



## TE20 Videoconferencing Endpoint

# Product Overview

Issue 05

Date 2017-08-15

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# About This Document

## Purpose

This document provides the positioning, highlights, networking schemes, features, and technical specifications of the HUAWEI TE20 videoconferencing endpoint (TE20 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
 <b>DANGER</b>	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 <b>NOTICE</b>	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
 <b>NOTE</b>	<p>Calls attention to important information, best practices and tips.</p> <p>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.</p>

## 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 **1 Product Positioning**.

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 TE20 Performance Specifications**.

### **Issue 03 (2017-06-10)**

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

Modified section [7.1 TE20 Physical Specifications](#).

Modified section [7.5 TE20 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](#).

Modified section [7.5 TE20 Standards Compliance](#).

### **Issue 01 (2017-01-20)**

This issue is the first official release.

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# 1 Product Positioning

The TE20 is an HD videoconferencing endpoint innovated by Huawei for small and medium conference rooms. It is highly cost-effective and easy-to-use.

The TE20 has three models: TE20 (5X), TE20 (5X-NoWIFI), and TE20 (12X).

**Table 1-1** describes the appearance, features, and application scenarios of the TE20.

**Table 1-1** TE20 appearance, features, and application scenarios

Appearance	Product Feature	Application Scenario
TE20 (5X) and TE20 (5X-NoWIFI) 	<ul style="list-style-type: none"><li>● Built-in HD camera, codec, and microphone</li><li>● Sleek and compact design, making it portable and easy to install</li><li>● Two camera models provided</li></ul>	Small- and medium-sized enterprises and high-end home users
TE20 (12X) 	<ul style="list-style-type: none"><li>● Easy pairing with AirPresence for content sharing</li><li>● A resolution of up to 1080p 30 fps or 720p 60 fps supported</li></ul>	

**Table 1-2** shows the differences of the three TE20 models in their specifications.



**Table 1-2** Differences in specifications

Item		TE20 (5X)	TE20 (5X- NoWIFI)	TE20 (12X)
Appearance		The two models have the same appearance.		In appearance, this model is different from the other two models only in the camera.
Wide-angle zoom		5x		12x
Wide-angle lens	1080p 30 fps	Maximum horizontal field of view: 80°		Maximum horizontal field of view: 72°
	720p 60 fps	Maximum horizontal field of view: 53°		Maximum horizontal field of view: 48°
Built-in Wi-Fi		Supported	Unsupported	Supported

# 2 Product Highlights

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## Sleek and Compact Device, Easy to Install

- With a compact design that integrates the camera and microphone, the TE20 is easy to install and quickly connected with simple ports.
- The TE20 installation can be complete within only 5 minutes. Only three steps are required: plugging the power cable into the TE20, connecting the TE20 to a display, and connecting the TE20 to a Wi-Fi network.
- A mounting bracket is provided to allow the TE20 to be installed on the top of a TV set, on a wall, on a ceiling, or on a tripod. Besides, the TE20 can be directly placed on a tabletop.
- You can complete the TE20 configuration with several simple operations. No professional knowledge is required.

## Professional Technologies, Delivering a Superb Audio and Video Experience

- The TE20 provides an 80-degree wide-angle camera that supports 5x or 12x optical zoom. With the cutting-edge imaging technology, the camera is able to capture 1080p HD video images even at low illumination.
- The TE20's built-in microphone provides 180-degree audio pickup, with an optimal range of six meters.
- Video and presentation can be simultaneously transmitted at 1080p.
- The TE20 is able to provide 1080p 30 fps HD video at a bandwidth of only 512 kbit/s.

## Lightweight Interactive User Interface

- The TE20 adopts a flat fan-shaped design for its user interface, and intuitively displays menus, enabling ease of use.
- A remote control is provided to allow you to easily control the TE20. It adopts a compact design and integrates the most commonly used buttons.

## Wireless Connections for Easy Sharing

- The TE20 has a built-in Wi-Fi module that supports 2.4 GHz and 5 GHz frequency bands. The TE20 can connect to a Wi-Fi network, serve as a Wi-Fi hotspot, or function as both at the same time.
- You can pair the AirPresence client on your smartphone with a TE20 in either of the following ways:

- Using the AirPresence client to scan the QR code on the TE20's user interface
- Entering the projection code obtained from the TE20'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 TE20.

- You can install the AirPresence client on your PC and connect the client to the TE20 over Wi-Fi. Then you can use it to share the PC desktop.

## **Powerful Network Adaptability and Security**

- The use of super error concealment (SEC) and automatic deceleration enables the TE20 to deliver smooth and sharp video.
- Multiple encryption measures are supported for media and signaling encryption.

## **Openness and Convergence: Interconnection with Multiple Cloud Platforms**

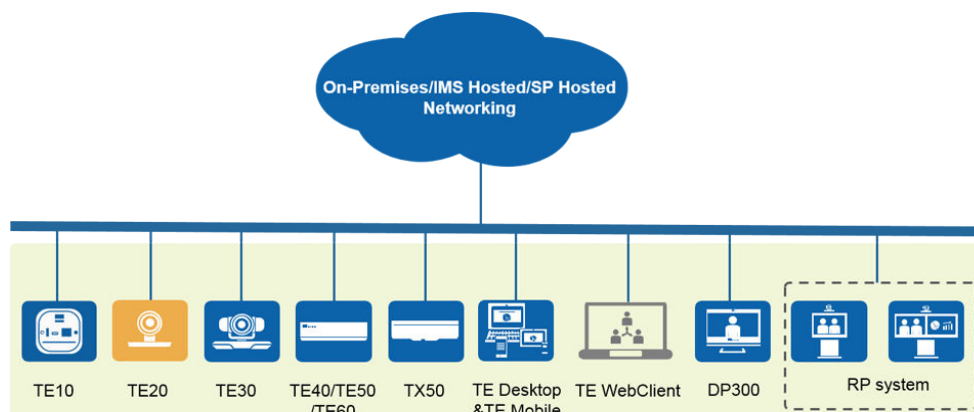
- The TE20 interconnects with cloud platforms provided by mainstream vendors, such as Huawei, Videxio, Zoom, BlueJeans, StarLeaf, Guochuang Software, EICG Technology, and City Cloud Technology.
- The TE20 can work together with standards-compliant servers and terminals of mainstream vendors.
- The TE20 provides a wide variety of APIs to facilitate integration with third-party systems and service customization.

# 3 Application Scenarios

## 3.1 On-Premises/IMS Hosted/SP Hosted Network

The TE20 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 TE20 connects to the on-premises network and joins HD video conferences through the standard H.323 or SIP protocol.
- The TE20 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 TE20 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.

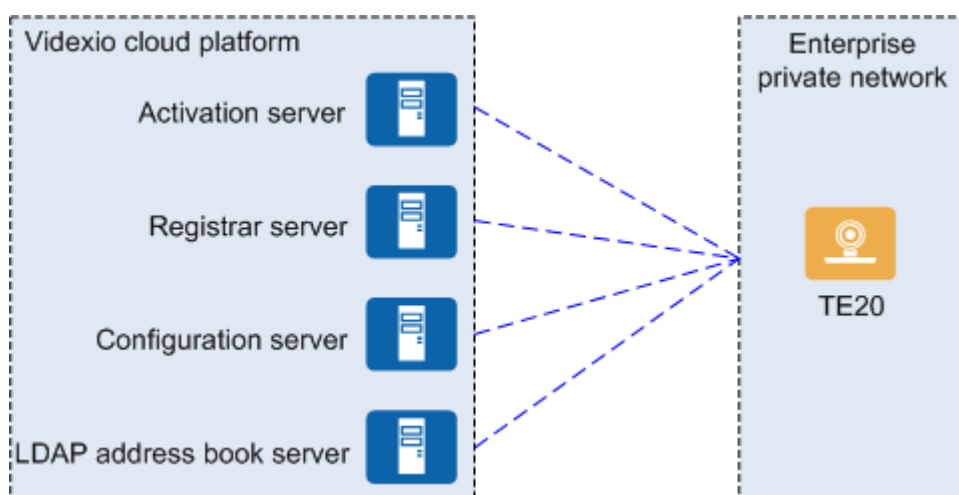
**Table 3-1** How to obtain the product documentation

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

## 3.2 Interconnecting with the Videxio Cloud Platform

To interconnect your TE20 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 TE20 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 TE20 is activated, obtains configuration data, acquires its own site name, and automatically registers with the Videxio platform based

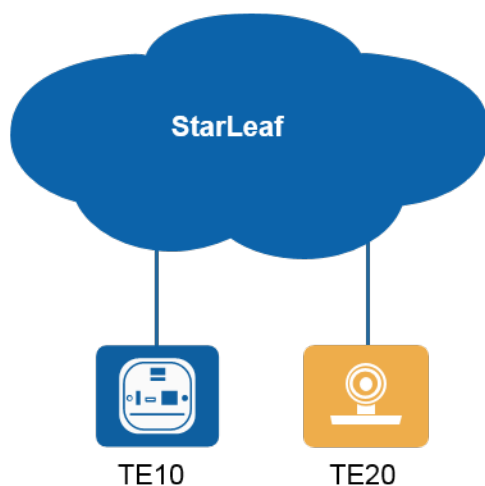
on the obtained data. It then acquires the address book from the LDAP server on the Videxio platform.

- The TE20 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 TE20 interconnects with the StarLeaf cloud platform through the Quick Connect Protocol (QCP) provided by the platform. **Figure 3-3** shows a TE20 interconnecting with the StarLeaf cloud platform.

**Figure 3-3** Interconnecting with the StarLeaf cloud platform



In this networking:

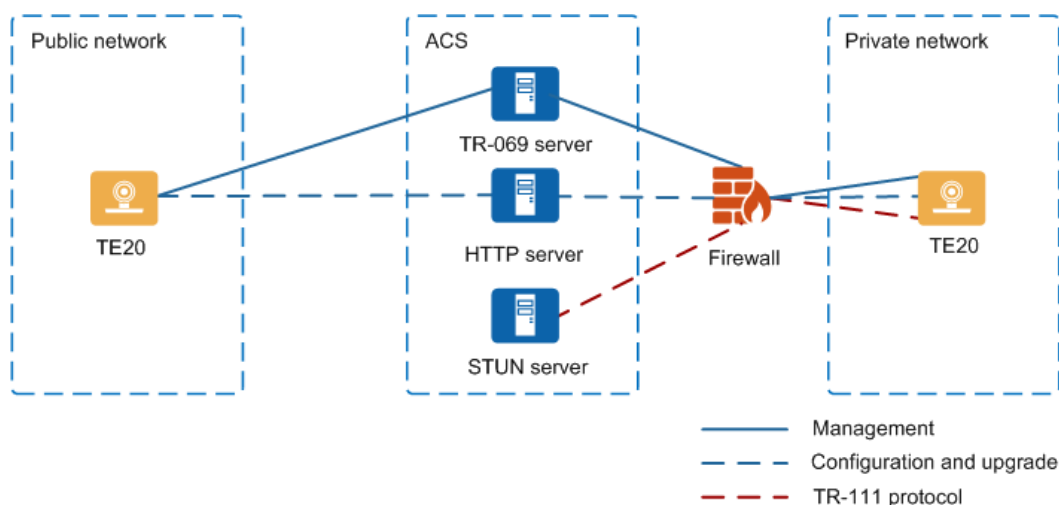
- The TE20 uses the quick-connect code obtained from the StarLeaf cloud platform to automatically register with the platform through the H.323 protocol.
- The TE20 automatically obtains configuration data, such as the TE20 name, language, and time zone, from the StarLeaf cloud platform and independently completes the configuration process.
- The TE20 can be automatically upgraded from the StarLeaf cloud platform.

### 3.4 Interconnecting with the ACS

The TE20 interconnects with the ACS so that the ACS can manage the TE20 through the TR-069 protocol.

**Figure 3-4** shows a TE20 interconnecting with the ACS.

**Figure 3-4** Interconnecting with the ACS



In this networking:

- The TE20 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 TE20 can be deployed on a public or private network, while the ACS must be deployed on a public network.
  - If the TE20 is deployed on a public network, it can be managed by the ACS through the TR-069 protocol.
  - If the TE20 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 TE20.

# 4 Product Structure

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## 4.1 Appearance

The TE20 adopts an integrated design and is minimalist, stylish, and upscale. The TE20 (5X) and TE20 (5X-NoWIFI) use the same camera, while the TE20 (12X) uses a different camera. However, the three models have the same appearance.

**Figure 4-1** shows the appearance of the TE20 (5X) and TE20 (5X-NoWIFI).

**Figure 4-1** Appearance of the TE20 (5X) and TE20 (5X-NoWIFI)



**Figure 4-2** shows the appearance of the TE20 (12X).



**Figure 4-2** Appearance of the TE20 (12X)



**Figure 4-3** shows the remote control that comes with a TE20.

**Figure 4-3** Remote control



## 4.2 Front Panel and Rear Panel

Figure 4-4 shows the TE20 front panel.

Figure 4-4 Front panel



Table 4-1 describes the components on the front panel.

Table 4-1 Components on the front panel

No.	Component	Description
1	Lens	<ul style="list-style-type: none"> <li>● TE20 (5X): 5x optical zoom, 80-degree or 53-degree wide angle</li> <li>● TE20 (5X-NoWiFi): 5x optical zoom, 80-degree or 53-degree wide angle</li> <li>● TE20 (12X): 12x optical zoom, 72-degree or 48-degree wide angle</li> </ul>
2	Built-in microphone	Provides 180-degree sound pickup for the local site, with an optimal range of six meters.

No.	Component	Description
3	Button and status indicator	<ul style="list-style-type: none"> <li>● Button: Press it to power on or off the TE20. When the TE20 is working, you can press this button to enable the TE20 to sleep or wake it up.</li> <li>● Status indicator: You can observe it to know whether the TE20 is operating, sleeping, faulty, or being upgraded.</li> </ul> <p><b>NOTE</b> If the TE20 is in an active conference or being upgraded, it cannot enter the sleep state. The screen will prompt you if you still press the sleep button.</p>

Table 4-2 describes the TE20 indicator status.

Table 4-2 TE20 Indicator status

When the indicator is...	The TE20 is...
off	powered off
blinking green twice per second	powering on
blinking green four times per second	upgrading
steady green	working properly
blinking once	responding to the press on a button on the remote control
blinking once per second	responding to the press and hold on a button on the remote control
blinking green (on for 1s, off for 2s)	standby
steady red	faulty (hardware)
steady orange	faulty (software)
blinking orange twice per second	overheating

Figure 4-5 shows the TE20 rear panel.

**Figure 4-5** Appearance of the rear panel



**Table 4-3** describes the components on the rear panel.

**Table 4-3** Components on the rear panel

No.	Component	Description
1	POWER	Connects to a power supply: 100 - 240 V AC or 12 V DC at 50 Hz or 60 Hz.
2	LAN	Ethernet port that supports 10/100/1000 Mbit/s full duplex.
3	USB port	Connects to a USB device, for example, U flash drive and keyboard or mouse.
4	HDMI 2 OUT	Connect to a device to deliver presentation as the second output by default. It supports a resolution of up to 1080p 30 fps. <b>NOTE</b> The dual-screen function is disabled for the TE20 by default. Video and presentation of the TE20 is displayed on the same screen.
5	HDMI 1 OUT	Connects to a device to deliver audio and video of the local site as the first output by default. It supports a resolution of up to 1080p 30 fps.
6	VGA IN	Connects to a VGA input source, for example, a computer or Digital Video Disc (DVD) player. It supports a resolution of up to 1366 x 768 60 fps.

No.	Component	Description
7	HDMI IN	Supports HD video and audio input. It supports a resolution of up to 1080p 30 fps. <b>NOTE</b> Between VGA IN and HDMI IN, only one of them can be used at a time.
8	RST	Reset button. <ul style="list-style-type: none"><li>● When the TE20 is being powered on, pressing and holding this button for 10s resets the TE20 to the pre-installed system version.</li><li>● To reset the TE20 to factory settings, you can perform in either of the following ways:<ul style="list-style-type: none"><li>- When it is running, press and hold the <b>RST</b> button for 10s.</li><li>- When it is powering on, press and hold the <b>RST</b> button and the button on the front panel simultaneously for 3s.</li></ul></li></ul>
9	HD-AI	Connects to a microphone array, for example, a HUAWEI VPM220.
10	LINE OUT	3.5 mm (0.14 in.) audio output port, which connects to the audio input port on a monitor or a standalone speaker.

# 5 Functions and Features

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## 5.1 Unified Access Through the SBC

On the on-premises, IMS hosted, and SP hosted networks, the TE20 can be deployed on the public network. To ensure secure access from the TE20 to the internal network, firewalls should be deployed on the network border.

In this situation, the TE20 connects to the internal network through the SBC. The TE20 automatically obtains the unified access settings through the SBC, and the SBC serves as the SIP or LDAP service proxy for the TE20 in direct-connection or SVN mode. (SVN stands for Secure Sockets Layer Virtual Private Network.)

## 5.2 Cloud-based Video Conference

The TE20 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 TE20, cloud conferencing has never been so easy.

## 5.3 Interconnection with a Wide Range of Hardware and Software

The TE20 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 TE20, employees in a company can join the same conference wherever they are and whatever terminals they are using.

## 5.4 HD Video Conference

The TE20 supports video calls at H.264 HP 1080p and H.264 BP 1080p. It can join conferences at different rates, using different protocols. It also supports AAC-LD high-fidelity stereo audio. The TE20 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 TE20 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
(Optional) 512 kbit/s	1080p 30 fps
512 kbit/s	720p 60 fps
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 TE20, 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 TE20 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 TE20. It connects to the TE20 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 TE20's user interface.

After installing the AirPresence client on a mobile device, you can pair it with the TE20 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

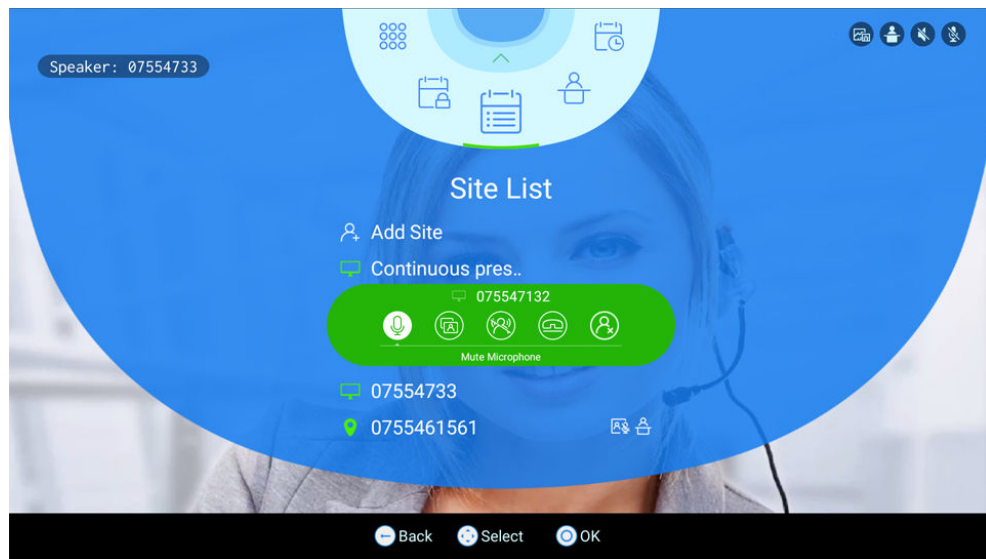
When a TE20 is in a multipoint conference, conference control functions are available on the TE20. These functions enable your flexible operations on your conference. When the TE20 is in a conference initiated by the Videxio platform, only the presentation sharing function is available on the TE20.

The conference control functions of the TE20 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.

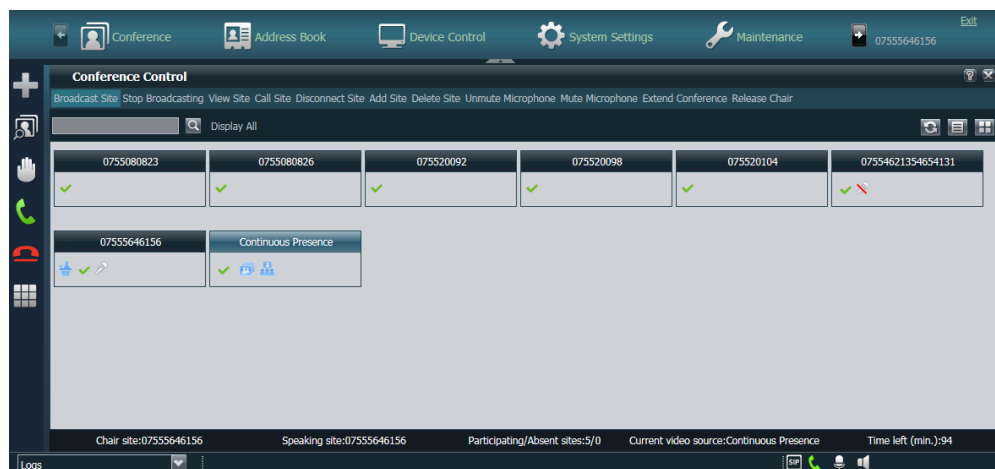


**Figure 5-1** Conference control from the user interface



**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 (by default), lower left corner, upper right corner, and upper left corner of the display. The small video is approximately 1/16 of the full-screen video.

- PoP

Two or more 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 or more 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 TE20'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 TE20, 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 TE20 through the USB port.

## 5.10 Multi-Language Interface

The web interface and user interface of the TE20 support multiple languages and time zone settings. If the time zone you select uses DST, the TE20 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 TE20.

**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

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

## 5.11 Wi-Fi Connection

The TE20 has a built-in Wi-Fi module that supports 2.4 GHz and 5 GHz frequency bands. The TE20 can connect to a Wi-Fi network, serve as a Wi-Fi hotspot, or both at the same time.

When the TE20 has the Wi-Fi function enabled, it automatically detects and connects to Wi-Fi networks. You can set the TE20 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 TE20 to the Internet through Wi-Fi.

When the TE20 has its Wi-Fi hotspot enabled, it can serve as a hotspot using which other devices connect to Wi-Fi.

## 5.12 Zero Configuration

### Automatically Obtaining Configuration Data

The TE20 automatically obtains configuration data from the connected cloud platform or server through its user interface. Then you can complete the TE20 configuration process with several simple operations.

### USB-based Configuration

The TE20 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 TE20 from the USB device, all configuration data is loaded automatically.

## 5.13 Startup Video Customization

The TE20 allows you to use the Terminal Management System (TMS), Service Management Center (SMC), or upgrade tool (released with the TE20 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 TE20 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 TE20 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 TE20 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 TE20 interconnects with the ACS so that the ACS can manage the TE20 through the TR-069 protocol. The ACS provides the following functions:

- Querying and setting the TE20 parameters
- Uploading and downloading the configuration file
- Upgrading the TE20
- Restarting the TE20
- Managing private and public network configurations
- Collecting the TE20 logs

The ACS supported by the TE20 includes eSight, TMS, and China Mobile Device Management (DM).

## 5.16 Third-Party APIs

The TE20 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 TE20 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 TE20 to deliver smooth and sharp video even with a low bandwidth.

## 5.18 Security

The TE20 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 TE20'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 TE20, 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 TE20 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 TE20 connections.
  - If no DMZ is deployed, the TE20 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 TE20 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 TE20 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 TE20 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 TE20.
- 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 TE20 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

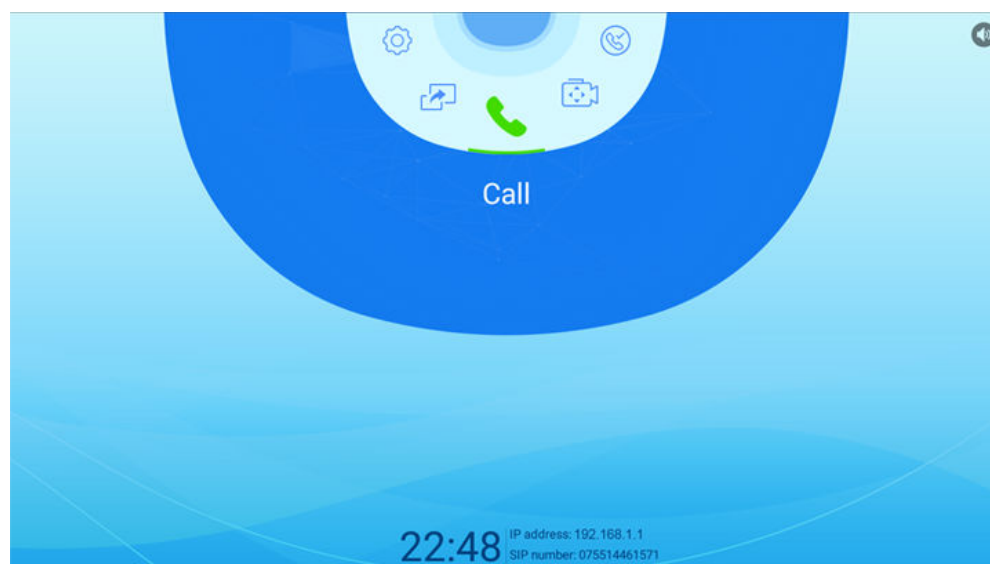
## 6.1 Using the Remote Control

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

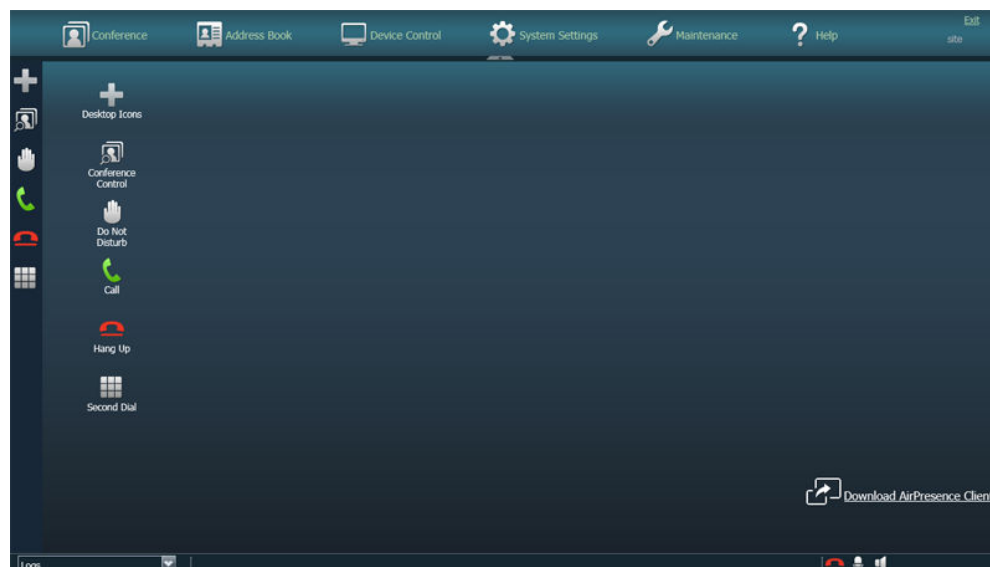
The TE20 also has a web interface, on which you can execute tasks such as placing a call, controlling a conference, storing the address book, modifying system settings, and



downloading the AirPresence PC client. Users in different locations can concurrently access and use the TE20 through the web interface, which eliminates the restriction of space. The administrator can remotely control the TE20. The web interface supports concurrent operations by a maximum of ten users. The same user name and password can be used by multiple users. When multiple users perform operations on the TE20, 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



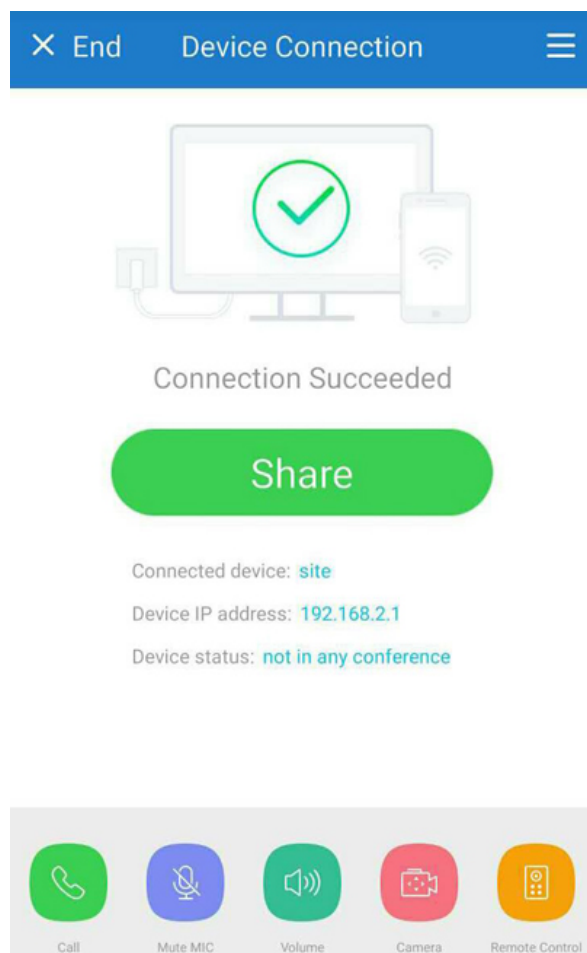
## 6.3 Using the AirPresence Client

A TE20 supports a maximum of three concurrent AirPresence client connections. The TE20 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.

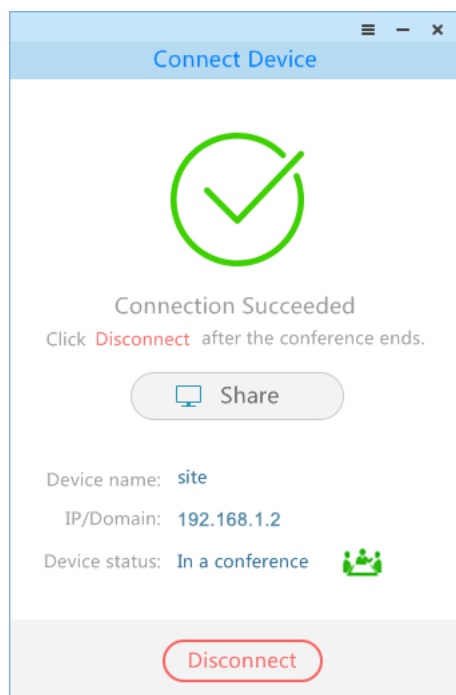
**Figure 6-3** shows the screen that is displayed after a successful connection between the AirPresence mobile client on an Android smartphone and the TE20.

**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 TE20.

**Figure 6-4** AirPresence PC client



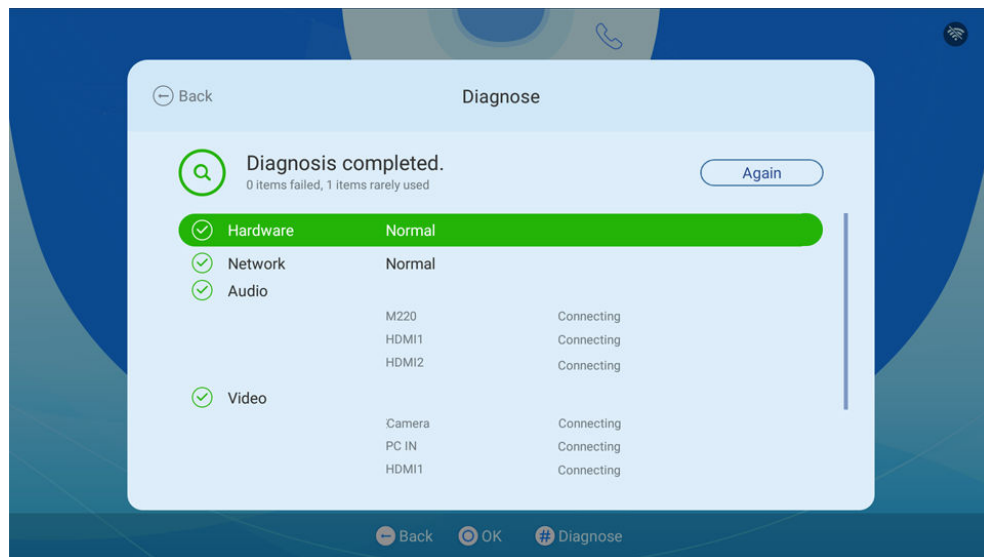
## 6.4 Intelligent Diagnostics

On the TE20'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
- VPM220 microphone array connection 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 TE20, helping the administrator maintain the system and locate faults.

Logs are stored as files on the TE20. 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 TE20:
  - 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 TE20 inspection task, which is interrupted as the TE20 is powered off or has set up a call, will be resumed after the TE20 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 TE20 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 TE20 to the latest version to fix its vulnerabilities and use the new functions provided in the latest version.

- The TE20 factory default system can be backed up and used for system restoration if necessary.
- The TE20 supports the silent upgrade mode, in which the TE20 is upgraded at scheduled time without affecting services.
- TE20s can be upgraded in batches.
- The TE20 can continue its upgrade after a pause.
- The TE20 can be upgraded automatically at specified intervals or manually using a specific tool.
- The TE20 connected to the ACS can be upgraded using the ACS.
- As a manageable device, the TE20 can be upgraded using the SMC2.0. If multiple TE20s exist, they can be upgraded in batches from the SMC2.0.

# 7 Technical Specifications

## 7.1 TE20 Physical Specifications

**Table 7-1** lists the physical specifications of the TE20.

**Table 7-1** TE20 physical specifications

Item	Specifications
<b>Electricity supply requirements</b>	
Power supply	100 - 240 V AC or 12 V DC
Working frequency	50 - 60 Hz
Maximum power consumption	25 W
<b>Working state environment requirements</b>	
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
<b>Non-working state environment requirements</b>	
Ambient temperature	- 40°C to +70°C ( - 40°F to +158°F)
Relative humidity	0% to 95%
<b>Dimensions and weight</b>	

Item	Specifications	
Endpoint dimensions (H x W x D)	152 mm (5.98 in.) x 249 mm (9.80 in.) x 136 mm (5.35 in.)	
Package dimensions (H x W x D)	215 mm (8.46 in.) x 375 mm (14.76 in.) x 230 mm (9.05 in.)	
Net weight	1.6 kg (3.53 lb)	
Gross weight	TE20 (5X) and TE20 (5X-NoWiFi): 4.31 kg (9.50 lb) TE20 (12X): 4.2 kg (9.26 lb)	
<b>Wi-Fi features</b>		
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	
<b>Built-in camera features</b>		
Image sensor	2-megapixel and 1/3 type CMOS imaging chip	
Resolution	Up to 1920 x 1080 (1080p 30 fps)	Up to 1280 x 720 (720p 60 fps) <b>NOTE</b> The horizontal angle of the TE20 camera that supports up to 720p 60 fps is two thirds of that when up to 1080p 30 fps is supported.
Lens	Zoom:	Zoom:
	<ul style="list-style-type: none"> <li>● TE20 (5X): 5x optical zoom, 80-degree wide angle</li> <li>● TE20 (5X-NoWiFi): 5x optical zoom, 80-degree wide angle</li> <li>● TE20 (12X): 12x optical zoom, 72-degree wide angle</li> </ul>	<ul style="list-style-type: none"> <li>● TE20 (5X): 5x optical zoom, 53-degree wide angle</li> <li>● TE20 (5X-NoWiFi): 5x optical zoom, 53-degree wide angle</li> <li>● TE20 (12X): 12x optical zoom, 48-degree wide angle</li> </ul>
	Focal length: F = 3.9 mm to 46.8 mm	
Lens aperture: F1.8 to F2.8		

Item	Specifications	
	Maximum horizontal field of view: <ul style="list-style-type: none"> <li>● TE20 (5X): 80°</li> <li>● TE20 (5X-NoWiFi): 80°</li> <li>● TE20 (12X): 72°</li> </ul>	Maximum horizontal field of view: <ul style="list-style-type: none"> <li>● TE20 (5X): 53°</li> <li>● TE20 (5X-NoWiFi): 53°</li> <li>● TE20 (12X): 48°</li> </ul>
	<ul style="list-style-type: none"> <li>● Maximum horizontal field of view: 90° to the left or right</li> <li>● Maximum vertical field of view: 5° upwards and 25° downwards</li> </ul>	
	Auto White Balance (AWB), Auto Exposure (AE), and Auto Focus (AF)	
	Video modes that can be switched flexibly: standard, vivid, natural, and user defined	
	Support for inverted installation	
	Support for inverted installation	
Exposure	Automatic or manual	
White balance	Automatic or manual	
<b>Built-in microphone</b>		
Sound pickup	The TE20 supports 180-degree audio pickup at a radius of up to 6 meters.	
<b>Peripherals</b>		
VPM220 microphone array	Only one VPM220 can be connected to each TE20.	

## 7.2 TE20 Performance Specifications

[Table 7-2](#) lists the performance specifications of the TE20.

**Table 7-2** TE20 performance specifications

Item	Specifications
Call bandwidth (IP)	64 kbit/s to 4 Mbit/s



Item	Specifications
Conference bandwidth	<ul style="list-style-type: none"> <li>● 1080p 30 fps with a minimum bandwidth of 512 kbit/s (optional)</li> <li>● 720p 60 fps with a minimum bandwidth of 512 kbit/s</li> <li>● 720p 30 fps with a minimum bandwidth of 384 kbit/s</li> <li>● 4SIF/4CIF with a minimum bandwidth of 128 kbit/s</li> <li>● SIF/CIF/SQSIF/SQCIF/QSIF/QCIF with a minimum bandwidth of 64 kbit/s</li> </ul>
Presentation resolution	<ul style="list-style-type: none"> <li>● Presentation sharing using the AirPresence client Remote conferences: <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> Local conferences: <ul style="list-style-type: none"> <li>- AirPresence mobile client: up to 1080p 3 fps</li> <li>- AirPresence PC client: up to 1080p 15 fps</li> </ul> </li> <li>● Wired presentation sharing: Input: <ul style="list-style-type: none"> <li>- HDMI: 640×480 60/72/75/85 fps, 800×600 56/60/72/75/85 fps, 1024×768 60/70/75/85 fps, 1152×864 60 fps, 1280×600 60 fps, 1280×768 60 fps, 1280×800 60 fps, 1366×768 60 fps, 1360×768 60 fps, 720p 50 fps, 720p 60 fps, 1080p 24/25/30 fps</li> <li>- VGA: 640×480 60/72/75/85 fps, 800×600 56/60/72/75/85 fps, 1024×768 60/70/75/85 fps, 1152×864 60 fps, 1280×600 60 fps, 720p 60 fps, 1280×768 60 fps, 1280×800 60 fps, 1360×768 60 fps, 1366×768 60 fps</li> </ul> Output: 1080p 24/25/30/50/60 fps Coding/Decoding resolution: 1280×720, 1024×768, 800×600</li> </ul>
Dual-stream (video + presentation) capability	Up to 1080p 30 fps+1080p 5 fps, 1080p 30 fps video and 720p 10 fps presentation or 720p 30 fps for both video and presentation
Other video features	<ul style="list-style-type: none"> <li>● VideoIntensifier</li> <li>● ViewProcessing</li> <li>● Super Error Concealment</li> </ul>
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	<ul style="list-style-type: none"> <li>● Scan the QR code on the user interface of the TE20 to access the app store. Then, download and install the AirPresence mobile client.</li> <li>● For Android smartphone or tablet users, search for <b>AirPresence</b> in Huawei HiApp or Google Play.</li> <li>● For iPhone or iPad users, search for <b>AirPresence</b> in App Store.</li> </ul>	<ul style="list-style-type: none"> <li>● Obtain the URL from the TE20's user interface and then access the URL using a browser to obtain the AirPresence PC client installation package.</li> <li>● Download the AirPresence PC client from the TE20's web interface.</li> </ul>
Operating system and hardware	<ul style="list-style-type: none"> <li>● 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</li> <li>● iOS 7.0 - 9.0 or later, iPhone 5 or later</li> </ul>	<ul style="list-style-type: none"> <li>● 32-bit and 64-bit Windows XP, Windows Vista, Windows 7, Windows 8, and Windows 10</li> <li>● 32-bit and 64-bit macOS 10.7 to 10.11</li> </ul>
Presentation sharing	<ul style="list-style-type: none"> <li>● The AirPresence mobile client on Android supports PDF files and PNG, JPG and BMP images.</li> <li>● The AirPresence mobile client on iOS supports PDF, Word, Excel, and PPT files and PNG, JPG and BMP images.</li> <li>● On the AirPresence mobile client, the document to share cannot exceed 30 MB, and the image to share cannot exceed 8 MB.</li> <li>● The screens of mobile phones running Android 5.0 or later can be shared at a resolution of 720p 10 fps.</li> </ul>	You can only share the desktop.

## 7.4 TE20 Ports and Protocols

**Table 7-4** lists the ports and protocols of the TE20.

**Table 7-4** TE20 ports and protocols

Port	Description and Quantity	Standards and Protocols Compliance	Remarks
Video input port	<ul style="list-style-type: none"> <li>● 1 x built-in camera</li> <li>● 1 x HDMI</li> <li>● 1 x VGA IN</li> </ul>	HDMI 1.4b	Users can select any display mode for video input.
Video output port	<ul style="list-style-type: none"> <li>● 2 x HDMI</li> </ul>	HDMI 1.4b	-
Audio input port	<ul style="list-style-type: none"> <li>● 1 x HDMI</li> <li>● 1 x HD-AI (microphone array)</li> </ul>	HDMI 1.4b	This port can be connected to a tuning console or VCR.
Audio output port	<ul style="list-style-type: none"> <li>● 1 x 3.5 mm</li> <li>● 2 x HDMI (audio output supported)</li> </ul>	HDMI 1.4b	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.
Network port	<ul style="list-style-type: none"> <li>● 1 x 10/100/1000 Mbit/s LAN</li> <li>● 1 x Wi-Fi (built-in)</li> </ul>	-	The TE20 (5X-NoWiFi) does not have built-in Wi-Fi.
Power input port	1 x power input port	-	-
Infrared remote control port	Infrared signal reception	NEC	-

## 7.5 TE20 Standards Compliance

**Table 7-5** lists the standards that the TE20 complies with.

**Table 7-5** TE20 standards compliance

Item	Specifications
Video encoding and decoding protocols	H.264 HP, H.264 BP, H.263 and H.263+
Audio encoding and decoding protocols	AAC-LD, G.711A, G.711U, G.722, G.729A, G.722.1C

Item	Specifications
Multimedia frame protocols	ITU-T H.323, IETF SIP
Dual-stream standard	ITU-T H.239, Binary Floor Control Protocol (BFCP)
Network transmission protocols	TCP/IP, RTP, RTCP, FTP, FTPS, DHCP, DNS, SNMP, SNTP, Telnet, SSH, HTTP, HTTPS, TR-069
Other communications protocols	H.225, H.235, H.241, H.245, H.281, H.350, H.460, RFC2833, LDAP, LDAPS
IP protocol	IPv4/IPv6 dual stack
Protocol for signaling and media stream encryption	H.235, TLS and SRTP
Wi-Fi	IEEE 802.11 a/b/g/n/ac, 802.1p/q, 802.1X, WEP, WPA, WPA2, and WPS authentication

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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 and using progressive scanning.

## A

**AAC** advanced audio coding

**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.

<b>AWB</b>	Automatic White Balance
<b>B</b>	
<b>Broadcast Site</b>	All sites, except for the site being broadcast, view the site that is broadcast.
<b>C</b>	
<b>CIF</b>	Common Intermediate Format
<b>Contacts</b>	Users can save the information about the IP address, number, type, and bandwidth of a remote site to a contact.
<b>D</b>	
<b>DHCP</b>	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.
<b>DMZ</b>	Demilitarized Zone The DMZ is located between the internal network and the external network to protect the internal network.
<b>DST</b>	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.
<b>Dual Stream</b>	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).
<b>E</b>	
<b>EUA</b>	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.
<b>F</b>	
<b>FTPS</b>	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.
<b>G</b>	

**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

**H.239** A standard recommended by ITU-T. It enables a video conference to have simultaneous transmission of both video and data content (for example, computer desktop).

**H.263** A video codec standard for video conferences at low rates. Five formats are available, SQCIF, QCIF, CIF, 4CIF, and 16CIF.

**H.264** Compared with H.263, H.264 can provide the same-quality video at half of the bit rate, with strong error resilience characteristics.

**H.323 protocol** A communication control protocol defined by the International Telecommunication Union (ITU). It offers multimedia services in the packet-switched (PS) network. Call control is an essential component in H.323 and is used to establish point-to-point media sessions and multi-point media conferences.

**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

<b>MCU</b>	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.
<b>MediaX</b>	Media Switch Server
<b>N</b>	
<b>NAT</b>	Network Address Translation
<b>P</b>	
<b>PiP</b>	Picture in Picture
<b>presentation</b>	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.
<b>Q</b>	
<b>QCP</b>	Quick Connect Protocol
<b>S</b>	
<b>SBC</b>	Session Border Controller
<b>SC</b>	Service Controller
<b>SD</b>	Standard Definition A video format with the resolution below 720p.
<b>SEC</b>	Super Error Concealment
<b>SIF</b>	Source Input Format
<b>SIP</b>	Session Initiation Protocol
<b>SRTP</b>	Secure Real-time Transport Protocol A real time transport protocol with enhanced security and encryption mechanism-based RTP.
<b>STUN</b>	Simple Traversal of UDP through NAT
<b>STG</b>	Security Traversing Gateway
<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>SNMP</b>	Simple Network Management Protocol
<b>SNTP</b>	Simple Network Time Protocol SNTP
<b>SP</b>	Service Provider



<b>SSH</b>	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.
<b>SSL</b>	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.
<b>sound pickup distance</b>	The maximum distance within which sounds can be picked up by a microphone.
<b>T</b>	
<b>TLS</b>	Transport Layer Security
<b>TMS</b>	Terminal Management System
<b>U</b>	
<b>UI</b>	user interface
<b>USM</b>	Unified Session Manager
<b>V</b>	
<b>VGA</b>	Video Graphics Array  A video transmission standard released by IBM in 1987. VGA features high resolution, fast display speed, and rich color. VGA is widely applied in color monitors.
<b>VMR</b>	Virtual Meeting Room
<b>VTS</b>	Versatile Tools Suite
<b>W</b>	
<b>WEP</b>	Wired Equivalent Privacy
<b>WPA</b>	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.
<b>Wi-Fi</b>	Wireless Fidelity  A short-distant wireless transmission technology. It enables wireless access to the Internet within a range of hundreds of feet wide.