TE10 Videoconferencing Endpoint

Product Overview

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About This Document

Purpose

This document provides the positioning, highlights, networking schemes, features, and technical specifications of the HUAWEI TE10 videoconferencing endpoint (TE10 or endpoint for short).

Intended Audience

This document is intended for:

- Presales engineers
- Technical support engineers
- Enterprise administrators
- End users

Symbol Conventions

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

Symbol	Description
⚠ DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
⚠ NOTICE	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.

Symbol	Description
NOTE	Calls attention to important information, best practices and tips.
	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 05 (2017-08-15)

This issue is the fifth official release, and has the following updates:

Modified chapter **1 Product Positioning**.

Modified chapter **2 Product Highlights**.

Modified chapter **3 Application Scenarios**.

Modified chapter **5 Functions and Features**.

Issue 04 (2017-07-25)

This issue is the fourth official release, and has the following updates:

Added section **3.3 Interconnecting with the StarLeaf Cloud Platform**.

Added section **7.3 AirPresence Client Performance Specifications**.

Modified chapter **2 Product Highlights**.

Modified section **3.1 On-Premises/IMS Hosted/SP Hosted Network**.

Modified section **3.4 Interconnecting with the ACS**.

Modified section **5.2 Cloud-based Video Conference**.

Modified section **5.6 AirPresence Client**.

Modified section **5.10 Multi-Language Interface**.

Modified section **5.15 Interconnection with the ACS**.

Modified section **5.18 Security**.

Modified section **6.3 Using the AirPresence Client**.

Modified section **7.2 TE10 Performance Specifications**.

Issue 03 (2017-06-10)

This issue is the third official release, and has the following updates:

Modified section **7.1 TE10 Physical Specifications**.

Modified section **7.5 TE10 Standards Compliance**.

Issue 02 (2017-04-25)

This issue is the second official release, and has the following updates:

Added section **5.5 SiteCall**.

Added section **6.4 Intelligent Diagnostics**.

Added section **6.6 Inspection**.

Modified chapter **2 Product Highlights**.

Modified section **5.7 Conference Control**.

Modified section **5.8 Screen Layout**.

Modified section **5.18 Security**.

Issue 01 (2017-01-20)

This issue is the first official release.

Contents

1 Product Positioning

The TE10 is an affordable integrated high definition (HD) videoconferencing endpoint, as well as an innovative product that also offers cloud services.

Table 1-1 describes the appearance, features, and application scenarios of the TE10.

Table 1-1 TE10 appearance, features, and application scenarios

Appearance	Feature	Application Scenario
	● Compact 9 cm cube with the digital HD camera, codec, stereo microphone, speaker, Bluetooth & Wi-Fi module, and foldable bracket integrated ● Extensive interconnection with various kinds of cloud platforms ● Easy paring with AirPresence for content sharing ● A resolution of up to 720p 30 fps supported	Small conference rooms (less than 20 m^2) and business trips

2 Product Highlights

Cloud-Device Synergy: Interconnection with Multiple Cloud Platforms

- The TE10 interconnects with cloud platforms provided by mainstream vendors, such as Huawei, Videxio, Zoom, BlueJeans, StarLeaf, Guochuang Software, EICG Technology, and City Cloud Technology.
- The TE10 provides a wide variety of APIs to facilitate integration with third-party systems and service customization.

Wireless Connections for Easy Sharing

- The TE10 has a built-in Wi-Fi module that supports 2.4 GHz and 5 GHz frequency bands. The TE10 can connect to a Wi-Fi network, serve as a Wi-Fi hotspot, or function as both at the same time.
- The TE10 can connect to a Bluetooth speaker that supports audio pickup.
- You can pair the AirPresence client on your smartphone with a TE10 in either of the following ways:
- Using the AirPresence client to scan the QR code on the TE10's user interface
- Entering the projection code obtained from the TE10's user interface in the input box on the AirPresence client

  After they are paired, the AirPresence client can initiate or join a conference, share a presentation, or control the TE10.
- You can install the AirPresence client on your PC and connect the client to the TE10 over Wi-Fi. Then you can use it to share the PC desktop.

Compact 9 cm Cube, Easy to Install

- With a compact design that integrates six components into one 9 cm cube, the TE10 is portable and easy to install.
- You can unfold the bracket and easily mount the TE10 on top of a display.
- A radio frequency (RF) remote control is provided to allow you to easily control the TE10.
- The TE10 installation can be complete within only 1 minute. Only three steps are required: plugging the power cable into the TE10, connecting the TE10 to a display, and connecting the TE10 to a Wi-Fi network.
- You can complete the TE10 configuration with several simple operations. No professional knowledge is required.

Ultra Wide-Angle Camera and Built-in Microphone, Delivering a Superb Audio and Video Experience

- The TE10 provides an ultra wide-angle camera that supports 3x digital zoom. With Electronic Pan-Tilt-Zoom (ePTZ), the camera is able to capture perfect video images even at low illumination.
- The TE10's built-in microphone provides 180-degree audio pickup, with an optimal range of six meters.
- 720p video and 1080p presentation can be simultaneously transmitted.
- The TE10 is able to provide 720p 30 fps HD video at a bandwidth of only 384 kbit/s.
- The use of super error concealment (SEC) and automatic deceleration enables the TE10 to deliver smooth and sharp video.
- Multiple encryption measures are supported for media and signaling encryption.

3 Application Scenarios

3.1 On-Premises/IMS Hosted/SP Hosted Network

The TE10 connects to on-premises, IMS hosted, or SP hosted CloudVC/CloudEC networks through IP networks, enabling video communication for enterprises and carriers.

Figure 3-1 Networking diagram
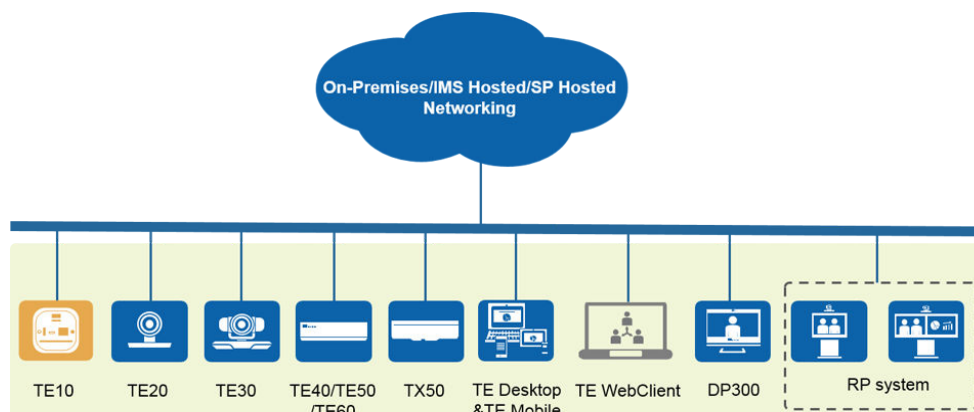
In this networking:

●	The TE10 connects to the on-premises network and joins HD video conferences through the standard H.323 or SIP protocol.

●	The TE10 connects to the SP or IMS hosted network and joins HD video conferences through the standard SIP protocol.

●	Video and presentation sharing can be implemented between the TE10 and various kinds of terminals and clients to deliver the optimal communications experience.

To learn more about the CloudVC and CloudEC on-premises, IMS hosted, and SP hosted networks, see the typical network part in the solution description (contained in the product documentation.) **Table 3-1** provides the link for the product documentation of each CloudVC/CloudEC network.

Table 3-1 How to obtain the product documentation

Solution Product Documentation	How to Obtain
CloudVC V600R006C00 Product Documentation (On-premises)	**http://support.huawei.com/enterprise/ docinforeader.action?contentId=DOC1000129678**
CloudVC V600R006C00 Product Documentation (SP Hosted)	**http://support.huawei.com/enterprise/ docinforeader.action?contentId=DOC1000129679**
CloudEC V600R006C00 Product Documentation (Enterprise On-premises)	**http://support.huawei.com/enterprise/ docinforeader.action?contentId=DOC1000129815**
CloudEC V600R006C00 Product Documentation (SP Hosted)	**http://support.huawei.com/enterprise/ docinforeader.action?contentId=DOC1000129816**

3.2 Interconnecting with the Videxio Cloud Platform

To interconnect your TE10 with the Videxio cloud platform, the necessary cloud services must be purchased from the same platform. Then you can complete the interconnection simply by clicking the activation button on the TE10 web interface or selecting the activation button on the user interface.

Figure 3-2 shows a TE10 interconnecting with the Videxio cloud platform.

Figure 3-2 Interconnecting with the Videxio cloud platform
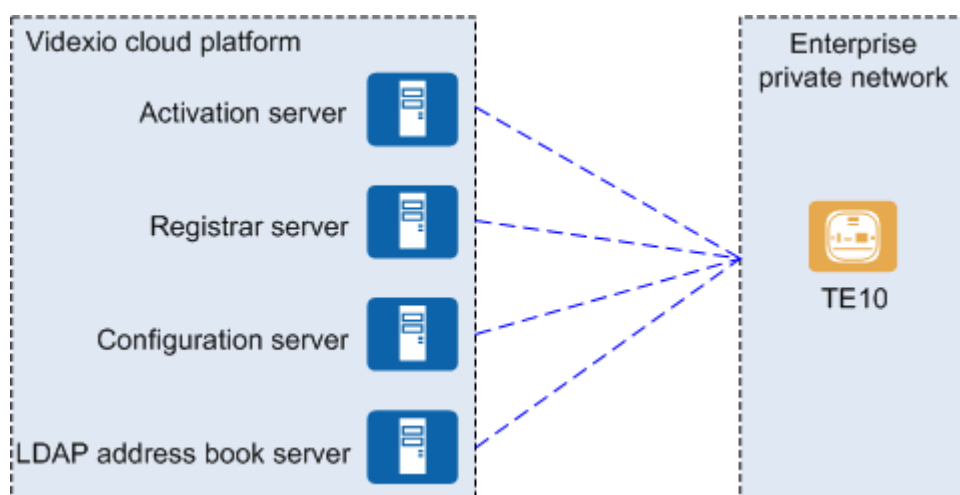
In this networking:

● By interacting with the activation server, registrar server, configuration server and LDAP server on the Videxio platform, the TE10 is activated, obtains configuration data, acquires its own site name, and automatically registers with the Videxio platform based

on the obtained data. It then acquires the address book from the LDAP server on the Videxio platform.

- The TE10 communicates with the Videxio platform through the SIP protocol to get registered and join conferences.

- For video conferences that are held on the Videxio cloud videoconferencing platform, only presentation sharing is supported.

3.3 Interconnecting with the StarLeaf Cloud Platform

The TE10 interconnects with the StarLeaf cloud platform through the Quick Connect Protocol (QCP) provided by the platform. **Figure 3-3** shows a TE10 interconnecting with the StarLeaf cloud platform.

Figure 3-3 Interconnecting with the StarLeaf cloud platform
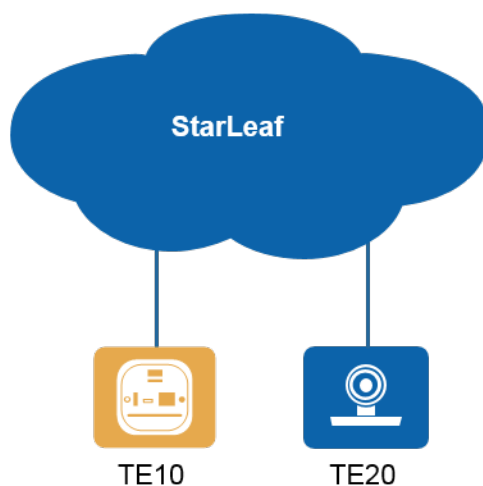
In this networking:

- The TE10 uses the quick-connect code obtained from the StarLeaf cloud platform to automatically register with the platform through the H.323 protocol.

- The TE10 automatically obtains configuration data, such as the TE10 name, language, and time zone, from the StarLeaf cloud platform and independently completes the configuration process.

- The TE10 can be automatically upgraded from the StarLeaf cloud platform.

3.4 Interconnecting with the ACS

The TE10 interconnects with the ACS so that the ACS can manage the TE10 through the TR-069 protocol.

Figure 3-4 shows a TE10 interconnecting with the ACS.

Figure 3-4 Interconnecting with the ACS
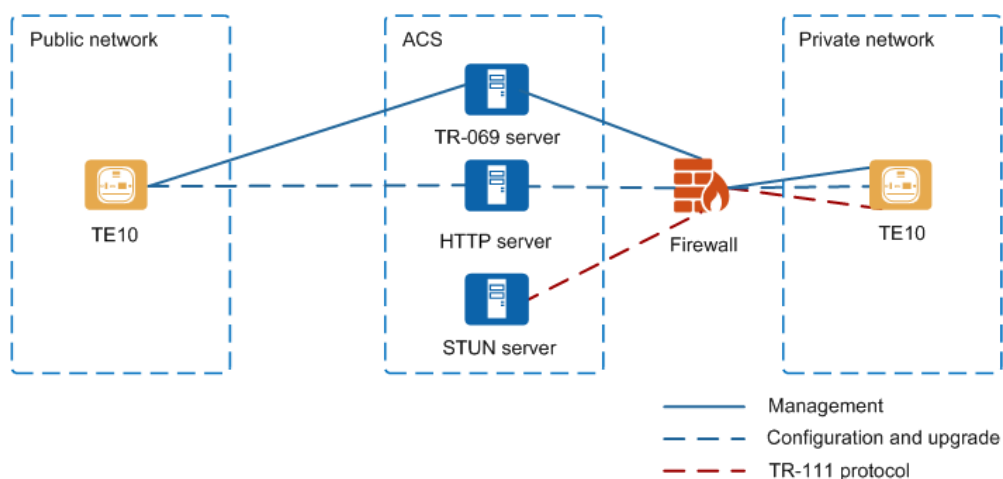
In this networking:

- The TE10 communicates with the TR-069 server through the TR-069 protocol.
- The HTTP server is used to upload and download configuration files and download upgrade files.
- The Simple Traversal of UDP through NAT (STUN) server implements traversal between private and public networks and delivers management over all devices on both networks.
- The TE10 can be deployed on a public or private network, while the ACS must be deployed on a public network.
    - If the TE10 is deployed on a public network, it can be managed by the ACS through the TR-069 protocol.
    - If the TE10 is deployed on a private network, the STUN server needs to be deployed for traversal between private and public networks. After the deployment, the TR-111 protocol, an extension of the TR-069 protocol, will be available for the ACS to manage the TE10.

4 Product Structure

4.1 Appearance

The TE10, a 9 cm cube, has a compact design and a metal exterior, which is easy to carry and install. **Figure 4-1** shows the appearance of the TE10.

Figure 4-1 TE10

Figure 4-2 shows the remote control that comes with a TE10.

Figure 4-2 Remote control

4.2 Front Panel and Rear Panel

Figure 4-3 shows the TE10 front panel.

Figure 4-3 Front panel
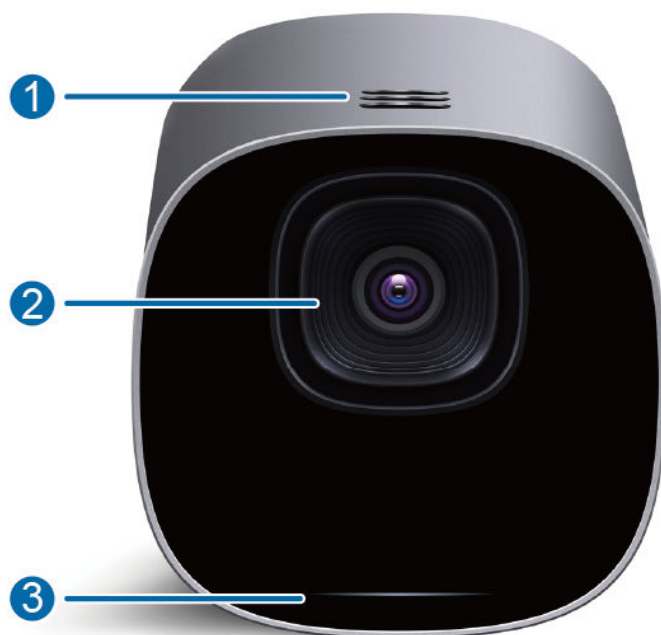
Table 4-1 describes the components on the front panel.

Table 4-1 Components on the front panel

No.	Component	Description
1	Built-in microphone	Provides 180-degree sound pickup for the local site, with an optimal range of six meters.
2	Lens	Supports 3x digital zoom and ultra wide angle.
3	Status indicator	Shows whether the TE10 is running, sleeping, upgrading, or malfunctioning.

Table 4-2 describes the TE10 indicator status.

Table 4-2 TE10 indicator status

When the indicator is...	The TE10 is...
off	powered off
blinking white twice per second	powering on
blinking white four times per second	upgrading
steady white	working properly
blinking once	responding to the press on a button on the remote control

When the indicator is...	The TE10 is...
blinking once per second	responding to the press and hold on a button on the remote control
blinking white (on for 1s, off for 2s)	standby
steady red	faulty (hardware)
steady orange	faulty (software)
blinking orange twice per second	overheating

Figure 4-4 shows the TE10 rear panel.

Figure 4-4 Rear panel
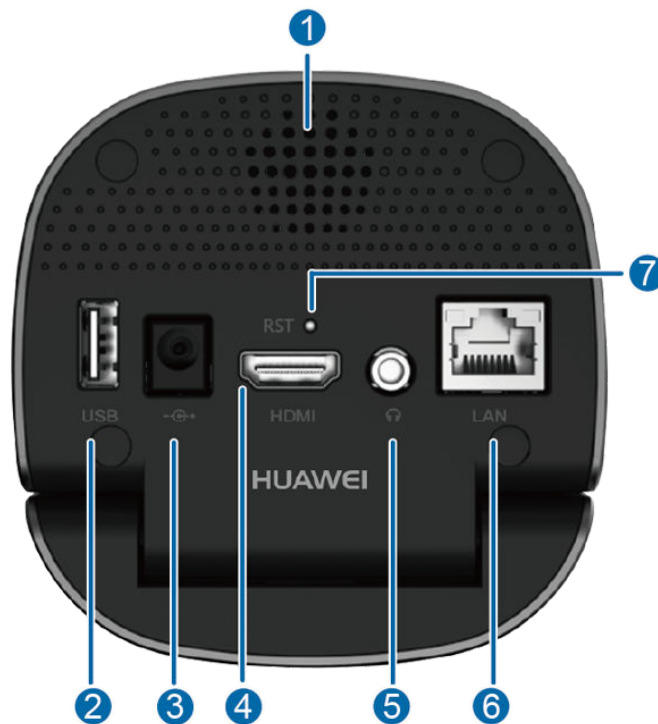
Table 4-3 describes the components on the rear panel.

Table 4-3 Components on the rear panel

No.	Component	Description
1	Built-in speaker	Used for audio output.
2	USB port	Connects to a USB device, for example, U flash drive and keyboard or mouse.

No.	Component	Description
3	Power port	Connects to a power supply. Voltage: 100 V to 240 V AC or 12 V DC Current: 1 A Frequency: 50 Hz or 60 Hz
4	HDMI OUT	Connects to a TV set or monitor to deliver video, presentation, and audio of the local or remote site. This port supports a resolution of up to 720p 30 fps.
5	LINE OUT	3.5 mm (0.14 in.) audio output port, which connects to the audio input port on a monitor or an external speaker.
6	LAN	Ethernet port that supports 10/100/1000 Mbit/s full duplex.
7	RST	Reset button. ● When the TE10 is being powered on, pressing and holding this button for 10s resets the TE10 to the pre-installed system version. ● When the TE10 is running, pressing and holding this button for 10s resets the TE10 to factory defaults. When you press and hold this button for 3s, the system will prompt you that your TE10 will be reset to factory settings if you press and hold this button for 10s.

5 Functions and Features

5.1 Unified Access Though the SBC

On the on-premises, IMS hosted, and SP hosted networks, the TE10 can be deployed on the public network. To ensure secure access from the TE10 to the internal network, firewalls should be deployed on the network border.

In this situation, the TE10 connects to the internal network through the SBC. The TE10 automatically obtains the unified access settings through the SBC, and the SBC serves as the SIP or LDAP service proxy for the TE10 in direct-connection or SVN mode. (SVN stands for Secure Sockets Layer Virtual Private Network.)

5.2 Cloud-based Video Conference

The TE10 can join video conferences on a variety of mainstream cloud platforms, including:

- Calling the domain name of a Virtual Meeting Room (VMR) to join a video conference on the Videxio cloud platform
- Joining a video conference on the Zoom or BlueJeans cloud platform from its cloud hall
- Entering the Huawei Cloud Meeting Room to initiate or join a conference simply by one click on the IMS or SP hosted network.

With the TE10, cloud conferencing has never been so easy.

5.3 Interconnection with a Wide Range of Hardware and Software

The TE10 can work together with TE series HD endpoints, TE Desktop&TE Mobile, and MCUs developed by Huawei, as well as standards-compliant endpoints and MCUs of mainstream vendors. Using the TE10, employees in a company can join the same conference wherever they are and whatever terminals they are using.

5.4 HD Video Conference

The TE10 supports video calls at H.264 HP 20p and H.264 BP 720p. It can join conferences at different rates, using different protocols. It also supports AAC-LD high-fidelity stereo audio. The TE10 is able to transmit video and presentation in both P2P conferences and multipoint conferences. During a conference, only one site can share content at a time.

The TE10 supports a conference rate of up to 2 Mbit/s that delivers industry-leading video quality. **Table 5-1** describes the minimum bandwidth required for offering the corresponding video when no presentation sharing is in progress.

Table 5-1 Video resolution and the minimum bandwidth required

Minimum Bandwidth	Video Resolution
384 kbit/s	720p 30 fps
128 kbit/s	4SIF/4CIF
64 kbit/s	SIF/CIF/QSIF/QCIF/SQSIF/SQCIF

5.5 SiteCall

With the TE10, you can place calls to other sites to set up multipoint video conferences directly from its user interface (namely, the interface operated using the remote control) or web interface. These calls are known as SiteCalls. The TE10 is the only huddle-room cloud video endpoint that supports SiteCalls in the industry. The SiteCall function is easy to use. You can initiate a SiteCall over H.323 or SIP once you finish setting necessary parameters such as the conference name and participants.

5.6 AirPresence Client

Huawei provides a wireless client named AirPresence for the TE10. It connects to the TE10 over the Wi-Fi or IP network. The AirPresence client can be installed on:

● A mobile device running Android or iOS (also known as AirPresence mobile client)
● A PC running Windows or Mac (also known as AirPresence PC client)

You can download the AirPresence client to your mobile device by scanning the corresponding QR code on the TE10's user interface.

After installing the AirPresence client on a mobile device, you can pair it with the TE10 using the QR code or projection code.

The AirPresence mobile client provides more functions than the AirPresence PC client. **Table 5-2** provides the comparison of their functions.

Table 5-2 Comparison of functions provided by the AirPresence mobile and PC clients

Function	AirPresence Mobile Client	AirPresence PC Client
Sharing content	Documents and images can be shared. If the Android operating system is version 5.0 or later, you can also share the desktop.	You can only share the desktop.
Placing a P2P call	Supported	Unsupported
Joining a conference	Supported	Unsupported
Adjusting the volume of the local speaker	Supported	Unsupported
Muting or unmuting the local microphone	Supported	Unsupported
Panning or tilting the camera	Supported	Unsupported
Using the virtual remote control	Supported	Unsupported

5.7 Conference Control

When a TE10 is in a multipoint conference, conference control functions are available on the TE10. These functions enable your flexible operations on your conference. When the TE10 is in a conference initiated by the Videxio platform, only the presentation sharing function is available on the TE10.

The conference control functions of the TE10 fall in two categories: chair control and non-chair control. More functions are available to chair control than non-chair control.

Figure 5-1 shows the conference control operations that the chair site can perform on the user interface.

Figure 5-1 Conference control from the user interface
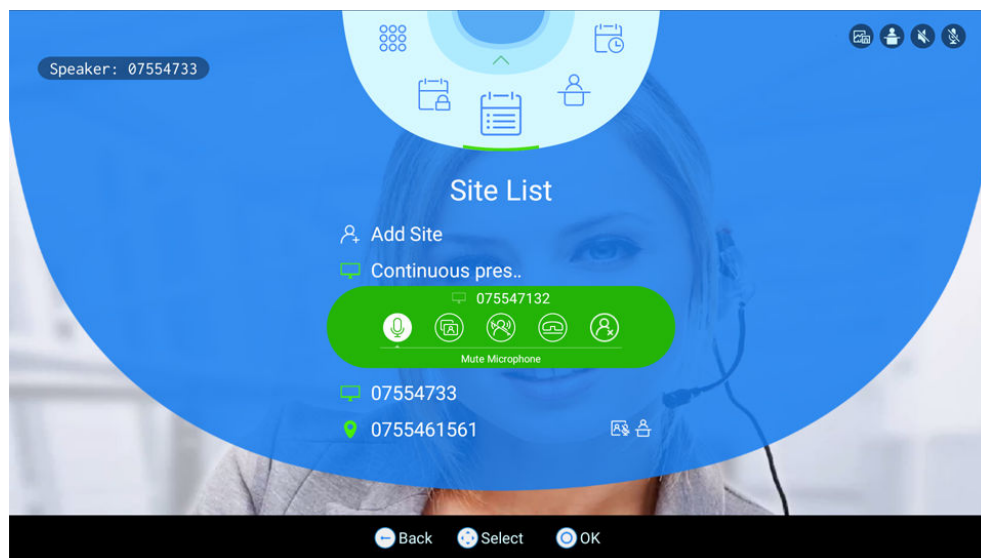
Figure 5-2 shows the conference control operations that the chair site can perform on the web interface.

Figure 5-2 Conference control from the web interface
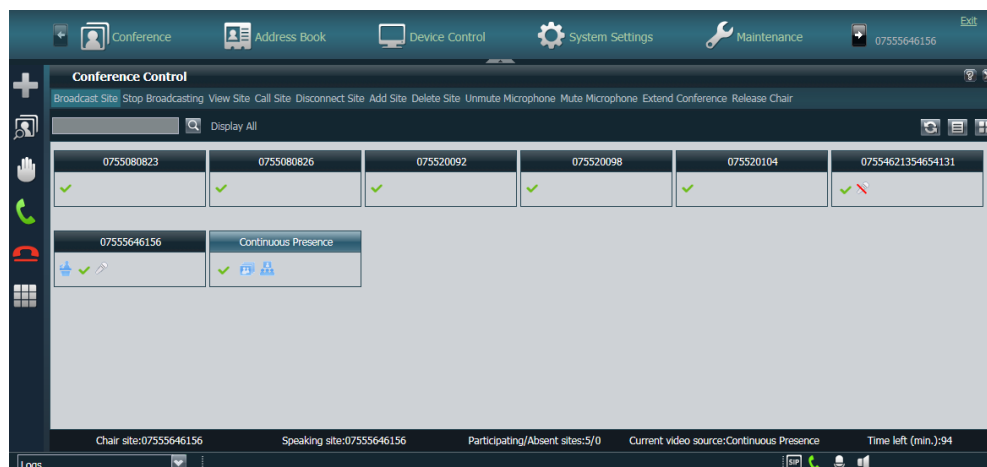
5.8 Screen Layout

You can adjust the screen layout to display a desired combination of video and presentation.

● On the web interface, you can set the screen layout to full-screen, Picture in Picture (PiP), or Picture out Picture (PoP).

  – Full-screen

    Only one channel of video or presentation is available, and it is displayed in full-screen mode.

  – PiP

    One channel of video is displayed in full-screen mode. At the same time, another channel of video is displayed in an inset window that appears in the lower right

corner of the display. The small video is approximately 1/16 of the full-screen video.

- PoP

Two panes are provided to display video and presentation.

- On the user interface, you can switch between multiple layouts including full-screen, PiP, and PoP (two separate panes).

You can switch between the layouts by choosing their menu items. Alternatively, you can press the **OK** button on the remote control to directly go to the next layout. However, in this mode, the PoP layout is unavailable when there is no presentation sharing.

5.9 Lightweight Interactive UI

Running on Android, the TE10's user interface has the following features:

- Adopts a flat fan-shaped design, and intuitively displays menus, enabling ease of use.
- Allows users to join a scheduled conference by one click, initiate a multipoint conference, and set up a P2P conference, and also provides diverse operations during a conference, such as adjusting the camera angle, selecting a screen layout, viewing a site, adding a site, and broadcast a site.
- Provides a one-stop configuration wizard to simplify the configuration process. To use the TE10, you only need to configure basic system information, such as the system language, audio performance, camera preferences, and H.323 and SIP registration settings.
- Allows operations using the wired or wireless mouse or keyboard, which is connected to the TE10 through the USB port.

5.10 Multi-Language Interface

The web interface and user interface of the TE10 support multiple languages and time zone settings. If the time zone you select uses DST, the TE10 will automatically enable DST and change the system time accordingly.

Table 5-3 lists the languages supported by the web interface and user interface of the TE10.

Table 5-3 Supported languages

Language	User Interface	Web Interface
Simplified Chinese	Supported	Supported
English	Supported	Supported
French	Supported	Supported
German	Supported	Supported
Japanese	Supported	Supported
Spanish (European)	Supported	Supported
Italian	Supported	Unsupported

Language	User Interface	Web Interface
Portuguese (European)	Supported	Unsupported
Traditional Chinese	Supported	Unsupported
Russian	Supported	Unsupported

5.11 Wireless Connections

Wi-Fi

The TE10 has a built-in Wi-Fi module that supports 2.4 GHz and 5 GHz frequency bands. The TE10 can connect to a Wi-Fi network, serve as a Wi-Fi hotspot, or both at the same time.

When the TE10 has the Wi-Fi function enabled, it automatically detects and connects to Wi-Fi networks. You can set the TE10 IP address in DHCP or static mode. This function applies to the scenarios where no wired network is available and you need to connect the TE10 to the Internet through Wi-Fi.

When the TE10 has its Wi-Fi hotspot enabled, it can serve as a hotspot using which other devices connect to Wi-Fi.

Bluetooth Speaker

The TE10 can automatically detect and connect to Bluetooth speakers. It automatically connects to the last Bluetooth speaker once the Bluetooth is enabled.

5.12 Zero Configuration

Automatically Obtaining Configuration Data

The TE10 automatically obtains configuration data from the connected cloud platform or server through its user interface. Then you can complete the TE10 configuration process with several simple operations.

USB-based Configuration

The TE10 automatically imports its configuration files from a USB device. The process is simple and efficient and no professional knowledge is required. The USB device that contains the configuration files can be obtained from agents or carriers. When the configuration files are imported to the TE10 from the USB device, all configuration data is loaded automatically.

5.13 Startup Video Customization

The TE10 allows you to use the Terminal Management System (TMS), Service Management Center (SMC), or upgrade tool (released with the TE10 system software) to tailor the startup video to your actual needs.

5.14 Network Address Book

The network address book stores all site information. The administrator can import or export the address book and update the entries in batches using the web interface.

On CloudVC and CloudEC on-premises, IMS hosted, and SP hosted networks, the TE10 can obtain the Lightweight Directory Access Protocol (LDAP) network address book through the Enterprise Unified Addressbook (EUA) server.

● If the network address book is stored on an FTP server, the TE10 automatically downloads and synchronizes site information from the FTP server upon power-on. The administrator can also manually download or update the address book.

● If the network address book is stored on an LDAP or EUA server, the TE10 searches the LDAP or EUA server for site information. The sites that are found on the LDAP server can be saved to the local address book, but the sites that are found on the EUA server cannot.

5.15 Interconnection with the ACS

The TE10 interconnects with the ACS so that the ACS can manage the TE10 through the TR-069 protocol. The ACS provides the following functions:

● Querying and setting the TE10 parameters

● Uploading and downloading the configuration file

● Upgrading the TE10

● Restarting the TE10

● Managing private and public network configurations

● Collecting the TE10 logs

The ACS supported by the TE10 includes eSight, TMS, and China Mobile Device Management (DM).

5.16 Third-Party APIs

The TE10 provides HTTP-based third-party APIs to implement various functions, such as login authentication, P2P calling, site query, conference control, address book management, system configuration, and status query. Users can choose necessary APIs based on their actual needs to develop required functions and integrate them into other products or applications.

5.17 Network Adaptability

With powerful network adaptability, the TE10 provides HD video even in the case of unstable network conditions and low bandwidth.

● SEC is utilized to ensure superb video even when the packet loss rate reaches 20%.

● The use of automatic deceleration enables the TE10 to deliver smooth and sharp video even with a low bandwidth.

5.18 Security

The TE10 provides a variety of security features, including operating system security, network layer security, firewall technology (NAT), web request authentication, protocol anti-attack measures, protection of sensitive data, and system management and maintenance security.

System Layer Security

secure and maintained system layer ensures that the operating system runs smoothly, in addition to stabilizing services at the application layer. The TE10's user interface uses Android, which is more secure and immune to viruses than Windows.

Network Layer Security

The on-premises, IMS hosted, and SP hosted networks have implemented different network layer security policies.

- On-premises network:
    - The TE10, 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 TE10 is deployed in the untrusted zone, isolated from the DMZ and the trusted zone through the SBC or the extranet firewall.
    - If the DMZ is deployed, install the SBC, SC, USM Proxy, and MediaX Proxy in the DMZ for TE10 connections.
    - If no DMZ is deployed, the TE10 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.

Firewall Technology (NAT)

The firewall protects your IP network by separating the internal and external network communication data. Using the Network Address Translation (NAT) technology and exchanging signaling between public network protocols and private network protocols, the firewall enables sites on local area networks (LANs) in different places to enjoy the convenience of communication through video conferences. With NAT, a device on an LAN is allocated a dedicated internal IP address that uniquely identifies the device on that 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.

Web Request Authentication

- When a user requests access to a specified web page or submits a servlet request, the TE10 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 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.

Protocol Anti-Attack Measures

- The communication matrix is provided in the product documentation and describes the services and ports that can be enabled or disabled as well as the criteria for enabling and disabling them. Services and ports that are not mentioned in the communication matrix must not be enabled.

  The communication port matrix contains the following information:
  - Open ports
  - Transport layer protocols used by the ports
  - Network elements (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)

- The TE10 utilizes multiple encryption measures, including H.235 (for encryption of media and signaling streams), Secure Real-time Transport Protocol (SRTP), Transport Layer Security (TLS), and Hypertext Transfer Protocol Secure (HTTPS), to ensure secure and stable running of the videoconferencing system.

- For network management, the TE10 supports the Simple Network Management Protocol v3 (SNMP v3), which features higher adaptability and security. User names are needed to connect the network management system to the TE10.

- Robustness testing tools are used to scan protocols to ensure that there are no high-risk vulnerabilities.

- The File Transfer Protocol over SSL (FTPS) and LDAP over SSL (LDAPS) are used to encrypt the address book data, which ensures data integrity and prevents data from being stolen.

Protection of Sensitive Data

- Log, diagnostic, debug, and alarm information must not contain sensitive data.

- Sensitive data must be transmitted through secure channels or transmitted after being encrypted.

- To prevent sensitive data from being disclosed, the TE10 checks the complexity of passwords. When entering passwords, each stroke is displayed as "." or "*", and the entered password cannot be copied (Ctrl + C).

- Sensitive data such as passwords and encryption context must not be recorded in logs. If sensitive data really needs to be recorded, it should be displayed as "***".
- Standard encryption algorithms (proprietary algorithms not allowed) and key negotiation mechanisms are used.

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 alarm is generated. In special cases, explanation is provided for alarms.
- All user operations and system abnormalities are logged.

6 Operation and Maintenance

6.1 Using the Remote Control

A remote control is provided to allow convenient operations. The user interface adopts the "what you see is what you get" design, and is therefore easy to understand and use.

Using the remote control, you can perform various operations, such as joining a scheduled conference by one click, initiating a multipoint conference, placing a P2P call, selecting a screen layout, controlling the microphone and speaker, adjusting the camera angle, and performing intelligent diagnostics.

Figure 6-1 shows the home screen of the user interface.

Figure 6-1 Home screen of the user interface
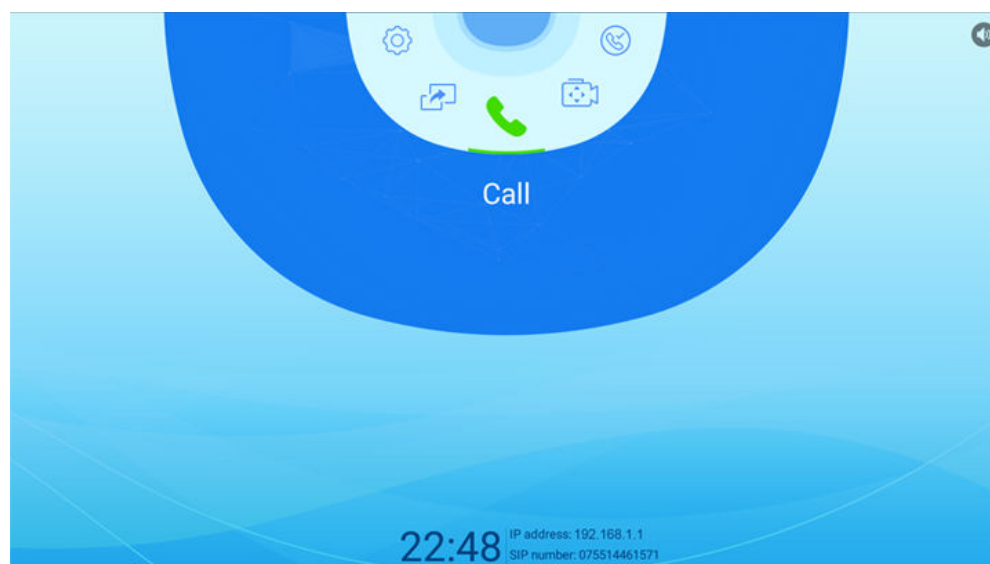
6.2 Using the Web Interface

The TE10 also has a web interface, on which you can execute tasks such as placing a call, controlling a conference, storing the address book, modifying system settings, and

downloading the AirPresence PC client. Users in different locations can concurrently access and use the TE10 through the web interface, which eliminates the restriction of space. The administrator can remotely control the TE10. The web interface supports concurrent operations by a maximu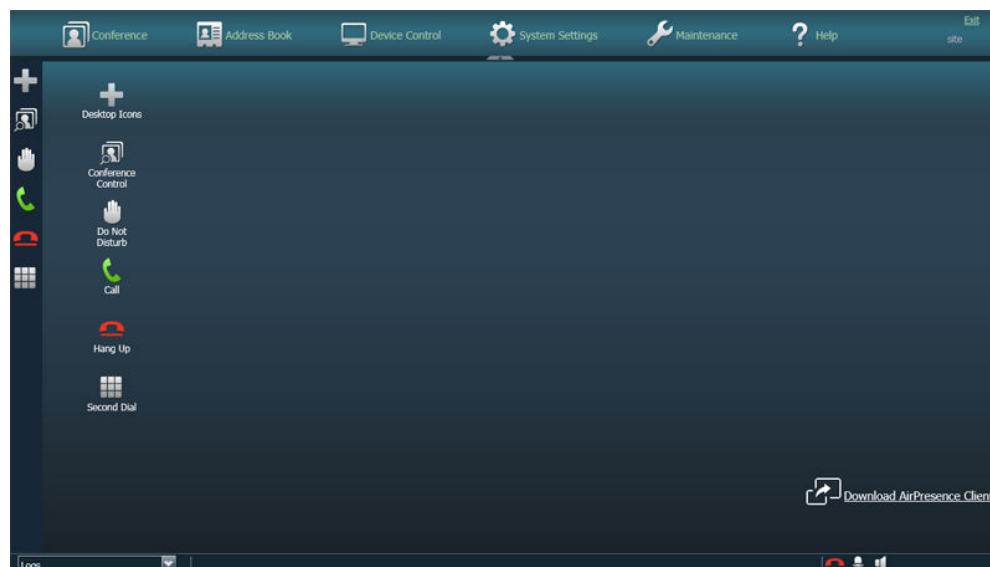m of three users. The same user name and password can be used by multiple users. When multiple users perform operations on the TE10, the last operation takes effect.

Figure 6-2 shows the home page of the web interface.

Figure 6-2 Home page of the web interface

6.3 Using the AirPresence Client

A TE10 supports a maximum of three concurrent AirPresence client connections. The TE10 can be operated from any of the connected clients, but only the latest operation takes effect. When an AirPresence is sharing content, another is also allowed to start sharing content. Then, the original content sharing will stop.

Some functions supported by the AirPresence mobile client are unavailable on the AirPresence PC client, including placing a P2P call, joining a conference, controlling the camera, and using the virtual remote control.

Figure 6-3 shows the screen that is displayed after a successful connection between the AirPresence mobile client on an Android smartphone and the TE10.

Figure 6-3 AirPresence mobile client
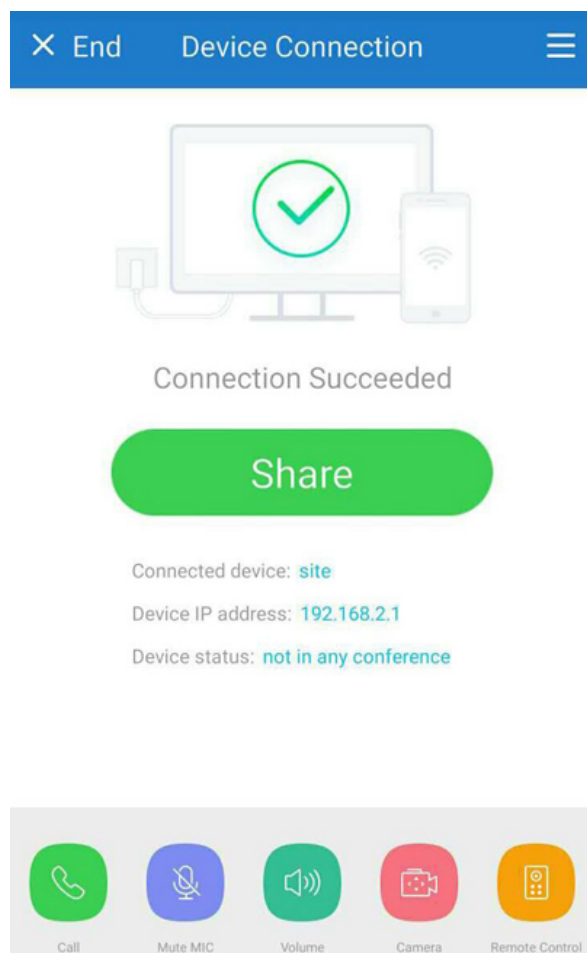
Figure 6-4 shows the screen that is displayed after a successful connection between the AirPresence PC client and the TE10.

Figure 6-4 AirPresence PC client
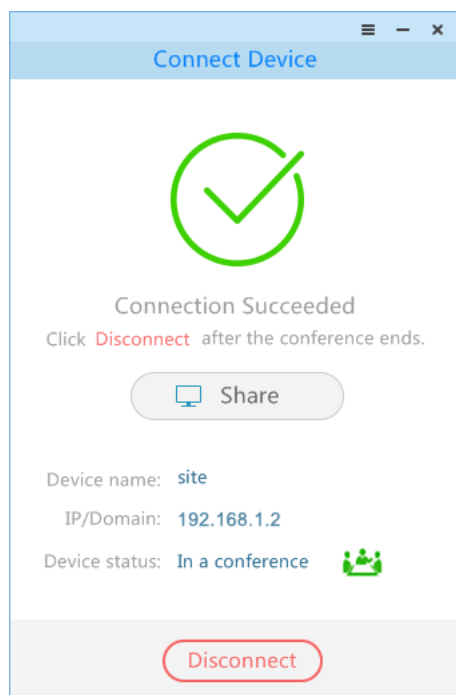
6.4 Intelligent Diagnostics

On the TE10's user interface, you can perform intelligent diagnostics to check:

- Running status of the key chip sensor and audio codec
- Network connection status
- Audio output status
- Video output port connection status and video format
- Settings of frequently used parameters
- GK/SIP registration status

Based on the check results, you can easily locate faults if there is any.

Figure 6-5 shows the screen where you can perform intelligent diagnostics.

Figure 6-5 Intelligent diagnostics screen
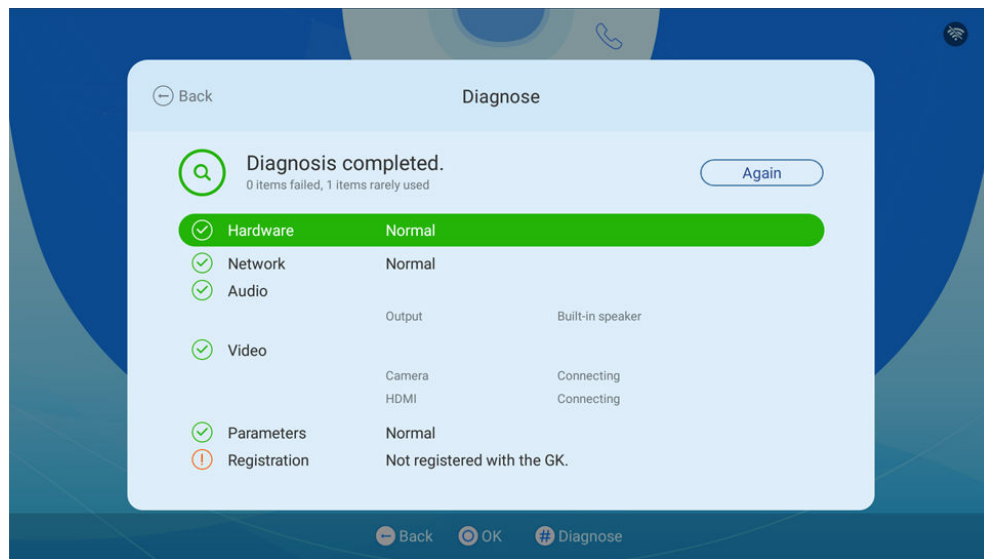
6.5 Log Management

Operation and error logs are recorded for the TE10, helping the administrator maintain the system and locate faults.

Logs are stored as files on the TE10. On its web interface, the system administrator can query, export, or delete the logs of a specified time frame or all the logs.

6.6 Inspection

- The SMC can automatically perform the following inspection tasks on the TE10:
  - Check the status of IP lines.
  - Check the system software version, CPU, memory, temperature, and fan.
  - Check the H.323 and SIP registration status.
  - Check the working status of the built-in camera.
  - Conduct diagnosis on local audio and video loopback.

  The SMC can stop an inspection task anytime. A TE10 inspection task, which is interrupted as the TE10 is powered off or has set up a call, will be resumed after the TE10 is restarted or the call is ended. The inspection status and result can be reported to the SMC.

- The Versatile Tools Suite (VTS) can be used to collect the TE10 information, including:
  - Basic information, including tracing information, one-click diagnostics results, signaling diagnostics results, and serial number (SN)
  - Hardware information, including the CPU usage, memory usage, camera status, temperature, and connection status of the video and presentation sources
  - Software information, including GK/SIP registration information, software version, network port mode, and answering mode

6.7 System Upgrade

You can upgrade the TE10 to the latest version to fix its vulnerabilities and use the new functions provided in the latest version.

- The TE10 factory default system can be backed up and used for system restoration if necessary.
- The TE10 supports the silent upgrade mode, in which the TE10 is upgraded at scheduled time without affecting services.
- TE10s can be upgraded in batches.
- The TE10 can continue its upgrade after a pause.
- The TE10 can be upgraded automatically at specified intervals or manually using a specific tool.
- The TE10 connected to the ACS can be upgraded using the ACS.
- As a manageable device, the TE10 can be upgraded using the SMC2.0. If multiple TE10s exist, they can be upgraded in batches from the SMC2.0.

7 Technical Specifications

7.1 TE10 Physical Specifications

Table 7-1 lists the physical specifications of the TE10.

Table 7-1 TE10 physical specifications

Item	Specifications
Electricity supply requirements	
Power supply	100－240 V AC or 12 V DC
Working frequency	50－60 Hz
Maximum power consumption	8 W
Working state environment requirements	
Ambient temperature	0°C to 40°C (32°F to 104°F)
Relative humidity	10% to 80%
Ambient noise	< 46 dBA SPL
Minimum illuminance	7 lux
Recommended illuminance	> 300 lux
Non-working state environment requirements	
Ambient temperature	－40°C to +70°C (－40°F to +158°F)
Relative humidity	0% to 95%
Dimensions and weight	

Item	Specifications
Endpoint dimensions (H x W x D)	90 mm x 90 mm x 90 mm (3.54 in. x 3.54 in. x 3.54 in.)
Package dimensions (H x W x D)	110 mm x 160 mm x 158 mm (4.33 in. x 6.30 in. x 6.22 in.)
Net weight	0.5 kg
Gross weight	1.6 kg
Wi-Fi features	
Technical standard	IEEE 802.11 a/b/g/n/ac
Working frequency band	2400 MHz to 2483.5 MHz 5150 MHz to 5250 MHz 5725 MHz to 5850 MHz
Maximum transmit power	<20 dBm
Bluetooth features	
Technical standard	BT 4.0
Working frequency band	2402 MHz to 2480 MHz
Maximum transmit power	4 dBm
Maximum working range without obstruction	10 m
Number of Bluetooth speakers (with embedded sound pickup) that can be connected	1
RF features	
Technical standard	IEEE 802.15.4
Working frequency band	2425 MHz to 2475 MHz
Maximum transmit power	4 dBm
Built-in camera features	
Image sensor	2-megapixel, 1/3-inch CMOS
Resolution	720p 30 fps

Item	Specifications
Lens	• Zoom: 3x digital zoom (optical zoom not supported) • Focal length: F = 3.9 mm to 46.8 mm • Lens aperture: F1.8 to F2.8 • Ultra-wide horizontal angle • Auto White Balance (AWB), Auto Exposure (AE) • Video modes that can be switched flexibly: standard, vivid, natural, and user defined • Support for ePTZ control
Exposure	Automatic or manual
White balance	Automatic or manual
Built-in microphone	
Sound pickup	The TE10 supports 180-degree audio pickup at a radius of up to 6 meters.

7.2 TE10 Performance Specifications

Table 7-2 lists the performance specifications of the TE10.

Table 7-2 TE10 performance specifications

Item	Specifications
Call bandwidth (IP)	64 kbit/s to 2 Mbit/s
Conference bandwidth	• 720p 30 fps with a minimum bandwidth of 384 kbit/s • 4SIF/4CIF with a minimum bandwidth of 128 kbit/s • SIF/CIF/SQSIF/SQCIF/QSIF/QCIF with a minimum bandwidth of 64 kbit/s
Presentation resolution	Remote conferences: • AirPresence mobile client: up to 1080p 3 fps • AirPresence PC client: up to 1080p 5 fps Local conferences: • AirPresence mobile client: up to 1080p 3 fps • AirPresence PC client: up to 1080p 15 fps
Dual-stream (video + presentation) capability	A maximum of 720p 30 fps for video and 1080p 5 fps for presentation or 720p 30 fps for video and 720p 15 fps for presentation

Item	Specifications
Other video features	- VideoIntensifier - ViewProcessing - Super Error Concealment
Audio features	AEC, ANS, AGC, VoiceClear, AudioEnhancer, and lip synchronization
Wi-Fi capability	Dual frequency bands, that is, 2.4 GHz and 5 GHz

7.3 AirPresence Client Performance Specifications

Table 7-3 describes how to download the AirPresence mobile client and the AirPresence PC client, their operating system and hardware requirements, and presentation sharing specifications.

Table 7-3 AirPresence client performance specifications

Item	AirPresence Mobile Client	AirPresence PC Client
How to download	- Scan the QR code on the user interface of the TE10 to access the app store. Then, download and install the AirPresence mobile client. - For Android smartphone or tablet users, search for **AirPresence** in Huawei HiApp or Google Play. - For iPhone or iPad users, search for **AirPresence** in App Store.	- Obtain the URL from the TE10's user interface and then access the URL using a browser to obtain the AirPresence PC client installation package. - Download the AirPresence PC client from the TE10's web interface.
Operating system and hardware	- Android 2.3 or later, CPU with the ARMv7 Neon chip or above, dominant frequency of 1.5 GHz or above, memory of 1 GB or above - iOS 7.0－9.0 or later, iPhone 5 or later	32-bit and 64-bit Windows XP, Windows Vista, Windows 7, Windows 8, and Windows 10 32-bit and 64-bit macOS 10.7 to 10.11

Item	AirPresence Mobile Client	AirPresence PC Client
Presentation sharing	• The AirPresence mobile client on Android supports PDF files and PNG, JPG and BMP images. • The AirPresence mobile client on iOS supports PDF, Word, Excel, and PPT files and PNG, JPG and BMP images. • On the AirPresence mobile client, the document to share cannot exceed 30 MB, and the image to share cannot exceed 8 MB. • The screens of mobile phones running Android 5.0 or later can be shared at a resolution of 720p 10 fps.	You can only share the desktop.

7.4 TE10 Ports and Protocols

Table 7-4 lists the ports and protocols of the TE10.

Table 7-4 TE10 ports and protocols

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Video input port	1 x built-in camera	-	Users can select any display mode for video input.
Video output port	1 x HDMI	HDMI 1.4b	-
Audio input port	• 1 x built-in microphone • 1 x Bluetooth	-	-
Audio output port	• 1 x 3.5 mm • 1 x built-in speaker • 1 x HDMI (audio output supported) • 1 x Bluetooth	-	This port can be connected to the audio input port of a TV set or a speaker.
USB port	1 x USB 2.0	USB 2.0	This port can be connected to a USB flash drive or a wired/wireless keyboard/mouse.

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Network port	1 x 10/100/1000 Mbit/s LAN	-	-
Wireless port	● 1 x Wi-Fi (built-in) ● 1 x Bluetooth	-	-
Power input port	1 x power input port	-	-
RF remote control port	RF remote control signal reception	NEC	-

7.5 TE10 Standards Compliance

Table 7-5 lists the standards that the TE10 complies with.

Table 7-5 TE10 standards compliance

Item	Specifications
Video encoding and decoding protocols	H.264 HP and H.264 BP
Audio encoding and decoding protocols	G.711A, G.711U, G.722, G.722.1C
Multimedia frame protocols	ITU-T H.323, IETF SIP
Dual-stream standard	Binary Floor Control Protocol (BFCP)
Network transmission protocols	TCP/IP, FTP, FTPS, DHCP, DNS, Telnet, SSH, HTTP, HTTPS, SNTP, and TR-069
Other communications protocols	LDAP, and LDAPS
IP protocol	IPv4/IPv6 dual stack
Protocol for signaling and media stream encryption	TLS and SRTP
Wi-Fi	IEEE 802.11 a/b/g/n/ac, 802.1p/q, 802.1X, WEP, WPA, WPA2, and WPS authentication
Bluetooth	Bluetooth 4.0
RF	IEEE 802.15.4

A Glossary

Numerics

4CIF   4 x Common Intermediate Format

A video resolution of 704 x 576 pixels.

4SIF   4 x Source Input Format

A video format with a resolution of 704 x 480 pixels and using progressive scanning.

A

ACS   Auto-Configuration Server

AE   Automatic Exposure

AEC   Acoustic Echo Cancellation

A type of signal processing commonly used in teleconferencing. The speech from the far-end caller is broadcast by the speakerphone or the hands-free cellular phone and then repeats itself by bouncing off the inside surfaces of a room or car. This repetition of sound is called an echo. Echoes are picked up by the near-end microphone, creating a feedback loop where the far-end caller hears an echo of his or her own voice. AEC is developed to solve this problem.

AGC   Automatic Gain Control

A process or means by which gain is automatically adjusted in a specified manner as a function of a specified parameter, such as received signal level.

ANS   Automatic Noise Suppression

API   Application Programming Interface

An application programming interface is a particular set of rules and specifications that are used for communication between software programs.

AWB   Automatic White Balance

B

Broadcast Site   All sites, except for the site being broadcast, view the site that is broadcast.

C

CIF   Common Intermediate Format

Contacts   Users can save the information about the IP address, number, type, and bandwidth of a remote site to a contact.

D

DHCP   Dynamic Host Configuration Protocol

A client-server networking protocol. A DHCP server provides configuration parameters specific to the DHCP client host requesting information the host requires to participate on the Internet network. DHCP also provides a mechanism for allocating IP addresses to hosts.

DMZ   Demilitarized Zone

The DMZ is located between the internal network and the external network to protect the internal network.

DST   Daylight Saving Time

Often referred to as "Summer Time" or "Daylight Savings Time", is a way of making better use of the daylight in the evenings and saving power by setting the clocks forward one hour during the longer days of summer, and back again in the fall.

Dual Stream   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).

E

EUA   Enterprise Unified Address Book

A next-generation address book server launched by Huawei. It provides LDAP-based unified address book services for Huawei videoconferencing and enterprise communication solutions.

F

FTPS   File Transfer Protocol over SSL

An extension to the commonly used File Transfer Protocol (FTP) that adds support for the Transport Layer Security (TLS) and the Secure Sockets Layer (SSL) cryptographic protocols.

G

G.722   Audio codec standard that uses adaptive differential pulse-code modulation (ADPCM). Its data rate is 48 kbit/s, 56 kbit/s, or 64 kbit/s.

G.722.1C	G.722.1 is a low-complexity audio codec protocol, which supports 7 kHz audio bandwidth at a 16 kHz audio sample rate. It also supports coding at 24 and 32 kbit/s for conferences with a low packet loss rate.	
	G.722.1C is an extension mode to G.722.1, which doubles the algorithm to permit 14 kHz audio bandwidth using a 32 kHz audio sample rate, with coding at 24, 32, and 48 kbit/s. G.722.1C is suitable for video conferences and network streaming media.	
H		
HD	High Definition	
HDMI	High Definition Multimedia Interface	
I		
IMS	IP Multimedia Subsystem	
L		
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	
	An extended lightweight directory access protocol (LDAP) that supports encryption protocols Transport Layer Security (TLS) and Secure Sockets Layer (SSL).	
M		
MCU	Multipoint Control Unit	
	Data connection equipment used in a videoconferencing system. An MCU is used for terminal access, video exchange, audio mixing, data processing, and signaling exchange.	
MediaX	Media Switch Server	
N		
NAT	Network Address Translation	
P		
PiP	Picture in Picture	
presentation	During a conference, the local site shares the content input from a computer with remote sites, such as an excel file, a diagram, or slides.	
Q		
QCP	Quick Connect Protocol	

S

SBC	Session Border Controller
SC	Service Controller
SD	Standard Definition
	A video format with the resolution below 720p.
SEC	Super Error Concealment
SIF	Source Input Format
SIP	Session Initiation Protocol
SRTP	Secure Real-time Transport Protocol
	A real time transport protocol with enhanced security and encryption mechanism-based RTP.
STUN	Simple Traversal of UDP through NAT
STG	Security Traversing Gateway
SMC	Service Management Center
	A videoconferencing service management system that manages videoconferencing devices (including GKs, MCUs, and participant endpoints) and allocates videoconferencing resources.
SNMP	Simple Network Management Protocol
SNTP	Simple Network Time Protocol SNTP
SP	Service Provider
SSH	Secure Shell
	A set of standards and an associated network protocol that allows establishing a secure channel between a local and a remote computer. A feature to protect information and provide powerful authentication function for a network when a user logs in to the network through an insecure network. It prevents IP addresses from being deceived and simple passwords from being captured.
SSL	Secure Sockets Layer
	A security protocol that works at a socket level. This layer exists between the TCP layer and the application layer to encrypt/decode data and authenticate concerned entities.
sound pickup distance	The maximum distance within which sounds can be picked up by a microphone.

T

TLS	Transport Layer Security
TMS	Terminal Management System

U

UI	user interface
USM	Unified Session Manager

V

VMR	Virtual Meeting Room
VTS	Versatile Tools Suite

W

WEP Wired Equivalent Privacy

WPA Wi-Fi Protected Access

A wireless security protocol replacing WEP and aiming to provide more powerful security performance for the IEEE 802.11 WLAN. WPA is a subset of IEEE 802.11i, whose core is IEEE 802.1x and TKIP.

Wi-Fi Wireless Fidelity

A short-distant wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.