ZTE

ZXV10 ET501
Product Description

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About This Manual

Purpose

As a new-generation ET-series videoconference terminal product launched by ZTE based on the android platform, the ZXV10 ET501 provides high-definition videoconference services.

This manual is applicable to the ZXV10 ET501 high-definition video call terminal. It describes the product positioning and features, structure, functions, networking application, interfaces and protocols, and technical specifications of the ZXV10 ET501 terminal. It helps users quickly understand the product positioning and features.

The Multipoint Control Unit (MCU) in this manual refers to the ZTE self-developed multimedia videoconference server, for example, ZXV10 M900 or ZXV10 M9000.

Intended Audience

This document is intended for:
- System administrators
- Hardware engineers
- Installation engineers

What Is in This Manual

This manual contains the following chapters.

Chapter	Summary
Chapter 1, Safety Precautions	Describes the precautions that you need to follow during the installation and use of the ZXV10 ET501 terminal.
Chapter 2, Product Positioning and Features	Describes the market positioning and features of the ZXV10 ET501.
Chapter 3, Product Structure	Describes the system components, overview, front panel, and back panel of the ZXV10 ET501.
Chapter 4, Product Functions	Describes the major functions of the ZXV10 ET501.
Chapter 5, Network Deployment	Describes the typical networking mode and application scenarios of the ZXV10 ET501 and the opening solutions of the default ports.
Chapter 6, Interfaces and Protocols	Describes the roles of the physical interfaces on the ZXV10 ET501 terminal and the matching protocols.
Chapter 7, Technical Specifications	Describes the standards, environment requirements, and major technical specifications for the ZXV10 ET501 terminal.

Related Documentation

The following documentation is related to this manual:

Manual	Description
ZXV10 ET501 Quick Start Guide	Describes how to perform quick connection between terminals and the other equipment, and create a conference.
ZXV10 ET501 Operation Guide (Through the Remote Control & Touchscreen)	Describes how to configure the terminal, create a conference, control a conference, perform system diagnosis and maintenance by using the remote control & touchscreen.
ZXV10 ET501 Operation Guide (Over the Web Page)	Describes how to control a terminal over the Web page.

Conventions

This manual uses the following conventions.

⚠️	Caution: indicates a potentially hazardous situation. Failure to comply can result in moderate or minor personal injury.
🛈	Notice: indicates equipment or environment safety information. Failure to comply can result in equipment damage, data loss, equipment performance degradation, environmental contamination, or other unpredictable results.
📚	Note: provides additional information about a topic.

Chapter 1
Safety Precautions

Basic Requirements

- When transporting, storing, or using device, keep it dry and avoid hard collision.
- Do not disassemble the device or open the enclosure. In case of any device failure, contact ZTE technical support.
- Without authorization, no unit or individual is allowed to modify the device structure, security, or performance design.
- The installation, operation and maintenance personnel must be well trained, follow correct operating procedures, and comply with safety precautions during device installation, operation, maintenance, disassembly, and inspection.
- When using this device, follow the relevant laws and regulations and respect the legitimate rights of others.

Unpacking and Inspection

- The surface of the device should be smooth without obvious defect, scratch, foreign object, water stain, or oil stain.
- All interfaces are secured well.
- All labels are clear and the coating is not damaged.
- All cables are not damaged, stained, or broken.

Environment Requirements

- Ensure that the device is installed in an environment with good ventilation and without direct light.
- Ensure that the device is away from a heat source or a high temperature area, and the device is not exposed to direct sunlight. For details, refer to Table 7-1.
- Do not install the device in an environment with severe vibration.
- Ensure that the device is away from flammable materials, for example, foam material.
- Ensure that the device is clean.
- Ensure that device is away from electric appliances with a strong magnetic field or electric field, such as a microwave oven and refrigerator.

Installation Instructions

- Take proper protective measures for electrostatic discharge. For example, wear antistatic gloves or an antistatic wrist strap before installing the device.
- Place the device on a platform that children cannot touch. Do not place heavy objects on top of the device.

- Ensure that there is no high-power device within the range of 5 meters around the device. Never use the same power-supply cable for the device and a high-power device nor connect the device to the same AC power strip with a high-power device.
- Ensure that there is no facility that affects heat dissipation within the range of one meter around the device. Ensure that the device vents are not blocked to avoid overheating.

Power-on and power-off

- Check before power-on:
  1. Check whether the ZXV10 ET501 terminal is stable. If the product shakes during operation, conferences are affected.
  2. Ensure that power and voltage are in the ranges required by the ZXV10 ET501. For the operating voltage range, refer to Table 7-1.
  3. Ensure that all cables are connected correctly and firmly.
- Power-on steps:
  1. Turn on the main power switch of the videoconferencing system.
  2. Power on the monitor, PA, and other peripheral devices, and ensure that they operate properly.
  3. Connect power to the ZXV10 ET501, and press the power switch on the front panel lightly.

     → Power surge occurs when an external device is powered on or off, transmitting interference signals to the ZXV10 ET501 and probably causing a startup failure or fault on the ZXV10 ET501. External devices must be powered on before the ZXV10 ET501 is started.

     → After the ZXV10 ET501 is started, check the status indicator. The indicator is lit blue when the ZXV10 ET501 operates properly.

Note:

→ The peripherals suffer an inrush current when they are powered up and shut down, and as a result they send interference signals to the terminal. This may cause a startup failure. Thus, you should power up the peripherals before starting up the system.

→ After the ZXV10 ET501 terminal starts up, you should check the indicators on the front panel. The RUN indicator flashes yellow green when the system operates properly.

- Sleep mode:

  Press the power switch on the front panel lightly.

- Power-off steps (opposite to the power-on procedure):
  1. Power off the ZXV10 ET501 terminal.

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2. Power off the monitor, PA, and other peripheral devices.

3. Turn off the main power switch of the video conferencing system.

Usage Instructions

- Do not frequently pull out and plug the input and output connectors.
- Do not pull out and plug the HDMI cable before the switch is turned off.
- After you power off the device, wait for at least 15 seconds before you power it on.
- Before cleaning the product, power it off and disconnect the power cable. Use a soft and dry cloth to clean the device case.
- If the product is not used or before cleaning the product, ensure that the product is powered off and the power cable is disconnected.

Battery Usage Instructions

- Use correct battery models and install the batteries correctly. Improper battery replacement may cause an explosion.

 Note:

The terminal uses the CR2032 3V lithium batteries, and the terminal control uses two AAA batteries.

- If the batteries cannot be installed in the device correctly, do not squeeze the batteries hard. Otherwise, the batteries may leak liquid or explode.
- Replace the batteries immediately if they lead liquid, smoke, or emit a smell.
- Do not use old and new batteries together. Replace all batteries at the same time.
- If battery liquid sticks to your skin or clothes, wash it with plenty of water and go to the hospital for medical treatment.
- If battery liquid splashes into your eyes, do not rub your eyes. Wash them with plenty of water and go to the hospital for medical treatment.
- Take batteries out if you do not use the system for a long time.
- Handle the exhausted batteries in accordance with the battery usage instructions.

Environmental Protection

Do not throw abandoned devices into a trash can. You should comply with the local regulations on equipment packaging materials, exhausted batteries, and replaced devices and support material collection.

Router Usage Instructions

You should comply with the following regulations:
- Use enterprise-class switches and routers.
- Never use hubs.

- The router software must support the QoS protocol and algorithm. Otherwise, you should upgrade the router software.
- Configure QoS for video and ordinary services on routers to ensure that video packets are not discarded in case of network congestion.
- Configure **Work Mode** of the connected device in accordance with the following requirements:

  → When you connect a terminal, set the network interface to **Auto**, and set the network device on the peer end to **Auto** as well. In some cases, both ends can be (but not recommended to) set to **100 M/Full-duplex**. Never set one end to **Auto** and set the other end to **100 M/Full-duplex**.

  → Because the network interface of the MCU ZXV10 M9xxx is set to **Auto** and it cannot be modified, the network interface connected to the ZXV10 M9xxx can be set only to **Auto**.

Notice!

If the terminal, MCU, and network device are set to different work modes, network packets may be lost in one direction, and the video services are affected.

The supplementary recommendations are as follows:
- The number of route hops should be as few as possible. The number of route hops should be reduced, because too many transmission hops may affect the video transmission. The video device should be connected to the master switching device.
- Different VLANs should be used to isolate video conference services and other services.
- In case of network congestion, the buffer sequence should be used first. The larger the buffer, the better, and the buffer should be allocated independently for each interface.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Radiation Exposure Statement

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

⚠ **Caution!**

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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Chapter 2
Product Positioning and Features

Product Positioning

The ZXV10 ET501 is a compact and delicate videoconference terminal based on the new generation ET smart platform. It provides an HD camera, two omni microphones, a wireless Wi-Fi module, and high-speed interfaces to provide users with 1080p HD video and broadband audio experience. The ZXV10 ET501 operates reliably and can be installed easily so it is applicable to small-scale videoconferences and households.

Product Features

- Installation and deployment

  → Uses a highly dense design that simplifies installation and deployment to the most. The terminal has one integrated camera and two built-in omni-microphones. The interfaces are simplified but extremely effective.

  → Supports multiple mounting modes that are applicable to various room structures. Supporting brackets are provided with the terminal. Besides being placed on a platform, the terminal can be mounted on the wall, on the ceiling, or above a TV.

  → Provides a wireless Wi-Fi module that enables the terminal to access a network immediately. No Network cables need to be routed for the terminal.

  → Provides an access point and two wireless microphones that can share the desktop remotely.

- Audio/Video features

  → Supports H.264 and H.264HP. Compared with traditional videoconference terminals, the ZXV10 ET501 uses half of the bandwidth only.

  → Supports 1080p 30fps HD videos.

  → Supports AAC-LD and other broadband voice signals, making the voice clear and pleasing.

  → Supports Acoustic Echo Cancellation (AEC), Automatic Noise Suppression (ANS), Automatic Gain Control (AGC), and lip synchronization that guarantee Hi-Fi audio performance.

- Easy operation

→ Various control modes: The ZXV10 ET501 can be controlled through the touchscreen TV, remote control, and Web page. Using the touchscreen TV to control the ZXV10 ET501 makes the configurations and videoconferences easy.

→ The operation menus and videos are separately displayed, and the videos can be displayed on other devices through output interfaces.

→ Various video layouts: local full screen, remote full screen, full screen of auxiliary videos, Picture-In-Picture (PIP), and Picture by Picture (PBP).

● Network adaptability

→ Supports Quality of Service (QoS) and Forward Error Correction (FEC) settings.

→ Supports audio and video packet loss compensation.

→ Supports automatic Internet Protocol (IP) speed adjustment.

→ Supports the Network Address Translation (NAT)/firewall traversal technologies.

● Interconnection capabilities

→ Interconnects with mainstream video terminals or servers.

→ Interconnects with the IMS network seamlessly.

→ Provides HD and SD terminals at the same time.

→ Provides the intelligent access to terminals using different audio and video protocols.

→ Provides the intelligent access to terminals using different bandwidths.

→ Provides the access of H.323 and SIP terminals.
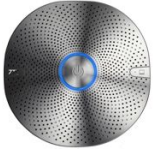
Chapter 3
Product Structure

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3.1 System Components

The system is composed of the terminal and infrared remote control. For a description of the ZXV10 ET501 system components, refer to Table 3-1.

Table 3-1 Components of the ZXV10 ET501 System

Compo-nent	Figure	Function Description
Terminal		It is the core part of the system. It sends the local image and voice to the transmission network after encoding. Meanwhile, it outputs the received remote image and voice after decoding to the local video device.
Infrared remote control		It is the main operation and control device. You can control the videoconference within a short distance via the infrared remote control. For detailed operations, refer to *Remote Control User Guide*.
(Op-tional) Wireless micro-phones and aux-iliary video transmit-ter		The ZXV10 A200 provides the wireless microphones and auxiliary video transmission functions to the ZXV10 ET501.

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3.2 Produce Overview

Front Panel

For the front panel of the ZXV10 ET501, see Figure 3-1.

Figure 3-1 Front Panel of the ZXV10 ET501

There is a status indicator on the front panel of the ZXV10 ET501. If the ZXV10 ET501 is operating properly, the indicator is solid blue.

Note:

● In shut-down status, press the power switch to turn the terminal on.
● In running state, Cut off the power supply to to shut the terminal down.

Rear Panel

For a description of the interfaces on the rear panel of the ZXV10 ET501, refer to Chapter 6 Interfaces and Protocols.

Chapter 4
Product Functions

The functions of the ZXV10 ET501 are described as follows:

Conference call
- Calls a terminal to initiate an audio conference or videoconference: You can input the H.323 number, SIP number, or IP address of the peer device to initiate a conference. You can also initiate a conference through the address book or latest call records.
- Calls the MCU server to create a multi-point conference: You can input the special service number (196 or 198) or IP address of the MCU to create a multi-point conference.
- Calls the MCU server to participate in a multi-point conference: You can input the special service number (196 or 198), conference number, or IP address of the MCU to participate in a multi-point conference.
- Accepts a call and participate in a conference.
- Supports automatic calls when the ZXV10 ET501 is powered on.
- Supports the customized calling and answering mode: manual mode, automatic mode, or automatic refusal mode.
- The ZXV10 ET501 can be interconnected to the clients of Microsoft Lync 2010 and Microsoft Lync 2013.
- The ZXV10 ET501 can be interconnected to VT100 series video conference software terminals developed by ZTE.

Conference control

- Supports the complicated chairman control functions, including broadcasting sites, browsing sites, calling the roll, adding terminals during a conference, disconnecting terminals, deleting terminals, forcedly refusing terminals, controlling the microphones and stereo equipment of each site, and extending conference duration.
- Supports the bulk sending or point-to-point transmission of short messages to release conference information in a timely manner.
- Supports the flexible caption setting and display, so that the conference notification is displayed clearly.
- Supports the banner display of conference sites, so that the conference topic is clear and distinct.
- Controls the external devices of conference sites, including cameras, microphones, and stereo equipment.

User interface
- The ZXV10 ET501 can be controlled through the touchscreen TV, remote control, and Web page.
- Supports video pictures in various layouts, including local full-screen, remote full-screen, secondary video full-screen, picture in picture, and picture by picture.

- Supports the customized settings of the display content and display mode of the screen, including the terminal status icon, terminal name, system alert box, logo, volume indication icon, and transparency of the menu interface.
- Supports the time synchronization function of Simple Network Time Protocol (SNTP).

Standard dual streams

- Supports H.323 dual-stream ITU-T H.239 and SIP dual-stream BFCP.
- Sends two-channel independent 720p HD video signals to remote terminals.
- Supports the customized secondary video bandwidth allocation.

Network adaptability

- Supports the Quality of Service (QoS) and Forward Error Correction (FEC) functions.
- Supports the video and audio packet loss compensation function.
- Supports the Internet Protocol (IP) automatic acceleration/deceleration function.
- Supports Network Address Translation (NAT)/Firewall traversal technology.

Security mechanism

- Uses a built-in operating system with a carrier-class reliable design to greatly improve the processing rate and anti-attack capability of the ZXV10 ET501 and realize 24 x 7 hours of reliable and stable operation.
- Supports various security mechanisms, including ITU-T H.235 encryption, terminal registration, and password authentication.

Chapter 5
# Network Deployment

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5.1 Networking Modes

When a ZXV10 ET501 terminal is connected to the IP network, it can hold point-to-point conferences with other terminals in the network. Different networking modes are used for different multipoint conference types.

Figure 5-1 shows the networking mode in which a ZXV10 ET501 holds a conference through an external MCU (such as the videoconference server ZXV10 M900).

● In area **A**, the ZXV10 ET501 terminal and the MCU server are in the same public network, which is applicable to a conference among different companies or organizations in the same public network.

● In area **B**, the ZXV10 ET501 terminal and the MCU server are in the same private network, which is applicable to an interdepartmental conference in a company.

● In area **A**, the MCU server configures two segments, one for the public network and the other for the private network. This networking is applicable to both an interdepartmental conference in a company and a conference between different companies or organizations in the public and private networks.

● If **A**, **B**, and **C** form a MCU server cascading network, this network is applicable to a conference among companies or organizations that are in the public and private networks. In this case, multiple MCUs are used.

Figure 5-1 Networking Mode for Holding a Conference Through an External MCU
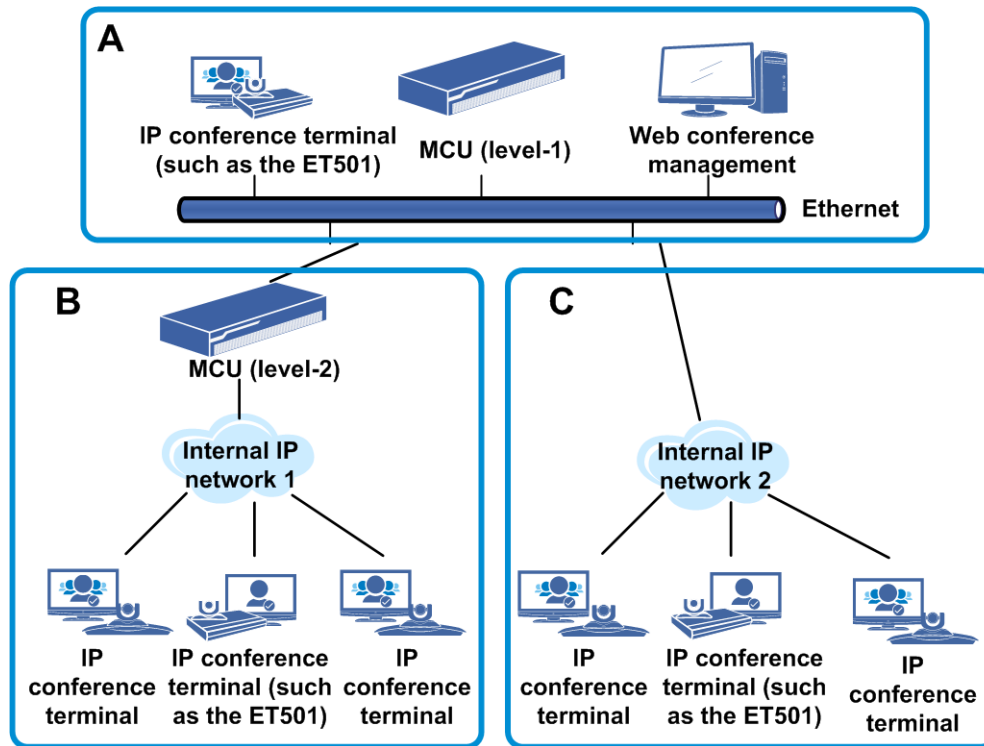
5.2 Default Ports

For the default ports of the ZXV10 ET501, refer to Table 5-1.

Table 5-1 Default Ports

Default Port	Connection Type	Function	Open Suggestion
1718	UDP	GK automatic search port	(Optional) This port does not need to be open if the GK automatic search function is disabled.
1719	UDP	H.323 GK RAS port	(Mandatory for H.323) This port must be open when the GK function is enabled.
1720	TCP	H.225 call port	This function must be open if calls are connected through H.323.
3230–3280	TCP	Dynamic H.245 port	● (Mandatory for H.323) At least eight ports need to be open if calls are connected through H.323. ● (Mandatory for SIP) At least one port needs to be open if calls are connected through SIP.

Default Port	Connection Type	Function	Open Suggestion
3230–3280	UDP	Media stream port: RTCP and RTP ports	(Mandatory) At least eight ports need to be open for an audio or video call.
5060	UDP	SIP port	(Mandatory for SIP) This port must be open for SIP calls.
5061	TCP	SIP port	(Mandatory for SIP) This port must be open for SIP TLS calls.
5070	TCP	BFCP dual stream port	(Mandatory for SIP) This port must be open for SIP standard dual stream.
80	TCP	ZXV10 ET501 Web port	(Mandatory) This port must be open for ZXV10 ET501 web pages.
123	UDP	Clock synchronization server port	(Optional) This port must be open when the ZXV10 ET501 needs to be connected to an external NTP server.
514	UDP	Log server port	This port must be open when the log server needs to be enabled.

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Chapter 6
Interfaces and Protocols

Physical Interfaces

The rear panel of the ZXV10 ET501 provides various physical interfaces, including the video interfaces, network interface, power supply interface, and USB interface. For the physical interfaces of the ZXV10 ET501, see Figure 6-1.

Figure 6-1 ZXV10 ET501 Interfaces

For a description of the interfaces, refer to Table 6-1.

Table 6-1 Interface Descriptions

No.	Description
1	Power input interface. Connects to a 12 V DC power supply.
2	HD video and audio output interface (HDMI OUT). Connects to an HD display device (such as an HD TV) that is used as the main display device to display the menu (GUI), main video, auxiliary video, and user operations.
3	Network interface (LAN). Connects to the Ethernet. Note: The ZXV10 ET501 provides built-in Wi-Fi (including Access Point) that enables the terminal to access the wireless network.

No.	Description
4	USB interface (USB). ● Connected to a standard touchscreen TV so the ZXV10 ET501 can be controlled through the touchscreen TV. ● Connected to a USB drive so you can browse and operate the files in the USB drive through the ZXV10 ET501. Note: If use the switch hub of USB interfaces, the ZXV10 ET501 can connect to 8 USB devices at most.

• Interfaces 1, 2, and 3 are basic interfaces. USB interface is optional interface.

Interface Protocols

For the protocols that the interfaces of the ZXV10 ET501 must comply with, refer to Table 6-2.

Table 6-2 Interface Technical Specifications

Interface Type	Description	Protocol	Supported Network Architecture	Remark
Network interface	1×LAN (IP: 10/100 Base-T, RJ-45)	IEEE 802.3, IP: 10/100Base-T	IP network	-
	built-in Wi-Fi (Including Access Point)	IEEE 802.11a/b/g/n	Wireless IP network	-
Video input interface	1× built-in camera	Video and control cables	1080p@30 HD camera input	-
	1× A200	-	Auxiliary video wireless access	External auxiliary video cannot be connected if no A200 is configured.
Video output interface	1×HDMI	HDMI1.4	Connected to the TV.	-
Audio input interface	2×built-in MIC	-	-	Two built-in omni microphones, one on the left of the front panel, the other on the right.
Audio output interface	1×HDMI audio out	HDMI 1.4	Outputs voice.	-

Interface Type	Description	Protocol	Supported Network Architecture	Remark
USB interface	2×USB	USB2.0	-	-
Power interface	1	-	Connected to the power adapter.	-
Power switch	1	Tact switch with an indicator	Two-color indicator that can specify the standby status.	The indicator is located on the front panel.

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Chapter 7
Technical Specifications

For the technical specifications of the ZXV10 ET501, refer to Table 7-1.

Table 7-1 Technical Specifications of the ZXV10 ET501

Item	Sub-item	Detailed Specifications
Compliant Standards	Multimedia Framework Protocol	ITU-T H.323, IETF SIP
	Video Encoding/Decoding Protocol	H.264HP, H.264BP
	Audio Encoding/Decoding Protocol	G.711A, G.711U, G.722, G.722.1 licensed from Polycom, G.722.1C licensed from Polycom
	Dual Video Standard	ITU-T H.239/IEFT BFCP
	Other Communication Protocols	H.224, H.225, H.241, H.243, H.245, H.281, H.283
	Network Transmission Protocol	TCP/IP, DHCP, SNMP, Telnet, HTTP, HTTPS, TR069
	Remote Camera Control	H.281, H.224
	Call Bandwidth	64 kbit/s to 8 Mbit/s
	Active Picture Resolution	1080p@25/30 fps, 720p@25/30/50/60 fps, 4CIF@25 fps, CIF@25 fps
	Data Content Resolution	640×480 (VGA), 800×600 (SVGA), 1024×768 (XGA), 720p
	Media Encryption Protocol	AES
	Encryption Standard	H.235, SRTP
Electric Characteristic	Working Voltage	100 VAC to 240 VAC, 50 Hz to 60 Hz
	Power Consumption	Maximum consumption: <20 W

Item	Sub-item	Detailed Specifications
Environment Requirements	Working Status	
	Altitude	<5000 m
	Temperature	0 °C to 40 °C (32 °F to 104 °F)
	Relative Humidity	10% to 90%
	Noise	< 46 dBA SPL
	Minimum Illuminance	15 lux
	Recommended Illuminance	> 300 lux
	Non-Working Status	
	Temperature	-40 °C to 70 °C (40 °F to 158 °F)
	Humidity	10% to 90%
Physical Parameters	Dimensions	Package dimensions: 395 mm×270 mm×385 mm (Height × Width × Depth) Terminal size: 298 mm×133 mm×180 mm (Height×Width×Depth)
	Weight	< 3 kg
Power Interface	-	DC 12 V/5 A
Infrared Remote Control Interface	Infrared Remote Control Receiving	NEC Code Standard
Built-in Camera	Image Sensor	1/3 inch HD CMOS, 2.1 million effective pixels
	Resolution	1080p@30 fps
	Lens	10x optical zoom, f=5.13 mm-46.3 mm, F1.8-F4.0 Automatic focus
	Angle of View	H: 51.8°(Tele)-5.9°(Wide) V: 39.1°(Tele)-4.4°(Wide)
	White Balance	Automatic
	Rotation Angle	Horizontal: -170°-170° Pitch angle: -30°-30°
	Signal-Noise Ratio	≥55 dB
Standard	Mandatory Certificate Standard	GB4943.1-2011, GB9254-2008, YD/T993-1998
Authentication	CCC	

Glossary

FEC
- Forward Error Correction

IP
- Internet Protocol

MCU
- Multipoint Control Unit

NAT
- Network Address Translation

QoS
- Quality of Service

SNTP
- Simple Network Time Protocol