

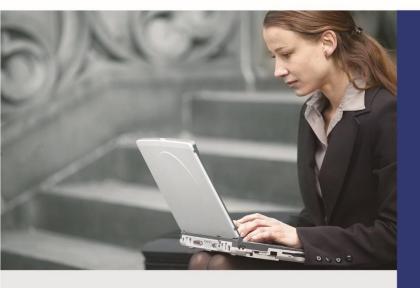


User's Manual

5GHz 802.11ac 900Mbps TDMA

Outdoor Long Range Wireless CPE

WBS-900AC



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Federal Communication Commission Interference Statement

FCC This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- 1. Reorient or relocate the receiving antenna.
- 2. Increase the separation between the equipment and receiver.
- 3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 4. Consult the dealer or an experienced radio technician for help.

FCC Caution

To assure continued compliance, use only shielded interface cables when connecting to computer or peripheral devices. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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
- (2) This device must accept any interference received, including interference that may cause undesired operation.

FCC Radiation Exposure Statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 26cm between the radiator & your body.

CE Compliance Statement

This device meets the RED 2014/53/EU requirements on the limitation of exposure of the general public to electromagnetic fields by way of health protection. The device complies with RF specifications when it is used at a safe distance of 20 cm from your body.

Safety

This equipment is designed with the utmost care for the safety of those who install and use it. However, special attention must be paid to the dangers of electric shock and static electricity when working with electrical equipment. All guidelines of this and of the computer manufacture must therefore be allowed at all times to ensure the safe use of the equipment.

National Restrictions

This device is intended for home and office use in all EU countries (and other countries following the EU directive 1999/5/EC) without any limitation except for the countries mentioned below:

| Country | Restriction | Reasons/remarks |
|------------|--|--|
| Bulgaria | None | General authorization required for outdoor use and public service |
| France | Outdoor use; limited to 10 mW e.i.r.p. within the band 2454-2483.5 MHz | Military Radiolocation use. Refarming of the 2.4 GHz band has been ongoing in recent years to allow current relaxed regulation. Full implementation planned 2012 |
| Italy | None | If used outside of own premises, general authorization is required |
| Luxembourg | None | General authorization required for network and service supply(not for spectrum) |
| Norway | Implemented | This subsection does not apply for the geographical area within a radius of 20 km from the centre of Ny-Ålesund |
| Russian | None | Only for indoor applications |
| Federation | | |

Note: Please don't use the product outdoors in France.

WEEE regulation



To avoid the potential effects on the environment and human health as a result of the presence of hazardous substances in electrical and electronic equipment, end users of electrical and electronic equipment should understand the meaning of the crossed-out wheeled bin symbol. Do not dispose of WEEE as unsorted municipal waste and have to collect such WEEE separately.

Revision

User Manual of 5GHz 802.11ac 900Mbps TDMA Outdoor Long Range Wireless CPE

Model: WBS-900AC

Rev: 2.0 (May, 2024)

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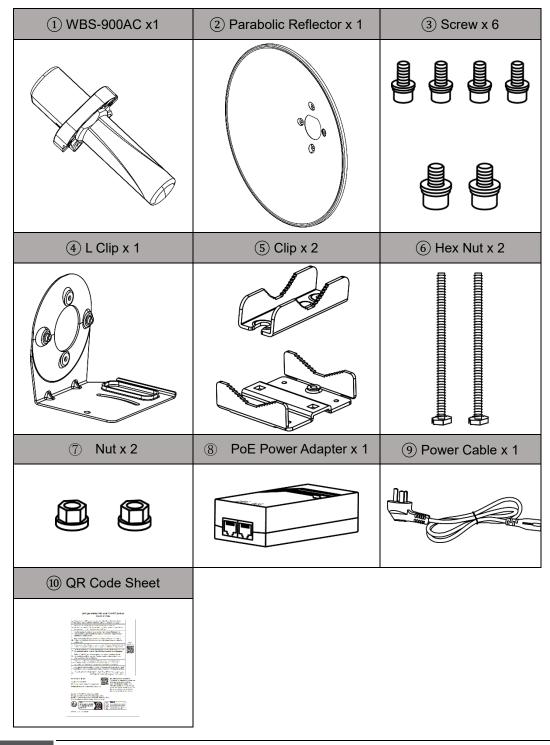
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Chapter 1. Product Introduction

1.1 Package Contents

Thank you for choosing PLANET WBS-900AC. Please verify the contents inside the package box.





If there is any item missing or damaged, please contact the seller immediately.





1.2 Product Description

Stable and Reliable Long-range Outdoor Wireless Solution with Superior Performance

PLANET's newly-revised WBS-900AC 5GHz 802.11ac 900Mbps TDMA Outdoor Long-range Wireless CPE offers a long-range and excellent throughput better than those of traditional wireless devices. One of its standout features is its seamless design, making installation easy. With the standard IEEE 802.3at Power over Ethernet (PoE), the WBS-900AC CPE can be easily installed in areas where power outlets are not available, further enhancing its versatility and ease of deployment. Its PoE capability is designed for both end-span and mid-span configurations, providing flexibility in deployment options.

Whether connecting directly to an end-span PoE switch or through a mid-span PoE injector, the WBS-900AC CPE ensures seamless integration into the existing network infrastructure. The WBS-900AC excels in providing wireless long-distance city-to-city connectivity for all applications. Leveraging TDMA (Time division multiple access) and ATPC (Automatic Transmit Power Control) technologies, it allows multiple users to share the same frequency band without interference, thanks to its intelligent scheduling that assigns different time slots for transmission. This ensures efficient spectrum utilization and reliable performance even in congested environments. Moreover, the WBS-900AC boasts an IP65-rated outdoor enclosure, making it resilient against rigorous weather conditions. Its rugged construction enables it to withstand harsh outdoor environments, ensuring uninterrupted operation in any situation. Overall, the WBS-900AC combines seamless integration, long-range connectivity, and robust weather resistance, making it an ideal choice for various outdoor wireless applications

Benefits of TDMA and ATPC

TDMA is a channel access method for shared-medium networks. It allows several users to share the same frequency channel by dividing the signal into different time slots. The users transmit in rapid succession, one after the other, each using its own time slot. This allows multiple stations to share the same transmission medium while using only a part of its channel capacity. With the TDMA technology, the WBS-900AC reduces interference between users by allowing them to transmit at different times. It provides a better quality data transmission compared to other techniques because it reduces interference and allows for more efficient use of the available frequency spectrum. The ATPC, providing automatic wireless signal adjustment in accordance with the environment, reduces mutual interference between the CPEs, and improves the stability of data transmission.



Benefits of MU-MIMO under 802.11ac Wave 2

With the MU-MIMO Wave 2 technology, the WBS-900AC, installed in public areas such as hotspots, airports and conferences, reduces the frustration that Wi-Fi users often experience in downloading web pages, e-mail file attachments and media contents. For cellular operators, the WBS-900AC provides a better Wi-Fi user experience, reducing the likelihood of users turning off Wi-Fi and putting more load on the cellular network. For enterprises, this technology also can solve Wi-Fi congestion issues in open work spaces and conference rooms.

Flexible, Durable and Reliable Outdoor Characteristics

To reach maximum reliability in the harsh environment, the **WBS-900AC** not only comes with **IP65-rated casing**, but also adopts the Qualcomm Chipset Solution, capable of withstanding wide temperature ranging from **-40 to 70** degrees C. Designed with the **IEEE 802.3at PoE+** (Power over Ethernet) power scheme, the **WBS-900AC** can be easily installed in the areas where power outlets are not available. Furthermore, it is also suitable to be integrated with PLANET Renewable Powered PoE System to offer farther wireless service in remote areas.

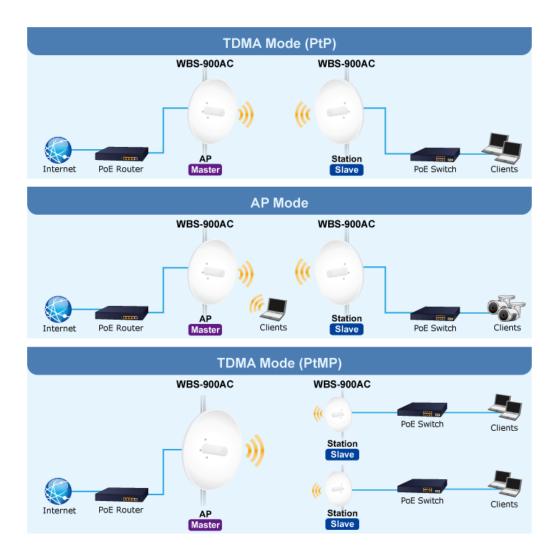


Environmental Adaptations in Outdoor Area



Designed for Various Requirements

The WBS-900AC is specially designed for long-distance outdoor wireless solutions that are capable of establishing stable bridge connection with 25dBi high gain dish antenna. To provide long range and maximum performance., the WBS-900AC can implement 3 operation modes and is easy to use where a multitude of applications in communities, warehouses, campuses, harbors, etc. can be made.





1.3 Product Features

Industrial Compliant Wireless LAN and LAN

- Compliant with time-division multiple access (TDMA) wireless technology
- Compliant with the IEEE 802.11a/n/ac WAVE2 MU-MIMO wireless technology
- 2T2R architecture with data rate of up to 900Mbps
- Equipped with two 10/100/1000Mbps RJ45 ports with auto MDI/MDI-X supported

RF Interface Characteristics

- 25dBi dual-polarization antenna
- High output power with multiply-adjustable transmit power control
- Supports Automatic Transmit Power Control (ATPC)

Outdoor Environmental Characteristics

- IP65 rating; built-in TVS lightning protection
- IEEE 802.3 at Power over Ethernet design
- Operating temperature: -40~70 degrees C

Multiple Operation Modes and Wireless Features

- Multiple operation modes: AP (auto WDS), AP (TDMA), Station (WDS/TDMA) and Station (ARPNAT)
- Supports ATPC function to reduce mutual interference between the CPEs
- WMM (Wi-Fi multimedia) provides higher priority to multimedia transmitting over wireless
- Coverage threshold to limit the weak signal of clients occupying session
- Real-time Wi-Fi channel analysis chart and client limit control for better performance
- Supports Terminal Fast Roaming with 802.11k, 802.11v, and 802.11r

Secure Network Connection

- Full encryption supported: WPA/WPA2, WPA-PSK/WPA2-PSK authentication
- Supports 802.1Q tagged VLAN over WDS/TDMA
- Supports MAC address filtering



1.4 Product Specifications

| Product | | WBS-900AC | |
|----------------------|------------|---|--|
| | | 5GHz 802.11ac 900Mbps TDMA Outdoor Long Range Wireless CPE | |
| Hardware | | | |
| Standard Support | | IEEE 802.11a/n/ac | |
| | | IEEE 802.11i | |
| | | IEEE 802.3 10BASE-T | |
| | | IEEE 802.3u 100BASE-TX | |
| | | IEEE 802.3x flow control | |
| | | IEEE 802.11k, 802.11v, and 802.11r | |
| WBS-900AC | Dimensions | 120 x 260 x 85 mm (W x D x H) | |
| | Weight | 333 g | |
| Antenna | Dimensions | Φ466 × 260 mm | |
| Antenna | Weight | 1560 g | |
| Power Requireme | 26 | Passive 48V DC inject (package included) or | |
| Power Requireme | nits | IEEE 802.3 at PoE+ or 12V DC IN | |
| Power Consumpti | on (max.) | < 15W per device | |
| MTBF (hrs.) | | 50,000 | |
| | | 2 x RP-SMA | |
| Interface | | PoE: 1 x 10/100/1000BASE-TX, auto-MDI/MDIX, 802.3 at PoE In | |
| | | LAN: 1 x 10/100/1000BASE-TX, auto-MDI/MDIX | |
| Button | | Reset button | |
| | | IEEE 802.11a: up to 54Mbps | |
| Data Rate | | IEEE 802.11n (20MHz): up to 150Mbps | |
| Dala Kale | | IEEE 802.11n (40MHz): up to 300Mbps | |
| | | IEEE 802.11ac (80MHz): up to 867Mbps | |
| Media Access Control | | CSMA/CA | |
| Modulation | | 802.11 a/n/ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) | |
| Frequency Band | | 5150~5850MHz | |
| | | 5GHz channel: 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, | |
| Operating Channels | | 124, 128, 132, 136,140, 149, 153, 157, 161 | |
| | | * 5GHz channel list will vary in different countries according to their | |
| | | regulations. | |



| Max. Transmit Power (dBm) | Up to 25 dBm (dep | pending on cou | ntry) | | |
|----------------------------|--|----------------|----------------|---------------------------|--|
| | Network Mode | Data Rate | | Receive Sensitivity (dBm) | |
| | 802.11a | 6M | | -87 | |
| | 002.11a | 54M | | -69 | |
| | 802.11n HT20 | | | -87 | |
| Receiver Sensitivity (dBm) | | MCS7 | | -68 | |
| | 802.11n HT40 | MCS0 | | -85 | |
| | | MCS7 | | -65 | |
| | 802.11ac | MCS0 | | -87 | |
| | | MCS9 | | -64 | |
| | Dual polarization d | ish antenna | 1 | | |
| | Gain | | 25 0 | JBi | |
| | Frequency range | | 5180 -5850 MHz | | |
| | Polarization | | ±45° | | |
| Antenna | Cross-polarization | | 30 dBi | | |
| | VSWR | | < 1.8 | | |
| | Azimuth beam width (H pol) | | 6° | | |
| | Azimuth beam width (V pol) | | 6° | 6° | |
| | Elevation beam width | | 6° | | |
| Environment & Certificatio | n | | • | | |
| Operating Temperature | -40 ~ 70 degrees C | | | | |
| Operating Humidity | 5 ~ 95% (non-condensing) | | | | |
| IP Level | IP65 | | | | |
| ESD Protection | ±6KV | ± 6KV | | | |
| Surge Protection | ±4kV | ±4kV | | | |
| Regulatory | CE, RoHS | | | | |
| Software | | | | | |
| LAN | Static IP/DHCP | | | | |
| | Supports Secondary IP | | | | |
| | Access Point (auto WDS) | | | | |
| Wireless Modes | Access Point (TDMA3)Station (WDS/TDMA3) | | | | |
| | Station (WDS/TDMA3) Station (ARPNAT) | | | | |
| Channel Width | hannel Width 20MHz, 40MHz, 80MHz | | | | |



| Encryption Type | WPA, WPA-PSK, WPA2, WPA2-PSK |
|-----------------------|--|
| | Enable/Disable SSID Broadcast |
| Wireless Security | Wireless Max. 32 MAC address filtering |
| | User Isolation |
| Max. SSIDs | 1 |
| Max. Wireless Clients | 128 (depending on usage) |
| Wireless QoS | Supports Wi-Fi Multimedia (WMM), 4 queues prioritization on TDMA |
| | Auto Channel Selection |
| | Transmit Power: 3 - 30 dBm |
| Wireless Advanced | Client Limit Control, Coverage Threshold |
| | Wi-Fi channel analysis chart |
| | Fast Roaming (IEEE 802.11k, 802.11r, 802.11v) |
| | Device status, wireless client List |
| Status Monitoring | DHCP client table |
| | System Log supports remote syslog server |
| VLAN | IEEE 802.1Q VLAN (VID: 2~4094) |
| | Remote management through HTTPS |
| | Configuration backup and restoration |
| Management | Supports Bonjour (mDNS), CDP/LLDP, SSDP |
| | Supports GRE tunnel |
| | SNMP v1/v2c/v3 support |



Chapter 2. Hardware Installation

2.1 Product Outlook

WBS-900AC

Dimensions: Φ466 × 260 mm



Figure 2-1 WBS-900AC

WBS-900AC CPE

Dimensions: 120 x 260 x 85mm

Front Side



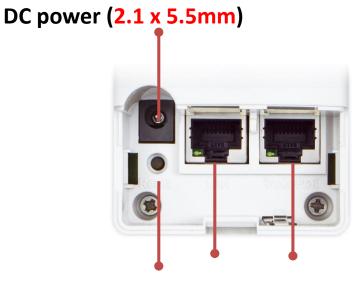
Figure 2-2 WBS-900AC CPE



2.1.1 Port and Button

It provides a simple interface monitoring the CPE. Figure 2-5 shows the hardware-based interface of the WBS-900AC.

WBS-900AC CPE Hardware-based Interface:



Reset button LAN PoE

Supports End-span, Mid-span PoE, and Passive 48V DC injection

Figure 2-3 WBS-900AC CPE Interface

2.1.2 Hardware Description

Hardware Interface Definition

| Object | Description | |
|--------------|--|--|
| 12V DC | 12V DC port for the power adapter (DC-Jack 5.5 x 2.1 mm) | |
| PoE LAN Port | 10/100/1000Mbps RJ45 port, auto MDI/MDI-X with IEEE 802.3 at | |
| | Power over Ethernet | |
| LAN Port | 10/100/1000Mbps RJ45 port, auto MDI/MDI-X | |
| Reset Button | Press and hold the Reset button on the device for over 10 seconds to | |
| | return to the factory default setting. | |



Chapter 3. Connecting to the CPE

3.1 System Requirements

- Broadband Internet Access Service (Cable/xDSL/Ethernet connection)
- IEEE 802.3at PoE switches (supply power to the WBS-900AC CPE)
- PCs with a working Ethernet adapter and an Ethernet cable with RJ45 connectors
- PCs running Windows 10/11, MAC OS 10 or later, Linux, UNIX or other platforms compatible with TCP/IP protocols



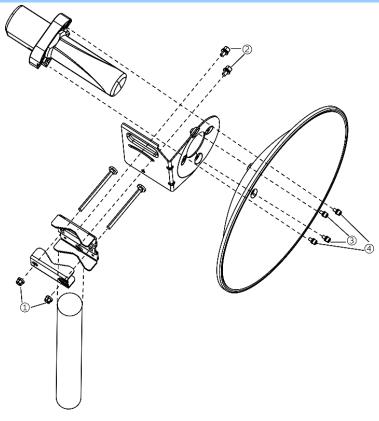
The CPE in the following instructions refers to PLANET WBS-900AC.
 It is recommended to use Microsoft Edge, Firefox or Chrome to access the CPE.

3.2 Installing the WBS-900AC

Before installing the CPE, make sure your PoE switch is connected to the Internet through the broadband service successfully at this moment. If there is any problem, please contact your local ISP.

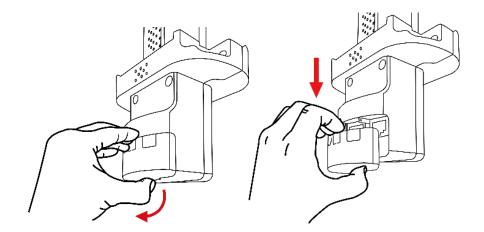
Please install the AP according to the following steps. Don't forget to pull out the power plug and keep your hands dry for safety's sake.

Step 1: Installing Antenna Set and AP Stand

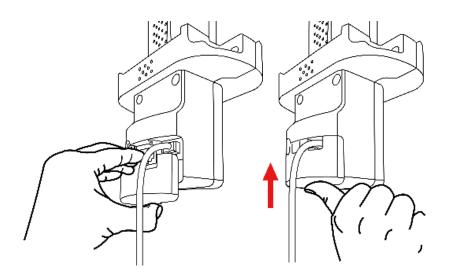




Step 2: Push the latch on the bottom of the Outdoor Wireless CPE to remove the sliding cover.



Step 3: Plug the RJ45 Ethernet cable into the PoE Port of the Outdoor Wireless CPE. Then, slide back the cover to finish the installation.





Chapter 4. Quick Installation Guide

This chapter will show you how to configure the basic functions of your CPE within minutes.



A computer with wired Ethernet connection to the Wireless CPE is required for the first-time configuration.

4.1 Manual Network Setup -- TCP/IP Configuration

The default Master IP address of the WBS-900AC is **192.168.1.253**. And the default Subnet Mask is 255.255.255.0. These values can be changed as you want. In this guide, we use all the default values for description.

Connect the WBS-900AC with your PC by an Ethernet cable plugging in LAN port on one side and in LAN port of PC on the other side. Please power on the WBS-900AC by PoE switch through the PoE port.

In the following sections, we'll introduce how to install and configure the TCP/IP correctly in **Windows 10**. And the procedures in other operating systems are similar. First, make sure your Ethernet Adapter is working, and refer to the Ethernet adapter manual if needed.

4.1.1 Configuring the IP Address Manually

Summary:

- Set up the TCP/IP Protocol for your PC.
- Configure the network parameters. The IP address is 192.168.1.xxx (If the default IP address of the WBS-900AC is 192.168.1.253, and the DSL router is 192.168.1.254, the "xxx" can be configured to any number from 1 to 252.) and subnet mask is 255.255.255.0.
- 1 Select **Use the following IP address**, and then configure the IP address of the PC.
- 2 For example, as the default IP address of the WBS-900AC is 192.168.1.253 and the DSL router is 192.168.1.254, you may choose from 192.168.1.1 to 192.168.1.252.



| eneral | |
|--------------------------------|--|
| | automatically if your network supports ed to ask your network administrator |
| Obtain an IP address automa | atically |
| • Use the following IP address | 6 |
| IP address: | 192.168.1.100 |
| Subnet mask: | 255.255.255.0 |
| Default gateway: | |
| Obtain DNS server address a | automatically |
| Use the following DNS server | |
| Preferred DNS server: | |
| Alternate DNS server: | |
| | |
| | Advanced |
| | |

Figure 4-1 TCP/IP Setting

Now click **OK** to save your settings.

Now, you can run the ping command in the **command prompt** to verify the network connection between your PC and the AP. The following example is in **Windows 10** OS. Please follow the steps below:

- 1. Click on **Start > Run**.
- 2. Type "**cmd**" in the Search box.



| = | d D | Filters \lor |
|---|----------------------------|----------------|
| ඛ | Best match | |
| | Command Pro Desktop app | mpt |
| • | Documents (3+) | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| ۲ | | |
| £ | | |
| | 𝒫 cmd | |

Figure 4-2 Windows Start Menu

- 3. Open a command prompt, type ping **192.168.1.253** and then press **Enter**.
 - If the result displayed is similar to Figure 4-3, it means the connection between your PC and the AP has been established well.

| Administrator: C:\Windows\system32\cmd.exe |
|--|
| Microsoft Windows [Version 6.1.7601] Copyright (c) 2009 Microsoft Corporation. All rights reserved. |
| C: \>ping 192.168.1.253 |
| Pinging 192.168.1.253 with 32 bytes of data: |
| Reply from 192.168.1.253: bytes=32 time=17ms TTL=64 |
| Reply from 192.168.1.253: bytes=32 time=18ms TTL=64 |
| Reply from 192.168.1.253: bytes=32 time=18ms TTL=64 |
| Reply from 192.168.1.253: bytes=32 time=18ms TTL=64 |
| Ping statistics for 192.168.1.253: |
| Packets: Sent = 4, Received = 4, Lost = $0 \langle 0 \times 1 \rangle$ |
| Approximate round trip times in milli-seconds: |
| Minimum = 17ms, Maximum = 18ms, Average = 17ms |
| C: >> |
| · · · · · · · · · · · · · · · · · · · |

Figure 4-3 Successful Result of Ping Command



If the result displayed is similar to Figure 4-4, it means the connection between your PC and the AP has failed.

```
Administrator: C:\Windows\system32\cmd.exe

Microsoft Windows [Uersion 6.1.7601]

Copyright (c> 2009 Microsoft Corporation. All rights reserved.

C:\Documents and Settings\user>ping 192.168.1.253

Pinging 192.168.1.253 with 32 bytes of data:

Destination host unreachable.

Destination host unreachable.

Destination host unreachable.

Ping statistics for 192.168.1.253:

Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\Documents and Settings\user>_
```

Figure 4-4 Failed Result of Ping Command

If the address is 0.0.0.0, check your adapter installation, security settings, and the settings on your AP. Some firewall software programs may block a DHCP request on newly installed adapters.



4.2 Starting Setup in the Web UI

It is easy to configure and manage the CPE with the web browser.

Step 1. To access the configuration utility, open a web-browser and enter the default IP address <u>https://192.168.1.253</u> in the web address field of the browser.

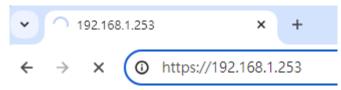


Figure 4-5 Login by Default IP Address

After a moment, a login window will appear. Enter **admin** for the username and password in lower case letters. Then click **LOGIN** or press the **Enter** key.

| 4 | Username | |
|---|----------|---|
| ø | Password | |
| 0 | English | ~ |



| Default IP Address: 192.168.1 | .253 |
|-------------------------------|------|
| Default Username: admin | |

Default Password: admin



If the above screen does not pop up, it may mean that your web browser has been set to a proxy. Go to Tools menu> Internet Options> Connections> LAN Settings on the screen that appears, uncheck **Using Proxy** and click **OK** to finish it.



Chapter 5. Configuring the CPE

This chapter delivers a detailed presentation of CPE's functionalities and features 3 main items below, allowing you to manage the CPE with ease.

| | Setting | gs _ | Tools | | | | |
|---|--|---|----------|------------------|--|-------------|-------------|
| | tatus | e) Simple mode (| | Support | | | Logou |
| | PLANET etworking & Communication | i 🔅 🗶 | | | Uptime 16 min. 52 sec. Ethernet1: 1000BaseT/full Ethernet2: Disconnected | CPU load (0 | %) |
| i | INFORMATION | | | | | | 0 |
| ₩ | Device s Netwo | uct name: WBS-900AC(V2) errial No.: 0F2A23480000034 ork mode: Bridge ss mode: Station (WDS/TDMA 3) | | | Operating country: US (PTMP sc endly device name: WBS-900AC(Device location: Device locatio atitude/Longitude: 0 / 0 | V2) | |
| | Channel wi Tx pov | Channel: dth, MHz: wer, dBm: 29 por, dBm: -97 | | | Protocol: 802.11a/n/ac/ Radio mode: MIMO 2x2 Antenna gain, dBi: 0 | TDMA 3 | |
| | Wireless Station (| WDS/TDMA 3) | | | | | |
| | Network SSID | Security | Peer MAC | Tx/Rx rate, Mbps | Tx/Rx CCQ, % | Protocol | Link uptime |
| | PLANET_5G | WPA/WPA2 Personal | | / | / | - | - |
| | IP Subi Default DNS Secondary IP | Pethod: Static address: 192.168.1.253 net mask: 255.255.255.0 gateway: 192.168.1.254 server 1: 8.8.8.8 'address: 192.168.1.00 net mask: 255.255.0 | | | IPv6 method: Disabled | | |

Figure 5-1 Main Menu



The page includes the following fields:

| Object | Description |
|---------------------|--|
| Version | It shows the firmware version (Click "Update" to update a firmware.). |
| Status | It shows the current mode status. |
| Settings | It shows the settings of Wireless, Network or other Services. |
| Tools | It provides some tools to check wireless connection status or link test. |
| Support | It shows the system log and download setting for troubleshooting. |
| Uptime | It shows time during the CPE is in operation. |
| CPU loading | It shows the current loading of CPU |
| Ethernet | It shows the Ethernet connection status and the connected speed |
| Wi-Fi connection | It shows how many clients are currently connected with. |
| Product information | It shows the CPE information and wireless mode status. |
| Radio status | It shows the current radio setting of the CPE. |
| Wi-Fi information | It shows the current wireless setting of the CPE. |
| Network information | It shows the current network port stats of the CPE. |

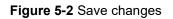


5.1 CPE Configuration

5.1.1 Apply Configuration

On the Web interface, you will find a button located in the upper-right corner that provides access to three device configuration management options.

| APCPE.QA-3.v7.7-Planet.e7135c5 (Update) Simple mode 🌣 | | | | | | |
|---|---------|---------------------------|---------------|---------------------------------|--|--|
| PLANET | i 🔹 🗶 👔 | Uptime 30 min. 22 sec. | CPU load (2 % | Test changes Discard changes | | |
| Networking & Communication | | Ethernet1: 1000BaseT/full | Searching | Logout | | |



The page includes the following fields:

| Object | Description |
|-----------------|---|
| Save changes | By pressing the "Save Changes" button, any modified settings will be saved and applied. |
| Test changes | When you press the "Test Changes" button, any modified settings will be applied within 3 minutes. During the testing period, you can evaluate whether the changes are working correctly, and then save the settings. If the changes result in failure or loss of connection, the settings will automatically roll back. |
| Discard changes | By pressing the "Discard Changes" button, it will discard any modified settings. |

5.1.2 Status

After logging in, the Web management interface displays the status information page. The top of the Web management interface displays the device's main information, including firmware version, product name, normal running time, CPU load, Ethernet port status, and client connection count.

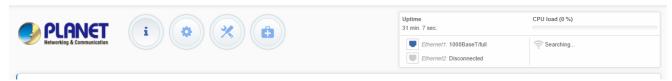


Figure 5-3 Status



5.1.2.1. Information

The information page displays a summary of the device's status information, showing important details related to the CPE operation mode, wireless and network settings.

| INFORMATION | | | | | | | | |
|--|---|----------|------------------|--|---------------------------------|----------|-------------|--|
| Device serial No Network mod | e: WBS-900AC(V2) .: 0F2A234800000034 e: Bridge e: Station (WDS/TDMA 3) | | Friend | erating country: U Iy device name: V Device location: D tude/Longitude: 0 | /BS-900AC(V2) evice location |) | | |
| Channel Channel width, MH Tx power, dBr Noise floor, dBr Wireless Station (WDS/T | z: n: 29 n: -97 | | An | Protocol: 8 Radio mode: M tenna gain, dBi: 0 | 02.11a/n/ac/TDMA IIMO 2x2 | .3 | | |
| Network SSID | Security | Peer MAC | Tx/Rx rate, Mbps | Tx/Rx CCQ | I, % | Protocol | Link uptime | |
| PLANET_5G | WPA/WPA2 Personal | | / | / | | | | |
| | | | | | | | | |
| Network | | | | | | | | |

Figure 5-4 Status – Information



5.1.2.2. STATISTICS

The statistics section is divided into two parts, which display network interface counters and traffic graphs for wired and wireless interfaces.

| | \$ | | | | | | | |
|---|-----------------------|--|----------|------------|------------|------------|-----------|-----------|
| Interface col | videra | | | | | | | |
| | | | | | | | | |
| Interface | | MAC address | Ta data | Rx data | Te packata | Rx packets | Tx errors | Rx errors |
| 849 | | | 227.66 | 361.20 KiB | 3.318 | 3.39 k | 0 | 0 |
| Wred | | | | | | | | |
| #80 (20seco | | 10000 | 20.90 MB | 29.79 Mill | 30.09 k | 26.30 k | | . 0 |
| eth1/Eitherne | da - | A 10 10 10 10 10 10 10 10 10 10 10 10 10 | 0 | 4 | | | 0 | 0 |
| Wireless | | | | | | | | |
| #00 ////weisi | -72123.00 | 10000 | 27.30 MB | 21.72 MB | 05.70 k | 96.45 k | 318 | |
| : A | | | | MA | ~ | | | |
| 2 Wired (Ether | | 1007.) | ~ | | 2 | ~ | | |
| 2 Wired (Ether Tr. Mbsr WR. Most | | | ~ | | | | | |
| 2 Wired (Ether Tx, Mber Wireless (at | 6 | | ~ | | | | | |
| 2 Wired (Ether Tx, Mbes Rx, Mbes Wireless (ab | x0) traffic (tast 5 m | | ~ | | | | | |
| 2 Wired (Ether 1 Rx, Mbps 1 Wireless (ab | x0) frathe (tast 5 m | | ~ | | | | | |
| 2 Wired (Ether Tr, Mbs Re, Mon Wireless (at) 4 14 14 14 15 14 15 14 15 16 17 14 17 17 18 18 18 18 18 18 18 18 18 18 | x0) frathe (tast 5 m | | ~ | | | | | |
| 2 Wired (Ether 1 Rx, Mbps 1 Wireless (ab | x0) frathe (tast 5 m | | ~ | | | | | |
| 2 Wired (Ether Tx, Mbsr Rx, Mosr Rx, Mosr Wireless (at) 14 14 15 14 15 14 15 16 17, Mbsr 16 16 16 16 16 16 16 16 16 16 | x0) frathe (tast 5 m | | | | | | | |

Figure 5-5 Status – Statistics



The SSID name is displayed in parentheses next to the wireless interface (and VAPs).

The MAC address displays the MAC address of the specified interface.

Tx Sent Data displays the amount of data sent.

Rx Received Data displays the amount of data received.

Tx Packets displays the number of packets sent.

Rx Packets displays the number of packets received.

Tx Errors displays the number of errors that occurred while sending.

Rx Errors displays the number of errors that occurred while receiving.

The wired and wireless interface graphs display real-time data traffic.



Figure 5-6 Wired and Wireless Interface Graphs



5.1.2.3. Network

In the Network page, you can view the network information, including the routing table and DHCP leases.

| i | NETWORK | | | | | 0 |
|---|---------------------------------|---------------|--------|---------------|----------------|---|
| M | Enter keyword to filter results | | | | | |
| = | Routing table | | | | | |
| | Routes: 2 | | | | | |
| | Network | Subnet mask | | Gateway | Interface | |
| | default | 0.0.0.0 | | 192.168.1.254 | br0 | |
| | 192.168.1.0 | 255.255.255.0 | | • | br0 | |
| | ARP table | | | | | |
| | ARP records: 1 | | | | | |
| | IP address | MAC addres | is | | Interface | |
| | 192.168.1.33 | 00:05:1B:33: | 44:EC | | br0 | |
| | Bridge MAC table | | | | | |
| | MAC addresses: 2 | | | | | |
| | Interface | MAC a | ddress | | Last seen | |
| | br0 | | | | | |
| | eth0 (Ethernet1) | | | | 3 min. 58 sec. | |
| | ath0 (Wireless-FB2B86) | | | | 0 min. 1 s.ec. | |
| | ath0 (Wireless-FB2E86) | | | | 1 min. 53 sec. | |

Figure 5-7 Status - Network

5.1.3 Settings

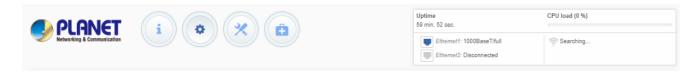


Figure 5-8 Setting

5.1.3.1. Wireless Configuration

The CPE device has two wireless modes: Access Point (TDMA3) and Station (WDS/TDMA3). The TDMA3 wireless mode is a proprietary protocol designed for point-to-multipoint wireless solutions. It uses a polling mode to effectively counter interference and improve wireless transmission performance.

| ę | WIRELESS CONFIGUR | RATION | | | | |
|------------|------------------------|----------------------------------|------------|--------------------|--------------------|---|
| ភំង | Enal | ble radio: 🔽 🔢 | | Operating country: | US (PTMP scenario) | |
| ₽ | | ng mode: Access point (auto WDS) | ~ | | | |
| | Radio settings | | | | | |
| 08 | Тх ром | ver, dBm: 29 |] | Channel: | Auto / 80 MHz | |
| 101 011 | Enat | ble ATPC: | | | | |
| | Advanced radio setting | S | | | | |
| | Network SSID | Security | Management | Broadcast SSID | VLAN | |
| | PLANET_5G | WPA/WPA2 Personal | Enabled | Yes | | • |
| | | | | | | |

Figure 5-9 Settings - Wireless Configuration

| | Operating country: US (PTMP scenario) |
|---------------------|---------------------------------------|
| ss point (auto WDS) | |
| | |
| 29 | Channel: Auto / 80 MHz |
| | |
| | |
| 0 2x2 ▼ BA | window size, frames: 64 |
| 7 (256-QAM 5/6) 🗸 | RTS/CTS: |
| | |
| | |
| Management | Broadcast SSID VLAN |
| 2 Personal Enabled | Yes 🔷 |
| | |

Wireless mode: Access Point

Figure 5-10 Access Point Configuration



The page includes the following fields:

| Object | Description | | |
|---------------------|---|--|--|
| Enable Radio | Enables or disables the CPE wireless switch. | | |
| Country | Displays the country in which the CPE bridge is operating. The country selection determines the available channels, frequencies, and transmission power levels based on regulatory restrictions in the operating country. The country is selected during the initial CPE device installation, but can be updated if necessary. | | |
| Tx power (dBm) | Sets the transmission power level when the device transmits data. The farther the distance is, the more transmission power is required. Use the slider or enter a value manually to set the transmission power level. When a value is entered manually, the slider position changes based on the input value. The maximum transmission power level is limited to the value allowed by the regulatory agency in the country where the device is operating. | | |
| АТРС | Selects whether to enable automatic transmit power control (ATPC). If enabled, the CPE wireless will continually communicate with the remote device to automatically adjust the best transmission power. | | |
| Channel | Displays the channel on which the AP is operating, or click to use the automatic channel function. Clicking the button displays the channel selection window. (See figure 5-14) | | |
| Max data rate, Mbps | Select the maximum data rate at which the AP should transmit data packets (in Mbps). The AP will attempt to transmit data at the set maximum data rate. If interference occurs, the CPE will fall back to the highest rate at which data transmission is allowed. Only applicable to 802.11a or 802.11a/n IEEE mode. | | |
| AMSDU | Enable AMSDU packet aggregation. If enabled, the maximum size of the 802.11 MAC frame will be increased. Only applicable to 802.11n or 802.11a/n IEEE mode. | | |



| (î: | WIRELESS CONFIGURATION | | | | | |
|------------|-------------------------|-----------------------|------------|--------------------------|------|---|
| សំ | Enable radio: | ~ []] | | Operating country: CT | | |
| ≓ | Operating mode: | Access point (TDMA 3) | ~ | | | |
| | Radio settings | | | | | |
| 0 8 | Tx power, dBm: | [] 29 | | Channel: Auto / 80 MHz | | |
| 101 | Enable ATPC: | II × | | | | |
| | Advanced radio settings | | | | | |
| | Radio mode: | MIMO 2x2 V | | Polling parameters: Edit | | |
| | Max data rate, Mbps: | 866.7 (256-QAM 5/6) | ~ | | | |
| | WMM: | ~ | | | | |
| | AMSDU: | ~ | | | | |
| | Network SSID | Security | Management | Broadcast SSID | VLAN | |
| | PLANET_5G | WPA2 Personal | Enabled | Yes | | ٥ |

Figure 5-11 Channel Table

The page includes the following fields:

| Object | Description | |
|----------------------|--|--|
| Channel Width | Select the width of the wireless channel. CPE supports 20, 40, and | |
| | 80 MHz channel widths. | |
| Hide Indoor Channels | Use switching to display only outdoor channels. | |

Wireless AP Settings

| Network SSID | Security | Management | Broadcast SSID | VLAN | |
|--------------|---------------|------------|----------------|------|---|
| PLANET_5G | WPA2 Personal | Enabled | Yes | | ٠ |

Figure 5-12 Wireless setting



Click the icon to edit AP wireless settings:

| WIRELESS AP SETTINGS | | | |
|---------------------------|---------------|---------------------------|----------|
| SSID: | PLANET_5G | Broadcast SSID: | ~ |
| Security settings | | | |
| Security: | WPA2 Personal | ~ | |
| Passphrase: | ****** | | |
| Bandwidth limitation | | | |
| Outgoing (AP to Station): | x II | Incoming (Station to AP): | * |
| B WACL | | | |
| MAC filter policy: | Open | ~ | |
| □ Advanced settings | | | |
| Client isolation: | x | Insert DHCP option 82: | |
| Max connected clients: | 128 | Multicast enhancement: | ✓ ■ |
| Min client signal, dBm: | -90 | Multicast echo: | ✓ □□ |
| Map to data VLAN ID: | 10 | Preamble type: | Short 🗸 |
| Management over wireless: | Enabled | ~ | |
| | | | Done |

Figure 5-13 Wireless AP Settings



The page includes the following fields:

| Object | Description |
|----------------------------------|--|
| SSID | Specify the unique name of the wireless network device. The device will broadcast this SSID message to all radios within range, promoting it. |
| Broadcast SSID | If this option is disabled, the CPE device will not broadcast its SSID to workstation devices. |
| User isolation | Select Layer 2 isolation to prevent client-to-client communication. |
| Business VLAN ID | Specify the VLAN ID that traffic is tagged for on a specific VAP interface. Devices associated with a specific SSID will be grouped into this VLAN. Mapping to the data VLAN ID is not available if the device is running in router network mode. |
| Maximum client connection number | Specify the maximum number of wireless clients associated with the AP radio. |
| Minimum client signal, dBm | If enabled, the AP will disconnect clients with a signal lower than the configured threshold. |
| Management over wireless | Control wireless management access. For security reasons, it is recommended to disable wireless access and use Ethernet cable for physical network connection to manage CPE access. Wireless management is not available if the device is running in router network mode. |
| Multicast enhancement | If clients do not send IGMP (Internet Group Management Protocol) messages, they will not register as recipients of multicast traffic. With IGMP listening, the multicast enhancement option isolates multicast traffic from unregistered clients and allows devices to send multicast traffic to registered clients at higher data rates. This reduces the risk of traffic overload on PtMP links and increases the reliability of multicast traffic as packets are retransmitted if the initial transmission fails. If clients do not send IGMP messages but should receive multicast traffic, you may need to disable multicast enhancement. This option is enabled by default. |



Wireless Mode: Station (WDS/TDMA3)

| (î; | WIRELESS CONFIGURATION | | | | |
|------|-------------------------|----------------------|-------------------------|------------|----|
| ភង | Enable radio: | ✓ []] | Operating country: | СТ | |
| ≓ | Operating mode: | Station (WDS/TDMA 3) | | | |
| | Radio settings | | | | |
| OS . | Tx power, dBm: | 1) 29 | Channel width, MHz: | 20/40/80 🗸 | |
| 00 | Enable ATPC: | * | Smart channel width: | × | |
| | | | Non-standard channels: | × | |
| | Advanced radio settings | | | | |
| | Radio mode: | MIMO 2x2 V | BA window size, frames: | | 64 |
| | Max data rate, Mbps: | 866.7 (256-QAM 5/6) | Missed beacon limit: | | 2 |
| | WMM: | ✓ Ⅱ | RTS/CTS: | li x | |
| | AMSDU: | ✓ □□ | | | |
| | Short GI: | ✓ □□ | | | |
| | Network SSID | Security | Management | VLAN | |
| | PLANET_5G | WPA/WPA2 Personal | Enabled | | 0 |

Figure 5-14 Wireless Station Configuration

The page includes the following fields:

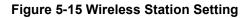
| Object | Description | | |
|---|---|--|--|
| Enable Radio | Enable or disable the CPE wireless switch. | | |
| Country | Display the country in which the CPE bridge is operating. The country selection determines the available channels, frequencies, and transmission power levels based on regulatory restrictions in the operating country. The country is selected during the initial CPE device installation, but can be updated if necessary. | | |
| Tx power (dBm)Set the transmission power level when the device transmits dateTx power (dBm)Set the transmission power level. When a value manually to set transmission power level. When a value is entered manually, slider position changes based on the input value. The maxim transmission power level is limited to the value allowed by regulatory agency in the country where the device is operating. | | | |
| АТРС | Select whether to enable automatic transmit power control (ATPC). If enabled, the CPE wireless will continually communicate with the remote device to automatically adjust the best transmission power. | | |
| Channel | Display the channel on which the AP is operating, or click to use the automatic channel function. Clicking the button displays the channel selection window. | | |



| | Select the maximum data rate at which the AP should transmit data | |
|---------------------|--|--|
| | packets (in Mbps). The AP will attempt to transmit data at the set | |
| Max data rate, Mbps | maximum data rate. If interference occurs, the CPE will fall back to | |
| | the highest rate at which data transmission is allowed. Only | |
| | applicable to 802.11a or 802.11a/n IEEE modes. | |
| | Enable AMSDU packet aggregation. If enabled, the maximum size | |
| AMSDU | of the 802.11 MAC frame is increased. Only applicable to 802.11n | |
| | or 802.11a/n IEEE modes. | |

Wireless Station Settings

| Network SSID | Security | Management | VLAN | |
|--------------|-------------------|------------|------|---|
| PLANET_5G | WPA/WPA2 Personal | Enabled | | ٠ |



Click the icon 🌞 to edit Station wireless settings:

| WIRELESS ST | ATION SETT | INGS | | | | |
|-----------------|----------------|-------------------|---|---------------------------|-------------------|--------|
| Primary SSID | Failover SSI | D | | | | |
| | SSID: | PLANET_5G | Q | Lock AP by MAC address: | 00:00:00:00:00:00 | |
| Security settin | gs | | | | | |
| | Security: | WPA/WPA2 Personal | ~ | | | |
| | Passphrase: | ******* | | | | |
| ⊟ Bandwidth lin | nitation | | | | | |
| Outgoing (S | tation to AP): | x | | Incoming (AP to Station): | x | |
| □ Advanced se | ttings | | | | | |
| Map to d | ata VLAN ID: | 10 | | Insert DHCP option 82: | × | |
| Management o | ver wireless: | Enabled | ~ | Multicast enhancement: | ✓ □ | |
| | | | | | Done | Cancel |

Figure 5-16 Wireless Station Settings



The page includes the following fields:

| Object | Description |
|--------------------------|---|
| SSID | Manually specify the SSID for the wireless network device, or automatically scan for access points. |
| Business VLAN ID | Specify the VLAN ID that traffic is tagged for on a specific VAP interface. Devices associated with a specific SSID will be grouped into this VLAN. Mapping to the data VLAN ID is not available if the device is running in router network mode. |
| Management over wireless | Control wireless management access. For security reasons, it is recommended to disable wireless access and use Ethernet cable for physical network connection to manage CPE access. Wireless management is not available if the device is running in router network mode. |
| Multicast enhancement | If clients do not send IGMP (Internet Group Management Protocol) messages, they will not register as recipients of multicast traffic. With IGMP listening, the multicast enhancement option isolates multicast traffic from unregistered clients and allows devices to send multicast traffic to registered clients at higher data rates. This reduces the risk of traffic overload on PtMP links and increases the reliability of multicast traffic as packets are retransmitted if the initial transmission fails. If clients do not send IGMP messages but should receive multicast traffic, you may need to disable multicast enhancement. This option is enabled by default. |



5.1.3.2. Network Configuration

By using the network configuration interface in the settings, you can control the network configuration of the device.

Using the Ethernet configuration table, you can configure the Ethernet interface.

| Ethernet settings | | | | |
|-------------------|------|-------------|--------|-----------------|
| Interface | Mode | Speed, Mbps | Duplex | Autonegotiation |
| Ethernet1 | Auto | 10/100/1000 | Full | Enabled |
| Ethernet2 | Auto | 10/100/1000 | Full | Enabled |



Click on the desired Ethernet interface name and configure the parameters:

| Mode: | Auto | ~ |
|------------------|-------------|---|
| Speed, Mbps: | 10/100/1000 | ~ |
| Duplex: | Full | * |
| Autonegotiation: | Enabled | |

Figure 5-18 Ethernet Interface Settings

| Object | Description |
|------------------|--|
| Mode | Select the configuration mode of the Ethernet port: auto, fixed, advanced. |
| Speed, Mbps | Select the Ethernet link speed for a specific Ethernet port. |
| Duplex | Select the duplex mode for a specific Ethernet port in the country where the device is operating. |
| Auto-negotiation | Select the automatic negotiation to advertise and negotiate the Ethernet link duplex configuration (half/full) to obtain the highest possible data rate. |

The page includes the following fields:





Network Mode: Bridge

When configuring the device in bridge mode, you only need to configure the device's LAN settings on the "Network Configuration" page:

| ((t) | NETWORK CONFIGUR | ATION | | | |
|--------------|--------------------|------------------------|-------------|-------------------|------------------|
| ភំ | Networ | rk mode: Bridge | ~ | Management VLAN I | D: 2 |
| ≓ | Enal | ble IPv6: 🛛 🗶 | | | |
| o: | Enal | ble STP: × | | | |
| | Ethernet settings | | | | |
| ļ ģi | Interface | Mode | Speed, Mbps | Duplex | Autonegotiation |
| | Ethernet1 | Auto | 10/100/1000 | Full | Enabled |
| | Ethernet2 | Auto | 10/100/1000 | Full | Enabled |
| | IPv4 configuration | | | | |
| | IP | method: Static | ~ | DNS server | 1: 8.8.8.8 |
| | IP a | address: 192.168.1.253 | | DNS server | 2: |
| | Subne | et mask: 255.255.255.0 | | Secondary I | P: 🗸 📗 |
| | Default g | gateway: 192.168.1.254 | | IP addres | s: 192.168.1.100 |
| | | | | Subnet mas | k: 255.255.255.0 |

Figure 5-19 Bridge Mode Settings

The page includes the following fields:

IPv4 configuration.

| Object | Description |
|-----------------|---|
| | Static - the IP address must be manually configured. |
| IP method | Dynamic - the IP address of this device will be assigned by the |
| | DHCP server. |
| IP address | The device's IP address. |
| Subnet mask | Specify the device's subnet mask. |
| Default gateway | Specify the device's gateway IP address. |
| DNS server | Specify the domain name server. |
| Secondary IP | Specify the backup IP address and subnet mask managed by the |
| | CPE. |



Click the "Enabled IPv6" tab to enable IPv6 configuration. The IPv6 settings will appear in the IPv6 configuration section:

IPv6 configuration.

| Object | Description | |
|----------------------|---|--|
| IPv6 method | Static - the DHCPv6 client only obtains network parameters other than the IPv6 address. Dynamic - the DHCPv6 client requires both the IPv6 address and other network parameters (such as DNS server, domain name, etc.). | |
| IPv6 address | Configure the IPv6 address of the interface. | |
| IPv6 prefix length | Enter the prefix length of the address. | |
| IPv6 default gateway | Specify the IPv6 address of the default gateway. | |
| IPv6 DNS server | Specify the IPv6 address of the domain name server. | |

5.1.3.3. Traffic Management

View and choose traffic optimization solutions

| ((t | TRAFFIC MA | TRAFFIC MANAGEMENT | | |
|-----|---|----------------------------------|-----------------|------------------------|
| ភង | Wireless traffic | optimization | | |
| ₽ | | Traffic optimization: Data/Data+ | /oip 🗸 | |
| | Priority | Traffic queue | 802.1p Priority | DSCP Priority |
| ¢\$ | Lowest | Best effort | 0,3 | 0,24,26,28,30 |
| | Medium | Background | 1,2 | 8,10,12,14,16,18,20,22 |
| | High | Video | 4,5 | 32,34,36,38,40,46 |
| | Highest | Voice | 6,7 | 48,50,52,54,56 |
| | Note: * Traffic has to be marked according to 802.1p or DSCP values to match one of the four queues. 802.1p has precedence over DSCP. Traffic prioritization is applied on wireless transmission. * In Station (WDS/TDMA 3) mode the traffic optimization will function only on TDMA 3. VLAN traffic precedence QoS precedence 802.1p | | | |

Figure 5-20 Traffic Management



5.1.3.4. Services Configuration

The service menu is further divided into eleven parts:

| (îŗ | SERVICES CONFIGURATION |
|-----|------------------------|
| ភំ | Date & time |
| ≓ | Remote management |
| o: | System alerts |
| ~~ | © SNMP |
| | Ping watchdog |
| | Discovery services |
| | System logging |
| | I Tunnels |
| | © PPPoE options |

Figure 5-21 Setting - Services Configuration

Date and Time

This section can be used to automatically manage the system time and date on the device using the Network Time Protocol (NTP), or manually manage the system time and date by setting the time and date on the device. An NTP (Network Time Protocol) client synchronizes the device's clock with the defined time server. To use the NTP service, select NTP from the configuration menu, select your time zone, and enter the NTP server.

| Enable NTP: | III | Timezone: | UTC+08:00 V |
|-------------------|-------------------------|-----------|-------------|
| NTP server 1: | pool.ntp.org | Date: | 11/04/2024 |
| NTP server 2: | | Time: | 00:34 |
| Test NTP servers: | Test/Update | | |

Figure 5-22 Date and Time: NTP Configuration

| Object | Description | |
|-----------------|---|--|
| Enable NTP | Select this option to enable NTP configuration. | |
| Time zone | Select time zone. The time zone should be specified as the difference between local time and GMT. | |
| NTP server | Specify the trusted NTP server IP or hostname for time synchronization. | |
| Test NTP server | Click this button to check if the specified server responds successfully. | |
| IPv6 DNS server | Specify the IPv6 address of the domain name server. | |



Remote Management

Use this menu to manage access to the CPE through SSH, Telnet, and HTTP:

| Remote management | | | |
|--|------------|---------------|--|
| Enable SSH: | Enable | e telnet: 🗸 🔢 | |
| SSH port: | 22 I Telne | net port: 23 | |
| Enable HTTP: | | | |
| HTTP port: | 80 | | |
| Note: HTTPS protocol is always enabled | | | |

Figure 5-23 Remote Management Configuration

| Object | Description | |
|---------------|--|--|
| Enable SSH | Enable or disable access to the device through SSH. | |
| SSH port | Specify the SSH service port. The default SSH port is 22. | |
| Enable Telnet | Enable or disable access to the device through Telnet (factory default is disabled). | |
| Telnet port | Specify the remote login port. The default Telnet port is 23. | |
| Enable HTTP | Select the switch to enable or disable HTTP access to device management. | |
| HTTP port | Specify the HTTP port. The standard HTTP port is 80. | |

Note: HTTPS is always enabled through the standard port 8080 connection.

SNMP

SNMP is a standard protocol widely used for remote network management over the Internet. After enabling SNMP, the CPE device will act as an SNMP agent. The SNMP agent provides a device monitoring interface using the Simple Network Management Protocol, allowing network administrators to monitor network performance, detect and resolve network problems.

| © SNMP | |
|----------------|----------|
| Enable SNMP: | |
| Version: | v1/v2c 🗸 |
| R/O community: | public |

Figure 5-24 SNMP Configuration



| Object | Description | |
|---------------|---|--|
| Enable SNMP | Specify the SNMP service status. | |
| R/O community | Specify the read-only community name for SNMP version 1 and version 2c. The read-only community allows CPE unit administrators to read values but denies any attempts to change | |
| | them. Ping Watchdog. | |
| Enable Telnet | Enable or disable access to the device through Telnet (factory default is disabled). | |
| Telnet port | Specify the remote login port. The default Telnet port is 23. | |
| Enable HTTP | Select the switch to enable or disable HTTP access to device management. | |
| HTTP port | Specify the HTTP port. The standard HTTP port is 80. | |

Ping Watchdog

Enable Ping Watchdog to continuously monitor the network connection between the CPE unit and a specified trusted host. If enabled, the CPE unit will periodically send Ping requests to the host, and if there is no response within a specified time frame, the Ping watchdog will restart the CPE unit.

| Ping watchdog | | | |
|-----------------------|---------------|----------------------------|-----|
| Enable ping watchdog: | ~ 1 | Ping interval, min: | 1 ~ |
| Host/IP address: | 192.168.1.253 | Ping fail count to reboot: | 2 |
| Test host/IP address: | Test | | |

Figure 5-25 Ping Watchdog Configuration

| Object | Description | |
|---------------------------|--|--|
| Enable Ping Watchdog | Click to enable Ping Watchdog functionality. | |
| Host/IP address | Specify the host to which Ping requests will be sent. | |
| Test Host/IP address | Click this button to check if the specified host responds successfully. | |
| Ping interval | Specify the time interval between Ping requests in minutes. | |
| Ping fail count to reboot | Specify the count of Ping reply failures. After the specified Ping failure count, the CPE unit will automatically restart. | |
| HTTP port | Specify the HTTP port. The standard HTTP port is 80. | |



Discovery Service

The corresponding automatic discovery service is enabled by default.

| Discovery services | | |
|--------------------|-------------|-----------|
| Bonjour (mDNS): | ~ 11 | CDP/LLDP: |
| SSDP: | ~ | |

Figure 5-26 Discovery Service Configuration

System Logging

By default, the corresponding logs are selected and displayed in the supported system logs, where Debug is the most detailed log level.

| Log level: | Debug | ~ |
|-----------------------|---------------|---|
| Enable remote logging | ✓ | |
| Server address: | 192.168.2.201 | |

Figure 5-27 System Logging Configuration

Tunnels

| Tunnels | |
|-----------------|----------------|
| Enable GRE | ~ 1 |
| Mode: | L2 V |
| Source IP: | 192.168.11.253 |
| Destination IP: | 192.168.1.253 |
| VLAN ID: | 2 |
| MTU: | 1476 |
| MSS: | 1410 |
| PMTU Discovery | |

Figure 5-28 Tunnels Configuration

PPPoE options

| PPPoE options | |
|---|--|
| Enable PPPoE relay: | Enable PPPoE intermediate agent: |
| Note: PPPoE relay can be enabled only when network mode is Router and operating mode is Station. | Note: PPPoE intermediate agent can be enabled only when network mode is Bridge and operating mode is Station. |

Figure 5-29 PPPoE Relay Configuration



5.1.3.5. System Configuration

The system menu allows you to manage the main CPE settings and perform major system operations (such as restart and restore configuration). This section is further divided into four parts:

| (î: | SYSTEM CONFIGURATION | | | |
|------|------------------------|---------------|----------------------------|-----------------|
| តំ | Device settings | | | |
| ₽ | Friendly name: | WBS-900AC(V2) | Location: | Device location |
| o\$ | Contact information: | Contact | Latitude: | 0 |
| - mo | | | Longitude: | 0 |
| 8 | System functions | | | |
| | Backup configuration: | Backup | Reboot device: | Reboot |
| | Restore configuration: | Restore | Reset to factory defaults: | Reset |
| | User accounts | | | |
| | LED settings | | | |
| | Advanced settings | | | |
| | Public status page: | | Software reset method: | Serial PIN 🗸 |

Figure 5-30 System Configuration

Device settings

| Device settings | | | | |
|----------------------|---------------|------------|-----------------|--|
| Friendly name: | WBS-900AC(V2) | Location: | Device location | |
| Contact information: | Contact | Latitude: | 0 | |
| | | Longitude: | 0 | |
| | | | | |

Figure 5-31 Device Settings

| Object | Description |
|---------------------|--|
| Friendly name | Specify the name of the CPE that will be used to identify the device. |
| Contact information | Specify the name of the contact person for the CPE, such as the network administrator. |
| Location | Describe the physical location of the device. |
| Latitude | Specify the longitude coordinates of the device [in a specific decimal format, such as 121.53] |
| Longitude | Specify the latitude coordinates of the device [in a specific decimal format, such as 24.98]. |



System functions

| n functions | | | |
|------------------------|---------|----------------------------|--------|
| Backup configuration: | Backup | Reboot device: | Reboot |
| Restore configuration: | Restore | Reset to factory defaults: | Reset |

Figure 5-32 System functions

| Object | Description | |
|---------------------------|--|--|
| Backup configuration | Click to save the current configuration file. The saved configuration file can be used to restore the configuration in case of device configuration errors or to upload standard configurations to multiple devices without manually configuring each device through the web interface | |
| Restore configuration | Click to upload an existing configuration file to the device. After the configuration file is uploaded, the new configuration will take effect when the Save Changes button is clicked. | |
| Reboot device | Restart the device with the last saved configuration. | |
| Reset to factory defaults | Click to restore the device to its factory default settings. | |

User accounts

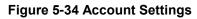
Use this section to modify the user access credentials for the CPE device to prevent unauthorized device configuration.

| □ User accounts | | |
|---------------------|------------------|--|
| Authorization type: | Local | |
| User: admin02 | Local TACACS+ | |

Figure 5-33 User Accounts Authorization type



| iuue 😽 | | |
|------------------|--------------------------|---|
| ACCOUNT SETTINGS | | |
| Username: | admin02 | |
| Old password: | | |
| 1 | Old password is required | |
| New password: | | |
| Verify password: | | |
| | | |
| | Change Close | e |
| | L'Ungitude. | |



| Object | Description | |
|-----------------|--|--|
| Username | Change the username of the administrator. | |
| Old password | Enter the current administrator password. | |
| New password | Enter the new administrator password for the user account. | |
| Verify password | Re-enter the new password to verify its accuracy. | |

Advanced settings

| e | Advanced settings | |
|---|---------------------|--|
| | Public status page: | |

Figure 5-35 Advanced settings of System

| Object | Description |
|--------------------|---|
| Public status page | Enable or disable the permission for non-logged-in users to view the status page. |



5.1.4 Firmware Update

The current version of the device firmware is displayed in the top left corner of the Web interface.

| APCPE.QA-3.v7.7-Planet.e7135c5 (Update) | Simple mode 🌣 | | Logout |
|---|---------------|----------------------------------|----------------|
| PLANET Networking & Communication | i 🔷 🗶 🖨 | Uptime 1 hour 38 min. 31 sec. | CPU load (1 %) |
| | | Ethemet2: Disconnected | |

Figure 5-36 Firmware Update

Click the (Update) link next to the running firmware name, select the correct firmware image in the firmware update pop-up window, and then click the Upload button:

| Upload a firmware file: Upload | MWARE UPDATE | | |
|--------------------------------|-------------------------|--------|--|
| | Upload a firmware file: | Upload | |
| | | | |

Figure 5-37 Uploading Firmware

The new firmware image will be uploaded to the controller's temporary storage. The next step is to save the firmware to the device's permanent storage. Click the Upgrade button:

| ſ | FIRMWARE UPDATE | | | (0 |
|----|---|--------|---------|-------|
| et | Select a File to Upload | | | hir |
| L | fwupdate.bin | Browse | | |
| | Current firmware: APCPE.QA-3.v7.7-Pla Uploaded firmware: APCPE.QA-3.v7.7-Pla | | | |
| | | | Upgrade | Close |

Note: During the firmware upgrade process, do not turn off the device or disconnect the device from the power source, otherwise the device may be damaged.



5.1.5 Tools

| | i 0 % A | Uptime 1 hour 40 min. 1 sec. | CPU load (3 %) |
|----------------------------|---------|---------------------------------|----------------|
| Networking & Communication | | Ethemet1: 1000BaseT/full | 🔶 Searching |

5.1.5.1. Site Survey

The site survey tool displays at-a-glance information about wireless networks in the local geographic area. Using this test, administrators can scan for working wireless devices, check their operating channels, and encrypt and view signal/noise levels.

To currently perform a site investigation test, click Start scan:

| Q | SITE SURVEY | | | | | | | | | |
|----|-------------------------|---------------------------|----------------|-------------------------|---------------|----------------------------|------------|----------------|---------------|--|
| 9 | Note: starting site sur | wey scan maj | y temporary di | sable wireless link(s). | | | | | | |
| 2 | Char | Channel width: Configured | | | * | Non-standard channels: | | | | |
| | Start scan | | | | En | ter keyword to filter rest | itts | | | |
| 65 | AP count: 27 | | | | | | | | | |
| 24 | © MAC address | © S SID | | * Security | © Signal, dBr | n 🕆 Noise floor, dBm | * Protocol | © Channel | Channel width | |
| 1 | 10.00 | U6Lite | | WPA2 Personal | -56 | -95 | 802.11ac | 36 (5180 MHz) | 40+ | |
| | 10.100 at 10.00 | TaipelHome | Mesh | WPA2 Personal | -87 | -95 | 802.11ac | 44 (5220 MHz) | 80 | |
| | Accessed and | 55 | | WPA2 Personal | -88 | -95 | 802.11ac | 44 (5220 MHz) | 80 | |
| | 2750 B 8 P | IAP1800AX_ | 5G | WPA2 Personal | -52 | -95 | 802.11ac | 48 (5240 MHz) | 80 | |
| | 10000-0000 | DM_C7200E | _5G | WPA/WPA2 Personal | -55 | -95 | 802.11a | 48 (5240 MHz) | 20 | |
| | 10.000 | KIN.L | | WPA2 Personal | -43 | -95 | 802.11ac | 48 (5240 MHz) | 80 | |
| | 10000 | PLANET_D | /_5G_C | WPA/WPA2 Personal | -55 | -95 | 802.11ac | 48 (5240 MHz) | 80 | |
| | | PLANET_7F | _AP_5G | WPA2 Personal | -87 | -95 | 802.11a/n | 64 (5320 MHz) | 40- | |
| | | span | | WPA2 Personal | -88 | -95 | 802.11a | 112 (5560 MHz) | 20 | |
| | | WDRT-1800 | AX_NMS test | WPA2 Personal | -53 | -95 | 802.11ac | 149 (5745 MHz) | 40+ | |
| | | PLANET_8F | _AP | WPA2 Personal | -77 | -95 | 802.11ac | 149 (5745 MHz) | 80 | |
| | | | | WPA2 Personal | -91 | -95 | 802.11ac | 149 (5745 MHz) | 80 | |
| | | PLANET_11 | F_MR1 | WPA2 Personal | -79 | -95 | 802.11ac | 149 (5745 MHz) | 80 | |
| | 10.00 | NWA50AX | | WPA2 Personal | -46 | -95 | 802.11ac | 149 (5745 MHz) | 80 | |
| | and the second second | 0808 | | WPA2 Personal | -92 | -95 | 802.11ac | 153 (5765 MHz) | 80 | |

Figure 5-38 The Result of Site Survey



5.1.5.2. Antenna Alignment

The Antenna Alignment Tool measures the signal quality between the base station and the AP. For best results during the antenna alignment test, turn off all wireless networking devices in range of the device except the one you are trying to align the antenna on. Keep an eye out for the constantly updating display as you adjust the antenna.

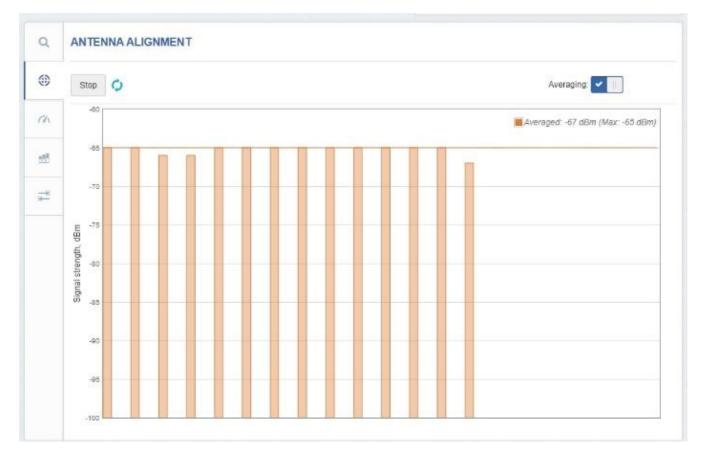


Figure 5-39 Antenna Alignment



5.1.5.3. Link Test

Use the link test tool to check the quality of the established TDMA3 link. The tool tests throughput at selected packet sizes and iterations.

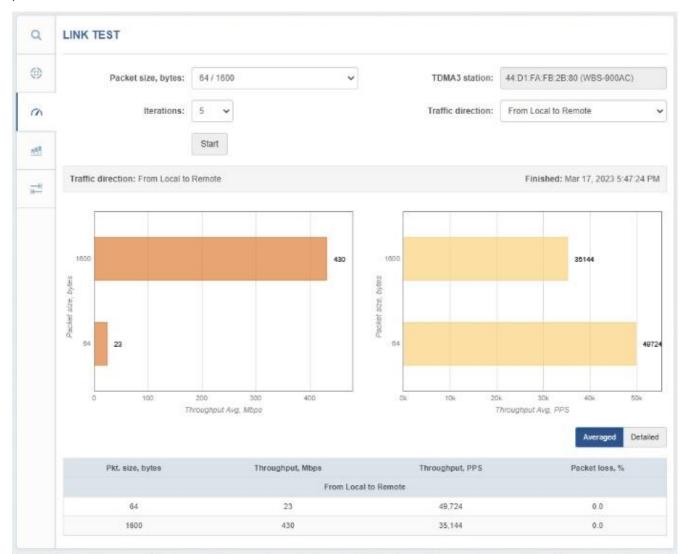
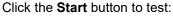


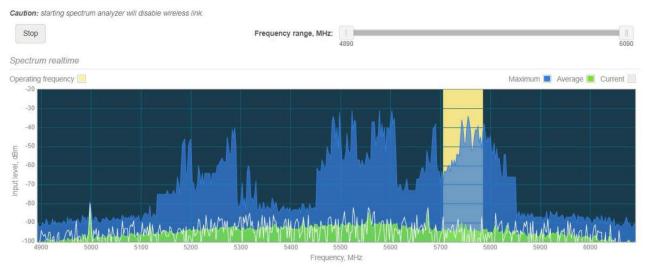
Figure 5-40 The Test Result of Link Test

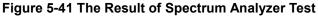


5.1.5.4. Spectrum Analyzer

The Spectrum Analyzer test shows details of the signal level of each CPE unit antenna on every available frequency. This enables administrators to select the best available frequency/channel for equipment operation. The frequency list depends on the country the device is operating in and the channel width selected.







The blue color of the graph indicates the current signal level on the appropriate frequency.

The yellow bands in the graph show the channel frequency range in which the CPE unit is currently operating.

5.1.5.5. Ping and Trace

Use the PING tool to discover how long it takes for packets to reach a specified trusted host. PING results are displayed in a table and graphically:

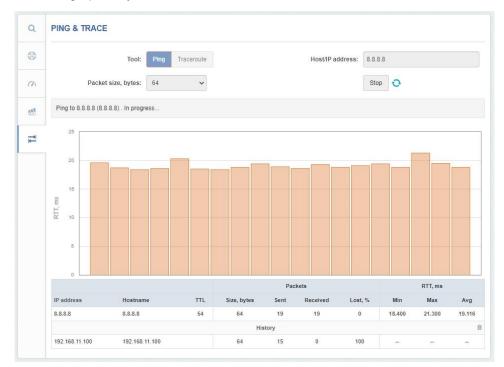


Figure 5-42 Ping Tool



| Object | Description |
|--------------------|--|
| Host/IP address | Specify the host to which the ping request will be sent. |
| Packet size, bytes | Specify the size in bytes of the data packet. |
| Start/Stop | Click to start or stop the ping tool. |

Use the traceroute tool to trace the route of packets from the CPE unit to the destination host. This is useful when trying to figure out why you can't reach your destination, since you'll be able to see where the connection failed.

| Q | PING | & TRACE | | | | | | |
|----|-------|--------------------|---------------------------------|-----------|-----------|-----------|-----------|---|
| ۲ | | | Tool: Ping Traceroute | | | | | |
| 71 | | Max hop | s, TTL: 20 🗸 | | | | Start | |
| 68 | Traci | ng 8.8.8.8 . Done. | | | | | | |
| * | Нор | IP address | Hostname | Send/Recv | Min, ms | Avg, ms | Max, ms | |
| | 1 | 192.168.11.1 | 192.168.11.1 | 3/3 | 0.203 | 0.264 | 0.350 | 1 |
| | 2 | 192.168.0.1 | 192.168.0.1 | 3/3 | 0.831 | 0.912 | 1.019 | 3 |
| | 3 | | | 3/3 | 1.768 | 1.900 | 2.160 | |
| | 4 | | | 3/3 | 1.756 | 1.860 | 2.014 | 1 |
| | 5 | - | The second second second second | 3/2 | 1,765.350 | 1,880.329 | 1,995.308 | |
| | 6 | | | 3/3 | 17.783 | 28.746 | 50.217 | 1 |
| | 7 | - | | 3/3 | 18.286 | 19.372 | 20.863 | 1 |
| | 8 | | | 3/0 | | | 122 | |
| | 9 | | | 3/3 | 18.834 | 19.461 | 20.380 | 1 |
| | 10 | Sec. 1 | 1 | 3/3 | 17.931 | 216.761 | 613.164 | - |
| | 11 | | 1 | 3/0 | 0.77 | | 100 | |
| | 12 | 8.8.8.8 | dns.google | 3/3 | 19.177 | 19.826 | 20.325 | 1 |

Figure 5-43 Trace Tool

| Object | Description |
|-----------------|--|
| Host/IP address | Specify the hostname or IP address of the target host. |
| Max hops, TTL | Specify the maximum number of hops to search for a target. |
| Start/Stop | Click to start or stop the trace tool. |



5.1.6 Support

5.1.6.1. Troubleshooting

Troubleshooting files contain valuable information about device configuration, routing, log files, command output, and more. When using a troubleshooting file, the device can quickly and automatically collect troubleshooting information without requiring you to manually collect each piece of information. This helps in submitting issues to the support team.

| ġ. | TROUBLESHOOTING |
|----|---|
| | Troubleshooting file: Download |
| | Warning: downloading the troubleshooting file may cause a temporary wireless link interruption. |

Figure 5-44 Troubleshooting

Click to **Download** the troubleshooting file. This may take a few minutes to gather information and complete the download.

5.1.6.2. System Log

The System Log Viewer utility provides debug information about system services and protocols. If a device fails, logged messages can help operators locate misconfigurations and system errors.

| ń. | SYSTEM LOG |
|----|---|
| ۶. | Enter keyword to filter results |
| | Apr 10 03:09:04 syslogd started: BusyBox v1.21.1 |
| | Apr 10 03:09:04 kernel: [0.545000] VFS: Mounted root (squashfs filesystem) readonly on device 31:3. |
| | Apr 10 03:09:04 kernel: [0.554000] Freeing unused kernel memory: 192k freed |
| | Apr 10 03:09:04 kernel: [2.203000] JFFS2 notice: (221) jffs2_build_xattr_subsystem: complete building xattr subsystem, 0 of xdatum (0 unchecked, 0 orphan) and 0 of xre- |
| | Apr 10 03:09:04 kernel: [6.564000] ag71xx_mdio: probed |
| | Apr 10 03:09:04 kernel: [6.568000] eth0: Atheros AG71xx at 0xb900000, irq 4 |
| | Apr 10 03:09:05 kernel: [7.139000] eth0: link up (1000Mbps/Full duplex) |
| | Apr 10 03:09:05 kernel: [7.470000] netlink: 12 bytes leftover after parsing attributes. |
| | Apr 10 03:09:05 kernel: [7.477000] netlink: 12 bytes leftover after parsing attributes. |
| | Apr 10 03:09:05 kernel: [7.483000] netlink: 12 bytes leftover after parsing attributes. |
| | Apr 10 03:09:05 kernel: [7.489000] netlink: 12 bytes leftover after parsing attributes. |
| | Apr 10 03:09:09 kernel: [11.823000] Ebtables v2.0 registered |
| | Apr 10 03:09:09 kernel: [11.891000] eth0: link down |
| | Apr 10 03:09:10 lua[326]: Starting device configuration |
| | Apr 10 03:09:11 syslogd exiting |
| | Apr 10 03:09:11 syslogd started: BusyBox v1.21.1 |
| | Apr 10 03:09:11 kernel: klogd started: BusyBox v1.21.1 (2024-04-10 03:01:36 UTC) |
| | Apr 10 03:09:11 kernel: [13.731000] asf: module license 'Proprietary' taints kernel. |
| | Apr 10 03:09:11 kernel: [13.737000] Disabling lock debugging due to kernel taint |
| | Apr 10 03:09:11 kernel: [14.023000] ath hal: 0.9.17.1 (ARS416. DEBUG. REGOPS FUNC. WRITE EEPROM. 11D) |

Figure 5-45 System Log

Click the Refresh ^O icon in the upper right corner to view current system messages.



Chapter 6. Quick Connection to a Wireless Network

In the following sections, the default SSID of the WBS-900AC is configured to "default".

6.1 Windows XP (Wireless Zero Configuration)

Step 1: Right-click on the wireless network icon displayed in the system tray



Figure 6-1 System Tray – Wireless Network Icon

Step 2: Select [View Available Wireless Networks]

Step 3: Highlight and select the wireless network (SSID) to connect

- (1) Select SSID [default]
- (2) Click the [Connect] button

| ¹⁰ Wireless Network Connec | tion | × |
|--|--|---|
| Network Tasks | Choose a wireless network | |
| 🚭 Refresh network list | Click an item in the list below to connect to a <u>w</u> ireless network in range or to get more information. | |
| Set up a wireless network for a home or small office | ((a)) | ^ |
| Related Tasks | Contraction of the security-enabled wireless network (WPA) | |
| Learn about wireless networking | Contract Security-enabled wireless network | = |
| Change the order of preferred networks | ((P)) | |
| Change advanced settings | (()) default | |
| | To connect to this network, click Connect. You might need to enter additional information. | |
| | | |
| | (((()) | ~ |
| | | t |

Figure 6-2 Choosing a Wireless Network



Step 4: Enter the encryption key of the wireless AP

- (1) The Wireless Network Connection box will appear
- (2) Enter the encryption key that is configured in section 5.7.1.1
- (3) Click the [Connect] button

| Wireless Network Conne | ection | × | |
|---|---------|---|--|
| The network 'PLANET' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network. | | | |
| Type the key, and then click Connect. | | | |
| Network <u>k</u> ey: | ••••• | | |
| C <u>o</u> nfirm network key: | ••••• | | |
| | Connect | | |

Figure 6-3 Entering the Network Key

| Step 5: Check if | "Connected" | is | displayed |
|------------------|-------------|----|-----------|
|------------------|-------------|----|-----------|

| Network Tasks | Choose a wireless network | |
|---|--|---------------------|
| 😴 Refresh network list | Click an item in the list below to connect to a <u>w</u> ireless network in ra information. | ange or to get more |
| Set up a wireless network for a home or small office | ((p)) default | Connected ☆ 🛆 |
| Related Tasks | ((p)) | |
| Learn about wireless networking | Security-enabled wireless network (WPA) | 1000. |
| Change the order of preferred networks | 👸 Security-enabled wireless network | itil |
| Change advanced settings | ((p)) | |
| | ((Q)) Unsecured wireless network | |
| | ((Q)) | |
| | Unsecured wireless network | •OOU 🚽 |

Figure 6-4 Choosing a Wireless Network -- Connected



Some laptops are equipped with a "Wireless ON/OFF" switch for the internal wireless LAN. Make sure the hardware-based wireless switch is switched to "ON" position.



6.2 Windows 7 (WLAN AutoConfig)

WLAN AutoConfig service is built-in in Windows 7 that can be used to detect and connect to wireless network. This built-in wireless network connection tool is similar to wireless zero configuration tool in Windows XP.

Step 1: Right-click on the **network icon** displayed in the system tray



Figure 6-5 Network Icon

Step 2: Highlight and select the wireless network (SSID) to connect

- (1) Select SSID [default]
- (2) Click the [**Connect**] button

| Not connected 😽 | |
|---------------------------------|----|
| Connections are available | |
| Dial-up and VPN | |
| Office VPN 🗙 | |
| Wireless Network | II |
| default | |
| Connect automatically | |
| lite. entertante | |
| the restrict | |
| the same | |
| an at | Ŧ |
| Open Network and Sharing Center | |

Figure 6-6 WLAN AutoConfig



If you will be connecting to this Wireless AP in the future, check [Connect automatically].



Step 3: Enter the encryption key of the wireless AP

- (1) The Connect to a Network box will appear
- (2) Enter the encryption key that is configured in section 5.7.1.1
- (3) Click the [OK] button

| | security key |
|---------------|---|
| Security key: | |
| | Hide characters |
| | ou can also connect by pushing the outton on the router. |

Figure 6-7 Typing the Network Key

| Connect to a Network | × |
|-----------------------|--------|
| Connecting to default | |
| | |
| | |
| | |
| | Cancel |

Figure 6-8 Connecting to a Network



Step 4: Check if "Connected" is displayed



Figure 6-9 Connected to a Network



6.3 Mac OS X 10.x

In the following sections, the default SSID of the WBS-900AC is configured to "default".



The AirPort Network Connection menu will appear



Figure 6-10 Mac OS - Network Icon

Step 2: Highlight and select the wireless network (SSID) to connect

- (1) Select and SSID [default]
- (2) Double-click on the selected SSID

| and the second se | • • • | * 🛜 | • 💻 🛛 | |
|---|--|--------------|-------|--|
| | AirPort: On Turn AirPort Off | | | |
| | No network selected | a (;; | | |
| 1 | default | (| | |
| | And the strength of the streng | | | |
| | INTER-INCIDE: | ((+ ((+ | | |
| | THE REAL PROPERTY AND INCOMENTS | | | |
| A STATE | And a second sec | | 1 | |
| | Join Other Network Create Network Open Network Preferences | | • | |

Figure 6-11 Highlighting and Selecting the Wireless Network



Step 3: Enter the encryption key of the wireless AP

- (1) Enter the encryption key that is configured in section 5.7.1.1
- (2) Click the [OK] button

| The network "default" requires a WPA password. |
|--|
| Password: |
| Show password Remember this network |
| Cancel OK |

Figure 6-12 Enter the Password



Step 4: Check if the AirPort is connected to the selected wireless network.

If "Yes", then there will be a "check" symbol in front of the SSID.

| | | 9 🕴 🛜 | • | | Q |
|-----------------------|--|------------|----|----------|-------|
| | AirPort: On | | 2 | | |
| | Turn AirPort Off | | | | |
| | √default | 6 🛜 | | | |
| | and the second s | | | | |
| | | ((i· | | | |
| | | A 🔶 | | | |
| | | ₽ 🔶 | | | |
| | TOTAL CONCINCT | ((:- | 10 | | 1 |
| | | ê 🔅 | | 1 100 10 | ÷., - |
| and the second starts | | ê 🔶 | | 1.1 | |
| | THE R. P. LEWIS CO., LANSING MICH. | | - | | |
| | jan Tand | | 1 | | |
| | ing Address | ₽ 🔶 | 12 | | |
| | 1000 | ₽ 🔶 | | | 12 |
| 1 | Join Other Network | | | | |
| | Create Network | | | | |
| | Open Network Preferences | | | | |

Figure 6-13 Connected to the Network



There is another way to configure the MAC OS X wireless settings:

Step 1: Click and open the [System Preferences] by going to Apple > System Preference or Applications

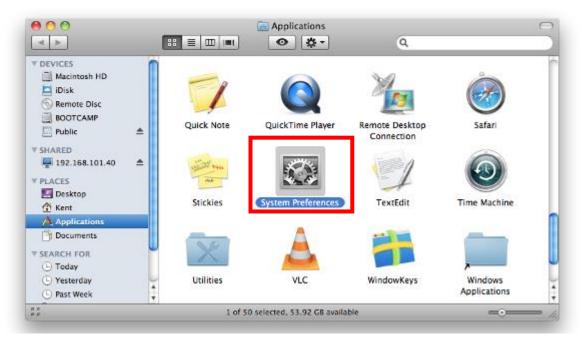


Figure 6-14 System Preferences



Step 2: Open Network Preference by clicking on the [Network] icon

Figure 6-15 System Preferences -- Network



Step 3: Check Wi-Fi setting and select the available wireless network

- (1) Choose the **AirPort** on the left menu (make sure it is ON)
- (2) Select Network Name [default] here

If this is the first time to connect to the Wireless AP, it should show "No network selected".

| 0 0 | | Network | |
|---------------------------------|-------------|-------------------------------------|-------------------------|
| Show All | | | ٩ |
| | Lo | cation: Automatic | • |
| USB Ethernet | ~~ > | Status: On | Turn AirPort Off |
| ● 802.11dapter Not Connected | ~~ > | AirPort is turned on a network. | but is not connected to |
| On AirPort | | Network Name ✓ No network selec | cted |
| Home VPN | | | ₽ ? |
| | | default | |
| | | | ≙ (;; |
| | | | |
| | | | |
| | | Join Other Netwo Create Network. | |
| + | | Show AirPort status in menu bar | Advanced) ? |
| Elick the lock to | preven | t further changes. Assist me | Revert Apply |

Figure 6-16 Selecting the Wireless Network



6.4 iPhone/iPod Touch/iPad

In the following sections, the default SSID of the WBS-900AC is configured to "default".

Step 1: Tap the [Settings] icon displayed in the home screen



Figure 6-17 iPhone – Settings icon

Step 2: Check Wi-Fi setting and select the available wireless network

- (1) Tap [General] \ [Network]
- (2) Tap [**Wi-Fi**]

If this is the first time to connect to the Wireless AP, it should show "Not Connected".

| iPad | 10:35 AM | 100% |
|---------------------------|-------------------|-------|
| Settings | General | |
| Airplane Mode OFF | | |
| S Wi-Fi Not Connected | About | > |
| Notifications On | Usage | > |
| Carrier | Sounds | > |
| 🕎 Cellular Data | | |
| 🙀 Brightness & Wallpaper | Network | > |
| Picture Frame | Bluetooth | Off > |
| General | Location Services | On > |
| Sall, Contacts, Calendars | Spotlight Search | > |
| 🔀 Safari | | |

Figure 6-18 Wi-Fi Setting



| iPad | 10:35 AM @ 100% |
|---------------------------|-----------------------|
| Settings | General Network |
| Airplane Mode OFF | |
| WI-FI Not Connected | VPN Not Connected > |
| Notifications On | Wi-Fi Not Connected > |
| Carrier | |
| 🕅 Cellular Data | |
| 🙀 Brightness & Wallpaper | |
| Picture Frame | |
| General | |
| Mail, Contacts, Calendars | |
| M Safari | |

Figure 6-19 Wi-Fi Setting – Not Connected

Step 3: Tap the target wireless network (SSID) in "Choose a Network..."

- (1) Turn on Wi-Fi by tapping "Wi-Fi"
- (2) Select SSID [default]

| iPad | 11:23 PM | 🕒 76% 🖃 |
|--------------------------|--|---------|
| Settings | Network Wi-Fi Networks | |
| Airplane Mode | | |
| SWI-FI Not Connected | Wi-Fi | ON |
| Notifications On | Choose a Network | |
| Location Services On | default | ₽ 🗢 🕥 |
| 🕎 Cellular Data | Other | > |
| 🙀 Brightness & Wallpaper | Ask to Join Networks | ON |
| Picture Frame | Known networks will be joined autom known networks are available, you | |
| General | before joining a new netwo | |

Figure 6-20 Turning on Wi-Fi



Step 4: Enter the encryption key of the Wireless AP

- (1) The password input screen will be displayed
- (2) Enter the encryption key that is configured in section 5.7.1.1
- (3) Tap the [Join] button



Figure 6-21 iPhone -- Entering the Password

Step 5: Check if the device is connected to the selected wireless network.

If "Yes", then there will be a "check" symbol in front of the SSID.

| iPad | 11:25 PM 🕑 75% 💷 |
|--------------------------|---|
| Settings | Network Wi-Fi Networks |
| Airplane Mode OFF | |
| 🛜 Wi-Fi default | Wi-Fi ON |
| Notifications On | Choose a Network |
| Location Services On | ✓ default 🔒 🗢 🔊 |
| 🕎 Cellular Data | Other > |
| 🙀 Brightness & Wallpaper | Ask to Join Networks ON |
| Picture Frame | Known networks will be joined automatically. If no known networks are available, γou will be asked |
| Seneral | before joining a new network. |

Figure 6-22 iPhone -- Connected to the Network

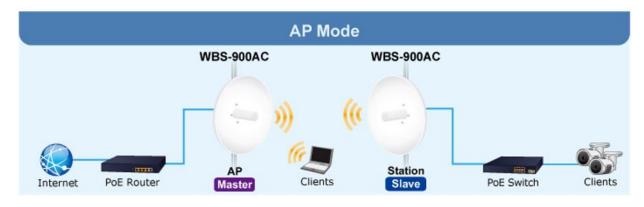


The fields in white background can be modified directly and then you can apply the new setting by clicking "**Update Device**".

Appendix A: FAQs

Q: How to set up the AP Client Connection

Topology:



Step 1 Use static IP in the PCs that are connected with AP-1 (Site-1) and AP-2 (Site-2). In this case, Site-1 is "192.168.1.101", and Site-2 is "192.168.1.201".

| 🛱 Ethernet 2 Properties | × Internet Protocol Version 4 (TCP/IPv4) Properties | \times |
|---|---|----------|
| Networking Sharing | General | |
| Connect using: Broadcom NetXtreme Gigabit Ethernet Configure This connection uses the following items: Client for Microsoft Networks Client for Microsoft Networks Microsoft Network Adapter Multiplexor Protocol Microsoft Network Adapter Multiplexor Protocol Microsoft LLDP Protocol Driver Install Uninstall Properties Description Allows your computer to access resources on a Microsoft network. | You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings. Obtain an IP address automatically IP address: IP address: <tr< td=""><td></td></tr<> | |
| OK Cancel | OK Canc | el |



Step 2. In AP-1, change Operating mode to Access point (Auto WDS) and set the IP to 192.168.1.253.

| Enable radio: | |
|-------------------------|------------------------|
| Operating mode: A | ccess point (auto WDS) |
| | |
| | |
| IP method | 1: Static 🗸 |
| IP method IP address | |
| | 5: 192.168.1.253 |

Step 3. In AP-2, change Operating mode to Station (WDS/TDMP3) and set the IP to 192.168.1.100.

| Enable radio: | ~ 🛄 | | |
|-------------------|-----------|--------------|----|
| Operating mode: | Station (| WDS/TDMA3) | |
| Pv4 configuration | | | |
| IP | method: | Static | ~ |
| IP a | ddress: | 192.168.1.10 | 00 |
| | | | |
| Subne | et mask: | 255.255.255 | 0 |

Step 4. In AP-2, Click the icon 🌞 to edit Station wireless settings .

| Network SSID | Security | Management | Broadcast SSID | VLAN | |
|-----------------|---------------|------------|----------------|-------------|---|
| Wireless-FB2B86 | WPA2 Personal | Enabled | Yes | | ٥ |



Step 5. Click the Search button or input the SSID of AP-1 to finish the setting.

| S SID: | Wireless-FB2B86 | Q |
|--------|-----------------|---|

Step 6. Go to check the LED of wireless signal if it lights up or not.

Step 7. Use command line tool to ping each other to ensure the link is successfully established.

In Site-1, the ping is 192.168.1.200 and in Site-2, the ping is 192.168.1.100.

| ст. C:\WINDOW5\system32\CMD.exe - ping 192.168.1.100 -t | |
|--|--|
| Destination host unreachable. Destination host unreachable. Destination host unreachable. Destination host unreachable. Destination host unreachable. | |
| Ping statistics for 192.168.0.100: Packets: Sent = 25, Received = 0, Lost = 25 (100% loss), Control-C ^C C:\Documents and Settings\Administrator>ping 192.168.1.100 -t Pinging 192.168.1.100 with 32 bytes of data: | |
| Request timed out. Reply from 192.168.1.100: bytes=32 time=7ms TTL=128 Reply from 192.168.1.100: bytes=32 time=1ms TTL=128 Reply from 192.168.1.100: bytes=32 time=2ms TTL=128 Reply from 192.168.1.100: bytes=32 time=1ms TTL=128 | |

Step 9. Configure the TCP/IP settings of Site-2 to "Obtain an IP address automatically".

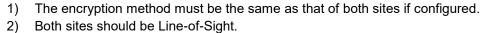
| tworking | General Alternate Configuration | | |
|---|--|--------------|----------|
| onnect using: Intel(R) PRO/1000 MT Desktop Adapter | You can get IP settings assigned an this capability. Otherwise, you nee for the appropriate IP settings. | | |
| Configure | Obtain an IP address automa | tically | |
| his connection uses the following items: | -O Use the following IP address: | | |
| Client for Microsoft Networks | IP address: | | |
| AVG network filter driver BQoS Packet Scheduler | Subnet mask: | 1 a a | 2 |
| File and Printer Sharing for Microsoft Networks Internet Protocol Version 6 (TCP/IPv6) | Default gateway: | | |
| Internet Protocol Version 4 (TCP/IPv4) Link-Layer Topology Discovery Mapper I/O Driver | Obtain DNS server address at | utomatically | |
| 🗹 🔺 Link-Layer Topology Discovery Responder | O Use the following DNS server | addresses: | |
| Instal Uninstal Properties | Preferred DNS server: | 14 (A | |
| Description | Alternate DNS server: | | 10 |
| Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks. | Validate settings upon exit | (| Advanced |



Step 10. Use command line tool to ping the DNS (e.g., Google) to ensure Site-2 can access internet through the wireless connection.

| cply from 8.8.8.8: bytes=32 time=37ms ITL=53 cply from 8.8.8.8: bytes=32 time=36ms ITL=53 eply from 8.8.8.8: bytes=32 time=36ms ITL=53 eply from 8.8.8.8: bytes=32 time=36ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 eply from 8.8.8.8: bytes=32 time=38ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 eply from 8.8.8.8: byt | |
|--|----------|
| a C:Windows/system32/cmd.exe-ping BB38-t cply from 8.8.8.8: hytes=32 time=37ms ITL=53 eply from 8.8.8.8: hytes=32 time=36ms ITL=53 eply from 8.8.8.8: hytes=32 time=36ms ITL=53 eply from 8.8.8.8: hytes=32 time=36ms ITL=53 eply from 8.8.8.8: hytes=32 time=37ms ITL=53 eply from 8.8.8.8: hytes=32 time=37ms ITL=53 eply from 8.8.8.8: hytes=32 time=37ms ITL=53 eply from 8.8.8.8: hytes=32 time=38ms ITL=53 eply from 8.8.8.8: hytes=32 time=37ms ITL=53 eply from 8.8.8.8: hytes=3 | <u>^</u> |
| entry from 8.8.8.8: hytes=32 time=38ms TTL=53 entry from 8.8.8.8: hytes=32 time=36ms TTL=53 entry from 8.8.8.8: hytes=32 time=36ms TTL=53 entry from 8.8.8.8: hytes=32 time=37ms TTL=53 | - 0 X |
| eply from 8.8.8.8: bytes=32 time=36m: ITL=53 eply from 8.8.8.8: bytes=32 time=36ms ITL=53 eply from 8.8.8.8: bytes=32 time=35ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 eply from 8.8.8.8: bytes=32 time=37ms ITL=53 | <u>~</u> |

The following hints should be noted:





- 3) For the short distance connection less than 1km, please reduce the "RF Output Power" of both sites.
- 4) For the long distance connection over 1km, please adjust the "Distance" to the actual distance or double the actual distance.



Appendix B: Troubleshooting

If you find the AP is working improperly or stops responding to you, please read this troubleshooting first before contacting the dealer for help. Some problems can be solved by yourself within a very short time.

| Scenario | Solution |
|---|--|
| The AP is not responding to | a. Please check the connection of the power cord and the |
| me when I want to access it | Ethernet cable of this AP. All cords and cables should be |
| by Web browser. | correctly and firmly inserted into the AP. |
| | b. If all LEDs on this AP are off, please check the status of |
| | power adapter, and make sure it is correctly powered. |
| | c. You must use the same IP address section where AP uses. |
| | d. Are you using MAC or IP address filter? Try to connect |
| | the AP with another computer and see if it works; if not, please reset the AP to the factory default settings by |
| | pressing the 'reset' button for over 7 seconds. |
| | e. Use the Smart Discovery Tool to see if you can find the AP or not. |
| | f. If you did a firmware upgrade and this happens, contact |
| | your dealer for help. |
| | g. If all the solutions above don't work, contact the dealer |
| | for help. |
| I can't locate my AP by my | a. 'Broadcast ESSID' set to off? |
| wireless device. | b. Both two antennas are properly secured. |
| | c. Are you too far from your AP? Try to get closer. |
| | d. Please remember that you have to input ESSID on your |
| | wireless client manually, if ESSID broadcast is disabled. |
| File downloading is very slow or breaks frequently. | Are you using QoS function? Try to disable it and try again. |
| | b. Internet is slow sometimes. Please be patient. |
| | c. Try to reset the AP and see if it's better after that. |
| | d. Try to know what computers do on your local network. If |
| | someone's transferring big files, other users may |
| | experience slow Internet usage. |
| | e. If the above are not the problems, call you Internet |
| | service provider to check if there is something wrong |
| | with their network. |
| I can't log into the web | a. Make sure you're connecting to the correct IP address of |
| | the AP! |



| management interface; the | b. | Password is case-sensitive. Make sure the 'Caps Lock' |
|---------------------------|----|---|
| password is wrong. | | light is not illuminated. |
| | c. | If you really forget the password, do a reset. |
| The AP becomes hot | a. | This is not a malfunction, if you can keep your hand on |
| | | the AP's case. |
| | b. | If you smell something wrong or see the smoke coming |
| | | out from AP, please disconnect the AP and power source |
| | | from utility power (make sure it's safe before you're |
| | | doing this!), and call your dealer for help. |



Appendix C: Glossary

- 802.11ac 802.11ac is a wireless networking standard in the 802.11 family (which is marketed under the brand name Wi-Fi), developed in the IEEE Standards Association process, providing high-throughput wireless local area networks (WLANs) on the 5 GHz band.
- 802.11n 802.11n builds upon previous 802.11 standards by adding MIMO (multiple-input multiple-output). MIMO uses multiple transmitter and receiver antennas to allow for increased data throughput via spatial multiplexing and increased range by exploiting the spatial diversity, perhaps through coding schemes like Alamouti coding. The Enhanced Wireless Consortium (EWC) [3] was formed to help accelerate the IEEE 802.11n development process and promote a technology specification for interoperability of next-generation wireless local area networking (WLAN) products.
- 802.11a 802.11a was an amendment to the IEEE 802.11 wireless local network specifications that defined requirements for an orthogonal frequency division multiplexing (OFDM) communication system. It was originally designed to support wireless communication in the unlicensed national information infrastructure (U-NII) bands (in the 5–6 GHz frequency range) as regulated in the United States by the Code of Federal Regulations, Title 47, Section 15.407.
- 802.11b The 802.11b standard specifies a wireless networking at 11 Mbps using direct-sequence spread-spectrum (DSSS) technology and operating in the unlicensed radio spectrum at 2.4GHz, and WEP encryption for security. 802.11b networks are also referred to as Wi-Fi networks.
- 802.11g specification for wireless networking at 54 Mbps using direct-sequence spread-spectrum (DSSS) technology, using OFDM modulation and operating in the unlicensed radio spectrum at 2.4GHz, and backward compatibility with IEEE 802.11b devices, and WEP encryption for security.
- DDNS (Dynamic Domain Name System) The capability of assigning a fixed host and domain name to a dynamic Internet IP Address.
- DHCP (Dynamic Host Configuration Protocol) A protocol that automatically configure the TCP/IP parameters for the all the PC(s) that are connected to a DHCP server.
- DMZ (Demilitarized Zone) A Demilitarized Zone allows one local host to be exposed to the Internet for a special-purpose service such as Internet gaming or videoconferencing.
- DNS (Domain Name System) An Internet Service that translates the names of websites into IP addresses.
- **Domain Name -** A descriptive name for an address or group of addresses on the Internet.
- DSL (Digital Subscriber Line) A technology that allows data to be sent or received over existing traditional phone lines.
- > **ISP** (Internet Service Provider) A company that provides access to the Internet.



- > MTU (Maximum Transmission Unit) The size in bytes of the largest packet that can be transmitted.
- NAT (Network Address Translation) NAT technology translates IP addresses of a local area network to a different IP address for the Internet.
- PPPoE (Point to Point Protocol over Ethernet) PPPoE is a protocol for connecting remote hosts to the Internet over an always-on connection by simulating a dial-up connection.
- SSID A Service Set Identification is a thirty-two character (maximum) alphanumeric key identifying a wireless local area network. For the wireless devices in a network to communicate with each other, all devices must be configured with the same SSID. This is typically the configuration parameter for a wireless PC card. It corresponds to the ESSID in the wireless Access Point and to the wireless network name.
- WEP (Wired Equivalent Privacy) A data privacy mechanism based on a 64-bit or 128-bit or 152-bit shared key algorithm, as described in the IEEE 802.11 standard.
- Wi-Fi A trade name for the 802.11b wireless networking standard, given by the Wireless Ethernet Compatibility Alliance (WECA, see http://www.wi-fi.net), an industry standards group promoting interoperability among 802.11b devices.
- WLAN (Wireless Local Area Network) A group of computers and associated devices communicate with each other wirelessly, which network serving users are limited in a local area.



EC Declaration of Conformity

| English | Hereby, PLANET Technology Corporation , declares that this 900Mbps 802.11ac Wireless Outdoor CPE is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU . | Lietuviškai | Šiuo PLANET Technology Corporation ,, skelbia, kad 900Mbps 802.11ac Wireless Outdoor CPE tenkina visus svarbiausius 2014/53/EU direktyvos reikalavimus ir kitas svarbias nuostatas. |
|-------------|--|-------------|--|
| Česky | Společnost PLANET Technology Corporation, tímto prohlašuje, že tato 900Mbps 802.11ac Wireless Outdoor CPE splňuje základní požadavky a další příslušná ustanovení směrnice 2014/53/EU. | Magyar | A gyártó PLANET Technology Corporation , kijelenti, hogy ez a 900Mbps 802.11ac Wireless Outdoor CPE megfelel az 2014/53/EK irányelv alapkövetelményeinek és a kapcsolódó rendelkezéseknek. |
| Dansk | PLANET Technology Corporation, erklærer herved, at følgende udstyr 900Mbps 802.11ac Wireless Outdoor CPE overholder de væsentlige krav og øvrige relevante krav i direktiv 2014/53/EU | Malti | Hawnhekk, PLANET Technology Corporation , jiddikjara li dan 900Mbps 802.11ac Wireless Outdoor CPE jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 2014/53/EU |
| Deutsch | Hiermit erklärt PLANET Technology Corporation , dass sich dieses Gerät 900Mbps 802.11ac Wireless Outdoor CPE in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 2014/53/EU befindet". (BMWi) | Nederlands | Hierbij verklaart , PLANET Technology orporation , dat 900Mbps 802.11ac Wireless Outdoor CPE in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 2014/53/EU |
| Eestikeeles | Käesolevaga kinnitab PLANET Technology Corporation, et see 900Mbps 802.11ac Wireless Outdoor CPE vastab Euroopa Nõukogu direktiivi 2014/53/EU põhinõuetele ja muudele olulistele tingimustele. | Polski | Niniejszym firma PLANET Technology Corporation , oświadcza, że 900Mbps 802.11ac Wireless Outdoor CPE spełnia wszystkie istotne wymogi i klauzule zawarte w dokumencie "Directive 2014/53/EU ". |
| Ελληνικά | $ \begin{array}{l} \textit{ME THN ΠAPOYSA$, $PLANET Technology} \\ \textit{Corporation, ΔHA$_{\Omega}NEI$ OTI $AYTO$ 900Mbps$ \\ \textbf{802.11ac Wireless Outdoor} \\ \textit{CPE}$SYMMOP$\Phi$_{\Omega}NETAI ΠPO$$TI$$ OYI_{\Omega}\Delta$EI$$ \\ AΠAITH$_{\Sigma}EI$$ KAI $TI$$ AOI\Pi$E$$ \\ SXETIKE$$ ΔIATA$=EI$$ TH$ D ΔH$$FIA$$$ 2014/53/EU $ \\ \end{array} $ | Português | PLANET Technology Corporation, declara que este 900Mbps 802.11ac Wireless Outdoor CPE está conforme com os requisitos essenciais e outras disposições da Directiva 2014/53/EU. |
| Español | Por medio de la presente, PLANET Technology Corporation, declara que 900Mbps 802.11ac Wireless Outdoor CPE cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 2014/53/EU | Slovensky | Výrobca PLANET Technology Corporation , týmto deklaruje, že táto 900Mbps 802.11ac Wireless Outdoor CPE je v súlade so základnými požiadavkami a ďalšími relevantnými predpismi smernice 2014/53/EU . |
| Français | Par la présente, PLANET Technology Corporation , déclare que les appareils du 900Mbps 802.11ac Wireless Outdoor CPE sont conformes aux exigences essentielles et aux autres dispositions pertinentes de la directive 2014/53/EU | Slovensko | PLANET Technology Corporation, s tem potrjuje, da je ta 900Mbps 802.11ac Wireless Outdoor CPE skladen/a z osnovnimi zahtevami in ustreznimi določili Direktive 2014/53/EU. |
| Italiano | Con la presente , PLANET Technology Corporation , dichiara che questo 900Mbps 802.11ac Wireless Outdoor CPE è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 2014/53/EU . | Suomi | PLANET Technology Corporation, vakuuttaa täten että 900Mbps 802.11ac Wireless Outdoor CPE tyyppinen laite on direktiivin 2014/53/EU oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen. |
| Latviski | Ar šo PLANET Technology Corporation, apliecina, ka šī 900Mbps 802.11ac Wireless Outdoor CPE atbilst Direktīvas 2014/53/EU pamatprasībām un citiem atbilstošiem noteikumiem. | Svenska | Härmed intygar, PLANET Technology Corporation , att denna 900Mbps 802.11ac Wireless Outdoor CPE står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 2014/53/EU . |

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