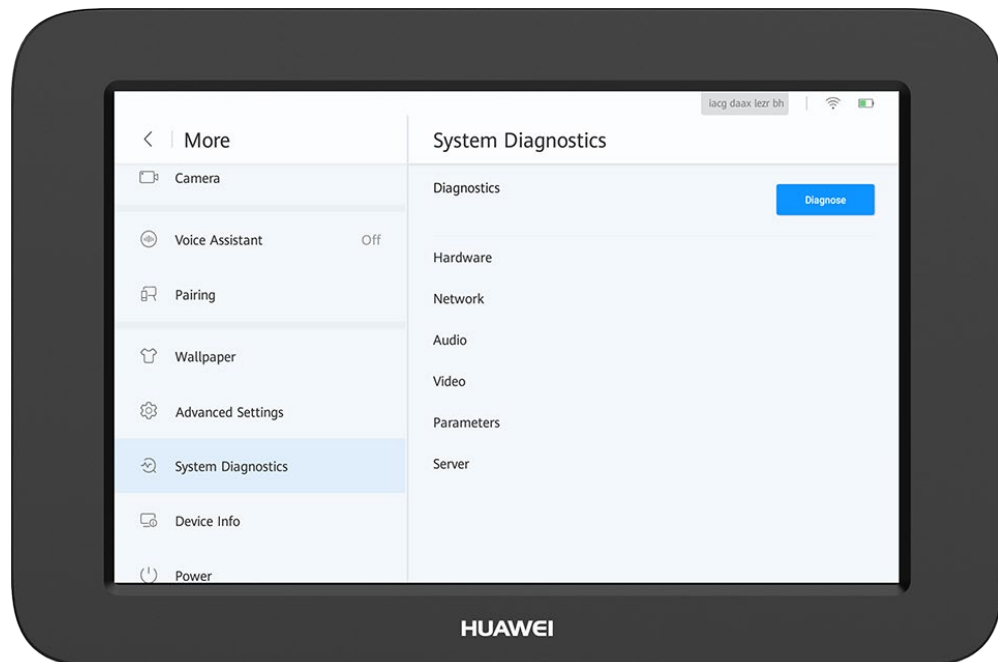


Figure 7-7 System Diagnostics module on the Touch



## 7.2.3 Inspection

The SMC2.0 can automatically check the following items on the Board:

- IP line status

- System software version
- System performance, including the temperature and fan status
- H.323 and SIP registration status
- Working status of the built-in camera
- Content source connection status and input port settings
- Video input cable connection status and video input port settings

Board inspection tasks are interrupted when the Board is powered off or initiates a call, and are resumed once the Board is restarted or the call ends.

The inspection status and result can be reported to the SMC2.0.

## 7.2.4 Upgrade

The Board allows users to upgrade its software packages (two software packages: one for users and the other for the production line). The software package for the production line can be used only by the production line for manufacturing and repair.

You can upgrade the Board to the latest version to fix its vulnerabilities and use the new functions provided in the latest version.

- The Board can be upgraded using the upgrade tool or on the web interface.
- The Board factory default system can be backed up and used for system restoration if necessary.
- The Board supports silent upgrade.
- Boards can be upgraded in batches.
- The Board upgrade can be paused and resumed.
- Any Board connected to eSight can be upgraded using eSight.
- As a manageable device, the Board can be upgraded using the SMC2.0. If multiple Boards exist, they can be upgraded in batches from the SMC2.0.

## 7.3 CHR Data Collection

After the Board connects to eSight, its session and media CHR data files can be sent to eSight. SessionInsight obtains CHR data files from eSight and analyzes them to quickly locate faults.

# 8 Technical Specifications

## 8.1 Physical Specifications

Table 8-1 lists the physical specifications of the Board.

**Table 8-1** Physical specifications

Item	Specifications
<b>Electricity supply requirements</b>	
Operating voltage	100–240 V AC
Operating frequency	50–60 Hz
Maximum power consumption	300 W
<b>Environmental requirements (operating state)</b>	
Ambient temperature	Board: 0°C to 40°C (32°F to 104°F) Touch: 0°C to 35°C (32°F to 95°F)
Relative humidity	5% to 95%
Ambient noise	< 46 dBA SPL
Minimum illuminance	7 lux
Recommended illuminance	> 200 lux
EMC	Class A
Operating altitude	< 5000 m (16404 ft)
<b>Environmental requirements (non-operating state)</b>	
Ambient temperature	–20°C to +60°C (–4°F to +140°F)
Relative humidity	5% to 95%

Item	Specifications
(non-condensing)	
<b>Dimensions and weight</b>	
Device dimensions (H x W x D)	974 mm x 1492 mm x 72 mm (38.3 in. x 58.7 in. x 2.8 in.)
Package dimensions (H x W x D)	1118 mm x 1660 mm x 252 mm (44.0 in. x 65.4 in. x 9.9 in.)
Net weight	59 kg (110.2 lb)
Gross weight	70 kg (154.3 lb)
<b>Wi-Fi</b>	
Frequency bands	2.4 GHz and 5 GHz
Working frequency ranges	2.4G: 2400MHz~2483.5MHz 5G: 5150MHz~5250MHz
Maximum transmission power	< 20 dBm
Working range in an environment without barriers	Maximum: 20 m (65.6 ft) Recommended: 10 m (32.8 ft)
<b>Display</b>	
Touchscreen	Capacitive and infrared
Screen brightness range	80-350 cd/m <sup>2</sup>
<b>Built-in HD camera</b>	
Image sensor	20 megapixels, 1-inch CMOS sensor
Resolution	Up to 5K
Zoom	Up to 3x lossless zoom
Focal length	F = 7.2 mm
Fixed aperture	F2.0
Maximum horizontal field of view	83° to 86°
Maximum vertical field of view	54°
Number of presets	Local camera: 30 at most; remote camera: 16 at most
Control	ePTZ
<b>Image mode</b>	

Item	Specifications
Image mode	Four image modes: standard, vivid, natural, and user-defined
<b>Image capture</b>	
Automatic adjustment	Auto White Balance (AWB), Auto Exposure (AE), and Auto Focus (AF)
Exposure mode	Auto, manual, and shutter priority
White balance mode	Auto, manual, and one-push
<b>Built-in microphone</b>	
Sound pickup	Range: 180°; distance: 6 m (19.7 ft)
Maximum sound localization distance	10 m (32.8 ft)
Sound localization angle	Forward, 180°
<b>Built-in speaker</b>	
Sound playing	Distance: 6 m (19.7 ft)
Speaker sensitivity	95dB SPL@1m (3.3 ft)
<b>Voice tracing</b>	
Distance	3 m (9.8 ft)
<b>Installation</b>	
Installation method	Wall mount and floor stand
<b>Peripherals</b>	
VPM220	Only one VPM220 can be connected.
Wireless mouse and keyboard	Recommended brands: Logitech, Rapoo, and A4Tech

## 8.2 Performance Specifications

Table 8-2 lists the performance specifications of the Board.

**Table 8-2** Performance specifications

Item	Specifications
Call bandwidth	64 kbit/s to 4 Mbit/s
Video capabilities (H.264)	Minimum bandwidth required to deliver video of a specific resolution (without any packet loss):


Item	Specifications
	<ul style="list-style-type: none"> <li>• 512 kbit/s for 1080p 30 fps</li> <li>• 768 kbit/s for 720p 60 fps</li> <li>• 384 kbit/s for 720p 30 fps</li> <li>• 128 kbit/s for 4SIF/4CIF 30 fps</li> <li>• 64 kbit/s for SIF/CIF/QSIF/QCIF/SQSIF/SQCIF 30 fps</li> </ul>
<p>Video capabilities (H.265)</p>	<p>Minimum bandwidth required to deliver video of a specific resolution (without any packet loss):</p> <ul style="list-style-type: none"> <li>• 768 kbit/s for 1080p 60 fps</li> <li>• 384 kbit/s for 1080p 30 fps</li> <li>• 512 kbit/s for 720p 60 fps</li> <li>• 256 kbit/s for 720p 30 fps</li> </ul>
<p>Presentation sharing capabilities</p>	<ul style="list-style-type: none"> <li>• Content sharing over a wireless connection <ul style="list-style-type: none"> <li>In a remote meeting: <ul style="list-style-type: none"> <li>– AirPresence mobile client: up to 1080p 3 fps</li> <li>– AirPresence PC client: up to 1080p 5 fps</li> </ul> </li> <li>In a local meeting: <ul style="list-style-type: none"> <li>– AirPresence mobile client: up to 1080p 3 fps</li> <li>– AirPresence PC client (Windows): up to 1080p 25 fps</li> <li>– AirPresence PC client (Mac): up to 1080p 15 fps</li> </ul> </li> </ul> </li> <li>• Content sharing over a cable connection <ul style="list-style-type: none"> <li>Input resolution: <ul style="list-style-type: none"> <li>– HDMI: 4K×2K 25/30/50/60fps, 3200×1800 30/60fps, 2880×1800 30/60fps, 2880×1620 50/60fps, 2560 x 1600 60 fps, 2048 x 1536 60 fps, 1920 x 1200 60 fps, 1680 x 1050 60 fps, 1600 x 1200 60 fps, 1600 x 900 60 fps, 1440 x 900 60 fps, 1400 x 1050 60 fps, 1366 x 768 60 fps, 1360 x 768 60 fps, 1280 x 1024 60/75/85 fps, 1280 x 960 60 fps, 1280 x 768 60/75/85 fps, 1280 x 800 60 fps, 1080p 24/25/30/50/60fps, 1024 x 768 60/70/75/85 fps, 800 x 600 56/60/72/75/85 fps, 720 x 400 85 fps, 640 x 480 60/72/75/85 fps</li> <li>– VGA: 640 x 480 60/72/75/85 fps, 720 x 400 85 fps, 800 x 600 56/60/72/75/85 fps, 1024 x 768 60/70/75/85 fps, 1152 x 864 75 fps, 1280 x 768 60/75/85 fps, 1280 x 800 60 fps, 1280 x 960 60 fps, 1280 x 1024 60/75/85 fps, 1366 x 768 60 fps, 1366 x 768 60 fps, 1440 x 900 60 fps, 1400 x 1050 60 fps, 1440 x 576i 60 fps, 1440 x 480i 60 fps, 720 x 480p 60 fps, 720 x 576p 50 fps, 720p 50/60 fps, 1080p 24/25/30/50/60 fps, 1600 x 900 60 fps, 1600 x 1200 60 fps, 1680 x 1050 60 fps, 1920 x 1200 60 fps</li> </ul> </li> <li>Coding/Decoding resolution: 800 x 600, 1024 x 768, 1280 x 1024, 1280 x 720, 1920 x 1080, 3840 x 2160</li> <li>Output resolution: 800 x 600, 1024 x 768, 1280 x 1024, 1280 x 720, 1920 x 1080, 3840 x 2160</li> </ul> </li> </ul>

Item	Specifications
Codec capabilities (H.264)	Video: CIF 25/30 fps, 4CIF 25/30 fps, 720p 25/30 fps, 720p 50/60 fps, 1080p 25/30 fps, 1080p 50/60fps Content sharing: VGA (640 x 480), SVGA (800 x 600), XGA (1024 x 768), 720p, 1280 x 1024, 1366 x 768, 1400 x 1050, 1680 x 1050, and 1080p
Codec capabilities (H.265)	Video: CIF 25/30 fps, 4CIF 25/30 fps, 720p 25/30 fps, 720p 50/60 fps, 1080p 25/30 fps Content sharing: VGA (640 x 480), SVGA (800 x 600), XGA (1024 x 768), 720p, 1280 x 1024, 1366 x 768, 1400 x 1050, 1680 x 1050, 1080p, 4K 8 fps
Dual-stream (video + presentation) capabilities	Video conferencing: Up to 1080p 30 fps+1080p 30 fps or 1080p 30 fps+4K 8 fps Data conferencing: Up to 1080p 30 fps+4K 3 fps
Operating system and hardware requirements for AirPresence mobile client installation	<ul style="list-style-type: none"> <li>Android 4.0 or later, CPU with the ARMv7 Neon chip or above, dominant frequency of 1.5 GHz or above, memory of 1 GB or above</li> <li>iOS 7.0 or later, iPhone 5 or later or iPad2 or later</li> </ul>
Operating system requirements for AirPresence PC client installation	<ul style="list-style-type: none"> <li>32-bit Windows XP</li> <li>32-bit or 64-bit Windows 7, 8, 8.1 or 10</li> <li>32-bit and 64-bit macOS 10.7 to 10.11</li> </ul>

## 8.3 Ports and Protocols

Table 8-3 lists the ports and protocols of the Board.

**Table 8-3** Board ports and protocols

Port Type	Description and Quantity	Standards and Protocols Compliance	Remarks
Video input ports	<ul style="list-style-type: none"> <li>1 x built-in camera</li> <li>1 x HDMI</li> <li>1 x HD-VI</li> <li>1 x VGA</li> </ul>	-	Users can select any display mode for video input.
Video output port	1 x HDMI	HDMI 2.0 	-
Audio input	<ul style="list-style-type: none"> <li>Built-in microphone</li> </ul>	-	Only one VPM220



Port Type	Description and Quantity	Standards and Protocols Compliance	Remarks
ports	<ul style="list-style-type: none"> <li>array</li> <li>• 1 x 3.5 mm</li> <li>• 1 x HD-AI</li> <li>• 1 x HDMI (audio input supported)</li> </ul>		can be connected.
Audio output ports	<ul style="list-style-type: none"> <li>• Built-in speaker</li> <li>• 1 x 3.5 mm</li> <li>• 1 x HDMI (audio output supported)</li> </ul>	-	-
USB ports	<ul style="list-style-type: none"> <li>• 2 x USB 3.0 Type-A</li> <li>• 1 x USB 2.0 Type-B</li> </ul>	USB 2.0/3.0	-
Network ports	<ul style="list-style-type: none"> <li>• 1 x 10/100/1000 Mbit/s LAN</li> <li>• 1 x Touch</li> <li>• 1 x COM RJ45 serial port</li> </ul>	-	-
Wireless ports	1 x Wi-Fi (built-in)	-	-
Ground stud	1 x ground stud	-	-
Power input port	1 x power input port	-	-

## 8.4 Standards Compliance

Table 8-4 lists the standards with which the Board complies.

**Table 8-4** Standards compliance

Item	Standards
Video encoding and decoding protocols	H.265, H.264 HP, and H.264 BP
Audio encoding and decoding protocols	AAC-LD (mono/stereo), G.711A, G.711U, G.722, G.722.1C, G.729A, and Opus
Multimedia framework protocols	ITU-T H.323 and IETF SIP
Dual-stream protocols	ITU-T H.239 and BFCP

<b>Item</b>	<b>Standards</b>
Network transmission protocols	TCP/IP, RTP, RTCP, DHCP, DNS, SMTP, SNMP, SNTP, Telnet, SSH, HTTP, HTTPS, and TR-069
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	H.235, STARTTLS, TLS, and SRTP
Wi-Fi standards	IEEE 802.11 a/b/g/n/ac, IEEE 802.1p/q, IEEE 802.1x, WEP, WPA, WPA2, and WPS

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# A Glossary

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## 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

<b>Address book</b>	Users can save a remote site as an address book contact, along with the site's IP address, number, type, and bandwidth.
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**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.

## C

<b>caption</b>	Text information that appears on video. During a conference, a site can add captions to the video sent by the local site. Users can add captions to the top, middle, and bottom areas of the screen.
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<b>chair site</b>	A site that has chair control rights.
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**CIF** Common Intermediate Format

**CPE** Customer Premises Equipment  
Any terminal and associated equipment located at a subscriber's premises and connected with a carrier's telecommunication channel at

	the demarcation point.
<b>CSCF</b>	<p>Call Session Control Function</p> <p>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.</p>
<b>D</b>	
<b>DMZ</b>	<p>demilitarized zone</p> <p>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.</p>
<b>DNS</b>	<p>Domain Name System</p> <p>A mechanism that maps easy-to-remember domain names to IP addresses recognizable for network devices.</p>
<b>dual stream</b>	<p>During a conference, 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).</p>
<b>DVI</b>	Digital Visual Interface
<b>DVI-I</b>	Digital Visual Interface-Integrated
<b>E</b>	
<b>EUA</b>	<p>Enterprise Unified Address Book</p> <p>A next-generation address book server launched by Huawei. It provides LDAP-based unified address book services for Huawei videoconferencing and enterprise communication solutions.</p>
<b>G</b>	
<b>G.722</b>	<p>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.</p>
<b>G.728</b>	<p>Audio codec standard that uses low-delay code excited linear prediction (LD-CELP). Its data rate is 16 kbit/s.</p>
<b>H</b>	
<b>H.239</b>	<p>A standard recommended by ITU-T. It enables a video conference to simultaneously transmit both video and data content (for example, computer desktop).</p>
<b>H.263</b>	<p>A video codec standard for video conferences at low rates. Five formats are available: SQCIF, QCIF, CIF, 4CIF, and 16CIF.</p>
<b>H.264</b>	<p>Compared with H.263, H.264 can provide the same-quality video at half of the bit rate, with strong error resilience.</p>

<b>HD</b>	High Definition
<b>HDMI</b>	High Definition Multimedia Interface
<b>HD display</b>	An HD plasma TV that is used to display the video from a telepresence codec.
<b>HTTP</b>	Hypertext Transfer Protocol
<b>HTTPS</b>	Hypertext Transfer Protocol over Secure Sockets Layer An HTTP protocol that runs on top of 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.
<b>I</b>	
<b>initiate call</b>	Initiating a call is a process in which 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.
<b>IMS</b>	IP multimedia subsystem
<b>L</b>	
<b>LAN</b>	Local Area Network
<b>LCD</b>	Liquid Crystal Display
<b>LDAP</b>	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.
<b>loopback test</b>	The terminal can transmit audio or video data on a channel as a simulation to 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.
<b>M</b>	
<b>MediaX</b>	Media Switch Server
<b>media stream</b>	Data stream (such as audio, video and fax) between different bearer networks.
<b>N</b>	
<b>netATE</b>	Net Automatic Transfer-enhancement
<b>P</b>	
<b>power on</b>	To start up a computer; to begin a cold boot procedure; to turn on the power.
<b>PPPoE</b>	Point-to-Point Protocol over Ethernet
<b>R</b>	

<b>RSE</b>	Recording & Streaming Engine
<b>RTCP</b>	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.
<b>S</b>	
<b>SBC</b>	Session Border Control
<b>SC</b>	Switch Center The Huawei Switch Center (SC) is a next-generation network switch system that provides H.323 GK, SIP server, and media proxy functions.
<b>schedule conference</b>	Specify the start time and duration of a conference so that the system schedules the conference automatically.
<b>SEC</b>	Super Error Concealment
<b>SIF</b>	Source Input Format
<b>SIP</b>	Session Initiation Protocol
<b>SMC</b>	Service Management Center A videoconferencing service management system that manages videoconferencing devices (including GKs, MCUs, and participant endpoints) and allocates videoconferencing resources.
<b>SP</b>	service provider A system that provides services to users. In IAM, the SP for federated identity authentication is the public cloud system.
<b>SRTP</b>	Secure Real-time Transport Protocol A real time transport protocol with enhanced security and encryption mechanism-based RTP.
<b>SSH</b>	Secure Shell A network security protocol for encrypting transmitted data for secure remote login and other secure network services over an insecure network.
<b>STG</b>	Security Traversing Gateway
<b>STUN</b>	Simple Traversal of UDP through NAT
<b>SVGA</b>	Super Video Graphics Array
<b>sound pickup distance</b>	The maximum distance within which sounds can be picked up by a microphone.
<b>T</b>	
<b>telepresence</b>	The Huawei telepresence system provides users a videoconferencing environment in which they can have true-to-life and face to face remote conferences.
<b>terminal</b>	A device that converts voice, sound, text, images, tables, data and

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	video from physical display to electronic signals or from electronic signals to physical display. A terminal generates and sends signals (such as telecommunications circuit setup or release) that maintain the normal operating state of the telecommunications network, and receives call signals from the telecommunications switch and transmission.
<b>TCP/IP</b>	Transmission Control Protocol/Internet Protocol
<b>TLS</b>	Transport Layer Security
<b>V</b>	
<b>VGA</b>	Video Graphics Array
<b>W</b>	
<b>WPA</b>	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.
<b>Wi-Fi</b>	Wireless Fidelity A short-distance wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.
<b>X</b>	
<b>XGA</b>	Extended Graphics Array