JetPalm 5M-15 manual

User's Guide

Revision 1.0
21 October 2013

Contents

About this Guide

Prerequisite Skills and Knowledge

To use this document effectively, you should have a working knowledge of Local Area Networking (LAN) concepts and wireless Internet access infrastructures.

Conventions Used in this Document

The following typographic conventions and symbols are used throughout this document:

	Additional information that may be helpful but which is not required.
	Important information that should be observed.
bold	Menu commands, buttons, input fields, links, and configuration keys are displayed in bold
italic	References to sections inside the document are displayed in italic.
`code`	File names, directory names, form names, system-generated output, and user typed entries are displayed in constant-width type

Abbreviation List

Abbreviation	Description
ACL	Access Control List
AES	Advanced Encryption Standard
AMSDU	Aggregated Mac Service Data Unit
AP	Access Point
CRC	Cyclic Redundancy Check
DHCP	Dynamic Host Control Protocol
EAP	Extensible Authentication Protocol
GHz	Gigahertz
GMT	Greenwich Mean Time.
GUI	Graphical User Interface
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
ISP	Internet Service Provider
IP	Internet Protocol
LAN	Local Area Network
LED	Light-Emitting Diode

| Abbreviation	Description
MAC	Media Access Control
Mbps	Megabits per second
MHz	Megahertz
MIMO	Multiple Input, Multiple Output
MSCHAPv2	Microsoft version of the Challenge-handshake authentication protocol, CHAP.
NAT	Network address translation – translation of IP addresses (and ports)
PC	Personal Computer
PDA	Personal Digital Assistant
PTP	Point To Point
PTMP	Point To Multi Point
PSK	Pre-Shared Key
QoS	Quality of Service
PEAP	Protected Extensible Authentication Protocol
RSSI	Received Signal Strength Indication – received signal strength in mV, measured on BNC outdoor unit connector
RX	Receive
SNMP	Simple Network Management Protocol
SMTP	Simple Mail Transfer Protocol
SSID	Service Set Identifier
TCP	Transmission Control Protocol
TKIP	Temporal Key Integrity Protocol
TTLS	Tunneled Transport Layer Security (EAP-TTLS) protocol
TX	Transmission
UDP	User Datagram Protocol
UAM	Universal Access Method
VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol
WDS	Wireless Distribution System
WEP	Wired Equivalent Privacy
WISPr	Wireless Internet Service Provider roaming
WLAN	Wireless Local Area Network
WPA	Wi-Fi Protected Access
WPA2	Wi-Fi Protected Access 2

JetPalm 5M-15 Specification

Introduction

It is a versatile, very efficient, and stable 5 GHz hardware platform. This product is equipped with an extreme output power (up to 30 dBm) 802.11n MIMO radio.

The robust hardware is coupled with an advanced and feature-rich operating system optimized for high performance communications which allows compatibility with older 802.11a/n standards while adding support for the latest in wireless communications. The device supports access point, station, and WDS operating modes and can act as bridge or as router making it one of the most flexible devices on the market.
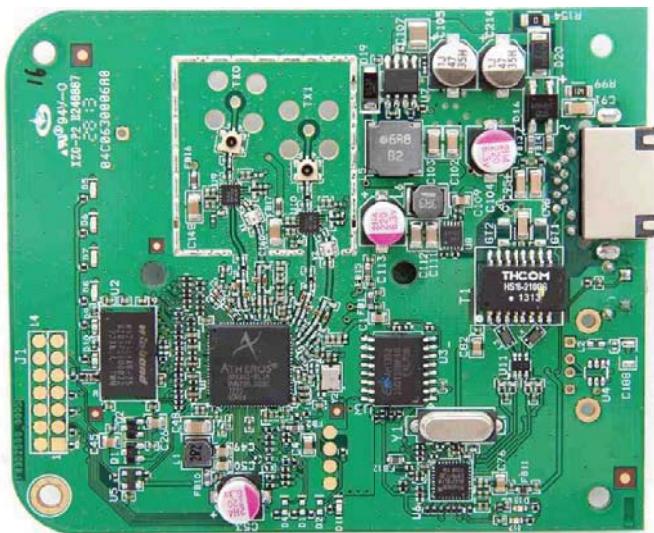
Block diagram
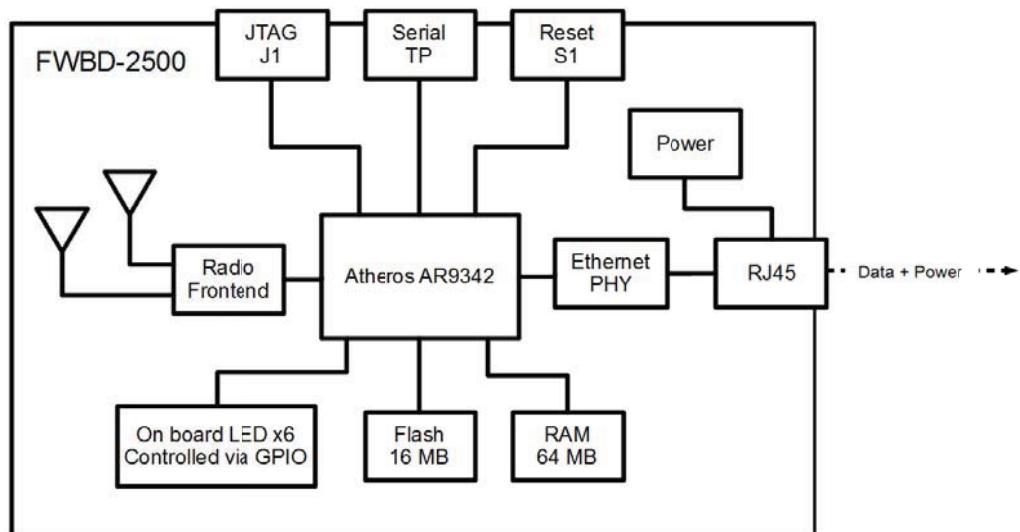
Hardware information

Feature	Description	Notes
CPU	AR9342	
RAM	DDR2 64MB	
Flash memory	16Mbytes SPI	
Watchdog timer	Integrated into CPU	
Reset push button	Connected to GPIO	
LED's	6 LED's connected to GPIO	
Ethernet	One 10/100 Ethernet port	
Power options	Power-Over-Ethernet	Passive PoE (RJ45)
Power supply range	12-24V	
Serial port (UART)	Serial TP	3.3V TTL level, not end user accessible
Operating temperature range	From -40C to +70C	
Humidity	0 ~ 90 % (non-condensing)	
Power consumption	up to 4.42W	

Wireless information

Parameter	Description
WLAN standard	IEEE 802.11 a/n
FCC Operation frequency：	5745MHz-5825MHz :802.11a&802.11nHT20 ; 5755MHz-5795MHz:802.11nHT40
Radio mode	MIMO 2x2
Operating modes	Access point (auto WDS), Station, Station WDS
Radio frequency band	5 GHz (Country dependent from 4.920 GHz to 5.915GHz)
Transmit power	Up to 30dBm
Receive sensitivity	Varying between -100 dBm and -73dBm depending on modulation
Channel size	20MHz, 40MHz
Modulation schemes	802.11 a/n: OFDM (64-QAM, 16-QAM, QPSK, BPSK)
Data rates	802.11 n: 300, 270, 240, 180, 120, 90, 60, 30 Mbps 802.11 a: 54, 48, 36, 24, 18, 12, 9, 6 Mbps
Operation & Installation	**Must be installed for** fixed point-to-point operation only

Power consumption

State	Current	Voltage	Power consumption
Idle	60 mA	24 V	1.44 W
Max load	184 mA	24 V	4.42 W

Initial Device Setup

ℹ️ The default product addressis `192.168.2.100.`

To access the Web management interface, configure your PCwith a static IP address on the 192.168.2.0 subnet with mask 255.255.255.0. Connect the AP device in to the same physical network as your PC. Open the Web browser and type the default IP address of the device `https://192.168.2.100/`and the login page will be loaded. Enter default administrator login settings:

Figure 1 – Login Page

ℹ️ The default administrator login settings are:
Login: **admin**
Password: **admin**

After successful administrator login you will see the main page of the device Web management interface. The device now is ready for configuration.

Initial AP Setup

Follow the steps for initial wireless Access Point setup that will be prepared to accept wireless Station connections (refer to the section*Initial Station Setup* for instructions).

Step 1.   Connect an Ethernet cable between your computer and the AP.

Step 2.   Make sure your computer is set to the same subnet as the AP, i.e. 192.168.2.150

Step 3.   Start your Web browser.

Step 4.   Each devices uses following default settings:

- WAN IP:**192.168.2.100**
- Subnet mask:**255.255.255.0**
- Username:**admin**
- Password:**admin**

The initial login screen looks as follow:
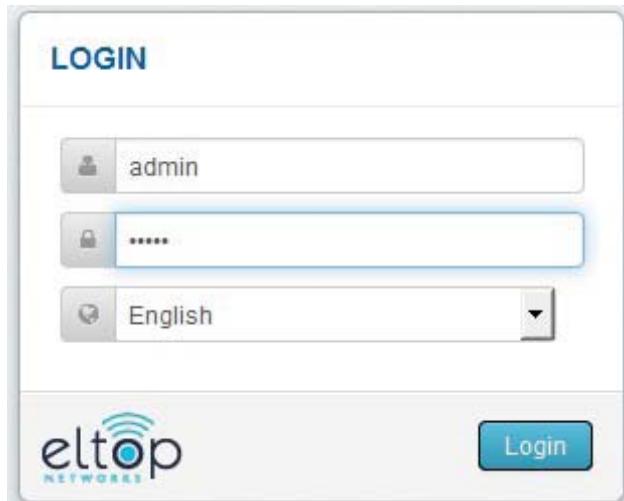
Step 5.   **Confirm the disclaimer of the APC.**According to the chosen country the regulatory domain settings may differ. You are not allowed to select radio channels and RF output power values other the permitted values for your country and regulatory domain.
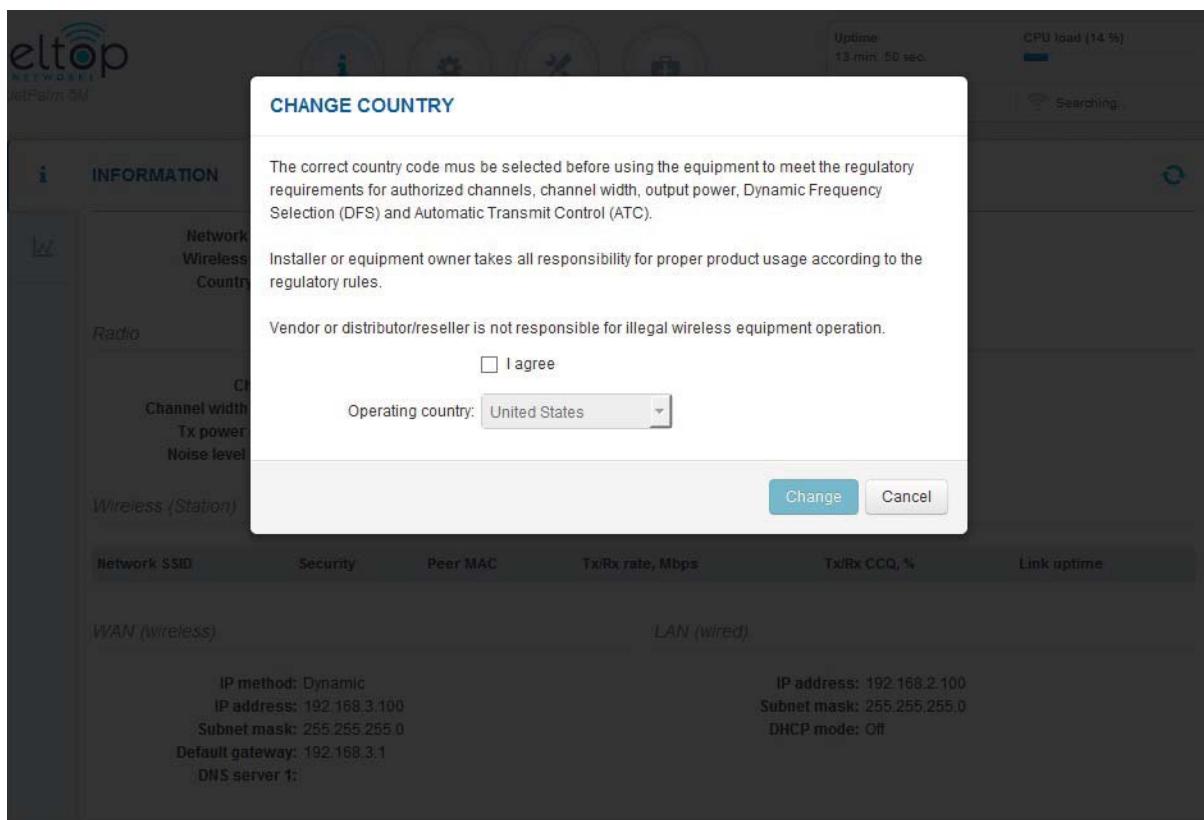
Step 6.   Enter the default password, and then press the Login button to enter the AP web management page.

Step 7. Navigate to the**NetworkConfiguration** tab and choose the Router network mode with NAT enabled, Static IP enabled, LAN settings with DHCP server enabled (to loan an IP addresses for connected clients) on LAN side and click **Save Changes**:

Step 8. Navigate to the **WirelessConfiguration** tab, choose Operating mode, Security parameters and IEEE mode and click **Save Changes**:

Step 9. Verify connection. Navigate to **Information** menu to check if the Station are successfully connected to the APC device:

Initial Station Setup

Follow the steps for initial wireless client setup that will be connected to the previously configured AP (refer to the section *Initial AP Setup*).

Step 1. Connect an Ethernet cable between your computer and the JetPalm 5M device.

Step 2. Make sure your computer is set to the same subnet as the APC, i.e. 192.168.2.150

Step 3. Start your Web browser.

Step 4. Each APC devices uses following default settings:

- WAN IP:**192.168.2.100**
- Subnet mask:**255.255.255.0**
- Username:**admin**
- Password:**admin**

The initial login screen looks as follow:

Step 5.   **Confirm the disclaimer of the APC.**According to the chosen country the regulatory domain settings may differ. You are not allowed to select radio channels and RF output power values other the permitted values for your country and regulatory domain.
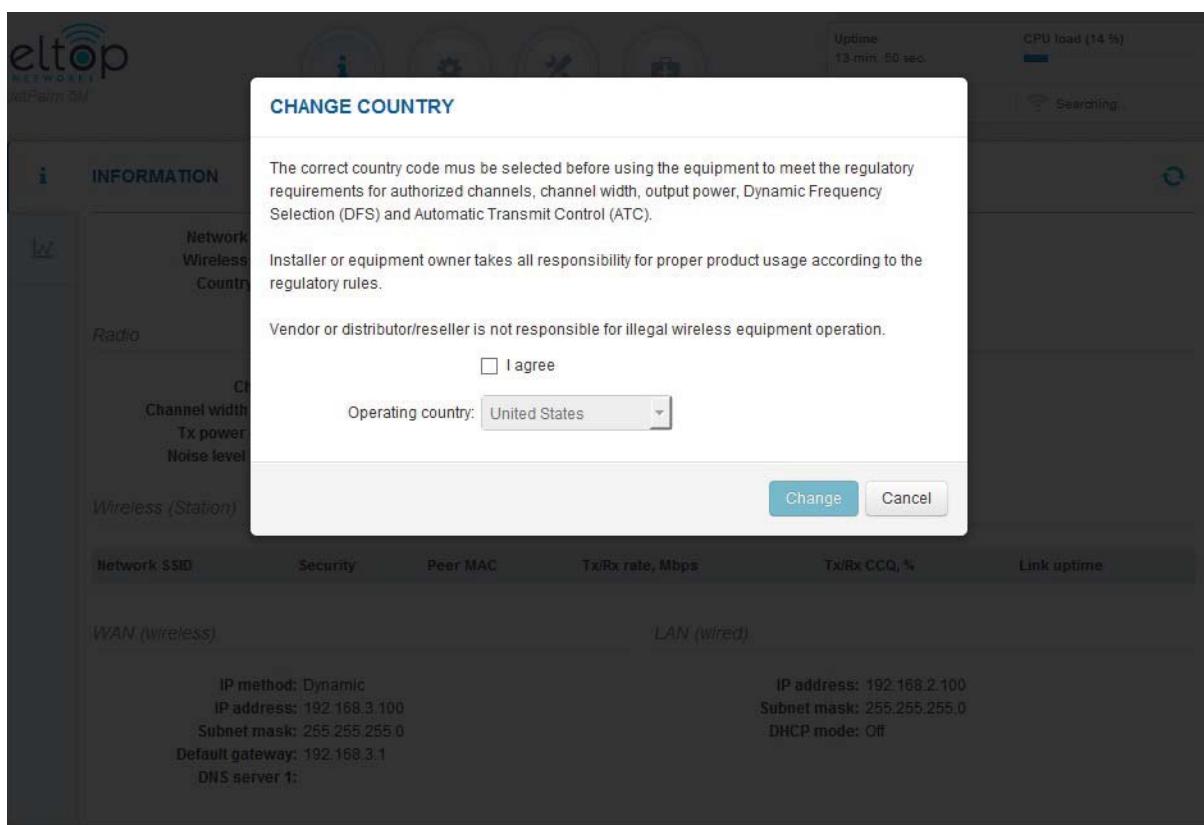
Step 6.   Enter the default password, and then press the Login button to enter the APC web management page.

Step 7. Navigate to the **NetworkConfiguration** tab and choose the bridgenetwork mode with, Dynamic IP enabled (be sure that AP to which the device will be associated has a DHCP server running ((refer to the section *Initial AP Setup* for instructions)), specify the DHCP fallback settings in case the DHCP server will be unreachable and click **Save Changes** button:
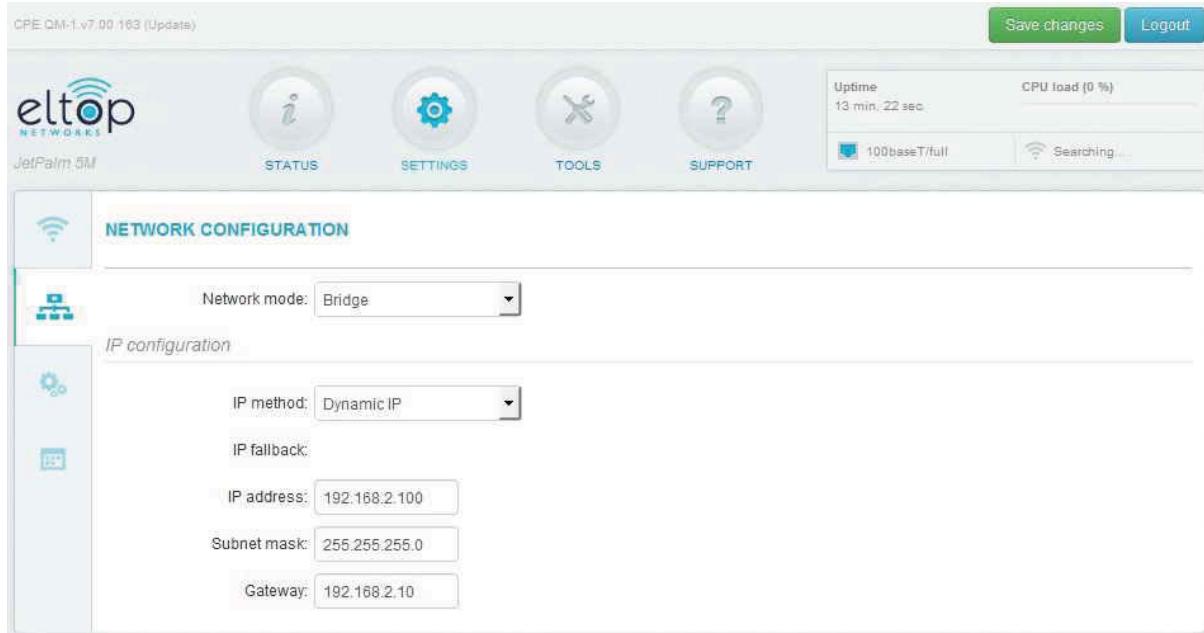
Step 8. Navigate to the **WirelessConfiguration** tab, choose Station WDS wireless mode, click **Scan** button near the SSID entry field to choose the SSID of the AP where the station will be associated to. Specify the Security parameters for the AP, check IEEE mode (these settings must conform with AP wireless settings) and click **Save Changes**:
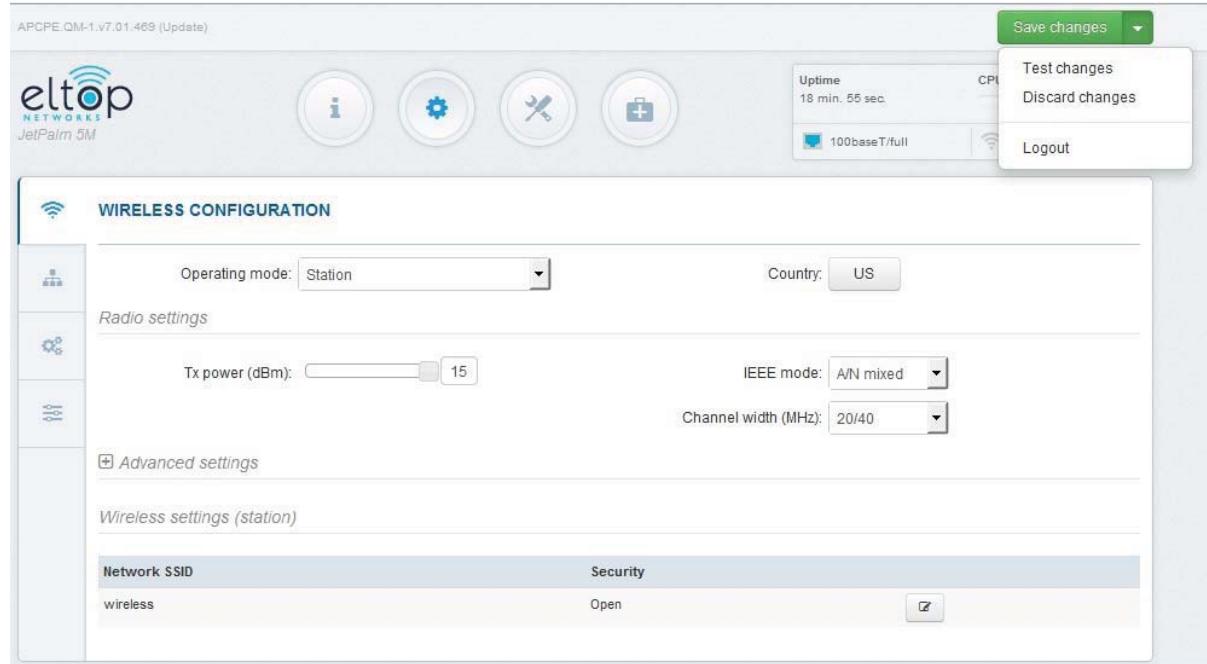
Step 9. Verify connection. Navigate to the **Information** page. The **Information** page will display wireless information of the link with AP. The connection status must be displayed as Connected and progress bars indicating the quality of the connection must be displayed:
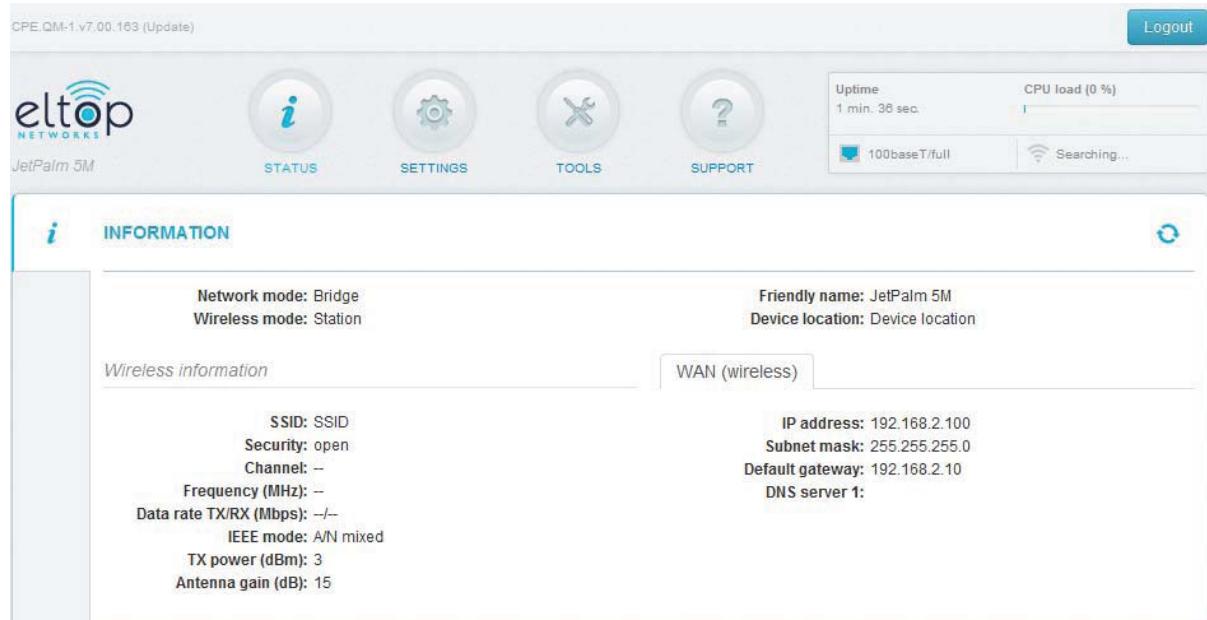
Network Operation Modes

The device can operate as transparent Bridge or Router.

Bridge Mode

The device can act as a wireless network bridge and establish wireless links with other APs. In this mode all LAN port and Wireless interface will be a part of the Bridge.
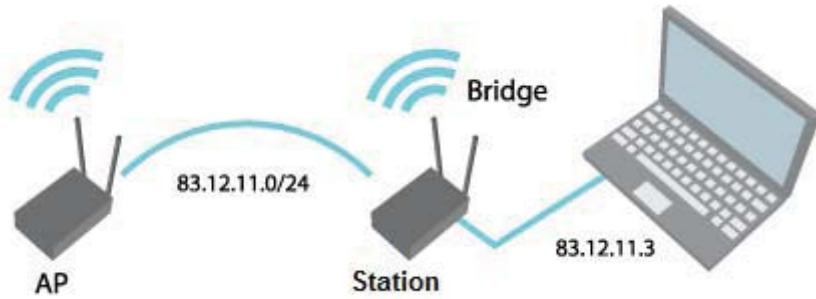

Figure 2 – Bridge Mode

With a Bridge, all connected computers are in the same network subnet. The only data that is allowed to cross the bridge is data that is being sent to a valid address on the other side of the bridge.

Router Mode

In router mode the device will receive internet through WAN port and will share it to the LAN ports that will be separated with a different IP range. The type of connection to the WAN interface can be made by Static IP, DHCP client or PPPoE client.
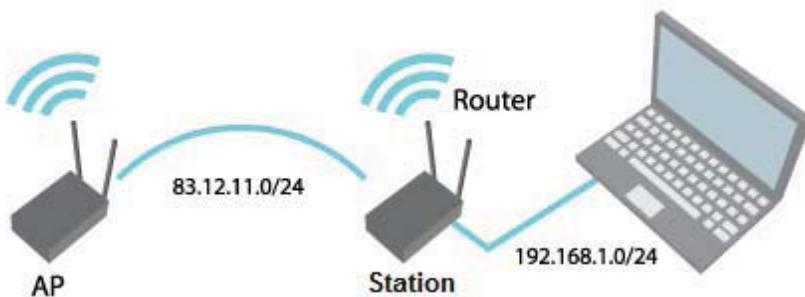

Figure 3 – Router Mode

When device operates in Router mode, the traffic coming on wired interface and going out on wireless interface can be masqueraded by enabling NAT. NAT allows a set of station's clients to invisibly access the Internet via the wireless station. To other clients on the Internet, all this outgoing traffic will appear to be from the APC device itself.

General Device Operation

Web Management Structure

The main webmanagement menu is displayed after successfully login into the system. From this menu all essential configuration pages are accessed.

By default the **Information** menu is activated where the main device information is displayed.

The APCwebmanagement menu has the following structure:

Status

    Information – displays general information and of the device.

Settings

    Wireless configuration – specify Operating mode (Station, Station WDS), country,SSID, IEEE mode, channel width (MHz), Tx power (dBm), security and advanced radio settings.

    Network configuration – to configure network mode, IP settings, management and data VLANs, DHCP.

    Services configuration:SNMP service settings allowing remote device monitoring.

    System configuration: specify device settings (friendly name, device location, contact information), choose system functions (backup, restore configuration, reboot, reset to factory defaults), work with users accounts (create, delete, edit).

Tools

    Site Survey – information about other wireless networks in the local area.

    Antenna alignment – measure received signal quality of the wireless link to align antenna in the best direction.

Support

    Troubleshooting–may be downloaded troubleshooting file.

Saving Configuration Changes

There are three general buttons located on the right top corner of the WEB GUIallowing managing device configuration:

    Save Changes – if pressed new configuration settings are applied instantly and written to the permanent memory.

FCC Caution

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received, including interference that may cause undesired operation.
2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE:
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 or more 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.

RF Exposure Warning Statement:

The device includes it's antenna must be installed to provide a separation distance of at least 50 cm

away from the user body.