ZXR10 WAS (V1.0) IP Wireless Access System

W140A Outdoor Wireless Access Point/Bridge

Professional Installation Instruction Manual

ZTE CORPORATION

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Manual Version **20040325-R1.0**
Product Version **V1.0**

ZTE CORPORATION

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Conventions

Four striking symbols are used throughout this manual to emphasize important and critical information during operation:

 Danger,  Warning,  Caution and  Note statements are used throughout this manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage. The statements are defined below.

Statement: The actual product may differ from what is described in this manual due to frequent update of ZTE products and fast development of technologies. Please contact the local ZTE office for the latest updating information of the product.

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1 Safety Precautions

This chapter introduces the safety precautions of this product and safety symbols used in this manual.

1.1 Safety Precautions

High voltage and high temperature exist in this equipment, so only trained professional personnel can install, operate and maintain it.

During the installation, operation and maintenance of the equipment, all the safety rules and related operation procedures on the site must be strictly abided by, to avoid body injuries or equipment damages. The safety precautions in this manual can only be used as a supplement to site safety regulations.

ZTE assumes no responsibility for consequences resulting from violation of general specifications for safety operations or of safety rules for design, production and use of the equipment.

1.2 Symbol Description

See Table 1.2-1 for the safety symbols used in this manual, which serves to remind the readers of the safety precautions to be taken when the equipment is installed, operated and maintained.

Table 1.2-1 Safety Symbols and Descriptions

Safety Symbol	Meaning
	Call for notice
	Call for antistatic measures
	Warn against electric shock
	Caution against scald
	Warn against laser
	Caution against microwave

Four types of safety levels are available: danger, warning, caution and note. To the right of a safety symbol is the text description of its safety level. Under the symbol is the detailed description about its contents. The formats are as follows.

 **Danger:**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

 **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, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

Note:

A Note statement is used to notify people of installation, operation, or maintenance information that is important, but not hazard-related.

Tips:

Indicates a suggestion or hint to make things easier or more productive for the reader

2 Installation and Debugging

W140A require installation by professional installer. This chapter introduces the W140A fittings, installation methods and steps, debugging methods and steps for your reference.

2.1 Equipment Configurations and Fittings

2.1.1 Equipment Configurations

The W140A is composed of a kit and optional fittings. Items in the kit are not to be changed randomly, but items in the fittings are dispensable depending on the user demands.

Please refer to Table 2.1-1 for a list of the W140A kit.

Table 2.1-1 A List of the W140A Kit

Name	Unit	Quantity	Remarks
W140A	Set	1	
Backplane	PCS	1	With seven M8×10 inner hex head screws and four expansion screws
Mounting panel	PCS	1	
Power over Ethernet (PoE) product	Set	1	
Power cord of PoE product	pc	1	1.5m
PoE cable	pc	1	30m
Grounding cable	pc	1	10m
Antenna feeder	pc	1	1.2m

Please refer to Table 2.1-2 for a list of optional fittings of the W140A.

Table 2.1-2 A List of Optional Fittings of the W140A

Name	Unit	Quantity	Remarks
Omni antenna	pc	1	8 dBi omni antenna
Directional antenna	pc	1	8.5 dBi directional antenna
Directional antenna	pc	1	14 dBi directional antenna
Directional antenna	pc	1	21 dBi directional antenna
Antenna kit	Set	1	Used for installing and fixing an omni antenna.
Installing support A	Set	1	Used for roof-mounted mode (comprising a vertical pole), applicable to install all types of antennae, and providing an installation position for a lightning arrester.
Installing support B	Set	1	Used for pole-mounted mode (excluding a vertical pole), inapplicable to install a directional antenna, and an installation position for a lightning arrester not available.
Installing support C	Set	1	Used for side wall-mounted mode (comprising a vertical pole), applicable to install all types of antennae, but an installation position for a lightning arrester not available. You can choose roof-mounted mode or side wall-mounted mode as required.
Lightning arrester	pc	1	If a lightning arrester is not available on the roof, you must install a lightning arrester in an installing support A.

2.1.2 Mechanical Parts

Mechanical parts of the W140A consist of the W140A, backplane, mounting panel and installation fittings. Fig. 2.1-1, Fig. 2.1-2 and Fig. 2.1-3 show the mechanical structures of W140A, backplane and mounting panel in turn.

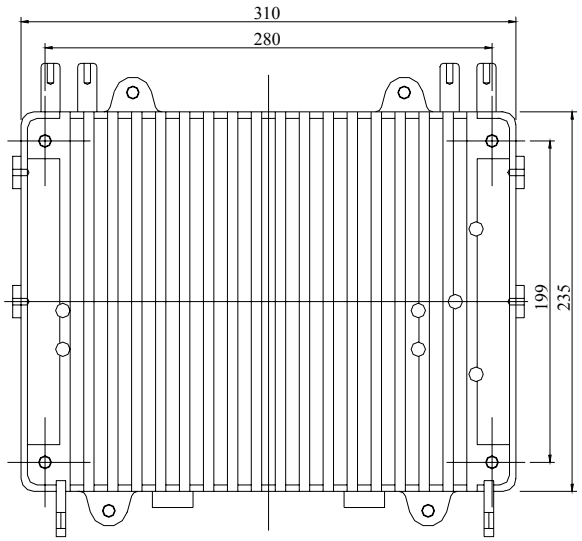


Fig. 2.1-1 W140A Structure

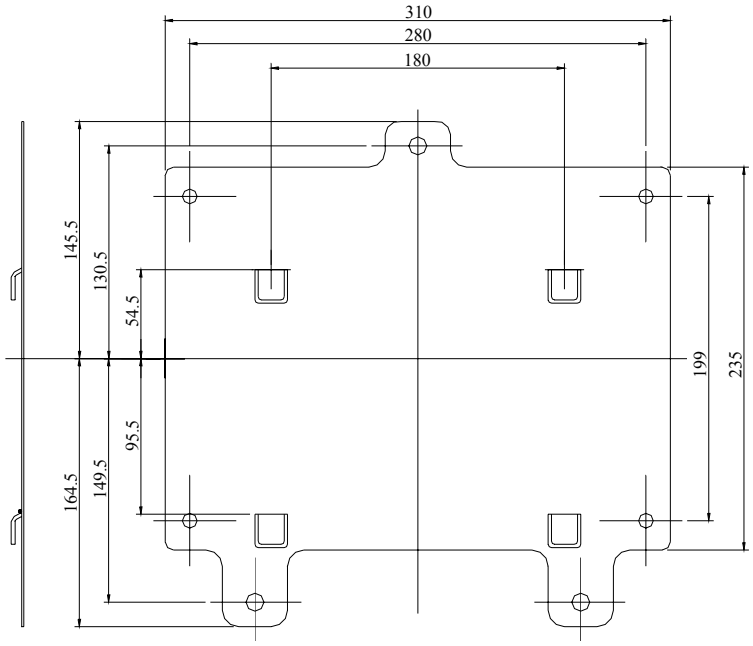


Fig. 2.1-2 The Structure of W140A Backplane

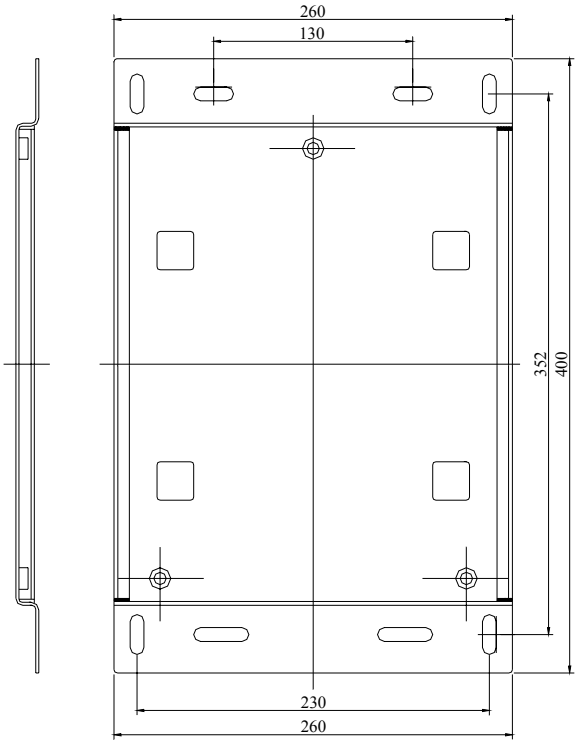


Fig. 2.1-3 The Structure of W140A Mounting Panel

2.1.3 Antenna

An antenna works effectively to convert high-frequency oscillating currents (energy) into radio waves which are transmitted to the air; or, convert the radio waves received from the air into high-frequency voltage (energy). It serves to implement energy conversion.

The W140A adopts an outdoor antenna: Omni antenna or directional antenna. Following are introductions to the common types of antennae.

1. Outdoor omni antenna

   Fig. 2.1-4 shows the physical appearance of an outdoor omni antenna, and Table 2.1-3 lists the technical indices.

Fig. 2.1-4 Physical Appearance of an Omni Antenna

Table 2.1-3 Technical Indices of an Outdoor Omni Antenna

Items	Technical Indices
Frequency range	2.4 GHz ~ 2.5 GHz
Gain	8 dBi
VSWR	1.5: 1 Max
Polarization	Vertical polarization
Horizontal beam width	360°
Vertical beam width	15°
Connector type	N-K
Input impedance	50 Ω
Outer dimensions	ϕ 22 mm × 800 mm
Installation mode	The antenna is fixed to a pole through a fixture, and connected to the antenna interface in the AP through a cable.

2. Indoor (outdoor) directional antenna

Fig. 2.1-5 shows the physical appearance of an indoor (outdoor) directional antenna, and Table 2.1-4 lists the technical indices.

Fig. 2.1-5 Physical Appearance of an Indoor (Outdoor) Directional Antenna

Table 2.1-4 Technical Indices of an Indoor (Outdoor) Directional Antenna

Items	Technical Indices
Frequency range	2.4 GHz ~ 2.5 GHz
Gain	8.5 dBi
VSWR	1.5: 1 Max
Polarization	Vertical polarization
Horizontal beam width	70°
Vertical beam width	65°
Connector type	N-K
Input impedance	50 Ω
Outer dimensions	120 mm × 120 mm × 44 mm
Installation mode	The indoor or outdoor antenna is fixed to a wall or a pole through the installation parts, and connected to the antenna interface in the AP through a cable.

3. 14 dBi directional antenna

Fig. 2.1-6 shows the physical appearance of a 14 dBi directional antenna, and Table 2.1-5 lists the technical indices.

Fig. 2.1-6 Physical Appearance of a 14 dBi Directional Antenna

Table 2.1-5 Technical Indices of a 14 dBi Directional Antenna

Items	Technical Indices
Frequency range	2.4 GHz ~ 2.5 GHz
Gain	14 dBi
VSWR	1.5: 1 Max
Polarization	Vertical polarization
Horizontal beam width	30°
Vertical beam width	30°
Connector type	N-K
Input impedance:	50 Ω
Outer dimensions	240 mm × 240 mm × 60 mm
Installation mode	The antenna is fixed to a support, and connected to the antenna interface in the AP through a cable.

2.2 Installation Preparations

Whether the W140A is properly installed has a direct impact on the QoS of the system. Due to the huge amount of installation work, it is necessary to work out a practicable installation scheme to effectively ensure the progress and quality of the installation work.

Complete the following issues before installing the W140A:

1. Network planning: Defining the installation location, installation mode and connection method of the working ground.
2. Obtaining installation approval documents: To install the W140A in any public building or the building of any group or individual, you should ask for permission in advance.
3. Line resource: The W140A must be connected with the upper layer network equipment via an RJ45 Ethernet interface. You should make sure beforehand that whether the necessary line resource is available.
4. Lightning protection measures: Determining the lightning protection measures. If a lightning arrester is to be installed, determining the grounding method of the lightning protection grounding wire.
5. Installation personnel: Only the trained personnel should be allowed to install the W140A, and supervision personnel should be present.

6. Installation materials: Before the W140A is installed, making sure that all the installation materials are ready.

7. The installation tools, instruments and documentations should be in place.

2.2.1 Channel Planning

According to the wireless LAN technology standard 802.11b and the standard of state radio management committee, a wireless device in the wireless LAN operates at 2400 MHz ~ 2483.5 MHz, and the working frequency bandwidth is 83.5 MHz. The working frequency is divided into 14 sub-channels, and the bandwidth of each sub-channel is 22 MHz. Fig. 2.2-1 shows the sub-channel allocations.

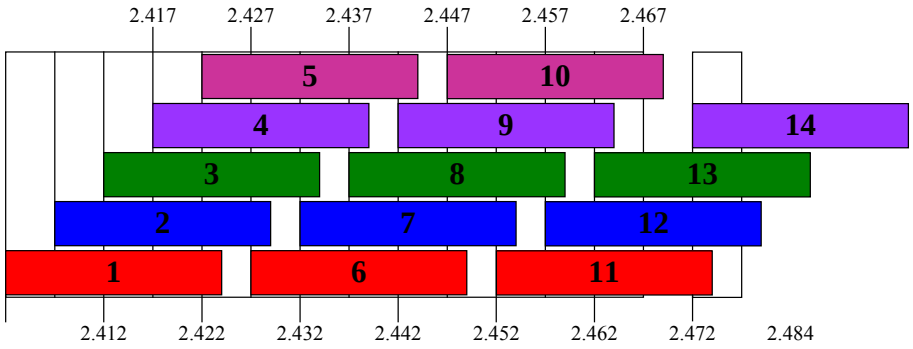


Fig. 2.2-1 Sub-channel Allocations

The above figure reveals that up to 13 channels are available. The IDs and central frequencies of these 13 channels are described in Table 2.2-1.

Table 2.2-1 Channel IDs and Frequencies

Channel ID	Central Frequency	Low End/High End Frequency of the Channel
1	2,412 MHz	2401/2423 MHz
2	2,417 MHz	2411/2433 MHz
3	2,422 MHz	2416/2438 MHz
4	2,427 MHz	2421/2443 MHz
5	2,432 MHz	2426/2448 MHz
6	2,437 MHz	2431/2453 MHz
7	2,442 MHz	2431/2453 MHz
8	2,447 MHz	2436/2458 MHz
9	2,452 MHz	2441/2463 MHz

10	2,457 MHz	2446/2468 MHz
11	2,462 MHz	2451/2473 MHz
12	2,467 MHz	2456/2478 MHz
13	2,472 MHz	2461/2483 MHz

When multiple channels are working at the same time, the central frequency intervals between two channels should not be less than 25 MHz to avoid mutual interference. As shown in Fig. 2.2-1, the technology of direct sequence spread spectrum can support three un-overlapped channels working simultaneously in a cell.

In the wireless LAN planning, the cellular coverage principle applied in the BTS system is introduced in the channel allocation to ensure efficient coverage of the APs and avoid inter-carrier interference. This principle supports three un-overlapped channels (for example, channels 1, 6 and 11) working simultaneously in the same area, as shown in Fig. 2.2-2.

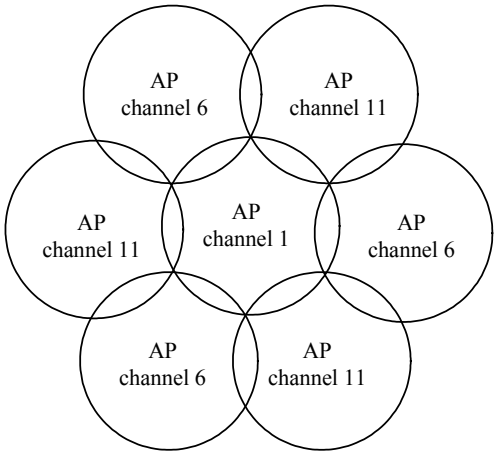


Fig. 2.2-2 Channel Allocations between the Adjacent APs in Actual Networking

You should choose the working channels (generally channels 1, 6 and 11) for the adjacent APs following the principle illustrated in Fig. 2.2-2, to guarantee normal operation of the equipment in the wireless LAN.

2.2.2 Configurations Before Installation

Prior to install the W140A, power on the APs in turn and check whether they work normally. If they fail to work normally, please check whether the versions are loaded correctly. Refer to Section **Error! Reference source not found.** for details of loading a

version.

When you are sure that the APs work normally, you should proceed with the following basic configurations:

1. Configuring IP addresses of the Ethernet interfaces, that is, the management addresses. At least one management address should be configured for each AP for the end of management configuration. This management address may be a private address or a public address.
2. Configuring SSIDs and working channels of the wireless interfaces.
3. Configuring the working mode of the W140A.

The configuration methods will be elaborated in the subsequent sections.

2.2.3 Tools, Instruments and Documentations

1. Tools

   A ladder, electric drill, wrench, diagonal pliers, scissors, 8-core cable clamp and common toolkit.

2. Instrument

   Multimeter

3. Documentations

   W140A Installation Data Sheet

   ZXR10 WAS (V1.0) IP Wireless Access System W140A Outdoor Wireless Access Point / Bridge User's Manual

2.2.4 Installation Environment Inspection

As the W140A is located outdoors, you should make sure that the lightning protection measures are in place.

Generally, the W140A uses W201P as the PoE product, which must be located indoors. To guarantee the normal work of the W201P and prolong its service lifetime, the indoor temperature should be in the range of -5°C ~ 45°C, and the relative humidity in the range of 5% ~ 95%. The equipment room should be dry and ventilated.

2.2.5 Unpacking Inspection

Follow the steps below to perform unpacking inspection.

1. Checking outer packing conditions

   If a package is obviously damaged, the technical personnel should mark the damage distinctly and check the performance of the equipment in the package afterwards.

2. Checking the amount of the packages

   Check the amount of the packages against the packing list. For any discrepancy, make a memo and report to the department concerned.

3. Unpacking

   During the unpacking, handle the packages with care and protect the surface coating in the parts. For any damage to the inner package materials, a detailed record must be made.

   All the part lists and technical documents of the W140A can be found in the packing boxes. The installation personnel should check against the lists and read the technical documents carefully.

4. Counting the articles

   After unpacking, check the articles against the configuration list and packing list. Make sure that the articles are all complete.

 **Note:**

Unpacking inspection should be based on the packing list in the package. If there is any missing part, please contact ZTE Cooperation.

2.3 Installation

2.3.1 Installation Process

Fig. 2.3-1 shows the process of installing the W140A.

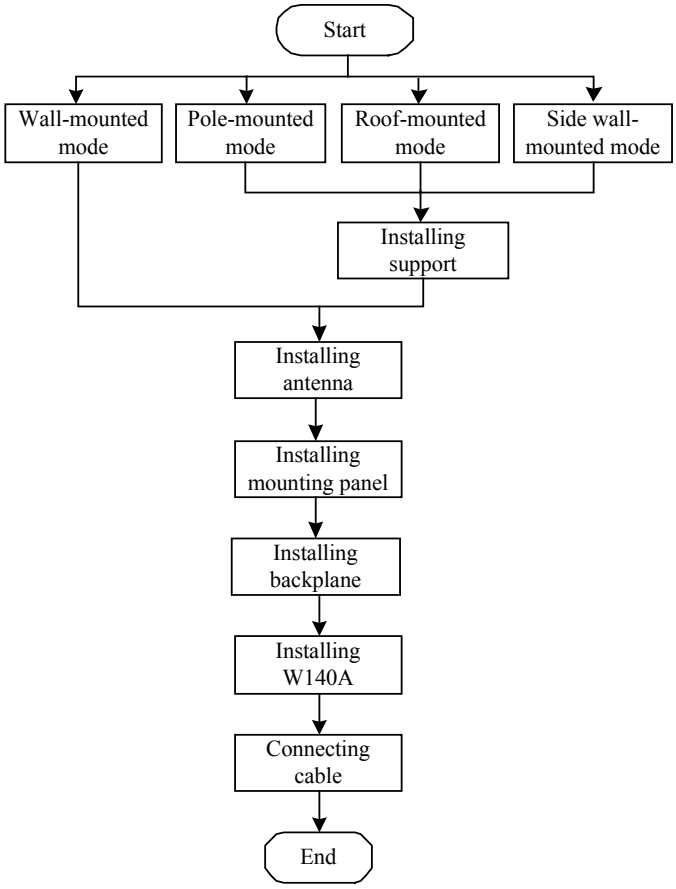


Fig. 2.3-1 The Process of Installing the W140A

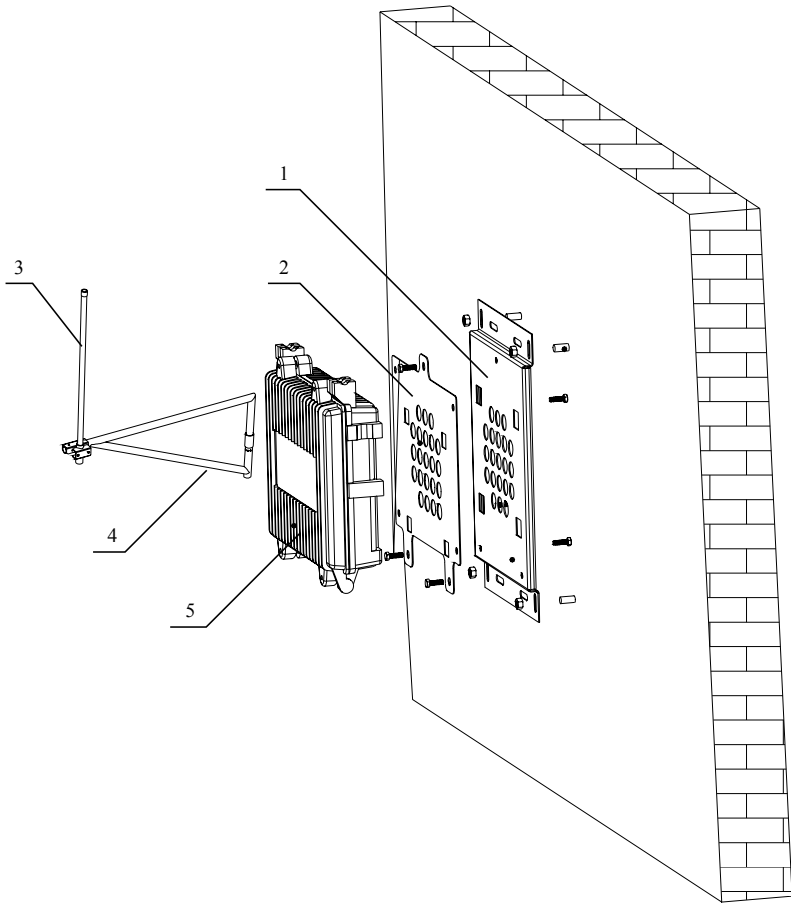
2.3.2 Installation Method

The W140A can be installed in four modes: Wall-mounted mode, pole-mounted mode, roof-mounted mode and side wall-mounted mode. You should choose a proper mode based on the actual requirement.

2.3.2.1 Wall-Mounted Mode

The wall-mounted mode is suitable for installing an omni antenna or a directional antenna. Following is an example of how to install the W140A with an omni antenna in the wall-mounted mode. You may install the W140A with a directional antenna in the similar way.

Fig. 2.3-2 shows the necessary components in the wall-mounted mode.



1. Backplane 2. Mounting panel 3. Omni antenna 4. Antenna kit 5. W140A

Fig. 2.3-2 The Necessary Components in the Wall-Mounted Mode

To install the W140A in the wall-mounted mode, follow the steps below:

1. Installing the mounting panel: Drill four holes (8 mm in diameter) in the wall with an impact drill. Clear the dusts and mount the expansion screws, making the four holes in a rectangular (measuring 230 mm horizontally by 352 mm vertically) perpendicular to the ground. Fasten the mounting panel to the wall using the expansion screw kit.
2. Installing the backplane: There are four fastening holes in the backplane of the W140A, as shown in Fig. 2.3-3. Fix the backplane to the wall using four matched screws.

Fig. 2.3-3 The W140A Backplane

3. Installing the antenna: Fix the antenna stand to the left and right locks in the W140A using a U-shape fixture. Do not screw it too tight. Then fix the omni antenna to the antenna stand using a U-shape clamp.

Note:

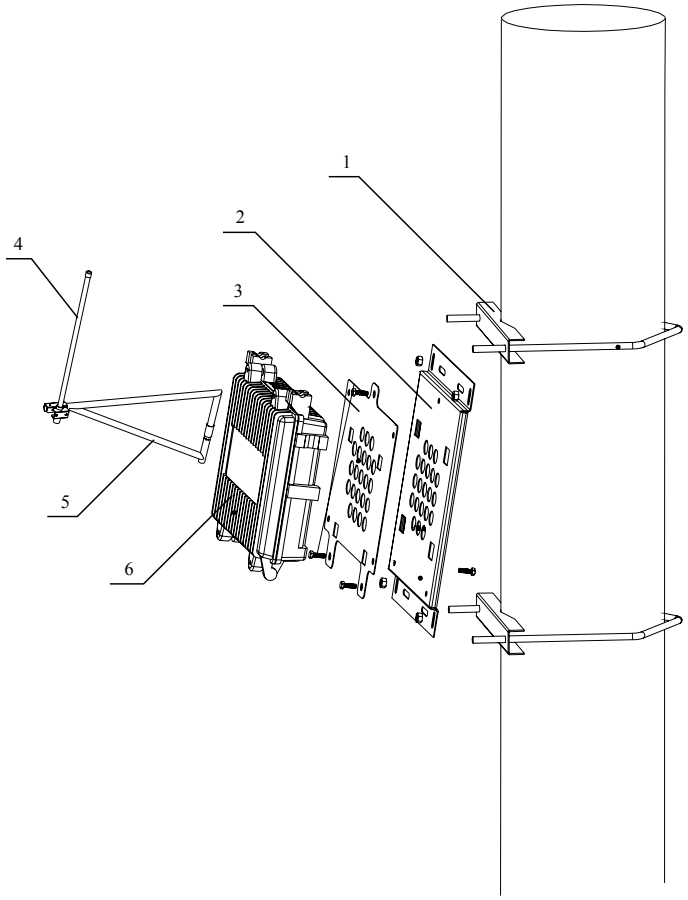
- All the antennas must be clamped on the metallic casings, to ensure that all the other parts in the antennas do not bear any weight.
- The antenna feeder shall go through the left and right locks of the W140A to make it look nicer.

4. Installing the W140A: Securing the W140A with a backplane to the mounting plane on the wall with reference to the three fastening holes in the backplane and by using the fastening screws.
5. Fixing the antenna: Turn the antenna stand to place the antenna in an optimum position. Then tighten the U-shape fixture to fix the antenna stand firmly.
6. Connecting the cable: Interconnect the U-interface cable led out from the distribution box with the twisted pairs of the W140A, and carry out water-proof and anti-aging treatment. Connect and tighten the cable connectors of the antenna with the antenna interface of the W140A, and make sure that they are waterproof.

2.3.2.2 Pole-Mounted Mode

The pole-mounted mode is suitable for installing an omni antenna in an installing support B. Two models of installing support are available: 150 mm-gauge and 230 mm-gauge.

Fig. 2.3-4 shows the components in the pole-mounted mode.



1. Installing support B 2. Backplane 3. Mounting plane 4. Omni antenna 5. Antenna stand kit 6. W140A

Fig. 2.3-4 The Necessary Components in the Pole-Mounted Mode

To install the W140A in the pole-mounted mode, follow the steps below:

1. Installing the mounting panel: Fix the mounting panel to the concrete pole using a lock ring.
2. Installing the backplane: There are four fastening holes in the backplane of the W140A, as shown in Fig. 2.3-3. Fix the backplane to the wall using four matched screws.
3. Installing the antenna: Fix the antenna stand to the left and right locks in the W140A using a U-shape fixture. Do not screw it too tight. Then fix the omni antenna to the antenna stand using a U-shape clamp.

Note:

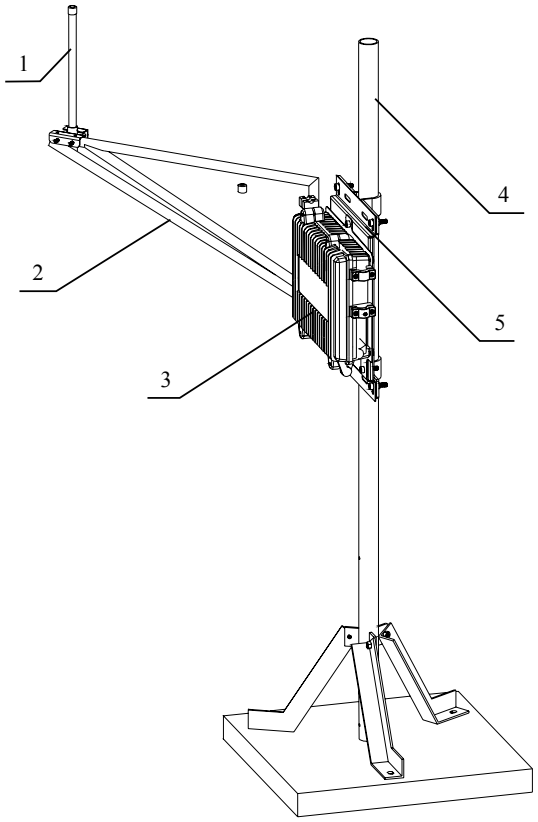
- All the antennas must be clamped on the metallic casings, to ensure that all the other parts in the antennas do not bear any weight.
- The antenna feeder shall go through the left and right locks of the W140A to make it look nicer.

4. Installing the W140A: Securing the W140A with a backplane to the mounting plane on the wall with reference to the three fastening holes in the backplane and by using the fastening screws.
5. Fixing the antenna: Turn the antenna stand to place the antenna in an optimum position. Then tighten the U-shape fixture to fix the antenna stand firmly.
6. Connecting the cable: Interconnect the U-interface cable led out from the distribution box with the twisted pairs of the W140A, and carry out water-proof and anti-aging treatment. Connect and tighten the cable connectors of the antenna with the antenna interface of the W140A, and make sure that they are waterproof.

2.3.2.3 Roof-Mounted Mode

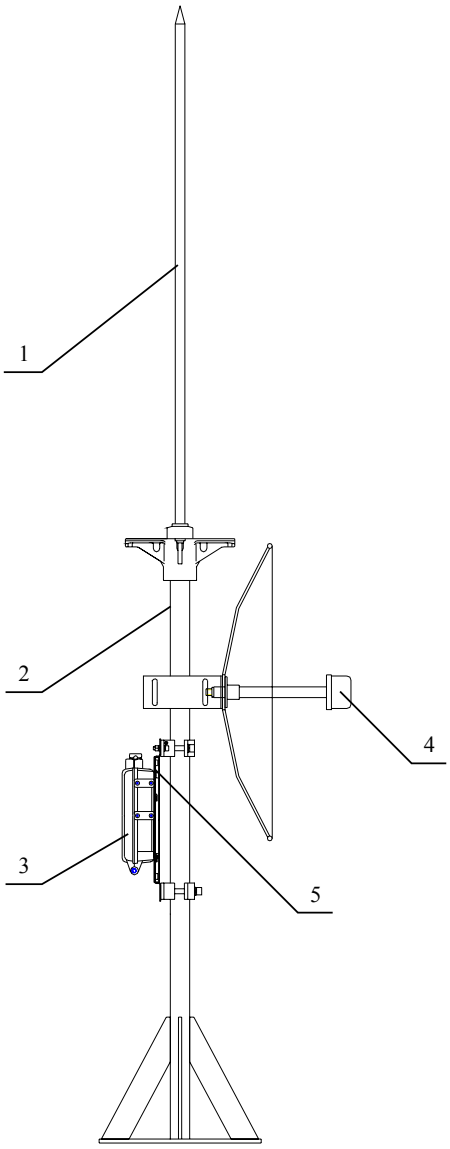
The roof-mounted mode is suitable for installing an omni antenna or a directional antenna. When the W140A is not within the 45° protection area of other lightning arresters, a lightning arrester should be installed in an installing support A or C.

Fig. 2.3-5 shows the components in the roof-mounted mode with an installing support C, and Fig. 2.3-6 shows the components in the roof-mounted mode with an installing support A.



1. Omni antenna 2. Installing support kit 3. W140A 4. Installing support C 5. Backplane and moutning panel

Fig. 2.3-5 The Necessary Components in the Roof-Mounted Mode with an Installing support C



1. Lightning arrester 2. Installing support A 3. W140A 4. Omni antenna 5. Backplane and mounting panel

Fig. 2.3-6 The Necessary Components in the Roof-Mounted Mode with an Installing support A

Following are steps of installing an omni antenna in the roof-mounted mode.

1. Installing the antenna stand: Fix the three pole supports to the installing support using fixing gaskets and screws. Put the installing supports fixed with three supports on the mounting base (a concrete base or flat roof). Mark the installation holes in the pole supports, and remove the installing support. Then drill the holes in the marked places, and secure the installing support to the

mounting base by the expansion bolts.

2. Installing the antenna: Fix the antenna stand to the left and right locks in the W140A using a U-shape fixture. Do not screw it too tight. Then fix the omni antenna to the antenna stand using a U-shape clamp.

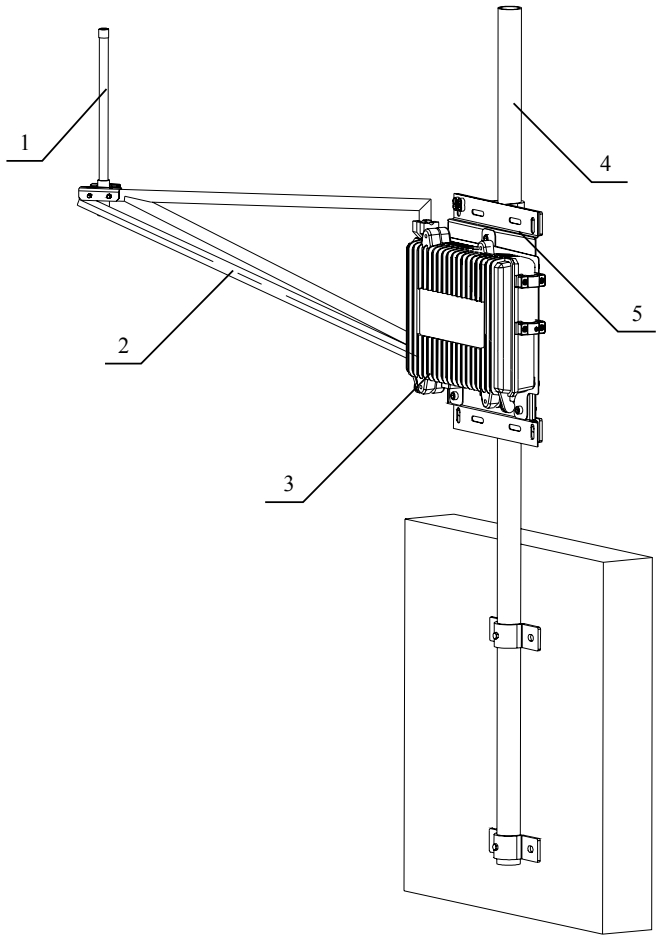
Note:

- All the antennas must be clamped on the metallic casings, to ensure that all the other parts in the antennas do not bear any weight.
- The antenna feeder shall go through the left and right locks of the W140A to make it look nicer.
- The omni antenna should be secured to the pole.

3. Installing the mounting panel: Secure the mounting panel to the installing support by using a fixture.
4. Installing the backplane: There are four fastening holes in the backplane of the W140A, as shown in Fig. 2.3-3. Fix the backplane to the wall using four matched screws.
5. Installing the W140A: Securing the W140A with a backplane to the mounting plane on the wall with reference to the three fastening holes in the backplane and by using the fastening screws.
6. Fixing the antenna: Turn the antenna stand to place the antenna in an optimum position. Then tighten the U-shape fixture to fix the antenna stand firmly.
7. Connecting the cable: Interconnect the U-interface cable led out from the distribution box with the twisted pairs of the W140A, and carry out water-proof and anti-aging treatment. Connect and tighten the cable connectors of the antenna with the antenna interface of the W140A, and make sure that they are waterproof.

2.3.2.4 Side Wall-Mounted Mode

The side wall-mounted mode is suitable for installing an omni antenna or a directional antenna. Fig. 2.3-7 shows the components in the side wall-mounted mode with an installing support C.



1. Omni antenna 2. Antenna stand kit 3. W140A 4. Installing support C 5. Backplane and mounting plane

Fig. 2.3-7 The Necessary Components in the Side Wall-Mounted Mode

To install an omni antenna in the side wall-mounted mode, follow the steps below:

1. Installing the antenna stand: Determine the installation location, and draw lines at the two fastening holes in the wall fixture which is to used along with the installing support. Then remove the wall fixture and drill holes (12 in diameter, 50 mm deep) at the marked places with an impact drill. After that, insert the expansion bolts into the installation holes and fix the installing support to the wall using the matched nuts. The installation spacing depends on the actual situation.
2. Installing the antenna: Fix the antenna stand to the left and right locks in the W140A using a U-shape fixture. Do not screw it too tight. Then fix the omni

antenna to the antenna stand using a U-shape clamp.

Note:

- All the antennas must be clamped on the metallic casings, to ensure that all the other parts in the antennas do not bear any weight.
- The antenna feeder shall go through the left and right locks of the W140A to make it look nicer.
- The omni antenna should be secured to the pole.

3. Installing the mounting panel: Secure the mounting panel to the installing support by using a fixture.
4. Installing the backplane: There are four fastening holes in the backplane of the W140A, as shown in Fig. 2.3-3. Fix the backplane to the wall using four matched screws.
5. Installing the W140A: Securing the W140A with a backplane to the mounting plane on the wall with reference to the three fastening holes in the backplane and by using the fastening screws.
6. Fixing the antenna: Turn the antenna stand to place the antenna in an optimum position. Then tighten the U-shape fixture to fix the antenna stand firmly.
7. Connecting the cable: Interconnect the U-interface cable led out from the distribution box with the twisted pairs of the W140A, and carry out water-proof and anti-aging treatment. Connect and tighten the cable connectors of the antenna with the antenna interface of the W140A, and make sure that they are waterproof.

2.3.3 Installing Antenna

The omni antenna of the W140A can be installed directly on a wall or a pole. It gets connected to the antenna arms which is installed in the W140A backplane.

2.3.4 Connecting Antenna Feeder

To connect an antenna feeder cable, complete the following steps:

1. Attaching a shrinkable sleeve (for normal temperature) to the feeder cable.
2. Taking off the plastic dust-proof cover mounted on the W140A socket to the feeder cable.
3. Plugging the feeder cable into the socket.
4. Fastening the feeder cable plug with the specified torque force (7 kgf/cm ~ 11.5 kgf/cm).
5. Attaching the shrinkable sleeve (for normal temperature) to the antenna connector, and adjusting the sleeve.

When using the waterproof tape, you should bind the tape around the joints carefully, wrap the outer cover with the insulting tape, and then apply the silica gel carefully.

Note:

- Never use the hot shrinkable sleeve.
- Observe the installation direction of the shrinkable sleeve (for normal temperature). Make sure that it reaches the root of the connector post. Guidance is required on how to use a shrinkable sleeve (for normal temperature).
- To fasten a feeder cable, you must use a torque wrench. Also, you must fasten the cable with the specified torque, to make the feeder cable connector to be waterproof.

2.3.5 Connecting PoE Cable

The W140A accepts power over Ethernet. The following steps describe how to connect a PoE cable.

1. Making the Ethernet cable according to the engineering requirements

   The W140A is accompanied with a 30m Ethernet cable. If a longer cable is needed, you should make an Ethernet cable following the instructions for making a standard straight-through cable. Please refer to Appendix A for details of making an Ethernet cable.

   Connect the manufactured Ethernet cable to the Ethernet cable originally in the

W140A through a bi-directional Ethernet connector.

2. Protecting the Ethernet cable

   As part of the Ethernet cable is exposed outdoor, the said segment of the Ethernet cable must be covered by a shrinkable sleeve (for normal temperature) or a PVC tube.

Note:

Observe the installation direction of the shrinkable sleeve (for normal temperature). When using the waterproof tape, you should bind the tape around the joints carefully, wrap the outer cover with the insulting tape, and then apply the silica gel carefully.

3. Installing the Ethernet cable
4. Fixing the Ethernet cable

2.3.6 Lightning Protection System

A safe grounding system should be able to protect the outdoor equipment from direct lightning strike and inductive lightning strike. The W140A can withstand a 2200 kV inductive lightning strike within 10m, 5m, 3m and 1m from the discharge electrode. It can also withstand a 2200 kV simulated direct lightning strike (the discharge electrode discharges to the lightning arrester of the W140A directly).

Fig. 2.3-8 shows how to install the lightning protection system of the W140A.

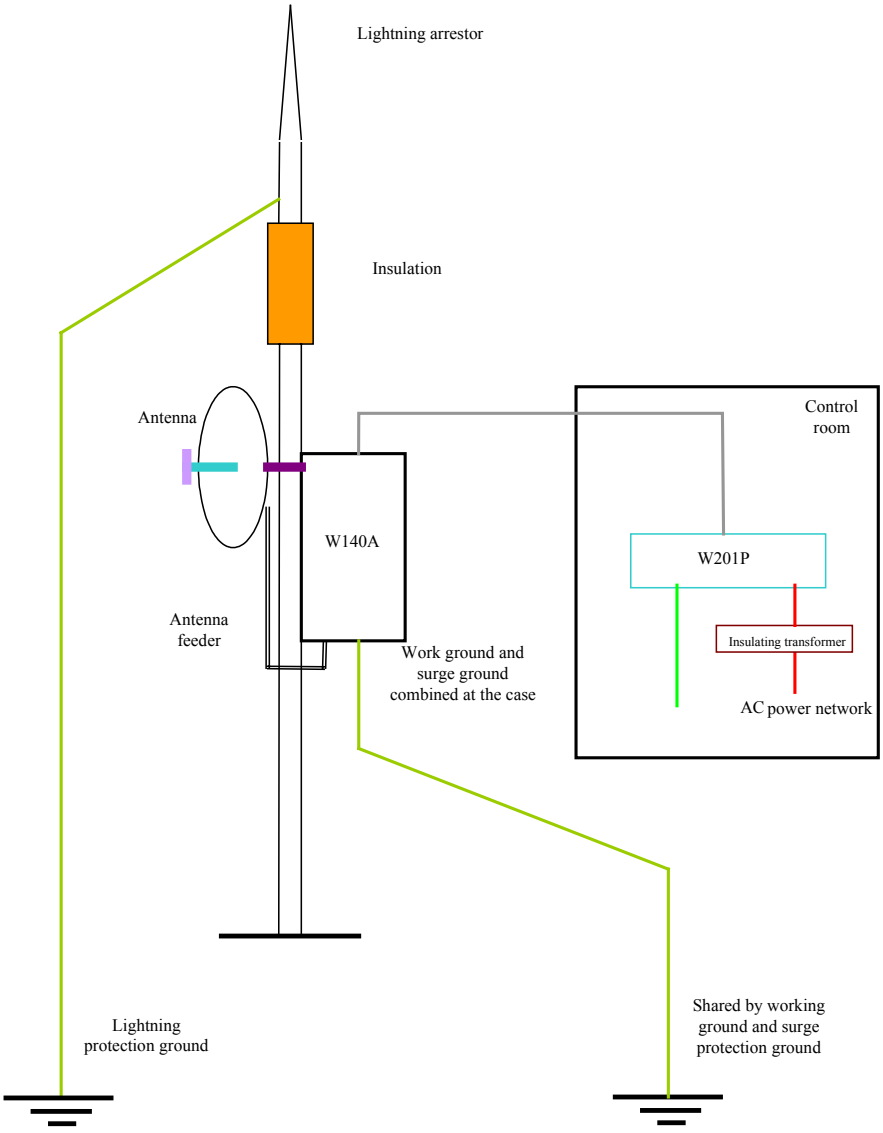


Fig. 2.3-8 The Grounding System of the W140A

2.4 Power-on and Power-off

The W140A accepts power supply over Ethernet. The W140A is equipped with a built-in PoE module. It is connected to the PoE interface in the W201P, the PoE terminal, through the PoE cable attached with the W140A.

To power on the W140A, follow the steps below:

1. Making sure that the W140A is installed correctly, the cable connections are correct, and the water-proof and lightning protection measures are in place.
2. Checking the W201P power supply, to ensure that the power connections are correct and the W201P works normally.
3. Connecting the PoE cable to the W201P.

To power off the W140A, you just need to disconnect the PoE cable.

After power on, the W140A will start automatically, without any manual operation at the management console.

2.5 Debugging

After the W140A is powered on and started, you should perform service debugging. Service debugging serves the following three purposes:

1. Ensuring that the routes between the W140A and Internet/customer server are smooth.
2. Ensuring that each client in the W140A coverage area can access the Internet normally.
3. Ensuring that in the whole engineering coverage area, the clients can roam and be handed over between the APs in different cells.

3 Command Line Configuration

This chapter describes the operation methods and configuration commands of the W140A command line configuration.

3.1 Overview

The W140A provides the Command Line Interface (CLI) for configuring the W140A data.

The CLI configuration of the W140A has the following features:

1. The CLI configuration of the W140A allows users to perform configuration through the Ethernet interface and wireless network card in the Telnet mode.
2. The CLI provides five command modes: User, privileged, configure, Ethernet interface configuration and wireless interface configuration modes One mode is the execution environment of a group of related commands, and one command can be executed only in the corresponding command mode. To obtain the valid commands in the current command mode, just input "?" in the current mode.
3. Commands are divided into information query command and function command. The information query command serves to obtain some information to be queried. The function command serves to change the function configuration of the W140A. The changed configuration is saved in the running configuration information library. To cancel the function configuration, execute the reverse command of the former command (that is, **no** + key word + original command)
4. The CLI provides perfect help system: At any time, you can input "?" to obtain the related help information.
5. The command inputting provides the fuzzy match function: Once the information input by the user is enough for determining a command, it is not necessary to input the full spell.
6. The CLI provides the command history function: You can select a historical command for executing through "↑" or "↓" of the keyboard.

7. The CLI provides two layers of password protection to reject illegal users. The first layer password authentication appears on the Telnet welcome interface, then the safety authentication for accessing the user mode is required. The default user name is “root” and default password is “public”. In the user mode, input the **enable** command and correct password to enter the privileged mode, the default password is “zte”.
8. The CLI can automatically page the output commands on the terminal: “—More—” at the lower left corner of the command output window indicates more output commands. At this time, you can press CTRL to display the next page, press ENTER to output the next line and press other keys to exit.
9. The W140A CLI provides the basic command line editing function. The short-cut keys for editing command lines are described as follows:

   Ctrl + U: Delete the whole command being input.

   Ctrl + A: Move the cursor to the first character of the command line.

   Ctrl + E: Move the cursor to the last character of the command line.

   Ctrl + X: Delete all the characters before the cursor.

   Ctrl + K: Delete all the characters after the cursor (containing the character at the cursor)

   Ctrl + C: Give up all the input contents. Enter the new line and the prompt character will appear.

When the Telnet mode is used for configuring the W140A, you just need to input “telnet *working IP address of W140A*”, as shown in Fig. 3.1-1. By default, the W140A working IP address is 192.168.1.254 and the sub-network mask is 255.255.255.0.

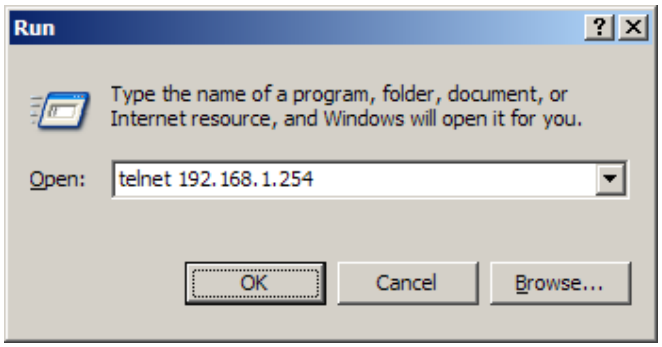


Fig. 3.1-1 Telnet to W140A

These five configuration modes of the W140A and all the available commands under each mode are described in detail as follows: The stipulation of command format is as follows:

1. The *abc* refers to the contents to be input by the user.
2. The {abc | def} means that the user should input either of the two items.
3. [A ~ B] indicates the digital range of the configuration parameters that the user can input.
4. For the contents included in [ ], the user can choose to input or not input them..

3.2 User Mode

Mode of entry: Telnet

Exit mode: exit

Default prompt: wlan>

Note: When an ordinary user logs in to the W140A via Telnet, he/she will not be able to enter the user mode unless he/she passes the username and password authentication. By default, the username and password are "root" and "public". To prevent illegal users from attempting the password frequently, the system will cut the Telnet connections of a user automatically if incorrect passwords have been entered 3 times continuously.

3.3 Privileged Mode

Mode of entry: Type in the enable command in the in use mode and enter the correct password.

Exit mode: disable for entering the user mode; exit for exiting the privileged mode and go back to the system.

Default prompt: wlan#

3.3.1 Command to Test Network Connectivity

Command mode: privileged mode

Function: Test the network connectivity

Command format: ping *A.B.C.D* [-n *echo-number*] [-w *timeout*] [-l *packet-size*]

Parameter description:

Name	Range	Description
A.B.C.D	IP address	Destination IP address
-n	Null	Sets the flag bits for the number of PING packets
echo-number	1~40	The number of PING packets
-w	Null	Sets the flag bits for the maximum timeout interval
Timeout	1~2	Maximum timeout interval (unit: s)
-l	Null	Sets the flag bits for the capacity of buffer area
packet-size	0~1504	Capacity of buffer area

3.3.2 Command to Save Configurations to Flash

Command mode: privileged mode

Function: Save configurations to flash

Command format: wlan#write flash

3.3.3 Command to Reset Software

Command mode: privileged mode

Function: Reset W140A

Command format: wlan#reboot

3.3.4 Command to Enter Configure Mode

Command mode: privileged mode

Function: Enter configuration modes

Command format: wlan#configure terminal

3.3.5 Command to Exit Privileged Mode

Command mode: privileged mode

Function: Exit Privileged Mode and enter User Mode

Command format: wlan#disable

3.3.6 Command to Exit TELNET Configuration

Command mode: privileged mode

Function: Exit Telnet and go back to the system

Command format: wlan#exit

Note: This command can only be used via Telnet. If you log in by using a hyperterminal mode via the serial port, this command will not be available.

3.4 Configure Mode

Mode of entry: Enter the configure terminal command in Privileged Mode

Exit mode: Exit and enter privileged mode

Default prompt: wlan (config) #

Note: In this mode (including the sub-mode), all the configuration commands can be executed.

3.4.1 Commands to Configure Wireless Access-Bridge

1. access-bridge client connect-server

   Command mode: Configure mode

   Function: Configure the MAC address of the access bridge connecting the server

   Command format: wlan (config) #access-bridge client connect-server *mac*

Parameter description:

Name	Range	Description
mac	MAC address in the xx-xx-xx-xx-xx-xx format	MAC address of the access bridge connecting the server

2. access-bridge client enable

   Command mode: Configure mode

   Function: Enable/disable the wireless bridge client

   Command format: wlan(config) #[no] access-bridge client enable

3. access-bridge server connect-client

   Command mode: Configure mode

   Function: Configure the MAC address of the access bridge connecting clients

   Command format: wlan（config）#[no] access-bridge server connect-client *mac*

   Parameter description:

Name	Range	Description
mac	MAC address in the xx-xx-xx-xx-xx-xx format	MAC address of the access bridge connecting clients

4. access-bridge server enable

   Command mode: Configure mode

   Function: Enable/disable the wireless bridge server

   Command format: wlan (config) #[no] access-bridge server enable

3.4.2 Command to Configure Bridge Information

bridge filterdb

Command mode: Configure mode

Function: Configure bridge filtration or cancel the configuration

Command format: wlan (config) #[no] bridge filterdb *max-user aging-time alarm-percent*

Parameter description:

Name	Range	Description
max-user	512~1024	Maximum capacity of the MAC address list
aging-time	10~100,000	Aging time of the MAC address list entries
alarm-percent	1~10	Percent of alarms

3.4.3 Commands to Configure DHCP Server

1. dhcp server dns

   Command mode: Configure mode

   Function: Configure the IP addresses of the master/slave DNS server in the DHCP server

   Command format: wlan (config) # dhcp server dns *A.B.C.D [A.B.C.D]*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP address of the master DNS server
[*A.B.C.D*]	IP address	IP address of the slave DNS server (optional)

2. dhcp server gateway

   Command mode: Configure mode

   Function: Configure the IP address of the default gateway of the DHCP server

   Command format: wlan (config) # dhcp server gateway *A.B.C.D*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP address of the gateway

3. dhcp server leasetime

   Command mode: Configure mode

   Function: Configure the address lease time of the DHCP server

   Command format: wlan (config) # dhcp server leasetime *time-value*

Parameter description:

Name	Range	Description
time-value	60~3600	DHCP server address lease time (unit: s), 60s by default

4. dhcp server run

   Command mode: Configure mode

   Function: Start, stop or restart the DHCP server

   Command format: wlan (config) # dhcp server run *run-flag*

   Parameter description:

Name	Range	Description
run-flag	start, stop, restart	start: Start the DHCP server stop: Stop the DHCP server restart: Restart the DHCH server

5. dhcp server start-flag

   Command mode: Configure mode

   Function: Configure the start flag of the DHCP server for the restart of the system

   Command format: wlan (config) # dhcp server start-flag {true|false}

   Parameter description:

Name	Range	Description
{true|false}	True, false	Start flag of the DHCP server. If it is set to **true**, it will be started when the system is restarted. If **false**, the DHCP server will not be started.

3.4.4 Discover commands

1. discover device

   Command mode: Configure mode

   Function: Configure the multicasting address for the integrated management and the port number of the equipment

   Command format: wlan (config) #discover device *A.B.C.D* [0~65535]

Parameter description:

Name	Range	Description
A.B.C.D	IP address	Multicasting address for the integrated management of the equipment
[0~65535]	0~65535	Snooping port number for the integrated management of the equipment

2. discover manager

   Command mode: Configure mode

   Function: Configure the multicasting address and port number for the integrated management server

   Command format: wlan (config) #discover manager *A.B.C.D* [0~65535]

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	Multicasting address for the integrated management server
[0~65535]	0~65535	Snooping port number for the integrated management server

3.4.5 Commands to Configure 802.1X Parameters

1. dot1x enable

   Command mode: Configure mode

   Function: Enable or disable 802.1x

   Command format: wlan (config) #[no] dot1x enable

2. dot1x max-reauth

   Command mode: Configure mode

   Function: Configure the maximum number of attempts for 802.1x authentication

   Command format: wlan (config)# dot1x max-reauth *max-reauth-times*

   Parameter description:

Name	Range	Description
max-reauth-times	0~10	the maximum number of attempts for 802.1x authentication

3. dot1x max-request

   Command mode: Configure mode

   Function: Configure the maximum number of requests for 802.1x authentication

   Command format: wlan (config) # dot1x max-request max-request-times

   Parameter description:

Name	Range	Description
max-request-times	1~10	Maximum number of requests for 802.1x authentication

4. dot1x md5-domain

   Command mode: Configure mode

   Function: Configure the domain name in the EAP-MD5 authentication mode

   命令格式：wlan（config）Command format: wlan (config) # dot1x md5-domain *string*

   Parameter description:

Name	Range	Description
String	No more than 32 characters	Domain name in the EAP-MD5 authentication mode

5. dot1x nas-id

   Command mode: Configure mode

   Function: Configure the NAS-ID field for 802.1x

   Command format: wlan (config) # dot1x nas-id *string*

   Parameter description:

Name	Range	Description
String	No more than 64 characters	NAS-ID character string

6. dot1x portenable

   Command mode: Configure mode

   Function: Enable or disable 802.1x port control

   Command format: wlan (config) # [no] dot1x portenable

7. dot1x quiet-period

   Command mode: Configure mode

   Function: Configure the quiet-period for 802.1x

   Command format: wlan (config) # dot1x quiet-period *value*

   Parameter description:

Name	Range	Description
Value	1~255	802.1x quiet-period (unit: s)

8. dot1x server-timeout

   Command mode: Configure mode

   Function: Configure the hold time for the 802.1x authentication server

   Command format: wlan (config) # dot1x server-timeout *value*

   Parameter description:

Name	Range	Description
value	1~255	Hold time of the authentication server (unit: s)

9. dot1x sim-domain

   Command mode: Configure mode

   Function: Configure the domain name in the EAP-SIM authentication mode

   Command format: wlan (config) # dot1x sim-domain *string*

   Parameter description:

Name	Range	Description
string	No more than 32 characters	the domain name in the EAP-SIM authentication mode

10. dot1x supp-timeout

    Command mode: Configure mode

    Function: Configure the supp hold time for 802.1x

    Command format: wlan (config) # dot1x supp-timeout *value*

Parameter description:

Name	Range	Description
value	1~255	Hold time of the 802.1x client (unit: s)

11. dot1x tx-period

Command mode: Configure mode

Function: Configure the transmission period for 802.1x

Command format: wlan (config) # dot1x tx-period *value*

Parameter description:

Name	Range	Description
value	1~255	802.1x transmission-period (unit: s)

3.4.6 Command to Set User Password in Privileged Mode

Command mode: Configure mode

Function: Set user passwords in privileged mode

Command format: wlan（config）#enable-password *password*

Parameter description:

Name	Range	Description
password	No more than 30 characters	User password in privileged mode

3.4.7 Command to Delete Filtration Rules

erase mac-access-rule

Command mode: Configure mode

Function: Delete MAC rules according to global rule numbers

Command format: wlan（config）#erase mac-access-rule {static} *acl-rule-number*

Parameter description:

Name	Range	Description
{static}	static	Static mac-access-rule flag
acl-rule-number	0~1023	Filtration rule number

3.4.8 Command to Exit Configuration Mode

Command mode: Configure mode

Function: Exit configure mode and enter privileged Mode

Command format: wlan (config) #exit

3.4.9 Commands to Configure IAPP (Load-balance)

1. iapp balance

   Command mode: Configure mode

   Function: Set the load-balance group ID and nominal capacity

   Command format: wlan (config) #iapp balance group-id capability

   Parameter description:

Name	Range	Description
group-id	1~65535	Load-balance group ID
capability	1~30	Nominal capacity

2. iapp enable-flag

   Command mode: Configure mode

   Function: Enable or disable load balance and the restriction to the maximum number of users allowed

   Command format: wlan (config) #iapp enable-flag {disable|balance|max-user}

   Parameter description:

Name	Range	Description
{disable|balance| max-user}	disable, balance, max-user	disable: Disable the IAPP function. Neither load-balance nor the restriction to the maximum number of users will be enabled. balance: Enable load-balance Max-user: Enable the restriction to the maximum number of users

Tips:

The **iapp balance** and **iapp max-user** configurations cannot take effect at the same time.

3. iapp max-user

   Command mode: Configure mode

   Function: Set the number of users allowed

   Command format: wlan (config) #iapp max-user *value*

   Parameter description:

Name	Range	Description
Value	1~150	Sets the number of users allowed

3.4.10 Interface Skip

1. interface ethernet

   Command mode: Configure mode

   Function: Skip to the Ethernet interface configuration mode. This command ends with the unit number of the Ethernet interface. For equipment, multiple Ethernet interfaces are available.

   Command format: wlan (config) #interface ethernet {0}

   Parameter description:

Name	Range	Description
{0}	0	Unit number of the Ethernet interface. W140A has only one Ethernet interface with the unchangeable value of 0.

2. interface wlan

   Command mode: Configure mode

   Function: Skip to the wireless interface configuration mode. This command ends with the unit number of the wireless interface. For equipment, multiple wireless interfaces are available.

   Command format: wlan (config) #interface wlan {0}

Parameter description:

Name	Range	Description
{0}	0	Unit number of the wireless interface. W140A has only one wireless interface with the unchangeable value of 0.

3.4.11 Commands to Configure Layer 2 Isolation

1. intra-security enable

   Command mode: Configure mode

   Function: Enable or disable Layer 2 Isolation

   Command format: wlan (config) #[no] intra-security enable

2. intra-security gateway

   Command mode: Configure mode

   Function: Configure the IP address or MAC address of the gateway

   Command format: wlan (config) # intra-security gateway {ip *A.B.C.D* | mac *xx-xx-xx-xx-xx-xx*}

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP address of the gateway
xx-xx-xx-xx-xx-xx	MAC address	MAC address of the gateway

3.4.12 Commands to Configure IP network Parameters

1. ip arp

   Command mode: Configure mode

   Function: Add/delete ARP list entries

   Command format: wlan (config) #[no] ip arp *A.B.C.D xx-xx-xx-xx-xx-xx*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP address of the host
xx-xx-xx-xx-xx-xx	MAC address	Hardware address of the host

2. ip route

   Command mode: Configure mode

   Function: Configure the default routing address for the system

   Command format: wlan (config) #[no] ip route *A.B.C.D*[1] *A.B.C.D*[2] *A.B.C.D*[3]

   Parameter description:

Name	Range	Description
A.B.C.D[1]	IP address	IP address of the host
A.B.C.D[2]	Subnet mask	IP address mask of the host
A.B.C.D[3]	IP address	IP address of the next-hop router

3. ip pool

   Command mode: Configure mode

   Function: Configure the IP address pool for the system

   Command format: wlan (config) #[no] ip pool *index A.B.C.D*[1] *A.B.C.D*[2] *A.B.C.D*[3]

   Parameter description:

Name	Range	Description
index	0~9	Group number of the IP address pools
A.B.C.D[1]	IP address	Starting IP address of the host address pool
A.B.C.D[2]	IP address	Ending IP address of the host address pool
A.B.C.D[3]	Subnet mask	Subnet mask of the addresses in an address pool

3.4.13 Command to Configure Log Print Information

1. logmsg all-enable

   Command mode: Configure mode

   Function: Open or close the log print information in all modules

   Command format: wlan (config) #[no] logmsg all-enable

2. logmsg level

   Command mode: Configure mode

   Function: Configure the level of log print information to be output

   Command format: wlan (config) # logmsg level *level-num*

Parameter description:

Name	Range	Description
level-num	Lowest (Flood) Lower (Info) Higher (Error) Highest (Fatal)	Level of the log print information to be output. Only the information with a higher level will be output.

3. logmsg mod-enable

   Command mode: Configure mode

   Function: Determine the module whose log print information should be output

   Command format: wlan (config) # [no] logmsg mod-enable *module*

   Parameter description:

Name	Range	Description
module	A specified module name	Module whose log print information should be output

4. logmsg telnet-log

   Command mode: Configure mode

   Function: Set the log print information output window to the active Telnet window.

   Command format: wlan (config) #[no] logmsg telnet-log

3.4.14 Command to Configure MAC Filter

Command mode: Configure mode

Function: Add/delete an access list by serial number

Command format: wlan（config）#[no] mac-access-list *acl-list-number* {deny|permit} {*macaddr*|any}

Parameter description:

Name	Range	Description
acl-list-number	1~99	MAC filter group number
{ deny|permit }	Deny, permit	Deny: If the conditions meet the requirements, the MAC communication is denied. Permit: If the conditions meet the requirements, the MAC communication is allowed.

Name	Range	Description
{*macaddr*|any}	MAC address in the xx-xx-xx-xx-xx-xx format or any	MAC address from which MAC packets are sent. The source address can be specified in two ways: One is to use six 48-bit hexadecimal numbers with dashes between them (HYPHEN), e.g. 00-d0-d0-f1-c4-ef Another is to use the any keyword as the abbreviation of source 00-00-00-00-00-00. It is not recommended to use this keyword.

3.4.15 Command to Configure MAC Address Authentication

Command mode: Configure mode

Function: Configure MAC address authentication

Command format: wlan (config) #[no] mac-authen {deny|permit} {*macaddr*|any}

Parameter description:

Name	Range	Description
{deny|permit}	Deny, permit	deny: If the conditions meet the requirements, the MAC communication is denied. permit: If the conditions meet the requirements, the MAC communication is allowed.
{*macaddr*|any}	MAC address in the xx-xx-xx-xx-xx-xx format or any	MAC address from which MAC packets are sent. The source address can be specified in two ways: One is to use six 48-bit hexadecimal numbers with dashes between them (HYPHEN), e.g. 00-d0-d0-f1-c4-ef Another is to use the any keyword as the abbreviation of source 00-00-00-00-00-00. It is not recommended to use this keyword.

3.4.16 Command to Configure Users

Command mode: Configure mode

Function: Add/delete usernames

Command format: wlan (config) #[no] manage-user *username password*

Parameter description:

Name	Range	Description
username	1~32 characters	Username
password	1~32 characters	User password

3.4.17 Commands to Configure Radius Server

1. radius-server account

   Command mode: Configure mode

   Function: Add/delete the accounting server of an ISP

   Command format: wlan (config) #[no] radius-server account isp-name master-flag A.B.C.D key-string

   Parameter description:

Name	Range	Description
isp-name	1~255 characters	ISP name
master-flag	master, slave	Master/slave flag of the accounting server
A.B.C.D	IP address	IP address of the accounting server
key-string	1~255 characters	Shared key string for accounting

2. radius-server authen

   Command mode: Configure mode

   Function: Add/delete the authentication server of an ISP

   Command format: wlan (config) wlan（config）#[no] radius-server authen *isp-name master-flag A.B.C.D key-string*

   Parameter description:

Name	Range	Description
isp-name	1-255 characters	ISP name
master-flag	master, slave	Master or slave authentication server. Only one master server can be set.
A.B.C.D	IP address	IP address of the authentication server
key-string	1-255 characters	Shared key string for authentication

3. radius-server dns

   Command mode: Configure mode

   Function: Add/delete the DNS server of an ISP

   Command format: wlan (config) #[no] radius-server dns isp-name A.B.C.D [A.B.C.D]

   Parameter description:

Name	Range	Description
isp-name	1~255 characters	ISP name
A.B.C.D	IP address	IP address of the master DNS server
[*A.B.C.D*]	IP address	IP address of the slave DNS server

4. radius-server isp-name

   Command mode: Configure mode

   Function: Add/delete an ISP

   Command format: wlan (config) #[no] radius-server isp-name *isp-name*

   Parameter description:

Name	Range	Description
isp-name	1~255 character	ISP name

5. radius-server retry-times

   Command mode: Configure mode

   Function: Set the number of retries of RADIUS authentication of an ISP

   Command format: wlan (config) #radius-server retry-times *isp-name retry-time*

   Parameter description:

Name	Range	Description
isp-name	1~255 characters	Name of an ISP which has been created.
retry-time	1~10	Number of retries of RADIUS authentication

6. radius-server timeout

   Command mode: Configure mode

   Function: Set the hold time of the RADIUS authentication of an ISP

   Command format: wlan (config) #radius-server timeout *isp-name timeout*

Parameter description:

Name	Range	Description
isp-name	1~255 characters	Name of an ISP which has been created.
timeout	1~65535	Hold time of the RADIUS authentication (unit: s)

3.4.18 Command to Configure SNMP Module

1. snmp access-host

   Command mode: Configure mode

   Function: Add and delete host IP addresses allowed to access

   Command format: wlan (config) #[no] snmp access-host *A.B.C.D*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	Host IP addresses (up to 10) in dotted decimal format (A.B.C.D)

2. snmp access-mode

   Command mode: Configure mode

   Function: Allow all hosts or hosts in the server-list to access this agent

   Command format: wlan (config) #snmp access-mode {all|list}

   Parameter description:

Name	Range	Description
{all|list}	all, list	all: All users are allow to access list: Users in server-list are allowed to access

3. snmp community

   Command mode: Configure mode

   Function: Configure the SNMP access community string and its access right

   Command format: wlan (config) #snmp community *comstr* {read-only| read-write}

   wlan（config）#no snmp community *comstr*

Parameter description:

Name	Range	Description
comstr	1~32 characters	Names of the SNMP access community strings (up to 10). comstr is a string with up to 32 characters
{read-only|read-write}	read-only, read-write	read-only: read-only access read-write: Read-write access

4. snmp contact

   Command mode: Configure mode

   Function: Set the name and contact information of the equipment administrator

   Command format: wlan (config) #snmp contact *sysContact*

   Parameter description:

Name	Range	Description
sysContact	1~255 characters	A management variable of the system group in MIB II, denotes the name and contact information of the equipment administrator

5. snmp location

   Command mode: Configure mode

   Function: Configure the geographical location of the managed equipment

   Command format: wlan (config) #snmp location *sysLocation*

   Parameter description:

Name	Range	Description
sysLocation	1~255 characters	A management variable of the system group in MIB, used to define the geographic location of the managed equipment

6. snmp nodecode

   Command mode: Configure mode

   Function: Configure the network element (NE) codes of the managed equipment

   Command format: wlan (config) #snmp nodecode *node-code*

Parameter description:

Name	Range	Description
node-code	>= 0 (integer)	A management variable of the system group in MIB, used to define the NE code of the managed equipment

7. snmp nodeid

   Command mode: Configure mode

   Function: Configure the NE ID of the managed equipment

   Command format: wlan (config) #snmp nodeid *node-id*

   Parameter description:

Name	Range	Description
node-code	1~31 characters	A management variable of the system group in MIB, used to define the NE ID of the managed equipment

8. snmp nodecreatdate

   Command mode: Configure mode

   Function: Configure the NE creation date of the managed equipment

   Command format: wlan (config) #snmp nodecreatdate *hh:mm:ss month day year*

   Parameter description:

Name	Range	Description
hh:mm:ss	Time	hh (hour): mm (minute): ss (second)
month	1~12	Month
day	1~31	Day
year	2002~2130	Year: 4 bits

   hh:mm:ss month day year: A management variable of the system group in MIB, used to define the NE creation date of the managed equipment

9. snmp proxytraphost

   Command mode: Configure mode

   Function: Add the address information of a proxy Trap destination host

   Command format: wlan (config) #[no] snmp proxytraphost *A.B.C.D*

Parameter description:

Name	Range	Description
A.B.C.D	IP address	Addresses of the proxy Trap destination hosts (up to 10)

10. snmp sysname

    Command mode: Configure mode

    Function: Set the name of the managed equipment

    Command format: wlan (config) #snmp sysname *sysName*

    Parameter description:

Name	Range	Description
sysName	1~255 characters	A management variable of the system group in RFC1213 MIB, used as the name of the managed equipment

11. snmp trap enable

    Command mode: Configure mode

    Function: Configure if the SNMP Agent is allowed to send Trap

    Command format: wlan (config) #[no] snmp trap enable

12. snmp authtrap enable

    Command mode: Configure mode

    Function: Configure if the SNMP Agent is allowed to send the authentication failed Trap

    Command format: wlan (config) #[no] snmp authtrap enable

13. snmp traphost

    Command mode: Configure mode

    Function: Add the address of a trap destination host and the trap version number

    Command format: wlan (config) #snmp traphost *A.B.C.D* [version *version*]

    wlan（config）#no snmp traphost *A.B.C.D*

Parameter description:

Name	Range	Description
A.B.C.D	IP address	Addresses of Trap destination hosts
version	1~2	Trap version number

3.4.19 Command to Manage Telnet Idle Timeout

Command mode: Configure mode

Function: Set the automatic exit time when the Telnet window is idle

Command format: wlan (config) #telnet idle-timeout *time-value*

Parameter description:

Name	Range	Description
time-value	300~3600 (unit: s)	The automatic exit time when the Telnet window is idle (300s by default)

3.4.20 Commands to Upload/download TFTP Files

1. tftp dir

   Command mode: Configure mode

   Function: Check the free space of a flash disk (unit: byte)

   Command format: wlan (config) #tftp dir

2. tftp pic

   Command mode: Configure mode

   Function: Download graphics files from the Web configuration pages on the TFTP server and save them to a flash disk.

   Command format: wlan (config) #tftp pic *A.B.C.D*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP Address of a TFTP server in dotted decimal format

3. Download files using tftp get

   Command mode: Configure mode

   Function: Download files from the TFTP server using TFTP and save them to

the flash disk.

Command format: wlan (config) #tftp get A.B.C.D *flash-file-name*

Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP Address of a TFTP server in dotted decimal format
flash-file-name	Filename of a version	Full name (including the extension name) of the file to be transmitted from the TFTP server

4. Upload files using tftp put

   Command mode: Configure mode

   Function: Upload files from the flash disk to the TFTP server using TFTP

   Command format: wlan (config) #tftp put *A.B.C.D flash-file-name*

   Parameter description:

Name	Range	Description
A.B.C.D	IP address	IP Address of a TFTP server in dotted decimal format
flash-file-name	Filename of a version	Full name (including the extension name) of the file to be transmitted from the flash disk

3.4.21 Commands to Configure VLAN

1. vlan ap-vid

   Command mode: Configure mode

   Function: Configure the VLAN ID of AP

   Command format: wlan (config) **#vlan ap-vid** *value*

   Parameter description:

Name	Range	Description
value	0~4094	VLAN ID

2. vlan enable

   Command mode: Configure mode

   Function: Enable VLAN

Command format: wlan (config) **#vlan enable**

3. vlan keep-vid

   Command mode: Configure mode

   Function: Allow a terminal to switch over with the same VLAN ID between different APs

   Command format: wlan (config) **#vlan keep-vid**

4. vlan sta-default-vid

   Command mode: Configure mode

   Function: Configure the default VLAN ID of the STA accessed from the AP

   Command format: wlan (config) **#vlan sta-default-vid** *value*

   Parameter description:

Name	Range	Description
value	1~4094	Default VLAN ID when the STA is accessed

5. vlan sta-vid

   Command mode: Configure mode

   Function: Configure the specified VLAN ID of the STA accessed from the AP

   Command format: wlan (config) **#vlan sta-vid** *xx-xx-xx-xx-xx-xx* vlan *value*

   Parameter description:

Name	Range	Description
value	1~4094	Default VLAN ID when the STA is accessed
xx-xx-xx-xx-xx-xx	MAC address	MAC address of the accessed STA

3.4.22 Show Commands

1. show access-bridge

   Command mode: Configure mode

   Function: Display configured parameters of a wireless bridge

   Command format: wlan (config) #show access-bridge

2. show alarm

1) show alarm all

Command mode: Configure mode

Function: Display all alarm information

Command format: wlan (config) #show alarm all

2) show alarm bycode

Command mode: Configure mode

Function: Display alarm Information by alarm code

Command format: wlan (config) #show alarm bycode *code*

Parameter description:

Name	Range	Description
code	1001~3999	Code of an alarm

3) show alarm bylevel

Command mode: Configure mode

Function: Display alarm information by alarm level

Command format: wlan (config) #show alarm bylevel *level*

Parameter description:

Name	Range	Description
level	1~3	Alarm level

3. show bridge configure

Command mode: Configure mode

Function: Display configured bridge parameters

Command format: wlan (config) #show bridge configure

4. show dhcp server

Command mode: Configure mode

Function: Display DHCP server parameters

Command format: wlan (config) #show dhcp server

5. show discover

   Command mode: Configure mode

   Function: Display configured discover parameters of the equipment

   Command format: wlan (config) #show discover

6. show dot1x-cfg

   Command mode: Configure mode

   Function: Display 802.1x parameters

   Command format: wlan (config) #show dot1x-cfg

7. show dynamic-key

   Command mode: Configure mode

   Function: Display dynamic WEP key parameters

   Command format: wlan (config) #show dynamic-key

8. show iapp

   Command mode: Configure mode

   Function: Display configured load-balance parameters

   Command format: wlan (config) #show iapp

9. show interface

   Command mode: Configure mode

   Function: Display configured interface parameters

   Command format: wlan (config) #show interface {ethernet|wlan} Function: Display configured Layer 2 isolation parameters

   Command format: wlan (config) #show intra-security

11. show ip

1) show ip arp

   Command mode: Configure mode

   Function: Display ARP address resolution information

   Command format: wlan (config) #show ip arp

2) show ip if-stat

Command mode: Configure mode

Function: Display IP interface status information

Command format: wlan (config) #show ip if-stat

3) show ip pool

- show ip pool config

Command mode: Configure mode

Function: Display information of all IP address pools

Command format: wlan (config) #show ip pool config

- show ip pool used

Command mode: Configure mode

Function: Display information of allocated IP addresses in the specified IP address pool

Command format: wlan (config) #show ip pool used index

Parameter description:

Name	Range	Description
Index	0~9	Serial number of an IP address pool

4) show ip route

Command mode: Configure mode

Function: Display configured IP route parameters

Command format: wlan (config) #show ip route

12. show logmsg

Command mode: Configure mode

Function: Display all configured log print information

Command format: wlan (config) #show logmsg

13. show mac-access-list

    Command mode: Configure mode

    Function: Display configured mac-access-list information

    Command format: wlan (config) #show mac-access-list {static} [1~99]

14. show mac-authen

    Command mode: Configure mode

    Function: Display configured mac-authen parameters

    Command format: wlan (config) #show mac-authen

15. show manage-user

    Command mode: Configure mode

    Function: Display configured manage-user parameters

    Command format: wlan (config) #show manage-user

16. show radius

    Command mode: Configure mode

    Function: Display configured radius parameters

    Command format: wlan (config) #show radius

17. show snmp

1) show snmp access-host

    Command mode: Configure mode

    Function: Display configured snmp access-host parameters

    Command format: wlan (config) #show snmp access-host

2) show snmp community

    Command mode: Configure mode

    Function: Display configured snmp community parameters

    Command format: wlan (config) #show snmp community

3) show snmp nodeinfo

Command mode: Configure mode

Function: Display configured snmp nodeinfo parameters

Command format: wlan（config）#show snmp nodeinfo

4) show snmp sysinfo

Command mode: Configure mode

Function: Display configured snmp sysInfo parameters

Command format: wlan (config) #show snmp sysinfo

5) show snmp traphost

Command mode: Configure mode

Function: Display configured snmp traphost parameters

Command format: wlan (config) #show snmp traphost

18. show telnet idle-timeout

Command mode: Configure mode

Function: Display the configured interval for telnet idle time-out

Command format: wlan (config) #show telnet idle-timeout

19. show version

Command mode: Configure mode

Function: Display the software version number

Command format: wlan (config) #show version

20. show vlan

Command mode: Configure mode

Function: Display configured VLAN information

Command format: wlan (config) #show vlan

3.5 Ethernet Interface Configuration Mode

Mode of entry: Enter the **interface ethernet** command in configure mode

Exit mode: Exit and enter configure mode

Default prompt: wlan (config-int-ethernet)#

Note: In this mode (including the sub-mode), all information can be configured for relevant interfaces.

3.5.1 Configurations in the Ethernet Interface Mode

Command mode: Ethernet Interface Configuration Mode

Function: Set the mode of rate negotiation for the Ethernet interface

Command format: wlan (config-int-ethernet)# ethernet-mode *mode*

Parameter description:

Name	Range	Description
mode	10M, autoNeg (100M/10M)	Mode of the Ethernet Interface

3.5.2 Command to Exit the Ethernet Interface Configuration Mode

Command mode: Ethernet Interface Configuration Mode

Function: Exit Ethernet interface configuration mode and enter configure Mode

Command format: wlan (config-int-ethernet)# #exit

3.5.3 Command to Configure Ethernet interface IP addresses

Command mode: Ethernet Interface Configuration Mode

Function: Set the IP address of the Ethernet interface

Command format: wlan（config-int-ethernet）#ipaddr *A.B.C.D*^{1} *A.B.C.D*^{2} [second]

wlan（config-int-ethernet）#no ipaddr *A.B.C.D*^{1} [*A.B.C.D*^{2}]

Parameter description:

Name	Range	Description
A.B.C.D^1	IP address	IP address of an interface
A.B.C.D^2	IP address	IP address mask of an interface
[second]	Optional	The additional IP address flag of an interface

3.5.4 Command to Configure MAC filter for the Ethernet Interface

Command mode: Ethernet Interface Configuration Mode

Function: Configure MAC filter for the Ethernet interface

Command format: wlan（config-int-ethernet）#[no] mac-access-group *acl-number direction*

Parameter description:

Name	Range	Description
acl-num	1~99	MAC filter entry number bound to the interface
direction	in	Bind to the "in" direction of the interface

3.6 Wireless Interface Configuration Mode

Mode of entry: Enter the **interface wlan** command in configure mode

Exit mode: Exit and enter configure mode

Default prompt: wlan (config-int-wlan)#

Note: In this mode (including the sub-mode), all information can be configured for relevant interfaces.

3.6.1 Command to Configure 80211b-related Parameters for the Wireless Interface

1. 80211b channel

   Command mode: Wireless interface configuration mode

   Function: Set the current operating channel

   Command format: wlan (config-int-wlan) #80211b channel *channel-num*

   Parameter description:

Name	Range	Description
channel-num	1~13	Wireless channel number: 6 by default

2. 80211b dynamic-key

   Command mode: Wireless interface configuration mode

   Function: Set the dynamic key of the wireless network

   Command format: wlan (config-int-wlan) #80211b dynamic-key key

xx-xx-xx-xx-xx-xx key1-string key2-string used-key

wlan（config-int-wlan）#no 80211b dynamic-key *xx-xx-xx-xx-xx-xx*

wlan（config-int-wlan）#80211b dynamic-key enable *xx-xx-xx-xx-xx-xx*

wlan（config-int-wlan）#no 80211b dynamic-key enable *xx-xx-xx-xx-xx-xx*

Note: The **80211b dynamic-key key** command is used to set the dynamic key for a specified MAC address. The **80211b dynamic-key enable** command is used to enable this dynamic key.

Parameter description:

Name	Range	Description
xx-xx-xx-xx-xx-xx	MAC address	MAC address of the wireless user using the dynamic key
key1-string	5 or 13 characters	First dynamic key (the key length can only be 5 or 13 characters)
key2-string	5 or 13 characters	Second dynamic key (the key length can only be 5 or 13 characters)
used-key	key1, key2	Key number that is used

3. 80211b enh-security enable

   Command mode: Wireless interface configuration mode

   Function: Set to enable or disable the enhanced security function of AP

   Command format: wlan (config) #[no] 80211b enh-security enable

   Note: If the enhanced security function is enabled, the wireless terminal will not be able to scan the AP. If this function is disabled, the AP can be scanned.

4. 80211b essid

   Command mode: Wireless interface configuration mode

   Function: Set ESSID of the wireless network

   Command format: wlan (config-int-wlan) #80211b essid *essid-string*

   Parameter description:

Name	Range	Description
essid-string	1~31 characters	ESSID of the wireless network. By default, it is zxwlan.

5. 80211b frg-threshold

   Command mode: Wireless interface configuration mode

   Function: Set fragment threshold

   Command format: wlan (config-int-wlan) #80211b frg-threshold *value*

   Parameter description:

Name	Range	Description
value	256~2346 (even)	Threshold of fragments, 2346 by default

6. 80211b power

   Command mode: Wireless interface configuration mode

   Function: Set the transmission power of the wireless network card

   Command format: wlan (config-int-wlan) #80211b power value

   Parameter description:

Name	Range	Description
value	auto， 10/20/30/40/50/60/70/80/90/100 (unit: mW) max	auto: automatic power control (default) 10/20/30/40/50/60/70/80/90/100: fixed transmission power max: maximal transmission power

7. 80211b rts-threshold

   Command mode: Wireless interface configuration mode

   Function: Set RTS threshold

   Command format: wlan (config-int-wlan) #80211b rts-threshold value

   Parameter description:

Name	Range	Description
value	0~2347	RTS threshold, 2347 by default

3.6.2 Command to Exit Wireless Interface Configuration Mode

Command mode: Wireless interface configuration mode

Function: Exit wireless interface configuration mode and enter configure mode

Command format: wlan (config-int-wlan)# exit

3.6.3 Command to Enable Link Integrity Detection

Command mode: Wireless interface configuration mode

Function: Set to enable or disable link integrity detection

Command format: wlan (config-int-wlan)#[no] link-integrity enable

Note: the link integrity detection function of AP means that when the Ethernet link of the AP is disconnected, the AP will release all connected wireless users, close the wireless port, and deny the connection requests of other wireless terminals. When the link is recovered, the AP will open the wireless port and accept connections of wireless users.

3.6.4 WEP Configuration of the Wireless Interface

1. wep mode

   Command mode: Wireless interface configuration mode

   Function: Set WEP encryption mode and WEP key format

   Command format: wlan (config-int-wlan) #wep mode {disable | wep64 | wep128 | mix-wep64 | mix-wep128} {Alphanumeric|Hexadecimal}

   Parameter description:

Name	Range	Description
{disable|wep64|wep128| mix-wep64|mix-wep128}	disable wep64 wep128 mix-wep64 mix-wep128	Disable: disable the WEP encryption function wep64: Use the 64-bit WEP encryption wep128: Use the 128-bite WEP encryption mix-wep64: Use a mixed 64-bit WEP encryption. In this mode, the clients can communicate normally with a correct 64-bit encryption key or without encryption. Mix-wep128: Use a mixed 128-bite WEP encryption. In this mode, the clients can communicate normally with a correct 128-bite encryption key or without encryption.
{Alphanumeric| Hexadecimal}	Alphanumeric Hexadecimal	Alphanumeric: WEP key in string format Alphanumeric: WEP key in sexadecimal format

2. wep set-key

   Command mode: Wireless interface configuration mode

   Function: Set the key of WEP encryption

   Command format: wlan (config-int-wlan) #wep set-key *key-id key-text*

   Parameter description:

Name	Range	Description
key-id	key1, key2, key3, key4	Entry number of the key to be set
key-text	5 or 13 characters, or a combination of 10 or 26 sexadecimal digits	If it is set to 64-bit encryption, the key_text argument can be 5 case sensitive characters (in alphanumeric format), e.g. MyKey, or 10 sexadecimal digits (in hexadecimal format), e.g. 11AA22BB33 If it is set to 128-bit encryption, the key_text argument can be 13 case sensitive characters (in alphanumeric format), e.g. MyKey12345678, or 26 sexadecimal digits (in hexadecimal format), e.g. 00112233445566778899AABBCC

3. wep use-key

   Command mode: Wireless interface configuration mode

   Function: Set the WEP encryption key to be used

   Command format: wlan (config-int-wlan) #wep use-key *key-id*

   Parameter description:

Name	Range	Description
Key-id	key1, key2, key3, key4	Entry number of the key to be used

3.6.5 Command to Configure MAC Filter in Wireless Interface Configuration

Command mode: Wireless interface configuration mode

Function: Configure MAC filter for the wireless interface

Command format: wlan (config-int-wlan) #[no] mac-access-group *acl-list-number direction*

Parameter description:

Name	Range	Description
Acl-list-number	1~99	MAC filter entry number bound to the interface
direction	in	Bind to the "in" direction of the interface

3.6.6 Command to Configure Authentication Mode in Wireless Interface Configuration

Command mode: Wireless interface configuration mode

Function: Configure authentication mode for the wireless interface

Command format: wlan (config-int-ethernet) #authmode *auth mode*

Parameter description:

Name	Range	Description
Authmode	OpenSystem SharedKey Both	OpenSystem: Authentication using Opensystem SharedKey: Authentication using Sharedkey Both: Both authentication modes are supported

Appendix A Making of Ethernet Cable

A.1 Making of Ethernet Cables

A.1.1 Making of Straight Through Ethernet Cables (RJ45)

In IP wireless access system, the following network cables must adopt the straight through Ethernet cables:

1. The Ethernet cable between the Ethernet switch (end A) and W201P (end B).
2. If no switch is used, the AC downlink port is directly connected to W201P, and the Ethernet cable between AC (end A) and W201P (end B) is a straight through Ethernet cable.

   The connections of the straight through Ethernet cables are shown in Table A.1-1.

Table A.1-1 Connections of Straight Through Ethernet Cables (RJ45)

End A	Signal Name	Conductor Color	End B	Signal Name	Conductor Color
1	Data receiving Rx+	White/orange	1	Data transmitting Tx+	White/orange
2	Data receiving Rx-	Orange	2	Data transmitting Tx-	Orange
3	Data transmitting Tx+	White/green	3	Data receiving Rx+	White/green
4	MATCH1	Blue	4	MATCH1	Blue
5	MATCH2	White/blue	5	MATCH2	White/blue
6	Data transmitting Tx-	Green	6	Data receiving Rx-	Green
7	MATCH3	White/brown	7	MATCH3	White/brown
8	MATCH4	Brown	8	MATCH4	Brown

A.1.2 Making of Straight Through Power Supply Ethernet Cables (C-RJ45-001)

The Ethernet cable between the W201P (end A) and AP (end B) not only serves as the Ethernet data signal cable, but also provides -48V DC power for two twisted pairs 4&5 and 7&8 on the load balance, to power AP remotely.

The connection method of this cable is the same as that of the straight through cable without power supply, and the connection table is shown in Table A.1-2.

Table A.1-2 Connections of Straight Through Power Supply Ethernet Cables (C-RJ45-001)

End A	Signal Name	Conductor Color	End B	Signal Name	Conductor Color
1	Data receiving Rx+	White/orange	1	Data transmitting Tx+	White/orange
2	Data receiving Rx-	Orange	2	Data transmitting Tx-	Orange
3	Data transmitting Tx+	White/green	3	Data receiving Rx+	White/green
4	GND	Blue	4	GND	Blue
5	GND	White/blue	5	GND	White/blue
6	Data transmitting Tx-	Green	6	Data receiving Rx-	Green
7	-48V	White/brown	7	-48V	White/brown
8	-48V	Brown	8	-48V	Brown

Note:

These cables are with -48 V DC power supply, so make sure to prevent short circuits, otherwise, the signal will be interrupted and the equipment may not work normally, and even the equipment protection action will be activated. GND and -48 V each occupy one twisted pair. These twisted pairs should be separate, otherwise short circuit may occur.

A.1.3 Making of Crossover Ethernet Cables (RJ45J)

The connections of the crossover Ethernet cables are shown in Table A.1-3.

Table A.1-3 Connections of Crossover Ethernet Cables (RJ45J)

End A	Signal Name	Conductor Color	End B	Signal Name	Conductor Color
1	Data receiving Rx+	White/orange	3	Data transmitting Tx+	White/green
2	Data receiving Rx-	Orange	6	Data transmitting Tx-	Green
3	Data transmitting Tx+	White/green	1	Data receiving Rx+	White/orange
4	MATCH1	Blue	4	MATCH1	Blue
5	MATCH2	White/blue	5	MATCH2	White/blue
6	Data transmitting Tx-	Green	2	Data receiving Rx-	Orange
7	MATCH3	White/brown	7	MATCH3	White/brown
8	MATCH4	Brown	8	MATCH4	Brown

Note:

The signals and connection methods mentioned here are designed according to the signal definitions of the ZTE AC equipment interface. If the AC in the actual engineering is not from ZTE, modify the cable making methods according to the actual conditions.

A.1.4 Ethernet Cable Label

After the Ethernet cable is crimped, paste labels on ends A and B of the network cable, indicating name and length of this cable.

1. Label of the straight through Ethernet cable

   The label of the straight through Ethernet cable (RJ45) is shown in Figure A.1-1.

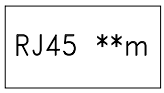


Figure A.1-1 Straight through Ethernet label

   In the diagram, "**m" indicates the actual length of the cable.

2. Label of the straight through power supply Ethernet cable

   The label of the straight through power supply Ethernet cable (C-RJ45-001) is shown in Figure A.1-2.

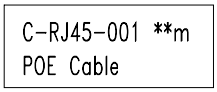


Figure A.1-2 Label of the Straight Through Power Supply Ethernet Cable

   In the diagram, "**m" indicates the actual length of the cable; "PoE Cable" indicates that this is the Ethernet power cable.

3. Label of the Crossover Ethernet Cable

   The label of the crossover Ethernet cable (RJ45J) is shown in Figure A.1-3.

Figure A.1-3 Crossover Ethernet Cable Label

In the diagram, “**m” indicates the actual length of the cable; “J” after “RJ45” indicates that this is the crossover Ethernet cable.