AirWorks AWK-1121/1127 User's Manual

Edition 3.0, August 2016

www.moxa.com/product

AirWorks AWK-1121/1127 User's Manual

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Introduction

The AirWorks AWK-1121/1127 enables wireless users to access network resources wirelessly. The AWK-1121/1127 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**
  - LED Indicators
  - Beeper
  - Reset Button

Overview

The AWK-1121/1127 is ideal for applications that are hard to wire, too expensive to wire, or use mobile equipment that connects to a TCP/IP network. The AWK-1121/1127 can 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. Installation is easy, with either DIN-Rail mounting or wall mounting in distribution boxes. The DIN-Rail/wall mounting capability, wide operating temperature range, and IP30 housing with LED indicators make the AWK-1121/1127 a convenient yet reliable solution for any industrial wireless application.

NOTE Unless otherwise specified, the AWK-1121 and AWK-2217 are referred to as the AWK in this document.

Package Checklist

Moxa's AWK-1121/1127 is shipped with the following items. If any of these items is missing or damaged, please contact your customer service representative for assistance.

- AWK-1121 or AWK-1127
- Swivel-type antenna (2dBi, RP-SMA, 2.4&5GHz)
- Quick installation guide (printed)
- Software CD
- Resistive terminator
- Protective cap
- Warranty card

NOTE The above items come with the standard AWK-1121/1127 model, but the package contents may vary for customized versions.

Product Features

- IEEE802.11a/b/g compliant
- Dedicated client
- 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 based)
- ABC-01 for configuration import/export
- Dedicated antenna selection
- Free firmware update for more advanced functions
- RS-232 console management
- Wide -40 to 75°C operating temperature range (-T model)
- Redundant 24 VDC power inputs or IEEE802.3af Power over Ethernet (PoE model)
- DIN-Rail or wall mounting
- IP30 protected high-strength metal housing

Product Specifications

WLAN Interface

Standards:

IEEE 802.11a/b/g for Wireless LAN
IEEE 802.11i for Wireless Security
IEEE 802.3u for 10/100BaseT(X)
IEEE 802.3af for Power-over-Ethernet (PoE model)

Spread Spectrum and Modulation (typical):

• DSSS with DBPSK, DQPSK, CCK
• OFDM with BPSK, QPSK, 16QAM, 64QAM
• 802.11b: CCK @ 11/5.5 Mbps, DQPSK @ 2 Mbps, DBPSK @ 11 Mbps
• 802.11a/g: 64QAM @ 54/48 Mbps, 16QAM @ 36/24 Mbps, QPSK @ 18/12 Mbps, BPSK @ 9/6 Mbps

Operating Channels (central frequency):

US:
2.412 to 2.462 GHz (11 channels)
5.18 to 5.24 GHz (4 channels)
EU:
2.412 to 2.472 GHz (13 channels)
5.18 to 5.24 GHz (4 channels)
JP:
2.412 to 2.472 GHz (13 channels, OFDM)
2.412 to 2.484 GHz (14 channels, DSSS)
5.18 to 5.24 GHz (4 channels for W52)

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

TX Transmit Power:

802.11b:
Typ. 18±1.5 dBm @ 1 to 11 Mbps
802.11g:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 17±1.5 dBm @ 36 Mbps,Typ. 16±1.5 dBm @ 48 Mbps, Typ. 16±1.5 dBm @ 54 Mbps
802.11a:
Typ. 18±1.5 dBm @ 6 to 24 Mbps, Typ. 16±1.5 dBm @ 36 Mbps, Typ. 15±1.5 dBm @ 48 Mbps, Typ. 14±1.5 dBm @ 54 Mbps

RX Sensitivity:

802.11b:
-97 dBm @ 1 Mbps, -94 dBm @ 2 Mbps, -92 dBm @ 5.5 Mbps, -90 dBm @ 11 Mbps
802.11g:
-88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps
802.11a:
-88 dBm @ 6 to 24 Mbps, -85 dBm @ 36 Mbps, -75 dBm @ 48 Mbps, -70 dBm @ 54 Mbps

Protocol Support

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

Interface

Default Antenna: 2 dBi dual-band omni-directional antenna, RP-SMA (male)

Connector for External Antennas: RP-SMA (female)

LAN Ports: 1, 10/100BaseT(X), auto negotiation speed (RJ45-type)

Serial Port: 1, RS-232/422/485, DB9 male connector (AWK-1127 only)
Console: RS-232 (RJ45-type)
LED Indicators: PWR, FAULT, STATE, signal strength, WLAN, LAN
Weight: 400 g (AWK-1121), 410 g (AWK-1127)
Dimensions:
AWK-1121: 50 x 115 x 70 mm (2.0 x 4.5 x 2.8 in)
AWK-1127: 50 x 127 x 70 mm (2.0 x 5.0 x 2.8 in)
Installation: DIN-Rail mounting, wall mounting (with optional kit)

Serial Communication Parameters (AWK-1127 Only)

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps
Serial Data Log: 256 KB

Serial Signals (AWK-1127 Only)

RS-232: DSR, RTS, GND, TxD, RxD, DCD, CTS, DTR
RS-422: Tx+, Tx-, Rx+, Rx-, GND
RS-485 (2-wire): Data+, Data- and GND
RS-485 (4-wire): Tx+, Rx+, Tx-, Rx+ and GND

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°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 or 48 VDC Power-over-Ethernet (IEEE 802.3af compliant, PoE model only)
Connector: 4-pin removable terminal block
Power Consumption:
• 0.16 to 0.55 A @ 12 to 48 VDC
• 0.28 A @ 24 VDC
Reverse Polarity Protection: Present

Regulatory Approvals

Safety: EN60950-1, UL60950-1
Radio: EN 300 328, EN 301 893, DSPR (Japan)
EMC: EN 301 489-1/-17, FCC Part 15, EN 55022/55024
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

ATTENTION

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

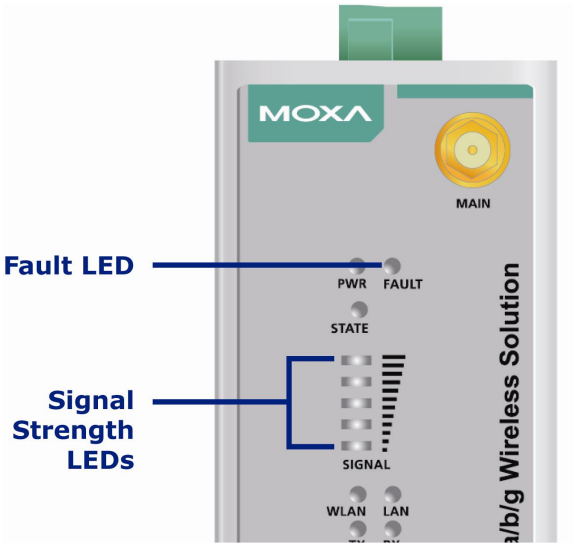
Patent http://www.moxa.com/doc/operations/Moxa_Patent_Marking.pdf

Functional Design

LED Indicators

The LEDs on the front panel of the AWK-1121/1127 provide a quick and easy means of determining the current operational status and wireless settings.

The **FAULT** LED indicates system failure and user-configured events. If the AWK is unable obtain an the IP address from a DHCP server or if there is an IP address conflict, the **FAULT** LED blinks at one second intervals. The **SIGNAL** LEDs indicate the signal strength.



ATTENTION

When the **FAULT**, **SIGNAL**, **STATE** and **WLAN** LEDs turn on simultaneously and blink at one second intervals, this indicates that the system has failed to boot. This may occur due to improper operation (for example, an unexpected shutdown during firmware update). For instructions on how to recover the firmware, refer to Appendix B.

Beeper

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

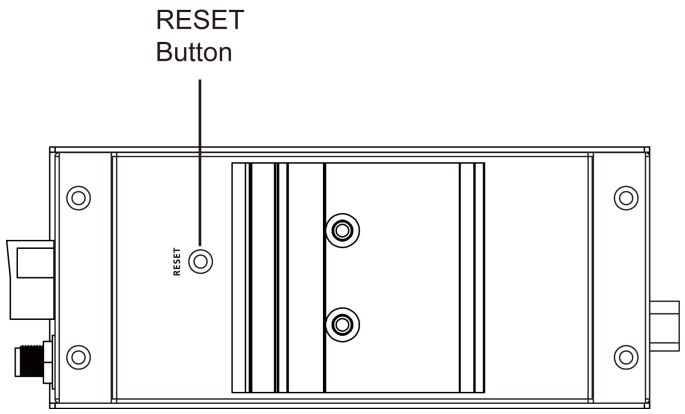
Reset Button

The **RESET** button is located on the back panel of the AWK-1121/1127. You can reboot the AWK-1121/1127 or reset it to factory default settings by pressing the **RESET** button with a pointed object such as an unfolded paper clip.

The following table describes the behavior of the **RESET** button based on how long you press the button.

Duration (sec)	Description
< 5	Restarts the AWK.
5 ~ 10	Resets the AWK to the customized default values. While you are pressing the button, the State LED turns red and starts to blink.
>10	Resets the AWK to the factory default settings. While you are pressing the button, the State LED turns green and starts to blink.

The following figure shows the location of the **RESET** button on the AWK.



2

Getting Started

This chapter explains how to install Moxa's AirWorks AWK-1121/1127 for the first time, and quickly set up your wireless network and test whether the connection is running well. The function map provides a convenient means of determining which functions you need to use.

The following topics are covered in this chapter:

- **Initial Setup**
- **Function Map**

Initial Setup

Before installing the AWK-1121/1127, make sure that you have all the items as listed in the Package Checklist section. You will also need a computer equipped with an Ethernet port. To connect to the AWK for the first time, you must use the default IP address of AWK.

- **Step 1: Select the power source.**
  You can supply power to the AWK from a DC power source or using Power over Ethernet (PoE, for PoE models only).
- **Step 2: Connect the AWK to a computer.**
  The Ethernet ports on the AWK supports MDI/MDI-X auto-sensing. You can use a cross-over or straight-through Ethernet cable to connect a computer to the AWK. On the AWK, the LED indicator on a LAN port turns on when a connection is established.
- **Step 3: Set up the IP address of the computer.**
  Configure the IP address of the computer to be on the same subnet as the AWK. The default IP address of the AWK is **192.168.127.253** and the default subnet mask is **255.255.255.0**. For the computer, you should set its IP address in the **192.168.127.xxx** range.

NOTE Each time you reset the AWK to the factory default settings, the IP address of the AWK is reset to **192.168.127.253**.

- **Step 4: Access the web console to configure the AWK**
  On the computer, open a web browser and enter **http://192.168.127.253** in the address bar to access the web console on the AWK.

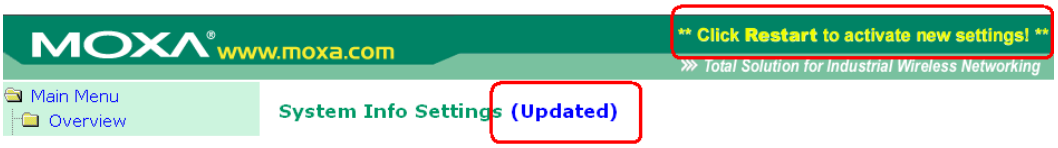
  Enter the default account username and password; then, click **Login**.

NOTE The default user name and password is:

User Name: **admin**
Password: **root**

For security reasons, we strongly recommend that you change the default password (click **Maintenance** > **Password**).

NOTE After you click **Submit** to save the changes, the web console refreshes and displays **(Updated)** on the screen and a blinking reminder on the upper-right corner.
The following figure shows an example.



To make the changes take effect, click **Restart** or **Save and Restart**.
It may take about 30 seconds for the AWK-1121/1127 to restart.

- **Step 5: Test communications.**
  The following section describes how to perform a communication test to verify that a network connection has been established.

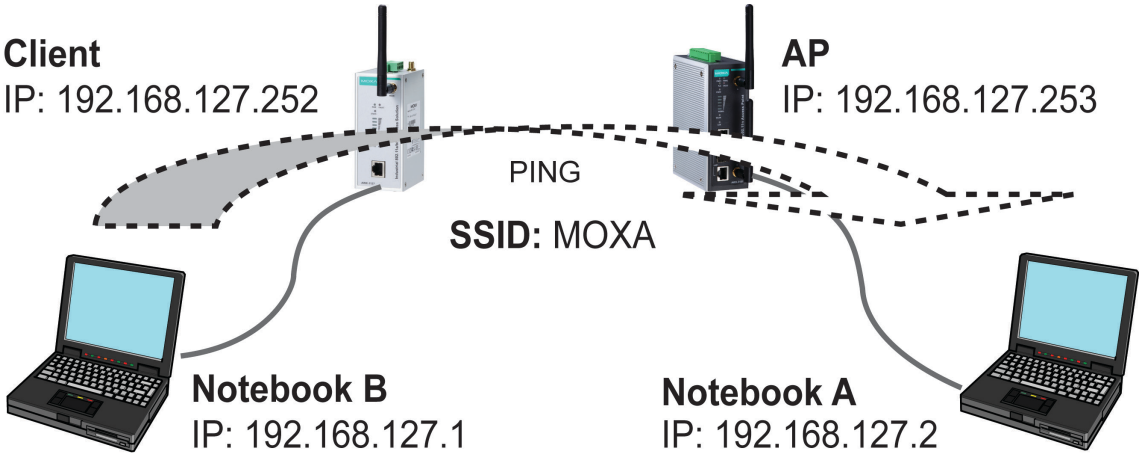
Communication Test

After setting up the AWK-1121/1127 for the first time, you can perform a simple test against an AP to make sure that the AWK has established a wireless connection and is functioning properly.

In this example, an AWK-3121 is configured as the access point on the wireless network.

Testing Network Connectivity on AWK-1121/1127

Connect an AP-configured AWK-3121 (or another access point) to Notebook A. Connect an AWK-1121/1127 to Notebook B. Configure the AWK-1121/1127 and AWK-3121 for the same SSID, and set their IP addresses as shown in the following figure.

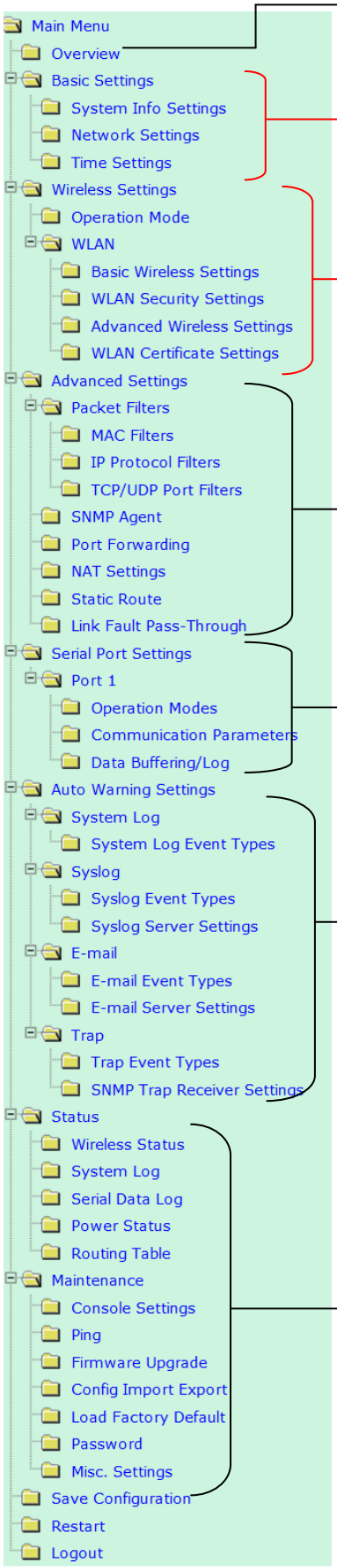


After setting up the testing environment, open a command window on notebook B. At the prompt, type:

ping *<IP address of notebook A>*

and press **[Enter]**. A "Reply from IP address …" response means the communication was successful. A "Request timed out" response means the communication has failed. In this case, check the settings to make sure that the configuration is correct.

Function Map



Quick overview of the AWK-1121/1127's information

Basic settings for administering the AWK-1121/1127

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.

Serial port settings to support additional serial to wireless connectivity

Note: These settings are only available for AWK-1127

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

Note: These functions are all optional.

Real-time status information for monitoring and maintaining network performance, advanced services, and device management functions.

3

Web Console Configuration

This chapter describes the configuration screens in the web console. Moxa's easy-to-use management functions help you set up your AWK-1121/1127 and make it easy to establish and maintain your wireless network.

The following topics are covered in this chapter:

- **Accessing the Web Console**
- **Overview**
- **Basic Settings**
  - System Info Settings
  - Network Settings
  - Time Settings
- **Wireless Settings**
  - Operation Mode
  - WLAN
- **Advanced Settings**
  - Packet Filters
  - SNMP Agent
  - Port Forwarding (Client-Router Mode with NAT Enabled)
  - NAT Settings (Client-Router Mode)
  - Static Route (Client-Router Mode)
  - Link Fault Pass-Through
- **Serial Port Settings (AWK-1127 Only)**
  - Operation Modes
  - Communication Parameters
  - Data Buffering/Log
- **Auto Warning Settings**
  - System Log
  - Syslog
  - E-mail
  - Trap
- **Status**
  - Wireless Status
  - System Log
  - Serial Data Log (AWK-1127 Only)
  - Power Status
  - Routing Table
- **Maintenance**
  - Console Settings
  - Ping
  - Firmware Upgrade
  - Config Import/Export
  - Loading Factory Defaults
  - Password
  - Misc. Settings
- **Save Configuration**
- **Restart**
- **Logout**

Accessing the Web Console

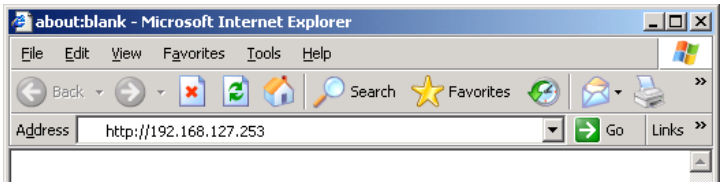
You can use the web console to configure network and administrative settings on the AWK-1121/1127. THe web console is best viewed using Microsoft® Internet Explorer with JVM (Java Virtual Machine) installed.

NOTE To use the AWK-1121/1127's management and monitoring functions from a computer on the same network as the AWK-1121/1127, make sure that the computer and the AWK-1121/1127 are on the same logical subnet. Similarly, if the AWK-1121/1127 is configured for other VLAN settings, you must make sure that the computer is on the same management VLAN.

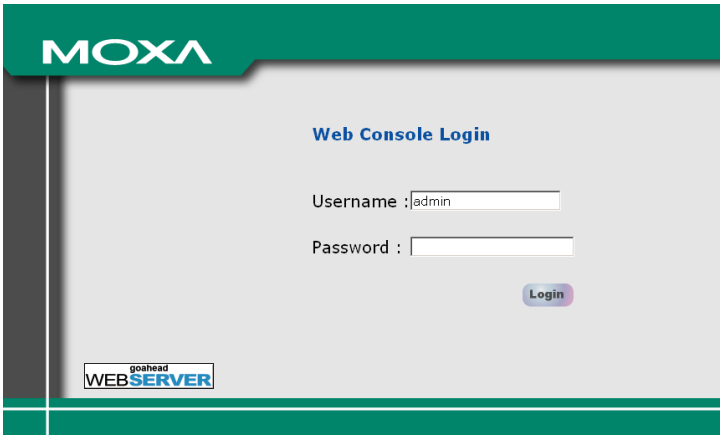
The default IP address of the AWK-1121/1127 is **192.168.127.253**.

Follow these steps to access the web console on the AWK-1121/1127.

1. On the computer, open a web browser and enter **http://192.168.127.253** in the address bar to access the web console on the AWK.



2. The login screen is displayed. Enter the password (the default is **root**) and click **Login**. The default username is **admin**.

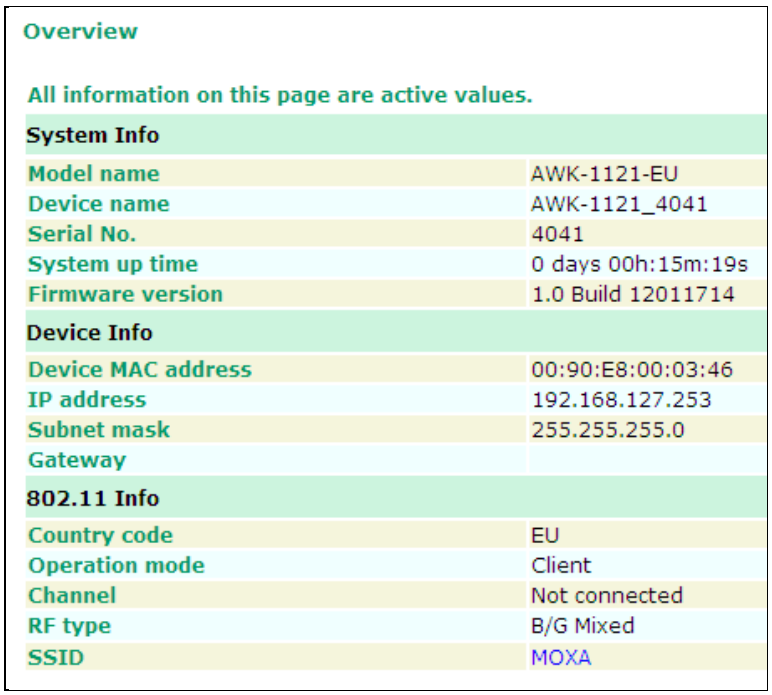


3. Wait while the web configurator displays the main screen on your computer. Note that the model name and IP address of your AWK-1121/1127 are both shown in the title bar of the web page. You can use this information to identify multiple AWK-1121/1127 units.
4. Use the menu tree on the left to open the configuration pages to set the AWK-1121/1127.

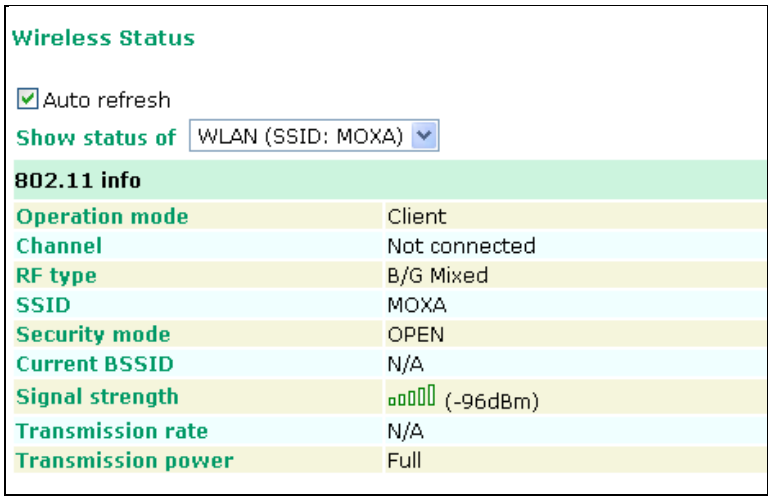
NOTE The model name of the AWK-1121/1127 is shown as AWK-1121/1127-XX, where XX indicates the country code. The country code indicates the AWK-1121/1127 version and the bandwidth it uses.
This document shows the screens for the **AWK-1121/1127-EU** as examples.
By default, the AWK automatically logs you out after five minutes of inactivity. If this happens, log back into the web console again.

Overview

The **Overview** page shows the AWK-1121/1127's current status. The information is categorized into groups: **System Info**, **Device Info**, and **802.11 Info**.



To view detailed 802.11 information (as shown in the following figure), click the SSID.

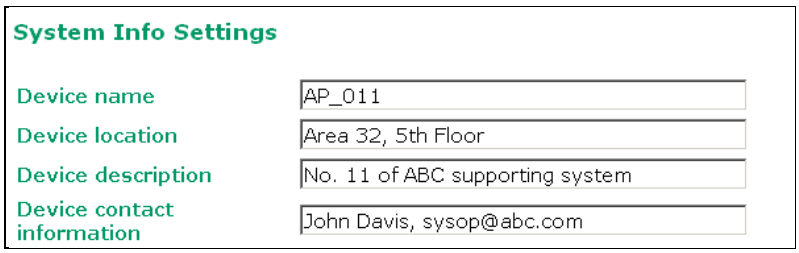


Basic Settings

The Basic Settings screens include the settings required to manage the AWK-1121/1127.

System Info Settings

System Info labels (especially ***Device name***) are displayed and included on the **Overview** page, in SNMP information, and in alarm emails. Giving descriptive, unique labels to items under **System Info** makes it easier to identify the different AWK-1121/1127 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-1121/1127 units.	AWK-1121/1127_<Serial No. of this AWK-1121/1127>

Device location

Setting	Description	Factory Default
Max. of 31 characters	Specifies the location of different AWK-1121/1127 units.	None

Device description

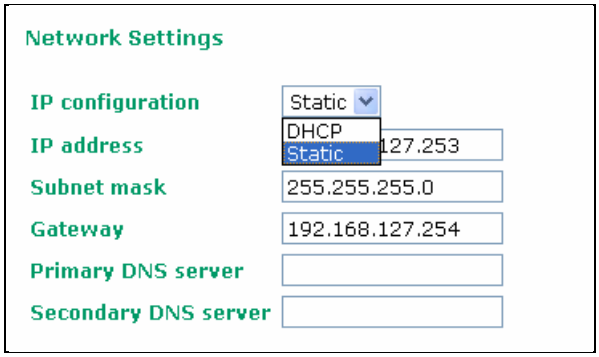
Setting	Description	Factory Default
Max. of 31 characters	Use this space to record a more detailed description of the AWK-1121/1127.	None

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-1121/1127.	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-1121/1127's IP address will be assigned automatically by the network's DHCP server.	Static
Static	Set up the AWK-1121/1127's IP address manually.	

IP address

Setting	Description	Factory Default
AWK-1121/1127's IP address	Identifies the AWK-1121/1127 on a TCP/IP network.	192.168.127.253

Subnet mask

Setting	Description	Factory Default
AWK-1121/1127's subnet mask	Identifies the type of network to which the AWK-1121/1127 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

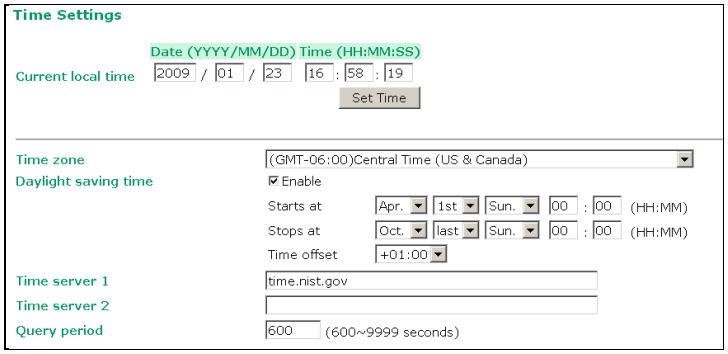
Setting	Description	Factory Default
AWK-1121/1127's default gateway	The IP address of the router that connects the LAN to an outside network.	None

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-1121/1127'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-1121/1127 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-1121/1127'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 is displayed 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-1121/1127 has a built-in real time clock (RTC). We strongly recommend that users update the **Local time** for the AWK-1121/1127 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.	Disabled

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

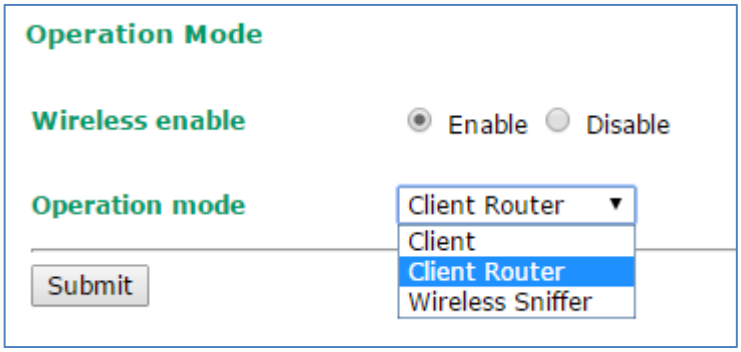
The essential settings for wireless networks are presented in this function group. Settings must be properly set before establishing your wireless network.

The AWK-1121/1127 as a client can be used as an Ethernet-to-wireless (or LAN-to-WLAN) network adapter. 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.

NOTE Although it is more convenient to use dynamic bridging, there is a limitation—the AP Client can only transmit IP-based packets between its wireless interface (WLAN) and Ethernet interface (LAN); other types of traffic (such as IPX and AppleTalk) are not forwarded.

Operation Mode

You can set the AWK-1121/1127 to operate as a client, wireless router, or wireless sniffer.



Wireless Enable

Setting	Description	Factory Default
Enable/Disable	The RF (Radio Frequency) module can be manually turned on or off.	Enable

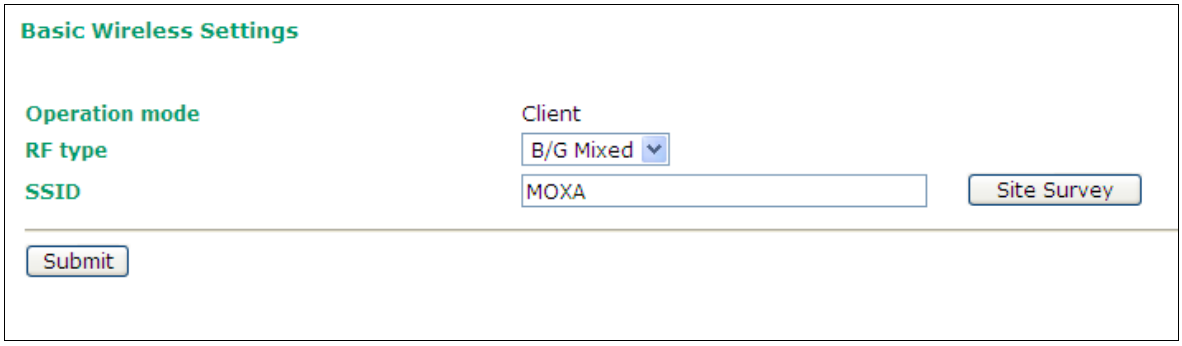
Operation Mode

Setting	Description	Factory Default
Client	The AWK-1121/1127 operates as a wireless client.	Client
Client Router	The AWK-1121/1127 operates as a wireless client router.	
Wireless Sniffer	The AWK-1121/1127 only operates as a wireless sniffer.	

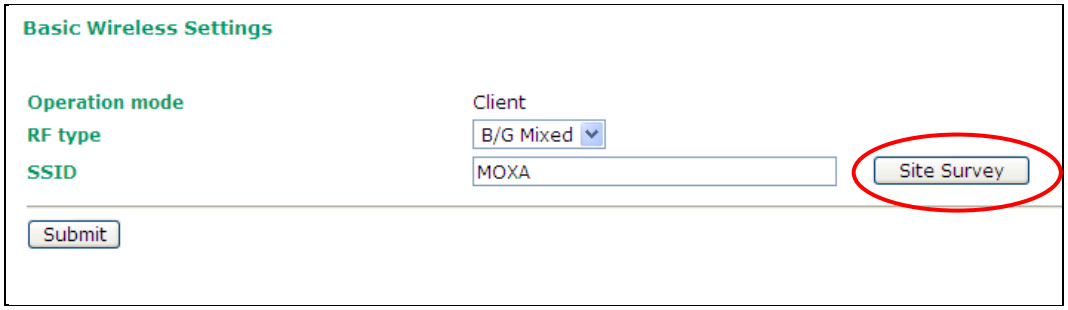
WLAN

Basic Wireless Settings

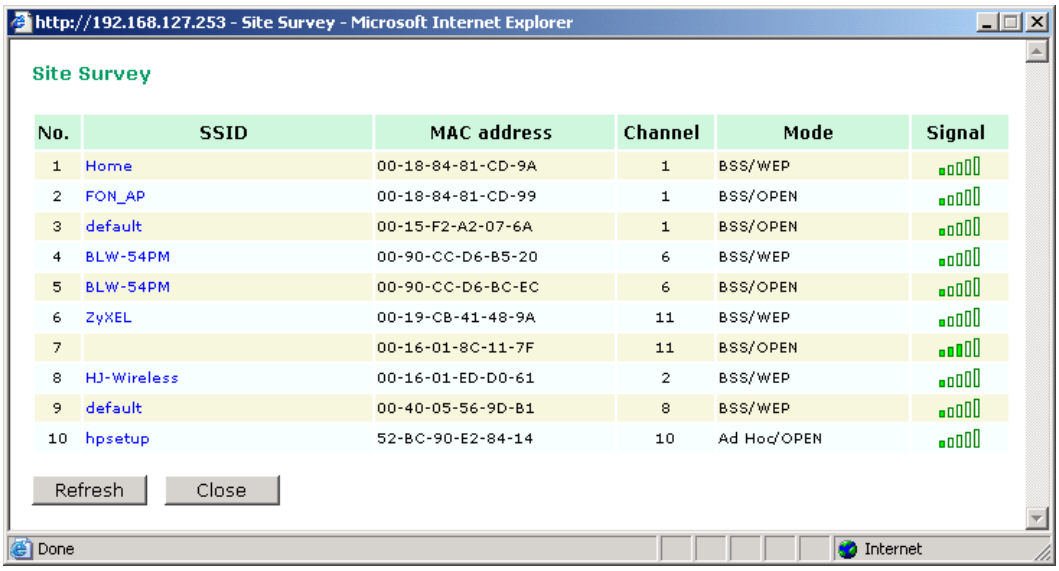
The "WLAN Basic Setting Selection" panel is used to edit SSIDs and set the RF type. The RF type selection will configure the AWK-1121/1127 to either the 2.4GHz or 5GHz frequency band. An SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Set the SSID parameter to match that of the APs you wish to connect to, so that the AWK-1121/1127 will associate with network defined by the SSID.



NOTE Click the "Site Survey" button to view information about available APs, as shown in the following figure. If this client is connecting to an AP, a brief disconnection will occur during site survey. 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.



RF type

Setting	Description	Factory Default
A	Supports IEEE802.11a standard only.	B/G Mixed
B	Supports IEEE802.11b standard only.	
G	Supports IEEE802.11g standard only.	
B/G Mixed	Supports both of IEEE802.11b/g standards, but 802.11g can be slowed down when 802.11b clients are on the network.	

SSID

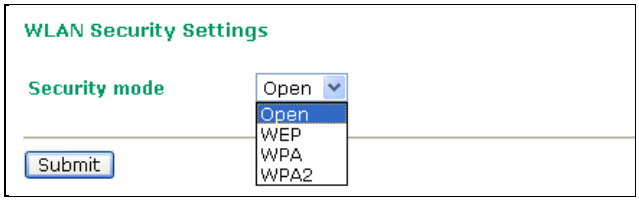
Setting	Description	Factory Default
Max. of 31 characters	The SSID must be identical to the target AP for the client and AP to be able to communicate with each other.	MOXA

NOTE The AWK-1121/1127-JP (for Japanese frequency bands) connects to APs with broadcast (for example, not hidden) SSIDs, in all IEEE802.11a channels and IEEE802.11g channels 1 to 11.
The AWK-1121/1127-EU (for European frequency bands) connects to APs with hidden SSIDs in all IEEE802.11b/g channels.

WLAN Security Settings

The AWK-1121/1127 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-1121/1127 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-1121/1127 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	Fully supports IEEE802.11i with "TKIP/AES + 802.1X"	
WPA2	Fully supports IEEE802.11i with "TKIP/AES + 802.1X"	

Open

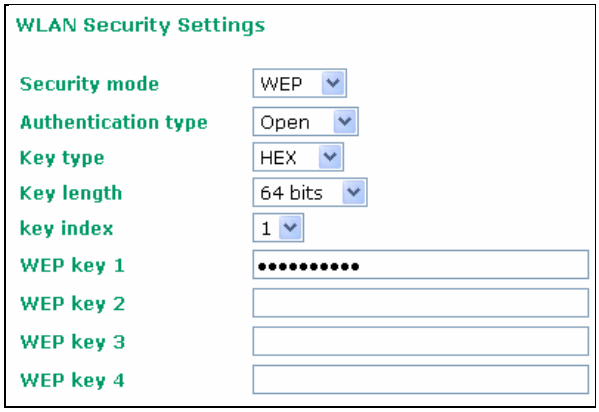
For security reasons, you should **NOT** set security mode to Open (or "Open System"), since authentication and data encryption are **NOT** performed in Open (or "Open System") mode.

WEP

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-1121/1127 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 104-bit key has 26 hex 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.	1

WEP key 1-4

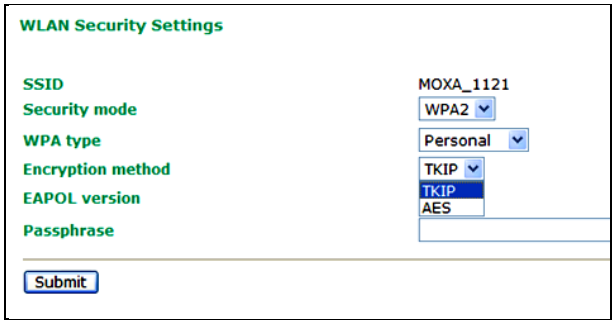
Setting	Description	Factory Default
ASCII type: 64 bits: 5 chars 128 bits: 13chars HEX type: 64 bits: 10 hex chars 128 bits: 26 hex chars	A string that can be used as a WEP seed for the RC4 encryption engine.	None

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-1121/1127 also supports AES algorithms in WPA and WPA2 for better compatibility.

Personal versions of WPA/WPA2, also known 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 8of 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.	TKIP
AES	Advance Encryption System is enabled.	

EAPOL Version

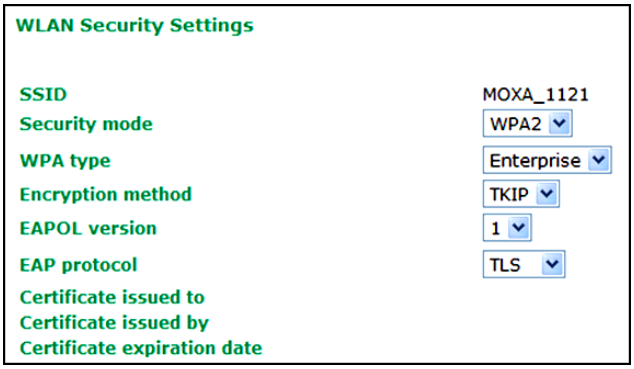
Setting	Description	Factory Default
1	EAPOL version 1 was standardized in the 2001 version of 802.1X, which is much more commonly implemented.	1
2	EAPOL version 2 was specified in 802.1X-2004.	

Passphrase

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

WPA/WPA2-Enterprise

When used as a client, the AWK-1121/1127 can support three EAP methods (or ***EAP protocols***): **EAP-TLS**, **EAP-TTLS**, and **EAP-PEAP**, corresponding to WPA/WPA2-Enterprise settings on the AP side.



EAP Protocol

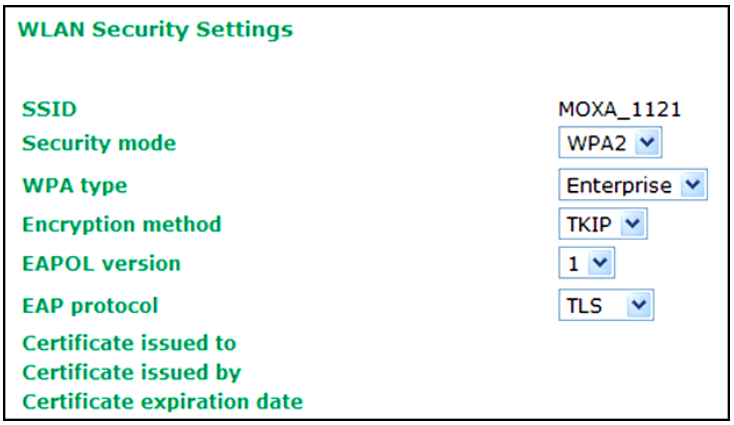
Setting	Description	Factory Default
TLS	Specifies Transport Layer Security protocol.	TLS
TTLS	Specifies Tunneled Transport Layer Security.	
PEAP	Specifies Protected Extensible Authentication Protocol, or Protected EAP.	

Before choosing the EAP protocol for your WPA/WPA2-Enterprise 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.



- **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

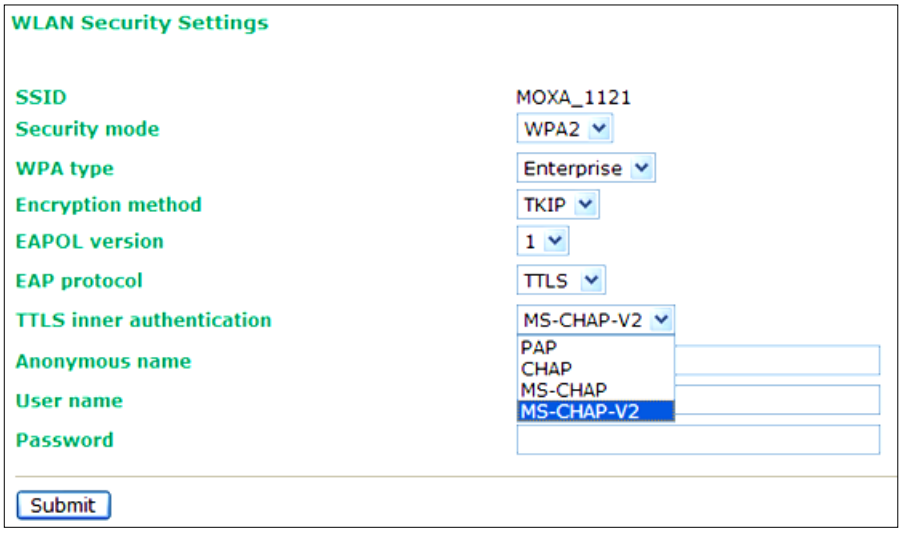
It is usually much easier to re-use existing authentication systems, such as a Windows domain or Active Directory, LDAP directory, or Kerberos realm, rather than creating a parallel authentication system. As a result, TTLS (Tunneled TLS) and PEAP (Protected EAP) are used to support the use of so-called "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-1121/1127 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.



TTLS 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

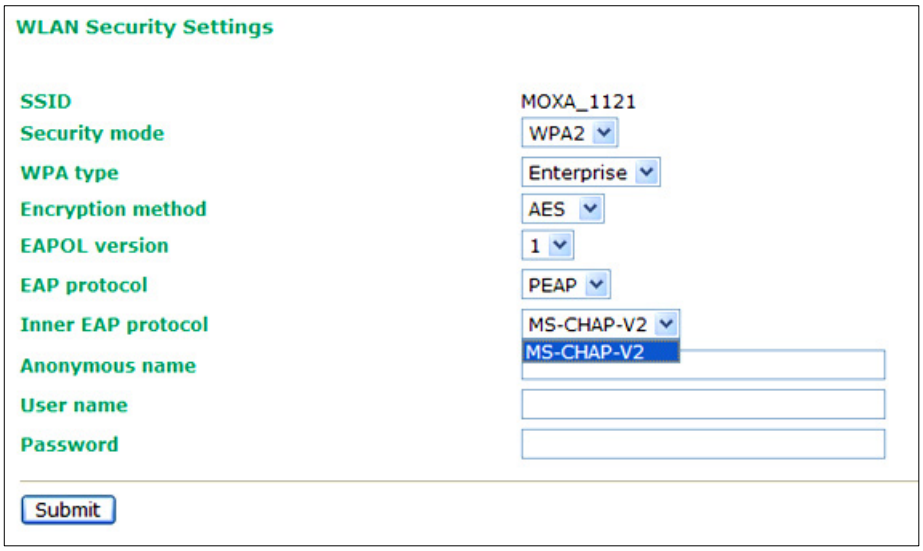
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication.	None

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-1121/1127 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

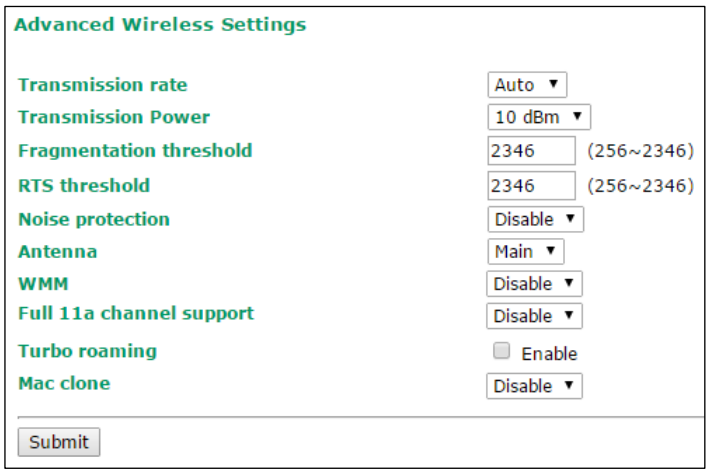
Setting	Description	Factory Default
Max. of 31 characters	A distinct name used for outer authentication.	None

User name & Password

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

Advanced Wireless Settings

Use this screen to configure advanced wireless settings (for example, transmission rates and Turbo roaming).



Transmission Rate

Setting	Description	Factory Default
Auto	The AWK-1121/1127 automatically detects and adjusts the data rate.	Auto
Available rates	Select a target transmission data rate.	

Transmission Power

Setting	Description	Factory Default
0 – 20 dBm	Select the maximum power that the AWK-1121/1127 uses for transmission.	10 dBm

NOTE **Transmission power** indicates the maximum value of transmission power which the user plans to use. However, the actual transmitted power depends on the radio module and other factors (for example, country, regulatory limitations, and data rate).
To view current transmission power on the AWK, click **Status** > **Wireless Status**.

Fragmentation threshold

Setting	Description	Factory Default
Fragment Length (256 to 2346)	Sets the maximum data packet size allowed before the system truncates and creates a new packet.	2346

RTS threshold

Setting	Description	Factory Default
RTS/CTS Threshold (256 to 2346)	Sets the maximum packet size allowed before the Access Point coordinates transmission and reception to ensure efficient communication.	2346

NOTE You can refer to the related glossaries in Appendix A 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. This option should be enabled for communication distance under 500 meters, and should be disabled for communication distances over 500 meters.	Disable

Antenna

Setting	Description	Factory Default
MAIN	The MAIN antenna is used for wireless communication.	Main
AUX	The AUX antenna is used for wireless communication.	

Note: For installation flexibility, either the MAIN antenna (on the front panel) or the AUX antenna (on the top panel) may be selected for use. Make sure the antenna connection matches the antenna configured in the AWK-1121/1127 interface.

To protect the connectors and 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.

WMhM

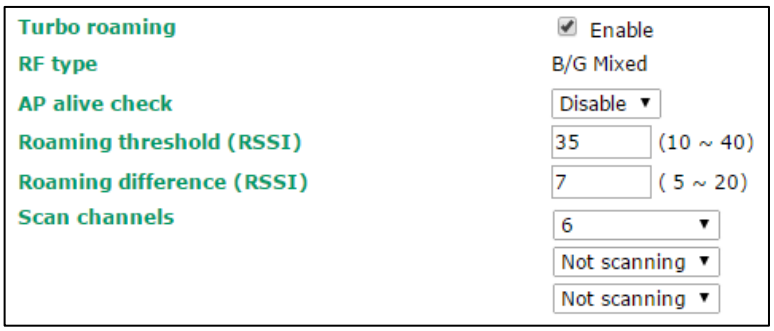
Setting	Description	Factory Default
Enable/Disable	WMM is a QoS standard for WLAN traffic. Voice and video data will be given priority bandwidth when enabled with WMM supported wireless clients.	Disable

Turbo Roaming

Setting	Description	Factory Default
Enable/Disable	Moxa's Turbo Roaming enables rapid handover when the AWK-1121/1127, as a client, roams among APs.	Disable

When Turbo Roaming is enabled, the RF type, AP alive check, Roaming threashold (RSSI), Roaming difference (RSSI), and Scan channels fields are displayed as shown in the following figure.

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**, or **B/G Mix** mode.)



Roaming Parameters

Setting	Description	Factory Default
Roaming threshold (RSSI)	Sets the data rate threshold. When RSSI value is lower than the roaming threshold, the AWK starts the roaming process.	35
Roaming difference (RSSI)	Sets the maximum difference allowed in signal strength between two adjacent APs before the AWK switches to the AP with higher signal strength.	7

MAC Clone

Setting	Description	Factory Default
Enable/Disable	When the AWK-1121/1127 is set as a Client, the MAC address of the AWK is used for network communication. In cases where you have registered a MAC address with your Internet Service Provider (ISP) or for network connection, you can enable the MAC Clone feature on the AWK to copy the registered MAC address. This avoids the trouble in changing the registered MAC address.	Disable

WLAN Certification Settings

When EAP-TLS is used, a WLAN Certificate will be required at the client end to support WPA/WPA2-Enterprise. The AWK-1121/1127 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-1121/1127. 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 status***. 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-1121/1127 reboots. Even though it is expired, it can still be seen on the ***Current status***.

Advanced Settings

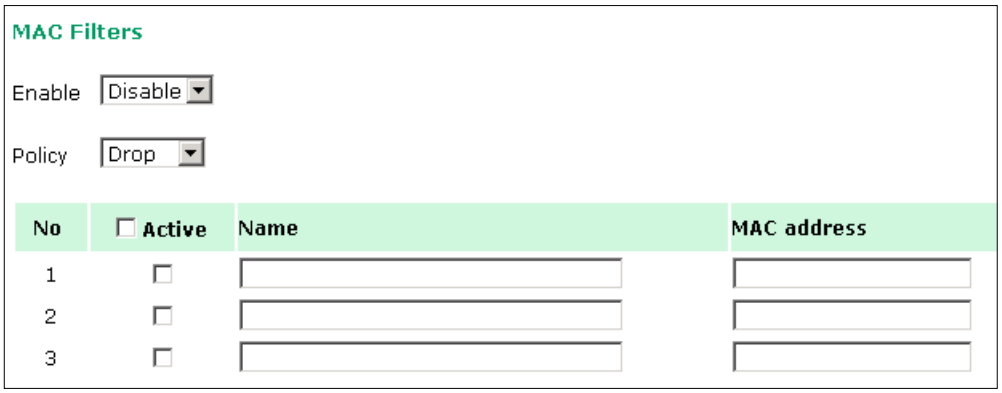
Several advanced functions are available to increase the functionality of your AWK-1121/1127 and wireless network system. The DHCP server helps you deploy wireless clients efficiently. Packet filters provide security mechanisms, such as firewalls, in different network layers. Moreover, the AWK-1121/1127 supports SNMP, making network management easier.

Packet Filters

The AWK-1121/1127 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-1121/1127's MAC filter is a policy-based filter that can allow or filter out IP-based packets with specified MAC addresses. The AWK-1121/1127 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.	

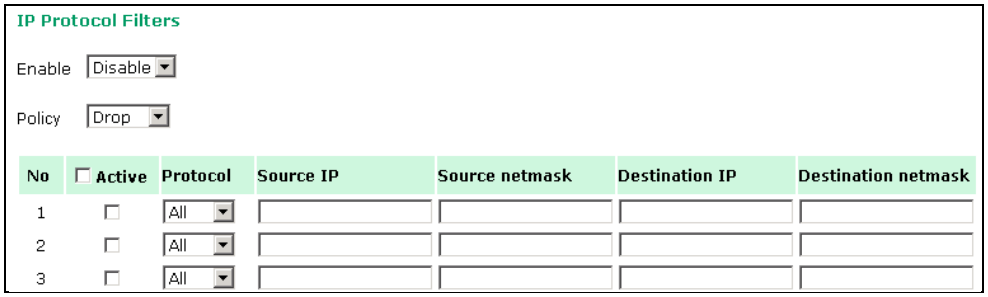
ATTENTION

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-1121/1127'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-1121/1127 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, netmask 255.255.255.255" refers to a sole IP address, while "IP address 192.168.1.1, netmask 255.255.255.0" refers to the range of IP addresses from 192.168.1.1 to 192.168.254. 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

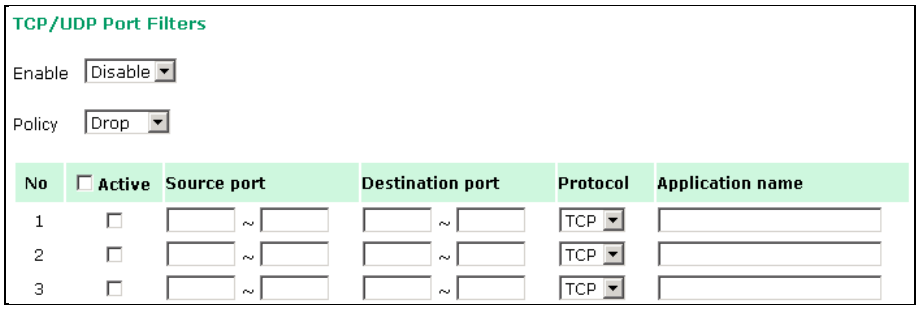
Be careful when you enable the filter function:
Drop + "no entity on list is activated" = all packets are **allowed.**
Accept + "no entity on list is activated" = all packets are **denied.**

TCP/UDP Port Filter

The AWK-1121/1127'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-1121/1127 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

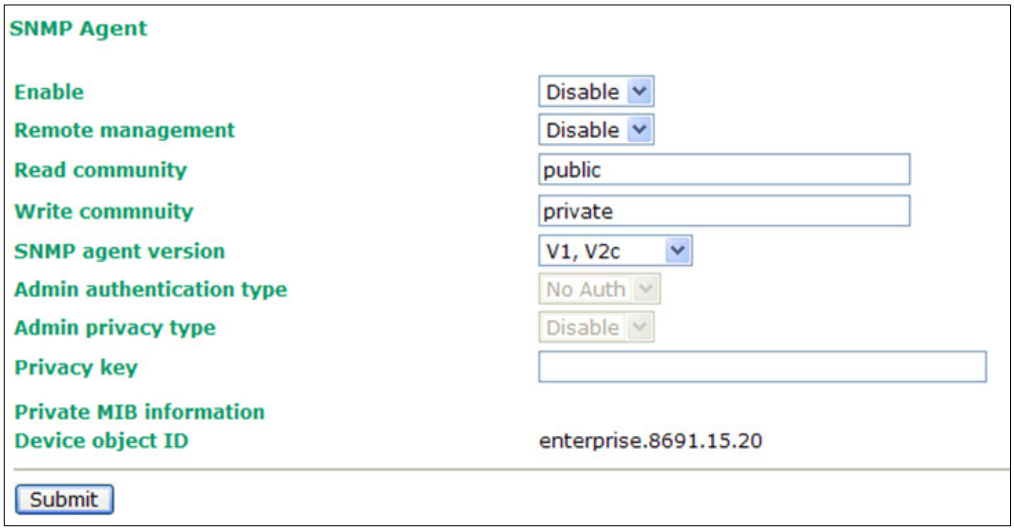
The AWK-1121/1127 supports SNMP V1/V2c/V3. SNMP V1 and SNMP V2c use a community string match for authentication, which means that SNMP servers access all objects with read-only or read/write permissions using the community string *public*/*private* (default value). SNMP V3, which requires you to select an authentication level of MD5 or SHA, is the most secure protocol. You can also enable data encryption to enhance data security.

The AWK-1121/1127'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-1121/1127 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	Yes	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 Authentication
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 type (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 known as ***OID***. This is the AWK-1121/1127's enterprise value. It is fixed.

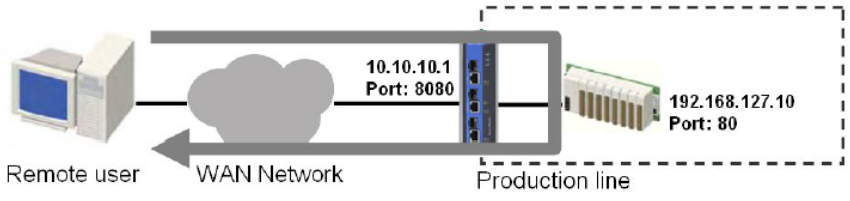
Port Forwarding (Client-Router Mode with NAT Enabled)

You can configure the Port Forwarding function on the AWK to hide IP address information for a connection that originates from the WAN.

In the Port Forwarding policy list, specify the port number and the external IP address. For example, if the IP address of a web server on the internal network is 192.168.127.10 with port 80, you can create a port forwarding policy to allow connections to the internal web server from an external IP address 10.10.10.10 on port 8080. The AWK forwards data to IP address 192.168.127.10 on port 80.

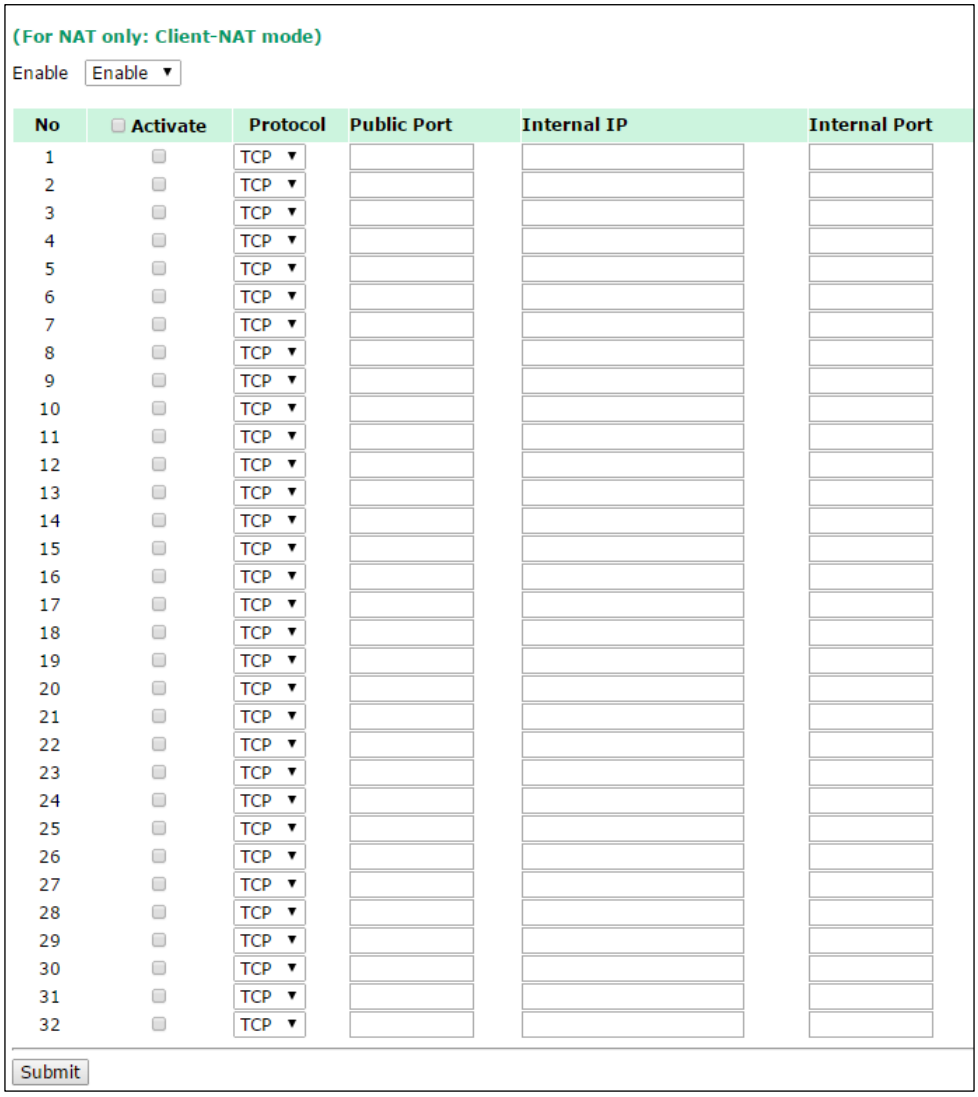
The Port Forwarding function enables connection from an external and insecure network (such as the WAN) to an internal network (such as the LAN). However, a user can initiate a connection from an external network to an internal network, but will not able to initiate a connection from the internal network to the external network.

The following figure shows a network example.



NOTE Make sure that the AWK is operating in Client-Router mode and that the NAT function is enabled.

Make sure that the AWK is set to operate in Client-Router mode. To configure port forwarding settings, click **Advanced Settings > Port Forwarding** from the main menu.



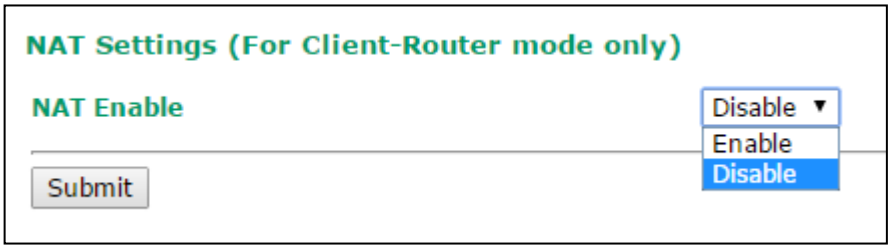
Enable

Setting	Description	Factory Default
Enable/Disable	Enable or disable the port forwarding function.	Disable

NAT Settings (Client-Router Mode)

NAT (Network Address Translation) is a common security function for changing the IP address during Ethernet packet transmission. If you want to hide an internal IP address on the LAN from an external network (WAN), the NAT function translates the internal IP address with a specific IP address, or an internal IP address range to one external IP address. The benefits of using NAT include:

- Hiding of Internal IP address of a critical network or device to increase the level of security of industrial network applications.
- Using the same private IP address for different, but identical, groups of Ethernet devices. For example, 1-to-1 NAT makes it easy to duplicate or extend identical production lines.

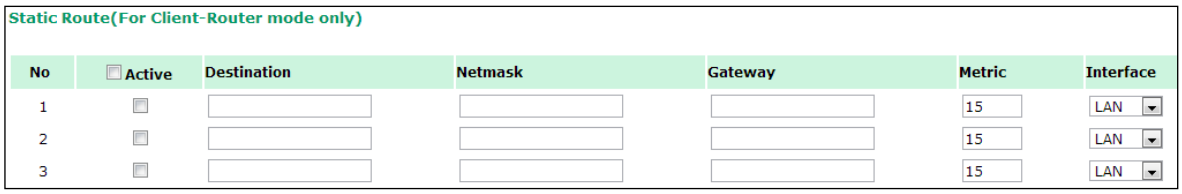


NAT Enable

Setting	Description	Factory Default
Enable/Disable	Enable or disable the selected NAT policy.	Disable

Static Route (Client-Router Mode)

When the AWK is set in Client-Router mode, you can configure the static routes. In the Static Routing page, specify the destination IP address, the subnet mask, the gateway, the route cost (metric) for a static route on an interface.

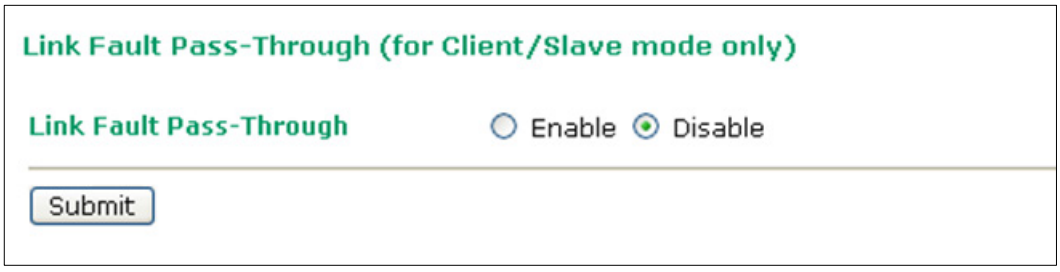


Link Fault Pass-Through

This function means if Ethernet port is link down, wireless connection will be forced to disconnect. Once Ethernet link is recovered, AWK-1121/1127 will try to connect to AP.

If wireless is disconnected, AWK-1121/1127 restarts auto-negotiation on Ethernet port but always stays in the link failure state. Once the wireless connection is recovered, AWK-1121/1127 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

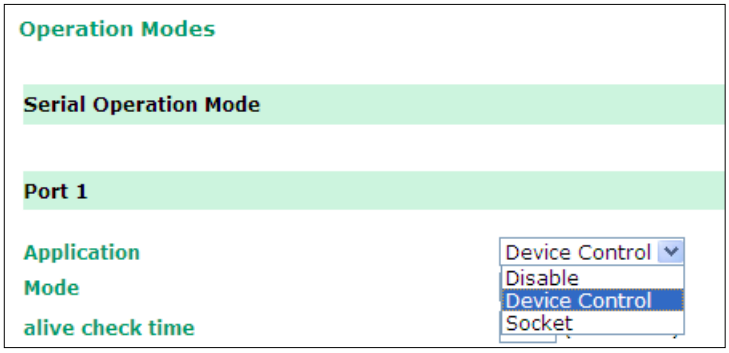
Setting	Description	Factory Default
Enable	Enables Link Fault Pass-Through	Disable
Disable	Disable Link Fault Pass-Through	

Serial Port Settings (AWK-1127 Only)

The AWK-1127 not only is capable of bring Ethernet devices onto the WLAN network, it also has a serial port for additional connectivity for serial devices. The AWK support various useful serial operation modes to make connecting to your serial devices much simpler.

Operation Modes

The Operation Modes page for the serial port is where you can configure the serial port operation mode and related settings.



Application

This field specifies what kind application you will be using for this serial port. Depending on the application, different operation modes and related settings will be displayed.

Setting	Description	Factory Default
Disable	This serial port will be disabled.	Disable
Device Control	This serial port will be used to control a device using legacy software installed on a Windows, Linux, or UNIX system. Drivers will need to be installed that will allow your software to communicate with the device as if it were physically attached to a local COM or TTY port. You may select between RealCOM and RFC2217 operation modes.	
Socket	This serial port will be used for a TCP or UDP socket-based application. You may select between TCP Client, TCP Server, and UDP operation modes.	

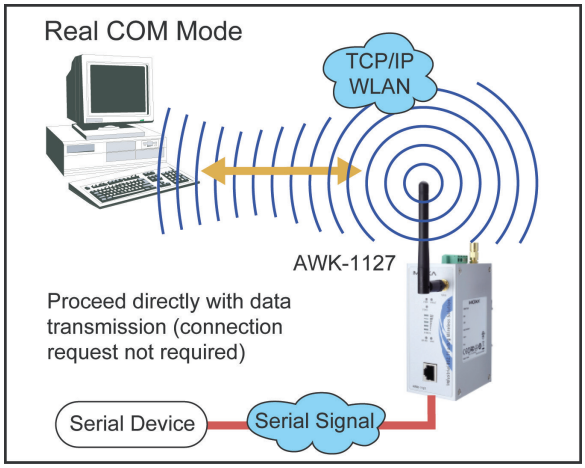
Mode

Along with Application, this field specifies the serial port's operation mode, or how it will interact with network devices. Depending on how Application is configured, different options are available for Mode. Depending on how Mode is configured, additional settings will be available for configuration.

Setting	Description	Factory Default
RealCOM	This serial port will operate in RealCOM mode.	(depends on Application)
RFC2217	This serial port will operate in RFC2217 mode.	
TCP Server	This serial port will operate in TCP Server mode.	
TCP Client	This serial port will operate in TCP Client mode.	
UDP	This serial port will operate in UDP mode.	

RealCOM Mode

RealCOM mode is designed to work with AWK drivers that are installed on a network host. COM drivers are provided for Windows systems, and TTY drivers are provided for Linux and UNIX systems. The driver establishes a transparent connection to the attached serial device by mapping a local serial port to the AWK-1127 serial port. RealCOM mode supports up to four simultaneous connections, so multiple hosts can collect data from the attached device at the same time.



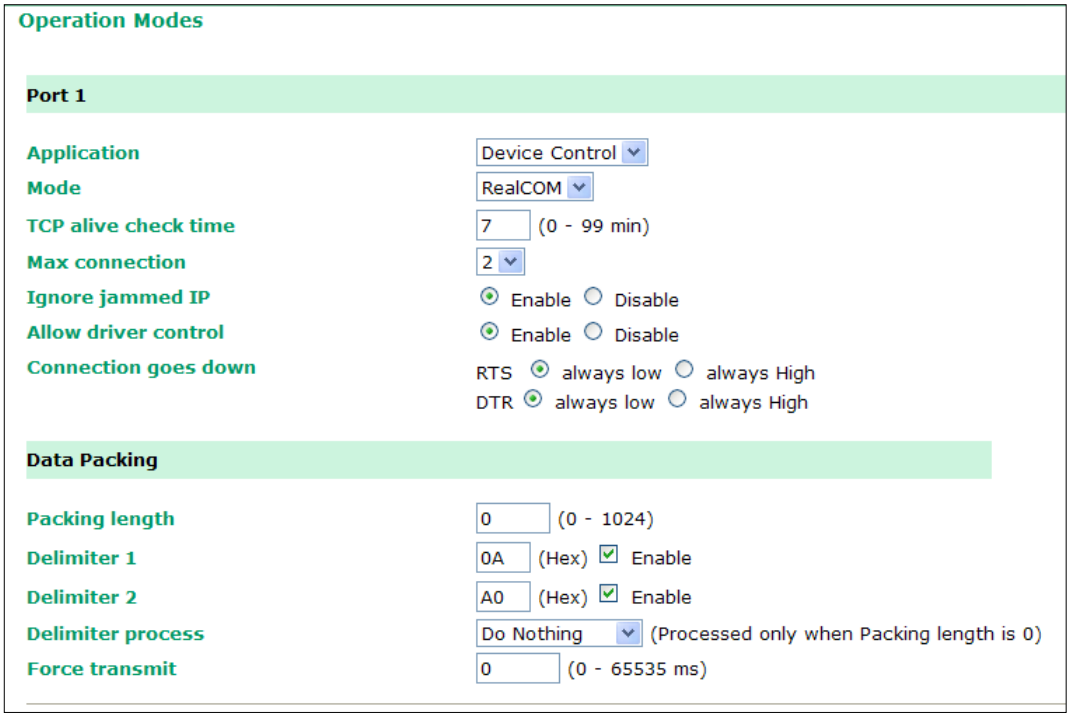
ATTENTION

RealCOM drivers are installed and configured through OnCell Windows Driver Manager.

RealCOM mode allows you to continue using your serial communications software to access devices that are now attached to your AWK-1127. On the host, the AWK RealCOM driver automatically intercepts data sent to the COM port, packs it into a TCP/IP packet, and redirects it to the network. At the other end of the connection, the AWK-1127 accepts the Ethernet frame, unpacks the TCP/IP packet, and sends the serial data to the appropriate device.

ATTENTION

In RealCOM mode, two hosts can have simultaneous access control over the AWK-1127 serial port.



When **Mode** is set to RealCOM on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Max connection**, and **Ignore jammed IP**.

TCP Alive Check Time

Setting	Description	Factory Default
0 to 99 min.	This field specifies how long the AWK-1127 will wait for a response to "keep alive" packets before closing the TCP connection. The AWK-1127 checks connection status by sending periodic "keep alive" packets. 0: The TCP connection will remain open even if there is no response to the "keep alive" packets. 1 to 99: If the remote host does not respond to the packet within the specified time, the AWK-1127 will force the existing TCP connection to close.	7 min.

Max Connection

This field specifies the maximum number of connections that will be accepted by the serial port.

Setting	Description	Factory Default
1 or 2	1: Only one specific host can access this serial port, and the RealCOM driver on that host will have full control over the port. 2: This serial port will allow the two connections to be opened simultaneously. With simultaneous connections, the RealCOM driver will only provide a pure data tunnel with no control ability. The serial communication will be determined by the AWK-1127 rather than by your application program. Application software that is based on the RealCOM driver will receive a driver response of "success" when using any of the Win32 API functions. The AWK-1127 will send data only to the RealCOM driver on the host. Data received from hosts will be sent to the attached serial device on a first-in- first-out basis.	1

ATTENTION

When **Max connection** is 2, the serial port's communication settings (i.e., baudrate, parity, data bits, etc.) will be determined by the AWK-1127. Any host that opens the COM port connection must use identical serial communication settings.

Ignore Jammed IP

This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the serial port.

Setting	Description	Factory Default
Disable	All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded.	Disable
Enable	Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.	

Allow Driver Control

This field specifies how the port will proceed if driver control commands are received from multiple hosts that are connected to the port.

Setting	Description	Factory Default
Disable	Driver control commands will be ignored.	Disable
Enable	Control commands will be accepted, with the most recent command received taking precedence.	

Connection Goes Down

This field specifies what happens to the RTS and DTR signals when the Ethernet connection goes down. For some applications, serial devices need to know the Ethernet link status through RTS or DTR signals sent through the serial port.

Setting	Description	Factory Default
always low	The selected signal will change to low when the Ethernet connection goes down.	always high
always high	The selected signal will remain high when the Ethernet connection goes down.	

Packet Length

This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending.

Setting	Description	Factory Default
0 to 1024	0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. 1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.	0

Delimiter 1 and 2

These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence.

Setting	Description	Factory Default
Enable	When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level. The Delimiter value can be set ranging from 00 to FF.	Unchecked

ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

Delimiter Process

This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.

Setting	Description	Factory Default
Do Nothing	Data accumulated in the serial port's buffer will be packed, including delimiters.	Do Nothing
Delimiter + 1	One additional character must be received before the data in the serial port's buffer is packed.	
Delimiter + 2	Two additional characters must be received before the data in the serial port's buffer is packed.	
Strip Delimiter	Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.	

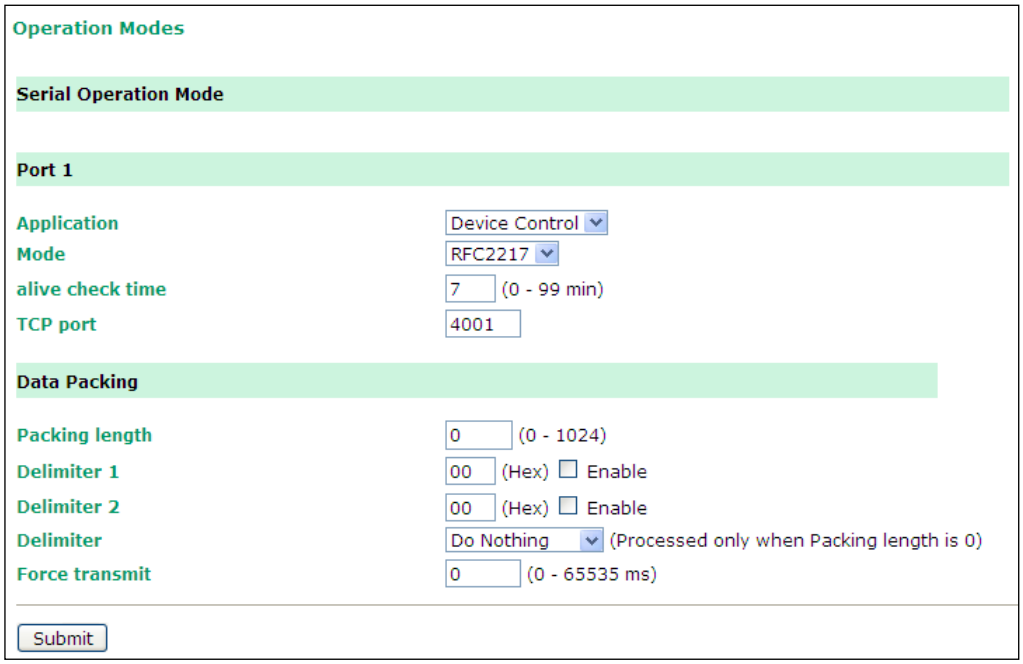
Force Transmit

This field controls data packing by the amount of time that elapses between bits of data. When using this field, make sure that Inactivity time is disabled or set to a larger value. Otherwise the connection may be closed before the data in the buffer can be transmitted.

Setting	Description	Factory Default
0 to 65535	0: If serial data is received, setting this value to 0 means no data will be buffered and all data will be transmitted immediately as received. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.	0 ms

RFC2217 Mode

RFC2217 mode is similar to RealCOM mode, since it relies on a driver to transparently map a virtual COM port on a host computer to a serial port on the AWK-1127. The RFC2217 standard defines general COM port control options based on the Telnet protocol and supports one connection at a time. Third party drivers supporting RFC2217 are widely available on the Internet and can be used to implement virtual COM mapping.



When **Mode** is set to RFC2217 on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **TCP port**, and **Packet length**.

TCP Alive Check Time

Setting	Description	Factory Default
0 to 99 min.	This field specifies how long the AWK will wait for a response to "keep alive" packets before closing the TCP connection. The AWK-1127 checks connection status by sending periodic "keep alive" packets. 0: The TCP connection will remain open even if there is no response to the "keep alive" packets. 1 to 99: If the remote host does not respond to the packet within the specified time, the AWK-1127 will force the existing TCP connection to close.	7 min.

TCP Port

Setting	Description	Factory Default
0 to 9999	This field specifies the TCP port number that the serial port will use to listen to connections, and that other devices must use to contact the serial port.	4001

Packet Length

Setting	Description	Factory Default
0 to 1024	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. 1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.	0

Delimiter 1 and 2

Setting	Description	Factory Default
Enable	When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level. The Delimiter value can be set ranging from 00 to FF.	Unchecked

ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

Delimiter Process

This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.

Setting	Description	Factory Default
Do Nothing	Data accumulated in the serial port's buffer will be packed, including delimiters.	Do Nothing
Delimiter + 1	One additional character must be received before the data in the serial port's buffer is packed.	
Delimiter + 2	Two additional characters must be received before the data in the serial port's buffer is packed.	
Strip Delimiter	Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.	

Force Transmit

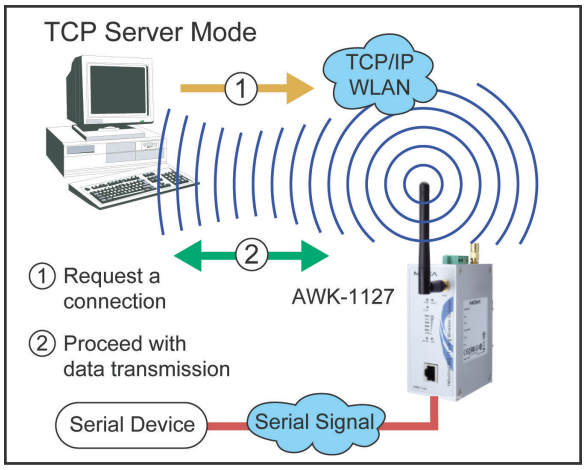
Setting	Description	Factory Default
0 to 65535	This field controls data packing by the amount of time that elapses between bits of data. When using this field, make sure that Inactivity time is disabled or set to a larger value. Otherwise the connection may be closed before the data in the buffer can be transmitted. 0: If serial data is received, setting this value to 0 means no data will be buffered and all data will be transmitted immediately as received. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.	0 ms

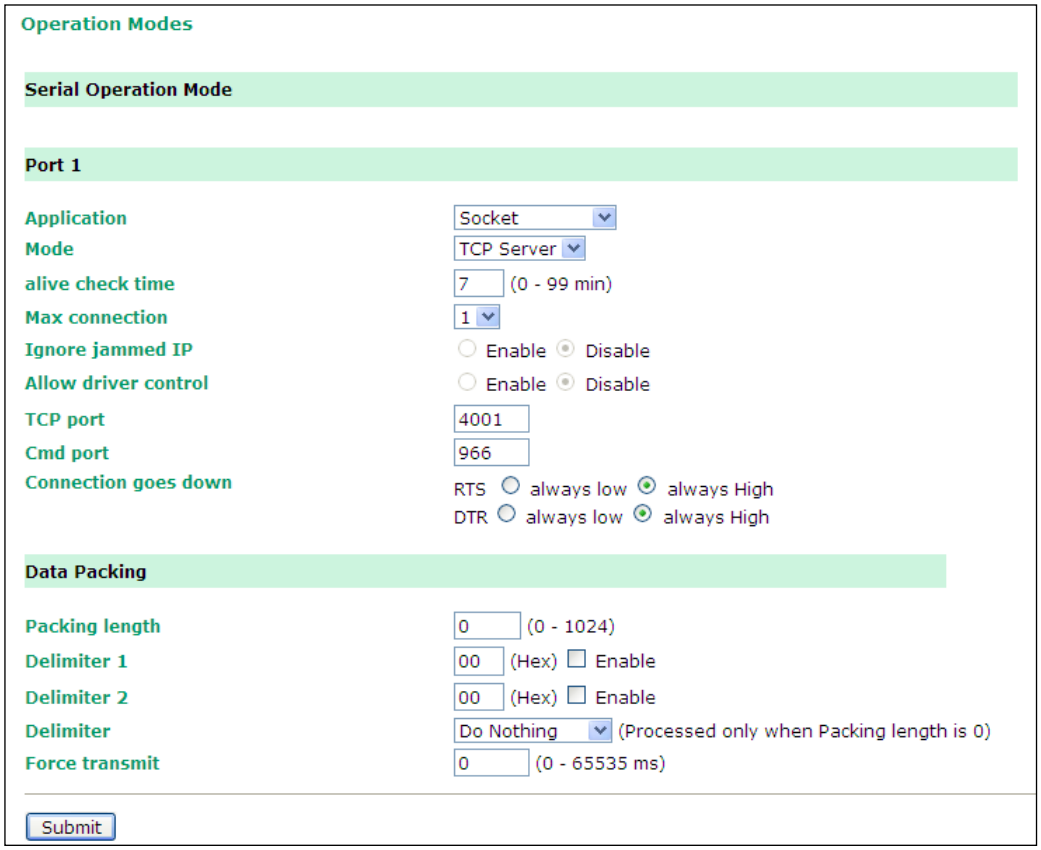
TCP Server Mode

In TCP Server mode, the AWK-1127 serial port is assigned an IP:port address that is unique on your TCP/IP network. It waits for the host computer to establish a connection to the attached serial device. This operation mode also supports up to four simultaneous connections, so multiple hosts can collect data from the attached device at the same time.

Data transmission proceeds as follows:

1. A host requests a connection to the AWK-1127 serial port.
2. Once the connection is established, data can be transmitted in both directions—from the host to the device, and from the device to the host.





When **Mode** is set to **TCP Server** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Inactivity time**, and **Max connection**.

TCP Alive Check Time

Setting	Description	Factory Default
0 to 99 min.	This field specifies how long the AWK-1127 will wait for a response to "keep alive" packets before closing the TCP connection. The AWK-1127 checks connection status by sending periodic "keep alive" packets. 0: The TCP connection will remain open even if there is no response to the "keep alive" packets. 1 to 99: If the remote host does not respond to the packet within the specified time, the AWK will force the existing TCP connection to close.	7 min.

Inactivity Time

Setting	Description	Factory Default
0 to 65535 ms	This field specifies the time limit for keeping the connection open if no data flows to or from the serial device. 0: The connection will remain open even if data is never received. For many applications, the serial device may be idle for long periods of time, so 0 is an appropriate setting. 1 to 65535: If there is no activity for the specified time, the connection will be closed. When adjusting this field, make sure that it is greater than the Force transmit time. Otherwise, the TCP connection may be closed before data in the buffer can be transmitted.	0 ms

Max Connection

Setting	Description	Factory Default
1 to 2	This field specifies the maximum number of connections that will be accepted by the serial port. 1: Only a single host may open the TCP connection to the serial port. 2: This serial port will allow the specified number of connections to be opened simultaneously. When multiple connections are established, serial data will be duplicated and sent to all connected hosts. Data from hosts will be sent to the attached serial device on a first-in-first-out basis.	1

Ignore Jammed IP

This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the serial port.

Setting	Description	Factory Default
Disable	All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded.	Disable
Enable	Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.	

Allow Driver Control

This field specifies how the port will proceed if driver control commands are received from multiple hosts that are connected to the port.

Setting	Description	Factory Default
Disable	Driver control commands will be ignored.	Disable
Enable	Control commands will be accepted, with the most recent command received taking precedence.	

TCP Port

Setting	Description	Factory Default
0 to 9999	This field specifies the TCP port number that the serial port will use to listen to connections, and that other devices must use to contact the serial port.	4001

Cmd Port

Setting	Description	Factory Default
0 to 9999	This field specifies the TCP port number for listening to SSDK commands from the host.	966

Connection Goes Down

This field specifies what happens to the RTS and DTR signals when the Ethernet connection goes down. For some applications, serial devices need to know the Ethernet link status through RTS or DTR signals sent through the serial port.

Setting	Description	Factory Default
always low	The selected signal will change to low when the Ethernet connection goes down.	always high
always high	The selected signal will remain high when the Ethernet connection goes down.	

Packet Length

Setting	Description	Factory Default
0 to 1024	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. 1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.	0

Delimiter 1 and 2

Setting	Description	Factory Default
Enable	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level.	Unchecked

ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

Delimiter Process

This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.

Setting	Description	Factory Default
Do Nothing	Data accumulated in the serial port's buffer will be packed, including delimiters.	Do Nothing
Delimiter + 1	One additional character must be received before the data in the serial port's buffer is packed.	
Delimiter + 2	Two additional characters must be received before the data in the serial port's buffer is packed.	
Strip Delimiter	Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.	

Force Transmit

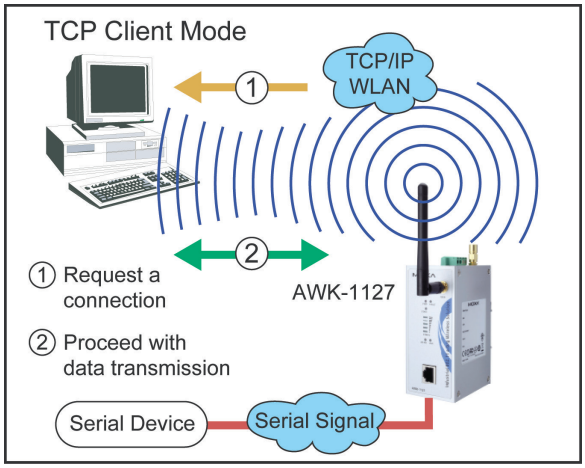
Setting	Description	Factory Default
0 to 65535	This field controls data packing by the amount of time that elapses between bits of data. When using this field, make sure that Inactivity time is disabled or set to a larger value. Otherwise the connection may be closed before the data in the buffer can be transmitted. 0: If serial data is received, setting this value to 0 means no data will be buffered and all data will be transmitted immediately as received. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.	0 ms

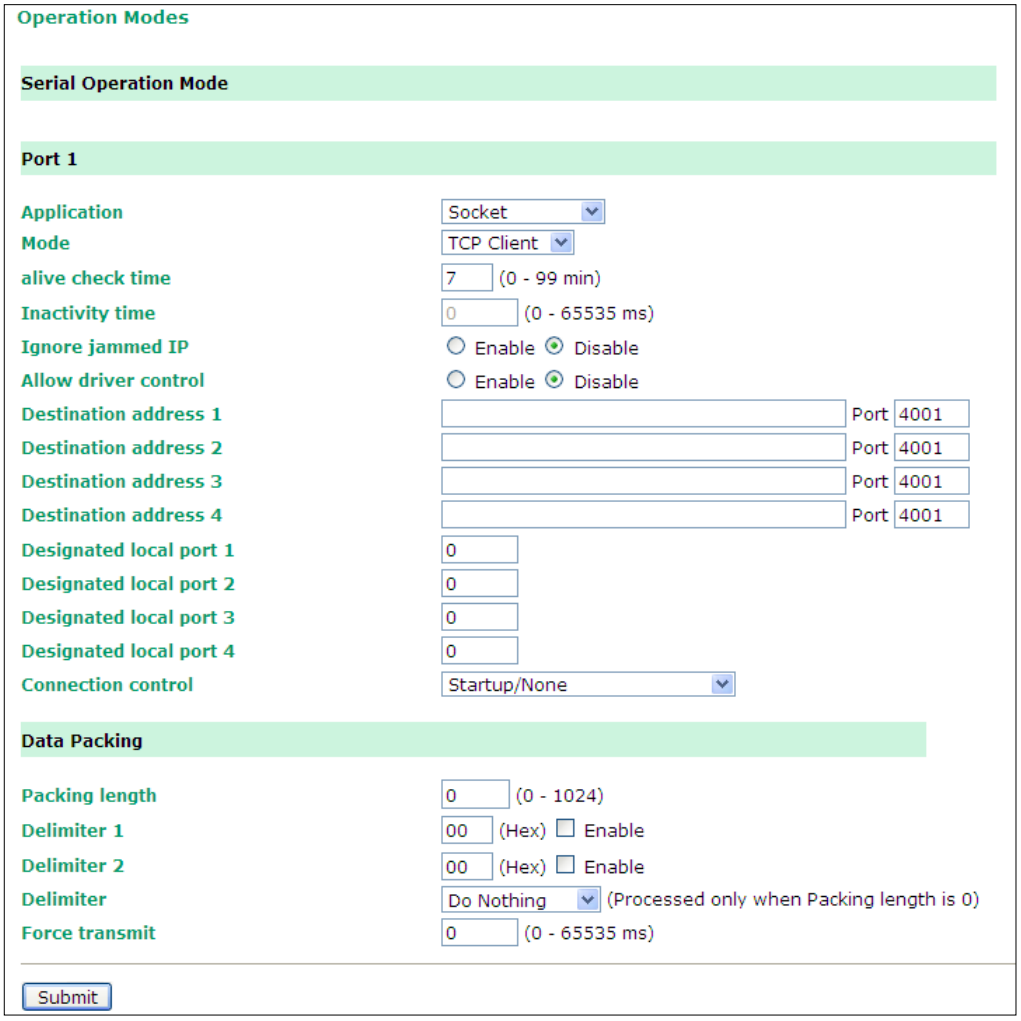
TCP Client Mode

In TCP Client mode, the AWK-1127 actively establishes a TCP connection to a specific network host when data is received from the attached serial device. After the data has been transferred, the AWK-1127 can automatically disconnect from the host computer through the **Inactivity time** settings.

Data transmission proceeds as follows:

1. The AWK-1127 requests a connection from the host.
2. The connection is established and data can be transmitted in both directions between the host and device.





When **Mode** is set to **TCP Client** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **TCP alive check time**, **Inactivity time**, and **Ignore jammed IP**.

TCP Alive Check Time

Setting	Description	Factory Default
0 to 99 min.	This field specifies how long the AWK-1127 will wait for a response to "keep alive" packets before closing the TCP connection. The AWK-1127 checks connection status by sending periodic "keep alive" packets. 0: The TCP connection will remain open even if there is no response to the "keep alive" packets. 1 to 99: If the remote host does not respond to the packet within the specified time, the AWK-1127 will force the existing TCP connection to close.	7 min.

Inactivity Time

Setting	Description	Factory Default
0 to 65535 ms	This field specifies the time limit for keeping the connection open if no data flows to or from the serial device. 0: The connection will remain open even if data is never received. For many applications, the serial device may be idle for long periods of time, so 0 is an appropriate setting. 1 to 65535: If there is no activity for the specified time, the connection will be closed. When adjusting this field, make sure that it is greater than the Force transmit time. Otherwise, the TCP connection may be closed before data in the buffer can be transmitted. **Connection Control** must be set to "Any character/Inactivity time" for this setting to have effect.	0 ms

Ignore Jammed IP

Setting	Description	Factory Default
Disable	All transmission will be suspended if one IP address becomes unresponsive. Transmission will only resume when all hosts have responded.	Disable
Enable	Data transmission to the other hosts will not be suspended if one IP address becomes unresponsive.	

This field specifies how an unresponsive IP address is handled when there are simultaneous connections to the serial port.

Destination Address 1 to 4

Setting	Description	Factory Default
IP address and port (e.g., "192.168.1.1" and "4001")	This field specifies the remote host(s) that will access the attached device. At least one destination must be provided. This field supports the use of domain names and names defined in the host table.	IP Address: Empty Port: 4001

ATTENTION

In TCP Client mode, up to 4 connections can be established between the serial port and TCP hosts. The connection speed or throughput may be low if any one of the four connections is slow, since the one slow connection will slow down the other 3 connections.

Designated Local Port 1 to 4

Setting	Description	Factory Default
1 to 65535	This field specifies the TCP port number that will be used for data transmission with the serial port.	0

Connection Control

This field specifies how connections to the device are established and closed.

Setting	Description	Factory Default
Startup/None	The connection will be opened as the AWK-1127 starts up. The connection will only be closed manually.	Startup/None
Any Character/None	The connection will be opened as soon as a character is received from the attached device. The connection will only be closed manually.	
Any Character/ Inactivity Time	The connection will be opened as soon as a character is received from the attached device. The connection will be closed if no data is received for the time specified in Inactivity time.	
DSR On/DSR Off	The TCP connection is opened when the DSR signal is on, and closed when the DSR signal is off.	
DSR On/None	The TCP connection is opened when the DSR signal is on. The connection will only be closed manually.	
DCD On/DCD Off	The TCP connection is opened when the DCD signal is on, and closed when the DCD signal is off.	
DCD On/None	The TCP connection is opened when the DCD signal is on. The connection will only be closed manually.	

Packet Length

Setting	Description	Factory Default
0 to 1024	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. 1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.	0

Delimiter 1 and 2

Setting	Description	Factory Default
Enable	These fields are used to define special delimiter character(s) for data packing. Enable Delimiter 1 to control data packing with a single character; enable both Delimiter 1 and 2 to control data packing with two characters received in sequence. When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level.	Unchecked

ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

Delimiter Process

This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.

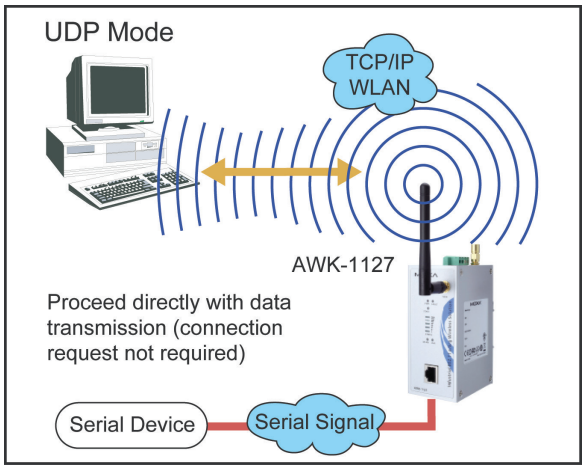
Setting	Description	Factory Default
Do Nothing	Data accumulated in the serial port's buffer will be packed, including delimiters.	Do Nothing
Delimiter + 1	One additional character must be received before the data in the serial port's buffer is packed.	
Delimiter + 2	Two additional characters must be received before the data in the serial port's buffer is packed.	
Strip Delimiter	Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.	

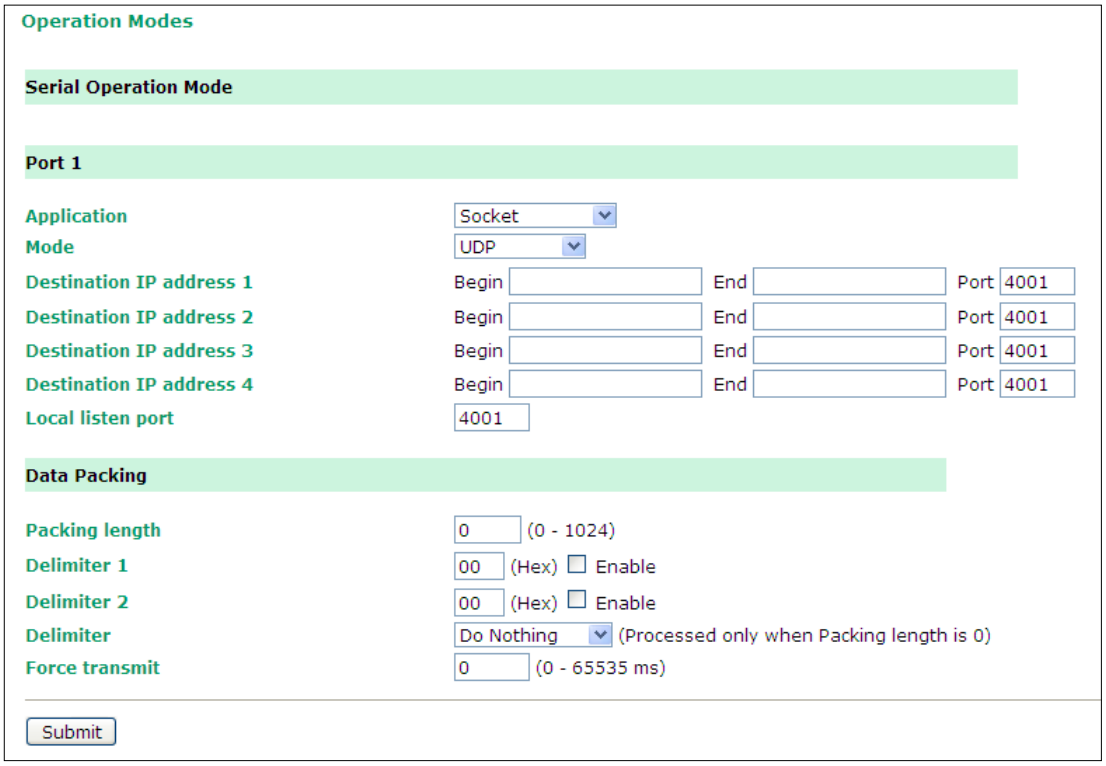
Force Transmit

Setting	Description	Factory Default
0 to 65535	This field controls data packing by the amount of time that elapses between bits of data. When using this field, make sure that Inactivity time is disabled or set to a larger value. Otherwise the connection may be closed before the data in the buffer can be transmitted. 0: If serial data is received, setting this value to 0 means no data will be buffered and all data will be transmitted immediately as received. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.	0 ms

UDP Mode

UDP is similar to TCP but is faster and more efficient. Data can be broadcast to or received from multiple network hosts. However, UDP does not support verification of data and would not be suitable for applications where data integrity is critical. It is ideal for message display applications.





When **Mode** is set to **UDP** on a serial port's **Operation Modes** page, you will be able to configure additional settings such as **Destination address 1** through **4**, **Local listen port**, and **Packet length**.

Destination Address 1 to 4

Setting	Description	Factory Default
IP address range and port (e.g., "192.168.1.1" to "192.168.1.64" and "4001")	In UDP mode, you may specify up to 4 ranges of IP addresses for the serial port to connect to. At least one destination range must be provided. The maximum selectable IP address range is 64 addresses. However, you can enter multicast addresses in the Begin field, in the form xxx.xxx.xxx.255. For example, enter "192.127.168.255" to allow the AWK-1127 to broadcast UDP packets.	Begin: Empty End: Empty Port: 4001

Local Listen Port

Setting	Description	Factory Default
0 to 9999	This field specifies the UDP port that the AWK-1127 listens to and that other devices must use to contact the attached serial device.	4001

Packet Length

Setting	Description	Factory Default
0 to 1024	This field specifies the maximum amount of data that is allowed to accumulate in the serial port buffer before sending. 0: Packet length is disregarded and data in the buffer will be sent as specified by the delimiter settings or when the buffer is full. 1 to 1024: Data in the buffer will be sent as soon it reaches the specified length.	0

Delimiter 1 and 2

Setting	Description	Factory Default
Enable	When these fields are enabled, serial data will accumulate in the serial port's buffer until the buffer is full or until the specified delimiter character(s) are received. For example, the carriage return character could be used as a delimiter in order to transmit each sentence or paragraph in a separate packet. Data will be packed according to Delimiter process. Delimiters must be incorporated into the data stream at the software or device level. The Delimiter value can be set ranging from 00 to FF.	Unchecked

ATTENTION

When **Delimiter 1** is enabled, **Packet length** must be set to 0.

Delimiter Process

This field specifies how data is packed when delimiter characters are received. This field has no effect if Delimiter 1 is not enabled.

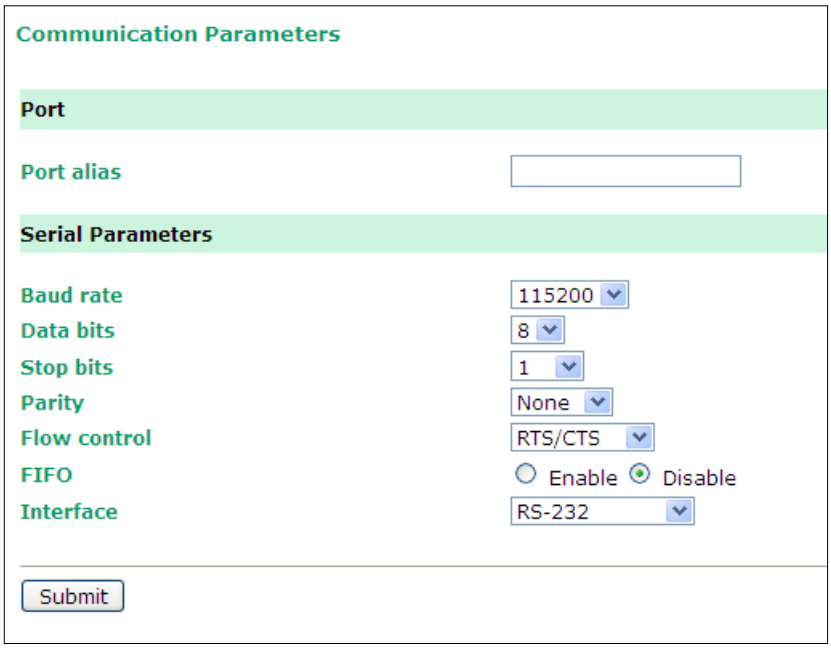
Setting	Description	Factory Default
Do Nothing	Data accumulated in the serial port's buffer will be packed, including delimiters.	Do Nothing
Delimiter + 1	One additional character must be received before the data in the serial port's buffer is packed.	
Delimiter + 2	Two additional characters must be received before the data in the serial port's buffer is packed.	
Strip Delimiter	Data accumulated in the serial port's buffer will be packed, but the delimiter character(s) will be stripped from the data.	

Force Transmit

Setting	Description	Factory Default
0 to 65535	This field controls data packing by the amount of time that elapses between bits of data. When using this field, make sure that Inactivity time is disabled or set to a larger value. Otherwise the connection may be closed before the data in the buffer can be transmitted. 0: If serial data is received, setting this value to 0 means no data will be buffered and all data will be transmitted immediately as received. 1 to 65535: If serial data is not received for the specified amount of time, the data that is currently in the buffer will be packed for network transmission. The optimal force transmit time depends on your application, but it must be at least larger than one character interval within the specified baudrate. For example, assume that the serial port is set to 1200 bps, 8 data bits, 1 stop bit, and no parity. In this case, the total number of bits needed to send a character is 10 bits, and the time required to transfer one character is 8.3 ms, so the force transmit time to be larger than 8.3 ms.	0 ms

Communication Parameters

The **Communication Parameters** page for the serial port is where serial communication settings are specified, such as **Baud rate**, **Data bits**, and **Stop bits**.



The **Communication Parameters** page for the serial port is where serial communication settings are specified, such as **Baud rate**, **Data bits**, and **Stop bits**.

Port Alias

Setting	Description	Factory Default
free text (e.g., "Secondary console connection")	This is an optional free text field to help you differentiate one serial port from another. It does not affect operation of the AWK-1127.	

ATTENTION

Serial communication settings should match the attached serial device. Check the communication settings in the user's manual for your serial device.

Baud Rate

Setting	Description	Factory Default
50, 75, 110, 134, 150, 300, 600, 1200, 1800, 2400, 4800, 7200, 9600, 19200, 38400, 57600, 115200, 230400, 460800, 921600	This field specifies the baudrate for the serial port. 50 to 921600: The serial port will operate at the specified baudrate.	115200

Data Bits

Setting	Description	Factory Default
5, 6, 7, 8	This field specifies the number of data bits used to encode each character of data.	8

Stop Bits

Setting	Description	Factory Default
1, 1.5, 2	This field specifies the number of stop bits used for each character frame.	1

Parity

Setting	Description	Factory Default
None, Odd, Even, Space, Mark	This field specifies the type of parity bit used for each character frame.	None

Flow Control

Setting	Description	Factory Default
None, RTS/CTS, XON/XOFF, DTR/DSR	This field specifies the type of flow control used by the serial port.	RTS/CTS

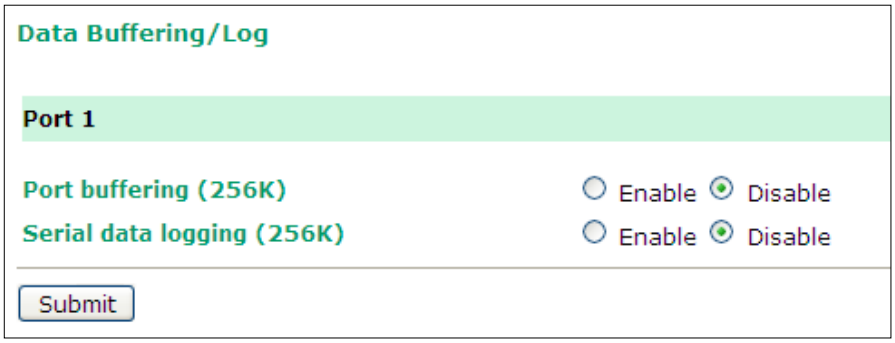
FIFO

Setting	Description	Factory Default
Enable, Disable	This field specifies whether the serial port will use the built-in FIFO. A 128-byte FIFO is provided to each serial port for both Tx and Rx directions. To prevent data loss during serial communication, this should be set to Disable if the attached serial device does not have a FIFO.	Enable

Interface

Setting	Description	Factory Default
RS-232, RS-422, RS-485 2-wire, RS-485 4-wire	This field specifies the type of interface the serial port will use.	RS-232

Data Buffering/Log



On the serial port's **Data Buffering/Log** page, you can enable or disable **Port buffering** and **Serial data logging**.

Port Buffering

Setting	Description	Factory Default
Enable, Disable	This field specifies whether the serial port will use port buffering when the network connection (Ethernet or WLAN) is down. Port buffering can be used in RealCOM mode, TCP Server mode, and TCP Client mode. For other modes, the port buffering settings will have no effect.	Disable

Serial Data Logging

Setting	Description	Factory Default
Enable, Disable	This field specifies whether data logs for the serial port will be stored on system RAM. Each serial port is allotted 256 KB for data logging. The data log is not saved when the AWK-1127 is powered off.	Disable

Auto Warning Settings

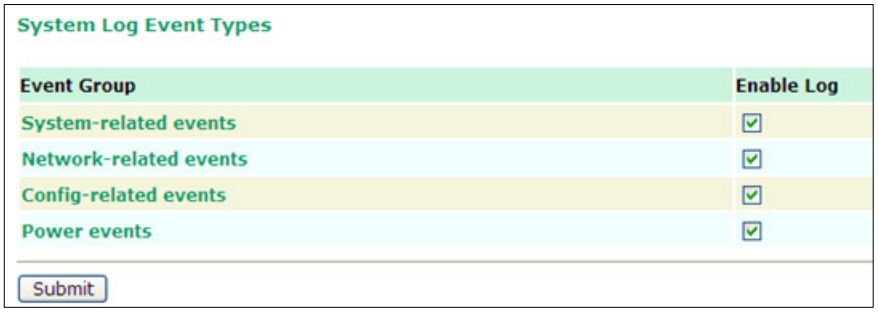
Since industrial-grade devices are often located at the endpoints of a system, these devices will not always know what is happening elsewhere on the network. This means that these devices, including wireless APs or clients, must provide system maintainers with real-time alarm messages. Even when system 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-1121/1127 supports different approaches to warn engineers automatically, such as SNMP trap or e-mail.

System Log

System Log Event Types

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



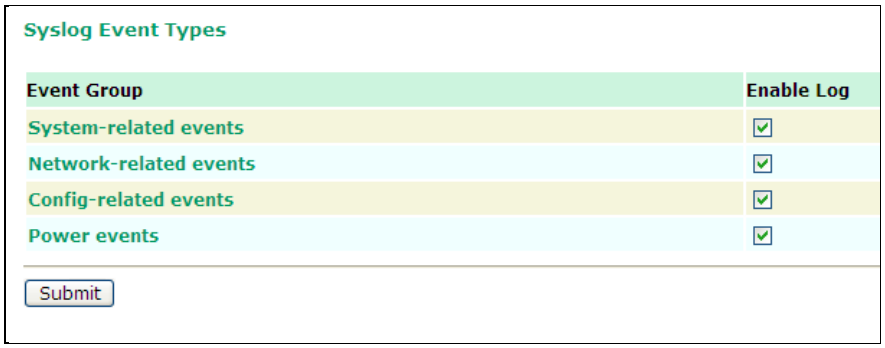
System-related events	Event is triggered when…
System restart (warm start)	The AWK-1121/1127 is rebooted, such as when its settings are changed (IP address, subnet mask, etc.).
Network-related events	**Event is triggered when…**
LAN link on	The LAN port is connected to a device or network.
LAN link off	The port is disconnected (e.g., the cable is pulled out, or the opposing device shuts down).
WLAN connected to AP	The AWK-1121/1127 is associated with an AP.
WLAN disconnected	The AWK-1121/1127 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-1121/1127.
Console authentication failure	An incorrect password is entered.
Firmware upgraded	The AWK-1121/1127's firmware is updated.
Power events	**Event is triggered when…**
Power 1/2 transition (On -> Off)	The AWK-1121/1127 is powered down in PWR1/2.
PoE transition (On -> Off)	The AWK-1121/1127 is powered down in PoE (PoE model only).
Power 1/2 transition (Off -> On)	The AWK-1121/1127 is powered via PWR1/2.
PoE transition (Off -> On)	The AWK-1121/1127 is powered via PoE (PoE model only).

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.

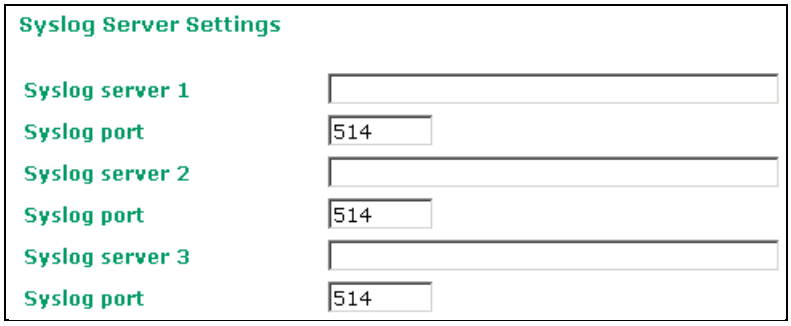
Syslog Event Types

Detailed information for grouped events is shown in the following table. You can check the box for "Enable Log" to enable groups of events. All values are enabled (checked) by default. Details for each event group can be found on the table "System Log Event Types", just above, on page 3-40.



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

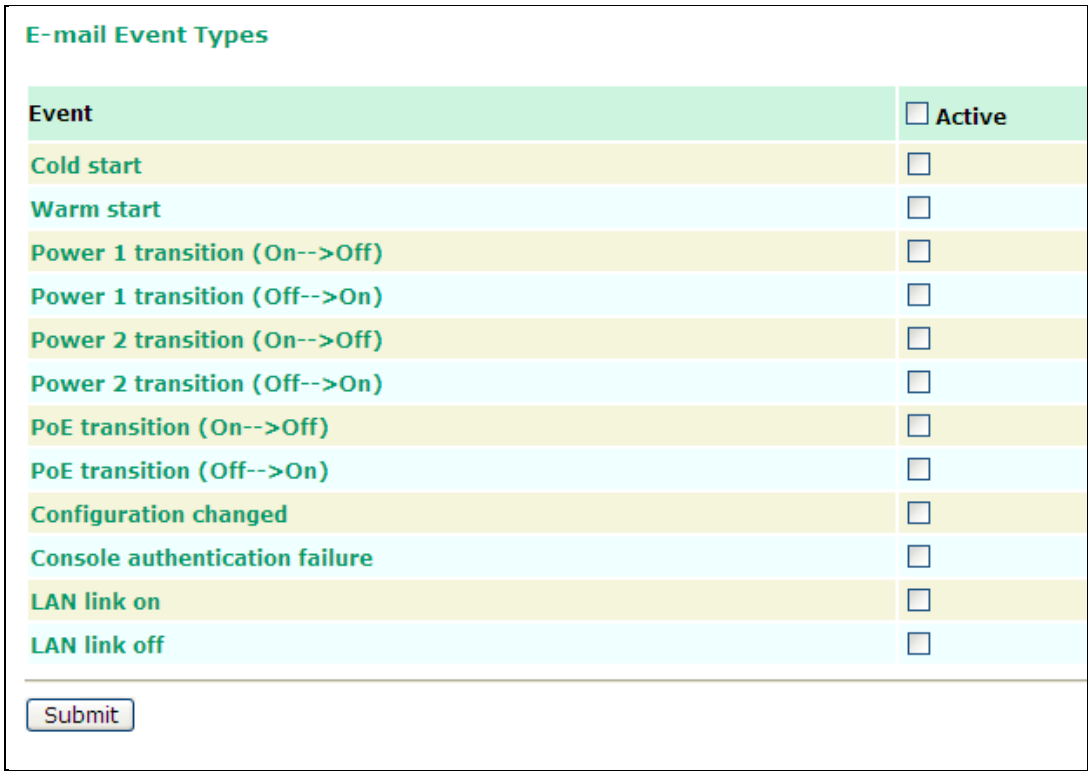
Syslog port

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 3-40.



E-mail Server Settings

You can set up to 4 e-mail addresses to receive alarm emails from the AWK-1121/1127. 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
Max. 63 chars	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

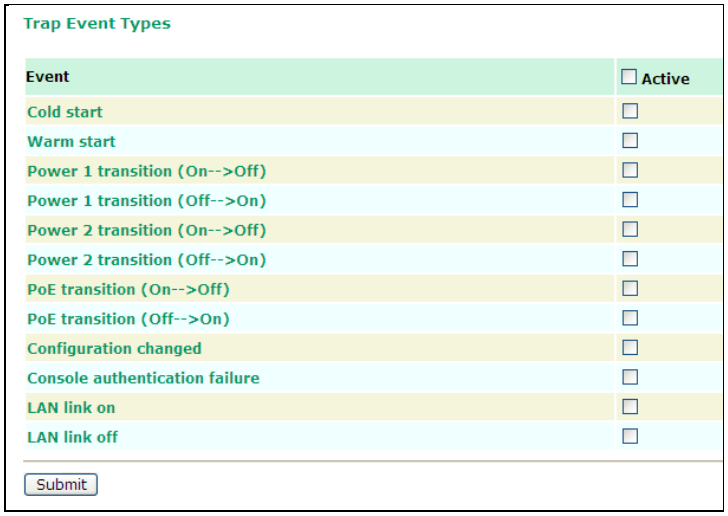
Setting	Description	Factory Default
Max. 63 characters	Enter the receivers' e-mail addresses.	None

Trap

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

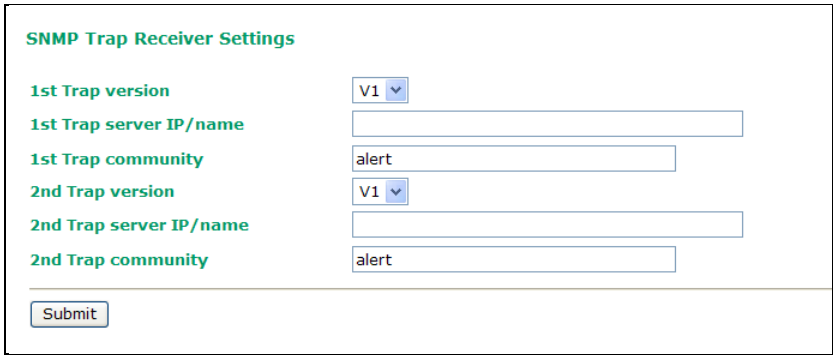
Because a management station usually takes care of a large number of devices that have a large number of objects, it will be overloading for the management station to poll or send requests to query every object on every device. It would be better if the managed device agent could notify the management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

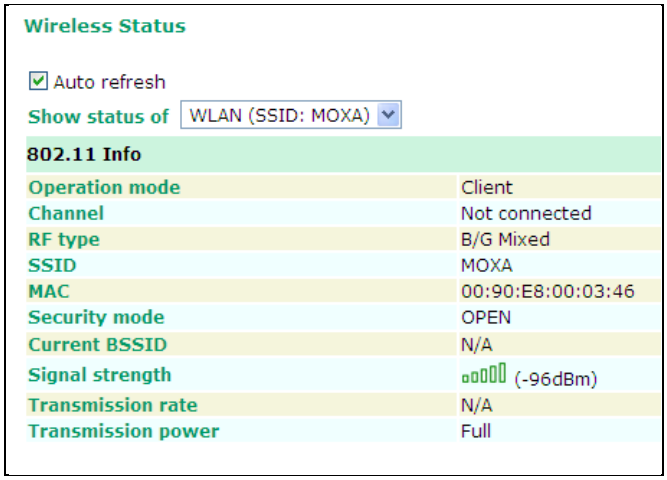
Setting	Description	Factory Default
Max. of 31 characters	Use a community string match with a maximum of 31 characters for authentication.	alert

Status

Wireless Status

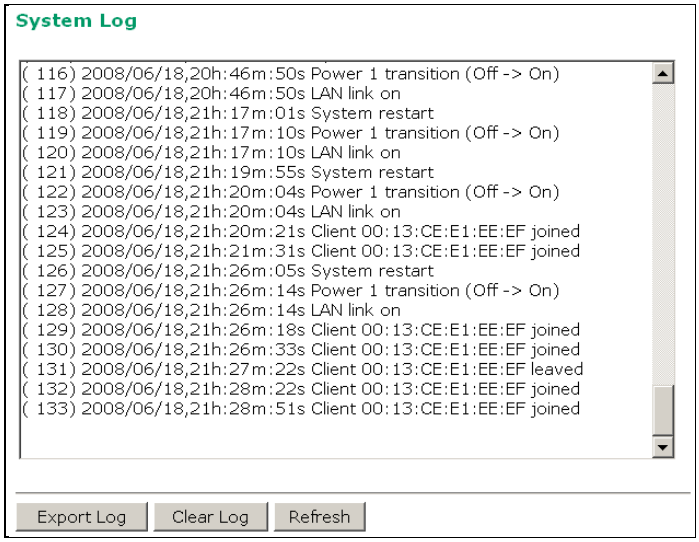
The status for **802.11 Info** parameters, such as Operation mode and Channel, are shown on the **Wireless Status** page. The status will refresh every 5 seconds if the **Auto refresh** box is checked.

It is helpful to use the continuously updated information on this page, such as **Signal strength**, to monitor the signal strength of the AWK-1121/1127.



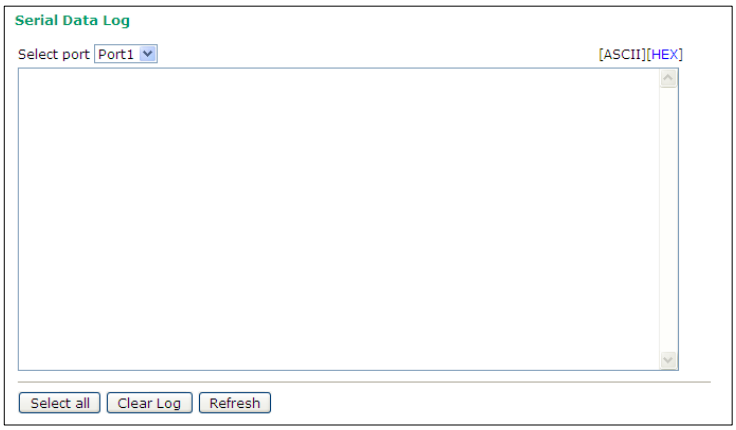
System Log

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.



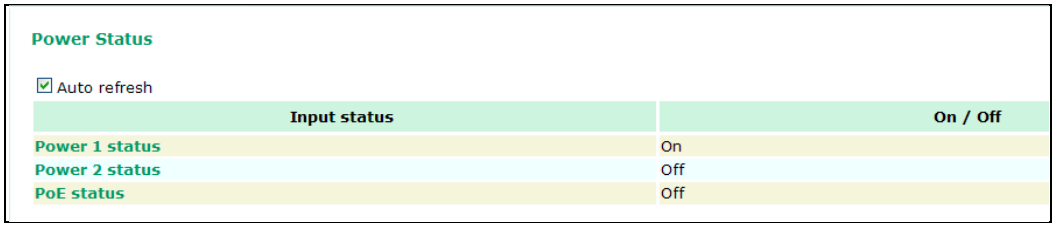
Serial Data Log (AWK-1127 Only)

Data logs for the serial port can be viewed in ASCII or HEX format. After selecting the serial port and format, you may click Select all to select the entire log if you wish to copy and paste the contents into a text file.



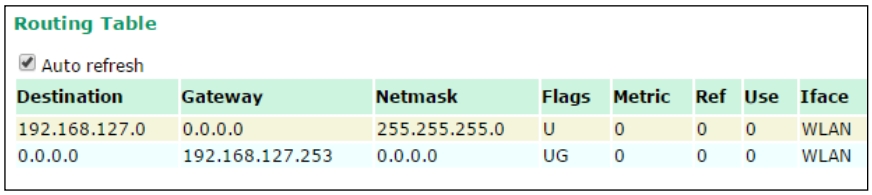
Power Status

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



Routing Table

You can view the routing entries on the Routing Table page.

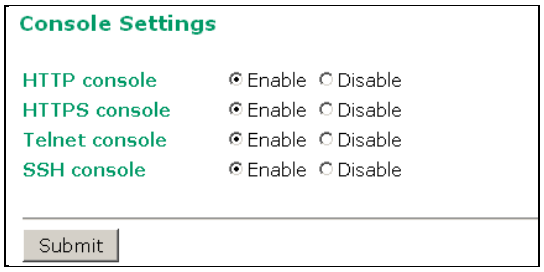


Maintenance

Maintenance functions provide the administrator with tools to manage the AWK-1121/1127 and wired/wireless networks.

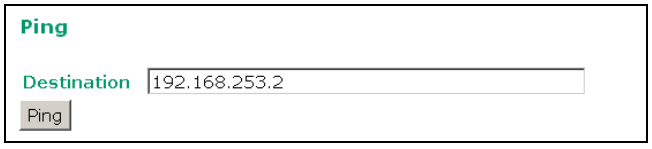
Console Settings

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.

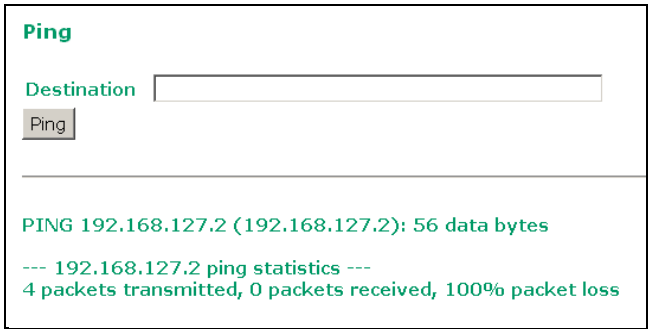


Ping

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.

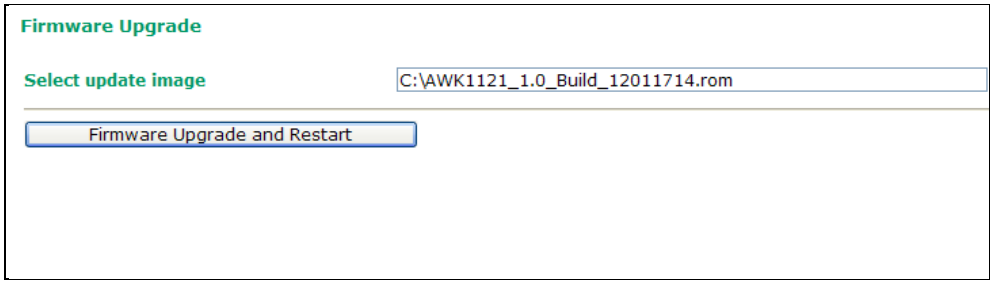


Firmware Upgrade

The AWK-1121/1127 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-1121/1127 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-1121/1127 will reboot itself.

When upgrading your firmware, the AWK-1121/1127's other functions are forbidden.



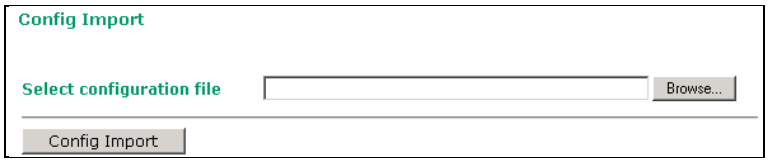
ATTENTION

Please make sure the power source is stable when you upgrade your firmware. An unexpected power breakup may damage your AWK-1121/1127.

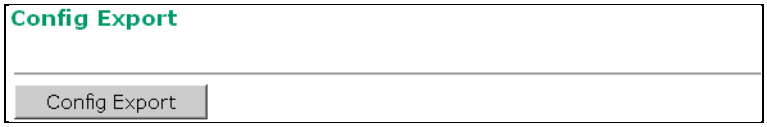
Config Import/Export

You can back up or restore the AWK-1121/1127's configuration with **Config Import/Export**.

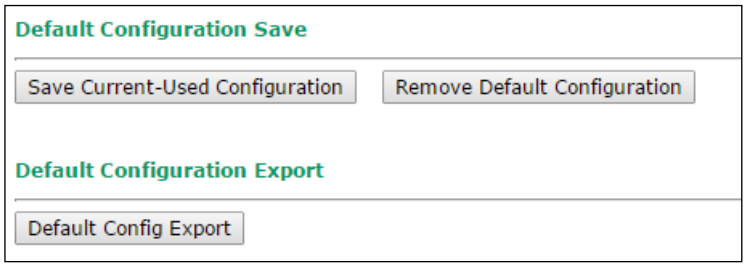
In the **Config Import** section, click **Browse** to specify the configuration file and click **Config Import** button to begin importing the configuration.



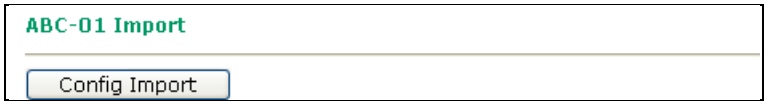
In the **Config Export** section, click the **Config Export** button and save the configuration file onto your local storage media. The configuration file is a text file and you can view and edit it with a general text-editing tool.

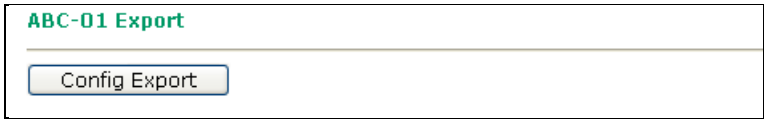


You can save your settings as the default configuration and save the configuration file onto a local storage media.



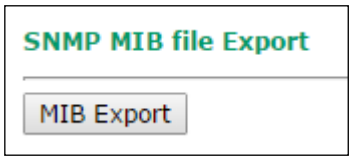
You can also do automated device back ups or setup restoration using Moxa's dedicated configuration import-export accessory, the **ABC-01** (HW Rev. 1.1 support only).





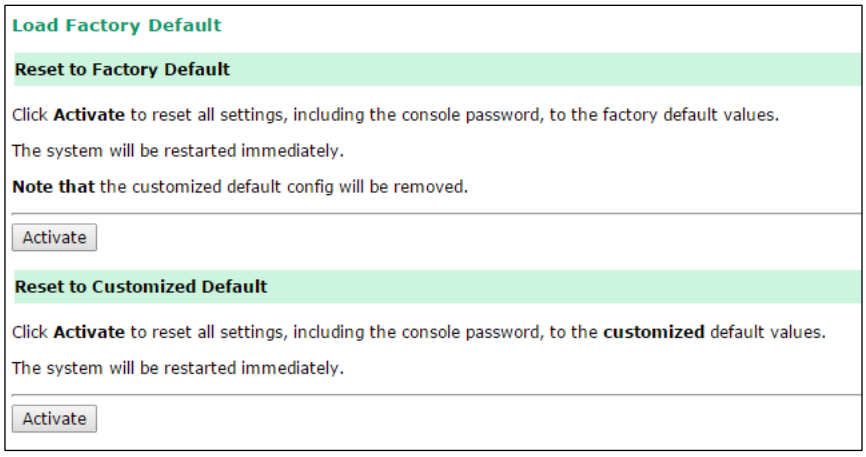
To download the configuration to the AWK:

1. Turn off the AWK.
2. Connect the ABC-01 to the AWK's console, via the RS-232 port.
3. Turn on the AWK.
4. The AWK automatically detects the ABC-01 during the boot process, and automatically downloads the configuration file from the ABC-01. After the configuration file is downloaded and the AWK verifies that the configuration format is correct, the AWK emits three short beeps and continues the boot process.
5. After the AWK is started successfully, it emits two beeps and the **Ready** LED turns solid green.
6. In the SNMP MIB file Export section, click **MIB Export** and save the MIB file onto your local storage media.



Loading Factory Defaults

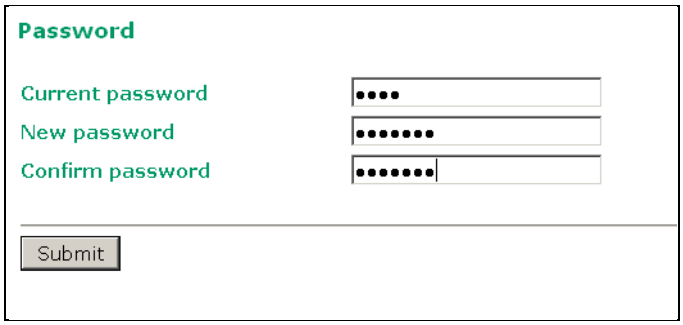
Use this function to reset the AWK-1121/1127 back to the factory default or customized default values.



You can also reset the hardware by pressing the reset button on the rear panel of the AWK-1121/1127. The behavior of the **RESET** button depending on the length the **RESET RESET** button is pressed. For more information, see the **RESET Button** section.

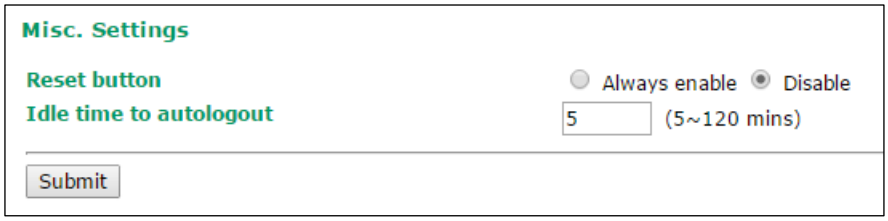
Password

You can change the administration password for each of the AWK-1121/1127'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-1121/1127, are available on this page.



Reset button

Setting	Description	Factory Default
Always enable	The AWK-1121/1127's Reset button works normally.	Always disabled
Disable	The AWK-1121/1127's function of Reset button is disabled. Select this option to prevent accidental configuration reset on the AWK.	

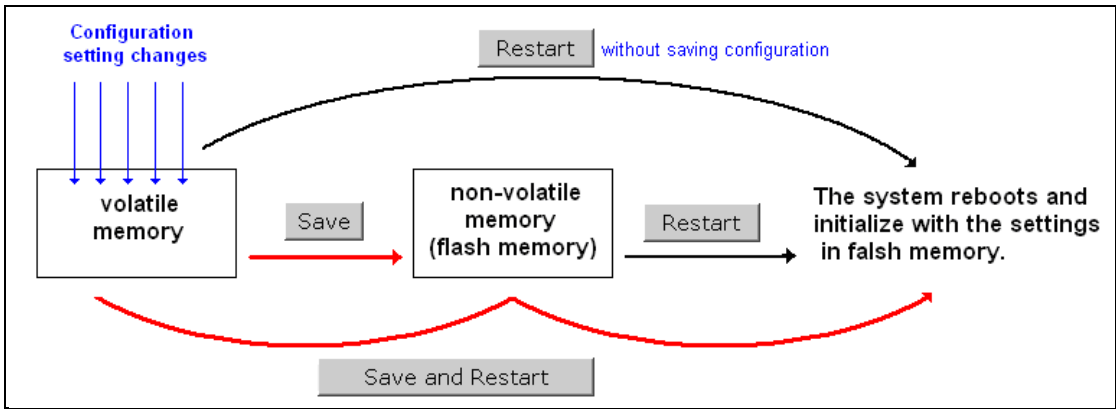
Idle time to autologout

Setting	Description	Factory Default
5~120 mins	Enter the number of minutes of inactivity before the AWK logs you out of the web configurator.	5

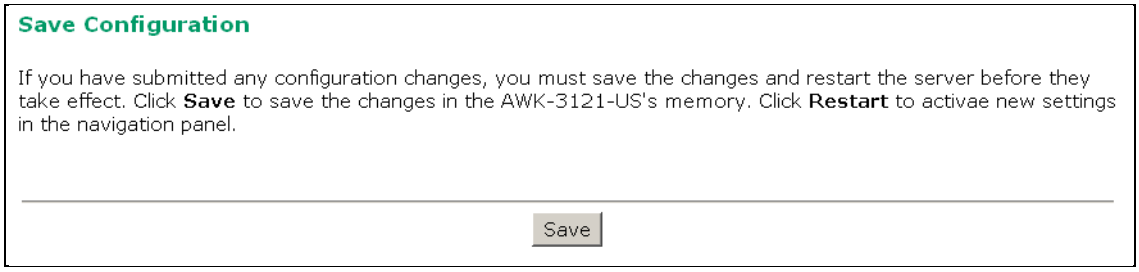
Save Configuration

The following figure shows how the AWK-1121/1127 stores the setting changes into volatile and non-volatile memory. All data stored in volatile memory is not retained when the AWK-1121/1127 is shutdown or rebooted unless they are saved in non-volatile memory. Because the AWK-1121/1127 starts up and initializes with the settings stored in flash memory, all new changes must be saved to flash memory before restarting the AWK-1121/1127.

This also means that new changes will not take effect unless you press the "Save and Restart" button.



After you click on **Save Configuration** in the left menu box, the following screen is displayed. 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.

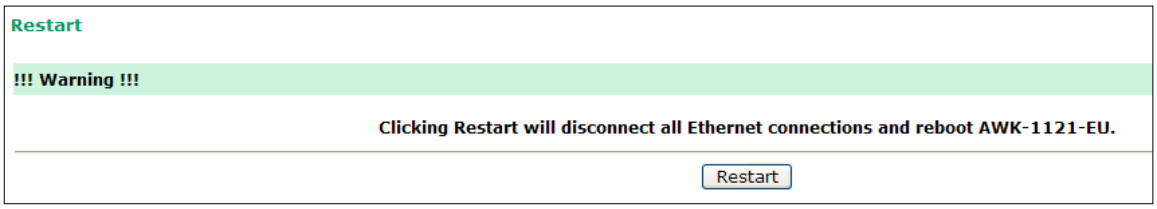


Restart

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 is displayed.

If you made changes recently but did not save, you will be given two options. Clicking the **Restart** button here will reboot the AWK-1121/1127 directly, and all setting changes will be ignored. Clicking the **Save and Restart** button will apply all setting changes and then reboot the AWK-1121/1127.

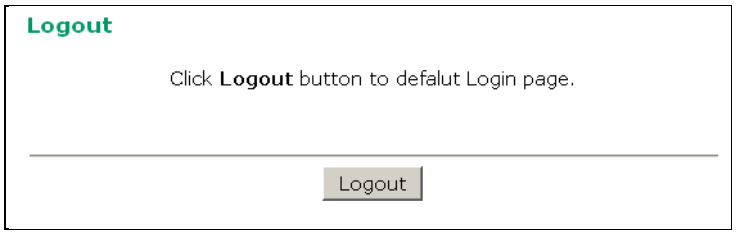
If you run the **Restart** function without changing any configurations or saving all your changes, you will see just one **Restart** button on your screen.



You will not be able to run any of the AWK-1121/1127'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

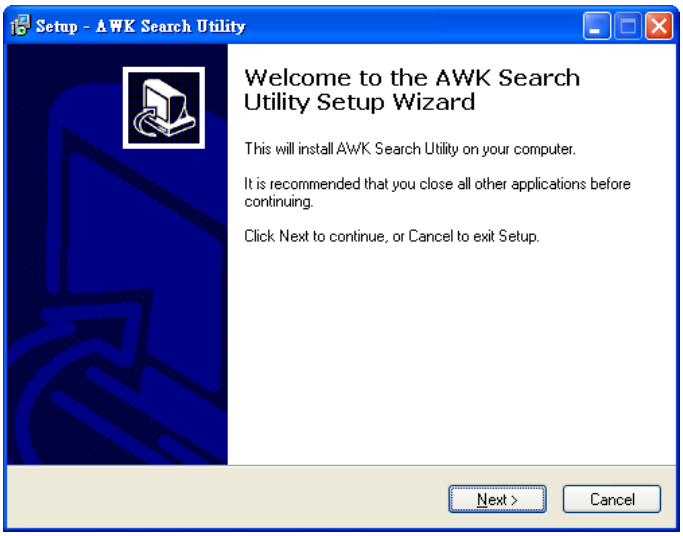
The Documentation & Software CD included with your AWK-1121/1127 is designed to make the installation and configuration procedure easy and straightforward. This auto-run CD includes AWK Search Utility (to broadcast search for all AWK's accessible over the network), the AWK-1121/1127 User's Manual, and Quick Installation Guide.

AWK Search Utility

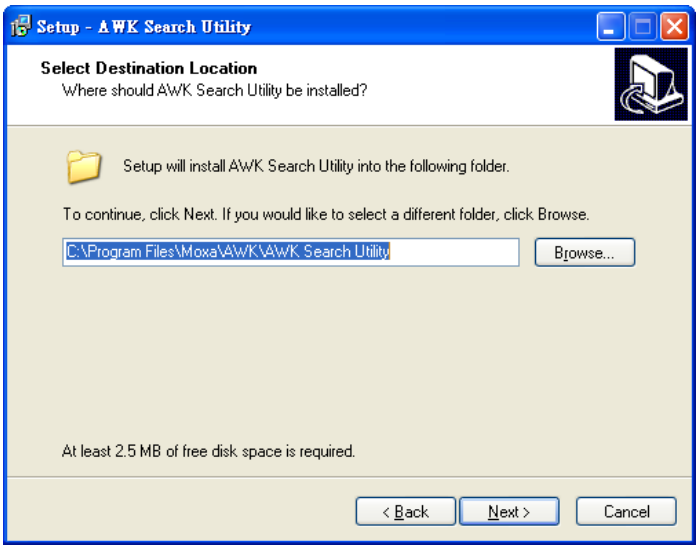
Installing AWK Search Utility

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.

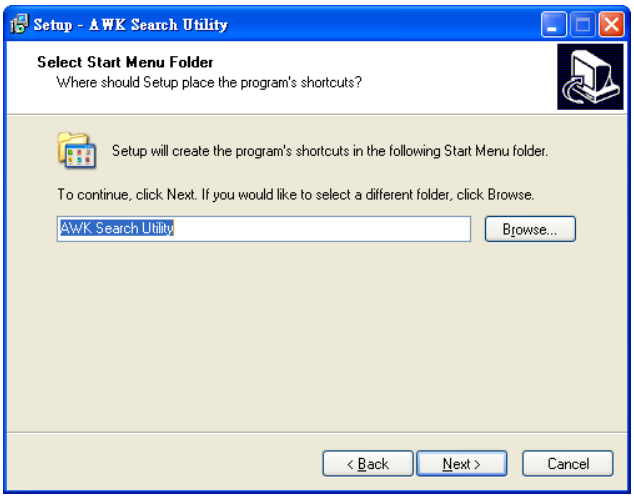
1. Click **Next** when the **Welcome** screen opens to proceed with the installation.



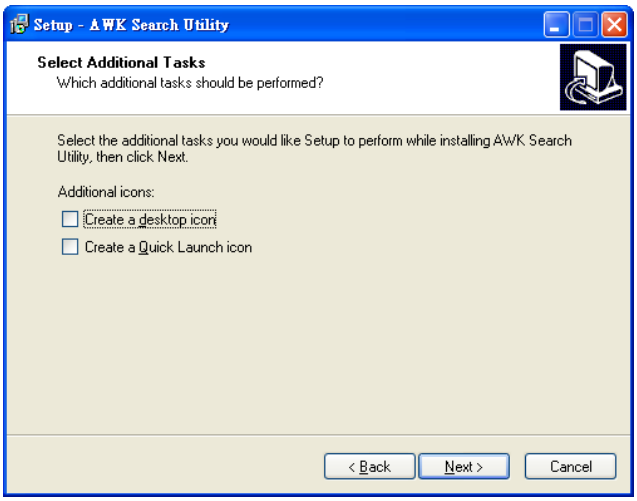
2. Click **Next** to install program files to the default directory, or click **Browse** to select an alternate location.



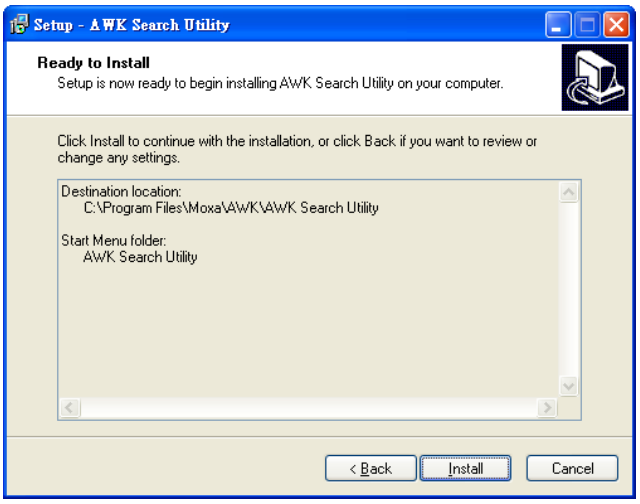
3. Click **Next** to create the program's shortcut files to the default directory, or click **Browse** to select an alternate location.



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

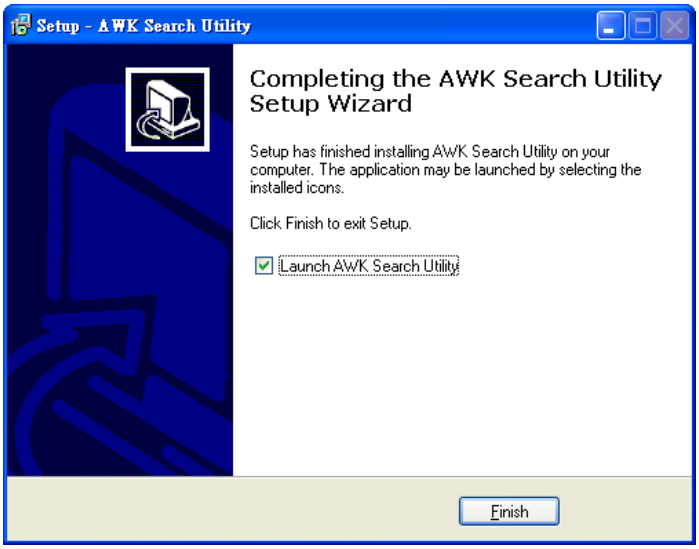


5. The installer then displays a summary of the installation options.



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.

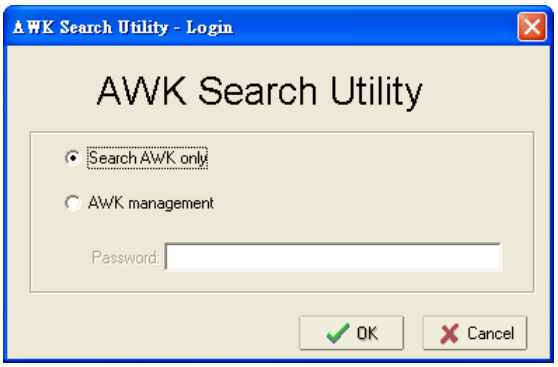
7. Click **Finish** to complete the installation of AWK Search Utility.



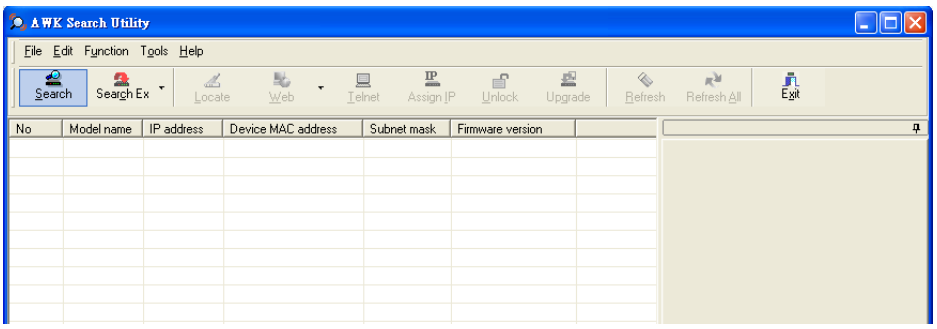
Configuring the AWK Search Utility

The Broadcast Search function is used to locate all AWK-1121/1127 APs that are connected to the same LAN as your computer. After locating an AWK-1121/1127, 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-1121/1127 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.

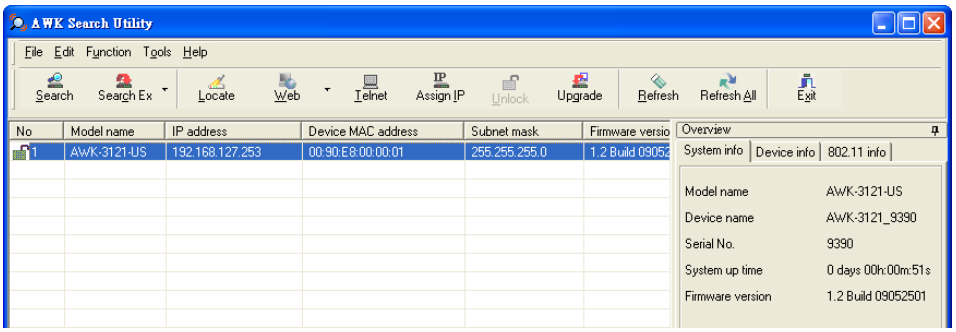
1. Start the **AWK Search Utility** program. When the Login page is displayed, select the "Search AWK only" option to search for AWKs and to view each AWK's configuration. Select the "AWK management" option to assign IPs, upgrade firmware, and locate devices.



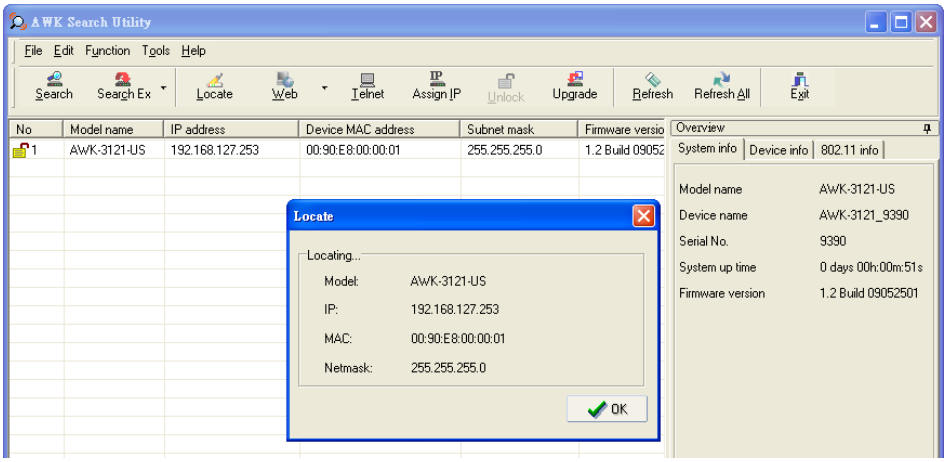
2. Open the AWK Search Utility and then click the **Search** icon.



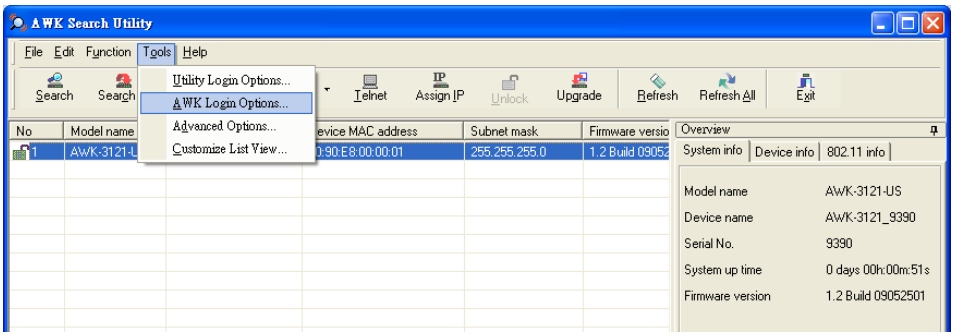
3. The "Searching" window indicates the progress of the search. When the search is complete, all AWKs that were located will be displayed in the AWK Search Utility window.



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



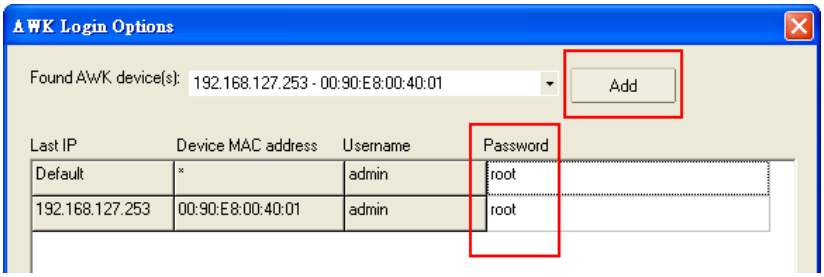
5. Make sure your AWK is **unlocked** before using the search utility's icons setting. The AWK will unlock automatically if the password is set to the default. Otherwise you must enter the new password manually.
6. Go to **Tools → AWK login Options** to manage and unlock additional AWKs.



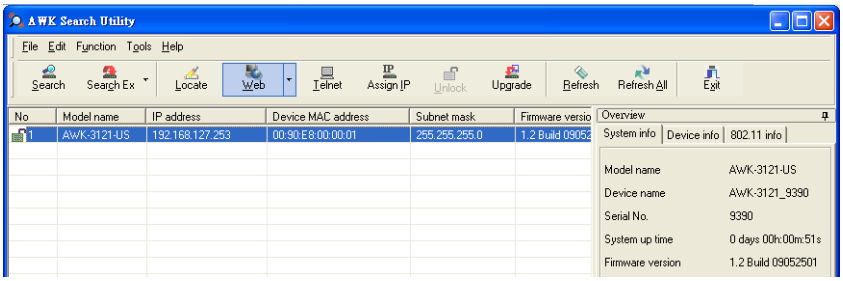
7. Use the scroll down list to select the MAC addresses of those AWKs you would like to manage, and then click **Add**. Key in the password for the AWK device and then click **OK** to save. If you return to the search page and search for the AWK again, you will find that the AWK will unlock automatically.

ATTENTION

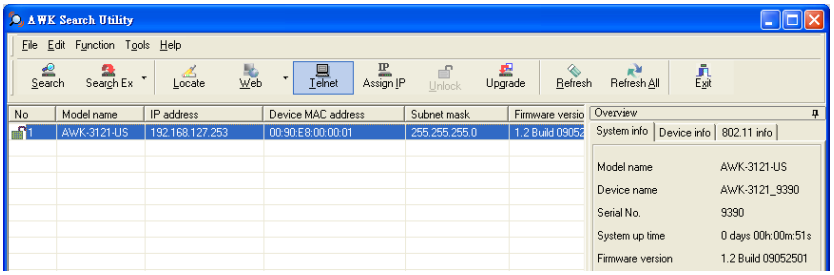
For security purposes, we suggest you can change the AWK search utility login password instead of using the default.



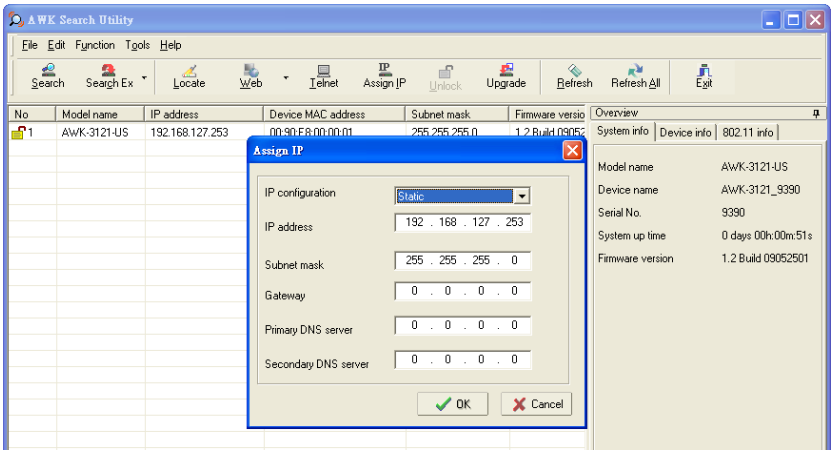
To modify the configuration of the highlighted AWK, click on the Web icon to open the web console. This will take you to the web console, where you can make all configuration changes. Refer to Chapter 3, "Using the Web Console," for information on how to use the web console.



Click **Telnet** if you want to use telnet to configure your AWKs.



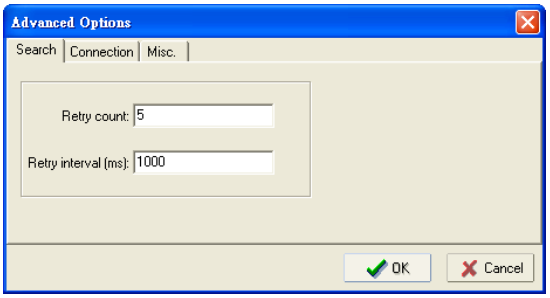
Click **Assign IP** to change the IP setting.



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

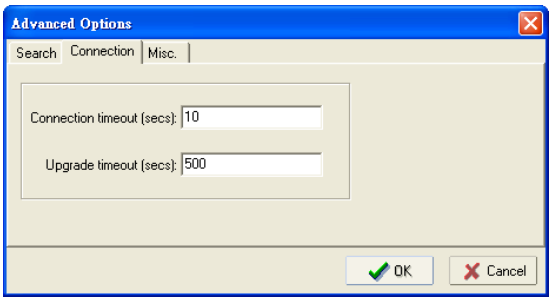
Search

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



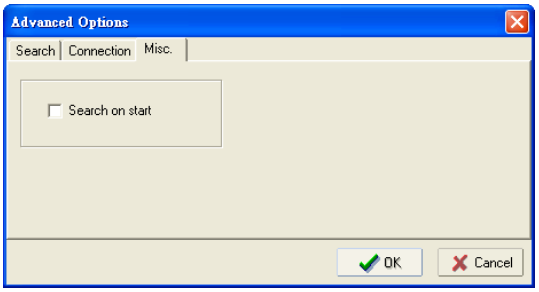
Connection

- **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.



OnCell Windows Driver Manager

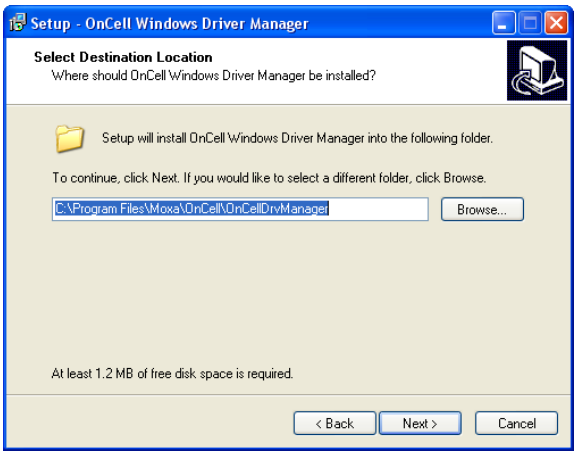
The AWK-1127 uses the same RealCom serial driver as Moxa's OnCell cellular gateways. The below section describes how to use the OnCell Windows Driver Manager to create a virtual COM port for the AWK-1127 in RealCom mode.

Installing OnCell Windows Driver Manager

OnCell Windows Driver Manager is intended for use with AWK-1127 serial ports that are set to RealCOM mode. The software manages the installation of drivers that allow you to map unused COM ports on your PC to serial ports on the AWK-1127. These drivers are designed for use with Windows 98/ME/NT/2000/XP/2003/Vista/2008. When the drivers are installed and configured, devices that are attached to serial ports on the AWK-1127 will be treated as if they were attached to the COM ports on your computer.

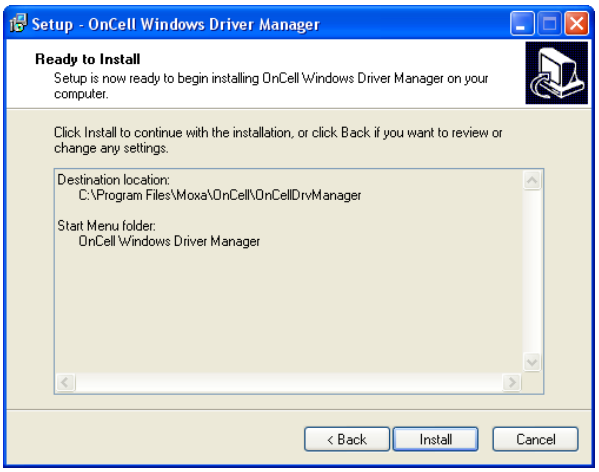
1. Click the **INSTALL COM Driver** button in the OnCell Installation CD auto-run window to install the OnCell Windows Driver. Once the installation program starts running, click **Yes** to proceed.
2. The Welcome screen appears, click **Next**.

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

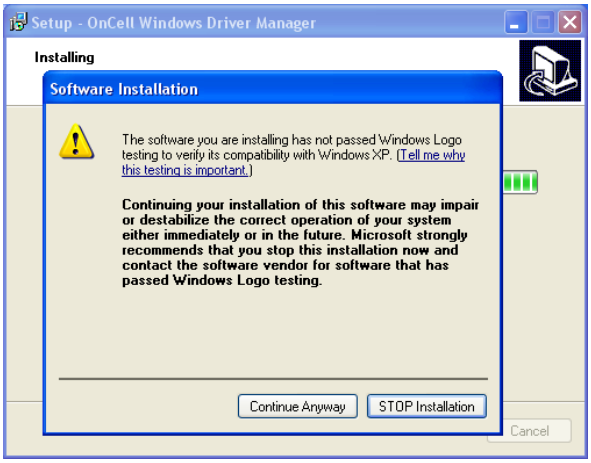


4. Click **Next** to install the program's shortcuts in the appropriate Start Menu folder.

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. On Windows XP, the installer will display a message that the software has not passed Windows Logo testing. This is shown as follows:



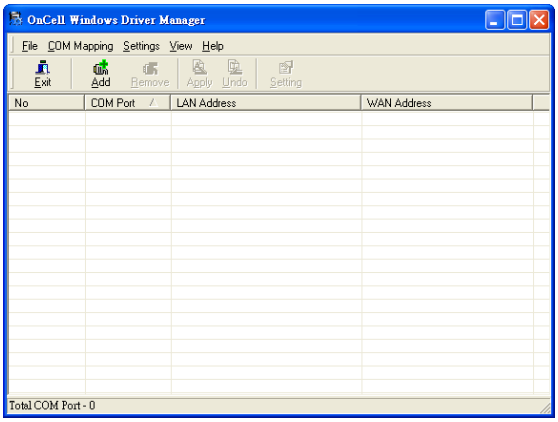
Click **Continue Anyway** to finish the installation.

7. Click **Finish** to complete the installation of the OnCell Windows Driver Manager.

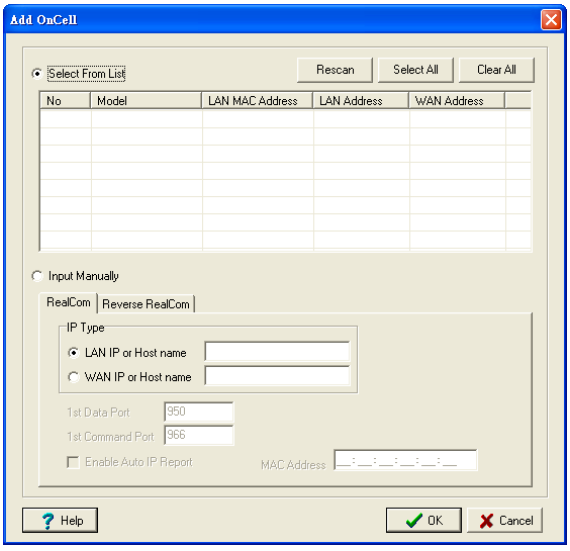
Using OnCell Windows Driver Manager

After you install OnCell Windows Driver Manager, you can set up the AWK-1127 's serial ports as remote COM ports for your PC host. Make sure that the serial port(s) on your AWK-1127 are set to RealCOM mode when mapping COM ports with OnCell Windows Driver Manager.

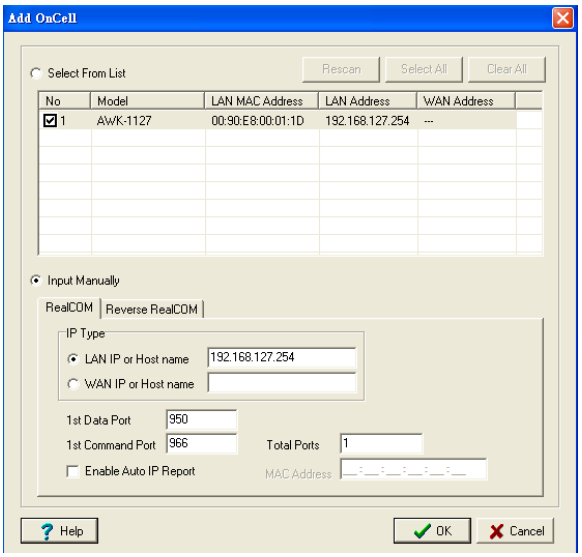
1. From the start menu, click **OnCell Windows Driver Manager > OnCell Windows Driver Manager** to start the COM mapping utility.
2. Click the **Add** icon.



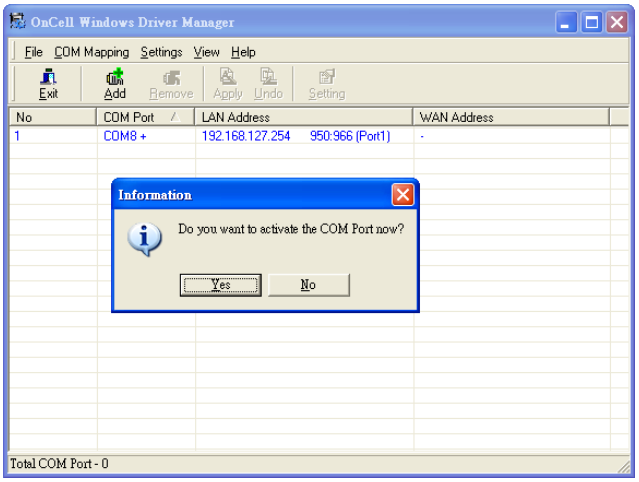
3. Click **Rescan** to search for the AWK-1127. From the list that is generated, select the server that you will map COM ports to, and then click **OK**.



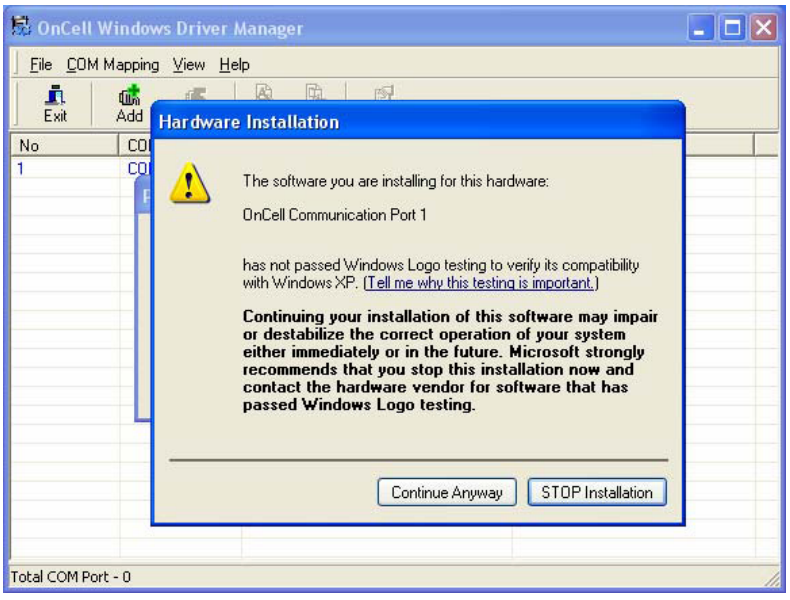
Alternatively, for RealCOM mode, you can select **Input Manually** and then manually enter the AWK-1127 's IP Type. To do this, select LAN type, followed by **1st Data Port**, and **1st Command Port** for the COM ports that will be mapped to. Click **OK** to proceed to the next step. Note that the **Add OnCell** page supports FQDN (Fully Qualified Domain Name), in which case the IP address will be filled in automatically.



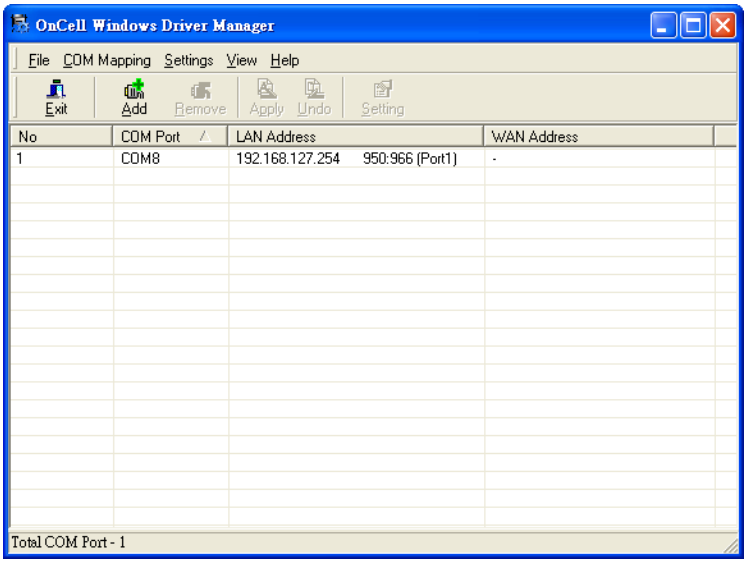
4. COM ports and their mappings are displayed in blue until they are activated. Activating the COM ports saves the information in the host system registry and makes the COM port available for use. The host computer will not have the ability to use the COM port until the COM ports are activated. Click **Yes** to activate the COM ports at this time, or click **Cancel** to activate the COM ports later.



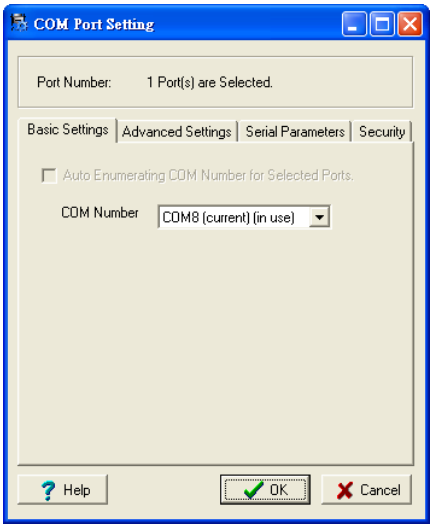
5. When using Windows XP, a message is displayed during the activation of each port, indicating that the software has not passed Windows Logo certification. Click **Continue Anyway** to proceed.



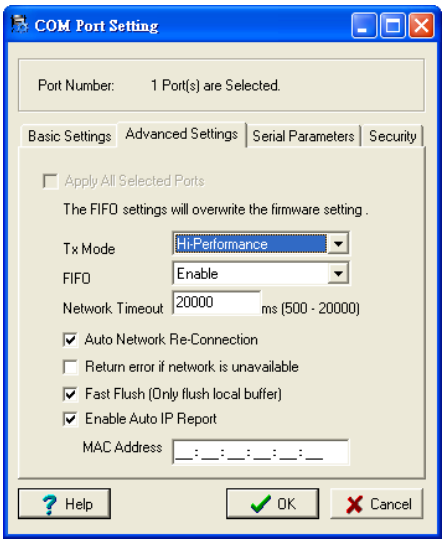
6. Ports that have been activated are displayed in black.



7. Click on the created COM port to select it. Then right click to select Basic Setting tab. On the **Basic Setting** tab, use the **COM Number** drop-down list to select a COM number to be assigned to the AWK-1127's serial port that is being configured. Note that ports that are "in use" will be labeled accordingly.



8. Click the **Advanced Setting** tab to modify Tx Mode, FIFO, Fast Flush, and other parameters.



Tx Mode

Hi-Performance is the default for Tx mode. After the driver sends data to the AWK-1127 , the driver immediately issues a "Tx Empty" response to the program. Under **Classical** mode, the driver will not send the "Tx Empty" response until after confirmation is received from the AWK-1127 's serial port. This causes lower throughput. Classical mode is recommended if you want to ensure that all data is sent out before further processing.

FIFO

If FIFO is **Disabled**, the AWK-1127 will transmit one byte at a time when the Tx FIFO becomes empty, and an Rx interrupt will be generated for each incoming byte. This will result in a faster response and lower throughput.

Network Timeout

You can use this option to prevent blocking if the target OnCell is unavailable.

Auto Network Re-Connection

With this option enabled, the driver will repeatedly attempt to re-establish the TCP connection if the AWK-1127 does not respond to background "check alive" packets.

Return error if network is unavailable

If this option is disabled, the driver will not return any error even when a connection cannot be established to the AWK-1127. With this option enabled, calling the Win32 Comm function will result in the error return code "STATUS_NETWORK_UNREACHABLE" when a connection cannot be established to the AWK-1127. This usually means that your host's network connection is down, perhaps due to a cable being disconnected. However, if you can reach other network devices, it may be that the AWK-1127 is not powered on or is disconnected. Note that **Auto Network Re-Connection** must be enabled in order to use this function.

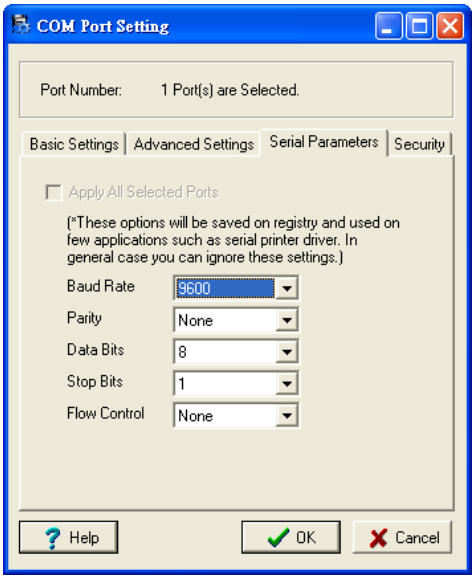
Fast Flush (only flushes the local buffer)

For some applications, the user's program will use the Win32 "PurgeComm()" function before it reads or writes data. After a program uses this PurgeComm() function, the OnCell driver continues to query the OnCell's firmware several times to make sure no data is queued in the OnCell firmware buffer, rather than just flushing the local buffer. This design is used to satisfy some special considerations. However, it may take more time (about several hundred milliseconds) than a native COM1 due to the additional time spent communicating across the Ethernet. This is why PurgeComm() works significantly faster with native COM ports on the PC than with mapped COM ports on the AWK-1127 . In order to accommodate other applications that require a faster response time, the new OnCell driver implements a new Fast Flush option. By default, this function is enabled.

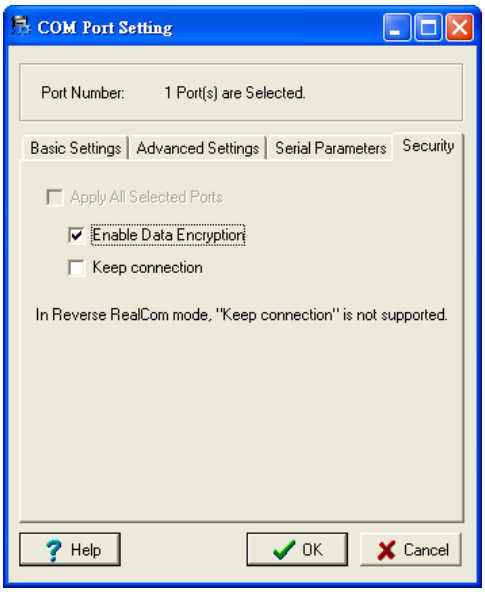
If you have disabled Fast Flush and find that COM ports mapped to the AWK-1127 perform markedly slower than when using a native COM port, try to verify if "PurgeComm()" functions are used in your application. If so, try enabling the Fast Flush function and see if there is a significant improvement in performance.

Auto IP Report: The functions applies to OnCell Series only and does not apply to the AWK-1127.

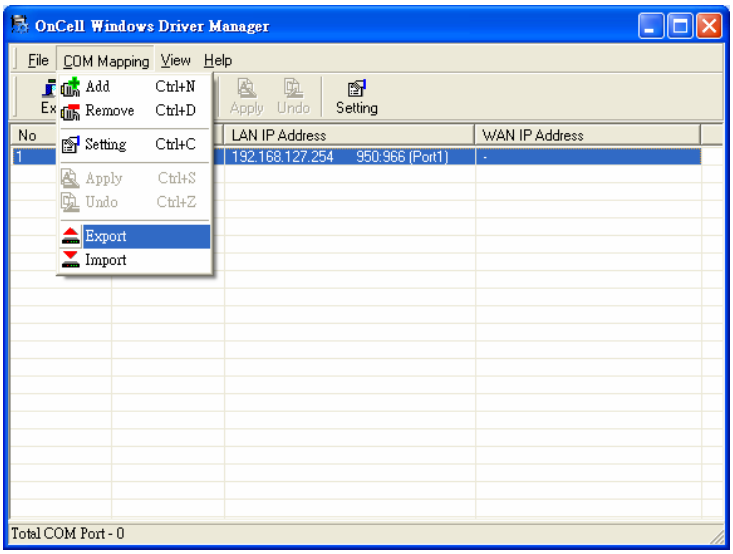
9. The **Serial Parameters** tab in the following figure show the default settings when the AWK-1127 is powered on. However, the program can redefine the serial parameters to different values after the program opens the port with Win32 API.



10. Click the **Security** tab to configure security settings. Select the **Enable Data Encryption** option to enable data to be encrypted when transmitted over the COM ports. After selecting the encryption option, select the **Keep connection** option to start encrypting COM port communications immediately without restarting the COM ports. (If your application opens and closes COM ports frequently and the AWK-1127 is only for one host, you can enable this option to speed up the opening/closing time. However, this will result in your host tying up the COM port so that other hosts cannot use it.).



11. To save the configuration to a text file, select **Export** from the **COM Mapping** menu. You will then be able to import this configuration file to another host and use the same COM Mapping settings in the other host.



Moxa OnCell Linux Real TTY Driver

The AWK-1127 uses the same Real TTY serial driver as Moxa's OnCell cellular gateways. The below section describes how to use the OnCell Linux Real TTY Driver to map a virtual tty port for the AWK-1127.

Basic Procedure

To map an AWK-1127 serial port to a Linux host's tty port, follow these instructions:

1. Set up the AWK-1127. After verifying that the IP configuration works and you can access the AWK-1127 (by using ping, telnet, etc.), configure the desired serial port on the AWK-1127 to RealCOM mode.
2. Install the Linux Real TTY driver files on the host.
3. Map the AWK-1127 serial port to the host's tty port.

Hardware Setup

Before proceeding with the software installation, make sure you have completed the hardware installation. Note that the default IP address for the LAN interface of AWK-1127 is **192.168.127.253**.

NOTE After installing the hardware, you must configure the operation mode of the serial port on your AWK-1127 to RealCOM mode.

Installing Linux Real TTY Driver Files

1. Obtain the driver file from the included CD-ROM or the Moxa website, at http://www.moxa.com.
2. Log in to the console as a super user (root).
3. Execute **cd** / to go to the root directory.
4. Copy the driver file **moxa_oncell_realtty.tgz to the / directory**.
5. Execute **tar xvfz moxa_oncell_realtty.tgz** to extract all files into the system.
6. Execute **/tmp/oncell_realtty/mxinst**.
   For RedHat AS/ES/WS and Fedora Core1, append an extra argument as follows:
   # /tmp/oncell_realtty/mxinst SP1
   The shell script will install the driver files automatically.

7. After installing the driver, you will be able to see several files in the **/usr/lib/oncell_realtty/driver** folder:
   > **mxaddsvr** (Add Server, mapping tty port)
   > **mxdelsvr** (Delete Server, un-mapping tty port)
   > **mxloadsvr** (Reload Server)
   > **mxmknod** (Create device node/tty port)
   > **mxrmnod** (Remove device node/tty port)
   > **mxuninst** (Remove tty port and driver files)
   At this point, you will be ready to map the AWK-1127 serial port to the system tty port.

Mapping TTY Ports

Make sure that you set the operation mode of the desired AWK-1127 serial port to RealCOM mode. After logging in as a super user, enter the directory **/usr/lib/oncell_realtty/driver** and then execute **mxaddsvr** to map the target OnCell serial port to the host tty ports. The syntax of **mxaddsvr** is as follows:

mxaddsvr *[OnCell IP Address] [Total Ports] ([Data port] [Cmd port])*

The **mxaddsvr** command performs the following actions:

1. Modifies **oncellreald.cf.**
2. Creates tty ports in directory /dev with major & minor number configured in **oncellreald.cf**.
3. Restarts the driver.

Mapping tty ports automatically

To map tty ports automatically, you may execute **mxaddsvr** with just the IP address and number of ports, as in the following example:

```
# cd /usr/lib/oncell_realtty/driver
# ./mxaddsvr 192.168.3.4 1
```

In this example, one tty port will be added, with IP 192.168.3.4, with data port 950 and command port 966.

Mapping tty ports manually

To map tty ports manually, you may execute **mxaddsvr** and manually specify the data and command ports, as in the following example:

```
# cd /usr/lib/oncell_realtty/driver
# ./mxaddsvr 192.168.3.4 1 4001 966
```

In this example, one tty port will be added, with IP 192.168.3.4, with data port 4001 and command port 966.

Removing Mapped TTY Ports

After logging in as root, enter the directory **/usr/lib/oncell_realtty/driver** and then execute **mxdelsvr** to delete a server. The syntax of mxdelsvr is:

```
mxdelsvr [IP Address]
```

Example:

```
# cd /usr/lib/oncell_realtty/driver
# ./mxdelsvr 192.168.3.4
```

The following actions are performed when executing **mxdelsvr**:

1. Modify oncellreald.cf.
2. Remove the relevant tty ports in directory /dev.
3. Restart the driver.

If the IP address is not provided in the command line, the program will list the installed servers and total ports on the screen. You will need to choose a server from the list for deletion.

Removing Linux Driver Files

A utility is included that will remove all driver files, mapped tty ports, and unload the driver. To do this, you only need to enter the directory **/usr/lib/oncell_realtty/driver**, then execute **mxuninst** to uninstall the driver. This program will perform the following actions:

1. Unload the driver.
2. Delete all files and directories in **/usr/lib/moxa_oncell**
3. Delete directory **/usr/lib/moxa_oncell**
4. Modify the system initializing script file.

Moxa OnCell UNIX Fixed TTY Driver

Installing the UNIX Driver

1. Log in to UNIX and create a directory for the Moxa TTY. To create a directory named **/usr/etc**, execute the command:

   ```
   # mkdir –p /usr/etc
   ```

2. Copy **moxa_oncell_fixedtty.tar** to the directory you created. If you created the **/usr/etc** directory above, you would execute the following commands:

   ```
   # cp moxa_oncell_fixedtty.tar /usr/etc
   # cd /usr/etc
   ```

3. Extract the source files from the tar file by executing the command:

   ```
   # tar xvf moxa_oncell_fixedtty.tar
   ```

   The following files will be extracted:

   README.TXT
   oncellttyd.c --- source code
   oncellttyd.cf --- an empty configuration file
   Makefile --- makefile
   VERSION.TXT --- fixed tty driver version
   FAQ.TXT

4. Compile and Link

   For SCO UNIX:
   # make sco

   For UnixWare 7:
   # make svr5

   For UnixWare 2.1.x, SVR4.2:
   # make svr42

Configuring the UNIX Driver

Modify the configuration

The configuration used by the **oncellttyd program** is defined in the text file **oncellttyd.cf**, which is in the same directory that contains the program **oncellttyd**. You may use vi, or any text editor to modify the file, as follows:

```
ttyp1 192.168.1.1 950
```

For more configuration information, view the file **oncellttyd.cf**, which contains detailed descriptions of the various configuration parameters.

NOTE The "Device Name" depends on the OS. See the Device Naming Rule section in README.TXT for more information.

To start the **oncellttyd** daemon after system bootup, add an entry into **/etc/inittab**, with the tty name you configured in **oncellttyd.cf**, as in the following example:

```
ts:2:respawn:/usr/etc/oncell_fixedtty/oncellttyd –t 1
```

Device naming rule

For UnixWare 7, UnixWare 2.1.x, and SVR4.2, use:

```
pts/[n]
```

For all other UNIX operating systems, use:

```
ttyp[n]
```

Starting moxattyd

Execute the command **init q** or reboot your UNIX operating system.

Adding an additional server

1. Modify the text file **oncellttyd.cf** to add an additional server. User may use **vi** or any text editor to modify the file. For more configuration information, look at the file **oncellttyd.cf**, which contains detailed descriptions of the various configuration parameters.
2. Find the process ID (PID) of the program **oncellttyd**.
   # ps -ef | grep oncellttyd
3. Update configuration of oncellttyd program.
   # kill -USR1 [PID]
   (e.g., if oncellttyd PID = 404, kill -USR1 404)

This completes the process of adding an additional server.

5

Other Console Considerations

This chapter explains how to access the AWK-1121/1127 for the first time. In addition to HTTP access, there are four ways to access AWK-1121/1127: 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-1121/1127 to a PC's COM port, can be used if you do not know the AWK-1121/1127's IP address. The other consoles can be used to access the AWK-1121/1127 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**
- **Wireless Sniffer**

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-1121/1127 to a PC's COM port, can be used if you do not know the AWK-1121/1127's IP address. It is also convenient to use serial console configurations when you cannot access the AWK-1121/1127 over Ethernet LAN, such as in the case of LAN cable disconnections or broadcast storming over the LAN.

ATTENTION

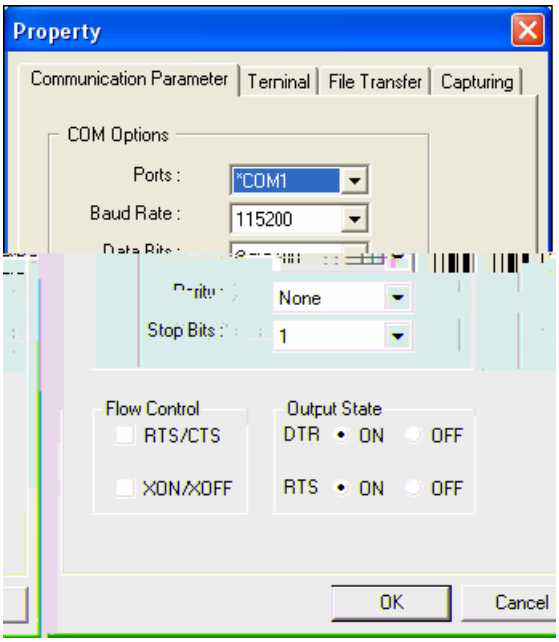
Do not use the RS-232 console manager when the AWK-1121/1127 is powered at reversed voltage (ex. -48VDC), even though reverse voltage protection is supported.
If you need to connect the RS-232 console at reversed voltage, Moxa's TCC-82 isolator is your best solution.

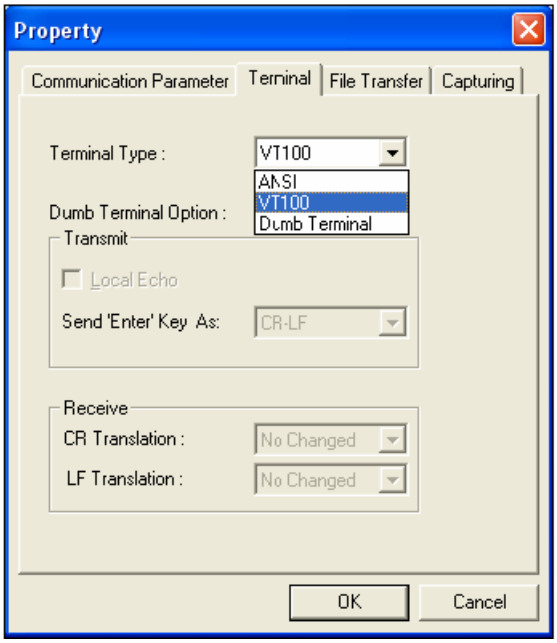
NOTE We recommend using **Moxa PComm (Lite)** Terminal Emulator, which can be downloaded free of charge from Moxa's website.

Before running PComm Terminal Emulator, use an RJ45 to DB9-F (or RJ45 to DB25-F) cable to connect the AWK-1121/1127'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.

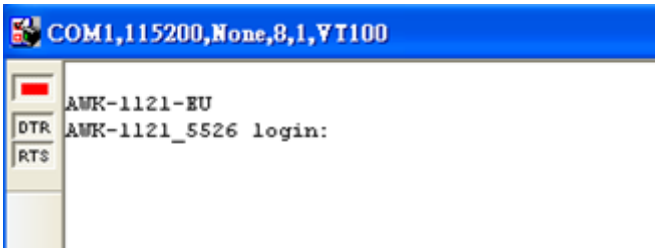
1. From the Windows desktop, open the Start menu and start **PComm Terminal Emulator** in the PComm (Lite) group.
2. Select Open under Port Manager to open a new connection.

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.

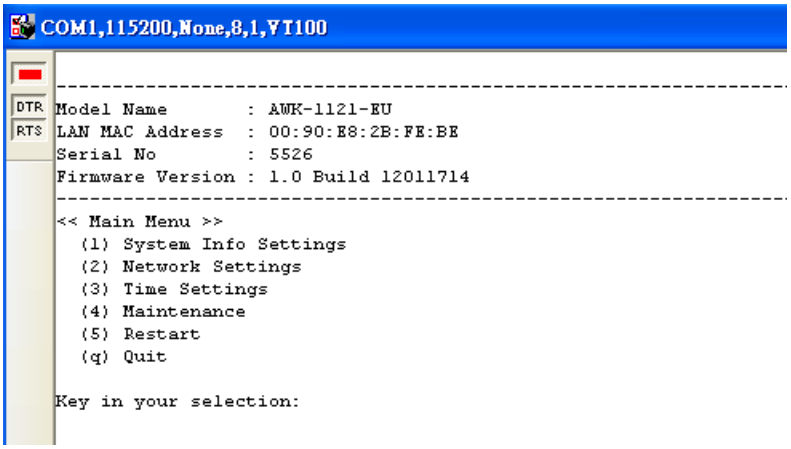




4. The Console login screen is displayed. Log into the RS-232 console with the login name (default: **admin**) and password (default: **root**, if no new password is set).



The AWK-1121/1127'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.

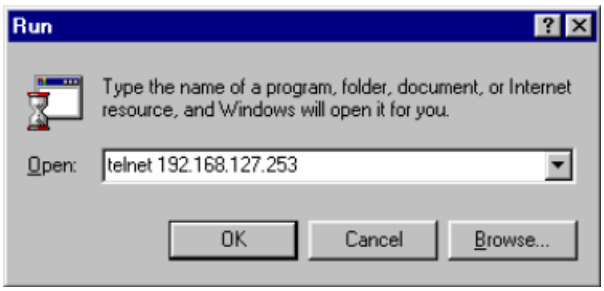
Configuration by Telnet and SSH Consoles

You may use Telnet or SSH client to access the AWK-1121/1127 and manage the console over a network. To access the AWK-1121/1127's functions over the network from a PC host that is connected to the same LAN as the AWK-1121/1127, you need to make sure that the PC host and the AWK-1121/1127 are on the same logical subnet. To do this, check your PC host's IP address and subnet mask.

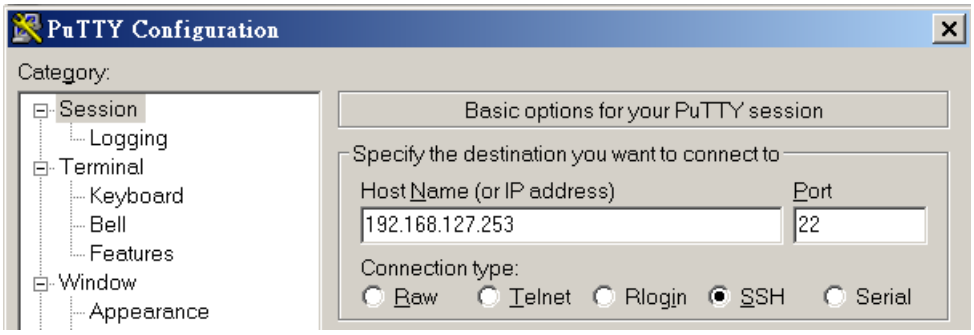
NOTE The AWK-1121/1127's default IP address is **192.168.127.253** and the default subnet mask is **255.255.255.0** (for a Class C network). If you do not set these values properly, please check the network settings of your PC host and then change the IP address to 192.168.127.xxx and subnet mask to 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-1121/1127'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-1121/1127's IP address, specifying **22** for the SSH connection port.

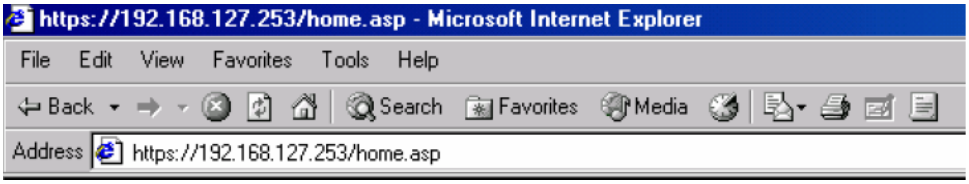


3. The Console login screen is displayed. Please refer to the previous paragraph "RS-232 Console Configuration" and for login and administration.

Configuration by Web Browser with HTTPS/SSL

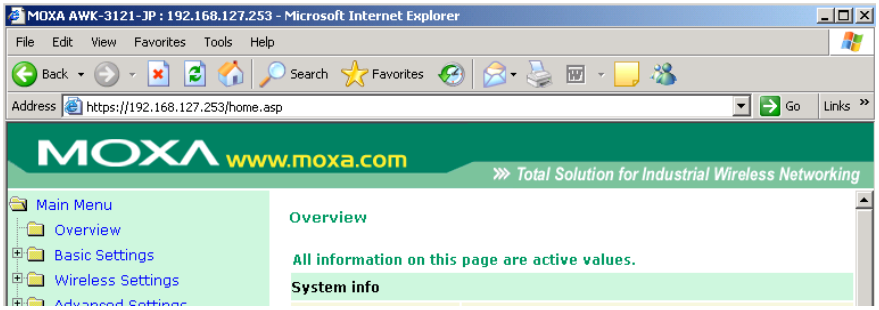
To secure your HTTP access, the AWK-1121/1127 supports HTTPS/SSL encryption for all HTTP traffic. Perform the following steps to access the AWK-1121/1127's web browser interface via HTTPS/SSL.

1. Open your web browser and type https://<AWK-1121/1127's IP address> in the address field. Press **Enter** to establish the connection.



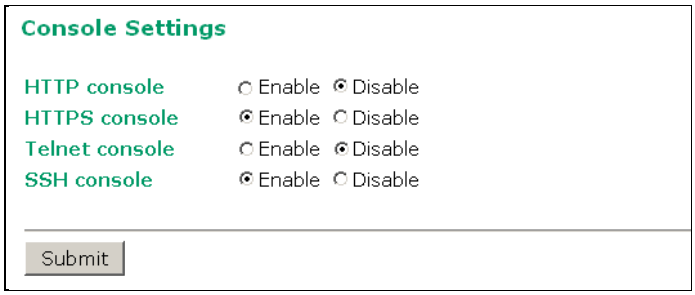
2. Warning messages will pop out to warn users that the security certificate was issued by a company they have not chosen to trust.

3. Select **Yes** to accept the certificate issued by Moxa IW and then enter the AWK-1121/1127'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-1121/1127's functions.



Disabling Telnet and Browser Access

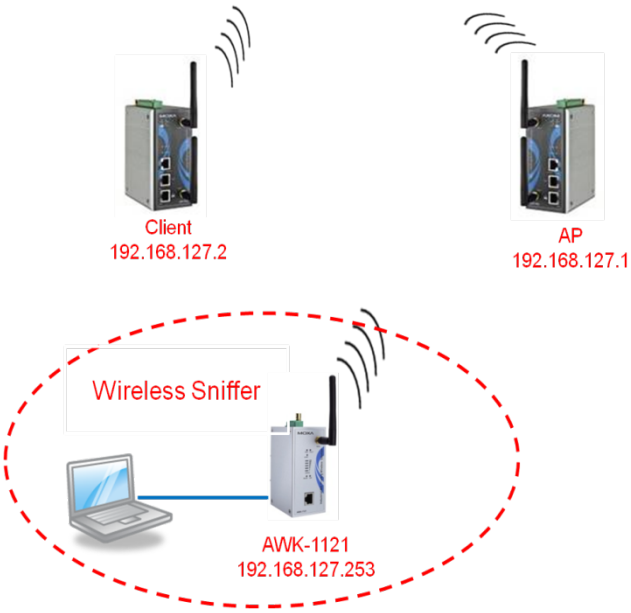
If you are connecting the AWK-1121/1127 to a public network but do not intend to use its management functions over the network, then we suggest disabling both Telnet Console and Web Configuration. Please run **Maintenance** → **Console Settings** to disable them, as shown in the following figure.



Wireless Sniffer

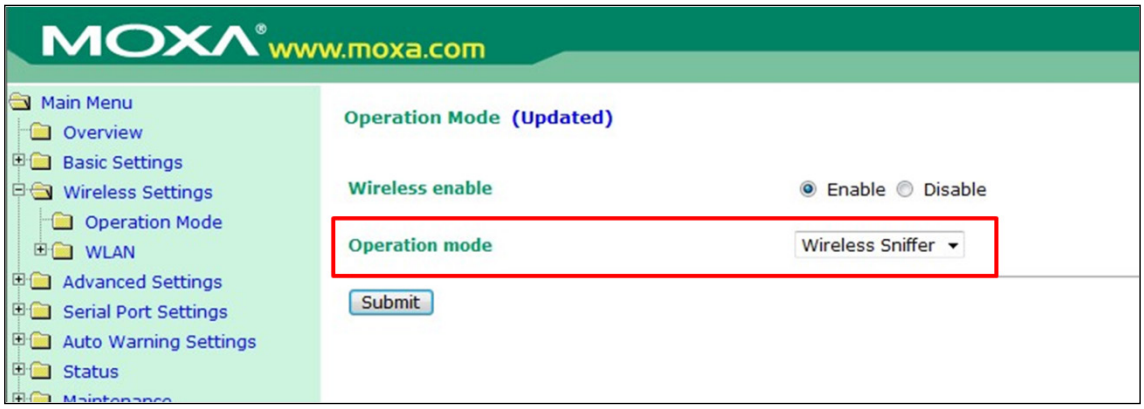
You can configure the AWK-2212/1127 as a wireless sniffer on the IEEE 802.11 a/b/g channels. If network security is not a concern, you can disable the security mode on the AP and wireless client on the network.

The following figure shows an example network topology.

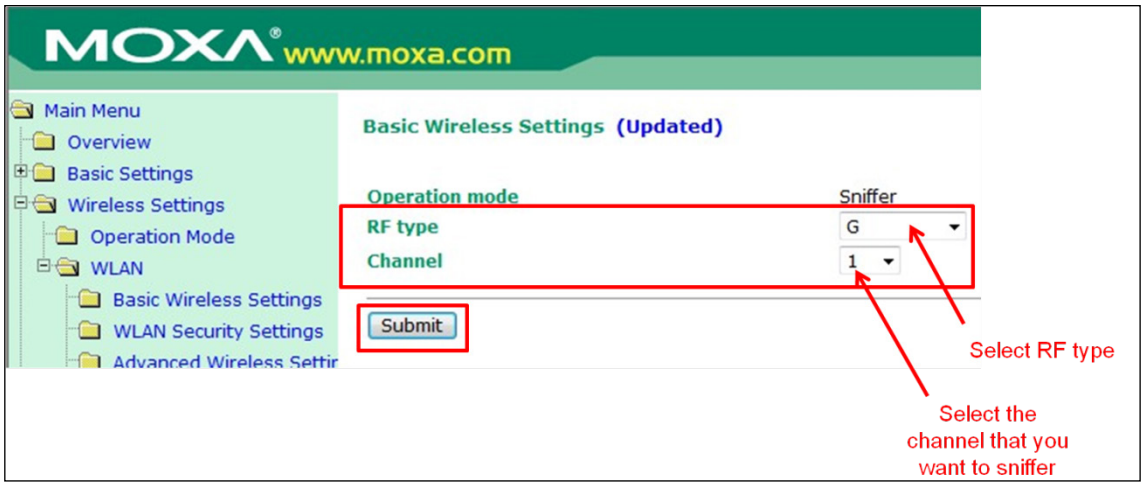


To set the AWK-1121/1127 as a wireless sniffer, complete the following steps:

1. Access the web configurator and click **Wireless Settings → Operation Mode**.
2. Select **Wireless Sniffer** from the **Operation mode** drop-down list.



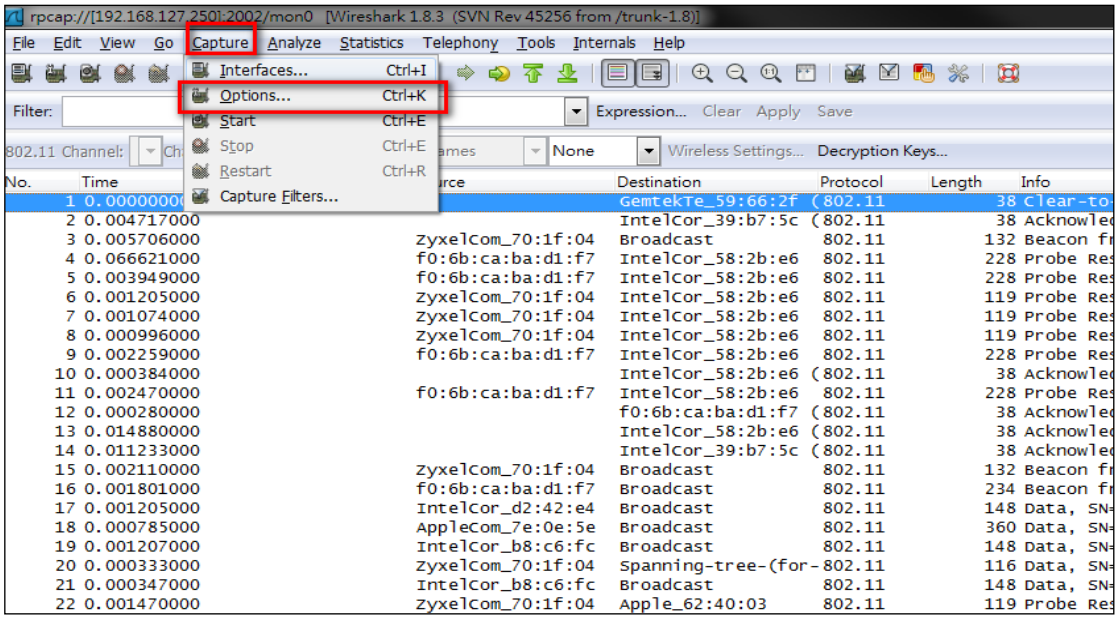
3. In the **Basic Wireless Settings** screen, select an option from the **RF type** and **Channel** drop-down lists.



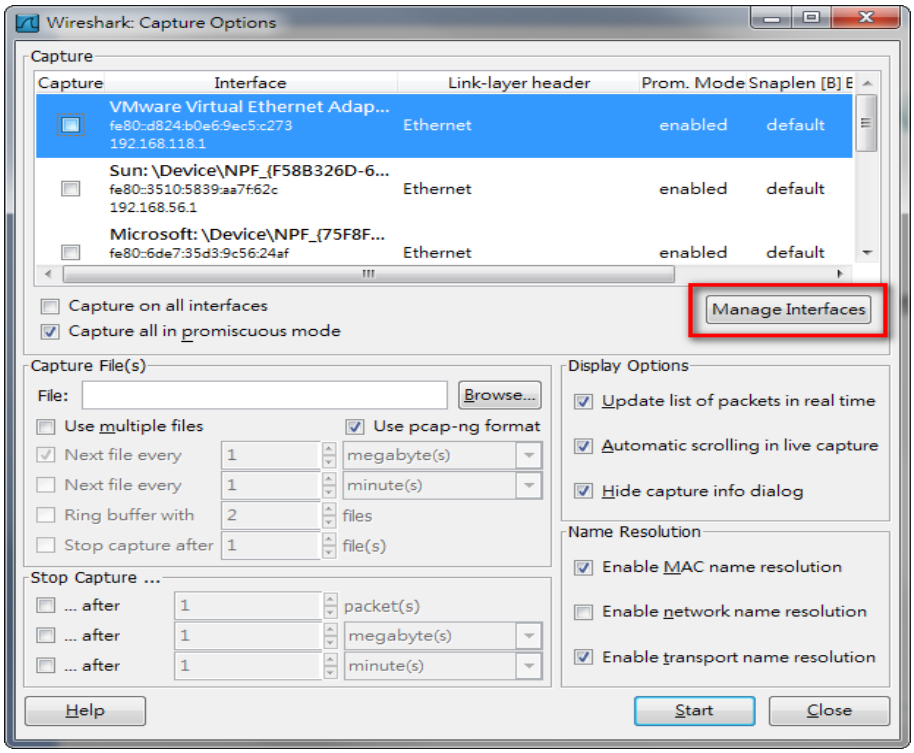
On a computer connected to the AWK, you can use a packet analyzer to view network traffic on an interface. The following steps describe how to configure Wireshark to analyze packets on the AWK.

To configure Wireshark to analyze packets on AWK, complete the following steps:

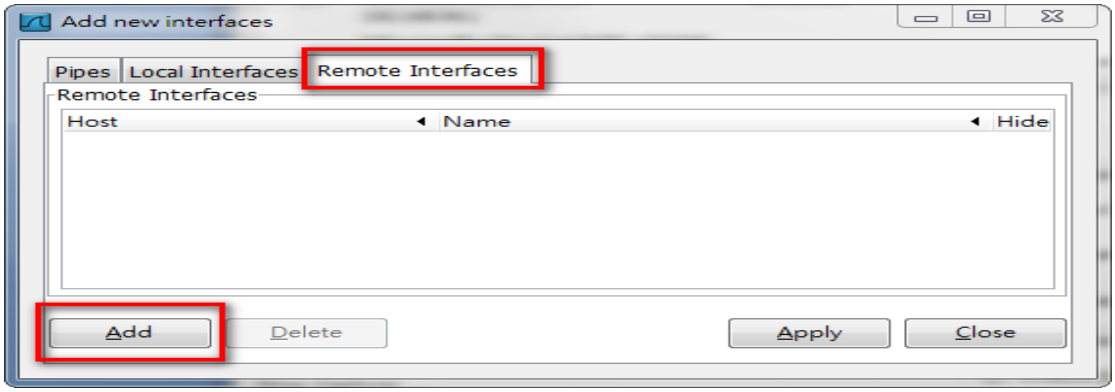
1. Start Wireshark on the computer connected to the AWK.
2. Click **Capture > Options**.



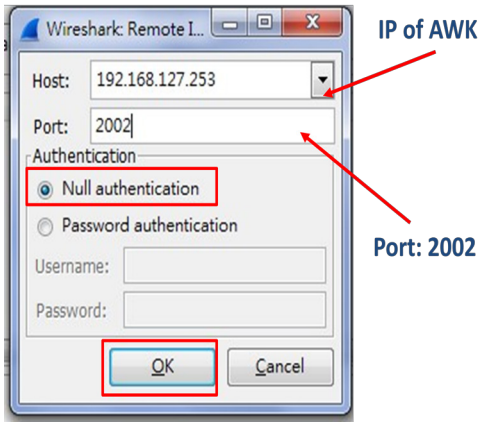
3. Click **Manage Interface**.



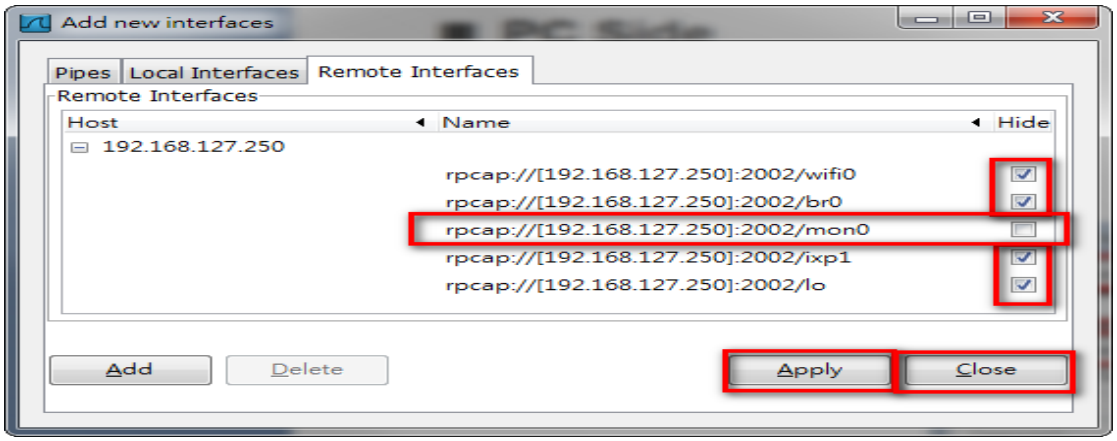
4. Click the **Remote Interfaces** tab.



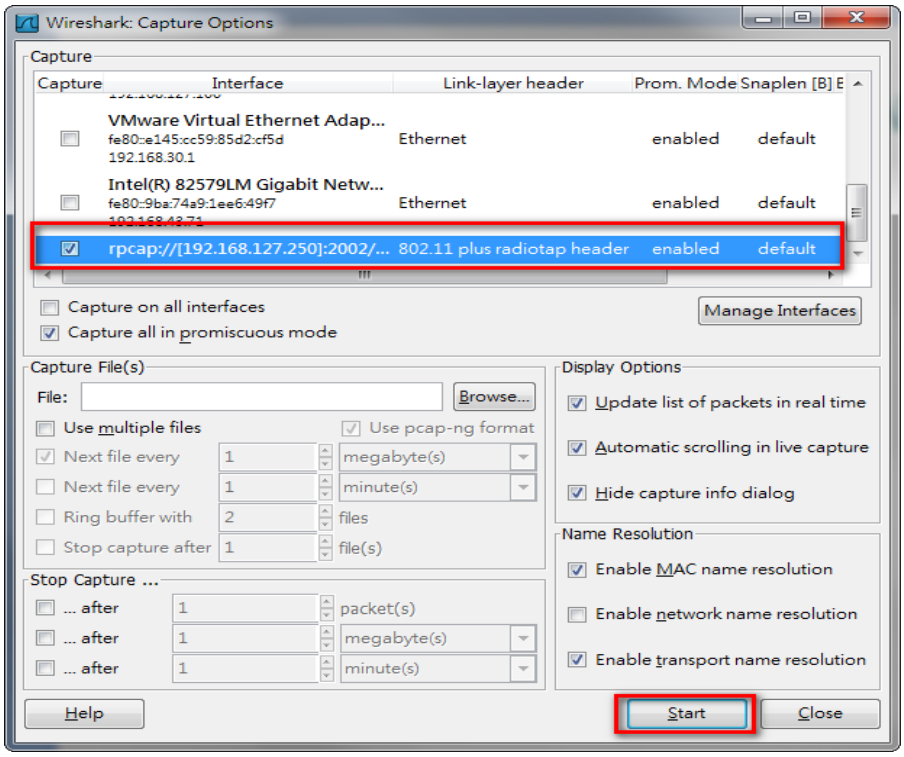
5. Configure the fields as shown in the following figure.



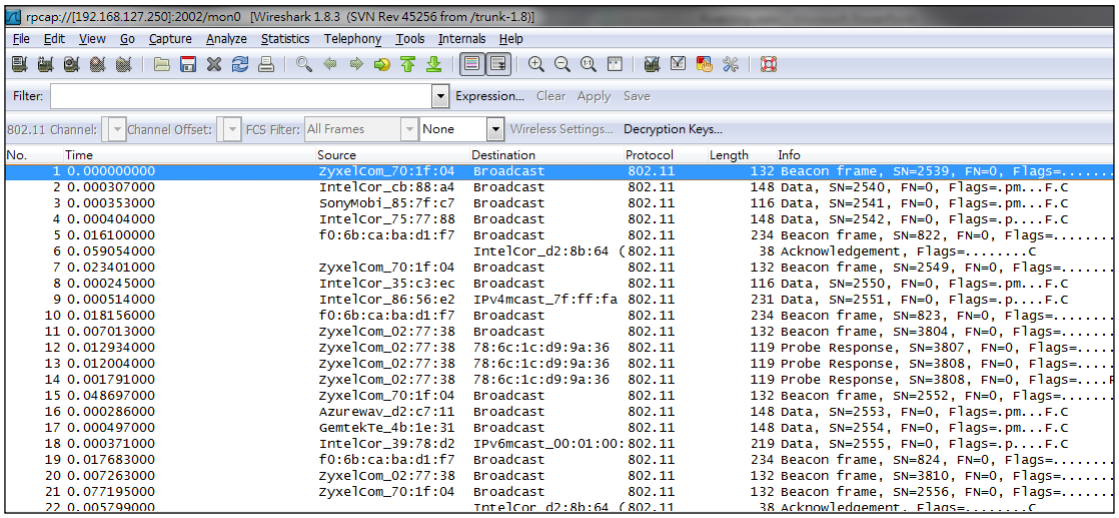
6. In the **Add new interfaces** screen, clear the **Hide** check box to show the **mon0** interface. Make sure that the Hide check box is selected to hide the other interfaces.



7. In the **Capture Options** screen, select the interface whose packets you want to capture and click **Start**.



The Capture screen displays the packets that are sniffed by the AWK. The following figure shows an example.



A

References

This chapter provides more detailed information about wireless-related technologies. The information in this chapter can help you administer your AWK-1121/1127s and plan your industrial wireless network better.

The following topics are covered in this appendix:

- **Fragment**
- **RTS threshold**

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

Supporting Information

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

The following topics are covered in this appendix:

- **About This User's Manual**
- **DoC (Declaration of Conformity)**
  - Federal Communication Commission Interference Statement
  - R&TTE Compliance Statement
- **Firmware Recovery**

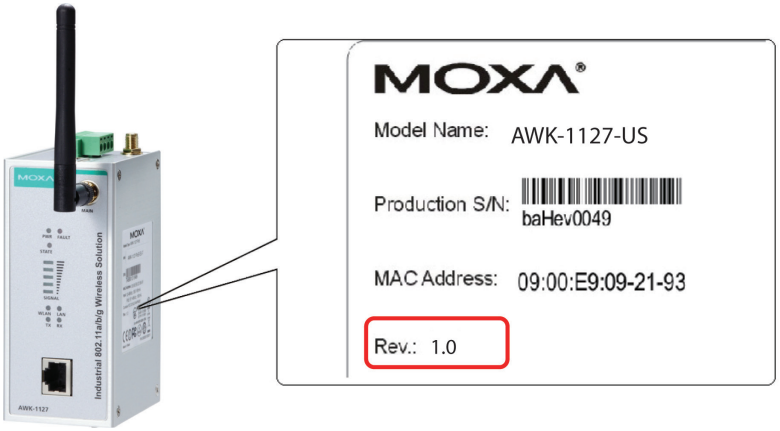
About This User's Manual

This manual is mainly designed for, but nto limited to, the following hardware and firmware for the AWK-1121/1127:

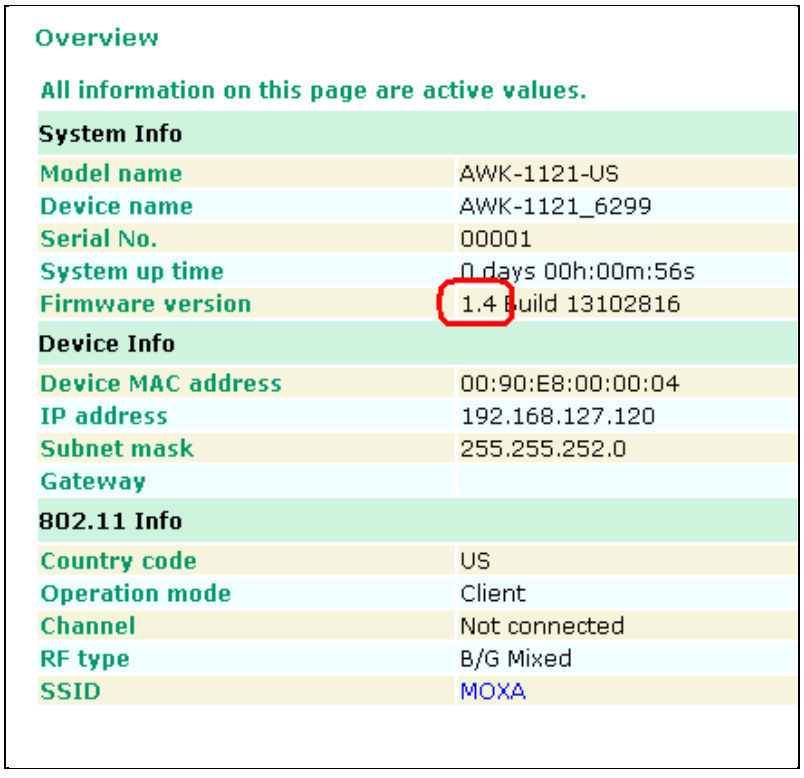
- Hardware Rev: **1.0**
- Firmware Ver: **1.5**

You are strongly recommended to visit Moxa's website (http://www.moxa.com) and find the latest product datasheet, firmware, QIG (Quick Installation Guide), UM (User's Manual) and related information.

NOTE You can find out the hardware revision number of AWK-1121/1127 on the side label.



The firmware version number can be seen on the **Overview** page, as follows:



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.

FCC 15.407(e): Within the 5.15-5.25 GHz band, U-NII devices will be restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operations.

NOTE The availability of some specific channels and / or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination. The firmware setting is not accessible by the end user.

R&TTE Compliance Statement

Moxa declares that the apparatus AWK-1121/1127 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.

Firmware Recovery

When the LEDs of **FAULT**, **Signal Strength**, **CLIENT**, **BRIDGE** 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-1121/1127 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-1121/1127's RS-232 console with **115200bps and N-8-1**. You will see the following message shown on the terminal emulator every one second.

```
Section userdisk Cksum error = 0xa5feadde --> 0x658c5051
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
Press Ctrl-C to enter Firmware Recovering Process.....
```

Press **Ctrl - C** and the following message is displayed.

```
Press Ctrl-C to enter Firmware Recovering Process.....
==========================================================================
IP address of AWK-1121 : 0.0.0.0
IP address of TFTP server : 0.0.0.0
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 
```

Enter **2** to change the network setting. Specify where the AWK-1121/1127's firmware file on the TFTP server and press **y** to write the settings into flash memory.

```
==========================================================================
IP address of AWK-1121 : 0.0.0.0
IP address of TFTP server : 0.0.0.0
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 2

IP address of AWK-1121 : 192.168.1.2
IP address of TFTP server : 192.168.1.1
Update RedBoot non-volatile configuration - continue (y/n)? y
```

AWK-1121/1127 restarts, and the "Press Ctrl-C to enter Firmware Recovery Process…" message is displayed. Press **Ctrl-C** to enter the menu and select **1** to start the firmware upgrade process.

```
Press Ctrl-C to enter Firmware Recovering Process.....
==========================================================================
IP address of AWK-1121 : 192.168.1.2
IP address of TFTP server : 192.168.1.1
==========================================================================
1. Start to firmware upgrade using the above network setting immediately.
2. Change the network settings.
Enter your selection :  (1-2,enter for abort): 1
```

Select **0** in the sub-menu to load the firmware image via LAN, and then enter the file name of the firmware to start the firmware recovery.

```
==========================================================================
Load method select :
0. Load from LAN
1. Load from serial with Xmodem
q. Abort select.
==========================================================================
Please select item : 0
Please input load image name..
Default file name : AWK-1121.rom
User Input file name : AWK-1121_1.0.rom
```