AirWorks AWK-1131A User's Manual

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AirWorks AWK-1131A User's Manual

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1

The AWK-1131A industrial a/b/g/n high speed wireless Access Point products are ideal wireless solutions for hard-to-wire applications that use mobile equipment connected over a TCP/IP network. The AWK-1131A is rated to operate at temperatures ranging from 0 to 60°C for standard models and -40 to 75°C for wide temperature models, and is rugged enough for any harsh industrial environment.

The following topics are covered in this chapter:

- **Overview**
- **Package Checklist**
- **Product Features**
- **Product Specifications**
- **Functional Design**
  - LAN Port
    - LED Indicators
  - Beeper
    - Reset Button

Overview

The AWK-1131A industrial wireless AP/client meets the growing need for faster data transmission speeds by supporting IEEE 802.11n technology with a net data rate of up to 300 Mbps. The AWK-1131A is compliant with the industrial standards and approvals, covering operating temperature, power input voltage, surge, ESD and vibration. The two redundant DC power inputs increase the reliability of the power supply. The AWK-1131A can operate on either the 2.4 or 5 GHz bands and is backwards-compatible with existing 802.11a/b/g deployments to future-proof your wireless investments.

Package Checklist

Moxa's AWK-1131A is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- 1 AWK-1131A
- 2 swivel-type antennas (2 dBi, RP-SMA, 2.4 and 5 GHz)
- Quick Installation Guide
- Software CD
- Moxa Product Warranty Card
- 1 plastic RJ45 protective caps
- Din-rail kit

NOTE The above items come with the standard AWK-1131A model, but the package contents may vary for customized versions.

Product Features

- IEEE802.11a/b/g/n compliant
- Advanced wireless security
  - 64-bit and 128-bit WEP/WPA/WPA2
    - SSID Hiding/IEEE 802.1X/RADIUS
  - Packet access control & filtering
- Turbo Roaming enables rapid handover (Client mode)
- ABC-01 for configuration import/export
- RS-232 console management
- DIN-Rail or wall mounting (option)
- IP30 protected high-strength metal housing

Product Specifications

WLAN Interface

Standards:

IEEE 802.11a/b/g/n for Wireless LAN

IEEE 802.11i for Wireless Security

IEEE 802.3 for 10BaseT

IEEE 802.3u for 100BaseT(X)

IEEE 802.3ab for 1000BaseT

Spread Spectrum and Modulation (typical):

- DSSS with DBPSK, DQPSK, CCK
- OFDM with BPSK, QPSK, 16QAM, 64QAM
- 802.11b: CCK @ 11/5.5 Mbps, QPSK @ 2 Mbps, BPSK @ 1 Mbps
- 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps
- 802.11n: 64QAM @ 300 Mbps to BPSK @ 6.5 Mbps (multiple rates supported)

Operating Channels (central frequency):

US:

2.412 to 2.462 GHz (11 channels)

5.180 to 5.320 GHz (4 channels)

5.260 to 5.320 GHz (4 channels)*

5.500 to 5.700 GHz (8 channels - excludes 5.600 to 5.650 GHz)* 5.745 to 5.825 GHz (5 channels)

EU:

2.412 to 2.472 GHz (13 channels)

5.180 to 5.240 GHz (4 channels)

5.260 to 5.320 GHz (4 channels)*

5.500 to 5.700 GHz (11 channels)* JP:

2.412 to 2.484 GHz (14 channels, DSSS)

5.180 to 5.240 GHz (4 channels)

5.260 to 5.320 GHz (4 channels)*

5.500 to 5.700 GHz (11 channels)*

*Note: These channels are not supported in AWK-1131A as the DFS certification has not been passed. Please check Moxa's website for the most up-to-date DFS status

Security:

- SSID broadcast enable/disable
- Firewall for MAC/IP/Protocol/Port-based filtering
- 64-bit and 128-bit WEP encryption, WPA /WPA2-Personal and Enterprise (IEEE 802.1X/RADIUS, TKIP and AES)

Transmission Rates:

802.11b: 1, 2, 5.5, 11 Mbps

802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 6.5 to 300 Mbps (multiple rates supported)

TX Transmit Power (per antenna port):

2.4 GHz
802.11b:

Typ. 23± 1.5 dBm @ 1 Mbps

Typ. 20± 1.5 dBm @ 5 Mbps

Typ. 19± 1.5 dBm @ 11 Mbps 802.11g:

Typ. 20± 1.5 dBm @ 6 to 24 Mbps

Typ. 19± 1.5 dBm @ 36 Mbps

Typ. 18± 1.5 dBm @ 48 Mbps

Typ. 17± 1.5 dBm @ 54
Mbps 802.11n:

MCS0, 8@20 MHz: Typ. 20 dBm (± 1.5 dBm)
MCS7, 15@20 MHz: Typ. 16 dBm (± 1.5 dBm)
MCS0, 8@40 MHz: Typ. 20 dBm (± 1.5 dBm)
MCS7, 15@40 MHz: Typ. 16 dBm (± 1.5 dBm)

5 GHz
802.11a:

Typ. 20± 1.5 dBm @ 6 to 24

Mbps Typ. 19± 1.5 dBm @ 36

Mbps Typ. 16± 1.5 dBm @ 48

Mbps Typ. 15± 1.5 dBm @ 54

Mbps 802.11n (20/40 MHz):

MCS0, 8@20 MHz: Typ. 19 dBm (± 1.5 dBm)
MCS7, 15@20 MHz: Typ. 14 dBm (± 1.5 dBm)
MCS0, 8@40 MHz: Typ. 18 dBm (± 1.5 dBm)
MCS7, 15@40 MHz: Typ. 14 dBm (± 1.5 dBm)

RX Sensitivity:

2.4 GHz
802.11b:

-92 dBm @ 1 Mbps,

-90 dBm @ 2 Mbps,

-88 dBm @ 5.5 Mbps,

-84 dBm @ 11
Mbps 802.11g:

-87 dBm @ 6 Mbps

-86 dBm @ 9 Mbps

-85 dBm @ 12 Mbps

-82 dBm @ 18 Mbps

-80 dBm @ 24 Mbps

-76 dBm @ 36 Mbps

-74 dBm @ 48 Mbps

-72 dBm @ 54
Mbps 802.11n:

-69 dBm @ MCS15 20 MHz,

-71 dBm @ MCS7 20
MHz 5 GHz

802.11a:

-87 dBm @ 6 Mbps

-86 dBm @ 9 Mbps

-85 dBm @ 12 Mbps

-82 dBm @ 18 Mbps

-80 dBm @ 24 Mbps

-76 dBm @ 36 Mbps

-74 dBm @ 48 Mbps

-72 dBm @ 54
Mbps 802.11n:

-68 dBm @ MCS15 40 MHz,

-69 dBm @ MCS15 20 MHz,

-70 dBm @ MCS7 40 MHz,

-71 dBm @ MCS7 20 MHz

Protocol Support

General Protocols: Proxy ARP, DNS, HTTP, HTTPS, IP, ICMP, SNTP, TCP, UDP, RADIUS, SNMP, PPPoE, DHCP,LLDP

AP-only Protocols: ARP, BOOTP, DHCP

Interface

Default Antennas:

2 dual-band omni-directional antennas, 2 dBi, RP-SMA (male)

Connector for External Antennas: RP-SMA (female)

RJ45 Ports: 1, 10/100/1000BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection

Console Port: RS-232 (RJ45-type) **Reset:** Present

LED Indicators: PWR, FAULT, STATE, SIGNAL, WLAN, 10/100/1000 (RJ45 port)

Physical Characteristics

Housing: Metal, providing IP30 protection **Dimensions:**

58 x 115 x 70 mm (2.28 x 4.53 x 2.76 in)

Installation: DIN rail mounting (standard), wall mounting (optional)

Environmental Limits

Operating Temperature:

Standard Models: 0 to 60°C (32 to 140°F)

Storage Temperature: -40 to 85°C (-40 to 185°F)

Ambient Relative Humidity: 5% to 95% (non-condensing)

Power Requirements

Input Voltage: 12 to 48 VDC, redundant dual DC power inputs **Connector:** 4-pin removable terminal block

Power Consumption: 6.72W (12V/0.56A to 48V/0.14A), 25°C

Reverse Polarity Protection: Present

Standards and Certifications

Safety: UL 60950-1, EN 60950-1

EMC: EN 301 489-1/17, FCC Part 15 Subpart B Class B, EN 55022/55024
Radio: EN 300 328, EN 301 893, TELEC

Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years

Details: See www.moxa.com/support/warranty.aspx

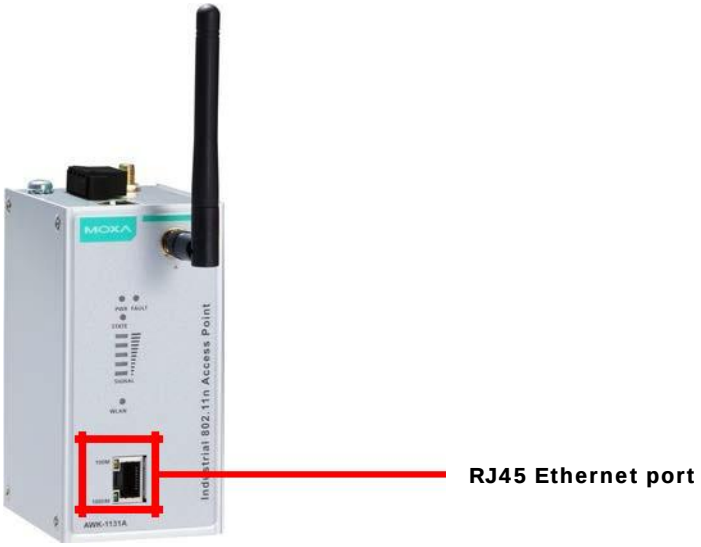
ATTENTION

- The AWK-1131A is NOT a portable mobile device and should be located at least 20 cm away from the human body.
- The AWK-1131A is NOT designed for the general public. A well-trained technician should be enlisted to ensure safe deployment of AWK-1131A units, and to establish a wireless network.

Functional Design

LAN Port

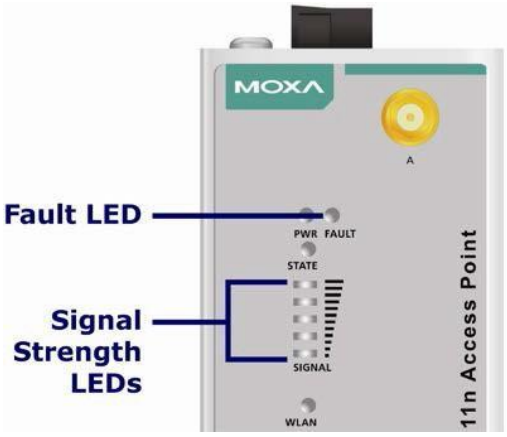
The AWK-1131A comes standard with 1 Gigabit port (Ethernet RJ45). The LAN LED will light up when the LAN cable is inserted.



LED Indicators

The LEDs on the front panel of the AWK-1131A provide a quick and easy means of determining the current operational status and wireless settings.

The **FAULT** LED indicates system failures and user-configured events. If the AWK-1131A cannot retrieve the IP address from a DHCP server, the **FAULT** LED will blink at one second intervals. The **SIGNAL** LEDs indicate signal strength, and only operate in **Client** mode.



The following table summarizes how to read the device's wireless settings from the LED displays. More information is available in Chapter 3 in the "Basic Wireless Settings" section.

LED	Color	State	Description
Front Panel LED Indicators (System)			
PWR	Green	On	Power is being supplied from power input 1&2.
		Off	Power is not being supplied from power input 1&2.
FAULT	Red	Blink (slow)	Cannot get an IP address from the DHCP server (interval: 1 sec)
		Blink (fast)	IP address conflict (interval: 0.5 sec)
		Off	Error condition does not exist.
STATE	Green/ Red	Green	Software Ready
		Green/Blink	The AWK has been located by AWK Search Utility. (interval: 1sec)
		Red	Booting error condition
SIGNAL (5 LEDs)	Green	On	Signal level(for Client mode only)
		Off	
WLAN	Green	On	WLAN function is in Client mode and AWK has established a link with an AP.
		Blink	WLAN data communication is run in Client mode
		Off	WLAN is not in Client Mode or AWK has not established a link with an AP.
	Amber	On	WLAN function is in AP mode.
		Blink	WLAN's data communication is run in AP mode
		Off	WLAN is not in use or not working properly
TP Port(RJ45) LED Indicators (Port Interface)			
1000M	Green	On	TP port's 1000Mbps link is active.
		Blink	Data is being transmitted at 1000 Mbps
		Off	TP port's 1000Mbps link is inactive.
10/100M	Amber	On	TP port's 10/100Mbps link is active.
		Blink	Data is being transmitted at 10/100 Mbps
		Off	TP port's 10/100Mbps link is inactive.

ATTENTION

When the system fails to boot, the LEDs for **STATE** (Green), **FAULT**, and **WLAN** will all light up simultaneously and blink at one-second intervals. This may be due to improper operation or uncontrollable issues, such as an unexpected shutdown while updating the firmware. To recover the firmware, refer to the "Firmware Recovery" section in Chapter 6.

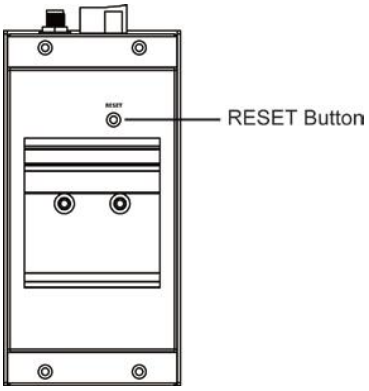
Beeper

The beeper emits two short beeps when the system is ready.

Reset Button

The **RESET** button is located on the rear panel of the AWK-1131A. You can reboot the AWK-1131A or reset it to factory default settings by pressing the **RESET** button with a pointed object such as an unfolded paper clip.

- **System reboot:** Hold the RESET button down for under 5 seconds and then release.
- **Reset to factory default:** Hold the RESET button down for *over* 5 seconds until the **STATE** LED starts blinking green. Release the button to reset the AWK-1131A.



2

This chapter explains how to install Moxa's AirWorks AWK-1131A for the first time, and quickly set up your wireless network and test whether the connection is running well. The Function Map discussed in the third section provides a convenient means of determining which functions you need to use.

The following topics are covered in this chapter:

- **First-time Installation and Configuration**
- **Communication Testing**
- **Function Map**

First-time Installation and Configuration

Before installing the AWK-1131A, make sure that all items in the Package Checklist are in the box. You will need access to a notebook computer or PC equipped with an Ethernet port. The AWK-1131A has a default IP address that must be used when connecting to the device for the first time.

- **Step 1: Select the power source.**

  The AWK-1131A can be powered by a DC power input. The AWK-1131A will use whichever power source you choose.

- **Step 2: Connect the AWK-1131A to a notebook or PC.**

  Since the AWK-1131A supports MDI/MDI-X auto-sensing, you can use either a straight-through cable or crossover cable to connect the AWK-1131A to a computer. The LED indicator on the AWK-1131A's LAN port will light up when a connection is established.

- **Step 3: Set up the computer's IP address.**

  Choose an IP address on the same subnet as the AWK-1131A. Since the AWK-1131A's default IP address is **192.168.127.253**, and the subnet mask is **255.255.255.0**, you should set the IP address of the computer to **192.168.127.xxx**.

NOTE After you select **Maintenance** → **Load Factory Default** and click the **Submit** button, the AWK-1131A will be reset to factory default settings and the IP address will be reset to **192.168.127.253**.

- **Step 4: Use the web-based manager to configure the AWK-1131A**

  Open your computer's web browser and type **http://192.168.127.253** in the address field to access the homepage of the web-based Network Manager. Before the homepage opens, you will need to enter the user name and password as shown in the following figure. For first-time configuration, enter the default user name and password and then click on the **Login** button:

NOTE Default user name and password:

User Name: **admin**

Password: **root**

For security reasons, we strongly recommend changing the default password. To do so, select **Maintenance** → **Password**, and then follow the on-screen instructions to change the password.

NOTE After you click **Submit** to apply changes the web page will refresh **(Updated)** will appear on the page and a blinking reminder will be shown on the upper-right corner of the web page:

To activate the changes click **Restart** and then **Save and Restart** after you change the settings. About 30 seconds are needed for the AWK-1131A to complete the reboot procedure.

- **Step 5: Select the AWK-1131A operation mode.**

  By default, the AWK-1131A's operation mode is set to AP. You can change to Client mode in **Wireless Settings** → **Basic Wireless Settings**. Detailed information about configuring the AWK-1131A's operation can be found in Chapter 3.

- **Step 6: Test communications.**

  In the following sections we describe two test methods that can be used to ensure that a network connection has been established.

Communication Testing

After installing the AWK-1131A you can run a sample test to make sure the AWK-1131A and wireless connection are functioning normally. Two testing methods are described below. Use the first method if you are using only one AWK-1131A device, and use the second method if you are using two or more AWK-1131A units.

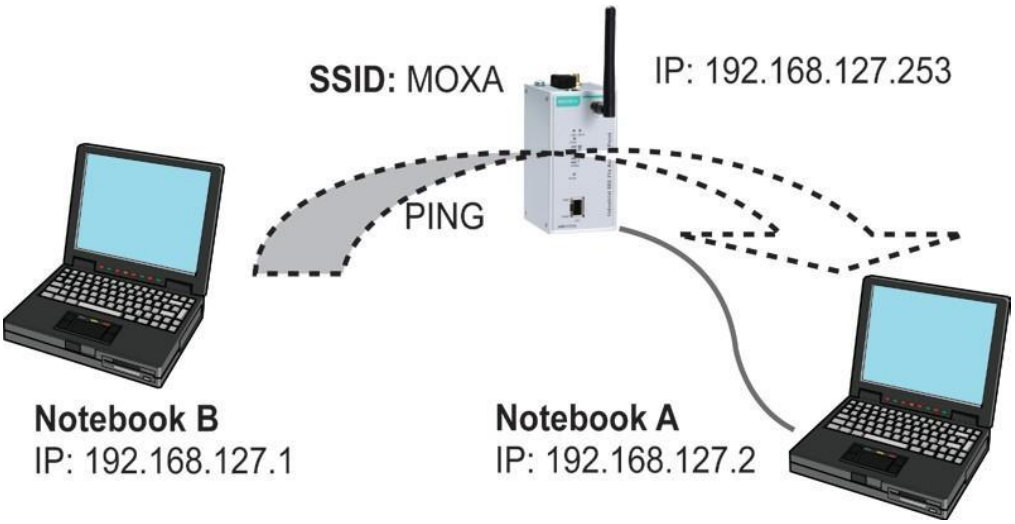
How to Test One AWK-1131A

If you are only using one AWK-1131A, you will need a second notebook computer equipped with a WLAN card. Configure the WLAN card to connect to the AWK-1131A (NOTE: the default SSID is **MOXA**), and change the IP address of the second notebook (Notebook B) so that it is on the same subnet as the first notebook (Notebook A), which is connected to the AWK-1131A.

After configuring the WLAN card, establish a wireless connection with the AWK-1131A and open a DOS window on Notebook B. At the prompt, type

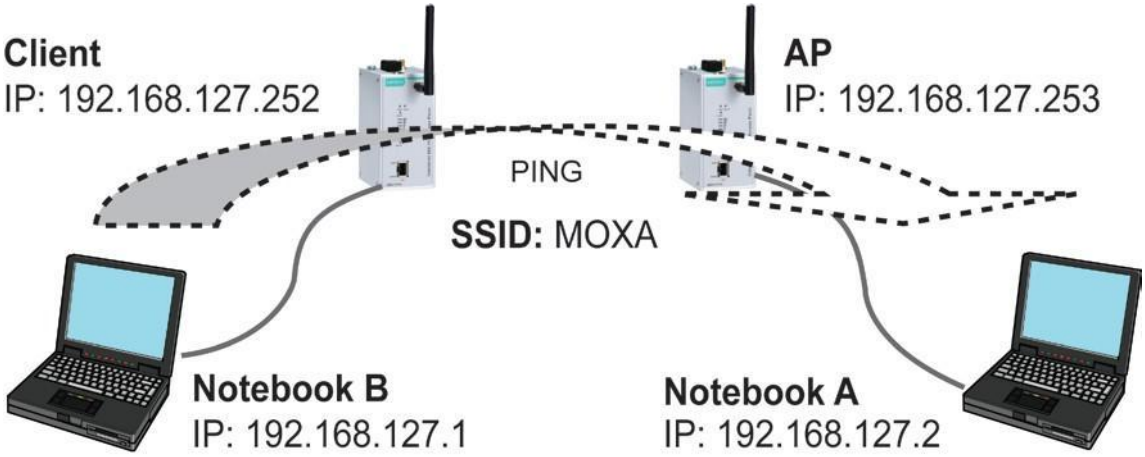
ping *<IP address of notebook A>*

and then press **Enter** (see the figure below). A "Reply from IP address …" response means the communication was successful. A "Request timed out." response means the communication failed. In this case, recheck the configuration to make sure the connections are correct.



How to Test Two or More AWK-1131A Units

If you have two or more AWK-1131A units, you will need a second notebook computer (Notebook B) equipped with an Ethernet port. Use the default settings for the first AWK-1131A connected to notebook A and change the second or third AWK-1131A connected to notebook B to Client mode, and then configure the notebooks and AWK-1131A units properly.



After setting up the testing environment, open a DOS window on notebook B. At the prompt, type:

ping *<IP address of notebook A>*

and then press **Enter**. A “Reply from IP address …” response means the communication was successful. A “Request timed out” response means the communication failed. In this case, recheck the configuration to make sure the connections are correct.

Function Map

- Main Menu
  - Overview
  - Basic Settings
    - System Info Settings
    - Network Settings
    - Time Settings
  - Wireless Settings
    - Operation Mode
    - WLAN
      - Basic Wireless Settings
      - WLAN Security Settings
      - Advanced Wireless Settings
      - WLAN Certificate Settings
  - Advanced Settings
    - DHCP Server
    - Packet Filters
      - MAC Filters
      - IP Protocol Filters
      - TCP/UDP Port Filters
    - SNMP Agent
    - Link Fault Pass-Through
  - Auto Warning Settings
    - System Log
      - System Log Event Types
    - Syslog
      - Syslog Event Types
      - Syslog Server Settings
    - E-mail
      - E-mail Event Types
      - E-mail Server Settings
    - Trap
      - Trap Event Types
      - SNMP Trap Receiver Settings
  - Status
    - Wireless Status
    - Associated Client List
    - DHCP Client List
    - System Log
    - Power Status
  - Maintenance
    - Console Settings
    - Ping
    - Firmware Upgrade
    - Config Import Export
    - Load Factory Default
    - Password
    - Misc. Settings
  - Save Configuration
  - Restart
  - Logout

Quick overview of the AWK-1131A's status

Basic settings for administering the AWK-1131A

Essential settings related to establishing a wireless network

Advanced features to support additional network management and secure wired and wireless communication

Note: These advanced functions are all optional.

Application-oriented device management functions to set up events, traps, and reactions via relay warning, e-mail, and SNMP notification

Note: These functions are all optional.

Current status information for monitoring wired/wireless network performance, advanced services, and device management functions.

Functions for maintaining the AWK-1131A, and for diagnosing the network.

On-demand functions to support the web-based console management operation.

3

In this chapter, we explain all aspects of web-based console configuration. Moxa's easy-to-use management functions help you set up your AWK-1131A and make it easy to establish and maintain your wireless network.

The following topics are covered in this chapter:

- **Web Browser Configuration**
- **Overview**
- **Basic Settings**
  - System Info Settings
  - Network Settings
  - Time Settings
- **Wireless Settings**
- **Operation Mode**
- **Basic Wireless Settings**
  - WLAN Security Settings
  - Advanced Wireless Settings
  - WLAN Certification Settings (for EAP-TLS in Client mode only)
- **Advanced Settings**
  - DHCP Server (for AP mode only)
  - Packet Filters
  - SNMP Agent
  - Link Fault Pass-Through (for Client mode only)
- **Auto Warning Settings**
  - System Log
  - Syslog
  - E-mail
  - Trap
- **Status**
  - Wireless Status
  - Associated Client List (for AP mode only)
  - DHCP Client List (for AP mode only)
  - System Log
  - Power Status
- **Maintenance**
  - Console Settings
  - Ping
  - Firmware Upgrade
  - Config Import Export
  - Load Factory Default
  - Password
  - Misc. Settings
- **Save Configuration**
- **Restart**
- **Logout**

Web Browser Configuration

Moxa AWK-1131A's web browser interface provides a convenient way to modify its configuration and access the built-in monitoring and network administration functions. The recommended web browser is Microsoft® Internet Explorer 7.0 or 8.0 with JVM (Java Virtual Machine) installed.

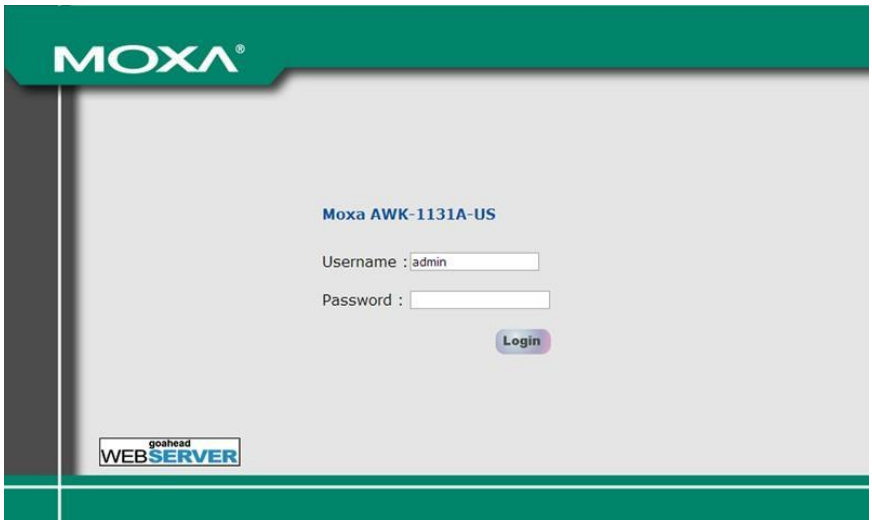
NOTE To use the AWK-1131A's management and monitoring functions from a PC host connected to the same LAN as the AWK-1131A, you must make sure that the PC host and the AWK-1131A are on the same logical subnet.

The Moxa AWK-1131A's default IP is **192.168.127.253**.

Follow these steps to access the AWK-1131A's web-based console management interface.

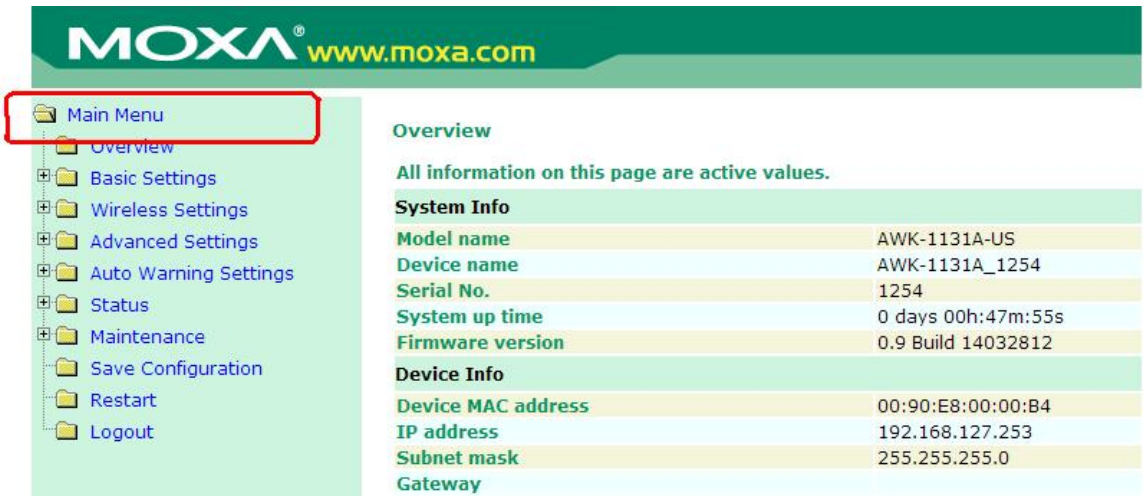
1. Open your web browser (e.g., Internet Explorer) and type the AWK-1131A's IP address in the address field. Press **Enter** to establish the connection.

2. The Web Console Login page will open. Enter the password (default Username = **admin**; default Password = **root**) and then click **Login** to continue.



3. You may need to wait a few moments for the web page to download to your computer. Note that the Model name and IP address of your AWK-1131A are both shown in the title bar of the web page. This information can be used to help you identify multiple AWK-1131A units.

4. Use the menu tree on the left side of the window to open the function pages to access each of the AWK-1131A's functions.

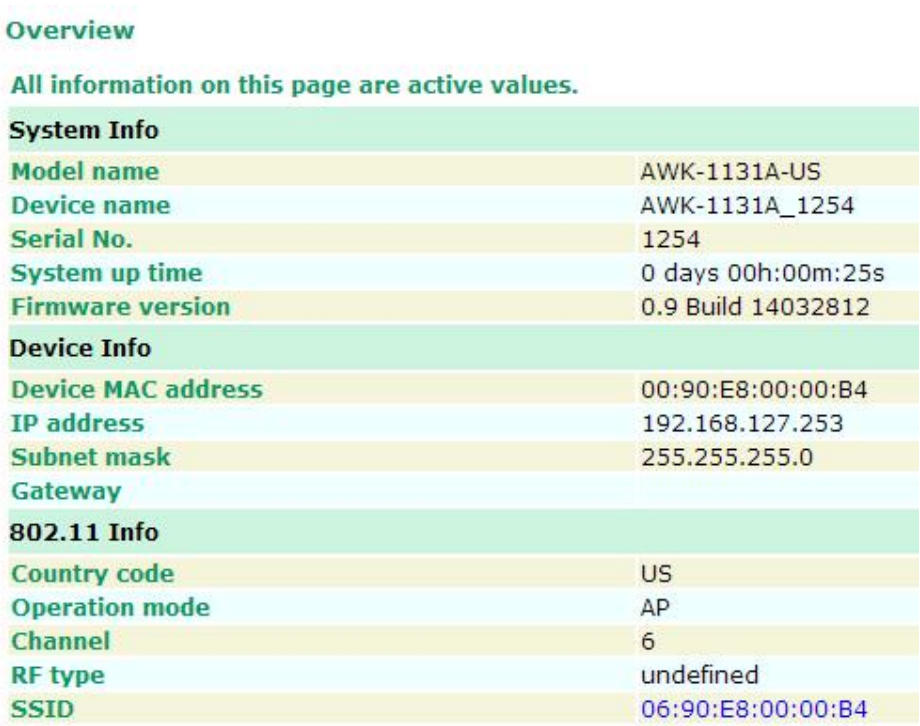


In the following paragraphs, we describe each AWK-1131A management function in detail. A quick overview is available in this manual in the "Function Map" section of Chapter 2.

NOTE The model name of the AWK-1131A is shown as AWK-1131A-XX, where XX indicates the country code. The country code indicates the AWK-1131A version and which bandwidth it uses. We use **AWK-1131A-US** as an example in the following figures. (The country code and model name that appears on your computer screen may be different than the one shown here.)

Overview

The **Overview** page summarizes the AWK-1131A's current status. The information is categorized into several groups: **System info**, **Device info**, and **802.11 info**.

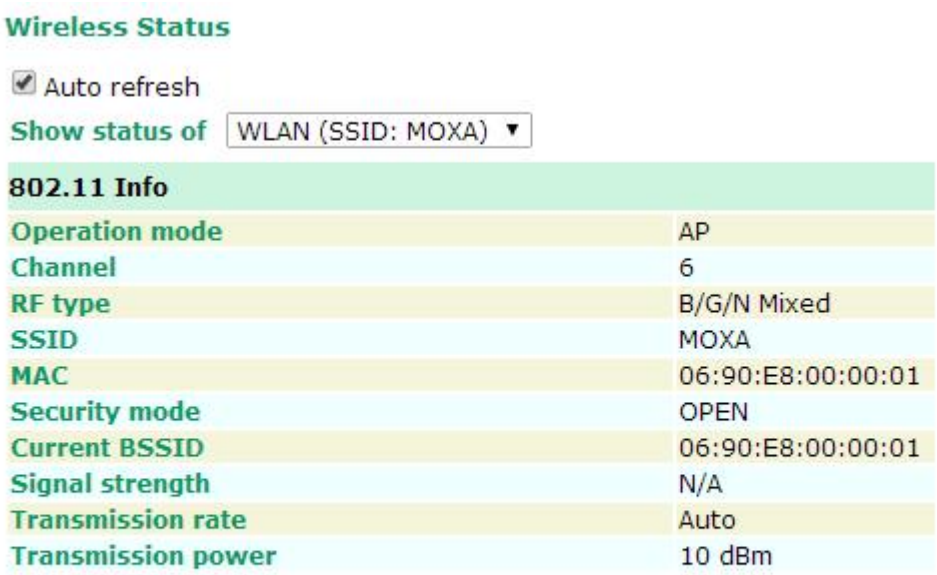


Overview

All information on this page are active values.

System Info	
Model name	AWK-1131A-US
Device name	AWK-1131A_1254
Serial No.	1254
System up time	0 days 00h:00m:25s
Firmware version	0.9 Build 14032812
Device Info	
Device MAC address	00:90:E8:00:00:B4
IP address	192.168.127.253
Subnet mask	255.255.255.0
Gateway	
802.11 Info	
Country code	US
Operation mode	AP
Channel	6
RF type	undefined
SSID	06:90:E8:00:00:B4

Click on **SSID** for more detailed 802.11 information, as shown in the following figure.



NOTE The **802.11 info** that is displayed may be different for different operation modes. For example, "Current BSSID" is not available in Client mode, and "Signal strength" is not available in AP mode.

Basic Settings

The Basic Settings group includes the most commonly used settings required by administrators to maintain and control the AWK-1131A.

System Info Settings

The **System Info** items, especially ***Device name*** and ***Device description***, are displayed and included on the **Overview** page, in SNMP information, and in alarm emails. Setting **System Info** items makes it easier to identify the different AWK-1131A units connected to your network.

Device name

Setting	Description	Factory Default
Max. 31 of characters	This option is useful for specifying the role or application of different AWK-1131A units.	AWK-1131A_<Serial No. of this AWK-1131A>

Device location

Setting	Description	Factory Default
Max. of 31 characters	Specifies the location of different AWK-1131A units.	None

Device description

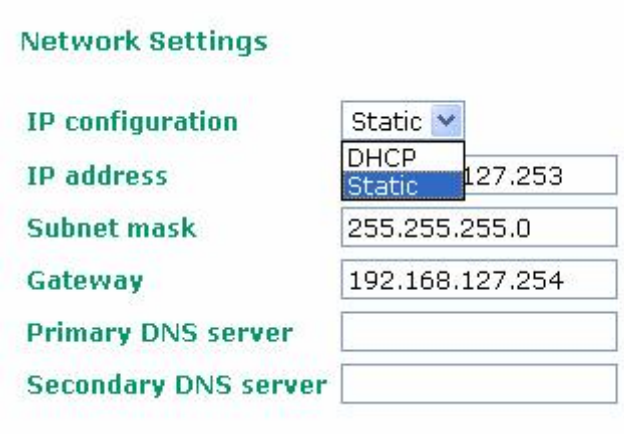
Setting	Description	Factory Default
Max. of 31 characters	Use this space to record a more detailed description of the AWK-1131A	None

Device contact information

Setting	Description	Factory Default
Max. of 31 characters	Provides information about whom to contact in order to resolve problems. Use this space to record contact information of the person responsible for maintaining this AWK-1131A.	None

Network Settings

The Network Settings configuration panel allows you to modify the usual TCP/IP network parameters. An explanation of each configuration item is given below.



IP configuration

Setting	Description	Factory Default
DHCP	The AWK-1131A's IP address will be assigned automatically by the network's DHCP server	Static
Static	Set up the AWK-1131A's IP address manually.	

IP address

Setting	Description	Factory Default
AWK-1131A's IP address	Identifies the AWK-1131A on a TCP/IP network.	192.168.127.253

Subnet mask

Setting	Description	Factory Default
AWK-1131A's subnet mask	Identifies the type of network to which the AWK-1131A is connected (e.g., 255.255.0.0 for a Class B network, or 255.255.255.0 for a Class C network).	255.255.255.0

Gateway

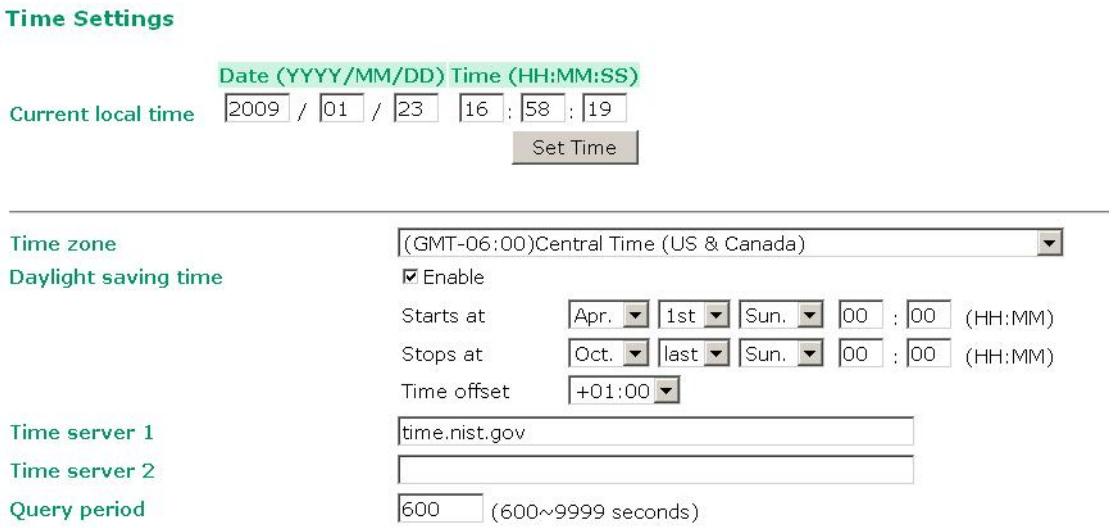
Setting	Description	Factory Default
AWK-1131A's default gateway	The IP address of the router that connects the LAN to an outside network.	None

Primary/ Secondary DNS server

Setting	Description	Factory Default
IP address of the Primary/Secondary DNS server	The IP address of the DNS Server used by your network. After entering the DNS Server's IP address, you can input the AWK-1131A's URL (e.g., http://ap11.abc.com) in your browser's address field instead of entering the IP address. The Secondary DNS server will be used if the Primary DNS server fails to connect.	None

Time Settings

The AWK-1131A has a time calibration function based on information from an NTP server or user specified Date and Time information. Functions such as Auto warning can add real-time information to the message.



The ***Current local time*** shows the AWK-1131A's system time when you open this web page. You can click on the **Set Time** button to activate the updated date and time parameters. An "(Updated)" string will appear to indicate that the change is complete. Local time settings will be immediately activated in the system without running Save and Restart.

NOTE The AWK-1131A has a built-in real time clock (RTC). We strongly recommend that users update the **Local time** for the AWK-1131A after the initial setup or a long-term shutdown, especially when the network does not have an Internet connection for accessing the NTP server or there is no NTP server on the LAN.

Current local time

Setting	Description	Factory Default
User adjustable time	The date and time parameters allow configuration of the local time, with immediate activation. *Use 24-hour format: yyyy/mm/dd hh:mm:ss*	None

Time zone

Setting	Description	Factory Default
User selectable time zone	The time zone setting allows conversion from GMT (Greenwich Mean Time) to local time.	GMT (Greenwich Mean Time)

ATTENTION

Changing the time zone will automatically adjust the **Current local time**. You should configure the **Time zone** before setting the **Current local time**.

Daylight saving time

Setting	Description	Factory Default
Enable/ Disable	Daylight saving time (also know as DST or summer time) involves advancing clocks (usually 1 hour) during the summer time to provide an extra hour of daylight in the afternoon.	Disable

When **Daylight saving time** is enabled, the following parameters will be shown:

- **Starts at:** The date that daylight saving time begins.
- **Stops at:** The date that daylight saving time ends.
- **Time offset:** Indicates how many hours forward the clock should be advanced.

Time server 1/2

Setting	Description	Factory Default
IP/Name of Time Server 1/2	IP or Domain name of the NTP time server. The 2nd NTP server will be used if the 1st NTP server fails to connect.	time.nist.gov

Query period

Setting	Description	Factory Default
Query period time (1 to 9999 seconds)	This parameter determines how often the time is updated from the NTP server.	600 (seconds)

Wireless Settings

The essential settings for wireless networks are presented in this function group. Settings must be properly set before establishing your wireless network. Familiarize yourself with the following terms before starting the configuration process:

AP: In a wireless local area network (WLAN), an access point is a station that transmits and receives data.

Client: When the AWK-1131A is configured for **Client** mode, it can be used as an Ethernet-to-wireless (or LAN-to-WLAN) network adaptor. For example, a notebook computer equipped with an Ethernet adaptor but no wireless card can be connected to this device with an Ethernet cable to provide wireless connectivity to another AP.

Operation Mode

The AWK-1131A supports four main operation modes—AP, Client—each of which plays a distinct role on the wireless network.

Wireless Enable

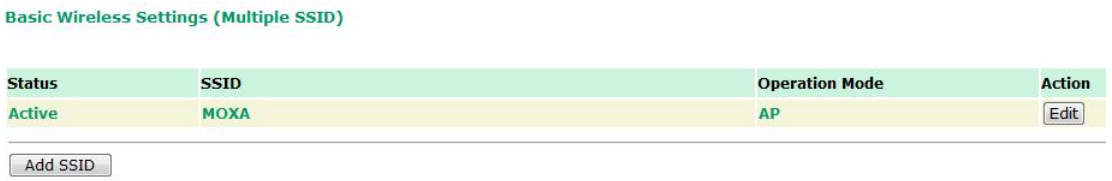
Setting	Description	Factory Default
Enable/Disable	The RF (Radio Frequency) module can be manually turned on or off. This function is available in AP operation mode only.	Enable

Operation Mode

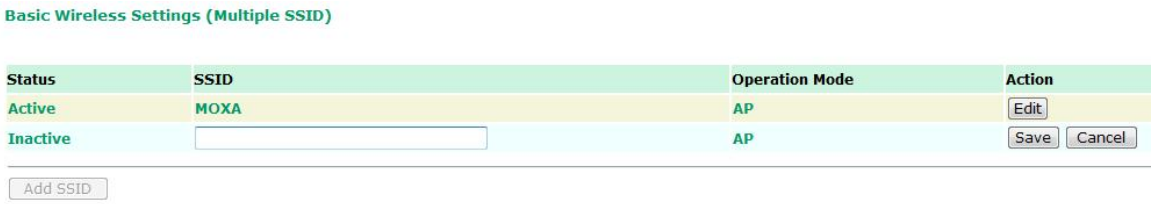
Setting	Description	Factory Default
AP	The AWK-1131A plays the role of wireless Access Point	AP
Client	The AWK-1131A plays the role of wireless Client	

Basic Wireless Settings

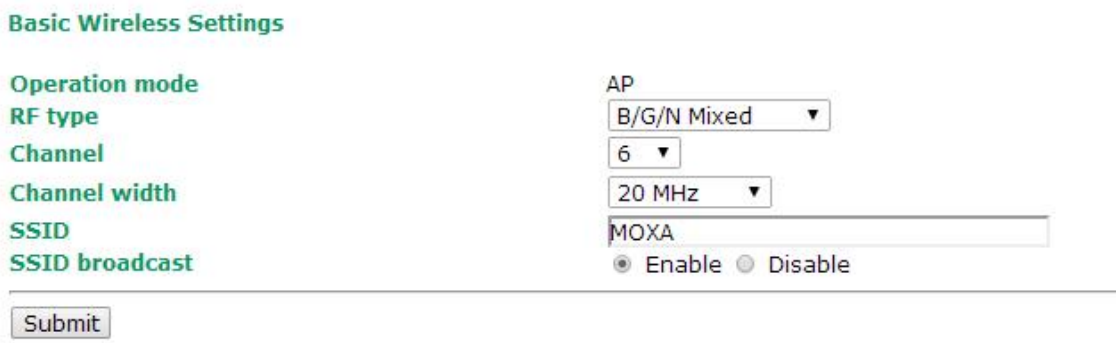
The "WLAN Basic Setting Selection" panel is used to add and edit SSIDs. An SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Multiple access points on a network or sub-network can use the same SSIDs.



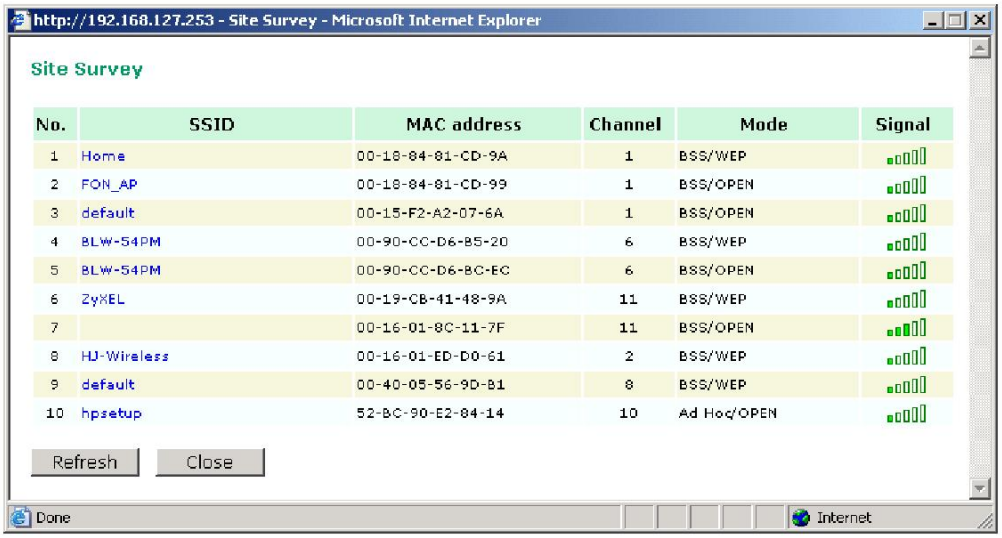
Click on **Add SSID** to create more SSIDs.



Click on **Edit** to assign different configuration settings to each SSID. The configuration panel appears as follows:



NOTE When you switch to **Client** mode, a **Site Survey** button will be available on the Basic Wireless Settings panel. Click the "Site Survey" button to view information about available APs, as shown in the following figure. You can click on the SSID of an entity and bring the value of its SSID onto the SSID field of the Basic Wireless Settings page. Click the **Refresh** button to re-scan and update the table.



No.	SSID	MAC address	Channel	Mode	Signal
1	Home	00-18-84-81-CD-9A	1	BSS/WEP	
2	FON_AP	00-18-84-81-CD-99	1	BSS/OPEN	
3	default	00-15-F2-A2-07-6A	1	BSS/OPEN	
4	BLW-54PM	00-90-CC-D6-B5-20	6	BSS/WEP	
5	BLW-54PM	00-90-CC-D6-BC-EC	6	BSS/OPEN	
6	ZyXEL	00-19-CB-41-48-9A	11	BSS/WEP	
7		00-16-01-8C-11-7F	11	BSS/OPEN	
8	HJ-Wireless	00-16-01-ED-D0-61	2	BSS/WEP	
9	default	00-40-05-56-9D-B1	8	BSS/WEP	
10	hpsetup	52-BC-90-E2-84-14	10	Ad Hoc/OPEN	

NOTE If the **Gateway** field in **Basic Settings** → **Network Settings** is empty, a warning message will appear, reminding you to set the default gateway when **Client** mode is enabled. You can ignore this message if you are only planning a local network and packets will not be sent outside the network.

RF type

Setting	Description	Factory Default
2.4 GHz		
B	Only supports the IEEE 802.11b standard	B/G/N Mixed
G	Only supports the IEEE 802.11g standard	
B/G Mixed	Supports IEEE 802.11b/g standards, but 802.11g may operate at a slower speed if when 802.11b clients are on the network	
G/N Mixed	Supports IEEE 802.11g/n standards, but 802.11n may operate at a slower speed if 802.11g clients are on the network	
B/G/N Mixed	Supports IEEE 802.11b/g/n standards, but 802.11g/n may operate at a slower speed if 802.11b clients are on the network	
N Only (2.4GHz)	Only supports the 2.4 GHz IEEE 802.11n standard	
5 GHz		
A	Only supports the IEEE 802.11a standard	
A/N Mixed	Supports IEEE 802.11a/n standards, but 802.11n may operate at a slower speed if 802.11a clients are on the network	
N Only (5GHz)	Only supports the 5 GHz IEEE 802.11n standard	

NOTE In legacy mode (802.11a/b/g) only antenna port "A" can work for transmitting and receiving. To protect the connectors and the RF module, all radio ports should be terminated by either an antenna or a terminator. The use of the resistive terminator for terminating the unused antenna port is strongly recommended.

Channel (for AP mode only)

Setting	Description	Factory Default
Available channels vary with RF type	The AWK-1131A plays the role of wireless AP.	6 (in B/G/N Mixed mode)

Channel Width (for any 802.11N RF type only)

Setting	Description	Factory Default
20 MHz	Select your channel width, If you are not sure which option to use, select 20/ 40MHz (Auto)	20 MHz
20/40 MHz		

Channel bonding

If 20/40 MHz only is the Channel Width setting, this channel bonding will auto set the channel based on your channel setting.

SSID

Setting	Description	Factory Default
Max. of 31 characters	The SSID of a client and the SSID of the AP must be identical for the client and AP to be able to communicate with each other.	MOXA

SSID broadcast (for AP mode only)

Setting	Description	Factory Default
Enable/ Disable	SSID can be broadcast or not	Enable

NOTE The AWK-1131A-JP (for Japanese frequency bands) only connects SSID-hidden APs for IEEE 802.11a channels, and IEEE 802.11g/n channels 1 to 11. The AWK-1131A-EU (for European frequency bands) only connects SSID-hidden APs for IEEE 802.11b/g/n channels.

WLAN Security Settings

The AWK-1131A provides four standardized wireless security modes: **Open**, **WEP** (Wired Equivalent Privacy), **WPA** (Wi-Fi Protected Access), and **WPA2**. Several security modes are available in the AWK-1131A by selecting ***Security mode*** and ***WPA type***:

- **Open:** No authentication, no data encryption.
- **WEP:** Static WEP (Wired Equivalent Privacy) keys must be configured manually.
- **WPA/WPA2-Personal:** Also known as WPA/WPA2-PSK. You will need to specify the Pre-Shared Key in the ***Passphrase*** field, which will be used by the TKIP or AES engine as a master key to generate keys that actually encrypt outgoing packets and decrypt incoming packets.

  WPA/WPA2-Enterprise: Also called WPA/WPA2-EAP (Extensible Authentication Protocol). In addition to device-based authentication, WPA/WPA2-Enterprise enables user-based authentication via IEEE802.1X. The AWK-1131A can support three EAP methods: EAP-TLS, EAP-TTLS, and EAP-PEAP.

Security mode

Setting	Description	Factory Default
Open	No authentication	Open
WEP	Static WEP is used	
WPA	WPA is used	
WPA2	Fully supports IEEE802.11i with "TKIP/AES + 802.1X"	

Open

For security reasons, you should **NOT** set security mode to Open System, since authentication and data encryption are **NOT** performed in Open System mode.

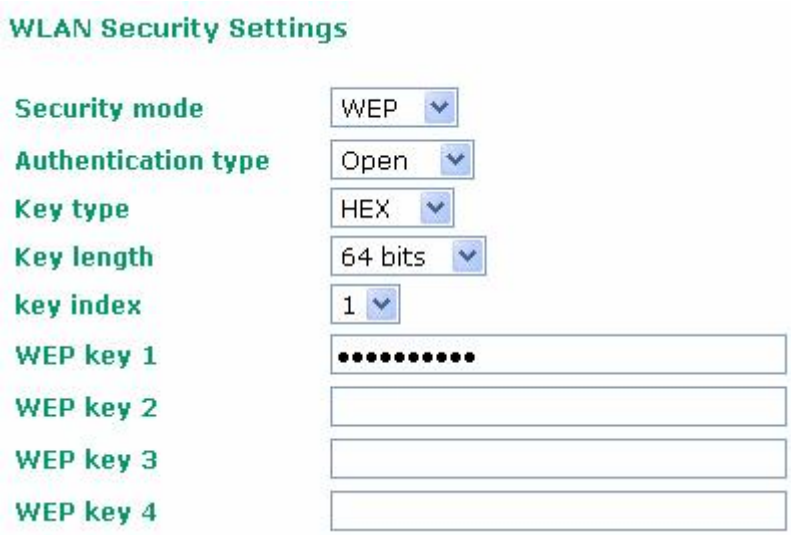
WEP (only for legacy mode)

NOTE Moxa includes **WEP** security mode only for legacy purposes. **WEP** is highly insecure and is considered fully deprecated by the Wi-Fi alliance. We do not recommend the use of WEP security under any circumstances.

According to the IEEE802.11 standard, WEP can be used for authentication and data encryption to maintain confidentiality. **Shared** (or **Shared Key**) authentication type is used if WEP authentication and data encryption are both needed. Normally, **Open** (or **Open System**) authentication type is used when WEP data encryption is run with authentication.

When WEP is enabled as a security mode, the length of a key (so-called WEP seed) can be specified as 64/128 bits, which is actually a 40/104-bit secret key with a 24-bit initialization vector. The AWK-1131A provides 4 entities of WEP key settings that can be selected to use with ***Key index***. The selected key setting specifies the key to be used as a *send-key* for encrypting traffic from the AP side to the wireless client side. All 4 WEP keys are used as *receive-keys* to decrypt traffic from the wireless client side to the AP side.

The WEP key can be presented in two ***Key types***, HEX and ASCII. Each ASCII character has 8 bits, so a 40-bit (or 64-bit) WEP key contains 5 characters, and a 104-bit (or 128-bit) key has 13 characters. In hex, each character uses 4 bits, so a 40-bit key has 10 hex characters, and a 128-bit key has 26 characters.



Authentication type

Setting	Description	Factory Default
Open	Data encryption is enabled, but without authentication	Open
Shared	Data encryption and authentication are both enabled.	

Key type

Setting	Description	Factory Default
HEX	Specifies WEP keys in hex-decimal number form	HEX
ASCII	Specifies WEP keys in ASCII form	

Key length

Setting	Description	Factory Default
64 bits	Uses 40-bit secret keys with 24-bit initialization vector	64 bits
128 bits	Uses 104-bit secret key with 24-bit initialization vector	

Key index

Setting	Description	Factory Default
1-4	Specifies which WEP key is used	Open

WEP key 1-4

Setting	Description	Factory Default
ASCII type: 64 bits: 5 chars 128 bits: 13chars HEX type: 64 bits: 10 hex chars 128 bits: 26 hex chars	A string that can be used as a WEP seed for the RC4 encryption engine.	None

WPA / WPA2-Personal

WPA (Wi-Fi Protected Access) and WPA2 represent significant improvements over the WEP encryption method. WPA is a security standard based on 802.11i draft 3, while WPA2 is based on the fully ratified version of 802.11i. The initial vector is transmitted, encrypted, and enhanced with its 48 bits, twice as long as WEP. The key is regularly changed so that true session is secured.

Even though AES encryption is only included in the WPA2 standard, it is widely available in the WPA security mode of some wireless APs and clients as well. The AWK-1131A also supports AES algorithms in WPA and WPA2 for better compatibility.

Personal versions of WPA/WPA2, also know as WPA/WPA-PSK (*Pre-Shared Key*), provide a simple way of encrypting a wireless connection for high confidentiality. A ***Passphrase*** is used as a basis for encryption methods (or cipher types) in a WLAN connection. The passphrases should be complicated and as long as possible. There must be at least 8 ASCII characters in the Passphrase, and it could go up to 63. For security reasons, this passphrase should only be disclosed to users who need it, and it should be changed regularly.

WPA type

Setting	Description	Factory Default
Personal	Provides Pre-Shared Key-enabled WPA and WPA2	Personal
Enterprise	Provides enterprise-level security for WPA and WPA2	

Encryption method

Setting	Description	Factory Default
TKIP**	Temporal Key Integrity Protocol is enabled	AES
AES	Advance Encryption System is enabled	
Mixed*	Provides TKIP broadcast key and TKIP+AES unicast key for some legacy AP clients. This option is rarely used.	

*** This option is only available with 802.11a/b/g standard*

** This option is available for legacy mode in AP only, and does not support AES-enabled clients.*

Passphrase

Setting	Description	Factory Default
8 to 63 characters	Master key to generate keys for encryption and decryption	None

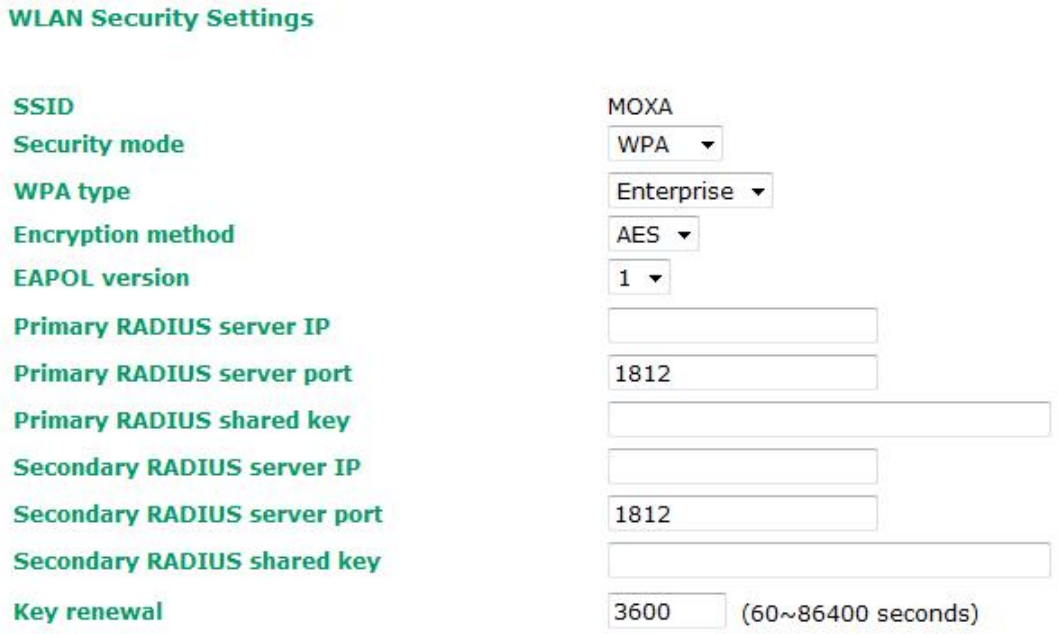
Key renewal (for AP mode only)

Setting	Description	Factory Default
60 to 86400 seconds (1 minute to 1 day)	Specifies the time period of group key renewal	3600 (seconds)

NOTE The ***key renewal*** value dictates how often the wireless AP encryption keys should be changed. The security level is generally higher if you set the key renewal value to a shorter number, which forces the encryption keys to be changed more frequently. The default value is 3600 seconds (6 minutes). Longer time periods can be considered if the line is not very busy.

WPA / WPA2-Enterprise (for AP mode)

By setting ***WPA type*** to **Enterprise**, you can use **EAP** (*Extensible Authentication Protocol*), a framework authentication protocol used by 802.1X to provide network authentication. In these Enterprise-level security modes, a back-end RADIUS (Remote Authentication Dial-In User Service) server is needed if IEEE 802.1X functionality is enabled in WPA /WPA2. The IEEE 802.1X protocol also offers the possibility of carrying out an efficient connection authentication on a large-scale network. It is not necessary to exchange keys or passphrases.



WPA type

Setting	Description	Factory Default
Personal	Provides Pre-Shared Key-enabled WPA and WPA2	Personal
Enterprise	Provides enterprise-level security for WPA and WPA2	

Encryption method

Setting	Description	Factory Default
TKIP**	Temporal Key Integrity Protocol is enabled	AES
AES	Advance Encryption System is enabled	
Mixed*	Provides TKIP broadcast key and TKIP+AES unicast key for some legacy AP clients. This option is rarely used.	

*** This option is only available with 802.11a/b/g standard*

** This option is available for legacy mode in AP only, and does not support AES-enabled clients.*

Primary/Secondary RADIUS server IP

Setting	Description	Factory Default
The IP address of RADIUS server	Specifies the delegated RADIUS server for EAP	None

Primary/Secondary RADIUS port

Setting	Description	Factory Default
Port number	Specifies the port number of the delegated RADIUS server	1812

Primary/ Secondary RADIUS shared key

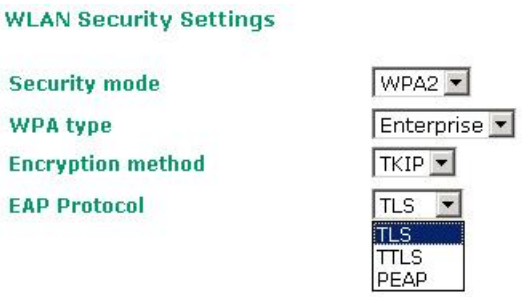
Setting	Description	Factory Default
Max. of 31 characters	The secret key shared between AP and RADIUS server	None

Key renewal

Setting	Description	Factory Default
60 to 86400 seconds (1 minute to 1 year)	Specifies the time period of group key renewal	3600 (seconds)

WPA/WPA2-Enterprise (for Client mode)

When used as a client, the AWK-1131A can support three EAP methods (or ***EAP protocols***): **EAP-TLS**, **EAP-TTLS**, and **EAP-PEAP**, corresponding to WPA/WPA-Enterprise settings on the AP side.



Encryption method

Setting	Description	Factory Default
TKIP**	Temporal Key Integrity Protocol is enabled	TKIP
AES	Advance Encryption System is enabled	

***This option is only available with 802.11a/b/g standard.*

EAP Protocol

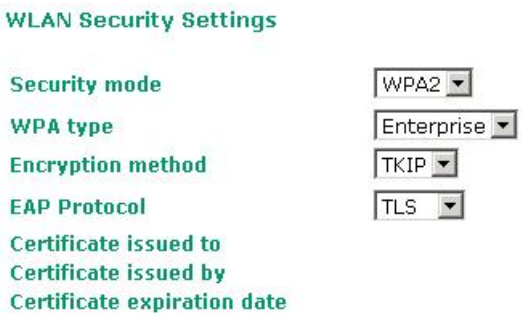
Setting	Description	Factory Default
TLS	Specifies Transport Layer Security protocol	TLS
TTLS	Specifies Tunneled Transport Layer Security	
PEAP	Specifies Protected Extensible Authentication Protocol, or Protected EAP	

Before choosing the EAP protocol for your WPA/WPA2-Enterpise settings on the client end, please contact the network administrator to make sure the system supports the protocol on the AP end. Detailed information on these three popular EAP protocols is presented in the following sections.

EAP-TLS

TLS is the standards-based successor to Secure Socket Layer (SSL). It can establish a trusted communication channel over a distrusted network. TLS provides mutual authentication through certificate exchange. EAP-TLS is also secure to use. You are required to submit a digital certificate to the authentication server for validation, but the authentication server must also supply a certificate.

You can use **Basic Wireless Settings** → **WLAN Certificate Settings** to import your WLAN certificate and enable EAP-TLS on the client end.



You can check the current certificate status in ***Current Status*** if it is available.

- **Certificate issued to:** Shows the certificate user
- **Certificate issued by**: Shows the certificate issuer
- **Certificate expiration date**: Indicates when the certificate has expired

EAP-TTLS

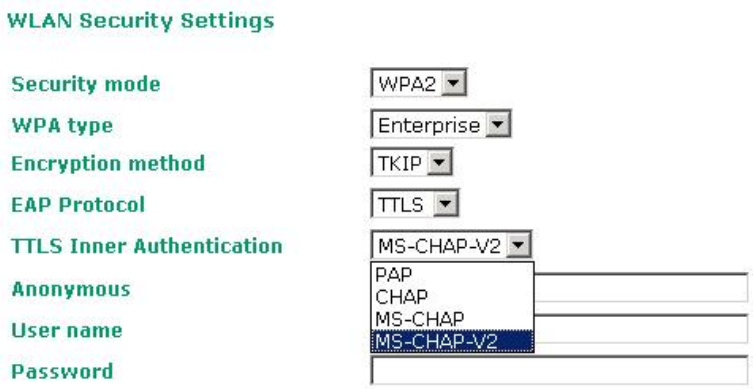
It is usually much easier to re-use existing authentication systems, such as a Windows domain or Active Directory, LDAP directory, or Kerberos realm, rather than creating a parallel authentication system. As a result, TTLS (Tunneled TLS) and PEAP (Protected EAP) are used to support the use of so-called "legacy authentication methods."

TTLS and PEAP work in a similar way. First, they establish a TLS tunnel (EAP-TLS for example), and validate whether the network is trustworthy with digital certificates on the authentication server. This step establishes a tunnel that protects the next step (or "inner" authentication), and consequently is sometimes referred to as "outer" authentication. The TLS tunnel is then used to encrypt an older authentication protocol that authenticates the user for the network.

As you can see, digital certificates are still needed for outer authentication in a simplified form. Only a small number of certificates are required, which can be generated by a small certificate authority. Certificate reduction makes TTLS and PEAP much more popular than EAP-TLS.

The AWK-1131A provides some non-cryptographic EAP methods, including **PAP**, **CHAP**, **MS-CHAP**, and **MS-CHAP-V2**. These EAP methods are not recommended for direct use on wireless networks. However, they may be useful as inner authentication methods with TTLS and PEAP.

Because the inner and outer authentications can use distinct user names in TTLS and PEAP, you can use an anonymous user name for the outer authentication, with the true user name only shown through the encrypted channel. Keep in mind that not all client software supports anonymous alteration. Confirm this with the network administrator before you enable identity hiding in TTLS and PEAP.



TTL Inner Authentication

Setting	Description	Factory Default
PAP	Password Authentication Protocol is used	MS-CHAP-V2
CHAP	Challenge Handshake Authentication Protocol is used	
MS-CHAP	Microsoft CHAP is used	
MS-CHAP-V2	Microsoft CHAP version 2 is used	

Anonymous

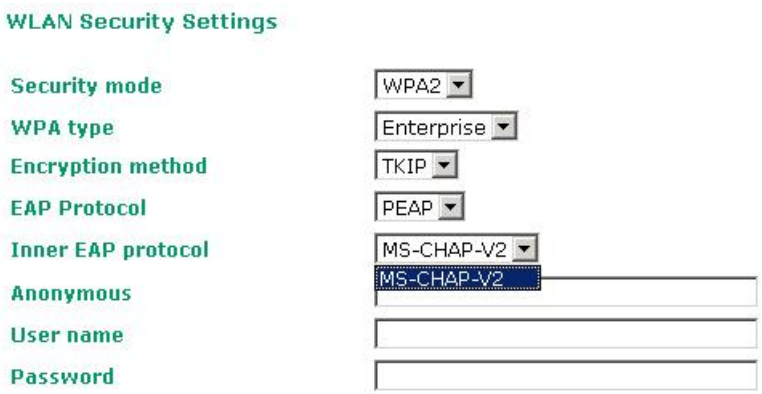
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication	None

User name & Password

Setting	Description	Factory Default
	User name and password used in inner authentication	None

PEAP

There are a few differences in the TTLS and PEAP inner authentication procedures. TTLS uses the encrypted channel to exchange attribute-value pairs (AVPs), while PEAP uses the encrypted channel to start a second EAP exchange inside of the tunnel. The AWK-1131A provides **MS-CHAP-V2** merely as an EAP method for inner authentication.



Inner EAP protocol

Setting	Description	Factory Default
MS-CHAP-V2	Microsoft CHAP version 2 is used	MS-CHAP-V2

Anonymous

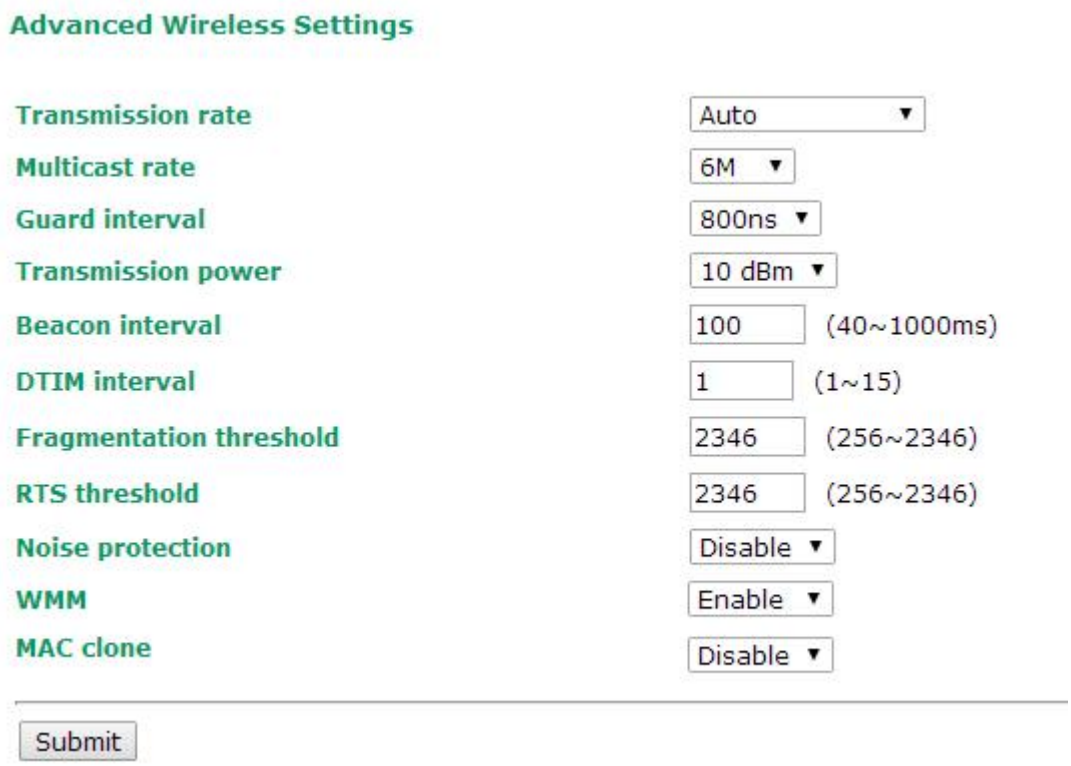
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication	None

User name & Password

Setting	Description	Factory Default
	User name and password used in inner authentication	None

Advanced Wireless Settings

Additional wireless-related parameters are presented in this section to help you set up your wireless network in detail.



Transmission Rate

Setting	Description	Factory Default
Auto	The AWK-1131A senses and adjusts the data rate automatically	Auto
Available rates	Users can manually select a target transmission data rate but does't support when RF type are G/N Mixed, B/G/N Mixed, A/N Mixed and N only.	

Multicast Rate

Setting	Description	Factory Default
Available rates	You can set a fixed multicast rate for the transmission of broadcast and multicast packets on a per-radio basis. This parameter can be useful in an environment where multicast video streaming is occurring in the wireless medium, providing the wireless clients are capable of handling the configured rate	6M

Guarding Interval

Setting	Description	Factory Default
Guarding Interval	Guarding interval is used to ensure that distinct transmissions do not interfere with one another. You can select the guarding interval manually for Wireless-N connections. The two options are Short (400ns) and Long (800ns).	800ns.

Transmission Power

Setting	Description	Factory Default
Available power	Users can manually select a target power to mask max output power. Because different transmission rate would have it own max output power, please reference product datasheet.	10

Beacon Interval (for AP mode only)

Setting	Description	Factory Default
Beacon Interval (40 to 1000 ms)	Indicates the frequency interval of the beacon	100 (ms)

DTIM Interval (for AP mode only)

Setting	Description	Factory Default
Data Beacon Rate (1 to 15)	Indicates how often the AWK-1131A sends out a Delivery Traffic Indication Message	1

Fragmentation threshold

Setting	Description	Factory Default
Fragment Length (256 to 2346)	Specifies the maximum size a data packet before splitting and creating another new packet	2346

RTS threshold

Setting	Description	Factory Default
RTS/CTS Threshold (256 to 2346)	Determines how large a packet can be before the Access Point coordinates transmission and reception to ensure efficient communication	2346

NOTE You can refer to the related glossaries in Chapter 5 for detailed information about the above-mentioned settings. By setting these parameters properly, you can better tune the performance of your wireless network.

Noise protection

Setting	Description	Factory Default
Enable/Disable	Adjusts the interference coping capability of the wireless signal. If you have some noisy areas, then give this a swing and see if you get an improvement.	Disable

WMM

Setting	Description	Factory Default
Enable/Disable	WMM is a QoS standard for WLAN traffic. Voice and video data will be given priority bandwidth when enabled with WMM supported wireless clients. Note: WMM will always be enabled under 802.11n mode.	Enable

MAC clone

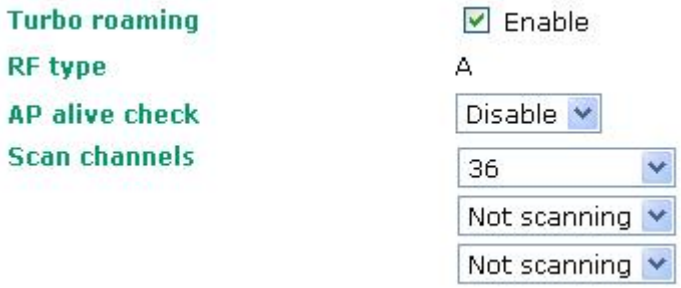
Setting	Description	Factory Default
Enable/Disable	When AWK-1131A becomes an a Client, it would replace the device's MAC address what is connected behind AWK-1131A to do communication. In some application would be asked to use specific MAC address to do communication, then you could use this function to clone device's MAC address on AWK-1131A to avoid replacement of MAC address.	Disable

Turbo Roaming (for Client mode only)

Setting	Description	Factory Default
Enable/ Disable	Moxa's Turbo Roaming can enable rapid handover when the AWK-1131A, as a client, roams among a group of APs.	Disable

When Turbo Roaming is enabled, the RF type, AP alive check, and Scan channels will be shown as follows. RF type shows the current **RF type** that this client is using. **AP alive check** will check if the AP connection is still available. When this function is enabled, a check will be done every 10 ms. You can set up **Scan channels** for the APs among which this client is going to roam. There are three Scan channels available. Note that the **Scan**

channels may need to be modified when the **RF type** is changed. (For example, channel 36 is not available in **B**, **G**, **N** or **B/G/N Mix** mode.)



WLAN Certification Settings (for EAP-TLS in Client mode only)

When EAP-TLS is used, a WLAN Certificate will be required at the client end to support WPA/WPA2-Enterprise. The AWK-1131A can support the **PKCS #12**, also known as *Personal Information Exchange Syntax Standard*, certificate formats that define file formats commonly used to store private keys with accompanying public key certificates, protected with a password-based symmetric key.

Current Status displays information for the current WLAN certificate, which has been imported into the AWK-1131A. Nothing will be shown if a certificate is not available.

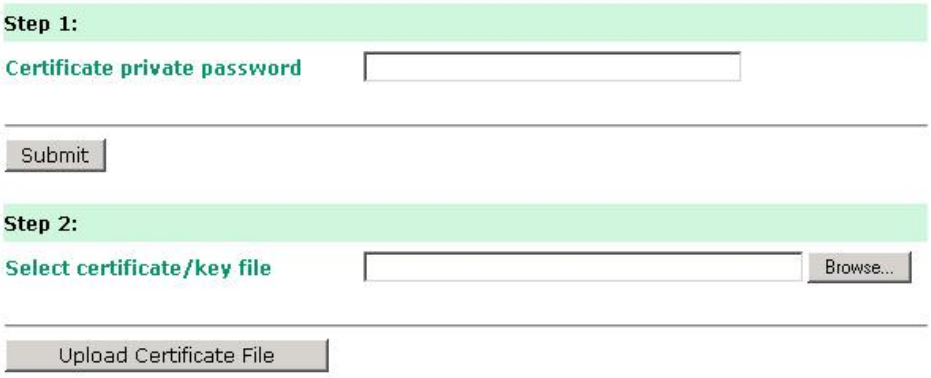
Certificate issued to: Shows the certificate user

Certificate issued by: Shows the certificate issuer

Certificate expiration date: Indicates when the certificate has expired

You can import a new WLAN certificate in ***Import WLAN Certificate*** by following these steps, in order:

1. Input the corresponding password (or key) in the **Certificate private password** field and then click **Submit** to set the password.
2. The password will be displayed in the Certificate private password field. Click on the **Browse** button in ***Select certificate/key file*** and select the certificate file.
3. Click **Upload Certificate File** to import the certificate file. If the import succeeds, you can see the information uploaded in ***Current Certificate***. If it fails, you may need to return to step 1 to set the password correctly and then import the certificate file again.



NOTE The WLAN certificate will remain after the AWK-1131A reboots. Even though it is expired, it can still be seen on the ***Current Certificate***.

Advanced Settings

Several advanced functions are available to increase the functionality of your AWK-1131A and wireless network system. The DHCP server helps you deploy wireless clients efficiently. Packet filters provide security mechanisms, such as firewalls, in different network layers. Moreover, SNMP support can make network management easier.

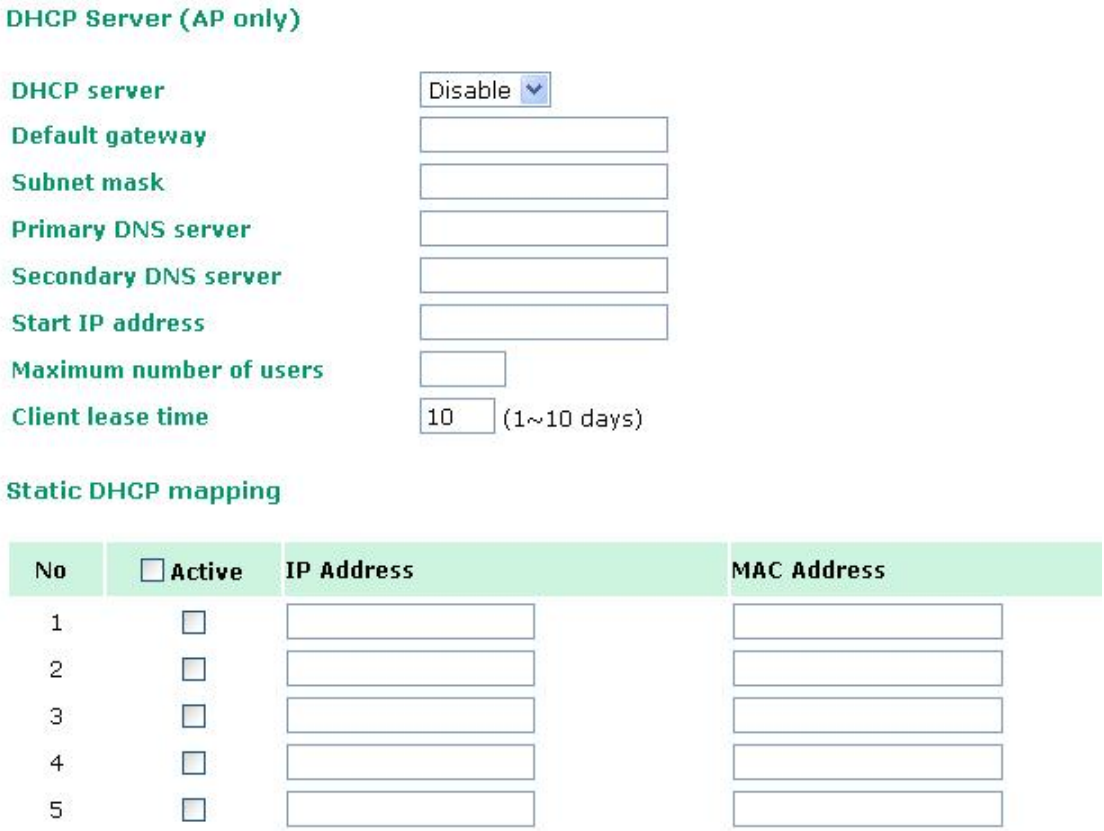
DHCP Server (for AP mode only)

DHCP (Dynamic Host Configuration Protocol) is a networking protocol that allows administrators to assign temporary IP addresses to network computers by "leasing" an IP address to a user for a limited amount of time, instead of assigning permanent IP addresses.

The AWK-1131A can act as a simplified DHCP server and easily assign IP addresses to your DHCP clients by responding to the DHCP requests from the client ends. The IP-related parameters you set on this page will also be sent to the client.

You can also assign a static IP address to a specific client by entering its MAC address. The AWK-1131A provides a **Static DHCP mapping** list with up to 16 entities. Be reminded to check the **Active** check box for each entity to activate the setting.

You can check the IP assignment status under **Status** → **DHCP Client List**.



DHCP server

Setting	Description	Factory Default
Enable	Enables AWK-1131A as a DHCP server	Disable
Disable	Disable DHCP server function	

Default gateway

Setting	Description	Factory Default
IP address of a default gateway	The IP address of the router that connects to an outside network	None

Subnet mask

Setting	Description	Factory Default
subnet mask	Identifies the type of sub-network (e.g., 255.255.0.0 for a Class B network, or 255.255.255.0 for a Class C network)	None

Primary/ Secondary DNS server

Setting	Description	Factory Default
IP address of Primary/ Secondary DNS server	The IP address of the DNS Server used by your network. After entering the DNS Server's IP address, you can use URL as well. The Secondary DNS server will be used if the Primary DNS server fails to connect.	None

Start IP address

Setting	Description	Factory Default
IP address	Indicates the IP address which AWK-1131A can start assigning	None

Maximum number of users

Setting	Description	Factory Default
1 – 999	Specifies how many IP address can be assigned continuously	None

Client lease time

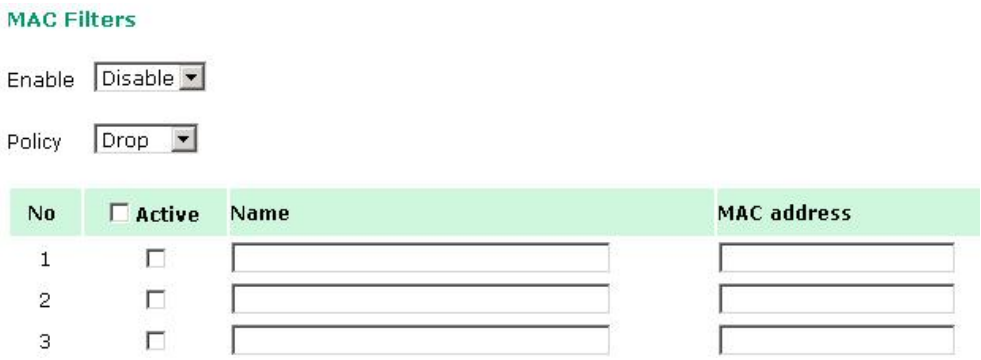
Setting	Description	Factory Default
1 – 10 days	The lease time for which an IP address is assigned. The IP address may go expired after the lease time is reached.	10 (days)

Packet Filters

The AWK-1131A includes various filters for **IP-based** packets going through LAN and WLAN interfaces. You can set these filters as a firewall to help enhance network security.

MAC Filter

The AWK-1131A's MAC filter is a policy-based filter that can allow or filter out IP-based packets with specified MAC addresses. The AWK-1131A provides 8 entities for setting MAC addresses in your filtering policy. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables MAC filter	Disable
Disable	Disables MAC filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on list can be allowed.	Drop
Drop	Any packet fitting the entities on list will be denied.	

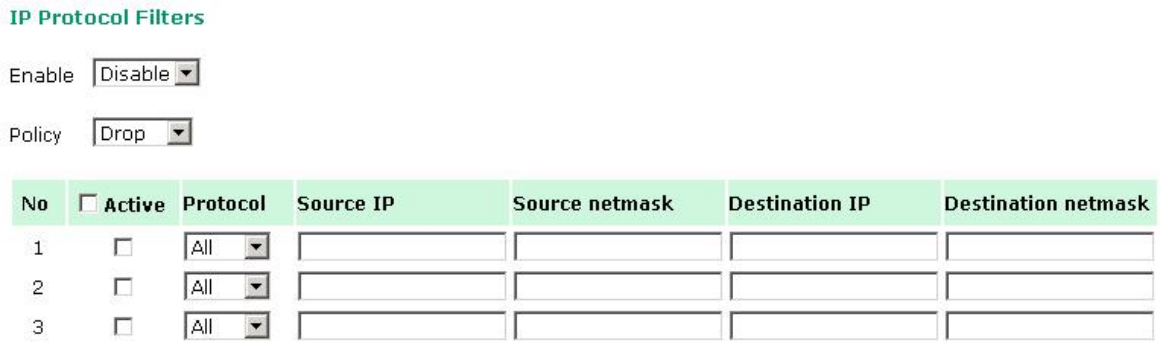
ATTENTION

Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed**
Accept + "no entity on list is activated" = all packets are **denied**

IP Protocol Filter

The AWK-1131A's IP protocol filter is a policy-based filter that can allow or filter out IP-based packets with specified IP protocol and source/destination IP addresses.

The AWK-1131A provides 8 entities for setting IP protocol and source/destination IP addresses in your filtering policy. Four IP protocols are available: **All**, **ICMP**, **TCP**, and **UDP**. You must specify either the Source IP or the Destination IP. By combining IP addresses and netmasks, you can specify a single IP address or a range of IP addresses to accept or drop. For example, "IP address 192.168.1.1 and netmask 255.255.255.255" refers to the sole IP address 192.168.1.1. "IP address 192.168.1.1 and netmask 255.255.255.0" refers to the range of IP addresses from 192.168.1.1 to 192.168.255. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables IP protocol filter	Disable
Disable	Disables IP protocol filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on the list can be allowed	Drop
Drop	Any packet fitting the entities on the list will be denied	

ATTENTION

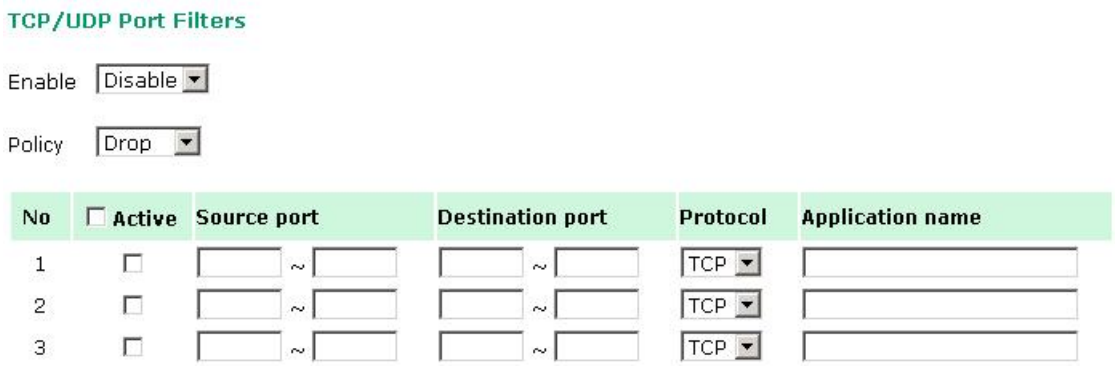
Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed.**
Accept + "no entity on list is activated" = all packets are **denied.**

TCP/UDP Port Filter

The AWK-1131A's TCP/UDP port filter is a policy-based filter that can allow or filter out TCP/UDP-based packets with a specified source or destination port.

The AWK-1131A provides 8 entities for setting the range of source/destination ports of a specific protocol. In addition to selecting TCP or UDP protocol, you can set either the source port, destination port, or both. The end port can be left empty if only a single port is specified. Of course, the end port cannot be larger then the start port.

The **Application name** is a text string that describes the corresponding entity with up to 31 characters. Remember to check the **Active** check box for each entity to activate the setting.



Enable

Setting	Description	Factory Default
Enable	Enables TCP/UDP port filter	Disable
Disable	Disables TCP/UDP port filter	

Policy

Setting	Description	Factory Default
Accept	Only the packets fitting the entities on list can be allowed.	Drop
Drop	Any packet fitting the entities on list will be denied.	

ATTENTION

Be careful when you enable the filter function:

Drop + "no entity on list is activated" = all packets are **allowed**

Accept + "no entity on list is activated" = all packets are **denied**

SNMP Agent

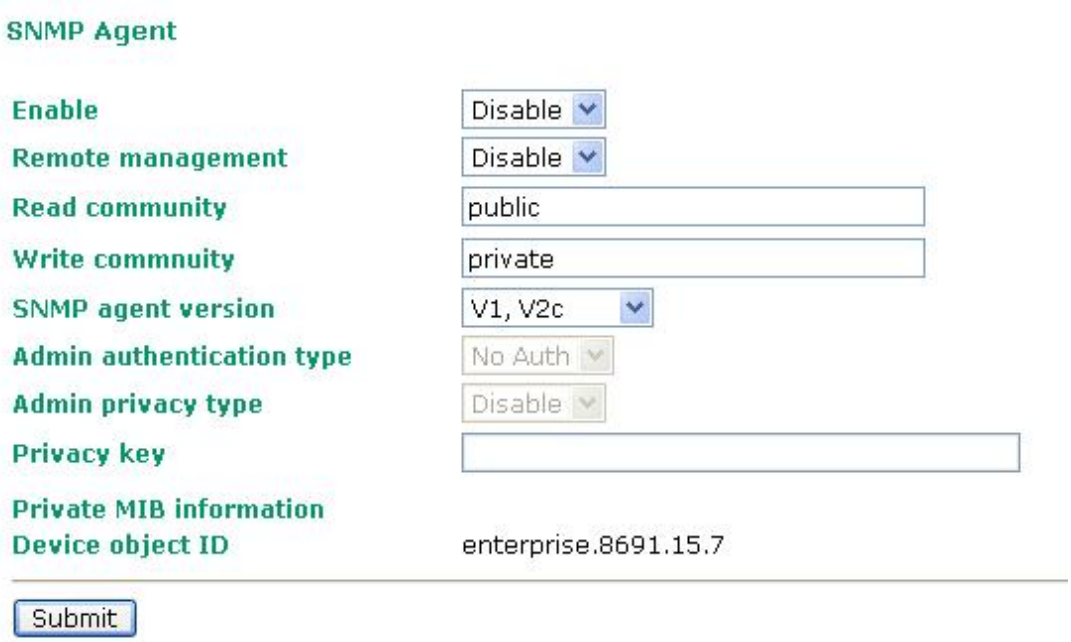
The AWK-1131A supports SNMP V1/V2c/V3. SNMP V1 and SNMP V2c use a community string match for authentication, which means that SNMP servers access all objects with read-only or read/write permissions using the community string *public/private* (default value). SNMP V3, which requires you to select an authentication level of MD5 or SHA, is the most secure protocol. You can also enable data encryption to enhance data security.

The AWK-1131A's MIB can be found in the software CD and supports reading the attributes via SNMP. (Only ***get*** method is supported.)

SNMP security modes and security levels supported by the AWK-1131A are shown in the following table. Select the security mode and level that will be used to communicate between the SNMP agent and manager.

Protocol Version	Setting on UI web page	Authentication Type	Data Encryption	Method
SNMP V1, V2c	V1, V2c Read Community	Community string	No	Use a community string match for authentication
	V1, V2c Write/Read Community	Community string	No	Use a community string match for authentication
SNMP V3	No-Auth	No	No	Use account with admin or user to access objects
	MD5 or SHA	Authentication based on MD5 or SHA	No	Provides authentication based on HMAC-MD5, or HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.
	MD5 or SHA	Authentication based on MD5 or SHA	Data encryption key	Provides authentication based on HMAC-MD5 or HMAC-SHA algorithms, and data encryption key. 8-character passwords and a data encryption key are the minimum requirements for authentication and encryption.

The following parameters can be configured on the **SNMP Agent** page. A more detailed explanation of each parameter is given below the following figure.



Enable

Setting	Description	Factory Default
Enable	Enables SNMP Agent	Disable
Disable	Disables SNMP Agent	

Remote Management

Setting	Description	Factory Default
Enable	Allow remote management via SNMP agent	Disable
Disable	Disallow remote management via SNMP agent	

Read community (for V1, V2c)

Setting	Description	Factory Default
V1, V2c Read Community	Use a community string match with a maximum of 31 characters for authentication. This means that the SNMP agent can access all objects with read-only permissions using this community string.	public

Write community (for V1, V2c)

Setting	Description	Factory Default
V1, V2c Read /Write Community	Use a community string match with a maximum of 31 characters for authentication. This means that the SNMP agent can accesses all objects with read/write permissions using this community string.	private

SNMP agent version

Setting	Description	Factory Default
V1, V2c, V3, or V1, V2c, or V3 only	Select the SNMP protocol version used to manage the switch.	V1, V2c

Admin auth type (for V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
No Auth	Use admin account to access objects. No authentication	No Auth
MD5	Provide authentication based on the HMAC-MD5 algorithms. 8-character passwords are the minimum requirement for authentication.	
SHA	Provides authentication based on HMAC-SHA algorithms. 8-character passwords are the minimum requirement for authentication.	

Admin private key (for V1, V2c, V3, and V3 only)

Setting	Description	Factory Default
Disable	No data encryption	Disable
DES	DES-based data encryption	
AES	AES-based data encryption	

Private key

A data encryption key is the minimum requirement for data encryption (maximum of 63 characters)

Private MIB Information Device Object ID

Also know as ***OID***. This is the AWK-1131A's enterprise value. It is fixed.

Link Fault Pass-Through (for Client mode only)

This function means if Ethernet port is link down, wireless connection will be forced to disconnect. Once Ethernet link is recovered, AWK will try to connect to AP.

If wireless is disconnected, AWK restarts auto-negotiation on Ethernet port but always stays in the link failure state. Once the wireless connection is recovered, AWK will try to recover the Ethernet link.

System log will indicate the link fault pass through events in addition to the original link up/down events.

Link Fault Pass-Through

Setting	Description	Factory Default
Enable	Enables Link Fault Pass-Through	Disable
Disable	Disables Link Fault Pass-Through	

Auto Warning Settings

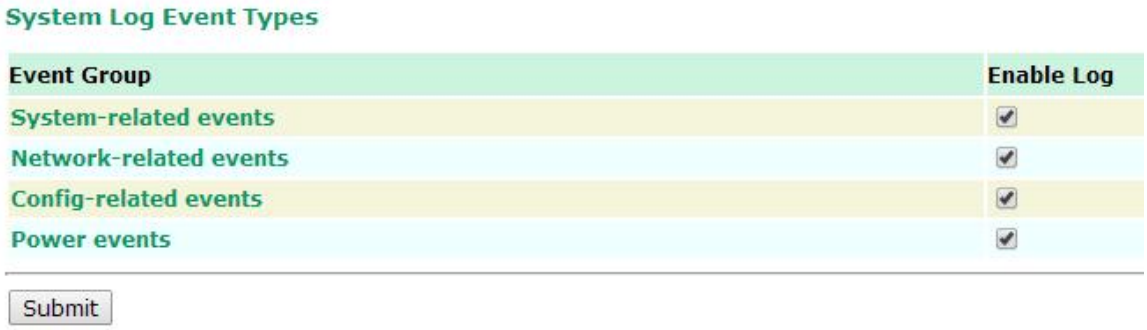
Since industrial-grade devices are often located at the endpoints of a system, these devices will not always know what is happening elsewhere on the network. This means that these devices, including wireless APs or clients, must provide system maintainers with real-time alarm messages. Even when system administrators are out of the control room for an extended period, they can still be informed of the status of devices almost instantaneously when exceptions occur.

In addition to logging these events, the AWK-1131A supports different approaches to warn engineers automatically, such as SNMP trap, e-mail, and relay output. It also supports two digital inputs to integrate sensors into your system to automate alarms by email and relay output.

System Log

System Log Event Types

Detail information for grouped events is shown in the following table. You can check the box for **Enable log** to enable the grouped events. All default values are enabled (checked). The log for system events can be seen in **Status** → **System Log**.



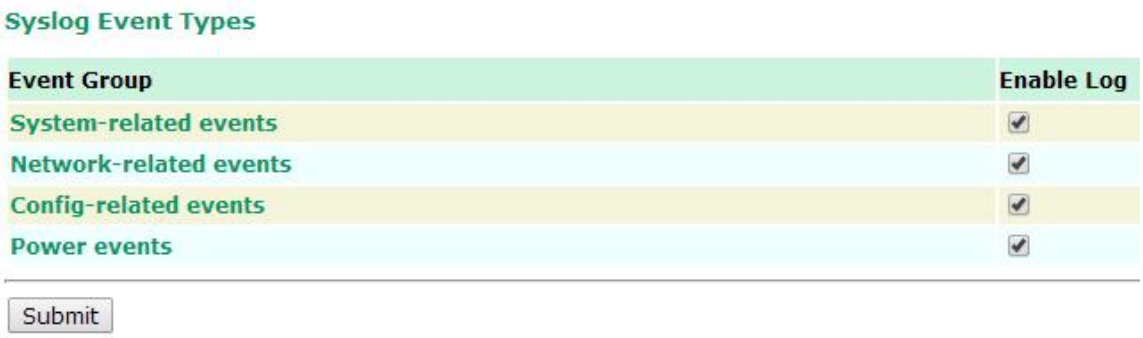
System-related events	Event is triggered when…
System restart (warm start)	The AWK-1131A is rebooted, such as when its settings are changed (IP address, subnet mask, etc.).
Network-related events	**Event is triggered when…**
LAN link on	The LAN port is connected to a device or network.
LAN link off	The port is disconnected (e.g., the cable is pulled out, or the opposing device shuts down).
Client joined/ left (for AP mode)	A wireless client is associated or disassociated.
WLAN connected to AP (for Client mode)	The AWK-1131A is associated with an AP.
WLAN disconnected (for Client mode)	The AWK-1131A is disassociated from an AP.
Config-related events	**Event is triggered when…**
Configuration Changed	A configuration item has been changed.
Configuration file import via Web Console	The configuration file is imported to the AWK-1131A.
Console authentication failure	An incorrect password is entered.
Firmware upgraded	The AWK-1131A's firmware is updated.
Power events	**Event is triggered when…**
Power 1/2 transition (On -> Off)	The AWK-1131A is powered down in PWR1/2.
Power 1/2 transition (Off -> On)	The AWK-1131A is powered via PWR1/2.

Syslog

This function provides the event logs for the Syslog server. The function supports up to three configurable Syslog servers and Syslog server UDP port numbers. When an event occurs, the event will be sent as a Syslog UDP packet to the specified Syslog servers.

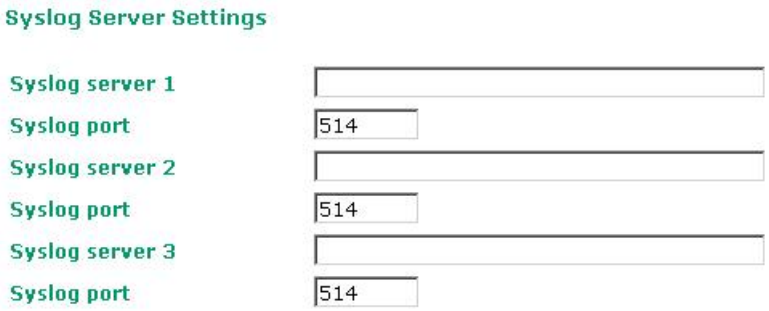
Syslog Event Types

Detail information for the grouped events is shown in the following table. You can check the box for **Enable log** to enable the grouped events. All default values are enabled (checked). Details for each event group can be found on the "System log Event Types" table on page 3-31.



Syslog Server Settings

You can configure the parameters for your Syslog servers in this page.



Syslog server 1 / 2 / 3

Setting	Description	Factory Default
IP address	Enter the IP address of the 1st/ 2nd/ 3rd Syslog Server	None

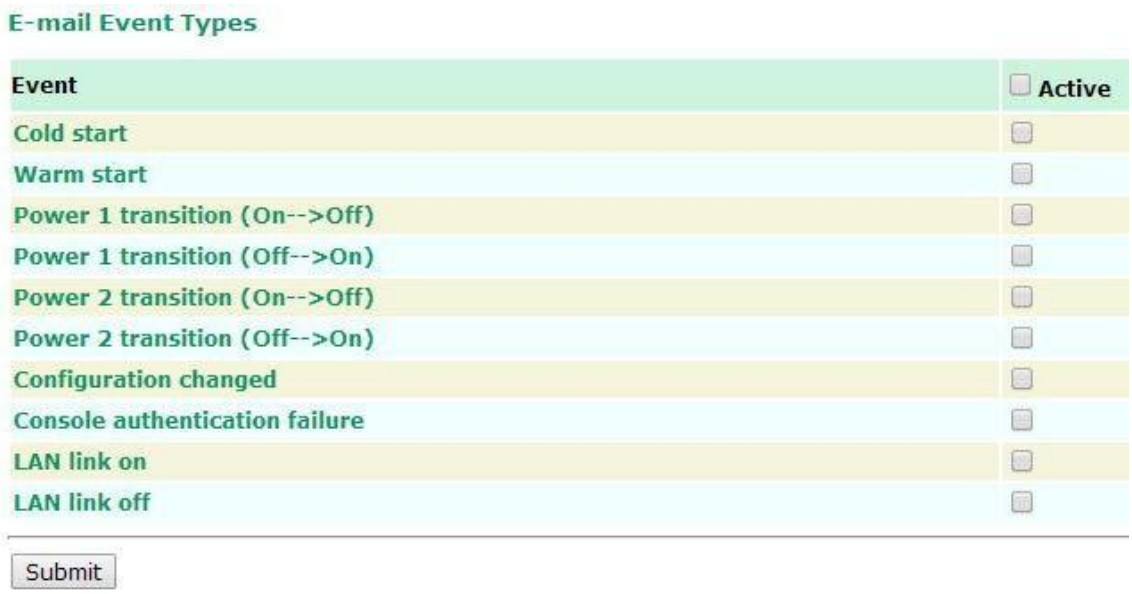
Syslog port

Setting	Description	Factory Default
Port destination (1 to 65535)	Enter the UDP port of the corresponding Syslog server	514

E-mail

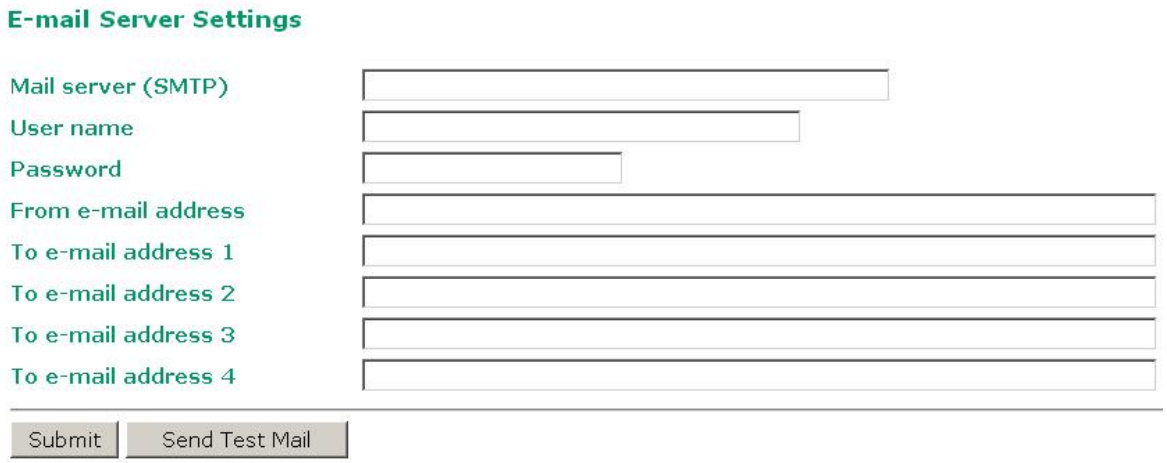
E-mail Event Types

Check the box for **Active** to enable the event items. All default values are deactivated (unchecked). Details for each event item can be found on the “System log Event Types” table on page 3-31.



E-mail Server Settings

You can set up to 4 e-mail addresses to receive alarm emails from the AWK-1131A. The following parameters can be configured on the **E-mail Server Settings** page. In addition, a **Send Test Mail** button can be used to test whether the Mail server and e-mail addresses work well. More detailed explanations about these parameters are given after the following figure.



Mail server (SMTP)

Setting	Description	Factory Default
IP address	The IP Address of your email server.	None

User name & Password

Setting	Description	Factory Default
	User name and password used in the SMTP server	None

From e-mail address

Setting	Description	Factory Default
Max. 63 characters	Enter the administrator's e-mail address which will be shown in the "From" field of a warning e-mail.	None

To E-mail address 1 / 2 / 3 / 4

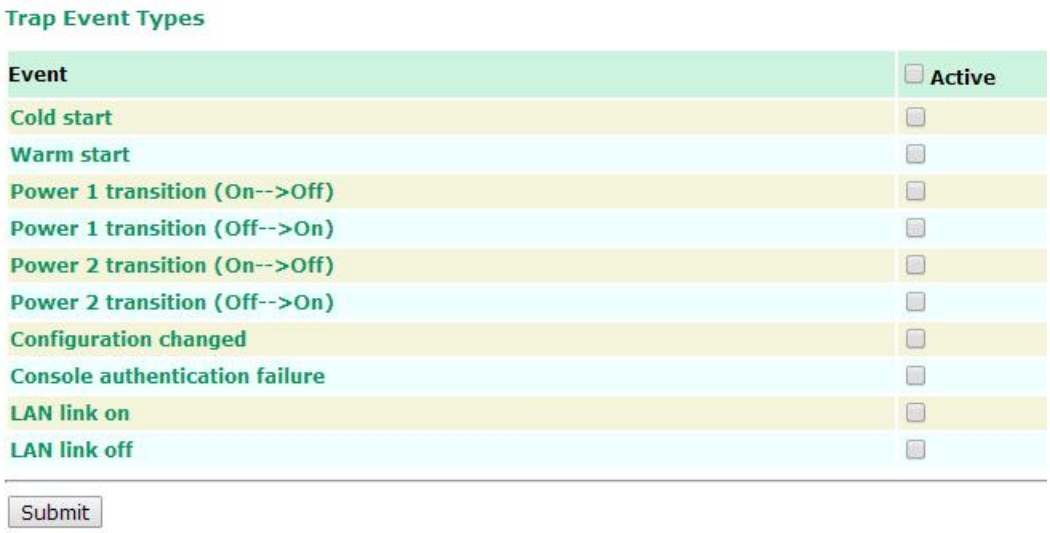
Setting	Description	Factory Default
Max. 63 characters	Enter the receivers' e-mail addresses.	None

Trap

Traps can be used to signal abnormal conditions (notifications) to a management station. This trap-driven notification can make your network more efficient.

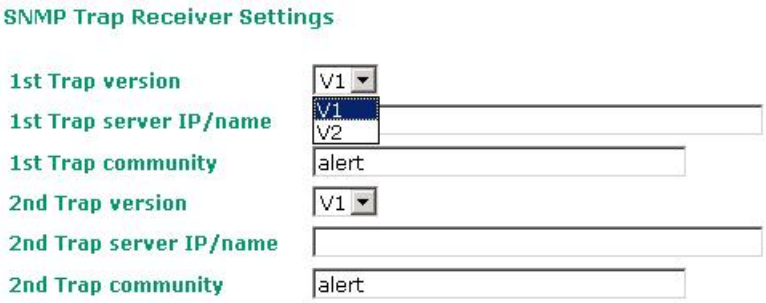
Because a management station usually takes care of a large number of devices that have a large number of objects, it will be overloading for the management station to poll or send requests to query every object on every device. It would be better if the managed device agent could notify the management station by sending a message known as a trap for the event.

Trap Event Types



SNMP Trap Receiver Settings

SNMP traps are defined in SMIv1 MIBs (SNMPv1) and SMIv2 MIBs (SNMPv2c). The two styles are basically equivalent, and it is possible to convert between the two. You can set the parameters for SNMP trap receivers through the web page.



1st / 2nd Trap version

Setting	Description	Factory Default
V1	SNMP trap defined in SNMPv1	V1
V2	SNMP trap defined in SNMPv2	

1st / 2nd Trap server IP/name

Setting	Description	Factory Default
IP address or host name	Enter the IP address or name of the trap server used by your network.	None

1st / 2nd Trap community

Setting	Description	Factory Default
Max. of 31 characters	Use a community string match with a maximum of 31 characters for authentication.	alert

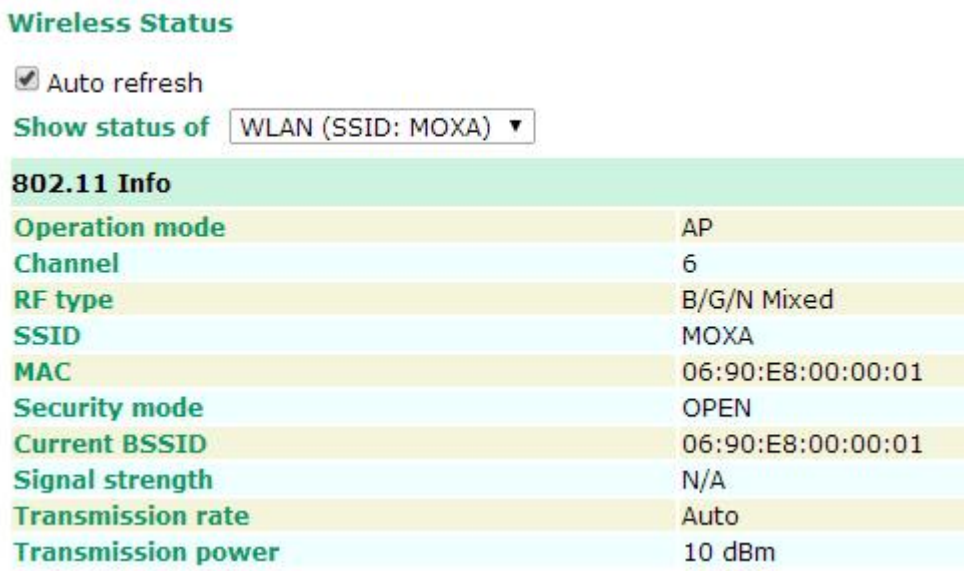
Status

Wireless Status

The status for **802.11 info** parameters, such as Operation mode and Channel, are shown on the **Wireless Status** page. The status will refresh every 5 seconds if the **Auto refresh** box is checked.

Certain values for **802.11 info** may not show up due to different operation modes. As a result, **Current BSSID** and **Signal strength** are not available in AP mode.

It is helpful to use the continuously updated information on this page, such as **Signal strength**, to monitor the signal strength of the AWK-1131A in Client mode.



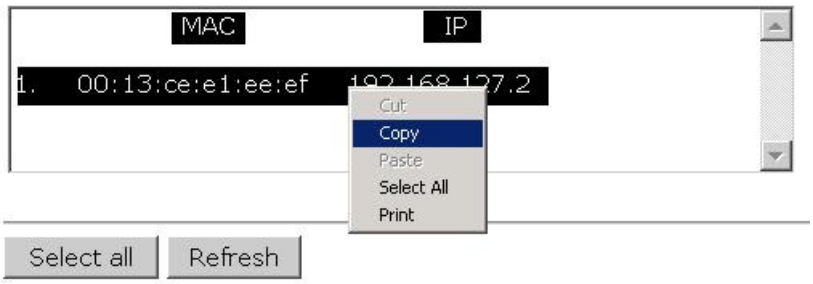
Associated Client List (for AP mode only)

Associated Client List shows all the clients that are currently associated to a particular AWK-1131A. You can click **Select all** to select all the content in the list for further editing. You can click **Refresh** to refresh the list.

DHCP Client List (for AP mode only)

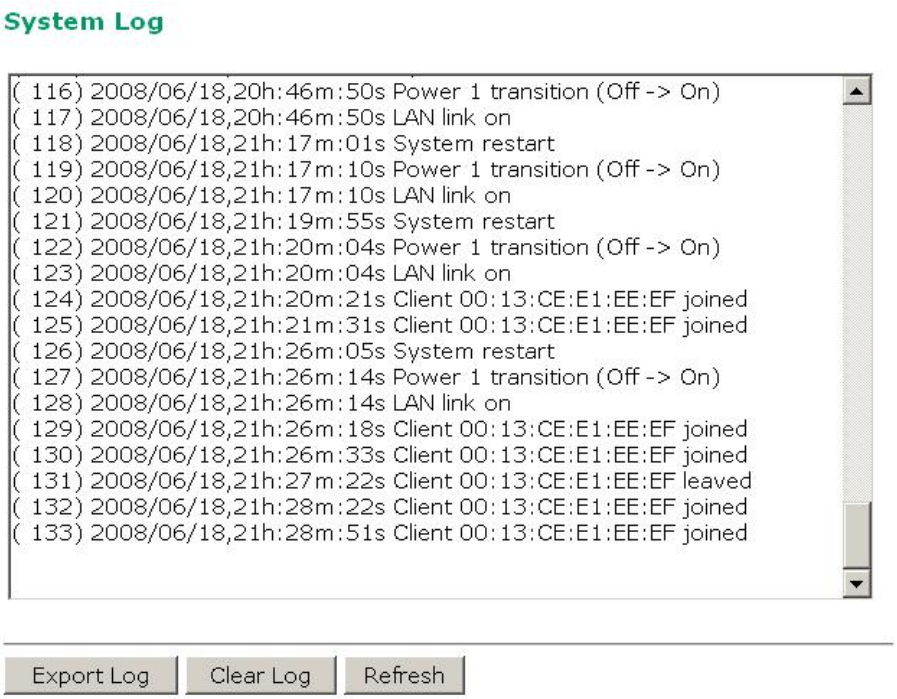
The DHCP Client List shows all the clients that require and have successfully received IP assignments. You can click the **Refresh** button to refresh the list.

You can press **Select all** button to select all content in the list for further editing.



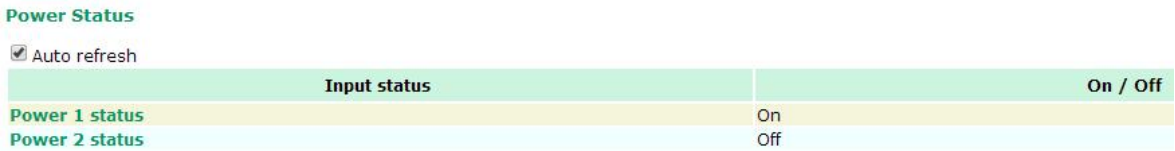
System Log

Triggered events are recorded in System Log. You can export the log contents to an available viewer by clicking **Export Log**. You can use the **Clear Log** button to clear the log contents and the **Refresh** button to refresh the log.



Power Status

The status of power inputs and digital inputs is shown on this web page. The status will refresh every 5 seconds if the **Auto refresh** box is checked.

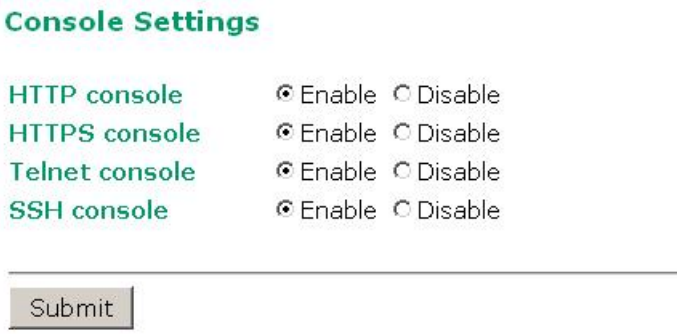


Maintenance

Maintenance functions provide the administrator with tools to manage the AWK-1131A and wired/wireless networks.

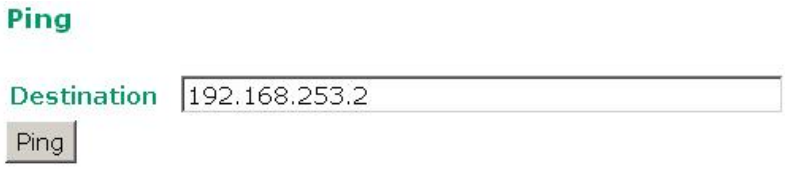
Console Settings

You can enable or disable access permission for the following consoles: HTTP, HTTPS, Telnet and SSH connections. For more security, we recommend you only allow access to the two secured consoles, HTTPS and SSH.

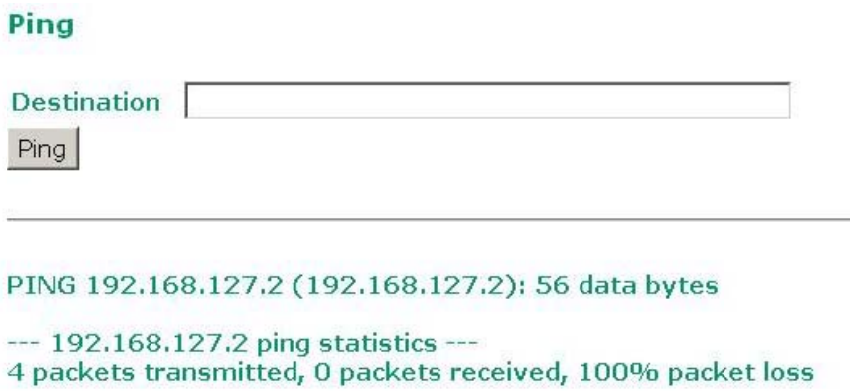


Ping

Ping helps to diagnose the integrity of wired or wireless networks. By inputting a node's IP address in the **Destination** field, you can use the **ping** command to make sure it exists and whether or not the access path is available.



If the node and access path are available, you will see that all packets were successfully transmitted with no loss. Otherwise, some, or even all, packets may get lost, as shown in the following figure.

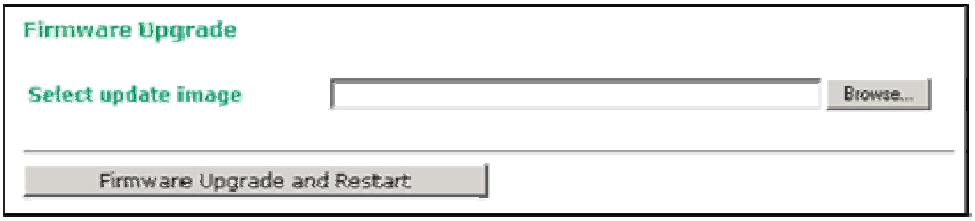


Firmware Upgrade

The AWK-1131A can be enhanced with more value-added functions by installing firmware upgrades. The latest firmware is available at Moxa's download center.

Before running a firmware upgrade, make sure the AWK-1131A is off-line. Click the **Browse** button to specify the firmware image file and click **Firmware Upgrade and Restart** to start the firmware upgrade. After the progress bar reaches 100%, the AWK-1131A will reboot itself.

When upgrading your firmware, the AWK-1131A's other functions are forbidden.



ATTENTION

Please make sure the power source is stable when you upgrade your firmware. An unexpected power breakup may damage your AWK-1131A.

Config Import Export

First way you can back up or restore the AWK-1131A's configuration and MIB with **Config Import Export**.

In the **Config Import** section, click **Browse** to specify the configuration file and click **Config Import** button to begin importing the configuration.

In the **Config Export** section, click the **Config Export** button and save the configuration file onto your local storage media. The configuration file is a text file and you can view and edit it with a general text-editing tool.

You can also back up or restore the ABC-01 configuration with **Config Import Export**.

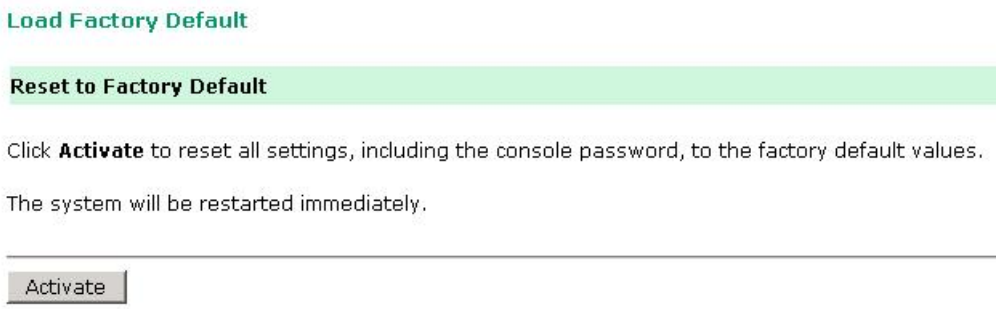
To download the configuration to the AWK:

1. Turn off the AWK.
2. Plug in the ABC-01 to the AWK's RS-232 console.
3. Turn on AWK.
4. AWK will detect ABC-01 during bootup, and download the configuration from the ABC-01 to the AWK automatically. Once the configuration downloads and if configuration format is correct, the AWK will emit three short beeps, then continue the boot up.
5. Once the AWK has booted up successfully, it will emit the normal two beeps, and the ready LED will turn to solid green.

For MIB file you can click SNMP MIB file Export to save the file onto your local storage media. The configuration file is a .my file and you can import it with a general SNMP tool to remote control or set AWK-1131A.

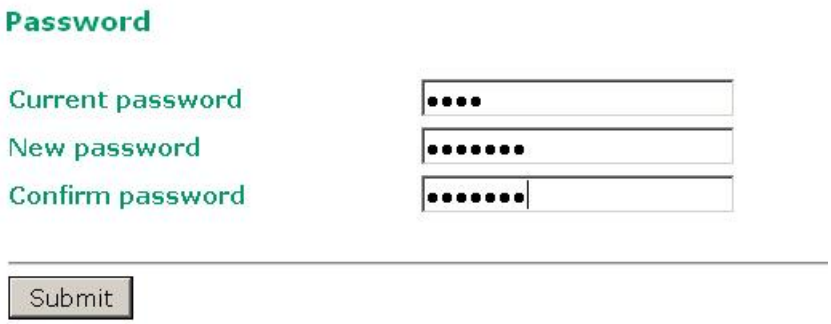
Load Factory Default

Use this function to reset the AWK-1131A and roll all settings back to the factory default values. You can also reset the hardware by pressing the reset button on the top panel of the AWK-1131A.



Password

You can change the administration password for each of the AWK-1131A's console managers by using the **Password** function. Before you set up a new password, you must input the current password and reenter the new password for confirmation. For your security, do not use the default password ***root***, and remember to change the administration password regularly.



Misc. Settings

Additional settings to help you manage your AWK-1131A, are available on this page.

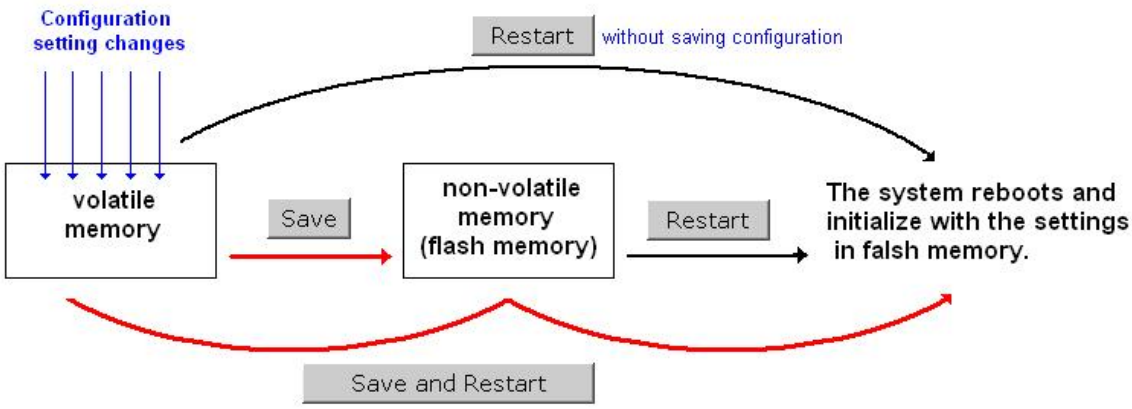
Reset button

Setting	Description	Factory Default
Always enable	The AWK-1131A's Reset button works normally.	Always enable
Disable after 60 sec	The AWK-1131A's reset to default function will be inactive 60 seconds after the AWK-1131A finishes booting up.	

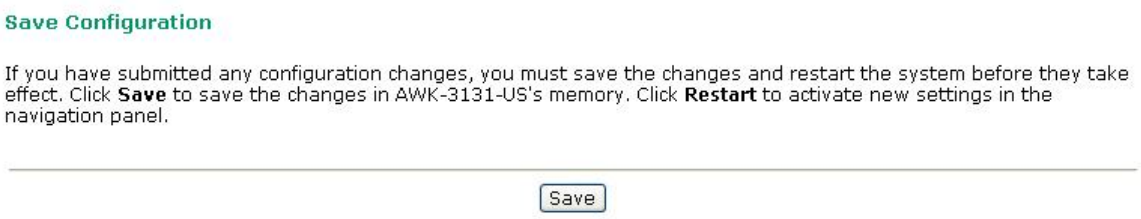
Save Configuration

The following figure shows how the AWK-1131A stores the setting changes into volatile and non-volatile memory. All data stored in volatile memory will disappear when the AWK-1131A is shutdown or rebooted unless they are **y**. Because the AWK-1131A starts up and initializes with the settings stored in flash memory, all new changes must be saved to flash memory before restarting the AWK-1131A.

This also means the new changes will not work unless you run either the **Save Configuration** function or the **Restart** function.



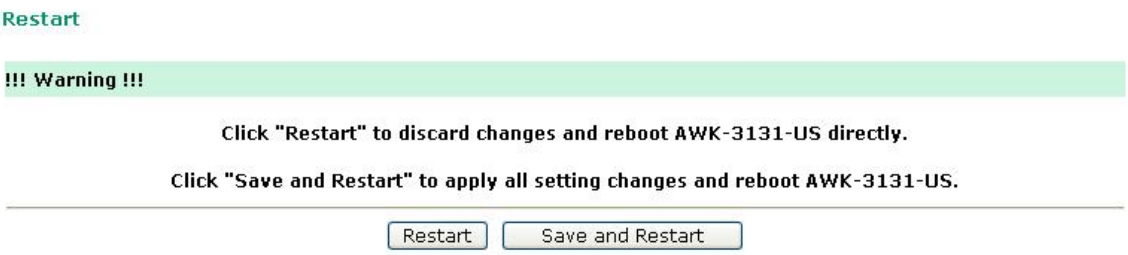
After you click on **Save Configuration** in the left menu box, the following screen will appear. Click **Save** if you wish to update the configuration settings in the flash memory at this time. Alternatively, you may choose to run other functions and put off saving the configuration until later. However, the new setting changes will remain in the non-volatile memory until you save the configurations.



Restart

If you submitted configuration changes, you will find a blinking string in the upper right corner of the screen. After making all your changes, click the **Restart** function in the left menu box. One of two different screens will appear.

If you made changes recently but did not save, you will be given two options. Clicking the **Restart** button here will reboot the AWK-1131A directly, and all setting changes will be ignored. Clicking the **Save and Restart** button will apply all setting changes and then reboot the AWK-1131A.



If you run the **Restart** function without changing any configurations or saving all your changes, you will see just one **Restart** button on your screen.

You will not be able to run any of the AWK-1131A's functions while the system is rebooting.

Logout

Logout helps users disconnect the current HTTP or HTTPS session and go to the Login page. For security reasons, we recommend you logout before quitting the console manager.

4

Software Installation and Configuration

The following topics are covered in this chapter:

- **Overview**
- **AWK Search Utility**
  - Installing AWK Search Utility
  - Configuring AWK Search Utility

Overview

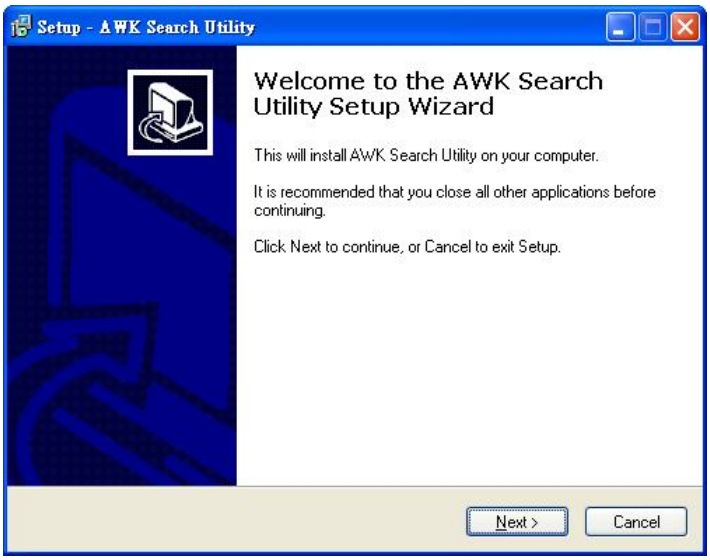
The Documentation & Software CD included with your AWK-1131A is designed to make the installation and configuration procedure easy and straightforward. This auto-run CD includes AWK Search Utility (to broadcast search for all AWK's accessible over the network), the AWK-1131A User's Manual, and Quick Installation Guide.

AWK Search Utility

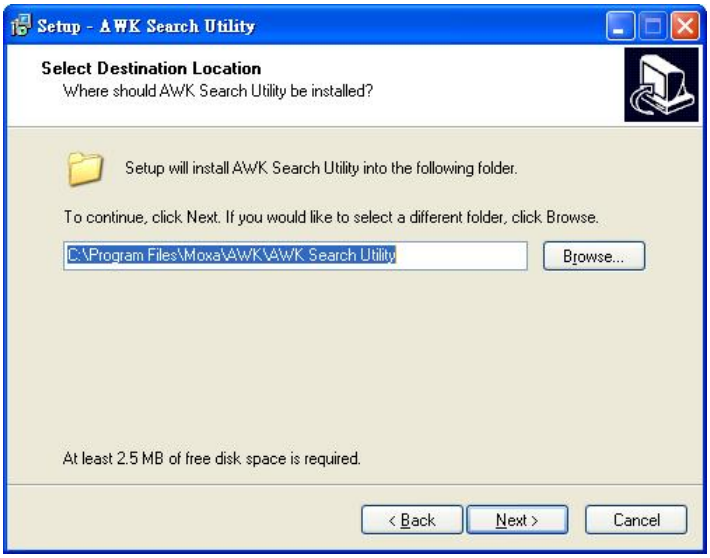
Installing AWK Search Utility

Click the **INSTALL UTILITY** button in the AWK Installation CD auto-run window to install AWK Search Utility. Once the program starts running, click **Yes** to proceed.

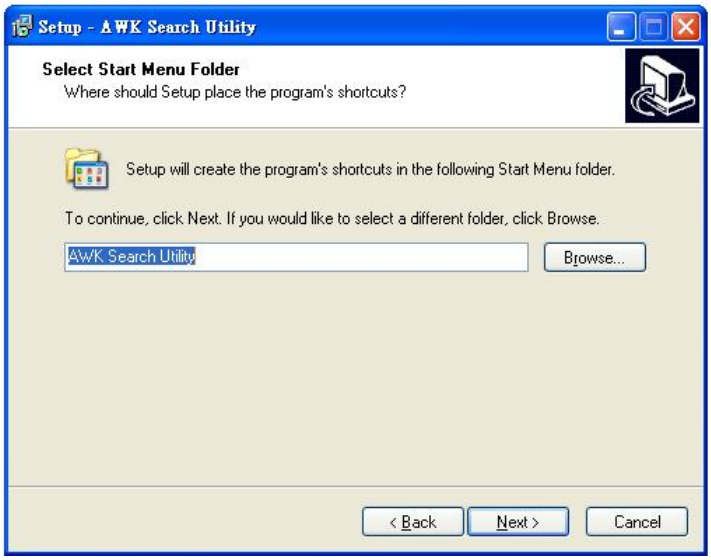
1. Click **Next** when the **Welcome** screen opens to proceed with the installation.



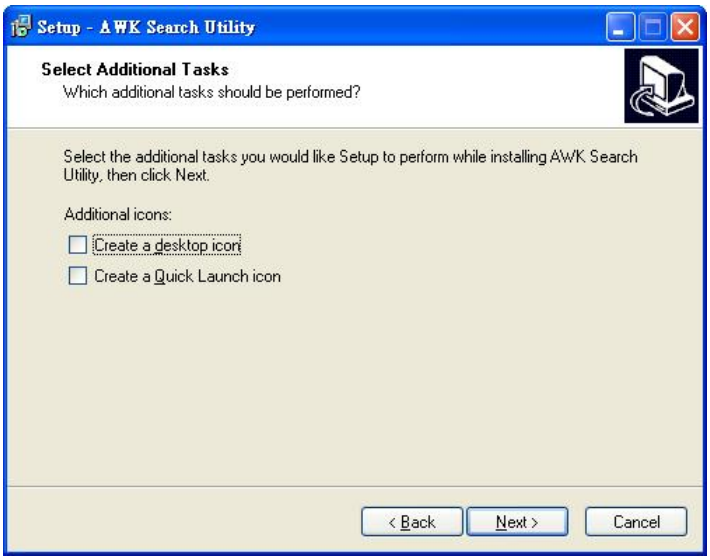
2. Click **Next** to install program files to the default directory, or click **Browse** to select an alternate location.



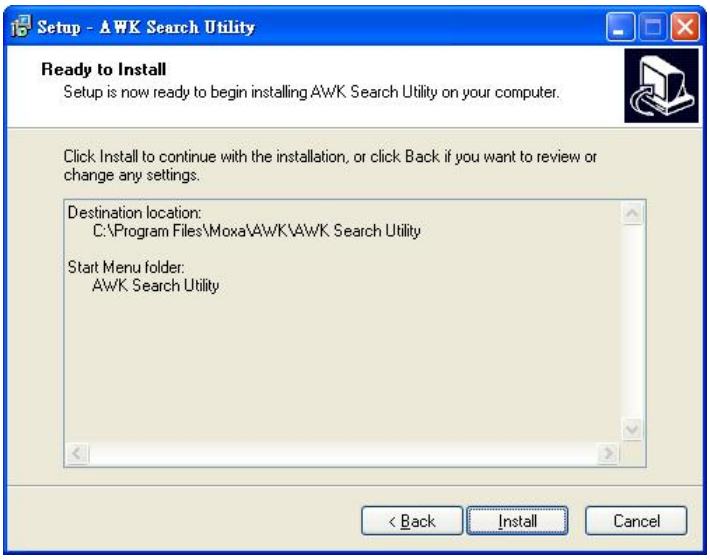
3. Click **Next** to create the program's shortcut files to the default directory, or click **Browse** to select an alternate location.



4. Click **Next** to select additional tasks.

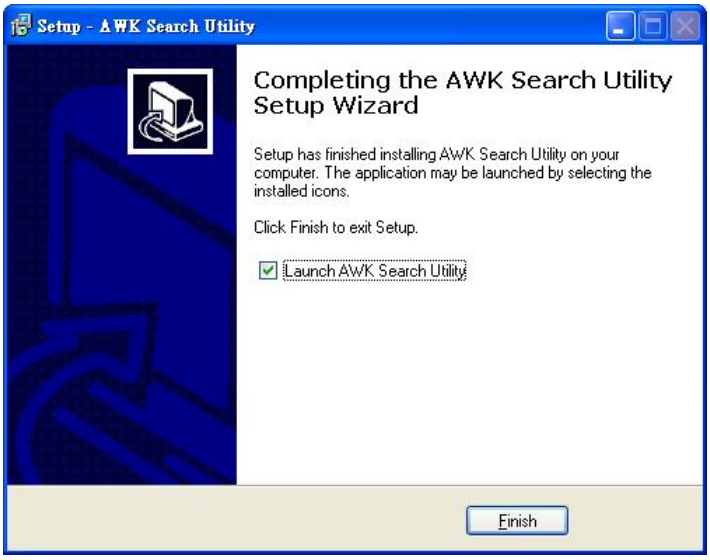


5. Click **Next** to proceed with the installation. The installer then displays a summary of the installation options.



6. Click **Install** to begin the installation. The setup window will report the progress of the installation. To change the installation settings, click **Back** and navigate to the previous screen.

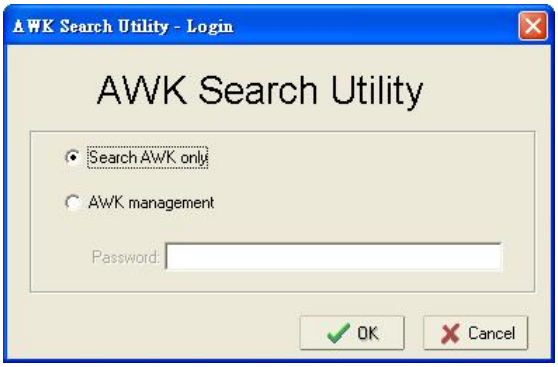
7. Click **Finish** to complete the installation of AWK Search Utility.



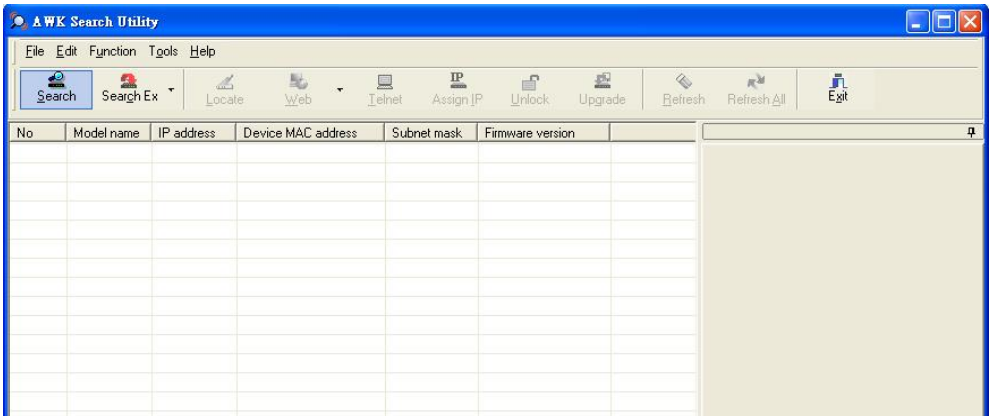
Configuring AWK Search Utility

The Broadcast Search function is used to locate all AWK-1131A APs that are connected to the same LAN as your computer. After locating an AWK-1131A, you will be able to change its IP address. Since the Broadcast Search function searches by TCP packet and not IP address, it doesn't matter if the AWK-1131A is configured as an AP or Client. In either case, APs and Clients connected to the LAN will be located, regardless of whether or not they are part of the same subnet as the host.

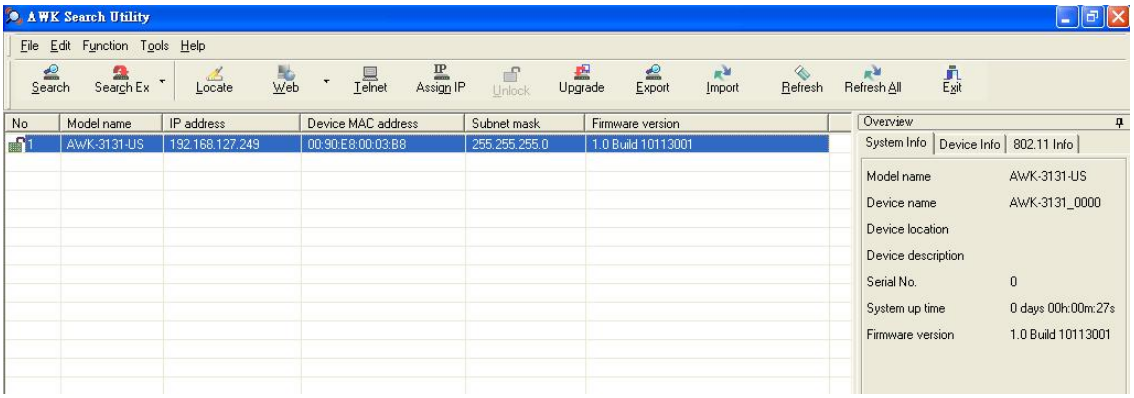
1. Start the **AWK Search Utility** program. When the Login page appears, select the "Search AWK only" option to search for AWKs and to view each AWK's configuration. Select the "AWK management" option to assign IPs, upgrade firmware, and locate devices.



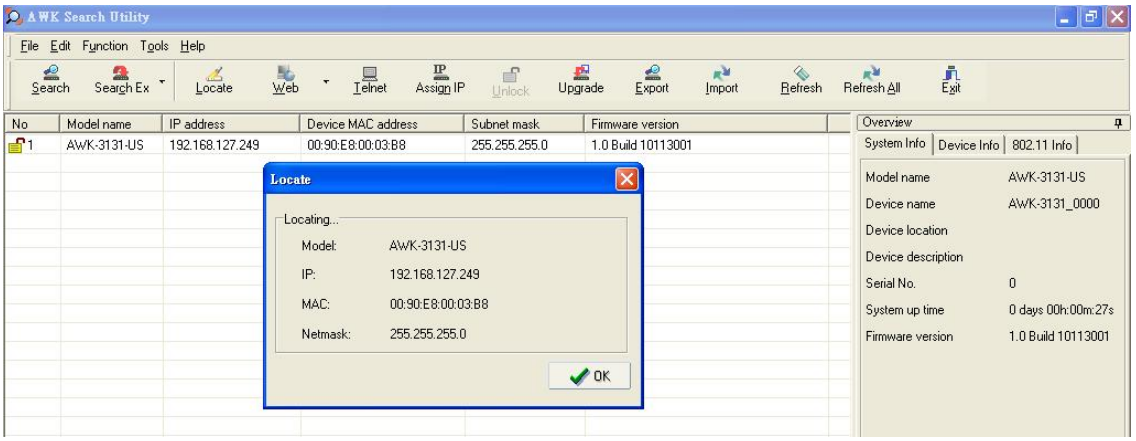
2. Open the AWK Search Utility and then click the **Search** icon.



3. The "Searching" window indicates the progress of the search. When the search is complete, all AWKs that were located will be displayed in the AWK Search Utility window.

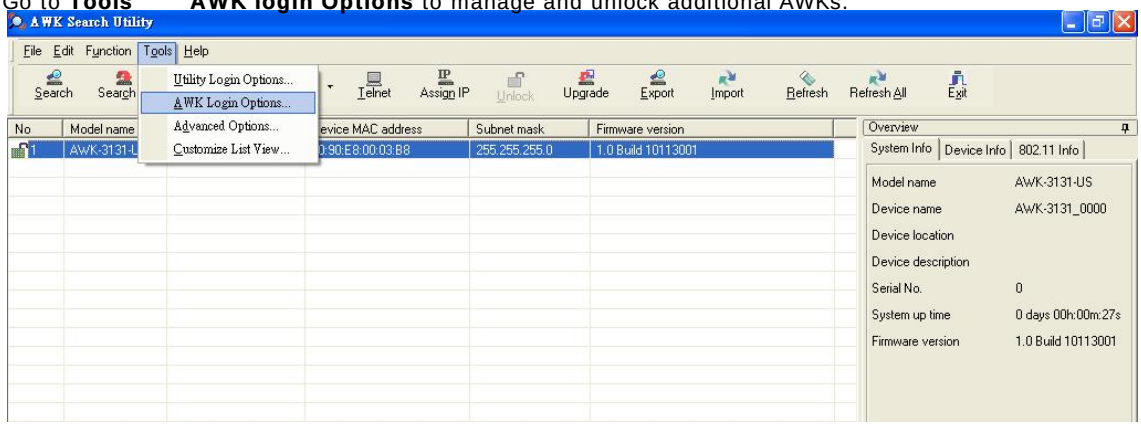


4. Click **Locate** to cause the selected device to beep.



5. Make sure your AWK is **unlocked** before using the search utility's icons setting. The AWK will unlock automatically if the password is set to the default. Otherwise you must enter the new password manually.

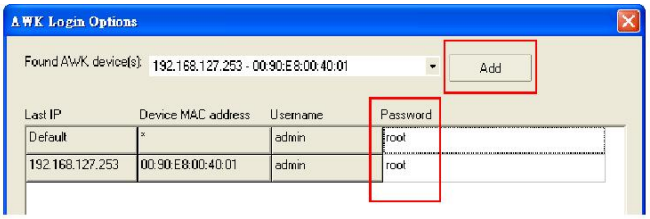
6. Go to **Tools** → **AWK login Options** to manage and unlock additional AWKs.



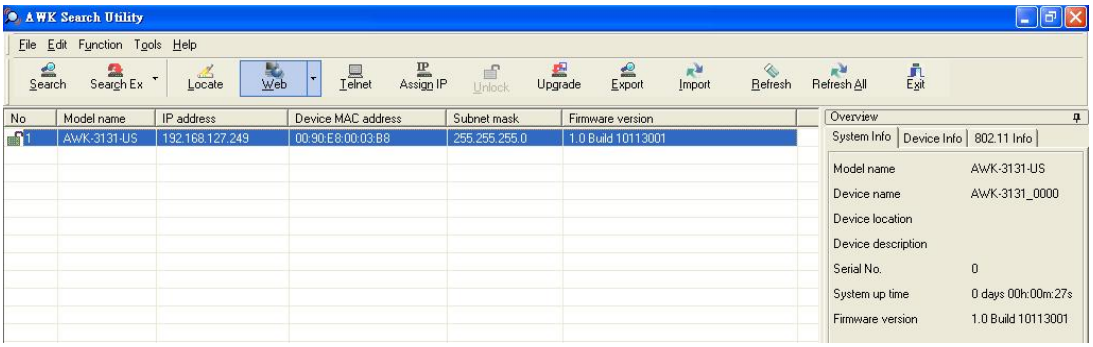
7. Use the scroll down list to select the MAC addresses of those AWKs you would like to manage, and then click **Add**. Key in the password for the AWK device and then click **OK** to save. If you return to the search page and search for the AWK again, you will find that the AWK will unlock automatically.

ATTENTION

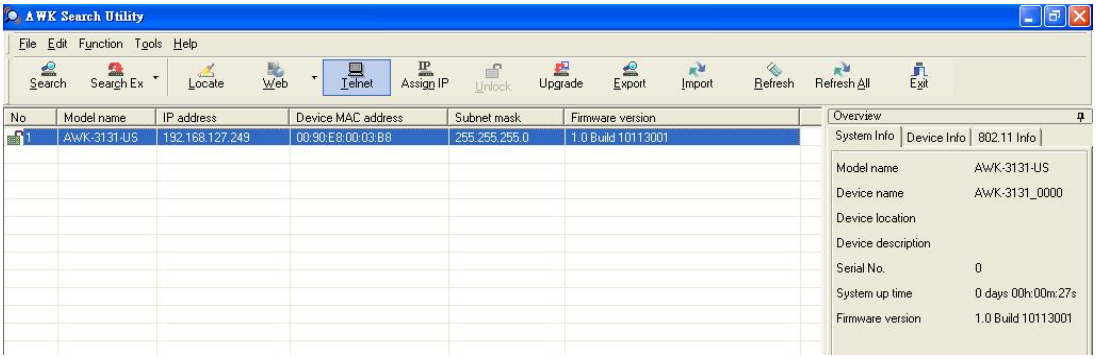
For security purposes, we suggest you can change the AWK search utility login password instead of using the default.



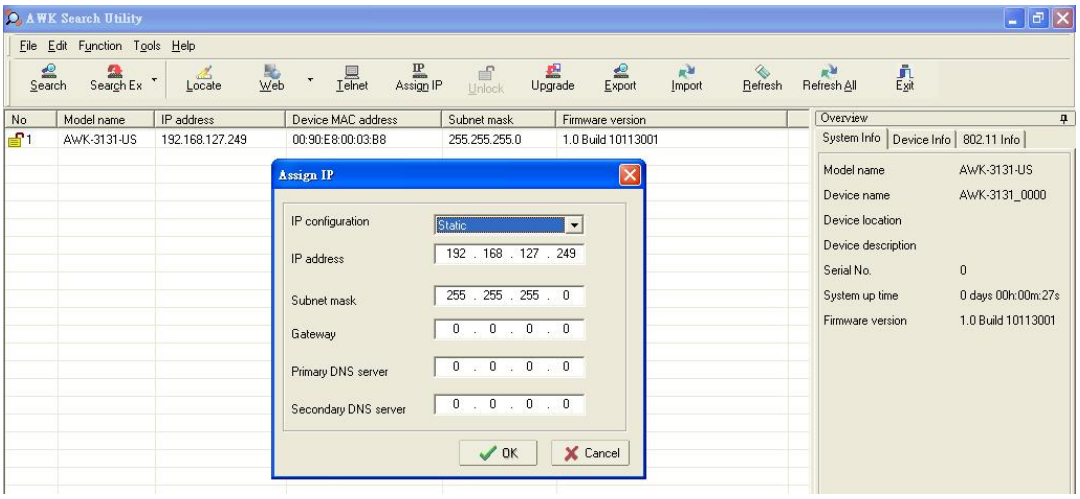
To modify the configuration of the highlighted AWK, click on the Web icon to open the web console. This will take you to the web console, where you can make all configuration changes. Refer to Chapter 3, "Using the Web Console," for information on how to use the web console.



Click on **Telnet** if you would like to use telnet to configure your AWKs.



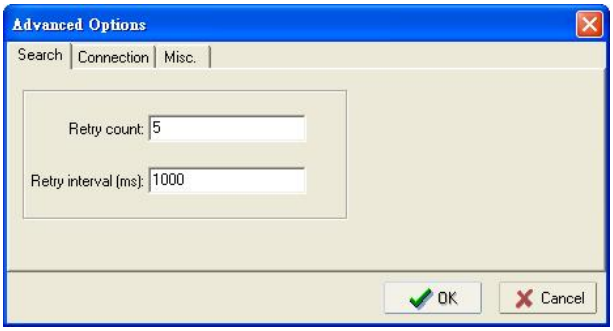
Click **Assign IP** to change the IP setting.



The three advanced options—**Search**, **Connection**, and **Miscellaneous**—are explained below:

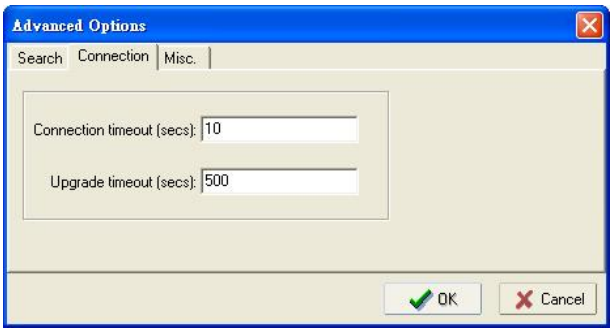
Search

- **Retry count (default=5):** Indicates how many times the search will be retried automatically.
- **Retry interval (ms):** The time lapsed between retries.



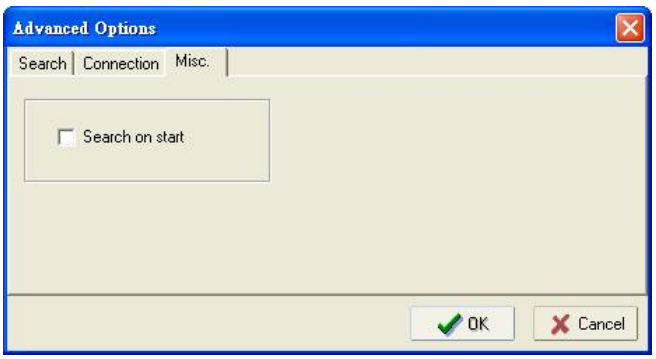
Connection

- **Connection timeout (secs):** Use this option to set the waiting time for the **Default Login**, **Locate**, **Assign IP**, **Upload Firmware**, and **Unlock** to complete.
- **Upgrade timeout (secs):** Use this option to set the waiting time for the connection to disconnect while the firmware is upgrading. Use this option to set the waiting time for the Firmware to write to flash.



Misc.

Search on start: Checkmark this box if you would like the search function to start searching for devices after you log in to the AWK search Utility.



5

This chapter explains how to access the AWK-1131A for the first time. In addition to HTTP access, there are four ways to access AWK-1131A: serial console, Telnet console, SSH console, and HTTPS console. The serial console connection method, which requires using a short serial cable to connect the AWK-1131A to a PC's COM port, can be used if you do not know the AWK-1131A's IP address. The other consoles can be used to access the AWK-1131A over an Ethernet LAN, or over the Internet.

The following topics are covered in this chapter:

- **RS-232 Console Configuration (115200, None, 8, 1, VT100)**
- **Configuration by Telnet and SSH Consoles**
- **Configuration by Web Browser with HTTPS/SSL**
- **Disabling Telnet and Browser Access**

RS-232 Console Configuration (115200, None, 8, 1, VT100)

The serial console connection method, which requires using a short serial cable to connect the AWK-1131A to a PC's COM port, can be used if you do not know the AWK-1131A's IP address. It is also convenient to use serial console configurations when you cannot access the AWK-1131A over Ethernet LAN, such as in the case of LAN cable disconnections or broadcast storming over the LAN.

ATTENTION

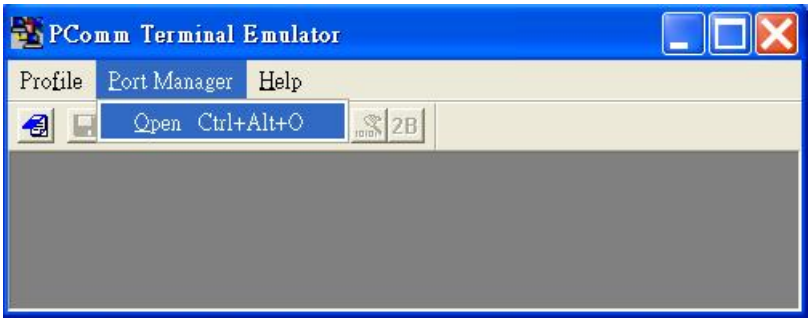
Do not use the RS-232 console manager when the AWK-1131A is powered at reversed voltage (ex. -48VDC), even though reverse voltage protection is supported.

If you need to connect the RS-232 console at reversed voltage, Moxa's TCC-82 isolator is your best solution.

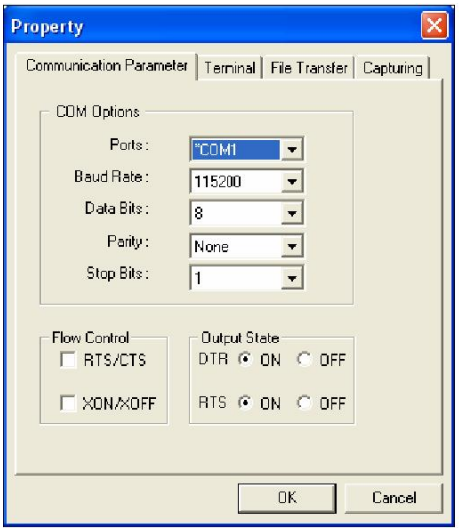
NOTE We recommend using **Moxa PComm (Lite)** Terminal Emulator, which can be downloaded free of charge from Moxa's website.

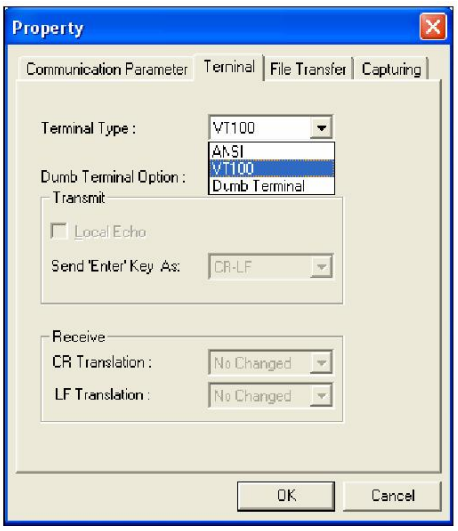
Before running PComm Terminal Emulator, use an RJ45 to DB9-F (or RJ45 to DB25-F) cable to connect the AWK-1131A's RS-232 console port to your PC's COM port (generally COM1 or COM2, depending on how your system is set up). After installing PComm Terminal Emulator, take the following steps to access the RS-232 console utility.

1. From the Windows desktop, open the Start menu and start **PComm Terminal Emulator** in the PComm (Lite) group.
2. Select Open under Port Manager to open a new connection.

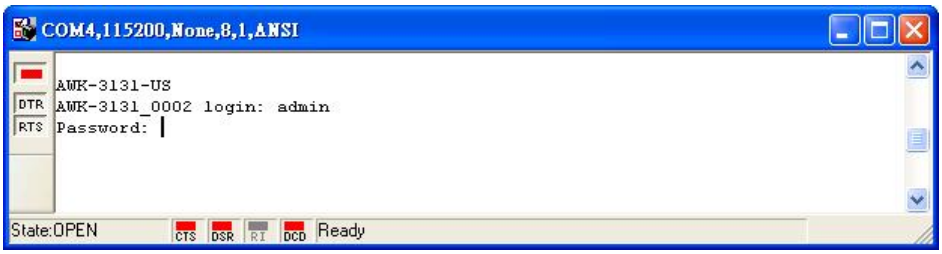


3. The **Communication Parameter** page of the Property window opens. Select the appropriate COM port for Console Connection, **115200** for Baud Rate, **8** for Data Bits, **None** for Parity, and **1** for Stop Bits. Click on the **Terminal** tab, and select **VT100 (or ANSI)** for Terminal Type. Click on **OK** to continue.

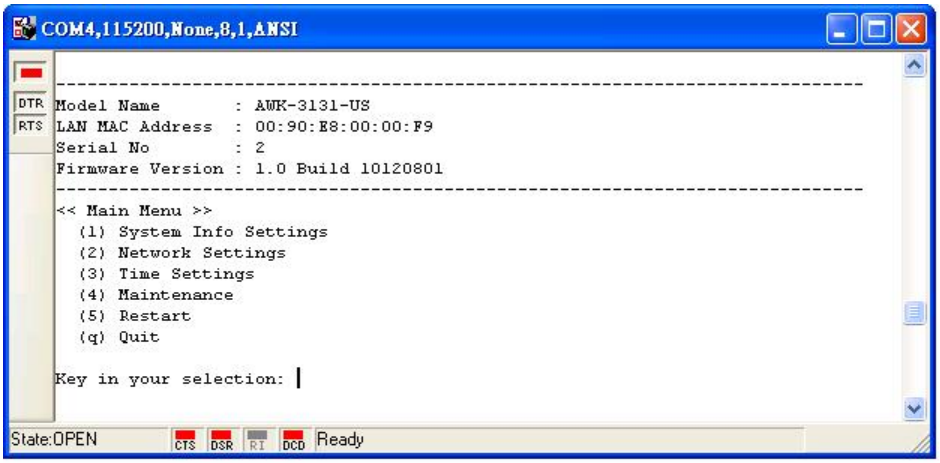




4. The Console login screen will appear. Log into the RS-232 console with the login name (default: **admin**) and password (default: **root**, if no new password is set).



5. The AWK-1131A's device information and Main Menu will be displayed. Please follow the description on screen and select the administration option you wish to perform.



NOTE To modify the appearance of the PComm Terminal Emulator window, select **Edit** → **Font** and then choose the desired formatting options.

ATTENTION

If you unplug the RS-232 cable or trigger **DTR**, a disconnection event will be evoked to enforce logout for network security. You will need to log in again to resume operation.

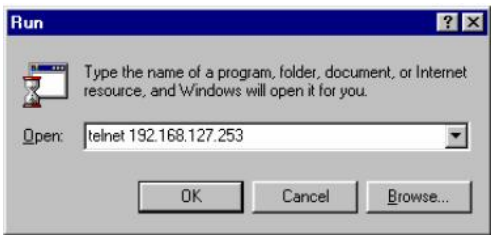
Configuration by Telnet and SSH Consoles

You may use Telnet or SSH client to access the AWK-1131A and manage the console over a network. To access the AWK-1131A's functions over the network from a PC host that is connected to the same LAN as the AWK-1131A, you need to make sure that the PC host and the AWK-1131A are on the same logical subnet. To do this, check your PC host's IP address and subnet mask.

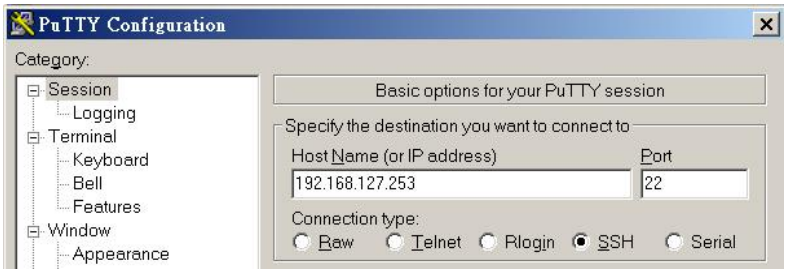
NOTE The AWK-1131A's default IP address is **192.168.127.253** and the default subnet mask is **255.255.255.0** (for a Class C network). If you do not set these values properly, please check the network settings of your PC host and then change the IP address to 192.168.127.xxx and subnet mask to 255.255.255.0.

Follow the steps below to access the console utility via Telnet or SSH client.

1. From Windows Desktop, run **Start** → **Run**, and then use Telnet to access the AWK-1131A's IP address from the Windows Run window (you may also issue the telnet command from the MS-DOS prompt).



2. When using SSH client (ex. PuTTY), please run the client program (ex. putty.exe) and then input the AWK-1131A's IP address, specifying **22** for the SSH connection port.

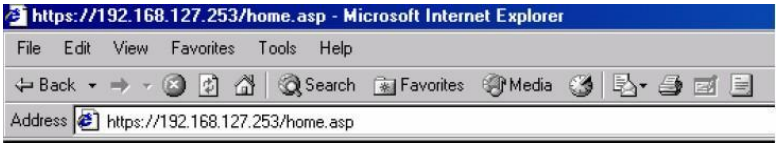


3. The Console login screen will appear. Please refer to the previous paragraph "RS-232 Console Configuration" and for login and administration.

Configuration by Web Browser with HTTPS/SSL

To secure your HTTP access, the AWK-1131A supports HTTPS/SSL encryption for all HTTP traffic. Perform the following steps to access the AWK-1131A's web browser interface via HTTPS/SSL.

1. Open your web browser and type https://<AWK-1131A's IP address> in the address field. Press **Enter** to establish the connection.

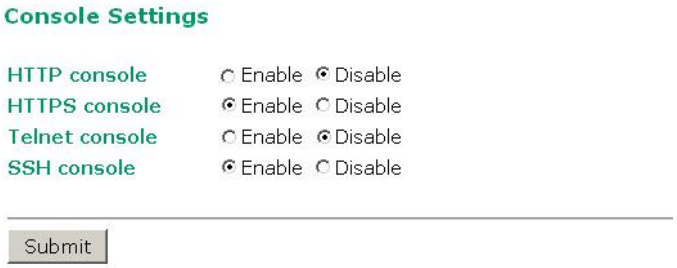


2. Warning messages will pop out to warn users that the security certificate was issued by a company they have not chosen to trust.

3. Select **Yes** to accept the certificate issued by Moxa IW and then enter the AWK-1131A's web browser interface secured via HTTPS/SSL. (You can see the protocol in URL is **https**.) Then you can use the menu tree on the left side of the window to open the function pages to access each of AWK-1131A's functions.

Disabling Telnet and Browser Access

If you are connecting the AWK-1131A to a public network but do not intend to use its management functions over the network, then we suggest disabling both Telnet Console and Web Configuration. Please run **Maintenance** → **Console Settings** to disable them, as shown in the following figure.



A

This chapter provides more detailed information about wireless-related technologies. The information in this chapter can help you administer your AWK-1131As and plan your industrial wireless network better.

The following topics are covered in this appendix:

- **Beacon**
- **DTIM**
- **Fragment**
- **RTS Threshold**

Beacon

A beacon is a packet broadcast by the AP to keep the network synchronized. A beacon includes the wireless LAN service area, the AP address, the Broadcast destination address, a time stamp, Delivery Traffic Indicator Maps (DTIM), and the Traffic Indicator Message (TIM). Beacon Interval indicates the frequency interval of AP.

DTIM

Delivery Traffic Indication Map (DTIM) is contained in beacon frames. It is used to indicate that broadcast and multicast frames buffered by the AP will be delivered shortly. Lower settings result in more efficient networking, while preventing your PC from dropping into power-saving sleep mode. Higher settings allow your PC to enter sleep mode, thus saving power.

Fragment

A lower setting means smaller packets, which will create more packets for each transmission. If you have decreased this value and experience high packet error rates, you can increase it again, but it will likely decrease overall network performance. Only minor modifications of this value are recommended.

RTS Threshold

RTS Threshold (256-2346) – This setting determines how large a packet can be before the Access Point coordinates transmission and reception to ensure efficient communication. This value should remain at its default setting of 2,346. When you encounter inconsistent data flow, only minor modifications are recommended.

B

This chapter presents additional information about this product. You can also learn how to contact Moxa for technical support.

The following topics are covered in this appendix:

- **Firmware Recovery**
- **DoC (Declaration of Conformity)**
  - Federal Communication Commission Interference Statement
  - R&TTE Compliance Statement

Firmware Recovery

When the LEDs of **FAULT**, **Signal Strength** and **WLAN** all light up simultaneously and blink at one-second interval, it means the system booting has failed. It may result from some wrong operation or uncontrollable issues, such as an unexpected shutdown during firmware update. The AWK-1131A is designed to help administrators recover such damage and resume system operation rapidly. You can refer to the following instructions to recover the firmware:

Connect to the AWK-1131A's RS-232 console with 115200bps and N-8-1. You will see the following message shown on the terminal emulator every one second.

please set-up TFTP server 192.168.127.1 contains awk1131a.rom for firmware recovery.

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Take the following steps for the firmware recovery:

1. Change the IP address of the laptop to 192.168.127.1.
2. Set up a TFTP sever in your laptop.
3. Download AWK-1131A's firmware from Moxa Website
4. Change firmware file name to awk1131a.rom
5. Connect to the AWK-1131A's RJ45 Ethernet port

If setting is correct, you will see the following message shown on the terminal emulator, and the AWK-1131A will reboot when the firmware recovery process has been finished.

Trying eth0

Using eth0 device

TFTP from server 192.168.127.1; our IP address is 192.168.127.253

Filename 'awk1131a.rom'.

Load address: 0x80060000

Loading:
*###

 ###

 ###

DoC (Declaration of Conformity)

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the 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 of the following measures:

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

FCC Caution: To assure continued compliance, (example – 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 this equipment. This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

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 a minimum distance of 20 cm between the radiator & your body.

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

R&TTE Compliance Statement

Moxa declares that the apparatus AWK-1131A complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

This equipment complies with all the requirements of DIRECTIVE 1999/5/CE OF THE EUROPEAN PARLIAMENT AND THE COUNCIL OF 9 March 1999 on radio equipment and telecommunication terminal equipment and the mutual recognition of their conformity (R&TTE).

The R&TTE Directive repeals and replaces in the directive 98/13/EEC (Telecommunications Terminal Equipment and Satellite Earth Station Equipment) as of April 8, 2000.

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 manufacturer must therefore be allowed at all times to ensure the safe use of the equipment.

EU Countries Intended for Use

The ETSI version of this device is intended for home and office use in Austria, Belgium, Denmark, Finland, France (with Frequency channel restrictions), Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, Sweden, The Netherlands, and United Kingdom.

The ETSI version of this device is also authorized for use in EFTA member states Norway and Switzerland.

EU Countries Not Intended for Use

None.

Potential Restrictive Use

France: only channels 10, 11, 12, and 13.

Professional installation instruction

1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

2. Installation location

A). The product shall be installed at a location where the radiating antenna can be kept 21cm from nearby person in normal operation condition to meet regulatory RF exposure requirement.

B). Within the 5.15-5.25 GHz band, the devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

C). Any installation of either a master or a client device within 35 km of a TDWR location shall be separated by at least 30 MHz (center-to-center) 4 from the TDWR operating frequency (as shown in the below table)

STATE	CITY	LONGITUDE	LATITUDE	FREQUENCY	TERRAIN ELEVATION (MSL) [ft]	ANTENNA HEIGHT ABOVE TERRAIN [ft]
AZ	PHOENIX	W 112 09 46	N 33 25 14	5610 MHz	1024	64
CO	DENVER	W 104 31 35	N 39 43 39	5615 MHz	5643	64
FL	FT LAUDERDALE	W 080 20 39	N 26 08 36	5645 MHz	7	113
FL	MIAMI	W 080 29 28	N 25 45 27	5605 MHz	10	113
FL	ORLANDO	W 081 19 33	N 28 20 37	5640 MHz	72	97
FL	TAMPA	W 082 31 04	N 27 51 35	5620 MHz	14	80
FL	WEST PALM BEACH	W 080 16 23	N 26 41 17	5615 MHz	20	113
GA	ATLANTA	W 084 15 44	N 33 38 48	5615 MHz	962	113
IL	MCCOOK	W 087 51 31	N 41 47 50	5615 MHz	646	97
IL	CRESTWOOD	W 087 43 47	N 41 39 05	5645 MHz	663	113

IN	INDIANAPOLIS	W 086 26 08	N 39 38 14	5605 MHz	751	97
KS	WICHITA	W 097 26 13	N 37 30 26	5603 MHz	1270	80
KY	COVINGTON CINCINNATI	W 084 34 48	N 38 53 53	5610 MHz	942	97
KY	LOUISVILLE	W 085 36 38	N 38 02 45	5646 MHz	617	113
LA	NEW ORLEANS	W 090 24 11	N 30 01 18	5645 MHz	2	97
MA	BOSTON	W 070 56 01	N 42 09 30	5610 MHz	151	113
MD	BRANDYWINE	W 076 50 42	N 38 41 43	5635 MHz	233	113
MD	BENFIELD	W 076 37 48	N 39 05 23	5645 MHz	184	113
MD	CLINTON	W 076 57 43	N 38 45 32	5615 MHz	249	97
MI	DETROIT	W 083 30 54	N 42 06 40	5615 MHz	656	113
MN	MINNEAPOLIS	W 092 55 58	N 44 52 17	5610 MHz	1040	80
MO	KANSAS CITY	W 094 44 31	N 39 29 55	5605 MHz	1040	64
MO	SAINT LOUIS	W 090 29 21	N 38 48 20	5610 MHz	551	97
MS	DESOTO COUNTY	W 089 59 33	N 34 53 45	5610 MHz	371	113
NC	CHARLOTTE	W 080 53 06	N 35 20 14	5608 MHz	757	113
NC	RALEIGH DURHAM	W 078 41 50	N 36 00 07	5647 MHz	400	113
NJ	WOODBRIDGE	W 074 16 13	N 40 35 37	5620 MHz	19	113
NJ	PENNSAUKEN	W 075 04 12	N 39 56 57	5610 MHz	39	113
NV	LAS VEGAS	W 115 00 26	N 36 08 37	5645 MHz	1995	64
NY	FLOYD BENNETT FIELD	W 073 52 49	N 40 35 20	5647 MHz	8	97
OH	DAYTON	W 084 07 23	N 40 01 19	5640 MHz	922	97
OH	CLEVELAND	W 082 00 28	N 41 17 23	5645 MHz	817	113
OH	COLUMBUS	W 082 42 55	N 40 00 20	5605 MHz	1037	113
OK	AERO. CTR TDWR #1	W 097 37 31	N 35 24 19	5610 MHz	1285	80
OK	AERO. CTR TDWR #2	W 097 37 43	N 35 23 34	5620 MHz	1293	97
OK	TULSA	W 095 49 34	N 36 04 14	5605 MHz	712	113
OK	OKLAHOMA CITY	W 097 30 36	N 35 16 34	5603 MHz	1195	64
PA	HANOVER	W 080 29 10	N 40 30 05	5615 MHz	1266	113
PR	SAN JUAN	W 066 10 46	N 18 28 26	5610 MHz	59	113
TN	NASHVILLE	W 086 39 42	N 35 58 47	5605 MHz	722	97
TX	HOUSTON INTERCONTL	W 095 34 01	N 30 03 54	5605 MHz	154	97
TX	PEARLAND	W 095 14 30	N 29 30 59	5645 MHz	36	80
TX	DALLAS LOVE FIELD	W 096 58 06	N 32 55 33	5608 MHz	541	80
TX	LEWISVILLE DFW	W 096 55 05	N 33 03 53	5640 MHz	554	31
UT	SALT LAKE CITY	W 111 55 47	N 40 58 02	5610 MHz	4219	80
VA	LEESBURG	W 077 31 46	N 39 05 02	5605 MHz	361	113
WI	MILWAUKEE	W 088 02 47	N 42 49 10	5603 MHz	820	113

* Latitude and Longitude are specified in NAD 83
• Last updated July 30, 2010
• Rev. Note (July 30, 2010) – Adjusted coordinates and Elevation Information for Charlotte, NC

3. External antenna

Use only the antennas that have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of FCC/IC limit and is prohibited.

4. Installation procedure

Please refer to user's manual for the detail.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.